56-1 One Report 2022

PTT Public Company Limited

Powering Life with Future Energy and Beyond

The key success for PTT in the future is to thrive amidst the rapid changes in the economy, society, and environment. We aim to

Step into future energy businesses and new beyond energy businesses

Transform work processes to cope with any challenges and opportunities

Enhance and strengthen businesses in all aspects

Contribute value to all stakeholders and drive inclusive growth in society and the environment for sustainability

The power of life towards the future together

Contents

Section 1
Business Operations and Performance

004 Vision, Mission and PTT Values
006 PTT Information
007 Financial Highlights
010 Milestone Achievement
016 Awards and Recognition
028 Message from the Board of Directors
032 Economic, Petroleum and Petrochemical Review and Outlook
041 1. Structure and Business Operations of PTT Group
122 2. Risk Management
134 3. Driving Business towards Sustainability
192 4. Management's Discussion and Analysis (MD&A)
224 5. General Information and Other Important Information

Section 2
Corporate Governance

229 6. Corporate Governance
258 7. Governance Structure and Key Data on the Board of Directors, Specific Committees, Management, Employees and Others
292 8. Corporate Governance Milestones
334 9. Internal Control and Connected Transaction

Section 3
Financial Report

366 Financial Report

Attachment

367 Attachment 1
Information of the Board of Directors, Executives, Controlling Persons and Company Secretary
442 Attachment 2
Details of Directors and Subsidiaries
444 Attachment 3
Detail of Head of the Office of Corporate Audit
445 Attachment 4
Business Assets and Details on Asset Valuation
445 Attachment 5
Corporate Governance, Ethical Standards and Code of Business Ethics Handbook of PTT Public Company Limited, including Authorities, Duties and Responsibilities of the Board and Duties and Responsibilities of Specific Committees of PTT Public Company Limited
445 Attachment 6
Report of the Audit Committee
446 About This Report
447 Assurance Report

VISION

Powering Life with
Future Energy and Beyond

MISSION

To conduct integrated energy
and petrochemical business
as the nation's energy company
whose mission to equally respond
to all stakeholders through
the following aspects

STAKEHOLDERS

To Public Sector

Ensuring long-term energy security by providing adequate high-quality energy supply at fair prices to support economic growth.

To Society and Communities

Maintaining an excellent corporate standing in Thai society by exercising environmental stewardship of internationally accepted standards, and helping to improve the quality of life for the community and the wider society.

To Investors

Operating commercial business that generates optimum returns and leads to sustainable growth.

To Customers

Ensuring customers' satisfaction and loyalty by delivering world-class quality products and services at fair prices.

To Suppliers and Partners

Conducting fair business practice with all partners while promoting trust, good relationship, and cooperation to expand business capability and increase efficiency in long-term business partnership.

To Directors and Employees

Promoting capability building professionally and ensuring that employees' well-being remains competitive with other leading companies.

STRATEGIC FRAMEWORK

Powering Life with Future Energy and Beyond

Target by 2030

1 BUSINESS GROWTH	2 NEW GROWTH	3 CLEAN GROWTH
LNG : 9 MTPA POWER (CONVENTIONAL) : 8 GW RENEWABLE ENERGY : 12 GW	PTT GROUP NET INCOME FROM FUTURE ENERGY AND BEYOND > 30%	15% GREENHOUSE GAS REDUCTION FROM 2020

Aspiration

POWERING THAILAND'S TRANSFORMATION by
PARTNERSHIP & PLATFORM · TECHNOLOGY FOR ALL · TRANSPARENCY & SUSTAINABILITY

Strategic Direction

CORE STRENGTHENING		FOUNDATION FOR GROWTH	
Resilience	Reenergize	Reimagination	Reform
Survive any crisis	Enhance competitiveness	Initiate businesses for the next normal	Enhance readiness
• Secure liquidity • Safety, Operation excellence • Synergy & optimization • Agile workforce • Risk & Crisis Management	• Create value along PTT Group value chain • Reinforce upstream & downstream • Reshape portfolio • Decarbonize towards Net Zero	• Accelerate growth through transition energy (LNG and power) • Generate Future Energy and Beyond business at speed and scale	• Transform organization & structure for regulatory and environment shift

Group Synergy - People - Finance - Communication

Mindset: Inside out + Outside in Values: SPIRIT

PTT VALUES

S	P	I	R	I	T
Synergy	Performance Excellence	Innovation	Responsibility for Society	Integrity & Ethics	Trust & Respect
Synchronize through partnership	Agile for excellence	Invent future growth through innovation	Reach sustainability with green economy and social care	Embed integrity & ethics to enhance good corporate citizenship	Tune-up trust through empowerment and respect

PTT Information

Name PTT Public Company Limited
Abbreviation PTT
Registered Number 0107544000108

Type of Business

The Company's operated businesses consist of natural gas, gas transmission, international trading, new business and infrastructure business; the rest are invested through subsidiaries joint arrangements and associates, and PTT Group, namely exploration and production, liquefied natural gas, petrochemical and refining, oil and retail, power and utilities, coal and service businesses.

Registered Capital

THB 28,562,996,250
comprising 28,562,996,250 ordinary shares
whose value is THB 1 per share (as of December 31, 2022)

Issued and Fully Paid-up Capital

THB 28,562,996,250
comprising 28,562,996,250 ordinary shares
whose value is THB 1 per share (as of December 31, 2022)

Head Office

555 Vibhavadi Rangsit Road, Chatuchak,
Bangkok 10900, Thailand
Telephone: 66 (0) 2537-2000
Fax: 66 (0) 2537-3498-9
Website: www.pttplc.com

Corporate Communications

Telephone: 66 (0) 2537-2150-1
Fax: 66 (0) 2537-2171
E-mail: pttcorporatecommu@pttplc.com

Investor Relations

Telephone: 66 (0) 2537-3518-9
Fax: 66 (0) 2537-3948
E-mail: ptt-ir@pttplc.com

Office of the President

Telephone: 66 (0) 2537-3855
Fax: 66 (0) 2537-3883, 66 (0) 2537-3887
E-mail: corporatesecretary@pttplc.com

References

- Securities Registrar
  Thailand Securities Depository Company Limited
  93, 14th Floor, The Stock Exchange of Thailand Building,
  Ratchadaphisek Road, Din Daeng, Din Daeng,
  Bangkok 10400, Thailand
  Telephone: 66 (0) 2009-9999
- Auditor
  EY Office Limited
  193/136-137, 33rd Floor, Lake Rajada Office Complex,
  Ratchadaphisek Road, Klong Toei, Klong Toei,
  Bangkok 10110, Thailand
  Telephone: 66 (0) 2264-9090
  Fax: 66 (0) 2264-0789
- THB Debentures Registrar
  Siam Commercial Bank Public Company Limited
  Registration 1, Markets Operations Division,
  15th Floor, North Wing, G Tower Grand Rama IX,
  9 Rama IX Road, Huai Khwang, Huai Khwang,
  Bangkok 10310, Thailand
  Telephone: 66 (0) 2128-2323-4,
  66 (0) 2128-2326-9, 66 (0) 2128-3540
  Fax: 66 (0) 2128-4625
  Bank of Ayudhya Public Company Limited
  Security Services Operations Department,
  AA Floor, 1222 Rama III Road, Bang Phongphang,
  Yan Nawa, Bangkok 10120, Thailand
  Telephone: 66 (0) 2296-2000 ext. 50604
  Fax: 66 (0) 2683-1302
- Legal Consultant for Debenture Issuance
  and Sales Offering
  Allen & Overy (Thailand) Company Limited
  23rd Floor, Sindhorn Tower III, 130-132 Wireless Road,
  Lumpini, Pathumwan, Bangkok 10330, Thailand
  Telephone: 66 (0) 2263-7600
  Fax: 66 (0) 2263-7699

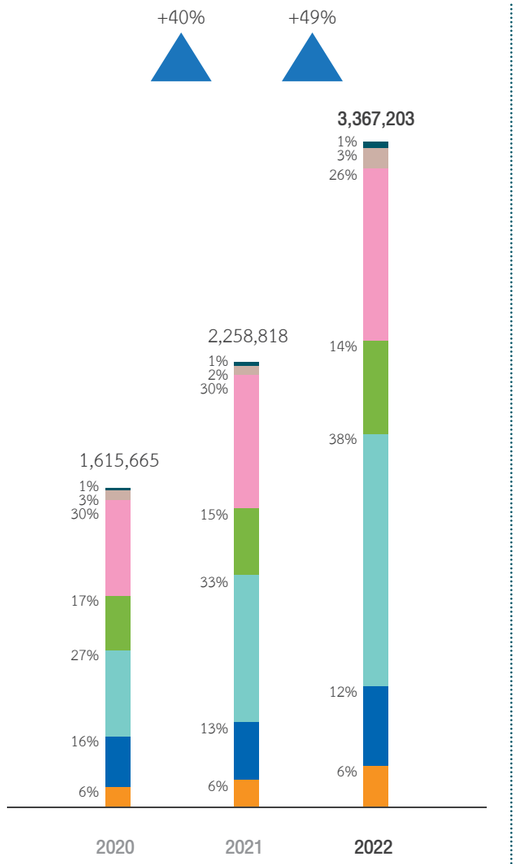
Financial Highlights

		2020	2021	2022
Statement of Income	(THB million)			
Sales and Service Revenue		1,615,665	2,258,818	3,367,203
Earnings before Interest, Taxes, Depreciation and Amortization (EBITDA)		225,672	427,956	491,288
Profit attribute to Equity Holders of the Company		37,766	108,363	91,175
Statement of Financial Position	(THB million)			
Total Assets		2,544,183	3,071,384	3,415,632
Total Liabilities		1,258,338	1,598,444	1,881,939
Non-controlling Interests of the Subsidiaries		403,805	466,244	481,102
Equity Attributable to Owners of the Company		882,040	1,006,696	1,052,591
Shares or Information about Common Shares				
Issued and Paid up Share Capital	(Million Shares)	28,563	28,563	28,563
Book Value per Share	(THB)	30.88	35.24	36.85
Earnings per Share	(THB)	1.32	3.79	3.20
Dividend per Share	(THB)	1.00	2.00	2.00
Dividend Payout Ratio	(%)	75.8	52.8	62.5
Share Price at the End of the Period	(THB)	42.50	38.00	33.25
Average Share Price for Full Year	(THB)	37.50	38.97	36.38

Financial Highlights

Sales and Service Revenue

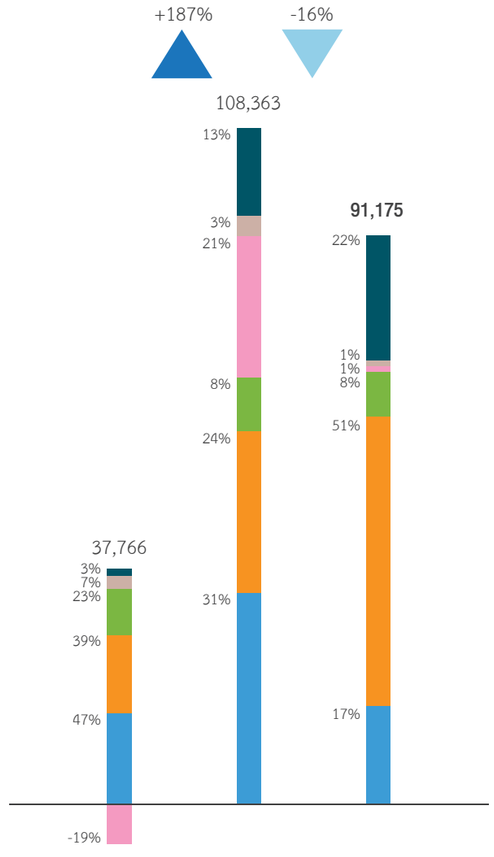
THB **3,367,203** million



Others[1/]
New Business and Infrastructure Business
Petrochemical and Refining Business
Oil and Retail Business
International Trading Business
Gas Business
Exploration and Production Business

Net Income

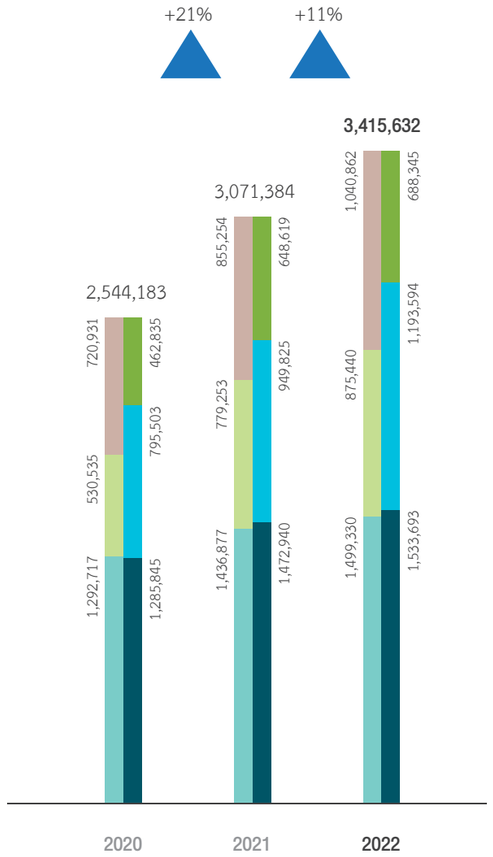
THB **91,175** million



Others Affiliates
New Business and Infrastructure Affiliates
Petrochemical and Refining Affiliates
Oil and Retail Affiliates
Exploration and Production Affiliates
PTT

Statement of Financial Position

THB **3,415,632** million



Current Asset
Other Non-current Asset
Net Property, Plant, and Equipment
Account Payable and Other Liabilities
Interest Bearing Debt (IBD)
Shareholder's Equity

Financial Ratios

Net Profit to Total Sales Revenue (%)	3.63
Return on Equity (%)	8.85
Return on Total Assets (%)	3.76
Debt to Equity (Times)	0.78
Net Debt[2/] to Equity (Times)	0.55
Net Debt[2/] to EBITDA (Times)	1.71
Interest Coverage (Times)	13.25

Remarks:
1/ Others such as coal business
2/ Net Debt = Interest Bearing Debt (IBD) - Cash and Cash Equivalents - Short-Term Investments in Financial Assets

Milestone Achievement

Toward clean energy businesses
Transition Fuel

COD LMPT2
PTT LNG Company Limited (PTTLNG) has commenced commercial operation of the LNG Map Ta Phut Terminal 2 (LMPT2), with capacity to handle 7.5 million tons per year of LNG, effective from November 24, 2022.

Supplied LNG for national energy security
PTT Global LNG Company Limited (PTTGL) has signed a 20-year sale and purchase agreement (SPA) for 1 million tons per annum (MTPA) of liquefied natural gas (LNG) with Corpus Christi Liquefaction LLC (CCL), a company in the Cheniere Energy Group and the first LNG delivery will be in 2026 to ensure the national energy security of Thailand.

Smooth Transition of G1/61 and G2/61 Project
PTT Exploration and Production Public Company Limited (PTTEP) successfully transitioned the operation of the Erawan gas field (G1/61) and Bongkot gas field (G2/61), and the process of receiving and distributing natural gas to customers has been running smoothly.

Procurement of 3.3-million-ton Spot LNG
PTT procured 53 cargoes of Spot LNG, totaling 3.3 million tons, to ensure the national energy security of Thailand.

Exit from the coal business
PTT International Holdings Limited (PTTIH) (a wholly owned subsidiary of PTT) has entered into a share purchase agreement of PTT Mining Limited (PTTML) with PT Astrindo Nusantara Infrastruktur Tbk (Astrindo).

Future Energy

Towards renewable energy
and electric vehicle businesses

EV Value Chain

Established
HORIZON PLUS Company Limited

To invest in Thailand's EV business. The goal is to produce and assemble 50,000 four-wheel EVs per year by 2024. An EV manufacturing factory is currently being built in Rojana Industrial Estate, Chon Buri province.

Established
NUOVO PLUS Company Limited

Focusing on conducting feasibility studies and supporting investment in the battery value chain to support the growth of the electric vehicle industry in accordance with Thailand's automotive industry policy, including the energy storage system from renewable energy and investment in related businesses.

Invested in Contemporary Amperex Technology Company Limited (CATL)

To operate the battery business for electric vehicles in ASEAN.

Energy Storage and Smart Energy Platform

Launched blockchain electricity trading system

Under the name "Renewable Energy Exchange (RENEX)" in collaboration with WHAUP - SERTIS to facilitate renewable power producers and purchasers in Peer-to-Peer Energy Trading Platform among entrepreneurs in industrial estates, with cooperation from Provincial Electricity Authority (PEA).

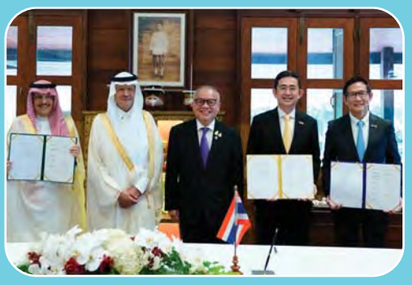
Hydrogen

Inaugurated Thailand's first hydrogen station

PTT in collaboration with PTT Oil and Retail Business Public Company Limited (OR), Bangkok Industrial Gas Company Limited (BIG), Toyota Daihatsu Engineering and Manufacturing Company Limited (TDEM), and Toyota Motor Thailand Company Limited (TMT) has launched a pilot hydrogen station for the first fuel cell electric vehicle in Thailand at Bang Lamung, Chon Buri province as part of a pilot study and future energy project development effort.

Sought opportunity in hydrogen business

PTT, ACWA Power Company Limited (ACWA Power), and the Electricity Generating Authority of Thailand (EGAT) have signed a memorandum of cooperation to jointly develop and invest in green hydrogen projects and related derivatives to promote the use of clean energy in Southeast Asia.



HYDROGEN

Beyond

Penetrate new business beyond energy,
drive new ventures,
and improve Thais' livelihood

Life Science

Pharmaceutical

Expanded the business to provide Thai people access to standard drugs at affordable prices

Innobic (Asia) Company Limited (Innobic (Asia)) has completed the cooperative investment with Aztiq HK Limited (Aztiq) to acquire all stakes in Alvogen Emerging Markets Holdings Limited (AEMH), a major shareholder in Lotus Pharmaceutical Company Limited (LOTUS). This acquisition makes Innobic (Asia) the largest shareholder of LOTUS and aims to enhance the country's access to quality generic drugs that meet international standards.

Entered into a comprehensive health products

Innobic (Asia) holds 20% of shares in Inter Pharma Public Company Limited to further the research and development of integrated health products.

Developed research on "RED-GEMs Molecule", an innovation against aging cells

Innobic (Asia) collaborated with Chulalongkorn University to extend the rehabilitation and prevention through genetic biology knowledge to support the country's strategy to be a comprehensive medical center and develop sustainable health industry.

Medical Device and Technology

Establish a non-woven fabric factory to elevate Thailand to a Medical Hub

Innopolymed Company Limited (Innopolymed) opened a non-woven fabric factory with a 5,600-ton-per-year production capacity at IRPC Industrial Zone in Rayong province.

Expand cooperation in production of medical equipment

Innobic (Asia) cooperated with Namwiwat Engineering (1992) Company Limited for the production and distribution of sterilized medical equipment to export and expand to the ASEAN market.

Nutrition

Opened alt.Eatery shop, the first plant-based food community in Bangkok

To become the center of Thailand's first sustainable future food, aligning with the concept of complete resource utilization and reducing its environmental impact.

Established Innobic Nutrition Company Limited

To support the investment and business of nutritional supplements and medical nutrition.

INNT
บริษัท อินโนบิก นูทริชั่น จำกัด
INNOBIC NUTRITION CO., Ltd.

Construct a plant-based protein production factory

Nutra Regenerative Protein Company Limited (NRPT) formed a joint venture with Plant & Bean (UK) to create Plant & Bean (Thailand) and establish a plant-based protein factory.

Logistics and Infrastructure

Established Global Multimodal Logistics Company Limited (GML)

To operate logistics business focusing on connecting both domestic and international transportation networks. The core services offered include freight services via rail, sea, land and air, cold chain management, property management and asset rental related to logistics business.

GML

AI, Robotics and Digitalization

Shareholding restructuring and capital increase of Mekha Technology Company Limited (Mekha Tech) and name change to Mekha V Company Limited (Mekha V)

To be a flagship for investment in AI & Robotics business.

MEKHAV

Awards
and Recognition

PTT focuses on operating sustainable business sectors in all, aiming for a three-dimensional balance:

Environmental

Environmental management aiming to strike a balance between business growth and efficient resource consumption.

Social

Social management applies PTT Group's expertise, innovation, and collaboration in creating model communities of wisdom and expanding nationwide in support of the well-being of people and communities in a sustainable manner.

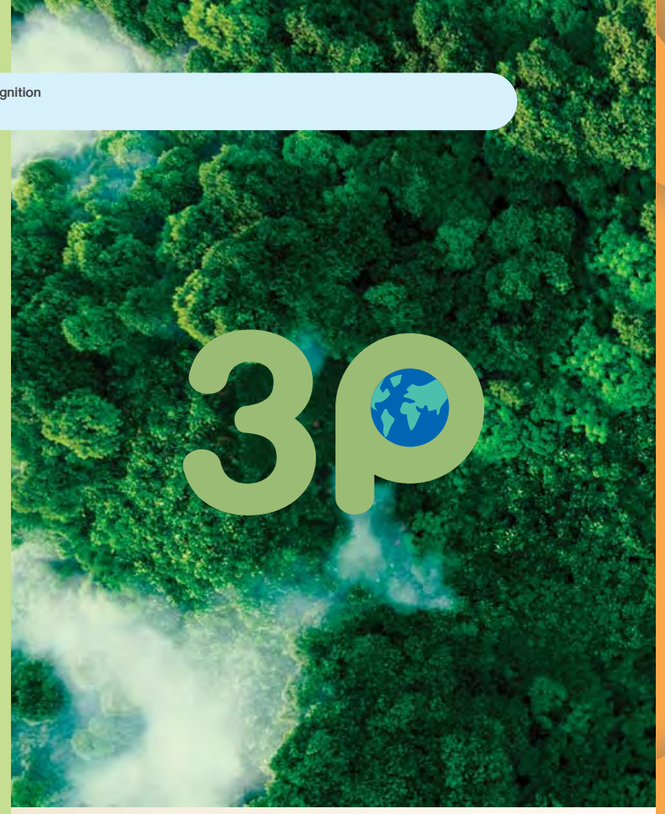
Governance

Conducting business under good governance principles.

In 2022,
PTT garnered domestic and international awards, prestigious rankings, and certifications from a total of

23 entities / **48** awards

Environmental



PTT Metro Forest Learning Center received an honorary award from the TGDA 2022.

Thailand Green Design Awards 2022 (TGDA) in the category of inspiration, environmental consideration, enhancement of quality of life and social contribution reinforces the operation of “PTT Metro Forest Learning Center” by PTT Reforestation and Ecosystems Institute.

- **Awarded**
  September 14, 2022
- **Awarded by**
  Kasetsart Agricultural and Agro-Industrial Product Improvement Institute, Kasetsart University

PTT was awarded the Low Carbon and Sustainable Business Assessment and Rating Project: (LCSB) for 2022 at an excellent level.

This reflects PTT’s commitment to conducting business with sustainable social and environmental responsibility to achieve the goals of carbon neutrality in 2040 and Net Zero Emissions in 2050 through the 3Ps strategy, namely Pursuit of Lower Emissions to drive PTT Group’s greenhouse gas emissions reduction projects; Portfolio Transformation, adjustment of investment plans to the future energy business and beyond and Partnership with Nature and Society , the cooperation with the public sectors and communities that plant terrestrial and mangrove forests to increase green areas and naturally capture carbon dioxide. PTT is committed to business development along with taking care of all stakeholders, driving Thailand towards a low-carbon society with stability and sustainability.

- **Awarded**
  September 20, 2022
- **Awarded by**
  Thailand Greenhouse Gas Management Organization (Public Organization)

Social

PTT received the “Golden Heart Organization” Award, honoring PTT contribution in public works, helping society fight against COVID-19.

The Golden Heart Award honors and praises organizations with outstanding tangible achievements and contributions to public charities, care for the elderly, dependent persons, and the underprivileged in disaster relief during the COVID-19 situation.

- **Awarded**
  March 31, 2022
- **Awarded by**
  Health and Elderly Establishment Confederation

PTT received a plaque of honor for the Workation Thailand project, “Work From Everywhere” at Gold level.

From an outstanding contribution to Thai’s tourism industry.

- **Awarded**
  February 2022
- **Awarded by**
  Ministry of Tourism and Sports by Tourism Authority of Thailand (TAT)

PTT Group received an honorary award under “Zero Accident Campaign 2022”.

Rayong Gas Separation Plant received a Platinum class award.

- **Awarded**
  June 2022
- **Awarded by**
  Thailand Institute of Occupational Safety and Health (Public Organization)

PTT received the State Excellence Awards 2022 in Public Service Category of Service Innovation.

The Upstream & Gas Business Group received the State Excellence Award 2022 in Public Service Category of Service Innovation under the project "LNG Innovation for NGV Users During Crisis"

- **Awarded**
  September 5, 2022
- **Awarded by**
  Office of the Public Sector Development Commission (OPDC)

PTT won the Outstanding Role Model Organization Human Rights Award 2022 in the State Enterprise sector.

Mr. Somsak Thepsutin, Minister of Justice, awarded the Outstanding Role Model Organization Human Rights Award 2022 in the State Enterprise sector to PTT for 2nd consecutive year. This highest award from the Rights and Liberties Protection Department, Ministry of Justice is granted as PTT is committed to conducting business under good corporate governance, compliance with international human rights principles, equality promotion, and integration in the operations to drive the organization along with continuously and sustainably creating shared value for all stakeholders.

- **Awarded**
  September 20, 2022
- **Awarded by**
  Rights and Liberties Protection Department, Ministry of Justice

PTT received the Outstanding Industry Award 2022 in Social Responsibility, reflecting operational excellence and continuous support for government policies.

This valuable award encourages the industrial business operators who have perseverance in creating things that are beneficial to Thailand's industrial development. Most recently, the engineering knowledge of cooling system has been applied to convert gas from the production process to cultivate winter crops namely Akihime strawberries with the all-year-round harvests at the smart greenhouse at the Princess Maha Chakri Sirindhorn Herbal Garden, which is an extension of knowledge in agriculture, engineering and planting technology to farmers in Rayong province.

- **Awarded**
  October 5, 2022
- **Awarded by**
  Ministry of Industry

Governance

PTT received Thailand Top Company Award 2022 in the energy industry category.

This award was given to the best Thai business organizations with excellent performance and adaptability through the COVID-19 situation and the constantly changing world situation.

- **Awarded**
  May 26, 2022
- **Awarded by**
  Business+ Magazine in collaboration with the University of the Thai Chamber of Commerce

PTT received the Outstanding Organization Award from King Prajadhipok's Institute Association.

His Excellency Chuan Leekpai, President of the National Assembly, presented a plaque of honor "Outstanding Organization Association of King Prajadhipok's Institute" for 2022 to Mr. Auttapol Rerkpiboon, President & CEO at the event "September 5, King Prajadhipok Institute's Society" in honor of organizations and alumni who made contributions to this country with their outstanding achievements as an outstanding organization and outstanding alumni of King Prajadhipok Institute's Society on the founding day of the Society.

- **Awarded**
  July 1, 2022
- **Awarded by**
  King Prajadhipok Institute's Society

PTT won the Asia Pacific Enterprise Awards 2022.

PTT received 3 Asia Pacific Enterprise Awards 2022 (APEA 2022):

1. Mr. Auttapol Rerkpiboon:
   The Master Entrepreneur Award,
2. Miss Pannalin Mahawongtikul:
   The Inspirational Brand Award, and
3. Mr. Suchat Ramarch:
   The Corporate Excellence Award.

- **Awarded**
  July 1, 2022
- **Awarded by**
  Asia Pacific Enterprise Awards (APEA)

PTT received Thailand Cybersecurity Excellence Awards 2022.

- **Awarded**
  August 15, 2022
- **Awarded by**
  National Cyber Security Agency (NCSA)

PTT received Excellent CG Scoring from the Corporate Governance Report of Thai Listed Company 2022: CGR 2022.

PTT received Excellent CG Scoring or scoring of 5 for the 14th consecutive year and is one of the Top Quartile of listed companies with market value of not less than THB 10,000 million.

- **Awarded**
  October 27, 2022
- **Awarded by**
  The Stock Exchange of Thailand and the Thai Institute of Directors Association (IOD)

PTT received 3 Thailand Corporate Excellence Awards 2022, reaffirming its management excellence.

General Prayut Chan-o-cha, Prime Minister, awarded 3 Thailand Corporate Excellence Awards 2022 to PTT as an organization with excellent management:

1. Finance Management Excellence Award,
2. Leadership Excellence Award,
3. Sustainable Development Excellence Award.

This demonstrates commitment to operational efficiency as well as giving importance to the development of organizational management, and continually strengthening business potential to increase competitiveness, ready to be an important force in driving the Thai economy and society to grow steadily and sustainably.

- **Awarded**
  November 24, 2022
- **Awarded by**
  Thailand Management Association (TMA) in collaboration with Sasin Graduate Institute of Business Administration of Chulalongkorn University

PTT won APQC's Excellence in Knowledge Management 2022.

Reiterating excellence in knowledge management.

- **Awarded**
  December 2022
- **Awarded by**
  American Productivity and Quality Center (APQC), USA

PTT received 6 Asian Excellence Awards 2022 (12th Asian Excellence Award).

An international award given to individuals or organizations that sustainably conduct business with good governance, provide excellent community, society, and environmental care.

Individual awards:

1. Asia's Best CEO Award: Mr. Auttapol Rerkpiboon
2. Asia's Best CFO Award: Miss Pannalin Mahawongtikul
3. Best Investor Relations Professional Award: Mr. Tanapon Prapapan

Organizational awards:

1. Asia's Best CSR Award
2. Best Investor Relations Company Award
3. Best Environmental Responsibility Award

- **Awarded**
  December 5, 2022
- **Awarded by**
  Corporate Governance Asia Magazine

CEO won "CEO of the Year 2022" Award from Krungthep Turakij for 2nd consecutive years.

Mr. Auttapol Rerkpiboon, President & CEO, received the "CEO of the Year 2022" or "Best CEO 2022" Award from Krungthep Turakij Editorial team for his capability to transform the energy business towards sustainability, amid the challenges of COVID-19.

- **Awarded**
  December 30, 2022
- **Awarded by**
  Editorial team of Krungthep Turakij

Awards from Leading Institutions

PTT recieved S&P Global Sustainability Award 2022 in Silver Class.

- **Awarded**
  February 2022
- **Awarded by**
  S&P Global

PTT received 4 regional awards from the Institutional Investor Magazine.

1. Mr. Auttapol Rerkpiboon: Best CEO Award in the Oil and Gas Business (including Chemical) in Asia (ex-Japan)
2. Miss Pannalin Mahawongtikul: Best CFO Award of Rest of Asia (ex-China and Japan)

PTT was listed in the Most Honored Company in the Oil and Gas Business categrory (including Chemicals). Also, PTT received Best IR Program Award and Best ESG Award

- **Awarded**
  June 23, 2022
- **Awarded by**
  Institutional Investor Magazine

PTT received the highest sustainability award and the Best Innovation Award for the 2nd consecutive year from the SET Awards 2022.

PTT received 2 SET Awards 2022 organized by the Securities Exchange of Thailand in collaboration with Money and Banking Magazine.

1. Sustainability Awards of Honor and
2. Best Innovative Company Awards from "PTT EV Charger and Charging Platform"
   This illustrates PTT's commitment to driving sustainable business operations, developing innovation for better lives.

PTT was also listed on the Thailand Sustainability Investment (THSI) 2022.

- **Awarded**
  October 28, 2022
- **Awarded by**
  The Stock Exchange of Thailand in collaboration with Money and Banking Magazine

PTT was selected as a member of Dow Jones Sustainability Indices (DJSI) for the 11th consecutive year, moving forward to the power of future energy.

PTT was selected as a DJSI member for the 11th consecutive year in the World Index group and Emerging Market Index group. Also, it was listed among the leader organization in the Oil & Gas Upstream & Integrated (OGX). This achievement reflects PTT's sustainable development approach through its strategic direction in line with the changing global contexts, especially climate change, biodiversity, and ecological services in sustainable business operations by focusing on growth in the clean energy business group and new businesses beyond energy to align with the behavior of today's consumers whilst continuously taking care of society, communities and the environment, which is regarded PTT's main mission.

- **Awarded**
  December 10, 2022
- **Awarded by**
  S&P Global

2021 Awards
Announced or Awarded in 2022

CEO of the Year Award 2021

Mr. Auttapol Rerkpiboon, President & CEO, received the “CEO of the Year 2021” or “Best CEO” award from the editorial team of Krungthep Turakij, selected from leaders who have contributed to drive the country through changes at the event Nation Dinner Talk: Thailand Future 2022.

- **Awarded**
  March 28, 2022
- **Awarded by**
  Editorial team of Krungthep Turakij

Bangkok Post CEO of the Year 2021 Award, the Best Leader in Thai Organizations

Mr. Auttapol Rerkpiboon, President & CEO, received the Bangkok Post CEO of the Year 2021 Award, which was selected by the committee and readers of the Bangkok Post newspaper, from Mr. Soonruth Bunyamanee, editor of the Bangkok Post. The award is given to the corporate leaders who are leading their companies with far-reaching visions, and strategic excellence, adjusting the operating model to be in line with the changing situation, and ready to sustainably drive the organization and the Thai economy.

- **Awarded**
  July 2022
- **Awarded by**
  Bangkok Post Newspaper

PTT was honored with 7 State Enterprise Awards (SOE Awards) in 2021.

For its contribution to navigate the country through crisis with efficient management and good governance adherence, fostering national capability and improving people’s quality of life via innovation and creativity, as well as a commitment to environmental sustainability and stewardship:

1. Excellent State Enterprise Award 2021
2. Outstanding Board of Directors Award (Honorable Acclaim)
3. Outstanding Organizational Management Award
4. Outstanding Information Disclosure and Transparency Award
5. Outstanding Social and Environmental Implementation Award
6. Outstanding Creativity and Innovation Award (Creativity Category)
7. Outstanding Creativity and Innovation Award (Innovation Category)

- **Awarded**
  January 31, 2022
- **Awarded by**
  State Enterprise Policy Office (SEPO)

PTT received the Deal of the Year Award at the ThaiBMA Best Bond Awards 2021.

This award recognizes the most outstanding private equity issuance transaction in every aspect with a widely accepted achievement in 2021.

- **Awarded**
  March 30, 2022
- **Awarded by**
  The Thai Bond Market Association

PTT won 3 ASEAN CG Scorecard Awards 2021.

PTT received 3 ASEAN CG Scorecard Awards 2021 as follows:

1. ASEAN Asset Class PLCs Award for listed companies with 75% scores or 97.50 points or more,
2. ASEAN Top 20 PLCs Award for listed companies with the highest score in the top 20 in ASEAN,
3. Country Top 3 PLCs Award for the top 3 listed companies in Thailand.

- **Awarded**
  December 1, 2022
- **Awarded by**
  ASEAN Capital Markets Forum (ACMF) and Asian Development Bank (ADB)

Message from the Board of Directors

The year 2022 witnessed the recovery from the COVID-19 pandemic and the return to normalcy as many countries eased COVID-19 control measures; the service sector, particularly tourism, has begun to regain. As a result, the world economy grew by 3.4% from 6.2% in 2021. The Thai economy expanded at 2.6% from 1.5% in 2021. The average Dubai oil price soared to USD 96.3 per barrel from USD 69.2 per barrel in 2021 as oil demand set off to recover in line with the global economy and concerns over tight oil supply.

Under a dedicated operation amid the crisis, PTT's total revenue was THB 3.37 trillion in 2022, with a net profit of THB 91,175 million, or 3% of total revenue, of which PTT's businesses accounted for 58% and PTT Group 42%. PTT has focused on operating according to strategic directions to generate business results, in line with the vision of "Powering Life with Future Energy and Beyond." The purpose of the organization is to create growth by conducting business while also improving the quality of life of people, culture, way of life, society, and environment (Powering Life) and Strategic Positioning by focusing on the energy business of the future and grow in new businesses beyond energy (Future Energy and Beyond). To measure success in achieving the vision, PTT has set long-term goals for 2030, consisting of Business Growth - expanding growth in the potential energy business, New Growth - growing in the future energy business and other potential businesses beyond energy, and Clean Growth - driving the reduction of greenhouse gas emissions for the entire PTT Group.

Enhance Competitiveness, Expand Growth in Current Businesses

PTT remains committed to strengthening national energy security in the face of global geopolitical uncertainty. The gas business will be critical in the transition to clean energy. PTT Global LNG Company Limited (PTTGL) has been restructured to become a flagship company in the liquefied natural gas (LNG) business and has signed an LNG sale and purchase agreement (SPA) with Corpus Christi Liquefaction LLC (CCL), a company in the Cheniere Energy Group, to supply PTT with 1 MTPA of LNG over a 20-year period, beginning in 2026. Furthermore, PTT LNG Company Limited (PTTLNG) completed the development of the LNG Map Ta Phut Terminal 2 project, which has already begun commercial operations, to accommodate LNG imports in line with demand, strengthen the country's energy security in the long run, and promote Thailand to become an ASEAN LNG Regional Hub. PTT Exploration and Production Public Company Limited (PTTEP) successfully transitioned the operation of the Erawan gas field (G1/61) and Bongkot gas field (G2/61) from the previous concessionaire, with the operation completed in order and the process of receiving and distributing natural gas to customers running smoothly.

Business growth
New growth
Clean growth

Powering Life with Future Energy and Beyond

Focus on Future Energy Businesses and Grow in New Businesses Beyond Energy

PTT has set a long-term goal of investing and increasing the proportion of profits from future energy and beyond energy businesses to not less than 30% by 2030. In regards to the future energy businesses, PTT prioritizes investments in the clean energy supply chain, beginning with renewable power generation, energy storage technology, electric vehicle business, and offering innovative energy solutions for consumers. Global Renewable Synergy Company Limited (GRSC) under Global Power Synergy Public Company Limited (GPSC), PTT Group's power generation flagship, has increased its investment in Avaada Energy Private Limited (Avaada), a renewable energy company in India, and expanded solar energy production capacity to 1,990 MW by the end of 2022. As for the electric vehicle (EV) business, PTT by ARUN PLUS Company Limited (ARUN PLUS) and Lin Yin International Investment Company Limited (Lin Yin), a company in the Foxconn Technology Group, jointly established HORIZON PLUS Company Limited (HORIZON PLUS) to invest in Thailand's EV business. The goal is to produce and assemble 50,000 four-wheel EVs per year by 2024. An EV manufacturing factory is currently being built in Rojana Industrial Estate, Chon Buri province. PTT has also partnered with Central Pattana Public Company Limited to expand its EV charging station service. At the moment, its service has been expanded to over 450 parking spaces in major shopping centers across the country.

PTT also invests in other potential businesses such as life science, where Innobic (Asia) Company Limited (Innobic (Asia)) has acquired shares and become the No. 1 major shareholder of Lotus Pharmaceutical Company Limited (LOTUS), a global pharmaceutical company, to enhance readiness and increase the country's ability to access quality generic drugs that meet international standards. Furthermore, PTT has developed research on RED-GEMs molecules, an anti-aging innovation, in collaboration with Chulalongkorn University. In the nutrition business, Plant & Bean (Thailand), a joint venture with Plant & Bean (UK), was established to build a plant-based protein factory and alt.Eatery was opened as Bangkok's first plant-based food community. In the medical equipment business, PTT joined hands with Namwiwat Engineering (1992) Company Limited to produce and distribute sterilized medical equipment. For logistics business, Global Multimodal Logistics Company Limited (GML) was established to focus on connecting both domestic and international transportation networks such as rail, sea, land, and air, as well as cold storage management, property management and asset rental. Additionally, PTT Global Chemical Public Company Limited (GC) is investing in the High-Value Business (HVB) to expand into high-value products, and PTT Oil and Retail Business Public Company Limited (OR) is investing in lifestyle businesses, including retail, food, and various service businesses, to meet lifestyle and future consumer needs.

Net Zero Emissions by 2050

PTT aims to drive Thailand towards a low-carbon society by managing and reducing greenhouse gas emissions (Scopes 1 and 2 covering both domestic and international business operations) by 15% by 2030, compared to 2020 greenhouse gas emissions, while aiming for Carbon Neutrality by 2040 and achieving the Net Zero Emissions goal by 2050, which is faster than Thailand's Net Zero Emissions target of 2065. This challenging target would support Thailand's decarbonization effort by bringing down the country's average emissions, helping to reduce global warming, and promoting environmental sustainability. PTT has defined 3P guidelines as an operational framework to achieve the goals, which are as follows:

Pursuit of Lower Emissions: Accelerate energy efficiency enhancements in production processes such as the debottlenecking project of the Benfield Unit at the Gas Separation Plant Units 5 and 6, Carbon Capture Storage (CCS), and Carbon Capture Utilization (CCU). PTTEP is the first company to study and develop the CCS project in Thailand at the Arthit Field, which is expected to reduce greenhouse gas emissions by approximately 1.0 million tons of carbon dioxide equivalent per year.

Portfolio Transformation: Accelerate the transformation towards an environmentally friendly business by focusing on the future energy business and expanding into new businesses beyond energy. This year, PTT completed the share purchase agreement of PTT Mining Limited (PTTML) with PT Astrindo Nusantara Infrastruktur Tbk to exit the coal business, which is in line with the corporate strategic direction of moving more towards clean energy.

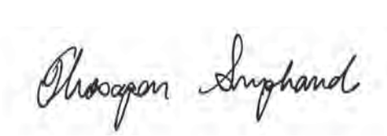
Partnership with Nature and Society: Accelerate an additional 1 million rai of forests plantation to increase greenhouse gas absorption. PTT Group has set a target of planting terrestrial and mangrove forests on an additional 2 million rai by 2030. These forest areas have the potential to absorb more than 4.15 million tons of carbon dioxide per year in the future.

Power Every Life, Brave through Crisis, Move Thailand Forward

PTT is committed to being the driving force for every life according to the organization's purpose. During Thailand's COVID-19 pandemic, PTT Group fought the disease alongside the Thai people, providing assistance through the projects "Giving Breath Project" and "Giving Chance for the Youth Project", as well as assisting over 30,000 people affected by natural disasters. Furthermore, for the 2nd year in a row, PTT has helped stimulate the economy through the Restart Thailand project, which create jobs, generate income, improve skills, create career stability for the next generation, and improve Thai people's quality of life by employing over 23,000 new graduates and the unemployed. In addition PTT has played a critical role in maintaining national energy security during the time of energy crisis by supplying 4-million-barrel crude to increase reserves, making a special contribution to the Oil Fund to help alleviate the cost of fuel and electricity for the people, freezing the NGV retail price, and providing a discount on LPG purchase to low-income people who work as hawkers or food stalls through the state welfare card. The total amount of assistance in 2022 is more than THB 24,000 million.

Strategic implementation within the sustainability framework, transparent operations with corporate governance and auditability made PTT earned the Outstanding State Enterprise Award 2021 and others, with a total of 7 SOE awards from the State Enterprise Policy Office, a member of the Dow Jones Sustainability Indices (DJSI) for the 11th consecutive year. PTT received the Silver Class S&P Global Sustainability Award, and Excellent CG Scoring of the Corporate Governance Report of Thai Listed Company (CGR) for the 14th consecutive year, with a combined total of 48 awards from 23 institutions.

On behalf of the PTT Board of Directors and management, we would like to thank all stakeholders for their continued trust and support of PTT's aspiration to be "Powering Life with Future Energy and Beyond" as stipulated in our vision.



Professor Dr. Thosaporn Sirisumphand
Chairman

Mr. Auttapol Rerkpiboon
President and CEO

Economic, Petroleum and Petrochemical Review and Outlook

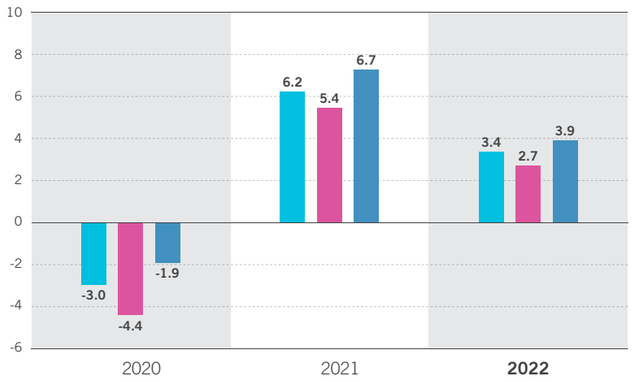
1. 2022 in Review

1.1 World Economy

The overall global economy grew at a slower pace in 2022 than the previous year, owing to a slowdown in major economies, namely the United States, the Eurozone, and China, as a result of key central banks tightening monetary policy to stem unprecedentedly high inflation, the protracted Russia-Ukraine war causing an energy crisis in Europe, frequent lockdowns under a zero COVID-19 policy and a real estate crisis in China. The International Monetary Fund (IMF) estimated global economic growth in 2022 at 3.4%, down from 6.2% in 2021. (Figure 1)

Figure 1

Global Economic Growth 2020 - 2022



Unit: % YoY
Sources: IMF as of January 2023

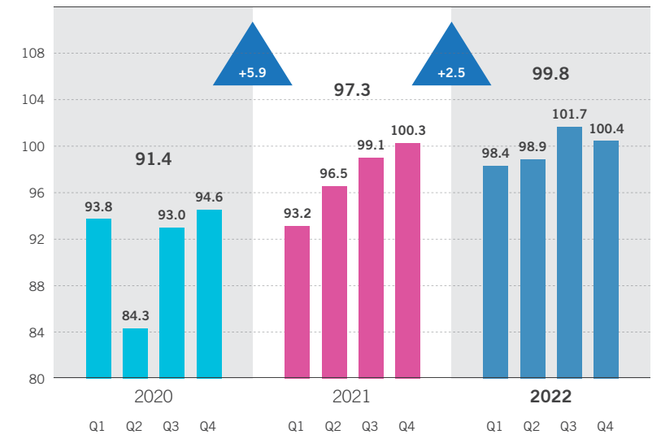
- World
- Advanced Economies (including US and Eurozone)
- Emerging Market and Developing Economies (including China)

1.2 Global Petroleum and Petrochemical Industries

According to S&P Global estimates as of January 2023, world oil demand in 2022 was 99.8 million barrels per day, up 2.5 million barrels per day from and a smaller increase than 2021 due to a slowing global economy and extremely high oil prices. (Figure 2)

Figure 2

World Oil Demand 2020 - 2022



Unit: Million Barrels/Day
Source: S&P Global as of January 2023

Outlook

Rising world oil demand, together with concerns about disruptions to Russian crude oil supply as a result of sanctions over Russian aggression against Ukraine, and OPEC+ cautiously increasing production to pre-COVID-19 levels before production reduction in the fourth quarter of 2022 due to concerns about global economic recovery, all contributed to a significant increase in Dubai crude prices in 2022, averaging USD 96.3 per barrel, up from USD 69.2 per barrel in 2021. (Figure 3)

As for the prices of refined petroleum products in 2022, the price of gasoline 95 octane averaged USD 115.2 per barrel, rising in tandem with crude oil prices and increased travel, particularly during the US summer, as well as concerns about low inventories, resulting in an increase in gasoline crack spreads. Diesel price averaged USD 130.6 per barrel in 2022, rising in tandem with crude oil prices, reduced Russia's diesel exports to Europe due to the war, refinery yield shifts towards more jet fuel in response to market demand, and a switch to diesel for power generation in the face of extremely high natural gas prices. As a result, diesel crack spreads increased significantly. Despite a drag from Russia's fuel oil exports to Asia, the price of high sulfur fuel oil 3.5%S (HSFO 3.5%S) in 2022 averaged USD 82.3 per barrel, rising in line with crude oil prices. High sulfur fuel oil crack spreads thus significantly lowered.

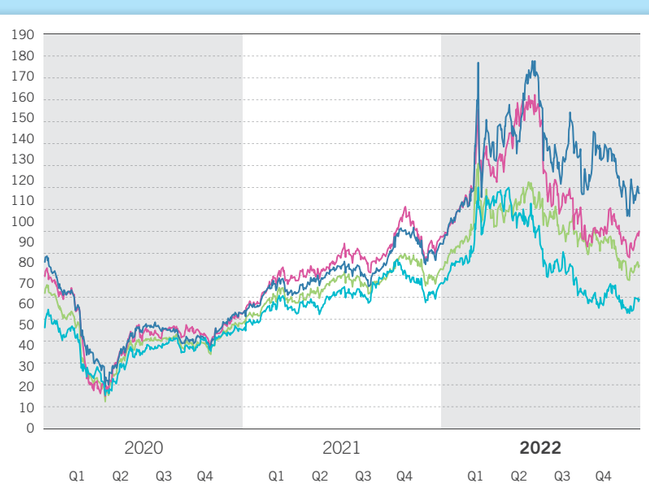
The Singapore cracking margin against Dubai crude in 2022 averaged USD 10.7 per barrel versus USD 3.4 per barrel in 2021.

Figure 3

Dubai and Petroleum Products Prices 2020 - 2022

Unit: USD/Barrel
Source: Reuters

	2020	2021	2022
Dubai	42.2	69.2	96.3
Gasoline 95 Octane	46.6	80.3	115.2
Diesel	48.3	76.0	130.6
Fuel Oil 3.5%S	39.2	64.4	82.3



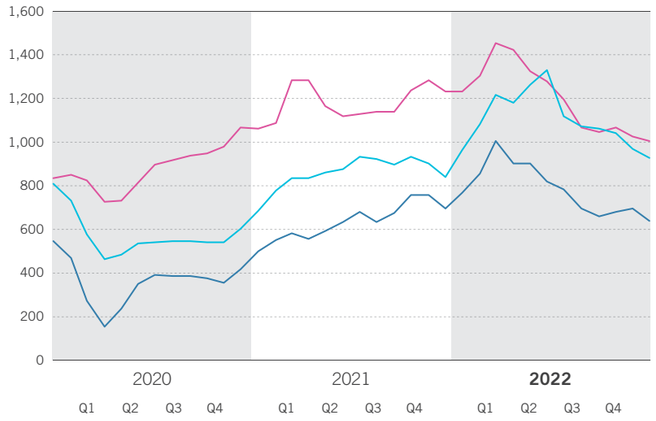
In 2022, the price of high density polyethylene (HDPE) averaged USD 1,203 per ton, rising in line with crude oil and naphtha prices, despite mean reversion in demand from downstream packaging and hygiene products, resulting in a significant decrease in naphtha-to-HDPE spreads. Paraxylene (PX) price in 2022 averaged USD 1,103 per ton, rising in line with crude oil and naphtha prices. This was further supported by several PX producers in Asia cutting production due to previous low profits, as well as the increased use of PX as a gasoline octane booster. The naphtha-to-PX spreads thus increased significantly. (Figure 4)

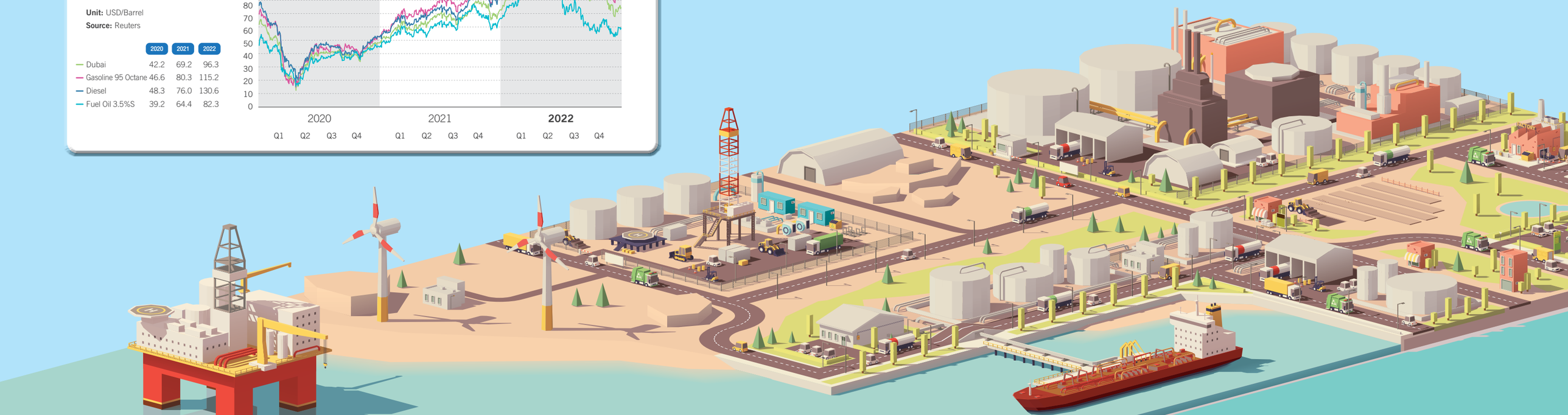
Figure 4

Prices of Petrochemical Products in Asia Market 2020 - 2022

Unit: USD/Ton
Sources: ICIS/ Platts

	2020	2021	2022
High Density Polyethylene	879	1,182	1,203
Paraxylene	577	859	1,103
Naphtha	362	635	785



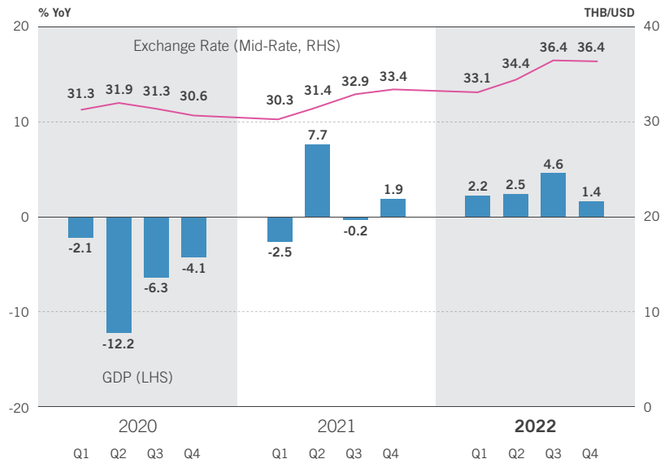


1.3 Thai Economy

The Thai economy recovered better in 2022 as a result of the tourism sector's recovery after the world gradually relaxed international travel restrictions, Thailand's return to accepting foreign tourists by canceling the Test & Go measure on May 1, 2022, and the Thailand Pass system on July 1, 2022. Private consumption and investment improved as the pandemic subsided amid high inflation and the Bank of Thailand's policy rate hikes. Meanwhile, merchandise exports grew at a slower rate, reflecting the economic slowdown of trading partners. Given the reduced fiscal space, the government's economic stimulus measures were more targeted. The Office of the National Economic and Social Development Council (NESDC) reported the growth rate of the Thai economy in 2022 at 2.6%, up from 1.5% in 2021. The Thai baht in 2022 averaged THB 35.1 per USD, weakened by a stronger USD amid rising demand for safe-haven assets. (Figure 5)

Figure 5

Thai Economic Growth 2020 - 2022



Source: Office of the National Economic and Social Development Council (NESDC)

	2020	2021	2022
GDP (% YoY)	-6.1	1.5	2.6
Exchange Rate (Mid-Rate, THB/USD)	31.3	32.0	35.1

1.4 Thailand Petroleum Industry

In 2022, Thailand's commercial primary energy consumption (excluding renewable energy) was 2.0 million barrels per day, down 0.1% from the previous year (Figure 6). Oil consumption increased by 14.9%, while natural gas consumption decreased by 9.6% due to the decline in natural gas production from the Erawan field. In addition, there was an increase in oil imports for power generation in place of high-priced Spot LNG imports.

Thailand's refined oil consumption increased by 14.5% in 2022 (Figure 7), with gasoline up 3.9%, diesel up 15.7%, liquefied petroleum gas (LPG) up 7.1%, and fuel oil up 15.7%. Economic factors and increased travel boosted demand for all four product groups. In addition, higher Spot LNG prices lifted the use of diesel base oil and fuel oil for power generation, as well as the rapidly increasing use of LPG in the industrial sector to replace liquefied natural gas (LNG). Jet fuel consumption rose by 87.7% owing to the relaxation of entry restrictions since the third quarter, resulting in increased international travel.

Figure 6

Thailand's Primary Commercial Energy Consumption 2020 - 2022

Unit: MBOED
Source: Energy Policy and Planning Office

Hydro/ Imported Power
Coal/ Lignite
Oil
Natural Gas

Remark:
Excluding renewables energy

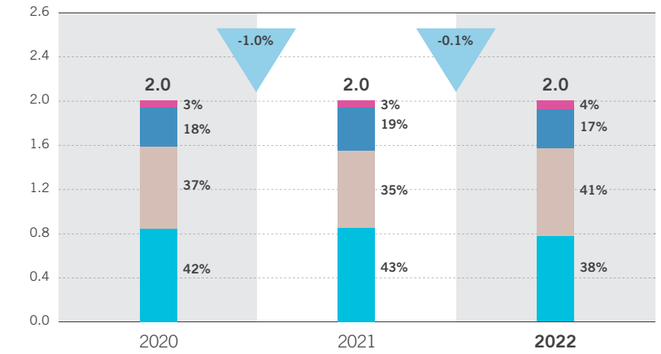


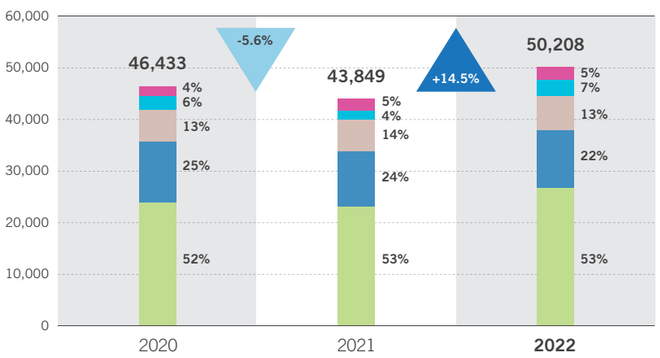
Figure 7

Thailand's Refined Petroleum Product Consumption 2020 - 2022

Unit: Million liters
Source: Department of Energy Business

Fuel Oil
Jet/ IK
LPG*
Gasoline
Diesel

Remark:
** Excluding LPG used as Feedstock in Petrochemical Industries*

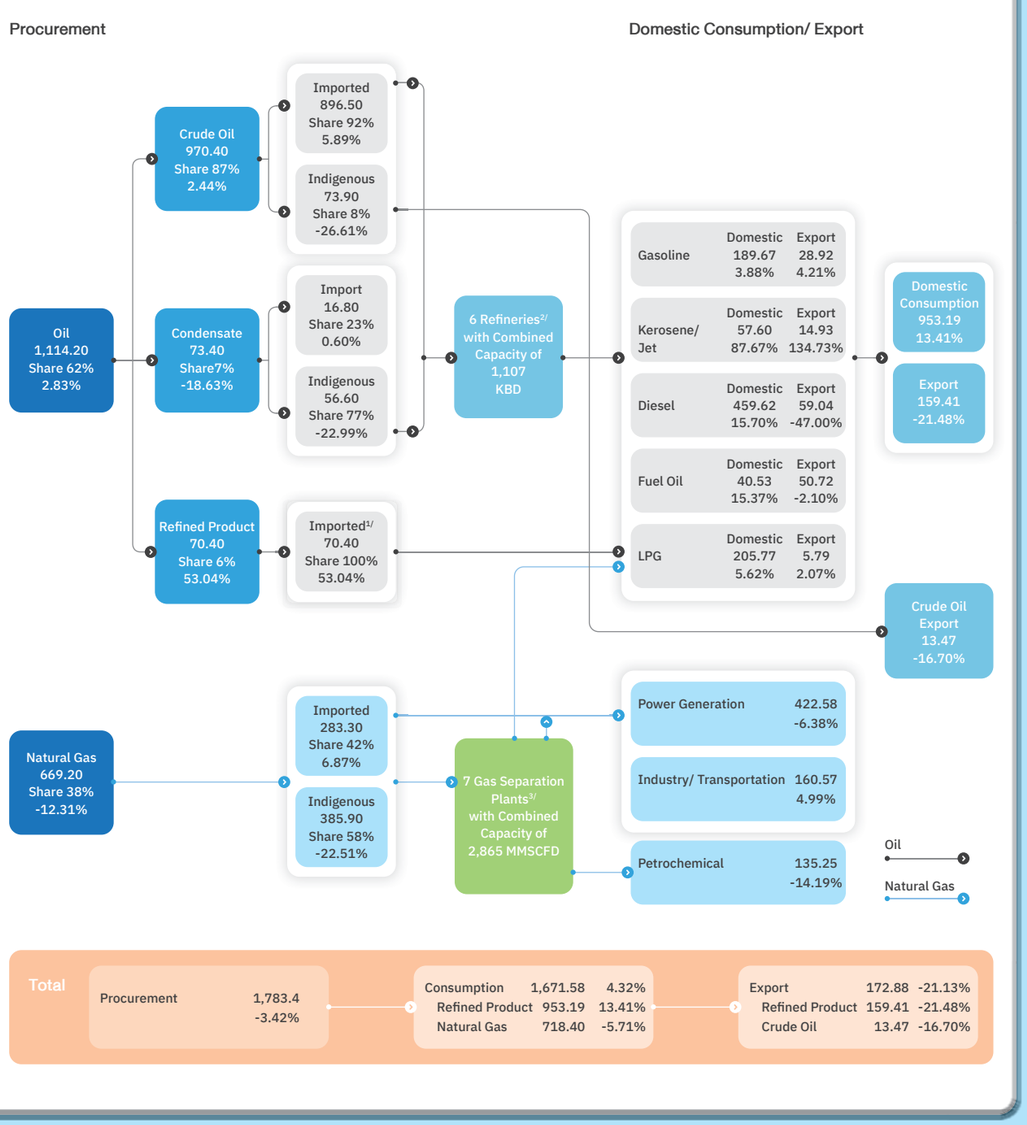


Thailand's petroleum balance in 2022 was up from 2021 due to increased energy demand following COVID-19, with petroleum procurement totaling 1,783.4 thousand barrels per day (KBD), down 3.42% from 2021 (Figure 8). Oil and natural gas procurement accounted for 62% and 38%, respectively. 92% of crude oil and 42% of natural gas were imported. Domestic consumption totaled 1,671.58 KBD, up 4.32% from 2021, with refined oil products accounting for 57% and natural gas 43%, whereas petroleum product exports totaled 172.88 KBD, down 21.13% from 2021, due to a decrease in domestic crude oil production for export, combined with rising domestic demand. As a result, petroleum product exports fell.

Figure 8

Thailand Petroleum Balance 2022

Unit: KBD



Source: *Energy Policy and Planning Office, Department of Energy Business, Department of Mineral Fuels, and PTT*

Notes:

(1) Including LPG

(2) Capacity includes those of BCP, ESSO, IRPC, PTTGC, SPRC, TOP and excludes PTTGC's condensate splitters & Fang refinery.

(3) Capacity includes those of PTT/GSP 1 - 6, PTT/ESP and PTTEP Siam/Phalang Phet. The Petroleum Procurement and Domestic Consumption/ Export exclude bitumen.

2. 2023 Outlook

2.1 Global Economic Outlook

The global economy is expected to expand at a slower pace in 2023, owing to rising interest rates, particularly in the United States and the Eurozone, to curb the still high (but slowly falling) inflation, as well as the Russia-Ukraine war, which shows no signs of abating. The cancellation of China's zero COVID-19 policy and the country's reopening on January 8, 2023, are expected to aid the global economic recovery. The IMF as of January 2023 forecasted 2.9% global economic growth in 2023.

2.2 Global Petroleum and Petrochemical Industry Outlook

According to S&P Global in February 2023, world oil demand is projected to increase 2.2 million barrels per day to 102 million barrels per day in 2023, as the global economy continues to recover amid China's reopening. An increase in world oil demand, together with OPEC+ supply curb, will be among factors supporting crude oil prices in 2023. However, crude oil prices are expected to settle lower in 2023 on receding supply fears, amid Russian crude oil exports pivoting to Asia and therefore a limited effect of sanctions so far. The Dubai crude prices are expected to average USD 82 - 87 per barrel in 2023. Whereas, the Singapore cracking margin against Dubai crude oil is expected to average USD 8.0 - 9.0 per barrel, down from a remarkably high base.

Overall petrochemical prices in 2023 are expected to fall from 2022 on lower costs of crude oil and naphtha, as well as new supply from Asia gradually entering the market both as planned and delayed from 2022. While high inflation and rising interest rates are expected to dampen consumer purchasing power. HDPE price is expected to average USD 1,060 - 1,210 per ton in 2023 and PX price USD 990 - 1,100 per ton.

2.3 Thailand Economic Outlook

The Thai economy in 2023 is expected to accelerate from 2022, amid better tourism prospects, particularly the return of Chinese tourists following China removal of COVID-19 quarantine for inbound travelers starting January 8, 2023, which should help boost private consumption and investment. Meanwhile, the continuous progress of major public infrastructure investment projects will continue to support growth. However, factors to closely monitor include major trading partners' economic outlook, financial market volatility, and domestic political instability. The NESDC in February 2023 forecasted the growth rate of the Thai economy in 2023 at 3.2%. As for the Thai baht, analysts foresee an appreciation in 2023, in line with the USD depreciation, as concerns about the global economy ease and the tourism sector recovers, allowing Thailand's current account balance to return to a surplus, with exchange rate between the Thai baht and US dollar averaging THB 32.3 - 33.3 per USD.

2.4 Thailand Petroleum Industry Outlook

Thailand's energy consumption in 2023 is likely to improve from 2022 due to the declining concern about the COVID-19 infection, which will result in increased energy demand for personal travel and commercial transportation. However, energy consumption is not expected to return to pre-COVID-19 levels in 2019 as the number of tourists is still recovering and adjusting to normal conditions.

Section

1

Business Operations and Performance

1. Structure and Business Operations of PTT Group
2. Risk Management
3. Driving Business towards Sustainability
4. Management's Discussion and Analysis (MD&A)
5. General Information and Other Important Information

Perfor

1. Structure and Business Operations of PTT Group

1.1 Business Policy and Overview

Background

The Petroleum Authority of Thailand (PTT) was established on December 29, 1978 according to the Petroleum of Thailand Act B.E. 2521 principally to operate petroleum and related businesses. However, amidst an intense competition environment, Government recognized the necessity of the private sector's participation in the energy business. The Cabinet resolution on August 21, 2001 approved a corporatization plan of the Petroleum Authority of Thailand, and on September 25, 2001 approved the corporatization under the State Enterprise Corporatization Act B.E. 2542 to establish PTT Plc. by converting capital of the Petroleum Authority of Thailand into capital stock. It is mandated the state holds at least 51% share in PTT and for PTT to remain the national oil company. After the Civil administration reform, PTT was placed under the supervision of the Ministry of Energy.

On October 1, 2001, the Petroleum Authority of Thailand became PTT Plc. under the State Enterprise Corporatization Act with initial registered capital of THB 20,000 million divided into 2,000 million ordinary shares at par value of THB 10, with the Ministry of Finance as the sole shareholder.[1/] Subsequently shares were offered to the public and institutional investors and then traded in The Stock Exchange of Thailand on December 6, 2001. The Finance Ministry remained a majority shareholder, and PTT's status remains that of a state enterprise regulated by the Ministry of Energy to this day. (On April 24, 2018 PTT split the par value from THB 10 to THB 1, resulting in a total number of common share 28,562.9 million, and registered capital of THB 28,562.9 million.) From its corporatization date, the Petroleum Authority of Thailand transferred it's businesses, rights, debts, liabilities, assets, and staff to PTT to enable PTT to operate seamlessly and efficiently. Through the State Enterprise Corporatization Act, a Royal Decree was gazette determining that PTT Plc. maintains the authority, rights, and benefits entitled to the Petroleum Authority of Thailand under the Petroleum Authority of Thailand Act B.E. 2521, with the provision that such authority, rights, and benefits entitlement end upon PTT's state enterprise status are dissolved according to the Budget Procedures Act. A separate Royal Decree was gazetted on the timeframe of revocation of the Petroleum Authority of Thailand Act B.E. 2544 resulting in the end of the law. Then on February 16, 2007, a Royal Decree was gazetted to determine the authority, rights, and benefits of PTT Plc. (Second Edition) in B.E. 2550. Substantively this Decree withheld or limited certain authority, rights, and benefits entitled to PTT under the Petroleum Authority of Thailand Act, and determine the authority, rights, and benefits of PTT such as exploration demarcation of petroleum transmission pipeline zone, planning of petroleum transmission pipeline, southward, northward, or passing through lands owned by any individuals, etc., according to the PTT Act to fall under the supervision of a committee regulating the company.

As the Energy Business Act B.E. 2550 become effective on December 11, 2007, PTT as an energy operator is regulated by the Energy Regulatory Commission, with PTT licenses to operate in the natural gas business. Licenses held by PTT include licenses for natural gas transmission through gas pipeline, natural gas supply and marketing, natural gas retail sale through distribution pipeline network, and the power business which consists of power generation for its own consumption at Gas Separation Plants in Rayong province and Khanom, and at natural gas control stations.

1.1.1 Vision, Strategy, and Business Direction of PTT Group

PTT commits to generates economic growth, enhancing Thailand's competitiveness, and developing society and people's well-being. With innovations and technology, we are the driving force in transitioning people, society, community, and environment forward, in line with our vision of "Powering Life with Future Energy and Beyond." Our mission is to equally respond to all stakeholders, the country, society, shareholders, clients, business partners, and our workforce. We promote the core value called SPIRIT: S for Synergy; P for Performance Excellence; I for Innovation, R for Responsibility for Society, I for Integrity & Ethics, and T for Trust & Respect. In order to achieve our long-term target according to the new vision, PTT set the following three goals by 2030:

1. Business Growth: Expanding energy business with a growth potential of 9 million tons per annum in LNG portfolio; 8 GW of conventional power and a total of 12 GW of renewable energy production capacity.

2. New Growth: Growth in future energy business and other businesses beyond energy, generating more than 30% of total net profit.

1/ PTT is exempted under the State Enterprise Corporatization Act B.E. 2542, from enforcement of provisions in the Public Company Act, on status and corporatization.

3. Clean Growth: 15% Greenhouse Gas emissions reduction compared to 2020's emissions. Moreover, PTT targets to achieve Carbon Neutrality within 2040, and Net Zero Emissions within 2050.

In attaining the goals outlined in the vision, PTT has the laid out operational principles called "PTT by PTT" which guides every aspect of business, through a business approach of forging "Partnership and Platform", where business means more than production and distribution. PTT will develop the platform business model through forming the partnership and collaborating with expertise from overseas, alongside collaboration with Thai state enterprises, the public sector, entrepreneurs, and SMEs. We will blend technology with knowhow, innovation, and digitalization in every aspect of work, "Technology for All". And we will conduct business with "Transparency and Sustainability", in consideration of Environment, Social and Governance including actions to reduce GHG emissions, including carbon sequestration through forestation schemes, and investment in clean energy business.

In addition, to strengthen the competitiveness of current businesses, while creating new business growth in response to the global economic recovery, PTT has adjusted our 4R operational strategies as follows:

1. Resilience: Create flexibility in order to operate business continually, maintain liquidity, create safety and operation excellence, promote synergy and optimization of existing assets, and encourage employees to be agile and prepared to cope with changing business situations, and also give precedence to risk and crisis management.

2. Reenergize: Strengthen the competitiveness of the existing business, create added value throughout the supply chain from upstream to downstream, adjust the portfolio to support the transition from hydrocarbon energy, and reduce carbon emissions from existing business operations.

3. Reimagination: Business expansion to accommodate changes that will become the Next Normal, including energy businesses that are likely continue to expand, consisting of liquefied natural gas and power businesses including accelerating the development and expansion of new business models beyond the hydrocarbon business, both future energy and other businesses beyond energy.

4. Reform: Restructuring or Re-design new business approaches to align with future trends, with the resilience to cope with any unforeseen challenges.

1.1.2 Major Development of the Past Three Years

January

January 16, 2020:
PTT's Board passed a resolution to establish PTT International Trading USA Inc. (PTTT USA), a wholly owned subsidiary of PTT in the USA with an initial registered capital of USD 5,000. The objective of PTTT USA's establishment is to operate the international trading business, strengthen national energy security as well as expand PTT's trading network globally. In this regard, PTTT USA completed its registration on April 2, 2020.

January 16, 2020:
PTT's Board approved the five-year (2020 - 2024) investment plan of PTT and its wholly-owned subsidiaries in an aggregate amount of THB 180,814 million. The investment plans focus on core businesses mainly in the Gas Business Group such as the capacity expansion of Liquefied Natural Gas (LNG) receiving terminal and the domestic and international expansion in oil and retail businesses. Additionally, PTT set provisional capital expenditure for the next 5 years amounting to THB 203,583 million to enhance added value and synergy among PTT Group from core businesses' expertise as well as new investments in energy businesses in line with the national development plan, technology disruption, consumer behaviors, and clean energy trends.

February

February 25, 2020:
PTT conducted a test on LNG transmission using a new model called "ISO-Container", a gas transportation mode by truck and marine vessel to China. The test is the cooperation with Liaoning Yuzhuo Energy to study the feasibility of exporting LNG from Laem Chabang Deepsea Port in Chon Buri province to China to promote Thailand to be a regional LNG hub.

February 27, 2020:
PTT announced the deregistration of Sakari Royal Ltd., a subsidiary of Sakari Resources Ltd. (SAR). SAR is a subsidiary of PTT Global Management Ltd. (PTTGM), PTT's wholly-owned subsidiary. Sakari Royal Ltd. was established for investment in coal mining development projects in Cambodia. However, after the exploration of the coal development project, the project was not feasible to further invest which align with PTT's strategy of closing down non-operating companies. The deregistration of Sakari Royal Ltd. did not affect PTT's business operation.

February 27, 2020:
PTT entered into an LNG sale and purchase agreement with five companies: Thai Special Gas Co., Ltd., LNG Link Co., Ltd., Cryo Thai Co., Ltd., Scan Inter Plc. and The Gas Carrier Co., Ltd. Transport will rely on semi-trailers or ISO container vehicles to receive LNG from the receiving terminal at Map Ta Phut, Rayong province, and transport it to gas customers in the domestic industrial sector. It wouldalso enhance opportunities to expand LNG customer base to promote Thailand to be a regional LNG hub in line with the National Energy Reformation Plan.

February 28, 2020:
PTT established PTT Raise Co., Ltd. (PTT RAISE) to provide robotics & AI solutions. The company is a joint venture of PTT and Mitsui & Co., Ltd. in which PTT owns 50% interest via PTTGM.

March

March 3, 2020:
PTT registered Alpha Com Co., Ltd. (Alpha Com), a subsidiary of Siam Management Holding Co., Ltd. (SMH), a subsidiary of PTTGM (a PTT subsidiary). The company was established to support various investments of PTT and PTT Group in new businesses under the New S-Curve strategy, with an initial registered capital of THB 3 million. Alpha Com thus became a PTT subsidiary.

March 6, 2020:
PTT and Banpu Plc. signed an MOU for business cooperation on the study of natural gas and LNG business opportunities. The collaboration will bring out the expertise or strength of each party to run a business with a 1 - 2 year study timeframe. The first Steering Committee meeting was convened on March 17, 2020 to define a joint operation direction.

March 19, 2020:
CEPA reviewed the LPG price by reducing the Ex-Refinery LPG prices from THB 17.1795 per kg. to THB 14.3758 per kg. resulting in the lower retail price of a standard 15 kg. LPG cylinder from THB 363 per cylinder to THB 318 per cylinder, decreased by THB 45 per cylinder for 3 months (March 24, 2020 - June 23, 2020) in order to alleviate public suffering from economic situation and impact of COVID-19 on June 17, 2020. Furthermore, on September 17, 2020, CEPA decided to extend the reduction of LPG price for another 3 months. Consequently, the wholesale price was capped at THB 14.3758 per kg. until December 31, 2020. However, the price adjustment had no impact on PTT's performance as LPG domestic selling prices of GSP were referenced to import parity. If the selling prices were higher or lower than the GSP cost, PTT's GSP margin would be limited to USD ±1 per ton. The difference of USD ±1 per ton from GSP's cost would be subsidized from or consigned to the LPG fund.

March 25, 2020:
CEPA decided to reduce the retail price of the Natural Gas for Vehicles (NGV) to alleviate public suffering from the economic situation and impact of COVID-19. NGV prices for public transportation thus lower by THB 3 per kg., from THB 13.62 per kg. to THB 10.62 per kg. for 3 months (April 1, 2020 - June 30, 2020). Later, on June 18, 2020, PTT's Board approved the extension of NGV price reduction for public transportation at THB 10.62 per kg. for another month (July 1 - 31, 2020) and proposed to the government to consider alternative ways of support, such as requesting public service subsidies. However, PTT's Board approved another extension of NGV price reduction for public transportation at THB 13.62 per kg until December 31, 2020 (price does not include local maintenance tax in Bangkok and perimeter) or until the retail price of NGV decreases lower than THB 13.62 to support the cost of fuel for public bus operators affected by the slowing economy from the spread of the COVID-19 and alleviate the suffering of the people.

March 30, 2020:
PTT's Board approved the interim dividend payment for the 2H2019 performance instead of the annual dividend payment at the rate of THB 1.10 per share, which was paid on April 24, 2020. Besides, PTT paid an interim dividend for the first half of 2019 (1H2019) performance at the rate of THB 0.90 per share. Therefore, the total dividend payment for 2019 performance was THB 2 per share, and no annual dividend payment for 2019 performance is to be further proposed by the Board.

May

May 12, 2020:

PTT in collaboration with EGAT signed an MOU on a feasibility study on the investment and development of infrastructure to support LNG import or LNG receiving facilities in the South of Thailand. The study was to support the government policy and strategy on the power development plan (PDP 2018), which consists of the Khanom Power Plant of Electricity Generating Plc. with a capacity of 930 MW, Surat Thani Power Plant Units 1 - 2 with a combined capacity of 1,400 MW (to supply electricity to the grid (COD) in 2027 and 2029) and New Power Plant (COD in 2035) with a capacity of 700 MW. The joint feasibility study on LNG receiving facilities aimed to support the import of LNG.

May 15, 2020:

PTT signed a Commercial Partnership Agreement with Sharge for EV charger service outside service stations. The debut of the service was at True Digital Park (July 10, 2020), followed by the second service outlet at BITEC Bangna (July 30, 2020).

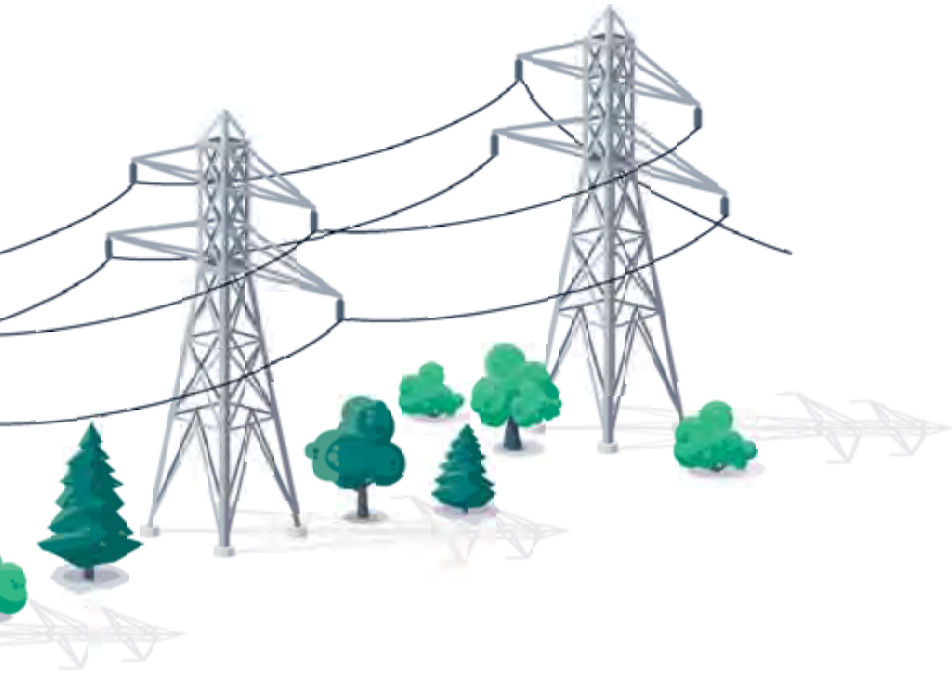
June

June 19, 2020:

PTT signed a Gas Sales Agreement (Global DCQ) with EGAT to strengthen national energy security. The agreement covered the distribution of natural gas to five EGAT plants, namely Bangpakong Power Plant, North Bangkok Power Plant, South Bangkok Power Plant, Wang Noi Power Plant, and Chana Power Plant, with a 10-year term starting from July 1, 2020 to the end of July 2030, to ensure energy security.

June 24, 2020:

PTT's Board approved the extension of LPG price discount for low-income people, shops, street vendors, and food stalls that were eligible for the state welfare card at THB 100 per person per month until December 2020.



July

PTT completed fund raising from the issuance of debentures in an approximate total amount of THB 57 billion. The debenture issuance is under the 2020 PTT 's MTN Program worth THB 64 billion approved by SEC together with the Global Medium Term Note Program to be issued in the US currency worth up to USD 2 billion, detailed as follows:

July 2, 2020:
PTT issued the unsubordinated and unsecured debentures No. 1/2020 in an amount of THB 20 billion at a fixed interest rate of 1.21% - 3.74% per annum with a tenor of 2 - 25 years to the institutional investors and/or high net worth investors.

July 16, 2020:
PTT Treasury Center Co., Ltd. (PTT TCC), a wholly-owned subsidiary of PTT, issued USD Senior Unsecured Notes to offshore investors in an amount of USD 700 million for the tenor of 50 years at the fixed interest rate of 3.70% per annum with unconditional and irrevocable guaranteed by PTT. The net proceeds from the issuance of the Notes will be used to on-lend to PTT by PTT TCC.

July 24, 2020:
PTT issued the unsubordinated and unsecured green debenture No. 1/2020 in an amount of THB 2 billion with a tenor of 3 years, and at a fixed interest rate of 2.25% per annum. PTT also issued the unsubordinated and unsecured debenture No. 2/2020 in an amount of THB 13 billion with a tenor of 7 years at a fixed interest rate of 2.85% per annum to the general public.

August

August 11, 2020:
Alpha Com Co., Ltd. (Alpha Com), a subsidiary of PTT, approved the establishment of Swap and Go Co., Ltd. (Swap and Go) with the registered capital of not exceeding THB 30 million (An initial registered capital not exceeding THB 1 million) to invest in the battery business for electric vehicles according to PTT's New S-Curve investment strategies.

August 20, 2020:
PTT's Board approved the shareholding restructure in the power business, consisting of PTT's purchase of TOP's entire shareholding in GPSC's common shares, and the entire business transfer of Thaioil Power Co., Ltd. (TP) (TP is a subsidiary of PTT and TOP with the 26% and 74% stakeholding respectively) from PTT to TOP.

September

September 17, 2020:

PTT's Board approved the interim dividend payment for 1H2020 performance to shareholders at the rate of THB 0.18 per share or 50% of the net profit of consolidated financial statements. The total dividend paid was THB 5.142 billion. The record date for eligible shareholders was October 1, 2020 and the payment date was October 16, 2020.

October

October 6, 2020:

PTT Group initiated a pilot project on the installation of a 100-KW floating solar generation system in Rayong province, located along the coast, therefore a suitable site. The floating solar panels were made of special-grade polymers that were safe for the environment and marine life but could reduce barnacles. GPSC, PTT Group's power flagship, commissioned CHPP, a GPSC subsidiary, to design and install the system. The electricity generated in the initial phase will be used by office buildings and will be a model for further R&D of new energy business models.

October 12, 2020:

PTT signed an MOU for collaboration with the Port Authority of Thailand in studying the efficiency enhancement of container transport in the Laem Chabang Port and the Eastern Economic Corridor (EEC) zone, which is the national logistics strategic point. In addition, the project was expected to reduce road impacts from heavy traffic as well as reduce carbon emissions along the Map Ta Phut - Laem Chabang route.

October 27, 2020:

PTT Group signed an MOU on Project One to boost competitiveness and sustainable growth. Project One employed an asset-backed trading model by synergizing the expertise and diverse assets of each company. This would create added value for PTT Group, leading to sustainable business growth and strengthening Thailand's energy security and national competitiveness.

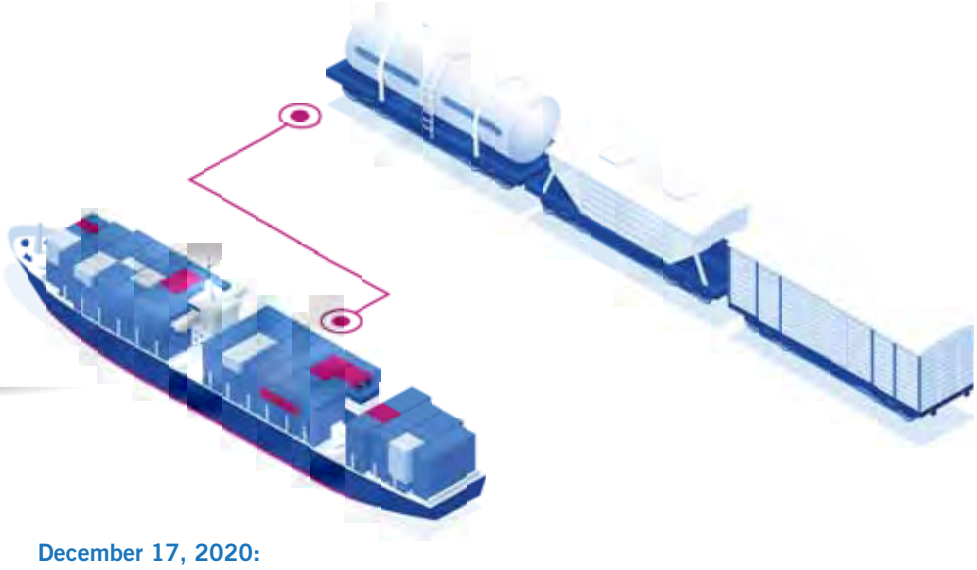
November

November 3, 2020:

HRH Princess Maha Chakri Sirindhorn graciously presided over the inauguration of the Intelligence Operation Center (IOC), located on the Eastern Economic Corridor of Innovation Area (EECi), Wangchan Valley, Rayong province.

November 18, 2020:

PTT's Board approved the purchase of shares in Global Renewable Power Co., Ltd. (GRP), a wholly owned subsidiary of GPSC, accounting for 50% of total shares, by PTT Global Management Co., Ltd. (PTTGM), a PTT subsidiary. The deal worth THB 693 million was another step in promoting greater cooperation under the stakeholder-centric of Powering Thailand's Transformation initiative and forming an operational network among PTT Group. This is in line with PTT Group's strategy to be the leader in the renewable energy or clean energy business. It also supported PTT Group's goal of reaching 8,000-MW renewable power generation capacity by 2030. In addition, the cooperation will synergize the forces of experienced and skilled personnel in renewable energy from PTT and GPSC, which will increase efficiency and enhance competitiveness, which would ultimately lead to sustainable energy development.



December

December 15, 2020:
PTT signed a Gas Product Sale and Purchase Agreement with SCG Chemical Co., Ltd. for petrochemical feedstock to maximize the benefit of natural resources, increase business opportunities and competitive edge, and strengthen the business partnership of the two organizations.

December 16, 2020:
PTT and Thailand Greenhouse Gas Management Organization (Public Organization) jointly signed an MOU on the collaboration to reduce GHG emissions and sequestration. The collaboration aimed to enhance the effectiveness of cooperation to certify the carbon credit of Thailand through the integration of expertise and knowledge of these two organizations and technical exchange on innovation and technology to drive actions in line with the policy on climate change, both domestically and internationally.

December 17, 2020:
PTT's Board approved the five-year (2021 - 2025) investment plan of PTT and its wholly owned subsidiaries in an aggregate amount of THB 179,072 million. PTT's investment plan still focuses on core businesses mainly in the Gas business group i.e. the Gas Separation Plant (GSP) unit 7 to replace GSP unit 1, the 5th pipeline, the Liquefied Natural Gas (LNG) receiving terminal 2 (Nong Fab), and Map Ta Phut Industrial Port Development Phase 3.

Additionally, PTT set provisional capital expenditure for the next 5 years amounting to THB 331,524 million to create added value and synergy among PTT Group from core businesses' expertise i.e. the Southern LNG terminal project and gas pipeline project which are subject to the Power Development Plan 2018 (PDP 2018), the investment in LNG Value Chain both in Thailand and overseas, the Gas to Power project, and the investment in the potential growth businesses which are aligned with the change of New Normal and New Ecosystem Business Model in line with government policy and global trends i.e. EV Value Chain project, the investment in Life Science (Pharmaceutical, Nutrition, and Medical Equipment). The provisional capital expenditure included investment in renewable energy and clean energy to achieve PTT Group's 8,000-MW renewable energy power generation target within the year 2030 according to our strategic plan to be a leader in the renewable energy business.

December 17, 2020:
PTT's Board passed a resolution to dissolve 3 subsidiaries in the coal business which are subsidiaries of SAR (SAR is a subsidiary of PTTGM and PTTGM is a wholly-owned subsidiary of PTT) including Reyka Wahana Digdjaya Pte. Ltd., Sakari Energy Pte. Ltd., and PT. Tri Tunggal Lestari Bersama. This is aligned with PTT's strategy in closing down the dormant companies, which have already been completed.

December 22, 2020:
PTT established Innobic LL Holding Co., Ltd. (INBL) (wholly owned by Innobic (Asia), a PTT subsidiary). The objective is to be one of PTT's arm for investment in international pharmaceutical business to align with PTT's new business strategy and to enhance PTT's capabilities in the Life Science business with a registered capital approximate of THB 2 billion.

January

January 1, 2021:
The retail price of NGV for public vehicles was adjusted to be similar to the retail price of private vehicles. Consequently, NGV retail price for all vehicles will be based on a cost-plus pricing structure.

January 8, 2021:
Mekha Technology Co., Ltd. (Mekha Tech) was established by Alpha Com Co., Ltd. (Alpha Com), PTT's wholly-owned subsidiary with a registered capital of THB 30 million. The objective of the company is to invest in the business of Public Cloud which provides various types of information system services via the Internet, including data storage, data processing, and data management to companies, organizations as well as PTT Group, which is aligned with PTT's investment strategy in Digitalization.

February

February 18, 2021:
Alpha Com completed the establishment of On-I on Solutions Co., Ltd. (On-I on Solutions) (Later changed the name to ARUN PLUS Co., Ltd. (ARUN PLUS), a wholly owned subsidiary of Alpha Com, with the registered capital of THB 30 million, later increased to THB 5,000 million). The company will be responsible for operating the EV Value Chain business in line with the New S-Curve strategy to support PTT's expansion in the EV business.

February 21, 2021:
PTT completed the establishment of PTT MEA Ltd. in the United Arab Emirates, which is wholly owned by PTT International Trading Pte. Ltd. (PTTT) (a subsidiary of PTT), with a registered capital of USD 1.5 million. The objective is to operate the international trading business, especially in the Middle East and Asia region.

February 25, 2021:
The Central Administrative Court rendered a judgment to dismiss the case that the Ombudsman filed a lawsuit against the Ministry of Finance and others, totaling 11 parties, including PTT. The complaint alleged that the separation and transfer of assets according to the Supreme Administrative Court did not comply with the Cabinet's Resolution on December 18, 2007. Consequently, the Central Administrative Court rendered a judgment to dismiss the case on the ground that the issues presented in this case are the same issues on which the Supreme Administrative Court had rendered the final judgment. Therefore, the Central Administrative Court is prohibited from reconsidering such issues. The judgment is consistent with the Supreme Administrative Court and the subsequent orders of the Court in various cases that PTT and relevant government agencies completed the separation and transfer the assets to the Ministry of Finance.

March

March 8, 2021:
PTT completed the deregistration of PTT International Trading DMCC (PTTT DMCC), PTTT's wholly-owned subsidiary. PTTT DMCC was established for international trading business in petroleum products in the United Arab Emirates. However, PTT has revised the trading strategy of the petroleum product in the United Arab Emirates. Hence, PTTT DMCC reduced its commercial operation and focused only on maintaining relationship with business partners. The resolution of PTTT DMCC's deregistration is aligned with PTT's strategy in closing down the dormant companies and did not affect PTT's business operation.

March 18, 2021:
PTT passed the resolution of the establishment of Innopolymed Co., Ltd. (Innopolymed), a joint venture between Innobic (Asia) (PTT's wholly-owned subsidiary) and IRPC, with a registered capital of THB 260 million. A 40% stake in Innopolymed Co., Ltd. is held by Innobic (Asia), and 60% is held by IRPC. The objective of the establishment is to manufacture and sell Non-Woven Fabric products as well as medical consumables, aligned with PTT's new business strategy in Life Science. The Company's registration was completed, with expected commercial operation within the first half of 2023.

April

April 9, 2021:
The annual general meeting of shareholders approved the dividend payment from 2020 performance which will be paid at THB 1 per share to the shareholders totaling 28,562,996,250 shares at an approximate amount of THB 28,563 million. The dividend payments are divided into the interim dividend payment from the first half of 2020 performance which PTT had already paid to shareholders at THB 0.18 per share. PTT also paid the dividend from the second half of 2020 performance at THB 0.82 per share on April 30, 2021.

April 16, 2021:
Boards of Directors of PTT and Lotus Pharmaceutical Co., Ltd. (LOTUS), a Taiwan-listed company on TWSE, approved the investment in LOTUS' newly issued shares by Innobic LL Holding Co., Ltd. (INBL), which is a wholly owned subsidiary of Innobic (Asia) Co., Ltd., in an amount of 17,517,348 common shares at NTD 80.7 per share and the total investment is approximately USD 50 million. After the aforementioned subscription of LOTUS' newly issued shares, INBL has a 6.66% stakeholding in LOTUS of the total registered and paid-up capital. On November 26, 2021, PTT's Board of Directors approved Innobic (Asia) to join Aztiq HK Ltd., an affiliate of Aztiq Investment Group, to acquire all stakes in Alvogen Emerging Markets Holdings Ltd., a major shareholder of LOTUS and with 100% stake in Alvogen Malta (Out-Licensing) Holding Ltd., who owns 100% of Adalvo Ltd. (Adalvo), B2B pharmaceutical company with the massive global network. The total consideration of the transaction is approximately USD 475 million. The transaction has been completed. After the closing date, Innobic (Asia) will then have an indirect shareholding in LOTUS of approximately 37% and 60% of the total issued capital in Adalvo. The objective of the investment is to align with PTT's New S-Curve strategy in expanding into a new business, especially in Life Science. LOTUS is a fully integrated pharmaceutical company that focuses on research and development, manufacturing, and distribution of generic drugs that cover therapeutic areas, especially oncology and the central nervous system. This investment will enable PTT to expand into addressable markets of the oncology portfolio as well as the strong global network and commercialization capabilities will reinforce business expansion not only in Asia but also globally.

April 19, 2021:
Energy Complex Co., Ltd. (EnCo), PTT's subsidiary, won the bidding for land and buildings at Thai Airways Crew Center at Lak Si, Bangkok of Thai Airways International Plc. with the proposed price at THB 1,810 million. This transaction would support PTT Group's business expansion.

April 22, 2021:
PTT's Board Meeting approved the shareholding restructure of PTT's power business. PTT and Siam Management Holding Co., Ltd. (SMH), a wholly-owned subsidiary of PTT, will purchase 358,936,756 shares of GPSC or equivalent to 12.73% of GPSC's total issued and paid-up shares, from GC, for the value of THB 70 per share or total approximately THB 25,126 million. Before the transaction, PTT owns 31.72% and GC owns 22.73% of GPSC's total issued and paid-up shares. After this transaction, PTT and SMH will own 44.45% and GC will own 10% of GPSC's total issued and paid-up shares. The Restructuring Transaction will enable PTT to increase its investment in the power business through its flagship company which aligns with PTT's strategy. The Share Purchase Agreement of GSPC's common shares was signed in May 2021 and the transfer of GPSC shares to relevant parties was completed on June 8, 2021.

May

May 20, 2021:

PTT's Board of Directors approved the following:

- Approved Innobic (Asia) to establish a new joint venture company with Nove Foods Co., Ltd., a subsidiary of NR Instant Produce Plc. (NRF) with the registered capital not over THB 300 million. Innobic (Asia) and Nove Foods Co., Ltd. will equally hold 50% stakes in this joint venture company. The investment objective aims to operate alternative proteins business of which the initial phase will cover the entire supply chain of Plant-based Proteins from the development, manufacturing, and distribution. The manufacturing plant using state-of-the-art imported technology will be based in Thailand with a production capacity of 3,000 tons per year. The company completed its registration on August 25, 2021 and will start its commercial operation within the second quarter of 2023.
- Approved the establishment of T-ECOSYS Co., Ltd. (T-ECOSYS), a subsidiary of PTT which is 100% owned by SMH, with a registered capital of THB 350 million. The objective is to operate the industrial digital platform business under the cooperation between PTT and the Ministry of Industry, together with the Industrial Estate Authority of Thailand, the Board of Investment Office (BOI), financial institutions, etc. The Platform is created as an Ecosystem for service providers and customers who want access to robotics, automation systems, and digital technologies through the Industrial Digital Platform (IDP) which is developed by PTT. The company has been completed its registration by 2022.

June

June 23, 2021:

The Supreme Court judgment of the Dispute between PTT and RPCG Plc. (RPCG) reported as follows:

- Dispute of the Thai Arbitration Institute No. Black 114/2552, No. Red 23/2559, in which RPCG sought damages from PTT on the ground of wrongful contract termination. The Supreme Court rendered judgment in concurrence with the Civil Court's judgment, to enforce the arbitral award and the case was final. As a result, PTT was obliged to make payment to RPCG in the approximate amount of THB 2,200 million within 30 days from the judgment date.
- Dispute of the Thai Arbitration Institute No. Black 78/2555 No. Red 37/2560, in which PTT sought an overdue payment for goods delivered from RPCG. The Supreme Court rendered judgment in reverse of the Civil Court's judgment, to enforce the arbitral award and the case was final. As a result, RPCG was obliged to make payment to PTT in the approximate amount of THB 2,800 million within 30 days from the judgment date.
- On 23 July 2021, PTT exercised the right to offset the obligation that RPCG has to pay to PTT from another case, RPCG has to pay PTT in the amount of THB 600 million. Subsequently, on November 26, 2021, RPCG paid the remaining obligation to PTT completely according to the Supreme Court's judgment.

July

July 22, 2021:

On-I on Solutions Co., Ltd. (On-I on Solutions), a wholly owned subsidiary of PTT, has registered to change the company name to ARUN PLUS Co., Ltd. (ARUN PLUS) and increase the registered capital to THB 5,000 million (initial registered capital is THB 30 million). ARUN PLUS will be responsible for operating in the EV Value Chain business in line with the New S-Curve strategy to support PTT's expansion plan in the EV business. ARUN PLUS established EVME PLUS Co., Ltd. (EVME PLUS) which is 100% owned by ARUN PLUS, with a registered capital of THB 1,000 million and initial paid-up capital of THB 340 million. The objective of the company is to operate the electric vehicle business through the digital platform in order to promote and create an EV ecosystem for the widespread use of electric vehicles in Thailand, which includes EV rental services and information services for the charging and maintenance stations.

July 27, 2021:

Global Renewable Power One Co., Ltd. (GRP 1) (a wholly owned subsidiary of Global Renewable Power Co., Ltd. (GRP) which is a subsidiary that PTT and GPSC equally hold at 50%) has met the conditions precedent under the share purchase agreement to acquire 90% stakes in Sheng Yang Energy Co., Ltd. (Sheng Yang) from Tatung Forever Energy Co., Ltd. with the total value of approximately THB 2,560 million. This transaction turned Sheng Yang into a subsidiary of PTT. Currently, Sheng Yang operates a solar power generation business in Taiwan with a total installed generation capacity of 55.8 MW with all commenced commercial operations.

August

August 6, 2021:
PTT has issued unsubordinated and unsecured debentures No. 1/2021 for the total amount of THB 47,000 million at an interest rate of compound THOR+0.18% to 2.37% per annum with a tenor of 1 year 6 months to 10 years to the institutional investors and/or high net worth investors (excluding individual). The debentures are issued under THB 130,000 million Medium-Term Note Program (MTN Program) 2020.

August 23, 2021:
PTT Global LNG Co., Ltd. (PTTGL) (a subsidiary of PTT in which PTT and PTTEP equally hold 50% shares) completely subscribed the 250,000 newly issued ordinary shares in B.Grimm Power LNG JV Ltd. (BGP LNG JV) with the subscription price at par value of THB 100 per share, totaling THB 25,000,000. As a result, PTTGL and B.Grimm Power Plc. (BGRIM) equally hold 50% stakeholding in BGP LNG JV. The objective of BGP LNG JV is to procure and supply LNG and explore other business opportunities related to LNG Value Chain both domestically and internationally as well as create a business alliance with the potential partner to expand our business opportunities.

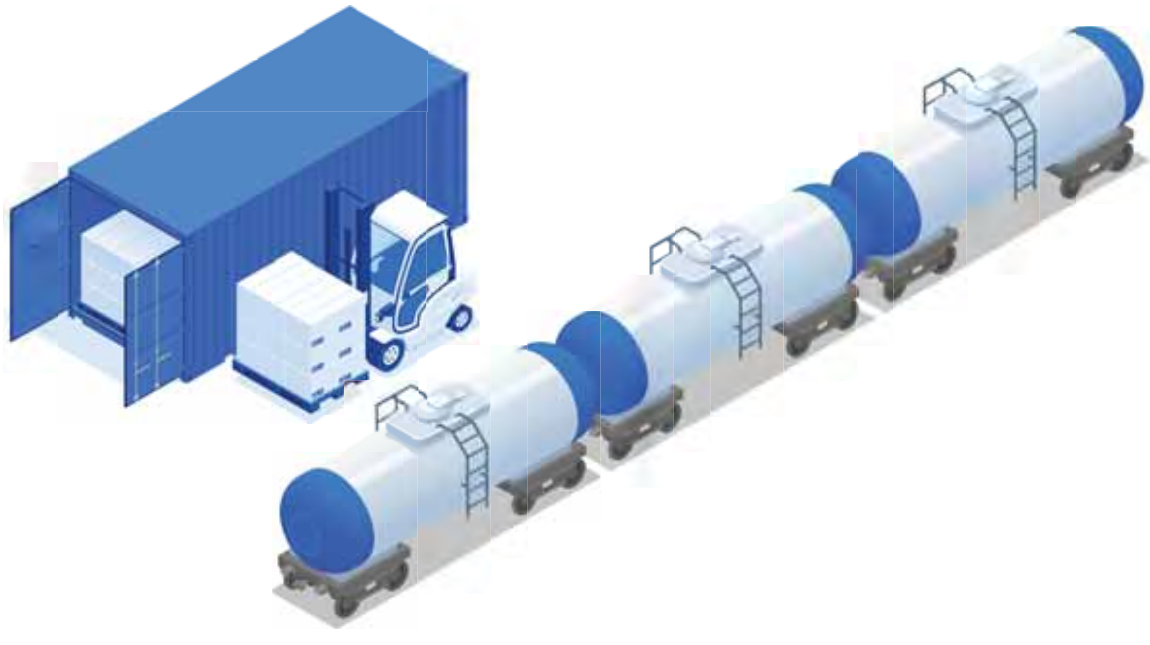
September

September 14, 2021:
ARUN PLUS has signed the joint venture agreement with Lin Yin International Investments Co., Ltd. (Lin Yin), the wholly owned affiliate of Hon Hai Precision Industry Co., Ltd. (Foxconn), and established the joint venture company, HORIZON PLUS Co., Ltd. (HORIZON PLUS), on February 3, 2022 with the registered capital not over THB 3,220 million. ARUN PLUS and Lin Yin will hold 60% and 40% stakes respectively. The objective of the company is to operate the electric vehicle manufacturing business in Thailand using Foxconn's state-of-the-art technology in manufacturing and developing of MIH (Mobility-In-Harmony) platform collectively with PTT Group's expertise in business operation within Thailand and the final investment decision have been reached and expect to start the commercial production within the first quarter of 2024.

September 16, 2021: PTT's Board approved a resolution of interim dividend payment for the first six-month performance of 2021 to PTT's shareholders at the rate of THB 1.20 per share, totaling approximately THB 34,276 million, or 60% of the consolidated net income.

September 18, 2021:
PTT Regional Treasury Center Pte. Ltd. (PTT RTC), PTT's wholly owned subsidiary, was completely dissolved which aligned with PTT's policy to close down the dormant company that did not affect PTT's business operation.

September 20, 2021:
CEPA reviewed the LPG price that the Ex-Refinery LPG prices have extended at THB 14.3758 per kg. Therefore, the retail price of a standard 15 kg LPG cylinder was THB 318 per cylinder. CEPA decided to extend the reduction of LPG price for another 3 months until December 31, 2021.



October

October 5, 2021:

PTT's Board approved SMH (PTT's 100% owned subsidiary) to establish PTT and TGES Optec Co., Ltd. (OPTEC), a new joint investment with Tokyo Gas Engineering Solutions Corporation (TGES) (a 100% owned subsidiary of Tokyo Gas Co., Ltd.) with the registered capital of not more than THB 60 million. SMH and TGES will hold 51% and 49% shareholding, respectively in this joint investment. The registration was completed on November 15, 2021. The investment objective aims to provide One-stop Total Improving Efficiency Technology Solutions and Services for Machinery and Equipment including fuel supply to the customers in industrial, power, and utilities sectors.

November

November 1, 2021:

To support energy prices for Thai people, PTT capped the NGV retail price for the taxi in Bangkok Metropolitan Area at THB 13.62 per kg from November 1, 2021 to March 15, 2022, and the NGV retail for general cars at THB 15.59 per kg from November 16, 2021 to March 15, 2022.

November 25, 2021:

Board of Directors of PTT Tank Terminal Co., Ltd. (PTT TANK), a wholly owned subsidiary of PTT, approved the establishment of a new joint venture with Gulf Energy Development Plc. (GULF) and CHEC OVERSEA INFRASTRUCTURE HOLDING PTE. LTD. (CHEC OVERSEA) under the name of GPC International Terminal Co., Ltd. (GPC) with a registered capital of THB 4,000 million. PTT TANK, CHEC OVERSEA, and GULF will hold 30%, 30%, and 40% stakeholding, respectively in this joint investment. The investment objectives are to operate a seaport and to provide services covering mooring, docking, loading, and goods unloading for container vessels as well as to conduct warehouse business. This is in line with PTT's strategy in pursuing Logistics & Infrastructure business and supporting infrastructure growth in Thailand.

November 29, 2021:

Board of Directors of Alpha Com approved the establishment of ReAcc Co., Ltd. (ReAcc) which is 100% owned by Alpha Com, with a registered capital of THB 29 million, to be the trading platform for clean energy and climate neutrality through the digital platform for the companies which have targets and needs to procure renewable energy.

December

December 2, 2021:

PTT's Board approved PTT Energy Resources Co., Ltd. (PTTER) (a wholly owned subsidiary of PTT) to sell its entire investment of 25% of the total issued shares in East Mediterranean Gas S.A.E (EMG) with the total amount of approximately USD 50 million to Snam S.p.A. The transaction caused EMG to cease to be the associated company of PTTER.

December 16, 2021:

PTT's Board approved the five-year (2022 - 2026) investment plan of PTT and its wholly-owned subsidiaries in an aggregate amount of THB 102,165 million. PTT has invested in the core businesses which account for 65% i.e. Gas business and Transmission business. Additionally, PTT prepared provisional capital expenditure for the next 5 years amounting to THB 238,032 million mainly for the investment expansion into new businesses with the focus on clean energy businesses towards a low-carbon society i.e. investment in renewable energy to achieve PTT Group's renewable energy target of 12,000 MW within the year 2030, EV Value Chain project, Life Science, Logistics and Infrastructure businesses. Furthermore, there is an investment in the gas business which is the transition fuel with a focus on the expansion of the pipeline network (subject to government approval) and the investment in the LNG value chain both in Thailand and overseas.

January

January 1, 2022:

To support Thai people on energy prices, PTT has extended the cap of NGV retail price from January 1, to March 15, 2022. For the taxi in Bangkok Metropolitan Area the retail price has capped at THB 13.62 per kg and the NGV retail price for general cars has capped at THB 15.59 per kg as well as extended the cap of retail prices for taxi to the end of March 15, 2023 including adjusting the NGV retail price for general car users to THB 17.59 per kg. Also, PTT has extended the period of LPG's discount for low-income household who sell food or operate food stalls through the State Welfare Card by THB 100 per person per month until March 31, 2023.

January 11, 2022:

Board of Directors of ARUN PLUS Company Limited (ARUN PLUS), the wholly owned subsidiary of PTT, approved the establishment of NUOVO PLUS Company Limited (NUOVO PLUS), a joint venture company with GPSC with the registered capital of THB 4,200 million and an initial paid-up capital of THB 1,050 million. ARUN PLUS and GPSC hold 51% and 49% of the shares in NUOVO PLUS, respectively. The objectives of the company establishment are to study the possibility of the investments in the battery value chain in order to support the electric vehicle industry in accordance with Thailand's automotive industry policy to promote electric vehicles, energy storage system (for the storage of electricity from renewable sources), as well as the investment in the related businesses. On February 28, 2022, Board of Directors of NUOVO PLUS approved the acquisitions of battery related assets from PTT Group companies with the total amount of not exceed THB 2,900 million. The battery related assets consist of:

1. The assets, expenses, contracts, and other agreements related to the battery plant with the initial capacity of 30 MWh per year in Map Ta Phut Industrial Estate, Rayong province from GPSC.

2. 100% of the ordinary shares of GPSC-SG Holding Company, Singapore (the subsidiary of GPSC) that holds 11.1%[1/] in Anhui Axxiva New Energy Technology Co., Ltd., China, which operates a battery plant with the capacity of 1 GWh per year, and also any relevant contracts and other agreements from GPSC.

3. The battery development under VISESS project of PTT and Alpha Com Company Limited (Alpha Com) (PTT's wholly owned subsidiary)

Remark:

1/ As of June 2022 NUOVO PLUS holds 10.3% in Anhui

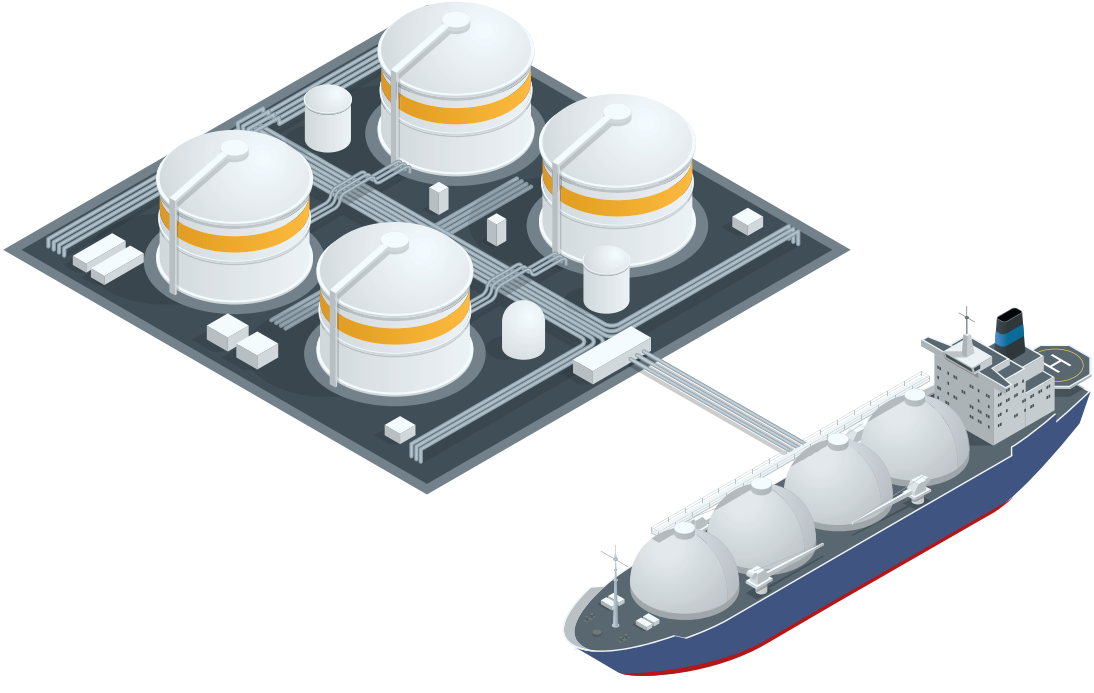
February

February 3, 2022:
ARUN PLUS completed the establishment of HORIZON PLUS Company Limited (HORIZON PLUS) according to the ARUN PLUS's Board of Directors that approved the establishment of a joint venture company with Lin Yin International Investments Company Limited (Lin Yin) (the wholly owned affiliate of Hon Hai Precision Industry Company Limited (Foxconn)) to operate the electric vehicle manufacturing business. HORIZON PLUS had the registered capital not in excess of THB 3,220 million, which ARUN PLUS and Lin Yin hold 60% and 40% stakes respectively. HORIZON PLUS expects to start its commercial operation within the first quarter of 2024.

February 17, 2022:
PTT's and TOP's Board of Directors approved the shareholding restructure of PTT Group's power business by the sale the ordinary shares of GPSC from TOP with a par value of THB 10 per share to PTT and/or Siam Management Holding Co., Ltd. (SMH), the wholly owned subsidiary of PTT, in the aggregate amount of 304,098,630 shares, representing approximately 10.78% of the total issued and paid-up shares of GPSC, totaling approximately THB 22,351 million, which is the price before deduction of GPSC's dividends after December 31, 2021 and before the share transfer date (if any). TOP will derive the proceeds to repay the loan to PTT and commercial banks for financial assistance in the form of bridging loan to finance the TOP's investment in PT Chandra Asri Petrochemical Tbk. Consequently, after the Restructuring Transaction, PTT and SMH will own 55.23% and TOP will own 10% of GPSC's total paid-up capital. SMH and PTT have completed the purchase of GPSC's ordinary shares from TOP on June 7, 2022.

April

April 1, 2022:
The Energy Regulatory Commission (ERC) announced criteria for calculating Energy Pool Price (EPP), which is the weighted average prices of energy used to generate power, including PTT's pool gas, New Shipper's liquefied natural gas (LNG), diesel, fuel oil, LPG and other fuels as specified by the ERC in order to average the cost of natural gas prices in the Pool Gas to calculate EPP price. EGAT which is the clearing house is responsible for gathering data from relevant sectors to calculate the EPP gas price and submit EPP to PTT for determining gas cost for PTT's all customers. The purposes of the change are to reduce power producer's burden of higher gas cost. EPP is effective from April 1, 2022 and implemented on May 1, 2022 onwards.



May

April 7, 2022:

Innobic (Asia) Company Limited (a wholly owned subsidiary of PTT), has completed the cooperative investment with Aztiq HK Limited, the affiliate of Aztiq Investment Group to acquire all stakes in Alvogen Emerging Markets Holdings Limited, a major shareholder of Lotus Pharmaceutical Company Limited (LOTUS) and also holds 100% stake in Alvogen Malta (Out-Licensing) Holding Limited who owns 100% of the company so called Adalvo Limited (Adalvo), B2B pharmaceutical company with the massive global network. Consequently, Innobic (Asia) will then has an indirect shareholding in LOTUS of approximately 37% of the total issued capital and 60% of the total issued capital in Adalvo. The objective for the investment is to align with PTT's New S-curve strategy in expanding into new business especially in Life Science area. LOTUS is a fully integrated pharmaceutical company that focuses on research and development, manufacturing, and distribution of Generic drugs that cover therapeutic areas especially oncology and central nervous system.

April 8, 2022:

The annual general meeting of shareholders approved the dividend payment from 2021 performance which will be paid at THB 2 per share to the shareholders of totaling 28,562,996,250 shares in an approximated amount of THB 57,126 million. The dividend payments are divided into the interim dividend payment from the first half of 2021 performance which PTT already paid to shareholders at THB 1.20 per share on October 15, 2021. PTT also paid the dividend from the second half of 2021 performance at THB 0.80 per share which already paid on April 29, 2022.

April 8, 2022:

PTT has issued unsubordinated and unsecured debentures No. 1/2022 for the total amount of THB 20,000 million with the tenor of 3 - 12 years and the interest rate of 1.79% - 3.47% per annum to the institutional investors and/or high net worth investors (excluding individuals). The debentures are issued under THB 130,000 million Medium-Term Note Program (MTN Program).

April 20, 2022:

PTT, as buyer, and PTTEP Energy Development Company Limited (PTTEP ED) (a wholly owned subsidiary of PTTEP), operator of G1/61 and G2/61 Project, together with Department of Mineral Fuels as sellers, have completely entered into Gas Sale Agreement, Condensate Sale Agreement, and Crude Sale Agreement. PTTEP ED will become an operator under a Production Sharing Contract of both projects from April 24, 2022 onwards. PTTEP ED has also reached an agreement with MP G2 (Thailand) Limited, a subsidiary of Mubadala Petroleum (Thailand) Holdings Limited (Mubadala), for PTTEP ED to be a sole investment operator of G1/61 and shall recognize all revenues and costs from the petroleum produced with effective date from December 1, 2021.

May 17, 2022:

PTT's Board of Directors Meeting approved the shareholding restructure of PTT Global LNG Company Limited (PTTGL) by assigning SMH to purchase all shares of PTTGL from PTT and PTTEP Business Center Company Limited (PTTEP BC), which equally hold 50% stake in PTTGL, at the amount approximately USD 255 million. The transaction was completed in June 2022, after the restructuring transaction, SMH will hold 100% of PTTGL's shares. The shareholding restructure will enable PTTGL to flexibly accelerating growth in the LNG value chain business and becoming a global LNG player in accordance with PTT group's strategic plan.

May 20, 2022:

PTT's Board of Directors and Board of Directors of Interpharma Public Company Limited (IP) (Thai listed company on MAI ticker: IP) have approved the investment in IP' newly issued shares via private placement by Innobic LL Holding Co., Ltd. (INBL) to acquire IP'S stakes at 20% of the total registered and paid-up capital. The total investment value is approximately THB 1,043 million. The transaction has been completed in the third quarter of 2022. The collaboration aims for the further development of R&D and for the escalation in businesses across the country, covering a full range of healthcare products including innovative medicine, eye healthcare, nutraceuticals & supplement, Thai herbal medicines, as well as health food and drink.

May 20, 2022:

PTT's Board of Directors passed a resolution for PTT to relieve electricity generating cost of EGAT in order to alleviate electricity burden for Thai people during the energy crisis in Thailand through the discharge of the interest from the delay of natural gas payment to EGAT according to the postponement of the natural gas payment for the period of May 2022. The due date will be extended from June to October 2022. The interest amount is approximately THB 340 million. EGAT has already paid for gas payment for the period as aforementioned.

May 25, 2022:

Alpha Com has established P-Dictor Company Limited (P-Dictor) with the registered capital of approximately THB 54.5 million with the objective to operate the predictive maintenance and machine monitoring artificial intelligence (AI) for industrial solution which help predicting the possibility of any mechanical failures on the critical machineries and equipments of the plants. Therefore, the production and maintenance could be properly planned and the risk of damage on operational production and product distribution would be reduced. The service will be provided to the industrial plants both within PTT group and external customers.

May 27, 2022:

PTT has issued the unsubordinated and unsecured debenture No. 2/2022 for the total amount of THB 20,000 million with the tenor of 7 years and interest rate of 3.25% per annum to general public, foundation, and non-profit organization. The debenture is issued under THB 170,000 million Medium-Term Note Program (MTN Program).

July

July 11, 2022:

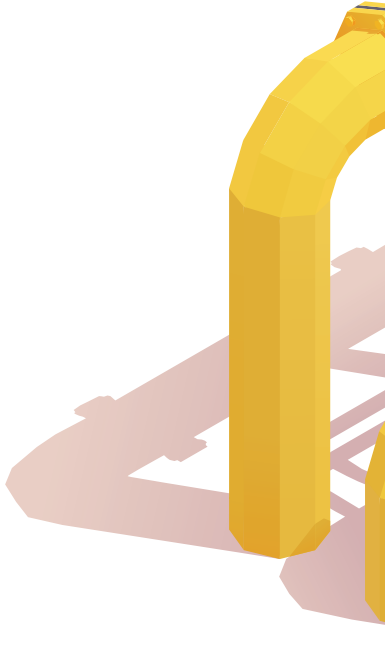
PTT's Board of Directors passed a resolution for PTT's gas business to specifically support the Oil Fuel Fund for the amount of THB 1,000 million per month for 3 months within the year of 2022 in the total amount of THB 3,000 million. PTT aims to support the oil fuel fund to stabilize the energy prices in Thailand during the period of fluctuating global energy prices.

July 21, 2022:

PTT's Board of Directors approved the establishment of Innobic Nutrition Co., Ltd. (INNT) which is 100% owned by Innobic LL Holding Co., Ltd. (INBL), with the registered capital of THB 100 million. The objective of the company establishment is to conduct Nutrition business including the Nutraceutical, which offer dietary supplements for general wellness that focuses on the suitable nutrition for each individual group by age, gender, or their nutritional needs as well as for specific prevention and the Medical Nutrition, which provide the nutritional needs for patients that will be developed for both general and specific patients. INNT is completed its registration in September 2022.

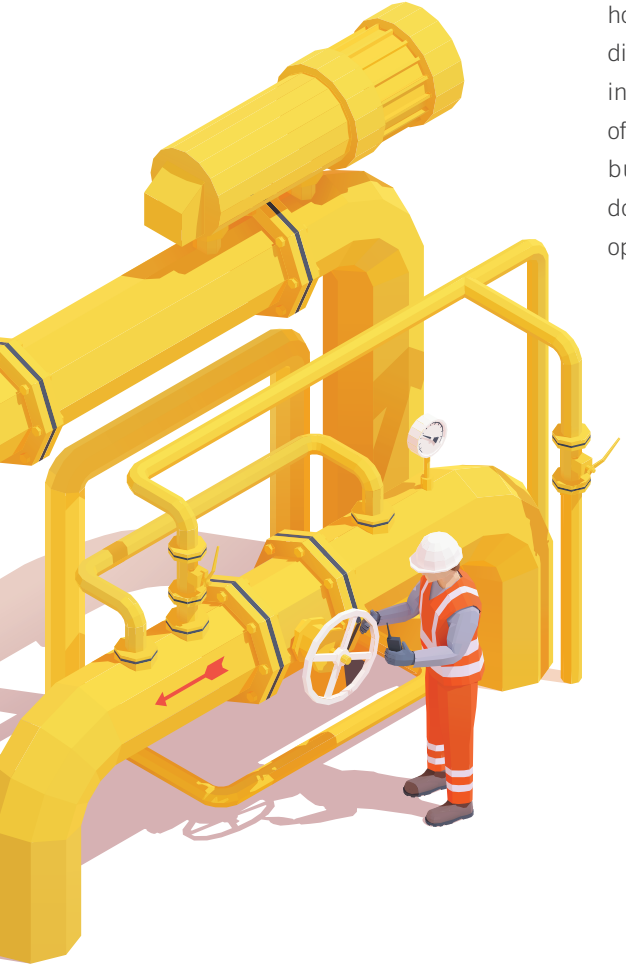
July 22, 2022:

PTTGL has signed the sale and purchase agreement of LNG with Corpus Christi Liquefaction LLC (CCL), which is a wholly-owned subsidiary of Cheniere Energy Inc. (the energy company in US) in the amount of 1 million tons per year for a period of 20 years, starting its first delivery in 2026 onwards. The signing of this long-term LNG purchase agreement was in according with the Board's resolution of National Energy Policy (NEPC) which approved PTT to procure for the additional 1 million tons per year of LNG, from current long-term LNG contracts of 5.2 million tons per year, in order to increase country's energy security.



August

August 2, 2022:
PTT International Holdings Limited (PTTIH) (a wholly owned subsidiary of PTT) has entered into a Share Purchase Agreement of its entire investment, being 100% of the total issued shares, in PTT Mining Limited (PTTML) with PT Astrindo Nusantara Infrastruktur Tbk (Astrindo), a listed company in Indonesia Stock Exchange, or its affiliate, on August 1, 2022 with a purchase price of approximately USD 486 million. The transaction has been completed on February 15, 2023. This transaction will divest all of PTT's investment in the coal business which is aligned with PTT's strategy towards sustainability and clean energy.



August 17, 2022:
The Energy Regulatory Commission (ERC) has approved the criteria of natural gas tariff for natural gas transportation licensee through pipeline which consist of two components; the Demand Charge (Td) for the period of 2022 - 2026 and Commodity Charge (Tc) for year 2022 according to new natural gas pricing structure from the resolution of National Energy Policy Council (NEPC)'s meeting on August 4, 2021. The revised gas pipeline tariff rates are effective since August 2022.

August 29, 2022:
The Extraordinary General Meeting of Shareholders of PTT Energy Solutions Co., Ltd. (PTTES) approved the dissolution of PTTES. PTTES is the subsidiary in which PTT holds 40% together with TOP, GC, and IRPC which hold equally at 20%. The registration of dissolution has already been completed in December 2022. The dissolution of PTTES is aligned with PTT group's business restructuring policy and does not affect PTT group's business operations.

September

September 15, 2022:
PTT's Board of Directors has approved a resolution of interim dividend payment for the first six-month performance of year 2022 to PTT's shareholders at the rate of THB 1.30 per share, totaling approximately THB 37,132 million, or 58% of the consolidated net income. The Record Date to entitle rightful shareholders who may receive the interim dividend was on September 29, 2022. The payment of the interim dividend was made on October 12, 2022.

October

October 5, 2022:
The Board of Directors of SMH approved the establishment of Global Multimodal Logistics Co., Ltd. (GML) which is 100% owned by SMH, with the registered capital of THB 230 million. The objective of the company's establishment is to operate a logistics business with a focus on creating connectivity all of Thailand's transportation system and also seamlessly connecting the international transportation network. This will help entrepreneurs increase their market competitiveness as well as reduce their logistics costs. The key services consists of freight services (by rail, sea, land, air), cold chain management, property management and asset rental (related to logistics business). The establishment of GML aims to support national policy under the 13th National Economic and Social Development Plan and PTT's New S-Curve strategy in logistics and infrastructure business.

December

December 14, 2022:

PTT's Board of Directors approved the shareholding restructuring of AI & Robotics business by assigning SMH to purchase all shares of ReAcc Co., Ltd. (ReAcc) from Alpha Com Co., Ltd. (Alpha Com) (SMH, ReAcc, and Alpha Com are indirect wholly-owned subsidiary of PTT). In addition, there was an approval for the shareholding restructuring of Mekha Tech by assigning ReAcc to purchase all shares of Mekha Tech from Alpha Com. The objective of the shareholding restructuring is to strengthen operational agility of AI & Robotics business to support new business opportunities as per PTT group's strategy. Moreover, Board of Directors Meeting approved the change in registered capital and company name which Mekha Tech completed the registration in 2022 and ReAcc is expected to complete the registration within the first quarter of 2023, detail as follows:

- Previous name : Mekha Technology Co., Ltd. (Mekha Tech)
  New name : MEKHA V Co., Ltd. (Mekha V)
  Registered capital : THB 266 million (initial registered capital is THB 30 million)
- Previous name : ReAcc Co., Ltd. (ReAcc)
  New name : NEW VER SAL Co., Ltd. (New Ver Sal)
  Registered capital : THB 302 million (initial registered capital is THB 29 million)

December 15, 2022:

PTT's Board of Directors has approved the five-year (Year 2023 - 2027) investment plan of PTT and its wholly owned subsidiaries in an aggregate amount of THB 100,227 million PTT has invested in the core businesses to ensure national energy security which are accounted for 55% of PTT's total five-year investment plan. Additionally, PTT has prepared provisional capital expenditure for the next 5 years amounting to THB 302,168 million mainly for the investment expansion into new businesses to align with PTT's vision "Powering Life with Future Energy and Beyond" with the focus on clean energy businesses towards a low-carbon society i.e. investment in EV value chain business covering from upstream to downstream, Logistics and Infrastructure businesses focusing on connecting all transportation networks throughout the country, Life Science (Pharmaceutical, Nutrition, and Medical Device & Diagnostics) to drive Life Science business in Thailand and the ASEAN, as well as the investment in Renewable energy to achieve PTT group's renewable energy target of 12,000 MW within year 2030. Furthermore, there is investment in gas business which is the transition fuel with the focus on the expansion of pipeline network and the investment in LNG value chain both in Thailand and overseas.

December 15, 2022:

NUOVO PLUS (a subsidiary which PTT holds 51% of shares and GPSC holds 49% of shares) enter into a joint venture agreement and to establish NV Gotion Company Limited (NV Gotion), a joint venture company with Gotion Singapore Pte. Ltd. (Gotion), the leading Chinese company specializing in power battery for electric vehicles and energy storage systems, with the registered capital of not exceeding THB 600 million, in which NUOVO PLUS and Gotion hold 51% and 49% of the shares, respectively. The objectives of the joint venture company are to operate the business of importing, assembling, and distributing battery modules and battery packs for energy storage systems and electric vehicles by combining technology and expertise of those two companies to increase competitiveness in the battery business and also to integrate the supply chain of renewable energy and electric vehicles for Thailand which are in line with PTT Group's investment strategy in Future Energy. The establishment of the joint venture company is expected to complete by the first quarter of 2023 with the initial capacity of 1,000 MH per year and is expected to start of operation by the fourth quarter of 2023 and scale up to 2,000 MH per year by 2025.

The Milestones of the past three years of each PTT Group's flagship companies listed on SET were disclosed on the website; the details are as follows:

READ MORE

PTT Exploration and Production Plc.
(PTTEP)

READ MORE

Global Power Synergy Plc.
(GPSC)

READ MORE

PTT Global Chemical Plc.
(GC)

READ MORE

Thai Oil Plc.
(TOP)

READ MORE

PTT Oil and Retail Business Plc.
(OR)

READ MORE

IRPC Plc.
(IRPC)

1.1.3 Use of Proceeds

Details of use of proceeds as of December 31, 2022 are as follows:

Domestic, Unsecured and Unsubordinated Bonds (Enforced under Thai Laws)

PTT utilized the funds derived from the issuance and offer of Thai Baht Bond consisting of: PTTC232A, PTTC237A, PTTC239A, PTTC243A, PTTC247A, PTTC248A, PTTC254A, PTTC257A, PTTC268A, PTTC277A, PTTC27OA, PTTC288A, PTTC295A, PTTC307A, PTTC318A, PTTC344A, PTTC357A, PTTC457A and PTTC10DA fulfilling completely the objectives as stated in the Registration Statement.

Foreign, Unsecured and Unsubordinated Bonds (Enforced under New York Laws)

PTT utilized the funds derived from offer of USD bond of PTT and PTT Treasury Center Co., Ltd. (PTT TCC) with PTT as guarantor consisting of USD Bond 2005, USD Bond 2012, USD Bond 2019 and USD Bond 2020 fulfilling the objectives completely as stated in the Registration Statement.

1.1.4 Obligations Pledged by the Company in the Registration Statement

Domestic Bonds and Foreign Bonds (Unsecured, Unsubordinated)

PTT has no financial obligation per each tranche of bond as stated in the Registration Statement and other documents pertaining to each tranche. Conditions for exercising of Put and Call Option of each tranche are disclosed in 1.5. Issuance of Other Securities (1.5.2 debt securities).

1.2 Nature of Business

1.2.1 Revenue Structure

Product/ Service	Operated by	% Share-holding	2020 (Audited)		2021 (Audited)		2022 (Audited)	
			THB million	%	THB million	%	THB million	%
1. Gas products	PTT Plc.		277,112	17	305,386	14	505,520	15
	PTT Exploration and Production Plc. (PTTEP)	63.79	15,119	1	27,801	1	42,581	1
	PTT Natural Gas Distribution Co., Ltd. (PTTNGD)	58.00	7,363	-	11,652	1	16,600	1
	Global Power Synergy Plc. (GPSC1/)	47.27	59	-	84	-	75	-
	PTT Oil and Retail Business Plc. (OR)	75.00	30,217	2	29,377	1	37,425	1
	PTT International Trading London Ltd. (PTTT LDN)	100.00	4,985	-	-	-	-	-
Total revenue from gas products			**334,855**	**20**	**374,300**	**17**	**602,201**	**18**
2. Oil products	PTT Plc.		112,465	7	193,348	9	338,011	10
	PTT Exploration and Production Plc. (PTTEP)	63.79	20,845	1	32,771	1	35,557	1
	PTT International Trading Pte. Ltd. (PTTT)	100.00	189,666	11	317,550	14	414,650	12
	PTT International Trading London Ltd. (PTTT LDN)	100.00	14,841	1	32,275	1	68,138	2
	PTT Global Chemical Plc. (GC)	45.18	21,773	1	23,783	1	36,976	1
	Thai Oil Plc. (TOP)	45.03	109,979	7	163,039	7	212,352	7
	IRPC Plc. (IRPC)	45.05	83,407	5	127,779	6	141,610	4
	PTT Oil and Retail Business Plc. (OR)	75.00	361,125	22	439,076	20	696,875	21
	PTT International Trading USA Inc. (PTTT USA)	100.00	-	-	7,285	-	51,034	2
Total revenue from oil products			**914,101**	**55**	**1,336,906**	**59**	**1,995,203**	**60**
3. Petrochemical products	PTT Plc.		10,295	-	13,245	1	4,558	-
	PTT Global Chemical Plc. (GC)	45.18	161,620	10	259,292	11	384,204	11
	Thai Oil Plc. (TOP)	45.03	18,242	1	30,638	1	38,193	1
	IRPC Plc. (IRPC)	45.05	45,617	3	67,016	3	60,568	2
	PTT International Trading Pte. Ltd. (PTTT)	100.00	31,197	2	67,379	3	83,768	3
	PTT Oil and Retail Business Plc. (OR)	75.00	399	-	619	-	608	-
	PTT International Trading USA Inc. (PTTT USA)	100.00	-	-	186	-	3,231	-
	PTT Global Management Co., Ltd. (PTTGM)	100.00	-	-	-	-	3	-
Total revenue from petrochemical products			**267,370**	**16**	**438,375**	**19**	**575,133**	**17**
4. Mining products	PTT Global Management Co., Ltd. (PTTGM)	100.00	10,202	1	15,560	1	31,331	1
Total revenue from mining products			**10,202**	**1**	**15,560**	**1**	**31,331**	**1**
5. Pharmaceutical products	PTT Global Management Co., Ltd. (PTTGM)	100.00	-	-	-	-	14,411	1
Total revenue from pharmaceutical products			**-**	**-**	**-**	**-**	**14,411**	**1**
6. Public utilities	Thai Oil Plc. (TOP)	45.03	4,573	-	4,842	-	7,519	-
	IRPC Plc. (IRPC)	45.05	3,391	-	3,420	-	4,003	-
	Global Power Synergy Plc. (GPSC1/)	47.27	54,573	4	57,845	3	100,939	3
	PTT Tank Terminal Co., Ltd. (PTT TANK)	100.00	52	-	46	-	59	-
	PTT Global Management Co., Ltd. (PTTGM)	100.00	-	-	628	-	739	-
Total revenue from public utilities			**62,589**	**4**	**66,781**	**3**	**113,259**	**3**

Remark:

Revenue of PTT and subsidiaries represents net revenue derived from external parties.

1/ During 2022, PTT changed its shareholding portion in GPSC.

Product/ Service	Operated by	% Share-holding	2020 (Audited)		2021 (Audited)		2022 (Audited)	
			THB million	%	THB million	%	THB million	%
7. Non-oil Business	PTT Plc.		141	-	28	-	20	-
	PTT Oil and Retail Business Plc. (OR)	75.00	16,938	1	17,190	1	21,606	1
Total revenue from non-oil business			**17,079**	**1**	**17,218**	**1**	**21,626**	**1**
8. Revenue from services	PTT Plc.		231	-	260	-	314	-
	PTT Exploration and Production Plc. (PTTEP)	63.79	2,895	1	2,993	-	5,331	-
	PTT Global Chemical Plc. (GC)	45.18	2,676	-	3,343	-	4,968	-
	Thai Oil Plc. (TOP)	45.03	258	-	90	-	-	-
	IRPC Plc. (IRPC)	45.05	543	-	576	-	487	-
	PTT Oil and Retail Business Plc. (OR)	75.00	480	-	391	-	472	-
	PTT Digital Solutions Co., Ltd. (PTT DIGITAL)	20.00	111	-	145	-	176	-
	PTT Tank Terminal Co., Ltd. (PTT TANK)	100.00	670	-	685	-	684	-
	PTT Energy Solutions Co., Ltd. (PTTES)	40.00	10	-	4	-	3	-
	Energy Complex Co., Ltd. (EnCo)	50.00	272	-	282	-	297	-
	Business Services Alliance Co., Ltd. (BSA[1/])	25.00	226	-	211	-	240	-
	Global Power Synergy Plc. (GPSC[2/])	47.27	19	-	30	-	63	-
	PTT LNG Co., Ltd. (PTTLNG)	100.00	63	-	288	-	314	-
	PTT Natural Gas Distribution Co., Ltd. (PTTNGD)	58.00	37	-	3	-	13	-
	PTT Global Management Co., Ltd. (PTTGM)	100.00	-	-	5	-	118	-
	PTT International Trading USA Inc. (PTTT USA)	100.00	-	-	-	-	5	-
Total revenue from services			**8,491**	**1**	**9,306**	**-**	**13,485**	**-**
9. Others	PTT Plc.		-	-	-	-	-	-
	Business Services Alliance Co., Ltd. (BSA[1/])	25.00	-	-	-	-	-	-
	Global Power Synergy Plc. (GPSC[2/])	47.27	-	-	-	-	-	-
	PTT Digital Solutions Co., Ltd. (PTT DIGITAL)	20.00	-	-	-	-	-	-
	PTT International Trading Pte. Ltd. (PTTT)	100.00	493	-	269	-	324	-
	IRPC Plc. (IRPC)	45.05	482	-	99	-	98	-
	PTT Oil and Retail Business Plc. (OR)	75.00	-	-	-	-	-	-
	PTT Global Management Co., Ltd. (PTTGM)	100.00	1	-	3	-	123	-
	PTT International Trading London Ltd. (PTTT LDN)	100.00	2	-	-	-	2	-
	PTT LNG Co., Ltd. (PTTLNG)	100.00	-	-	1	-	7	-
Total revenue from other products			**978**	**-**	**372**	**-**	**554**	**-**
Total revenue from products and services			**1,615,665**	**98**	**2,258,818**	**100**	**3,367,203**	**101**
10. Others								
10.1 Other revenue[3/]			20,579	1	(3,018)	-	(50,494)	(1)
10.2 Gain (loss) from foreign exchange			9,270	1	(6,469)	-	5,552	-
Total other revenue			**29,849**	**2**	**(9,487)**	**-**	**(44,942)**	**(1)**
11. Share of profit from investment in joint ventures and associates			**4,178**	**-**	**9,010**	**-**	**5,849**	**-**
Grand total			**1,649,691**	**100**	**2,258,341**	**100**	**3,328,110**	**100**

Remarks:

Revenue of PTT and subsidiaries represents net revenue derived from external parties.

1/ PTT holds 100.00% of BSA's ordinary shares. Thus, PTT's ownership interest in BSA is 100.00%.

2/ During 2022, PTT changed its shareholding portion in GPSC.

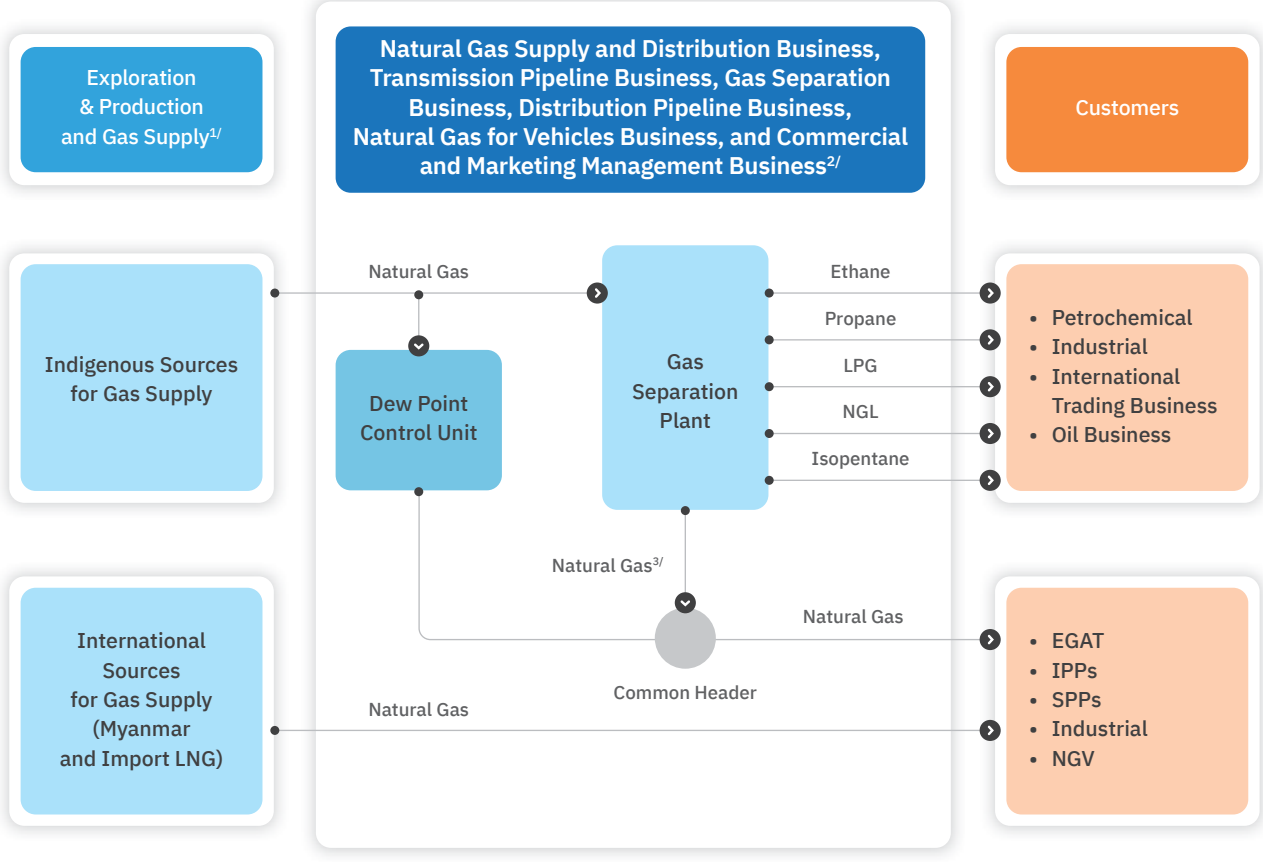
3/ Other revenue includes gain(loss) on derivatives.

1.2.2 Business/ Supply/ Distribution

Upstream Petroleum and Natural Gas Business Group

Currently, PTT and PTT's affiliates under the upstream petroleum and natural gas business are the only fully integrated natural gas operator in Thailand, which covers exploration and production, natural gas supply, Liquefied Natural Gas (LNG) import and regasification, pipeline transmission, gas separation, distribution, including investment in natural gas-related business in Thailand and internationally, and business development.

Diagram of PTT Group's Upstream & Gas Business Group



Remarks:

1/ PTT operates exploration and production through PTTEP. PTT procures natural gas from both indigenous and international sources together with import LNG.

2/ Operated by PTT.

3/ Refers to a portion of natural gas which is left after other products have been separated. It mainly consists of methane.

PTT-Operated Upstream Business

Gas Business Unit

The Gas Business Unit engages in procurement, wholesaling, and retailing, distribution of products from gas separation plants (GSP), as well as investment in businesses that utilize and creates value for natural gas through PTT's affiliates. The gas procurement includes domestic sourcing and international sourcing from neighboring countries, including LNG import to ensure adequate

supply for Thailand's ever-increasing demand. For distribution, it supplies power generators: Electricity Generating Authority of Thailand (EGAT), Independent Power Producer (IPP), and Small Power Producer (SPP). For industrial customers, distribution is through PTT-invested distribution pipeline. For transportation sector distribution is to incentivize natural gas as an alternative to gasoline and diesel via Natural Gas for Vehicles (NGV) service network. For gas separation business, PTT has invested in gas separation plants to add value to Gulf of Thailand gas for outputs to feed Thailand's petrochemical industry in support of other sectors thereby contributing to national economic growth. LPG is also distributed as fuel to household, industrial, and transportation sectors.

The Gas Business Unit operates related businesses namely pipeline asset management, gas logistics through transmission pipeline consisting of offshore pipeline system connected to production platforms in the Gulf of Thailand, onshore eastern pipeline system that receives gas from the Gulf of Thailand, and LNG Receiving Terminal, together with onshore western pipeline system that receives gas from Yadana, Yetagun, and Zawtika in Myanmar along the Thailand-Myanmar border to feed natural gas to power producers, gas separation plant, NGV, and industries. PTT invests in LNG Receiving Terminal through PTTLNG in which PTT holds 100.0% shares to cater to LNG vessels, storage, and regasification to accommodate LNG import. PTTLNG allows the external party to register intent to connect with LNG terminal from March 30, 2015.

The Energy Regulatory Commission (ERC) is the competent authority according to Energy Business Act B.E. 2550 to determine natural gas tariffs wholesale and retail. PTT divides natural gas business further into four sub-business units:

(1) Supply and Marketing Business: sources natural gas from Thailand and internationally including supply of LNG and regasification to be distributed to customers, with power producers as the major user.

(2) Gas Separation Plant: operates and develops gas separation plant business. There are currently six units of gas separation plants.

(3) Distribution Pipeline: operates and develops distribution systems that connect with the Transmission Pipeline, to deliver natural gas to industrial customers.

(4) Natural Gas for Vehicles (NGV) Business: is responsible for the expansion of NGV service stations, coverage, and promoting gas as alternative transport fuel because it is greener and cheaper than oil, less costly for consumers while mitigating air pollution.

In addition, Phase 2 of the state's gas liberalization policy to promote competition in the natural gas business results in emerging business competitors from existing clients, particularly when LNG price is low which incentivizes entry of New Shipper. The new shipper could seek promising opportunities for the LNG market expansion into the growing international market, especially in the Asia-Pacific. With these developments, PTT formed a fifth sub-business unit:

(5) Commercial and Marketing Management: in charge of commercial supply and distribution of LNG domestically and internationally, and of natural gas-related products and services.

In 2022, PTT's revenue from natural gas sales totals THB 602,201 million, an increase of THB 227,901 million or 60.9% from 2021 sales at THB 374,300 million (More details of PTT's revenue structure and subsidiaries per product specialization are outlined in 1.2.1)

Natural Gas Supply and Marketing Business

Natural Gas Supply

PTT's gas supply is under the charge of Natural Gas Supply and Distribution Business, with 55% mainly from sources in-country and the rest from Myanmar and LNG import.

Currently, PTT is the buyer from gas producers governed by existing 16 contracts. Of the total, 13 are from sources in Thailand namely: Pailin, Bongkot North, Bongkot South[1/], C5 & G4/48[2/], Unocal 123[3/], B8/32[4/], Arthit, MTJDA Block A-18, MTJDA Block B-17, G1/61, G2/61, Nam Phong, Sinphuhorm[5/], Sirikit (Lankrabue Area) and three contracts with producers outside Thailand - Yadana, Yetagun, and Zawtika[6/] in Myanmar.

PTTEP Energy Development Co., Ltd. (PTTEP ED) (a subsidiary of PTT Exploration and Production Plc.) holds exploration and production rights in Block G1/61 (Erawan) and G2/61 (Bongkot) and it signed a Production Sharing Contract (PSC) with the public sector since February 2019 with a minimum contractual capacity of 800 MMSCFD and 700 MMSCFD respectively. PTT has negotiated a trading contract for Block G1/61 which will replace the UNOCAL123 (Erawan) contract which expires in 2022. It is seeking negotiation for a contract for Block G2/61 to replace the Bongkot North and Bongkot South contract which will expire in 2022 - 2023.

Currently, PTTEP ED and PTT signed the Gas Sale Agreement on April 20, 2022. At the same time to manage contractual transition risks which may impact the continuity of production, PTT has negotiated additional supply as a backup from the Gulf of Thailand, and LNG to ensure adequate supply to meet clients' demand, without affecting power generation and energy security.

In addition, PTT secured LNG supply to reinforce security and meet the ever-increasing demand. PTT has 4 long-term LNG supply contracts totaling 5.2 million tons per year: 2 million tons per year with Qatar Liquefied Gas Co., Ltd.; 1 million tons per year with Shell Eastern Trading (Pte) Ltd., and with BP Singapore Pte. Ltd.; and 1.2 million tons per year with Petronas LNG Ltd.

PTT procures additional 1 million tons per year of long-term LNG from PTTGL to ensure energy security to Thailand.

PTT meets additional demand for these contracts through Spot LNG purchases given the market situation which fluctuates in accommodating deregulation. In any case, should the Spot LNG price fall, PTT will seek opportunities to secure a proportion of Spot LNG to partially substitute the Gulf of Thailand supply to ease production in a bid to optimize and lengthen the lifespan of a precious resource, and to manage the country's resources for maximum benefit.

Remarks:

1/ The contract was signed on July 30, 2009 for 320 MMSCFD. Contractual delivery began on June 16, 2012.

2/ Contract/ Concession expires in 2035.

3/ Contract/ Concession expires on April 23, 2022.

4/ Consisting of Benjamas, Benjamas North, Maliwan, Chamchuree, North Chamchuree, Chabaa, Lanta. From October 1, 2019, volume averages 45 MMSCFD.

5/ Contract expiry date is November 28, 2021 and new Sinphuhorm contract was signed on October 1, 2021 for ten years (October 1, 2021 - March 15, 2031).

6/ Contract was signed on July 30, 2010 for volume of 240 MMSCFD with first delivery on August 5, 2014.

In any case, a large chunk of PTT's gas supply originates from concessions/ production blocks in-country shown in the volume and proportion of PTT's gas supply 2020 - 2022 in the chart below.

Location/ Concession Block	2020		2021		2022	
	MMSCFD	%	MMSCFD	%	MMSCFD	%
Domestic						
- Pailin	325	7.4	395	8.9	399	9.5
- Bongkot (North/ South)	753	17.2	827	18.7	663	15.9
- UNOCAL 1, 2, 3	1,117	25.4	805	18.2	136	3.3
- B 8/32	55	1.3	50	1.1	51	1.2
- G1/61	-	-	-	-	138	3.3
- G2/61	-	-	-	-	134	3.2
- C5&G4/48	-	-	-	-	4	0.1
- Arthit	215	4.9	234	5.3	288	6.9
- MTJDA	351	8.0	423	9.6	413	9.9
- Nam Phong/ Sinphuhorm	101	2.3	97	2.2	103	2.5
- Sirikit	6	0.1	7	0.2	7	0.2
Total in Thailand	**2,923**	**66.6**	**2,838**	**64.2**	**2,336**	**56.0**
Overseas						
- Yadana	409	9.3	434	9.8	428	10.3
- Yetagun	52	1.2	16	0.4	27	0.6
- Zawtika	233	5.3	243	5.5	229	5.5
- LNG	772	17.6	889	20.1	1,153	27.6
Total overseas	**1,466**	**33.4**	**1,582**	**35.8**	**1,837**	**44.0**
Total	**4,389**	**100.0**	**4,420**	**100.0**	**4,173**	**100.0**
Average gas buying price (THB/MMBTU)	205.5		226.2		391.2	

Remark:
Natural gas calculated at heat rate of 1,000 BTU per cubic foot.

Key Terms in Gas Supply Contract

Gas supply contracts between PTT and Seller typically cover a duration of 25 - 30 years. The contract parties agree to trade natural gas at agreed delivery points for example at a wellhead platform or another agreed location at quality, quantity, and pressure as specified in the contract.

The Seller is duty-bound to prepare Contractual Delivery Capacity (CDC) for PTT to dispatch in the range of 105 - 125% of Daily Contract Quantity (DCQ) depending on the contract, whereas PTT must take the daily minimum quantity. PTT also has the right to buy more than CDC contracted volume provided if the Seller is ready to deliver.

However, if in any contractual year, PTT is unable to take the Annual Contracted Quantity (ACQ), the Take-or-Pay obligation is applied with the right to receive the paid commodity rolled over to subsequent years in the contract without a deadline and additional cost (make-up gas). In the year when PTT wishes to exercise the right to take the make-up gas volume, this can be executed only after PTT completes its CDC obligation of the year. In reverse, should PTT buy more than CDC in any contract year, PTT can carry forward the surplus to be counted in the CDC portion in subsequent years not exceeding 15 - 20% depending on the contract. The right to exercise this is valid for five years from the starting year of Carry-Forward.

In the event of a shortfall where the Seller is unable to deliver PTT dispatch in full, PTT shall pay for the actual quantity received, and be entitled to 20 - 25% discount for the shortfall amount in that month, or subsequent month or subsequent year depending on contracts. Upon the end of each contract year, PTT can use the shortfall to reduce the ACQ.

On pricing, the contract shall fix an Initial Base Price as constant, with the formula to determine the highest and lowest prices to protect the Buyer and Seller. The gas price formula incorporates the following considerations: High Sulfur Fuel Oil price in the Singapore market, Dubai price, exchange rate, and key economic indicators such as Thailand's wholesale price index, and US oil and gas producers' index among others. The time frame for pricing adjustment varies according to contracts ranging from every 12 months, 6 months, 3 months, or monthly. This pricing shall be passed through to clients in the power generation sector which are core customers that buy gas from PTT, according to the pricing formula in the NG contract, and hence relatively low risks of pricing volatility for PTT.

All gas supply contracts have a force majeure clause which can be invoked by either PTT or the Seller as a reason for failing to meet the obligation. The clause covers acts of gods faced by the contracting party. Some contracts specify cases in which PTT cannot dispatch due to force majeure on parts of PTT clients. This can only be invoked by PTT on the single condition that PTT must decrease dispatch across the board among Sellers involved proportionate to the amount decreased.

Gas supply contracts end in the event of one of the following:

(1) Expiry date as stated in the contract
(2) Expiry of concession (gas fields in Thailand)
(3) The natural gas reserve on-site runs dry.

Natural Gas Marketing

PTT markets most of its supply to power producers: EGAT, independent power producers, small power producers, through Transmission Pipeline.

Volume of gas supply to different segments (inclusive of that used in PTT's gas separation plant) during 2020 - 2022 is shown in the chart:

Customer	2020		2021		2022	
	MMSCFD	%	MMSCFD	%	MMSCFD	%
1. EGAT	786	17.9	700	15.8	688	16.4
2. IPP	546	12.4	587	13.2	547	13.1
3. SPP	1,281	29.2	1,331	30.0	1,218	29.1
4. Industry[1/]	872	19.8	910	20.5	957	22.8
5. Gas Separation Plant	909	20.7	909	20.5	780	18.6
Total	**4,394**	**100.0**	**4,437**	**100.0**	**4,190**	**100.0**

Source: PTT
Remarks:
Natural Gas volume calculated at heat value of 1,000 BTU per 1 cubic foot feet and based on calendar days.
1/ Inclusive of gas sold to PTT Natural Gas Distribution Co., Ltd. and NGV.

Generally, natural gas pricing structure to power producer segment consist of two components: gas cost and pipeline tariffs, elaborated herewith.

(1) Gas Cost

Gas cost is the sum of average gas price that PTT buys from Seller and remuneration for supply and marketing.

The supply and marketing remuneration which covers expenses and risks in sourcing natural gas and marketing varies in rates depending on types of clients. At present, supply and marketing remuneration for EGAT and IPPs equals 1.75% of average gas price that PTT buys from Seller. The rate charged on EGAT and IPPs is capped at THB 2.1525 per MMBTU. Small power producers whose volume is lower than the first two groups, PTT charges 9.33% of average gas cost that PTT buys from Seller at production fields. Nonetheless, the rate charged SPP must not exceed THB 11.4759 per MMBTU.

On August 4, 2021 the National Energy Policy Council (NEPC) approved the natural gas pricing structure to facilitate the second phase of natural gas liberalization alongside a timeframe to enforce the structure. As a result, natural gas liberalization is now in the second phase, when operators are competing to supply LNG. Currently, the Energy Regulatory Commission (ERC) granted LNG Shipper Licenses to a total of 8 recipients: PTT, EGAT, Gulf LNG, B.Grimm LNG, Hin Kong Power Holding, EGCO, PTTGL, and SCG Chemicals Co., Ltd. (SCG Chemical)

(2) Pipeline Tariffs

Pipeline tariffs consist of two components. The first part is the fixed cost (Demand Charge: Td) with a 5-year regulatory cycle, calculated from the net value (NPV) of the Allowed Revenue of the licensee. Permission should be received (Allowed Revenue) of the next regulatory cycle divided by the NPV of the Capacity Reserved in the next regulatory cycle. The Allowed Revenue will reflect the investment, expenses and return on investment in the form of a weighted average cost of capital (WACC) as approved by the ERC. The second part is the natural gas transportation service charge of the variable cost (Commodity Charge: Tc), calculated from the cost incurred in servicing the variable cost according to the amount of gas delivered through the natural gas pipeline system.

In 2022, the Energy Regulatory Commission (ERC) approved the Demand Charge (Td) of the gas pipeline tariff for natural gas transportation via pipeline through the natural gas transmission system for the 2022 - 2026 regulatory cycle and the Commodity Charge (Tc) according to the criteria on setting natural gas service rates for natural gas transportation licensees via pipeline through the natural gas transmission system 2021, in which PTT announced and has charged the new service rate since August 1, 2022. Therefore, natural gas transmission service rates for 2022 are as follows:

Demand Charge component of pipeline tariff structure is as follows:

Unit: THB/MMBTU

Zone	Pipeline	Demand Charge (January 1 - July 31, 2022)	Demand Charge (From August 1, 2022 or until ERC's approval of tariff adjustment)
1	Offshore pipeline at Rayong province	8.5899 1/	12.8869 4/
2	Offshore pipeline at Khanom	14.2177 1/	2.1135
3	Onshore pipeline	12.0654 1/	11.6894
4	Onshore pipeline at Chana	2.4855 2/	1.0061
5	Onshore pipeline at Nam Phong	1.1299 3/	0.2693

Remarks:

1/ Effective from April 1, 2009.

2/ Effective from June 2011.

3/ Effective from July 2012.

4 / Offshore system includes TTM.

Commodity Charge

Unit: THB/MMBTU

Zone	Pipeline	Commodity Charge (January 1 - July 31, 2022)	Commodity Charge (From August 1, 2022, or until the tariff adjustment is approved by the ERC)
1	Offshore pipeline at Rayong province	1.0405[1/]	0.1903[2/]
2	Offshore pipeline at Khanom		0.0002
3	Onshore pipeline		1.3954
4	Onshore pipeline at Chana	0.0994[1/]	0.0901
5	Onshore pipeline at Nam Phong	0.0000[1/]	0.0000

Remarks:
1/ Effective from April 2021.
2/ Offshore system includes TTM.

The Demand Charge is subject to periodic adjustment, through review of constant costs over a cycle of five years or ERC-approved timing, or in the event of factors affecting significant change in tariff to main the approved EIRR. The Commodity Charge component is reviewed annually by defining indexes to adjust variable costs to reflect current circumstances and operational efficiency.

Gas Separation Business

Besides the selling of natural gas direct to customers, PTT feeds parts of supply to its gas separation plants to add value and optimize the feed through extraction of key hydrocarbon components. Products from PTT gas separation plants include ethane, propane, liquefied petroleum gas (cooking gas), natural gasoline and isopentane. Another byproduct of the process is carbon dioxide that can be utilized in various industries. Products from gas separation plants and applications are listed in this chart.

Product	Application
Ethane	Raw material in upstream petrochemical industry
Propane	Raw material in upstream petrochemical industry
Liquefied petroleum gas (LPG)	Fuel for household, vehicle, industrial factory and raw material in upstream petrochemical industry
Natural Gasoline	Feed for oil refinery as gasoline and raw material in upstream petrochemical industry
Isopentane	Raw material in upstream petrochemical industry

PTT is currently the major GSP operator with six GSP units. All of PTT's gas separation plants have consistently been improved and optimized, with actual processing capacity totaling 2,870 MMSCFD, outperforming the nameplate capacity of 2,660 MMSCFD.

The production volumes of GSP products from 2020 to 2022 are as follows:

Product (Ton)	2020	2021	2022
Ethane	2,198,718	2,181,596	1,752,406
Propane	940,818	1,017,933	963,476
Liquefied petroleum gas (LPG)	2,377,171	2,293,291	1,912,982
Natural Gasoline	496,963	489,937	385,284
Isopentane	37,164	43,055	48,800
Total	**6,050,834**	**6,025,812**	**5,062,948**

Source: PTT

Commercial and Marketing Management

In support of the government's natural gas liberalization policy, energy reform plan to make Thailand as the Regional LNG hub, new sub-unit on Commercial and Marketing Management was established under PTT's Natural Gas Business. Commercial and Marketing is responsible for commercial LNG market, natural gas products and services related to natural gas including expansion into growing markets such as Cambodia, Laos, Myanmar and Vietnam as well as China to in line with PTT's strategy expanding into growing overseas markets.

Main product sales volume under Commercial and Marketing Management is divided into Commercial Liquefied Natural Gas Market and Natural Gas Products Market. Commercial liquefied natural gas is distributed via trucks both domestically and internationally. In 2022, sale volume amounted to 82,217 tons. Previously, natural gas products are sold by PTT's gas separation plant business, and from 2021 the distribution of natural gas products will be operated through Commercial and Marketing Management Business. The sales volume of each product in 2020 - 2022 is as follows:

Product (Ton)	2020	2021	2022
Ethane	2,198,542	2,181,272	1,752,287
Propane	853,025	953,395	1,139,216
Liquefied petroleum gas (LPG)	2,947,307	3,113,277	3,301,907
Natural Gasoline	603,433	617,011	504,133
Isopentane	37,161	43,057	48,803
Total	**6,639,468**	**6,908,012**	**6,746,346**

Source: PTT

The major customers consist of the petrochemical group, including GC, HMC Polymers, Rayong Olefins and oil operators according to Section 7 of the Fuel Oil Trade Act B.E. 2543. In 2022, gas separation plants sold mainly to Section 7 operators namely PTT Oil and Retail Business Plc. (OR), Siam Gas and Petrochemicals Plc., and Unique Gas and Petrochemicals Plc.

Pricing of products from gas separation plants to petrochemical clients complies with the formula mutually agreed upon with individual client, mainly benchmarked against petrochemical product prices in the global market. Natural gasoline price is benchmarked against naphtha price in the global market. For LPG sold domestically from August 2017, EPPO shall announce reference price for domestic retail price of LPG only. Criteria have been changed for imported LPG price from CP price announced monthly to benchmarking instead against LPG Cargo with Platts' Spot Cargo data (FOB Arab Gulf) bi-weekly average, to make LPG cost from all supply sources comparable and competitive in a liberalization environment. For gas separation plants, currently, the Committee of Energy Policy Administration resolved to collect the spread onto the Fuel Oil Fund in case LPG Cargo+X (import expense) is higher than LPG cost from gas separation plants and compensate in the event where LPG Cargo+X is lower than LPG cost from GSPs.

Since 2015 the public sector requested PTT's cooperation in assisting LPG users in the household sector (low-income households, vendors, small shops and food hawkers) to lessen the impact of LPG retail price adjustment. Effective from October 2017 PTT targeted help to only low-income citizens through the government's welfare card scheme. In 2022, PTT supported a total of THB 6,160,968.76.

Natural Gas Retail Business

In addition to selling most of natural gas to power producers, PTT supplies industrial customers, having invested in a distribution pipeline system connected from the main transmission pipeline system to industry customers for the purposes of production processes, cogeneration and commercial use, together with the contribution through trucking of CNG (Compressed Natural Gas) and LNG. PTT and retail clients shall enter a gas supply contract that specifies the quantity required and the agreed selling price structure, for a duration ranging from 6 months to 10 years. As of December 31, 2022, PTT is serving a total of 368 pipeline contracts and 10 CNG/LNG contracts.

The pricing structure for industrial customers differs from that of power producers. For industry clients, the gas charge consist of two components: gas cost according to actual volume used per month, and management fees to ensure availability per their advance notification to PTT. NG price for industrial customers is determined to be competitive with other alternatives such as fuel oil and LPG.

Natural Gas for Vehicles Business

In order to promote natural gas as an alternative transportation fuel, ease impacts on fluctuation in crude oil and refined oil prices, reduce environmental impact and encourage the use of fuel produced domestically PTT introduced NGV to the public bus fleet of Bangkok Metropolitan Mass Transit since 1993. Subsequently NGV market expanded to other types of vehicles, and by end of December 2022, a total of 295,164 vehicles use NGV as fuel according to transport authority's data. Total sales of NGV in 2022 averaged 3.4 million kilograms per day. The 354 NGV service stations consist of 18 mother stations, distributing and trucking to feed 220 daughter stations outside the pipeline route, and to 116 conventional stations located along the pipeline route. A total of 151 stations serve Bangkok and Metropolitan area as well as 185 stations serve the upcountry.

Transmission Pipeline Business Unit

The business unit operates service, operation, maintenance work for transmission pipeline, and carrying out legal work related to gas transmission pipeline. When the Seller delivers natural gas to PTT at delivery point, natural gas shall be transmitted to clients via the pipeline systems which are assets of PTT's Upstream Petroleum and Natural Gas Business Group. These assets consist of offshore transmission pipeline, connected to production fields in the Gulf of Thailand and the onshore pipeline system in the east coast receiving gas from Gulf of Thailand, and the LNG station onshore westward that receives gas from Yadana, Yetagun and Zawtika fields in Myanmar to be distributed to power producers, GSPs, NGV and industries. Within PTT's pipeline systems, other critical components include Dew Point Control Unit and Common Header for quality control and harmonization processes for gas from various sources to yield unified heat rate and quality across the system.

As of December 31, 2022, PTT's transmission pipeline runs a total length of 4,573 kms consisting of onshore pipeline the length of 2,440 kms (inclusive of pipeline to supply independent power producers and to power plants, but excluding distribution pipeline) and offshore pipeline the length of about 2,133 kms.

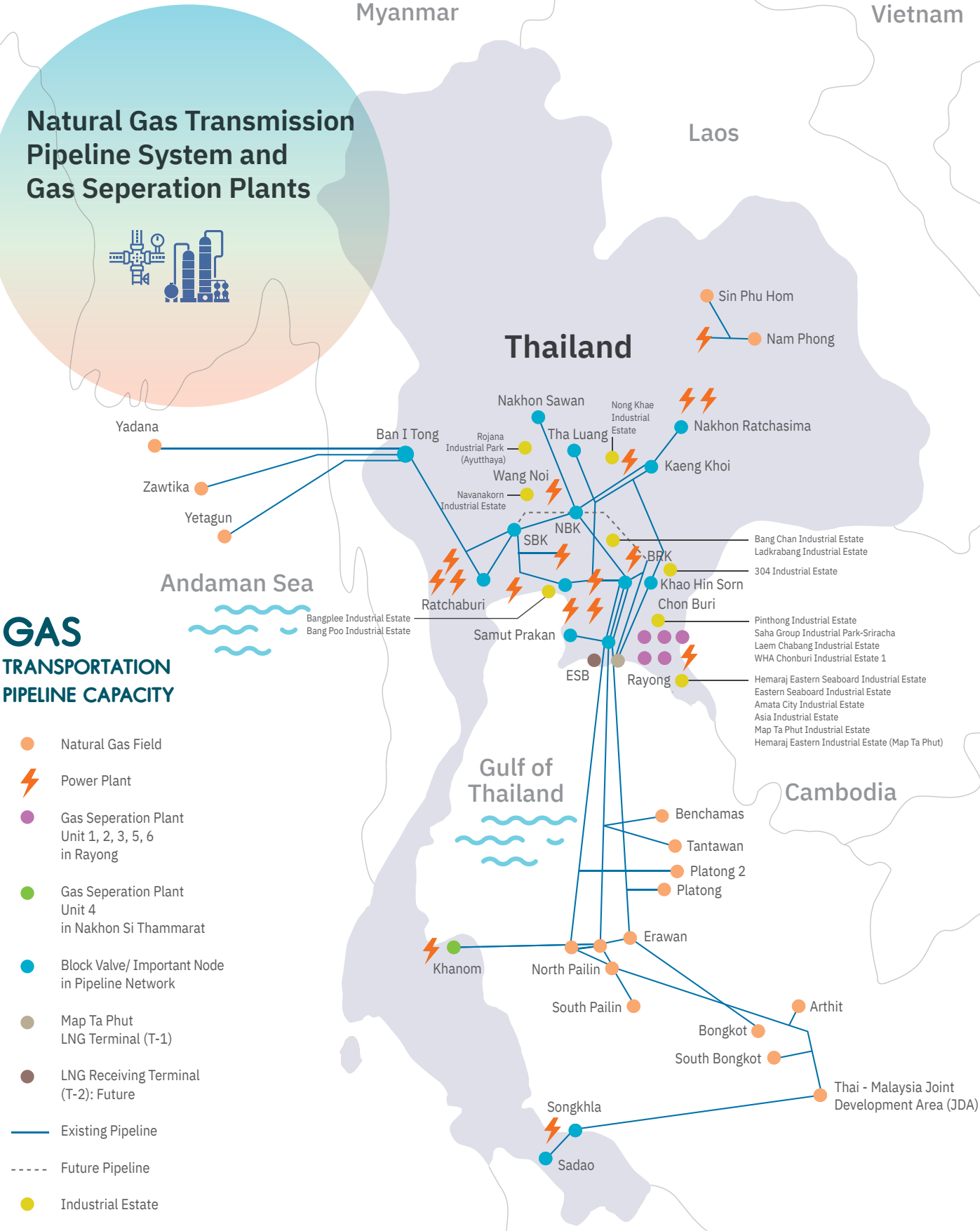
This table presents information on Transmission Pipeline, only the crucial systems, as of December 31, 2022.

Transmission Pipeline System	Length (km)	Pipe size (inch)	COD Year	Details
Offshore Pipeline System				
Erawan - Rayong Gas Separation Plant (1st principal pipeline)	415	34	1981	Pipeline from Erawan production platform in the Gulf of Thailand to Rayong Gas Separation Plant in Map Ta Phut, Rayong.
Bongkot - Erawan (1st principal pipeline)	171	32	1996	From Bongkot platform in the Gulf of Thailand, connected to Erawan platform.
Erawan - Rayong Gas Separation Plant (parallel pipeline)	413	36	1996 - 1997	Parallel pipeline from Erawan platform to Rayong GSP in Map Ta Phut, Rayong
Erawan - Khanom Power Plant	161	24	1996	Pipeline from Erawan platform to Khanom Electricity Plant in Nakhon Si Thammarat
Arthit - Rayong Gas Separation Plant (3rd pipeline)	610	42	2007	The third pipeline from Arthit platform to Rayong GSP in Map Ta Phut, Rayong
JDA - Arthit	95	42	2008	The third pipeline from JDA to Arthit
Chevron Platform Extension (Platong 2) - 3rd offshore pipeline	48	28	2011	From Chevron Platform Extension (Platong 2) to 3rd offshore pipeline
South Bongkot - 3rd offshore pipeline	38	24	2012	Linking South Bongkot platform with the third offshore pipeline
Onshore Pipeline System				
Rayong Gas Separation Plant - Bang Pakong Power Plant (2nd principal pipeline)	107	28	1981	From Rayong Gas Separation Plant in Map Ta Phut to Bang Pakong Power Plant in Chachoengsao
Bang Pakong Power Plant - South Bangkok Power Plant (1st principal pipeline)	57	28	1981	From Bang Pakong Power Plant in Chachoengsao to South Bangkok Power Plant in Samut Prakan
Bang Phli - Saraburi (principal pipeline)	99	24	1981	This pipeline system runs from Bang Phli, Samut Prakan to the cement factory of Siam Cement Plc. in Tha Luang, Saraburi

Transmission Pipeline System	Length (km)	Pipe size (inch)	COD Year	Details
Nam Phong - Nam Phong Power Plant	3	16	1990	From Nam Phong production platform to Nam Phong Power Plant in Khon Kaen
Rayong Gas Separation Plant - Bang Pakong Power Plant (parallel pipeline)	105	28	1996	Parallel pipeline system from Rayong GSP to Bang Pakong Power Plant in Chachoengsao
Bang Pakong - Wang Noi Power Plant (parallel pipeline)	101	36	1996	Parallel pipeline from the compressor station at Bang Pakong to Wang Noi Power Plant in Phra Nakhon Si Ayutthaya
Transmission Pipeline from Thai-Myanmar border to Ratchaburi Power Plant	238	42	1998	From the delivery point along Thai-Myanmar border at Ban-I-Tong in Kanchanaburi, this system pipes natural gas from Yadana and Yetagun to feed Ratchaburi Power Plant in Ratchaburi
Ratchaburi - Wang Noi	154	30	2000	This connects the transmission pipeline at the gas measuring station in Ratchaburi with the Bang Pakong - Wang Noi Power Plant segment (parallel pipeline) at Wang Noi gas measuring station.
Rayong Gas Separation Plant - Bang Pakong Power Plant (3rd pipeline)	110	36	2006	The third pipeline from Rayong Gas Separation Plant to Bang Pakong Power Plant in Chachoengsao
Wang Noi Power Plant - Kaeng Khoi Power Plant	72	36	2006	Pipeline system from Wang Noi Power Plant in Phra Nakhon Si Ayutthaya to Kaeng Khoi Power Plant in Saraburi
Transmission pipeline from the pressure control station RA#6 - South Bangkok Power Plant	67	30	2007	Transmission pipeline from the pressure control station RA#6 - South Bangkok Power Plant in Samut Prakan
Offshore - Chana Power Plant	8	20	2007	Pipeline system off the coast of Chana district, Songkhla to Chana Power Plant in Songkhla

Transmission Pipeline System	Length (km)	Pipe size (inch)	COD Year	Details
Transmission pipeline to North Bangkok Power Plant	7	24	2009	The pipeline system connects South Bangkok Power Plant with North Bangkok Power Plant in Nonthaburi
Onshore pipeline along the Thai-Myanmar border - BVW#1	0.59	28	2014	The project to accommodate supply from Zawtika in Myanmar to feed existing transmission pipelines operated by PTT at BVW#1 in Kanchanaburi
Rayong - Kaeng Khoi (4th pipeline)	298	42	2015	Pipeline system from Rayong to Wang Noi - Kang Khoi Power Plant
Nakhon Sawan	192	28	2015	The pipeline from Wang Noi Power Plant in Phra Nakhon Si Ayutthaya to Nakhon Sawan
Nakhon Ratchasima	145	28	2018	The pipeline from Wang Noi Power Plant in Phra Nakhon Si Ayutthaya to Nakhon Ratchasima
5th onshore pipeline (GDF4 - BV5.4)	72	42	2021	This system runs from Rayong to the gas compression station 5.4 in Chon Buri
Transmission system from the 6th gas compression station Ratchaburi - Wang Noi to Ratchaburi province	119	30	2021	From gas compression station RA#6 in Nonthaburi to BVW#10 in Ratchaburi connecting the transmission pipeline network between the east and west
The 5th onshore gas pipeline transmission project (BV5.6 - BP4)	57	36	2021	The pipeline runs from gas compression station 5.6 in Chon Buri to BP4 compression station in Chachoengsao
The 5th onshore gas pipeline transmission project (BV5.4 - BV5.8)	74	42	2021	The section connects gas compression station 5.4 in Chon Buri with control station 5.8 in Chachoengsao
The 5th onshore gas pipeline transmission project (GDF4 - TP5MX)	5	42	2021	The system from Rayong to Gas Quality Mixing Zone (TP5MX)
The 5th onshore gas pipeline transmission project (GDF5 - TP5MX)	7	42	2022	The system from Rayong to Gas Quality Mixing Zone (TP5MX)

Natural Gas Transmission Pipeline System and Gas Seperation Plants



GAS TRANSPORTATION PIPELINE CAPACITY

- Natural Gas Field
- Power Plant
- Gas Seperation Plant Unit 1, 2, 3, 5, 6 in Rayong
- Gas Seperation Plant Unit 4 in Nakhon Si Thammarat
- Block Valve/ Important Node in Pipeline Network
- Map Ta Phut LNG Terminal (T-1)
- LNG Receiving Terminal (T-2): Future
- Existing Pipeline
- Future Pipeline
- Industrial Estate

Nameplate Capacity	Nameplate Capacity
Unit 1 420 MMSCFD Unit 2 and 3 820 MMSCFD (Including incremental capacity from Ehane Seperation Plant)	Unit 4 170 MMSCFD Unit 5 580 MMSCFD Unit 6 880 MMSCFD

Upstream Business Invested through PTT Group

Gas-Related Business

PTT operates natural gas-related businesses through its affiliates. For example, the LNG business operates LNG vessels, storage and regasification to accommodate Thailand's LNG import. PTT is expanding investment and business into the gas value chain. The business scope to date includes development and construction of distribution pipeline systems, gas transportation. PTT invests through PTT Natural Gas Distribution Co., Ltd. (PTTNGD), Trans Thai-Malaysia (Thailand) Co., Ltd. (TTM(T)), Trans Thai-Malaysia (Malaysia) Sdn. Bhd. (TTM(M)), PTT LNG Co., Ltd. (PTTLNG) and Map Ta Phut Air Products Co., Ltd. (MAP).

Petroleum Exploration and Production

PTT has conducted petroleum exploration and production businesses via PTT Exploration and Production Plc. (PTTEP), which is PTT Group's flagship company in exploration and production. PTTEP operates domestic and international petroleum E&P and invests in related businesses to prospect petroleum sources of crude oil and natural gas for the purposes of ensuring Thailand's energy security and selling petroleum outputs from domestic and regional projects, mostly natural gas, primarily to the domestic market. As of December 31, 2022, PTTEP had more than 50 petroleum exploration and production projects in 15 countries, both in Thailand and overseas.

Overseas Investment (Upstream)

PTT has operated energy businesses overseas to find new energy sources and alternative energy to reinforce Thailand's energy security and upgrade its own existing businesses by leveraging the knowledge, expertise, and experiences of its human resources as well as collaborations within its group to expand its investment outside Thailand. PTT invests through 4 PTT Group companies, namely PTT Energy Resources Co., Ltd. (PTTER), PTT Global Management Co., Ltd. (PTTGM), PTT Green Energy Pte. Ltd. (PTTGE) and PTT Global LNG Co., Ltd. (PTTGL).

More details on Business/ Supply/ Distribution by individual company within the Group in which PTT invests are available at investor.pttplc.com/en/downloads/supplementary-one-report

READ MORE

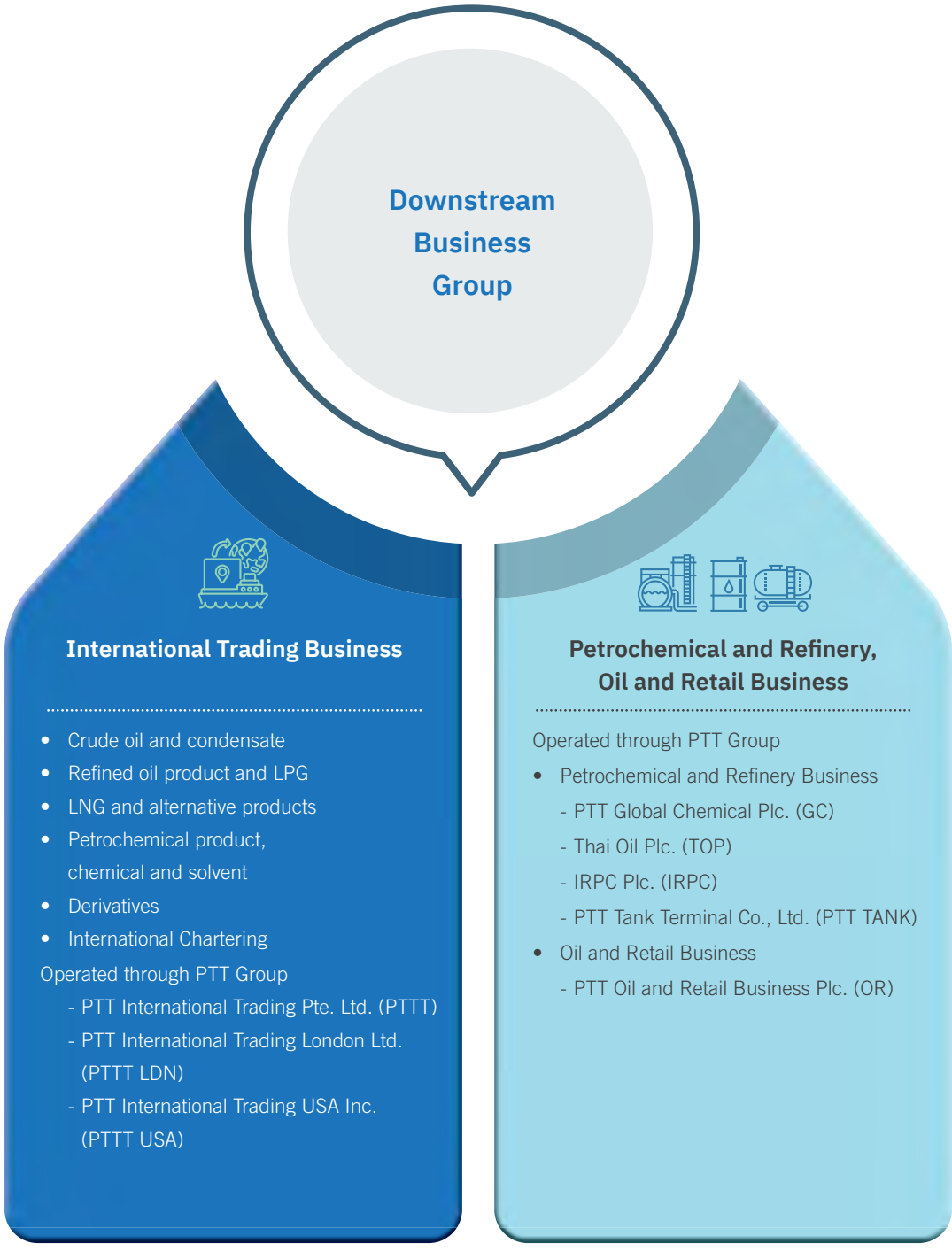
and on PTTEP at pttep.com/en/Investorrelations/Regulatorfilings/Annualfiling.aspx

READ MORE

Downstream Business Group

PTT's downstream business is divided into two business segments.

Downstream Business Group Structure



PTT-Operated Downstream Business

International Trading Business

International Trading Business Unit engages in fully integrated international trading ranging from supply procurement, import, export, to international trading of assorted products, namely crude oil, condensate, liquefied natural gas, liquefied petroleum gas, refined product, petrochemical, solvent, and chemical, together with price risk management (hedging) services and international chartering services. Its core objective is to enhance energy security while adding value to Thailand's surplus products in parallel with trading platform expansion to all regions around the world and raising international trading competitiveness for PTT Group.

The business unit's performance hinges on its pursuit of growth opportunities in out-out trading activities. It therefore formed affiliates and representative offices in trading hubs around the world, including Singapore, Abu Dhabi (the United Arab Emirates), Shanghai (China), London (the United Kingdom), and Houston (the United States of America). As a result, the business unit engages trading transactions with various partners covering around the world. Since international trading transactions carrying high values activities, the business unit applied the risk control system employed by the world-class trading houses as its best practices. In addition, a committee is in place to set risk management policies, steer assorted risk management tasks and clearly divide the work structure and roles in the system as Front-Mid-Back for checks and balances. Digital technology is also applied to develop systems for operation and transaction risk controls to enable quick and transparent transactions along with an efficient audit.

Nature of Merchandises and Products

International Trading Business deals in 5 categories of Merchandises and Products:

1) Crude Oil

Crude oil represents assorted hydrocarbon compounds. Its quality varies with the types of organic substances where a given crude oil originates from, along with associated impurities. This is one of a constraint facing refineries. Thailand has several crude oil fields, but since the amount of crude oil extracted and used domestically accounts for only less than 20% of the total demand of domestic refineries, therefore, it is necessary for Thailand to import crude oil from aboard. The crude suppliers are primarily from the Middle East, including Saudi Arabia, UAE, Qatar, and Oman, and from the Far East, including Australia, Malaysia, Brunei, Vietnam, and Indonesia, along with other sources such as Africa and the USA.

2) Condensate

Condensate is natural gas that is present as gaseous components in underground under high pressure but liquefies once brought up to the surface of the earth, and it is considered as a by product of natural gas production. Over 60% of condensate used in Thailand is mainly from domestic gas production, with the rest imported. Refineries process condensate directly or blend with crude oil for refining. Products yielded will have the same property as those refined using light crude.

3) Liquefied Natural Gas

Liquefied natural gas (LNG) is natural gas that has been converted into liquid at atmospheric pressure by reducing the temperature to -160 degrees Celsius for the purpose of long-distance transportation by ship. The demand for LNG is currently increasing around the world in the energy transition era because natural gas is a low-carbon fuel compared to coal-fired power and other types of petroleum.

4) Refined Oil Product & Liquefied Petroleum Gas

Refined Oil Product & Liquefied Petroleum Gas are products obtained from crude oil refining process or gas separation process consisting of

- Refined oil products such as gasoline, kerosene, aviation fuel, gasoil, fuel oil, low sulfur waxy residue, etc.
- Liquefied Petroleum Gas (LPG)
- Natural Gasoline (NGL)

5) Petrochemical Product, Chemical and Solvent

Petrochemical Product, Chemical are products obtained from processing by heat, pressure and chemical reaction with the main raw materials from oil or natural gas consisting of

- Aromatics products such as Benzene, Toluene, Mixed Xylene, Paraxylene, Cyclohexane, Styrene Monomer, etc.
- Olefins products such as Propylene, C4 Raffinate, Butane, etc.
- Feedstock & By-Product such as Naphtha, Pygas etc.
- Chemicals such as Methyl Tert-butyl Ether (MTBE), Sulfuric Acid, etc.
- Solvents such as Methanol, Diethylene Glycol, Acetone, etc.

Product Distribution of International Trading Business

PTT's international trading business is divided into 3 main aspects namely

1) Crude oil and condensate business
2) Refined Oil Product & Liquefied Petroleum Gas
3) Liquefied Natural Gas
4) Petrochemical Product, Chemical and Solvent

1) Crude Oil and Condensate

The scope of operations includes international trading transactions, procurement, import and export of crude oil and condensate from domestic and international sources to supply refineries in and outside Thailand, as well as seeking opportunities for physical swap of crude oil and condensate for profit and balance of the system, and ensuring that indigenous crude oil and condensate are consumed effectively.

1.1) Domestic Crude Oil

Due to resource scarcity in Thailand which is an importer, crude oil is precious and must be optimized. At present PTT procures domestically from various fields including Sirikit (Phet), Kampangsaen and U-thong (BP), Sankajai, Buengyah and Buengmuang (North Central), Wichianburi and Srithep (Wichianburi), East Na-sa-noon (NSE), Arunotai, Pattani, Jasmine, Thantawan, Benjamas, Bualuang, Manohra. PTT buys parts of indigenous crude from concessionaires and sells this portion to domestic refineries.

1.2) International Crude Oil

PTT procures and transports crude oil from outside Thailand for domestic refineries together with providing hedging management services. PTT fully supplies crude and condensate to GC, TOP and IRPC refineries, whereas supply part of crude and condensate to Bangchak Corporation Plc. (BCP), and Star Petroleum Refining Plc. (SPRC). The procured volumes are dependent on the quality, prices, bidding, and trading terms offered by refineries.

PTT procures and imports feedstock to domestic refineries, accounting for over 60% of their throughput needs. PTT also serves as the PTTEP's trading arm for the domestic and international crude oil trade.

Besides supplying imported crude oil for domestic refining, PTT also trades crude oil overseas for out-out trading, procured from producing countries worldwide and supply to other countries. This could generate revenue and profits from overseas, as well as build a reputation for the country in the international trading platform.

1.3) Condensate

PTT procures and transports condensate for domestic petrochemical plants and refineries, which GC, PTT Group's petrochemical flagship, serves as the foremost buyer for feedstock purposes. PTT purchases condensate from domestic concessionaires, operators of onshore gas fields namely Sinphuhorm and Gulf gas fields, namely Erawan, Pailin, Bongkot, and Arthit. However, during the shortage of domestic condensate, PTT will import from overseas sources for instance Malaysia, Australia, Philippines, and Indonesia, etc.

Volume of PTT's Crude Oil and Condensate Supply

	2020		2021		2022	
	Volume (Million barrels)	%	Volume (Million barrels)	%	Volume (Million barrels)	%
Domestic crude oil	28.0	7.8	26.3	7.9	23.4	6.2
Domestic condensate	27.9	7.8	26.8	8.0	22.8	6.0
Imported crude oil	168.2	46.9	175.2	52.3	230.9	61.0
Imported condensate	22.1	6.2	18.4	5.5	17.9	4.8
Internationally traded crude oil and condensate	112.4	31.3	88.3	26.3	83.4	22.0
Total	**358.6**	**100.0**	**335.0**	**100.0**	**378.4**	**100.0**

Source: PTT

2) Refined Oil Product & Liquefied Petroleum Gas

PTT procures, imports, exports and trades in refined oil product, semi-refined products and LPG for the purpose of energy security and balance under normal circumstances and emergency. It sells to PTT Group and other corporate buyers, both domestically and internationally. PTT also seeks trading opportunities in the world market to generate income for the national economy and fostering energy-security network worldwide. These endeavors have established PTT's reputation in the world arena. PTT imported LPG and basic gasoline for production of gasohol to meet domestic demands, and then exported natural gasoline, which is by-product of gas separation plants, as well as surplus fuels from refineries. Currently, PTT is well-positioned to export refined oil product to all parts of the world, with trading price in line with market mechanism.

3) Liquefied Natural Gas

PTT by International Trading Business Unit imports Spot LNG or short-term LNG purchase contracts for Commercial and Marketing Management Business under the gas business unit and those with Shipper License to create energy security for the country. Along with expanding liquefied natural gas trade in the international market continuously in line with the growing demand for clean energy, International Trading Business seeks opportunities for LNG Reloading Cargo to increase trade opportunities to other international markets.

4) Petrochemical Product, Chemical and Solvent

PTT procures, imports, exports and engaging in out-out trading both upstream and midstream aromatics and olefins petrochemical products, as well as chemicals and solvents, covering both raw materials, main products and by-product from refineries and petrochemical plants. PTT is the main exporter of petrochemical products that exceed GC's demand in the aromatics sector, such as benzene (BZ) and paraxylene (PX). In addition, PTT also increases trade opportunities by participating in bidding for various products from other petrochemical plants both domestically and internationally to generate income and profit from international trade covering all regions of the world.

International Trading Support

PTT has the supports for its international trading as follows:

1) Price risk management
2) International chartering

1) Price Risk Management

The Derivatives Trading Department is a support unit dealing with price risk management from trading transactions, refining, production, petroleum products, petrochemicals, cargo vessels to PTT, including PTT Group by trading derivatives in the derivatives market to hedge against transaction risk and product price volatility risk.

2) International Chartering

The International Chartering Department is a support unit for international trade by securing cargo vessels and managing time charter for import, export and trading products of PTT and PTT Group as well as external agencies both in Thailand and overseas, to enhance our competitiveness and end-to-end business operation.

Revenue Structure of International Trading

As of December 31, 2022, PTT's international trading business reported sales revenue of THB 2,172,566 million.

Volume and Value of International Trading by Product

Product	2020		2021		2022	
	Value (THB million)	Volume (Million Liter)	Value (THB million)	Volume (Million Liter)	Value (THB million)	Volume (Million Liter)
International Trading						
- Crude oil and condensate	482,062	359	761,374	335	1,351,138	378
- Refined oil product	131,752	97	301,484	114	723,104	162
- Petrochemical product	41,898	19	83,420	24	97,973	22
- Other product	506	-	286	-	351	-
Total of international trading	**656,218**	**475**	**1,146,564**	**473**	**2,172,566**	**562**

Source: PTT (inclusive of transactions through PTT Group)

Downstream Business Invested through PTT Group Companies

International Trading Business

PTT invested in international trading business to undertake full-fledged international trading transactions through 3 companies which are PTT International Trading Pte. Ltd. (PTTT), PTT International Trading London Ltd. (PTTT LDN) and PTT International Trading USA Inc. (PTTT USA).

READ MORE

Details of business/ procurement/ distribution of each company in which PTT invests through its affiliates are available on the website investor.pttplc.com/en/downloads/supplementary-one-report

Petrochemical and Refining and Oil and Retail Business

PTT invests in refining business in 3 out of 6 existing refineries of Thailand, with a combined capacity of 770,000 barrels per day (BPD), accounting for 62% of the national refining capacity (as of December 31, 2022) and integrated petrochemical business covering upstream to downstream, from production to distribution of fuel oil, upstream-midstream and downstream petrochemicals both olefins and aromatics, which focus on value creation, including marine terminal and tank service. PTT procures crude oil and purchases fuels and petrochemical products partially from PTT Group to supply both domestic and international markets. Performance of oil, petrochemical and refining businesses mainly depends on economic situation, spreads between crude and feedstock to petroleum and petrochemical products in the global market which fluctuate according to global demand and supply, as well as year-end inventories. For PTT Group, GC is the Petrochemical Flagship, TOP is the Refinery Flagship, IRPC is the Integrated Petrochemical and Refinery Flagship and OR is the Oil and Retail Business Flagship. OR conducts the business of distributing petroleum products, retails, and other services (Non-Oil), inside and outside Thailand. Its business includes distribution of petroleum and other products in retail and commercial markets, coffee business, food and beverages, convenient stores and space management. PTT TANK operates the business of receiving, storing and transferring of products to PTT Group. PTT exercises direct and indirect governance of its affiliates through representative that serves as directors and secondment.

PTT has invested in petrochemical and refining business, as well as oil and retail business through shareholding in 5 companies in the PTT Group as follows:

1. PTT Global Chemical Plc. (GC)
2. Thai Oil Plc. (TOP)
3. IRPC Plc. (IRPC)
4. PTT Oil and Retail Business Plc. (OR)
5. PTT Tank Terminal Co., Ltd. (PTT TANK)

Details of business/ procurement/ distribution of each company in which PTT invests through its affiliates are available on the website investor.pttplc.com/en/downloads/one-report

READ MORE

including additional information of
GC: pttgcgroup.com/en/investor-relations/document/annual-filings
TOP: investor.thaioilgroup.com/form_561_one_report.html
IRPC: irpc.co.th/annualreport_post/annual-report/
OR: investor.pttor.com/en/document/annual-reports

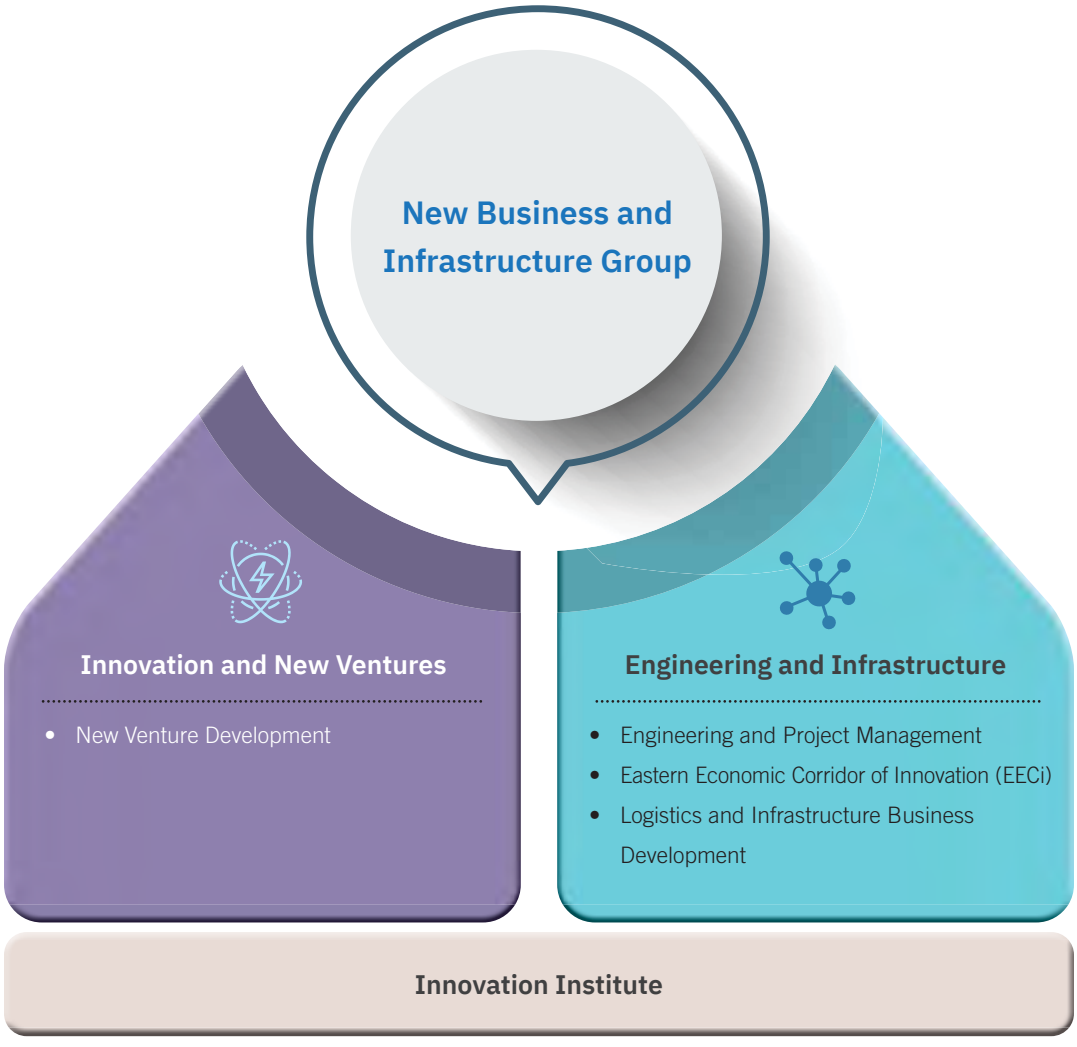
READ MORE READ MORE READ MORE READ MORE

New Business and Infrastructure Group

New Business and Infrastructure Group was formed on October 1, 2021, as a result of organizational restructuring. The objective is to steer the operation of business units and subsidiaries in line with PTT Group's transition from legacy to new business in which Future Energy and Beyond will become PTT's core business in the future. This business group engages in engineering-related management, construction, real estate, logistics business development related to transport and infrastructure, research and development (R&D) of innovations for the commercialization, as well as extending digital advancements and developing digital transformation to accommodate business growth.

New Business and Infrastructure Group operates as follows:

Structure of New Business and Infrastructure Group



PTT-Operated New Business and Infrastructure

Innovation and New Ventures

This segment focuses on developing new businesses, exploring business opportunities in new technologies and innovations to accommodate megatrends and groom PTT for entering New Businesses which is in line with “Powering Life with Future Energy and Beyond” vision. These include new energy businesses by investing in renewable power projects, battery related to the energy storage system business, EV value chain business, and Hydrogen business. Growth opportunities are explored in businesses other than energy, such as Life Science (includes Pharmaceuticals, Medical Devices, and Nutrition), AI, Robotics and Digitalization to provide energy management services, and digital platforms to support other business that are not currently in PTT’s business value chain. Furthermore, this business unit shall regulate the investment in new business development and charting direction for the operation of companies within the Innovation and New Ventures.

Engineering and Infrastructure

This segment consists of engineering and project management in engineering and construction, such as construction of gas transmission pipeline and gas separation plant, assets management including land, building, and construction, etc. In addition, this segment shall implement projects that execute PTT's new business strategy, primarily logistics and infrastructure business that focuses on connecting domestic and international transportation networks, as well as executing the Eastern Economic Corridor of Innovation Project (EECi); exploring joint development possibilities in various Smart City projects and exploring business opportunities in logistics and infrastructures. All these are geared towards excellence in the real estate development business and integrated engineering services.

Innovation Institute

This segment undertakes research and development (R&D) for products and innovations by focusing on strengthening technologies and evolving researcher's caliber to become specialists in individual aspects. All these are aimed for the cost-optimization, productivity maximization and commercialization of R&D and innovations to yield business outcomes.

New Business and Infrastructure Operated through PTT Group

As of December 31, 2022, the following PTT Group companies are under the supervision of the New Business and Infrastructure Group:

1. Global Power Synergy Plc. (GPSC)
2. District Cooling System and Power Plant Co., Ltd. (DCAP)
3. Energy Complex Co., Ltd. (EnCo)
4. PTT Energy Solutions Co., Ltd. (PTTES)
5. PTT Digital Solutions Co., Ltd. (PTT DIGITAL)

Currently, power business is a core business under the New Business and Infrastructure Group. PTT Group has engaged in the power business through GPSC, a Power Flagship company. GPSC conducts its business primarily in the production and distribution of electricity, steam, industrial water, electricity, and other public utilities which operates by itself and by investing in other companies. As of the year-end 2022, its total committed equity capacities were 7,227 megawatts (MW) of power generation (4,501 MW from conventional and 2,726 MW from renewable energy), 3,064 tons per hour of steam, 7,026 cubic meters per hour of industrial water, 15,400 refrigerated tons of chilled water, and 65 megawatts hour of energy storage unit.

In addition, PTT Group has set the strategic direction by moving towards the energy business of the future and growing in new business beyond energy. In this regard, PTT had established new subsidiaries to execute these new businesses or New S-Curve businesses under the vision of Powering Life with Future Energy and Beyond. The following new businesses have already started its commercialization.

Renewable Energy Business operates through GPSC and Global Renewable Power Co., Ltd. (GRP), which are leading investments in renewable energy businesses both domestically and internationally, in order to achieve the goal of having a power generation from renewable energy of 12,000 MW by 2030. As of the year-end 2022, GRP's total equity capacity were 90 MW of power generation (which representing 45 MW of PTT's shareholding and 45 MW of GPSC's shareholding). In this regard, PTT group has a total electricity generation capacity from renewable energy of 2,771 MW.

EV Value Chain Business: ARUN PLUS Co., Ltd. operates a fully integrated EV business which aims to be a leader in developing and driving the EV ecosystem in ASEAN, including exploring EV manufacturing opportunities in Thailand through business partnership, providing electric bus services, distributing of EV chargers and expanding the EV charging station located outside oil service stations, etc. In addtion, HORIZON PLUS Co., Ltd. is set up to operate the EV manufacturing in Thailand with the target to start its commercialize in 2024 and with the initial production capacity of approximately 50,000 vehicles per year. EVME PLUS Co., Ltd. offers services through EV digital platforms such as EV rental, information of charging and maintenance service stations, etc. Meanwhile, Swap and Go Co., Ltd. operates infrastructure platform and instant-battery-swap network for electric motorcycles.

Energy Storage & System Related Business has established NUOVO PLUS Co., Ltd. to study the feasibility of the investment in the battery value chain in order to support the electric vehicle industry in accordance with Thailand's automotive industry policy to promote electric vehicles, as well as energy storage systems to enhance the electricity storage capacity from renewable energy and investment in related businesses.

Life Science Business: Innobic (Asia) Co., Ltd. engages in pharmaceutical, nutrition, medical equipment, diagnosis businesses, and etc. The investment in this business will enhance PTT's capability in life science

and create added value for the country. For example, Innobic (Asia) has purchased common stock of Lotus Pharmaceutical Co., Ltd. (LOTUS), a listed company in Taiwan Stock Exchange whose core business is research and development (R&D), manufacturing, and distribution of the generic drugs that cover various therapeutic areas especially oncology, central nervous system, and etc.

AI, Robotics and Digitalization Business: Alpha Com Co., Ltd. serves as an investment vehicle in new businesses for PTT and PTT Group, whereby new business concepts and models can be tested prior to actual investments. PTT Raise Co., Ltd. supplies and installs robotics and automation system for industrial customers. PTT and TGES Optec Co., Ltd. operates One-stop Total Improving Efficiency Technology Solutions/ Services that deploy technology to enhance efficiency of industrial equipment and machineries. ReAcc Co., Ltd., which is in the process of changing its name to New Ver Sal Co., Ltd. (expected to be completed within the first quarter of 2023) and undergoing a restructuring to hold shares in Mekha V Co., Ltd. to be a flagship for supporting investment in AI & Robotics, which the company restructuring was completed in November 2022. Moreover, T-Ecosys Co., Ltd. operates a digital platform business called "Industrial Digital Platform" or "IDP" for driving industrial transformation in the Thai industry through connecting service providers with industrial users who want to access the robotics technology, automation, and digital technology services which is the basic ecosystem to support the growth of the industry.

Logistics & Infrastructure Business: Global Multimodal Logistics Co., Ltd. was established to connect all transportation networks of Thailand and also seamlessly connecting the international transportation network. Its main services include freight services (by rail, sea, land, and air), cold chain management, property management and asset rental of properties and real estate related to logistics business. This will help entrepreneurs increase their market competitiveness as well as reduce their logistics costs.

Details of business/ procurement/ distribution/ of each company in which PTT invests through affiliates are available on the website investor.pttplc.com/en/downloads/one-report and for GPSC on gpscgroup.com/en/investor-relations/downloads/one-reports

READ MORE

READ MORE

Other Businesses

PTT Treasury Center Co., Ltd. (PTT TCC) serves as a treasury center for PTT and companies within PTT Group by securing Thai Baht and foreign currency over the long and short term to be lent to PTT and/or affiliates. It also handles their debt management, liquidity management and financial management, in the interest of PTT and affiliates.

Further information concerning business/ procurement/ distribution of companies in which PTT invests through its affiliates is available on the website investor.pttplc.com/en/downloads/one-report

READ MORE

1.2.3 Marketing and Competition

Exploration and Production Business

Marketing

PTTEP operates petroleum exploration and production business both domestically and internationally. The target markets are both domestic and overseas where the company has invested. In 2022, the total sales ratio of domestic to overseas was 63% : 37%. PTTEP sells its outputs from domestic and ASEAN primarily to the Thai market through PTT, the major buyer and processor of all products. PTT then turns the processed products into the power sector, petrochemical sector, transportation sector, industry sector, and household sector.

Marketing of petroleum products varies with their characteristics and field location which results in differentiating the market and sales price structures as summarized herewith.

1) Natural gas

Due to capital-intensive investment in developing oil and gas exploration business, gas sales agreements (GSAs) must be agreed upon or signed between the buyer and seller before any major investment is made. GSAs are typically long-term contracts, ranging from 15 to 30 years. Prices, volumes, and points of sale are stipulated for each of the contracts. Gas prices are mostly linked to fuel oil prices or Dubai crude prices as well as several key economic indices and exchange rate to reflect the investment costs and be competitive compared with other fuels along the GSA period.

2) Condensate and Crude Oil

Condensate and crude oil prices are determined by their properties and benchmarked with condensate prices and crude oil prices of Regional Benchmark Price. Contracts are either short-term or long-term, and some are sold in spot markets.

3) Naphtha

PTTEP sells naphtha from its investment in the ADNOC Gas Processing Project (AGP), the largest gas processing complex located onshore of Abu Dhabi, UAE, which is sold by Abu Dhabi National Oil Company (ADNOC) and represents as a Marketing Agent. The selling price followed the official selling price in the region and naphtha is sold under a short-term contract.

4) Liquefied Petroleum Gas

PTTEP sells LPG produced from S1 Project to PTT under a long-term contract with a price in line with the government's policy and announcements by the Joint Committee on Energy Policy Administration. In addition, LPG produced by ADNOC Gas Processing Project (AGP) is sold under a short-term contract in which the selling price refers to the official selling price in the region.

Competition

Thailand's E&P industry is oligopolistic due to high petroleum demand compared with production, resulting from the business' relatively high investment and advanced technology required. The GSAs, especially natural gas, are predominantly long-term contracts coupled with take-or-pay clauses to attract new investments to the market and reduce the risk of investors investing in this business.

Based on estimated data of 2022 production petroleum of PTTEP from domestic sources accounted for 62% of total domestic production, the highest among peers as follows:

Producers	% Domestic Production Volume
PTTEP	62
Chevron	10
Mitsui Oil Exploration	9
Petronas	6
Total	2
Others	11

Source: Department of Mineral Fuels, Ministry of Energy (as of November 2022)

As of 2022-year-end, the total amount of the natural gas reserves in Thailand and the Malaysia-Thailand Joint Development Area (MTJDA) are as follows:

Reserves	Natural Gas (Billion Cubic Feet)	Crude Oil (Million Barrels)	Condensate (Million Barrels)
Proved Reserves	3,444.64	94.67	86.42
Probable Reserves	4,507.71	102.74	152.28
Possible Reserves	2,352.68	46.53	111.16

Source: Department of Mineral Fuels, 2021 Annual Report

In Thailand, there are many large operators in petroleum exploration and production such as PTT Exploration and Production Plc., Chevron Thailand Exploration and Production Ltd., Chevron Offshore (Thailand) Ltd., Hess (Thailand) Ltd., Mitsui Oil Exploration Co., Ltd. In 2022, the average production volume of domestic natural gas was at 2,192 MMSCFD, decreased by approximately 32% from previous year, crude oil production was at 78,793 BPD, decreased by 19% from previous year. Additionally, condensate production volume was at 58,630 BPD, decreased by 26% from previous year .

Thailand's Petroleum Production Volume 2013 - 2022

Year	Natural Gas (MMSCFD)	Crude Oil (BPD)	Condensate (BPD)
2013	4,045	149,482	91,159
2014	4,073	138,552	94,330
2015	3,852	152,387	95,629
2016	3,777	163,527	94,489
2017	3,620	141,248	98,572
2018	3,527	129,201	99,010
2019	3,623	125,889	102,332
2020	3,262	117,029	84,835
2021	3,204	97,620	79,549
2022	2,192	78,793	58,630

Source: Website of the Energy Policy and Planning Office, Ministry of Energy (www.eppo.go.th)

Natural Gas Business

In Thailand, natural gas business is regulated by the Energy Regulatory Commission under the Energy Business Act B.E. 2550. In view of the government's policy to restructure the energy business, separating regulatory work from the energy business, and for the regulatory scope to cover the electricity and natural gas business for efficiency, prosperity, and adequate supply, the Energy Regulatory Commission was established. As an independent regulator, the scope of ERC authority includes the prevention of monopoly and protection of energy users and those affected by the energy business. The Energy Business Act B.E. 2550 was gazetted on December 10, 2007, effective from December 11, 2007 onwards.

PTT is the sole integrated operator of natural gas business in Thailand. Currently, PTT and affiliates engaging in the gas business adhered to the following marketing policies:

- Supply Strategy: This includes the procurement of natural gas and LNG to ensure energy security together with commercial competition accommodating the policy to promote competition in natural gas business.
- Operating Strategy: Maintaining operational excellence in meeting client's needs and lay the foundation for future growth.
- Marketing Strategy: Managing supply contracts with power producers to maintain market share while exploring new avenue to boost natural gas sales or LNG in Thailand and internationally.
- Portfolio Expansion: Pursuing investment opportunities in Thailand and beyond including Gas/ LNG Business and Non-Gas Business.

For the natural gas wholesale business, the ERC granted Shipper License to the following eight companies:

1. PTT Plc.
2. EGAT
3. Gulf LNG Co., Ltd.
4. B.Grimm LNG Co., Ltd.
5. Hin Kong Power Holding Co., Ltd.
6. EGCO Plc.
7. PTT Global LNG Co., Ltd.
8. SCG Chemicals Co., Ltd.

However, in 2022, PTT has continued to supply most natural gas and LNG from both long-term contracts and spot market into the pipeline transmission system for the country's energy security and energy cost management owing to the energy crisis, including the provision of additional natural gas to meet Thailand's energy demand. Only the Electricity Generating Authority of Thailand (EGAT) imports LNG from spot market for use in EGAT's power plants, as part of the implementation of the Third Party Access (TPA) policy, which allows third parties to access gas pipelines and LNG stations as well as promotes competition in the natural gas business in accordance with the framework established by the Ministry of Energy.

Regarding Distribution Pipeline System, PTT remains the lead player in investment and operation. Apart from PTT, there are other companies operating in distribution pipeline system including PTTNGD, which engaged in developing and constructing distribution systems to transport and distribute natural gas to customers in industrial zones around Bangkok and perimeter.

Current Natural Gas Demand

In 2022, natural gas supply averaged 4,173 MMSCFD (heat value of 1,000 BTU per cubic foot), 56% of which domestic and 44% international production. The volume of gas supply in 2022 decreased by 248 MMSCFD or 6% from 2021. Overall supply and distribution of natural gas decreased due to lower supply of gulf gas during the transition of operator for G1/61 concession.

PTT supplied natural gas in 2022 to the following clients:

- **Electricity**

Averaging 2,453 MMSCFD, accounting for 58% of overall sales volume, 6% decrease from 2021, an average of 2,618 MMSCFD. In this segment, supply to EGAT totaled 688 MMSCFD, along with 547 MMSCFD to independent power producers and 1,218 MMSCFD to small power producers.

- **Industry**

Averaging 817 MMSCFD, 20% of total sales, increased by 5% from 2021 sales volume of 779 MMSCFD.

- **Transport**

Natural gas sales in the transport sector in 2022 averaged at 140 MMSCFD, 3% of total sales, which increased by 7% from 2021 at 131 MMSCFD.

- **Gas Separation Plant**

The gas usage on gas separation plant in order to add the value to natural gas had the total volume at 780 MMSCFD, accounted for 19% of total sales volume, which decreased by 14% from 2021 at 909 MMSCFD.

Electricity Output by Fuel Type 2018 - 2022

Unit: Million Units

	2018	2019	2020	2021	2022
1. Hydropower	7,597	6,310	4,540	4,540	6,599
2. Natural gas	116,265	121,841	113,859	113,113	114,637
3. Fuel oil and diesel	177	1,125	722	716	1,731
4. Coal	35,796	35,825	36,823	36,065	35,523
5. Imported electricity	26,669	25,547	29,551	33,356	35,472
6. Renewable energy	17,923	21,402	20,540	21,894	21,862
Total	**204,427**	**212,050**	**206,035**	**209,684**	**215,824**
Expansion rate (%)	**1.6**	**3.7**	**(2.8)**	**1.8**	**2.9**

Source: www.eppo.go.th

Policy to Promote Competition in Natural Gas Business

The government has launched a policy to promote natural gas business competition throughout the system. The objective is to raise the efficiency of supplying and service providing, which enables consumers to get quality services at reasonable and fair prices. To this end, the government advocated a rise in the number of LNG supply and wholesale players and assigned ERC to grant shipper licenses and issue the third party access regime (TPA regime) so that other shippers can use PTT's natural gas infrastructure. PTT Group complied with such policy and on March 30, 2015, announced its first onshore natural gas pipeline third party access code (the latest revision was announced on June 7, 2017). PTTLNG announced its first LNG terminal third party access code on March 30, 2015 (the latest revision was announced on August 1, 2021).

The Committee on Energy Policy Administration (CEPA) on August 30, 2019, endorsed experimental guidelines for EGAT's Spot LNG import of up to 200,000 tons in two vessels, each 65,000 tons. PTTLNG coordinated with EGAT in implementation of CEPA's resolution by receiving the first LNG shipment on December 28, 2019, and the second on April 21, 2020.

Following EGAT's trial in Phase 1, the Energy Ministry reviewed and drew up a framework and blueprint for Phase 2 and on April 1, 2021, the National Energy Policy Council (NEPC) approved the natural gas liberalization Phase 2 and assigned relevant agencies to work out the details. The Council assigned CEPA to deliberate and act according to the guideline. On August 4, 2021, NEPC approved the natural gas pricing structure to promote competition in Phase 2, along with the timeframe to enforce the pricing structure. This would increase to more natural gas operators for LNG supply. Currently, the ERC has approved a total of eight shipper licenses as mentioned.

On its parts, PTT has been preparing for the imminent competition in natural gas business. It has plans, structure, and investment capital in place to act on the government's policy of making Thailand Regional LNG Hub for importing and exporting LNG to countries in the region, concurrently promoting the Thai economy as a regional energy hub.

In addition, the Energy Regulatory Commission on March 29, 2022 announced the criteria for calculating natural gas prices under the supervision of the Energy Regulatory Commission (Energy Pool Price: EPP), which are weighted average prices of fuel costs. These include PTT's pool gas, New Shipper's liquefied natural gas, diesel oil, fuel oil, liquefied petroleum gas, or other fuels as specified by the ERC in order to protect the interests of energy consumers both in terms of service rates fines and service quality, and promote competition in the energy industry, prevent abuse of power and promote energy industry operations to be efficient and fair to licensees and energy users, in which PTT has supported and implemented the guidelines set by the ERC.

Natural Gas Demand Outlook

The Cabinet on October 20, 2020 endorsed NEPC's resolution of March 19, 2020 to approve Thailand's Power Development Plan B.E. 2561 - 2580, the first revision edition. (PDP 2018 Rev. 1) and Gas Plan 2018 as proposed by the Energy Ministry. The conceptual framework and objectives of Gas Plan 2018 envisage natural gas use in multiple economic sectors to reduce air pollution, accelerate exploration and production in-country, in Joint Development Areas and overlapping areas, develop and optimize natural gas infrastructure and promote sector competition.

On gas demand outlook, Gas Plan 2018 worked on assumptions of demand chiefly from power generation, according to PDP 2018 Rev. 1 reduced output from coal and nuclear and increased natural gas share from 37% in 2079 (PDP 2015) to 53% in 2080 (PDP 2018 Rev. 1). Gas separation plants' demand (as feedstock for LPG and petrochemicals) is estimated on the back of Gulf of Thailand supply. Industry sector demand is based on GDP growth forecast 2018 - 2037 at 3.8% annual average and factoring in distribution pipeline network expansion while the transport sector is calculated on future numbers of NGV vehicles. These elements combined, overall Thailand gas demand is estimated in the range of 5,348 MMSCFD in 2037, annual average increase of 0.7% per year. (Power generation 67%, industry 21%, gas separation plants 11% and transport 1%) These estimates are revised upward of Gas Plan 2015 according to revision 2 assumptions forecasting 2036 demand at 5,062 MMSCFD, an increase of 0.1% per year.

On September 27, 2021, the EPA resolved to approve the long-term electricity demand forecast for the preparation of the Thailand's Power Development Plan B.E. 2565 - 2580 (PDP 2022) and acknowledged the draft PDP 2022 base case plan that takes into account the utilization of the existing infrastructure for maximum benefit. This is the initial case for the preparation of other case plans. of the country and presented to the CPB for consideration again. In this regard, it will consider the draft plan in the case that is most suitable for Thailand as a draft PDP 2022 plan for actual implementation.

The PDP 2022 plan places importance on the following issues: (1) Security of the country's power system (Security), including power generation, transmission and area security (2) Cost of electricity is at an appropriate level (Economy) and (3) Environmental impact (Ecology) that must limit the amount of carbon dioxide emissions in accordance with the goals of the national energy plan and the country's long-term greenhouse gas emissions target (LTS) according to the Carbon Neutrality and Net Zero Emissions policies that were signed at the COP26 meeting.

Trends in renewable and clean energy are increasing. PTT Group can increase channels to expand the market for natural gas and liquefied natural gas. PTT Group will promote the use of renewable and clean energy in parallel with the usage of natural gas.

International Trading Business Unit

Marketing

Domestic markets feature main customers, including refineries with demand for crude oil and condensate through the supply of domestic producers and import from overseas producers, along with petrochemical plants needing feedstock from overseas producers, import of gasoline for gasohol production, import of LPG for the industrial, transport, and household sectors, LNG import for power and industries to cater to national demand for imports, which reflect on the role of strengthening national energy security. In 2022, the share of revenue from domestic market is 59% (8% from domestic supply and 51% from import).

Outside Thailand, main clients include refineries, petrochemical plants, national oil companies, multinational energy companies and international trading houses through transactions of commodities such as crude oil, condensate, LNG, LPG, refined oil, petrochemicals, chemical and solvent, and export of refined oil products, petrochemicals, chemical and solvent the portion exceeding domestic demand to generate income and profits from oversea. In 2022 share of revenue from international market is 41% (41% from out-out trading and 0.1% from export).

To foster business growth and trading opportunities, one needs to engage in worldwide trading. One of the key strategies is to penetrate oil trading hubs through offices in various countries, including Singapore for Asia, China for China and nearby countries, UAE for Middle East, UK for Europe and Africa, and in the US for the Americas. This global presence enables PTT to closely monitor ongoings around the clock across time zones for demand-supply, effectively capturing arbitrage opportunity when imbalance arises. These offices also facilitate relationship between PTT and clients and partners and exploring value-add opportunity in those regions.

Competition

International trading has become more competitive as national oil companies in the Middle East and global energy companies holding various assets such as production wellheads, jetty, oil terminal, refinery and petrochemical plants ventured into Asset-backed Trading. Asset-backed trading is a form of trade in which major multinational trading companies expand investment into their assets to add value and competitiveness in the playing field. In addition, technology and digitalization enable fast and well-rounded access to pricing and trading data, where speed can make or break trading and profitability opportunities. In 2022, the volume of International Trading Business and PTT Group total trade volumes of 1.5 million barrels a day with partners and clients numbering over 1,200 companies located in 70 countries worldwide.

Going forward, industry and competition outlook remain intense. The World's economic growth, particularly post of COVID-19 recovery and trade war between China and the US is affecting global energy demand while political instability besetting oil-producing countries and oil producing countries' influence on global production affect competition. In the long-term trading outlook, global fossil fuel trade may slow due to protracting trends to reduce climate-harmful energy and the switch to clean energy such as wind and solar, or battery cells and hydrogen in automobile and transport sectors. However, clean energy is far from being tenable and limitations abound. Therefore, LNG is the key alternative in the energy transition. For the moment, LNG is emerging prominent in international energy trading due to continuous expansion in production capacity by large-scale producers and enabling inter-continental transport. As a result, many countries are leaning towards LNG as national staple energy source of the world. This presents a challenging opportunity for LNG trade expansion for its International Trading Business Unit.

Refining Business

Refining Industry

Marketing

Currently, Thailand has a total of 6 oil refineries with a combined refining capacity of 1,244,500 barrels per day (BPD) (including GC's condensate splitter capacity of 135,000 BPD). As of December 31, 2022, these refineries yielded 1,039,132 BPD (including LPG production from gas separation and petrochemical plants).

Unit: BPD

Product	2020	2021	2022
Gasoline	224,358	214,845	223,203
Diesel	486,583	476,859	481,972
Aviation fuel	56,192	36,221	71,447
Fuel oil	81,366	91,782	99,308
Kerosene	28,448	28,864	33,086
LPG	142,132	143,840	130,116
Total	**1,019,079**	**992,411**	**1,039,132**

Source: Department of Energy Business, Ministry of Energy

Competition

Thailand's average daily demand for fuel products increased by 13.5% in 2022 compared to 2021, with demand for diesel, aviation fuel (Jet A1), fuel oil, LPG (including petrochemical feedstock), and gasoline increasing by 15.7%, 91.6%, 15.7%, 5.9%, and 3.9%, respectively, while demand for kerosene decreased by 15.9%. Overall, oil demand has been steadily rising as a result of the COVID-19 situation, which has begun to unravel. The country has reopened and the economy is starting to recover. Foreign tourists are interested in visiting Thailand, and Thais are increasingly traveling across provinces, particularly during the New Year celebrations at year's end.

In 2022, refined product exports included gasoline, diesel, fuel oil, aviation fuel, kerosene, and LPG, with the export volume decreasing to 159,414 BPD (a decrease of 21.5%), with a total export value of THB 20,155 million per month (an increase of 33.1%).

Petrochemical Business

Marketing

The relaxation of COVID-19 control measures improved Thailand's petrochemical industry in 2021. Thai petrochemical producers increased their output due to increased demand for petrochemical and plastic products, particularly plastic for packaging, medical equipment, hygiene products, and home appliances as consumer behavior changed. Simultaneously, the Thai petrochemical industry is investing in more environmentally friendly products in line with the Bio-Circular-Green (BCG) Economy Model, such as recycling plastic waste back into petrochemical raw materials and using agricultural products to produce bioplastics.

Thailand's Profile of Overall Production, Import, Export and Consumption of Petrochemical Product

Unit: Thousand tons per year

Year	Supply		Consumption	
	Production	Import	Consumption	Export
2019	23,934	1,577	17,277	8,234
2020	23,500	1,739	17,672	7,573
2021	25,130	1,703	18,182	8,203

Source: Petroleum Institute of Thailand

Competition

Olefins

Production volume in 2021 increased from 2020, owing primarily to the completion of production capacity expansion during the year, and also to the expansion and improvement of production units to increase capacity and flexibility of the plant's raw material selection. This is in line with the growing demand resulting from the country's recent expansion of olefins downstream product production facilities' production capacity. As a result, full-year imports declined. Meanwhile, exports increased due to increased regional demand, which is consistent with the recovery of the economy and manufacturing sectors, inside and outside Thailand, as well as the petrochemical market, which has gradually improved since the end of 2020.

Aromatics

In 2021, production volume increased compared to 2020 due to rising demand from domestic downstream products in line with the economic situation and the overall manufacturing sector, which has begun to improve since the end of 2020. Furthermore, in comparison to the previous year, the production profit margin was relatively high. This was caused by a snowstorm in the southern United States. Imports and exports grew from the previous year, with China, India, Vietnam, Indonesia, and Singapore being the main destination countries.

Oil and Retail Business

Thailand has a total of 52 registered fuel traders in Article 7 (as of December 31, 2022). In 2022, domestic oil demand totaled 50,351 million liters with the largest share being diesel, followed respectively by gasoline, LPG, aviation fuel, and fuel oil.

Oil sale in Thailand is a free market, with constant competition based on market forces in terms of price, product and service quality development, supply chain cost management, and new business model development to increase revenue. Thailand's oil consumption in 2022 increased compared to 2021 due to the economic recovery from the unfolding COVID-19 pandemic, resulting in an increase in travel and energy demand.

Thailand's Fuel Consumption for 2020 - 2022

Unit: Million liters

Product	2020	2021	2022
LPG[1/]	6,276	6,246	6,705
Gasoline	11,608	10,762	11,180
Kerosene	6	6	5
Aviation fuel	2,745	1,775	3,337
Diesel	23,946	23,042	26,664
Fuel oil[2/]	1,728	1,897	1,992
Lube	425	458	468
Total	**46,734**	**44,186**	**50,351**

Source: Department of Energy Business, PTT Oil and Retail Business Plc. (OR)

Remarks:

1/ Excluding Propane and Butane

2/ Excluding fuel oil sold to the Electricity Generating Authority of Thailand

OR is a lead player in the domestic fuel market across most product categories. According to the Department of Energy Business, in 2022, OR's market share was 43.22% of the overall oil's sales volume.

Oil Traders' Market Shares from 2020 - 2022

Unit: Percent

Company	2020	2021	2022
OR[1/]	42.30	42.21	43.22
Bangchak	10.32	10.39	11.15
Esso	10.94	11.29	10.53
Shell	8.88	7.50	7.13
Minor traders	27.56	28.61	27.97

Source: Department of Energy Business
Remarks:
Excluding LPG used as petrochemical feedstock
1/ Including PTT's and OR's market shares

Oil Price Structure

Oil price structure consists of 2 components: refiners' wholesale price and retail price. The wholesale price at refinery gate incorporates refining costs, excise duty, municipal tax, contribution to Oil Fuel Fund, Energy Conservation Fund, and value-added tax (VAT). The retail price component consists of refiners' wholesale price, marketing margin and VAT.

Given Thailand's oil importer status mostly in crude oil and partially refined oil, and a free-market trade system, determination of oil price at refinery is benchmarked against global oil price on Import Parity principle, decided by the authority. Pricing is also subject to foreign exchange rates (value of Thai Baht) which directly affects Import Parity cost calculation.

Regarding excise duty, municipality tax and VAT, contribution to the Oil Fuel Fund, and Energy Conservation Fund, the state determines tariffs which differ with each category of oils. Producers are responsible to paying tax and into funds at the rates fixed by the state.

With refined oil price in the world market moving in line with market conditions, and that the government fixed different rates for different fuel categories resulted in continuous adjustments of retail oil prices. The table shows oil price structure on December 29, 2022.

Oil Price Structure in Bangkok Metropolis as of December 29, 2022

Unit: THB/liter

	Gasoline 95	Gasohol 95 E10	Gasohol 91	Gasohol 95 E 20	Gasohol 95 E 85	Diesel B10
Ex-refinery price	**21.0473**	**21.5657**	**21.1355**	**22.1085**	**27.5575**	**26.6090**
Excise tax	6.5000	5.8500	5.8500	5.2000	0.9750	1.3400
Municipal tax	0.6500	0.5850	0.5850	0.5200	0.0975	0.1340
Oil fund	8.2800	1.7000	1.7000	0.0100	0.0100	3.5100
Energy Conservation Promotion Fund	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
Ex-refinery wholesale price	**36.5273**	**29.7507**	**29.3205**	**27.8885**	**28.6900**	**31.6430**
VAT	2.5569	2.0825	2.0524	1.9522	2.0083	2.2150
Ex-refinery wholesale price including VAT	**39.0842**	**31.8332**	**31.3730**	**29.8407**	**30.6982**	**33.8580**
Marketing margin	2.5942	2.4456	2.6234	2.5227	1.8615	1.0112
VAT	0.1816	0.1712	0.1836	0.1766	0.1303	0.0708
Retail price	**41.8600**	**34.4500**	**34.1800**	**32.5400**	**32.6900**	**34.9400**

Source: Energy Policy and Planning Office

Remarks:

- *Refiners' price, benchmarked against refined oil in global market on Import Parity principle*
- *Tax and fund contribution rates determined by the state*

LPG Supply Industry

In 2022, Thailand's demand for LPG averaged 17.49 million kg/day, increase 5.9% from 2021 due to higher use in all sectors: Transport sector consumed 2.19 million kg/day (increase 25.7%), industry sector consumed 2.03 million kg/day (increase 8.6%), petrochemical sector consumed 7.54 million kg/day (increase 3.9%) and household sector consumed 5.74 million kg/day (increase 1.6%).

LPG Price Structure

LPG price structure consists of two components:

(1) Ex-refinery wholesale price, consisting of

- Price at refinery
- Excise duty, municipal tax, oil fund contribution, and VAT

(2) Retail price, consisting of

- Ex-refinery wholesale price
- Marketing margin and VAT

LPG Price Structure as of December 29, 2022

	THB/kg
Ex-refinery price	**23.7247**
Excise tax	2.1700
Municipal tax	0.2170
Oil fund	(6.1284)
Ex-refinery wholesale price	**19.9833**
VAT	1.3988
Ex-refinery wholesale price Including VAT	**21.3821**
Marketing margin	3.2566
VAT	0.2280
Retail price	**24.8700**

Source: Energy Policy and Planning Office

New Business and Infrastructure Group

Power Business

Industry Overview

At the end of September 2022, Thailand has an installed power generation capacity of 52,805 megawatts and has the electric power consumption of 149,972 gigawatt-hours, increased 4.4% compared to the same period last year. The increase was resulted from robust electricity demand from industrial and business sectors following the economic recovery. The overall peak demand of the electricity system in 2022 was at 33,177 megawatts, 6.9% higher than in 2021. The direction of renewable energy production according to the framework of the National Energy Plan of the National Energy Policy Council (NEPC) focuses on increasing production of renewable and clean energy power plants with the goal of supporting Thailand to achieve Net Zero Emissions in 2065.

Competition

Amidst increasingly competitive market in power sector, PTT's power company stands strong with the potential to compete with other players from its expertise and long experience in power generation and steam businesses, in combination with security of grids linking outputs from various generation plants as well as coverage of large geographical area, customer care, guarantee of secure electricity and steam supply to clients throughout contractual duration and coupled with a sustainable growth policy with an emphasis on innovation development. Moreover, it can generate using wide range of fuel types, resulting in lower cost compared to competitors, or proprietary utility that invested by individual customers in an industrial estate.

Electric Vehicle (EV) and EV-Related Businesses

Industry Overview

Currently, Electric Vehicle (EV) is emerging globally as a megatrend to address environmental challenge, to reduce fossil fuel dependence, presenting New S-Curve opportunity. These are positive drivers for EV operators in Thailand as the country has plans to develop EV industry with the potential to become a lead global player. Thailand's National EV Policy Committee has announced an EV incentives guideline under a "30/30 Policy" which targets manufacturing Zero Emissions Vehicle (ZEV) by at least 30% of total car outputs by 2030, as part of Thailand's drive towards a Low-Carbon Society in the future. Currently, many countries including China, Japan, the USA and other European countries have set clear targets and measures to promote EVs. Thailand's National EV Policy Committee assigned various sub-committees to study details and feasibility of incentives to be implemented in 3 phases:

Phase 1 (Immediate): 2021 - 2022

Launched pilot promotion for electric motorcycles and support EV infrastructure nationwide.

Phase 2: 2023 - 2025

Develop EV industry by set the production target of 225,000 units of passenger cars and pick-up trucks, 360,000 units of motorcycles, and 18,000 units of buses/ trucks by 2025 along with battery production to meet domestic demand, which is the first indicator to achieve the economies of scale production target.

Phase 3: 2026 - 2030

Drive plans and measures to achieve concrete results in line with the 30/30 policy for total target production of 725,000 passenger cars and pick-up trucks, 675,000 electric motorcycles, amounting to 30% share of total production in 2030 including battery production to meet domestic demand.

The Board of Investment (BOI) meeting on November 4, 2020 approved a new round of EV investment promotion after the application period for promotion has expired since 2018. The promotion covers all types of EVs, including cars, motorcycles, tricycles, buses, trucks, and electric-powered boats. In the past, only electric cars and electric buses were promoted. The benefits and conditions are as announced by the Office of the Board of Investment. Subsequently, on February 15, 2022, the Cabinet approved measures to promote EVs which contains both of tax measures and other non-tax measures to increase the competitiveness. These measures cause the price of EVs to drop and stimulate the demand of EVs in Thailand. To achieve the goal in 2030, the measures issued by the Cabinet meeting are divided into two main parts: tax-related measures and subsidy measures.

Competition

The trend of using EVs around the world tends to grow rapidly, such as in China, European countries and the USA, which will inevitably affect the automobile industry in Thailand. The combustion engine industry must adapt to the EV industry. The development of the EV industry in Thailand has lagged behind many countries in terms of production, sales and infrastructure. On the other hand, it is an opportunity to create growth because Thailand has market readiness and has a production base in the region. However, consumers still have some concerns such as charging service stations and driving distance per charge cycle which will affect the decision-making to use EV and will also be a guideline for the adjustment of industry players in the future.

As for the competition in Thailand, there are many foreign EV manufacturers, especially China, have given importance to entering Thailand's market. Moreover, having a tax support policy for EVs imported from China, resulting in competition that will benefit consumers and the development of Thailand's EV ecosystem. However, the increasing in competition and transforming in automotive industry, causing players in the industry and related parties to quickly adjust themself and their networks in response to the new era of automobile industry, such as adjusting product and service models, seeking for the target customers, developing a new business models, and collaborating with other players both inside and outside the industry in order to be able to compete in the market.

1.2.4 Business Assets

PTT's core business assets consist of investment properties; property, plant and equipment; right-of-use assets; goodwill; intangible assets; and exploration and evaluation assets. The net book values as of December 31, 2022 were as follows:

Unit: THB million

	Investment Properties	Land	Buildings & Building Improvements	Machinery & Equipment	Exploration and Production Properties	Other Assets	Construction in Progress	Right-of-use Assets	Goodwill	Other Intangible Assets	Exploration and Evaluation Assets	Total
Net value	10,736	58,527	150,405	630,659	399,955	6,908	252,876	124,053	188,964	137,051	106,161	2,066,295
Obligations	None	768	9,486	43,052	None	8,381	88	None	None	None	None	61,775

Besides the assets stated above, PTT's business assets include petroleum reserves, which are core business assets of PTTEP, PTT's subsidiary. As of December 31, 2022, PTTEP and its subsidiaries have total Proved Reserves of 365 million barrels of crude oil, condensate, and LPG, as well as 6,523 billion cubic feet of natural gas, or equivalent to a total of 1,442 million barrels of crude oil equivalent. PTTEP's geologists and petroleum engineers audit and appraise these reserves every year to achieve standardized numbers.

Proved Crude Oil, Condensate, and Natural Gas Reserves[1/]

	Crude Oil and Condensate[2/] (Million Barrels)			Natural Gas (Billion Cubic Feet)			Crude Oil Equivalent (Million Barrels of Crude Oil Equivalent)		
	Indigenous	Overseas	Total	Indigenous	Overseas	Total	Indigenous	Overseas	Total
Proved Reserves									
As of December 31, 2020	112	183	295	2,580	2,171	4,751	533	540	1,073
1) Revision of previous estimates	7	4	11	51	(25)	26	15	2	17
2) Improved recovery	2	-	2	2	-	2	3	-	3
3) Additional development well drilling & new discoveries	20	8	28	781	48	829	147	15	162
4) Purchase/ sale of reserves	-	69	69	-	1,117	1,117	-	264	264
5) Production	(26)	(22)	(48)	(470)	(342)	(812)	(103)	(76)	(179)
As of December 31, 2021	**115**	**242**	**357**	**2,944**	**2,969**	**5,913**	**595**	**745**	**1,340**

Remarks:

1/ Proved reserves include PTTEP's net equity reserves and those of the countries that own oil and gas fields

2/ Including NGL

	Crude Oil and Condensate[2/]			Natural Gas			Crude Oil Equivalent		
	(Million Barrels)			(Billion Cubic Feet)			(Million Barrels of Crude Oil Equivalent)		
	Indigenous	Overseas	Total	Indigenous	Overseas	Total	Indigenous	Overseas	Total
Proved Reserves									
As of December 31, 2021	115	242	357	2,944	2,969	5,913	595	745	1,340
1) Revision of previous estimates	13	6	19	173	208	381	41	33	74
2) Improved recovery	1	-	1	1	-	1	1	-	1
3) Additional development well drilling & new discoveries	32	9	41	859	171	1,030	174	37	211
4) Purchase/ sale of reserves	3	-	3	80	35	115	16	4	20
5) Production	(31)	(25)	(56)	(566)	(402)	(968)	(123)	(89)	(212)
Proved reserves derived from joint-venture investments[3/]	-	-	-	51	-	51	8	-	8
Total Proved Reserves As of December 31, 2022	**133**	**232**	**365**	**3,542**	**2,981**	**6,523**	**712**	**730**	**1,442**

Remarks:

2/ Including NGL

3/ Including reserves under the APICO joint-venture project

Long-Term Leases

PTT's major long-term property leases are the agreements for using Ratchaphatsadu land (royal land) subleased to the Ministry of Finance for PTT Plc.'s business under an agreement between the Ministry and PTT dated June 3, 2008. Properties which PTT segregated to the Ministry under the verdict of the Supreme Administrative Court are right-of-use land, pipelines, equipment, and tools which together form transmission pipeline systems. The assets under the agreement were booked as right-of-use of such Ratchaphatsadu land for 30 years (January 1, 2008 to December 31, 2037). After the period expiration, the Ministry pledges to allow PTT to use this segregated land for another 30 years. Regarding compensation payment for land use, the agreement calls for annual payment at the rate derived from revenue sharing of onshore gas transmission pipeline tariff of each calendar year. This tariff means the charge for the onshore transmission pipeline system (Area 3), which includes demand charge and commodity charge under the rule for setting natural gas prices and pipeline charges under the NEPC announcement No. 1 of 2001 or future amendments. The compensation is calculated by a sliding scale as detailed below.

Unit: THB million

Revenue	Compensation Rate (% of Revenue)		Annual Compensation
	Minimum	Increment	
0 - 3,600	5%		= Minimum Compensation 180
> 3,600 - 3,700		10%	> 180 - 190
> 3,700 - 3,900		15%	> 190 - 220
> 3,900 - 4,100		20%	> 220 - 260
> 4,100 - 4,300		25%	> 260 - 310
> 4,300 - 4,500		30%	> 310 - 370
> 4,500 - 5,000		36%	> 370 - 550
> 5,000			= Maximum Compensation 550

Investment Policy in Subsidiaries and Associates

PTT's investment policy, whether for new investments, expansion or capacity growth, share purchase or acquisition. PTT has taken many factors into consideration, namely, business growth trends, investment capable of adding value and economic viability, and enhanced competitiveness. PTT or its subsidiaries may carry out the investments, depending on each company's suitability and capability.

1.2.5 Outstanding of Undelivered Project

-None-

1.2.6 Environmental Impacts

Environmental Impacts of Gas Separation Plants (GSPs)

Throughout the operations of the Gas Separation Plants (GSPs), PTT pays great attention to the impacts on the environment, safety and occupational health as well as the quality of life and health of people living nearby by continuously and strictly monitoring environmental quality following the relevant laws. Based on the environmental quality monitoring results of all GSPs since the start of operations, air quality, water quality and waste management from the processes are all well below regulatory limits, as well as complying with environmental impact prevention and mitigation measures with continuous monitoring. If the results of the environmental impact monitoring measures do not conform to the environmental impact assessment, PTT would develop an implementation plan to improve and comply with the established measures, including reporting information to relevant agencies within the guidelines and time frame specified by law. In addition, PTT improves the efficiency of processes as well as implementing energy conservation projects, for example, a waste heat recovery project at GSP Unit 5, power generation and cogeneration projects for the Ethane GSPs, and a waste gas recovery unit (Remaining Gas Recovery Unit: RGRU) for GSPs in Rayong province.

Moreover, PTT has determined to control air pollution consistently. In 2019, the construction was begun to install the Regenerative of Thermal Oxidizer (RTO) and the SO_2 Scrubber at GSP Unit 5 and the expansion of the installation of Regenerative Thermal Oxidizer (RTO), a hydrogen sulfide removal unit for gas contaminated with residual acidic gas from gas separation, and SO_2 Scrubber to GSP Unit 6 and Ethane Separation Plant. The installation began in 2022, of which EIA report has been approved by the licensing agency.

In addition to compliance with laws, PTT's GSPs at Rayong province achieved Integrated Management Systems (IMS) Certification, Environmental Management Systems Certification (ISO 14001), Occupational Health and Safety Management System (ISO 45001) Certification, Quality Management System (ISO 9001) Certification, Business Continuity Management System (ISO 22301) Certification and Energy Management System (ISO 50001) Certification. Khanom GSP has received the above management standard certifications as well.

Environmental Impacts of Gas Transmission Pipeline Operations

PTT has been developing the natural gas pipeline network since 1981. Originally, the natural gas pipeline system was not designated for environmental impact studies until the adoption of the National Environmental Quality Promotion and Preservation Act B.E. 2535 and the Ministry of Science, Technology and Environment Announcement No. 3 in 1996 on determining the type and size of projects or businesses of government, state-owned or private sectors that require the preparation of the Environmental Impact Analysis Report, respectively. As a result, Environmental Impact Assessment (EIA) of natural gas pipeline system projects must be studied and prepared. At the time, the network of natural gas pipeline systems under PTT's operations consisted of natural gas pipeline projects under the Natural Gas Pipeline Master Plan Project, Natural Gas Pipeline Project to Industrial Customers, Power Plants and Natural Gas for Vehicles (NGV) Service Stations. Environmental impacts in accordance with the requirements of the announcement have been studied since then. In addition, when additional environmental requirements are enacted, PTT has studied and specified the types of projects that are deemed to be subject to a complete study of environmental impacts in accordance with relevant requirements, such as the Ministry of Energy Announcement on determining the type and size of natural gas pipeline transport system and the guidelines, methods, regulations, and guidelines for preparing Environmental Report (ER) B.E. 2556.

Therefore, before the construction preparation, construction and operation phases, all PTT natural gas pipeline projects must study and assess direct or indirect potential environmental impacts from project implementation to lead to the determination of preventive, corrective, and environmental impact monitoring measures, then compiling it as an EIA or ER and presented to the Office of Natural Resources and Environment Policy and Planning (ONEP) and related licensors such as the Department of Energy Business (DOEB), the Energy Regulatory Commission (ERC). After the EIA or ER is approved, PTT will direct, monitor, and present the results of compliance with the conditions specified in the report, including strict environmental measures both during the construction and after-construction phases. The project will deliver the project care to the natural gas transmission business throughout the period of gas transportation through the pipeline system. The results of EIA or ER compliance will be reported to the relevant licensors on a 6-month basis or according to the conditions specified by each agency. All PTT projects have fully implemented the measures proposed in the report until now.

1.2.7 Notable Research and Development (R&D) Work of PTT Innovation Institute

Process Technology and Applied Energy

The core business of PTT Group revolves around production process, from natural gas industry to petroleum refinery and petrochemicals. PTT Innovation Institute focuses on research and development to add value to product, increase process efficiency in terms of energy use, productivity, and enhance high-tech processes. To date, PTT Innovation Institute has played an instrument role in the development and evaluation of catalyst and adsorbents for PTT Group of companies to substitute import and to enable performance evaluation for appropriate choice of catalyst and adsorbents. These result in cost cutting and value adding to Business Units to the tune of over THB 200 million per year.

In addition, the Institute works on simulation of processes to enhance energy efficiency or develop new technology corresponding with raw material and market trends. For example, the Microchannel Base reactor that is compact and efficient in transfer of intense energy and matters. It plays a part in evaluation of CO_2 Conversion to manage process and turn CO_2 into valuable product, demonstrating for Business Units in their investment consideration and potential new business of PTT in the future.

To assist PTT Group and external agencies with energy applications. PTT Innovation Institute has created a readiness for the Energy Application Lab to assess the impact of gas quality on industrial machinery, as well as provide training on gas engines to PTT's natural gas business customers to support the replacement of industrial fuel from diesel. LPG or fuel oil to natural gas, with future transition to liquefied natural gas.

Biotech and Materials Research

In support of PTT's sustainable business, PTT Innovation Institute pursues R&D in biotechnology, Microbial development and selection, polymer technology and products, materials, and chemicals to generate innovation and products for PTT Group and to support PTT's new business in Life Science.

In supporting PTT's new business, the Institute works on biomaterial for medical use such as bio-cellulose wound dresser, multi-purpose masks with dust filters and disinfection capability. In addition, it works in the polymer field, material and chemicals for PTT Group, ranging from petroleum plastic and bioplastic such as pellets to clean machinery. The Institute also successfully developed Coffee Chaff Compound, using coffee chaff which is waste from bean roasting process to mix with polymer and shape into products and furniture pieces to reduce waste generation and add value by producing environmentally friendly products.

In addition, PTT Innovation Institute has also focused on the research and development of extracts. active ingredients from plants and herbs to be used in the food supplement industry and pharmaceuticals by using domestic raw materials that contain the desired active ingredients such as stevia, black galingale, etc.

Petroleum Product and Automobile Research

PTT Innovation Institute plays an active role in development of oil and lubricant products for automobiles, industrial lubricant and specialties, including by-products from petroleum and new products for factory machinery and equipment to accommodate overseas market expansion. This enables PTT Group to maintain its market share and leadership by responding to new needs of clients, and new international standards and to provide technical support to the state in matters relating to fuel, alternative fuel, lubricant, and automobiles supplying evidence for a policy formulation. New products launched in 2022 included Clean X with nozzle cleaning feature and higher acceleration for Gasohol 95, E20 and diesel. Premium gasohol was developed and launched to the market in March 2022.

In addition, PTT Innovation Institute has laboratories to provide fuel-related technical services and lubricants for machinery and vehicle for PTT Group and external entities. This is to support research, solutions, analysis and test, and standard setting. The Institute offers consultancy and keeps a database of related research. There is a state-of-the-art Automotive Lab for testing and benchmark testing against international standards, testing and evaluation of vehicle and engine performance, combustion, and pollution emissions from different fuel types. In 2022, the capacity has been expanded to support Euro 5/6 emissions tests and electric vehicle and battery tests to support the expansion of the electric vehicle market in the future.

New Energy Technology Research

PTT Innovation Institute has developed innovations to support the growth of the EV value chain business and technology that will drive the energy business towards an electricity-consuming society in the future, including the use of energy produced from renewable energy sources for sustainability and reducing environmental impact, such as the EV Wall Charger and Charging Platform, with continuous development to support power and formats, more diverse applications including connecting to other network's charging devices. Currently, it has cooperated with ARUN PLUS Co., Ltd. (ARUN PLUS) to produce and distribute EV Wall Charger and manage the charging service network. Energy storage technology has been developed either in battery or hydrogen form. PTT Innovation Institution collaborates with Vidhyasirimedhi Institute (VISTEC) and NUOVO PLUS Co., Ltd. (NUOVO PLUS) in developing battery cells using Core-Shell technology for higher storage capacity than those available in the market, and it is ready for commercialization and business development. The Institute has equipment and a lab to mold cells at bench scale and pilot scale. Furthermore, the Institute works on capacity-strengthening for technical due diligence tasks for investment in renewables namely wind, and solar, to expand the renewables portfolio of PTT Group in Thailand and internationally.

In addition, PTT has realized the importance of related businesses which necessary to build the foundation for the country. Therefore, a working group has been set up to drive business in both hydrogen and smart electronics.

Environment Technology Research

Beyond business perspective, PTT upholds environmental conservation. It has conducted R&D in environment management to mitigate and prevent impacts of PTT operations, to ensure sustainability in PTT Group's sustainable growth in line with the Net Zero goal of the organization and Thailand, generating Circular Economy. The Institute provides R&D services, development, and application of environmental technology and products to PTT Group and external parties.

PTT Innovation Institute conducts R&D on environmental quality assessment - air, water, soil and waste to PTT's businesses and PTT's office building to define approach, method and measures to resolve or mitigate non-compliance. Its R&D work covers preventive solutions, control, and elimination of pollution from PTT Group's business activities over short and long terms. These include factory-generated VOCs treatment system, prototype food waste digestion machine, prototype anti-PM2.5 and pathogen machine. The Institute has developed a climate simulation prototype using pollution databases to enable 3-dimensional inspection of pollution on the ground for PTT Group. It has conducted Life Cycle Analysis (LCA) of fuel and products by PTT Group to gather evidence for renewables with the least environmental impact. All these efforts are exerted to ensure efficiency of environmental rehabilitation process and mitigate business impact on the environment and community, aligned with corporate social responsibility and sustainability principles in PTT Group's business.

In addition, the Institute has also collaborated with PTT Group in feasibility studies and technology development of Carbon Capture & Sequestration and plan to implement as a national pilot project in the Gulf of Thailand.

Strategic Plan and Innovation Management

Research and innovation management plays an important part in shaping the direction, tracking performance and steering PTT Innovation Institute's work towards outcomes efficiently. Managing research and innovation consists of strategic planning and innovation management, intellectual property management, research capacity development, commercial technology work and other support.

In strategic planning and innovation, PTT has a process of project screening to prioritize and allocate resources properly, as well as collaboration on innovation with other units within PTT Group under the supervision of PTT Innovation Management Committee (PTT IMC) and PTT Group-wide integration through oversight of the PTT Group Technology Committee (PTT GTC).

Furthermore, PTT Innovation Institute operates a unit on the commercialization of technology. The scope of its work includes economic feasibility assessment of research projects, developing a business model to commercialize research, and ensuring effective commercialization of research. PTT Innovation Institute has an intellectual property management unit in charge of IP Landscape & FTO study prior to research undertaking. The unit maintains IP data base, IP valuation as well as facilitates patent application in support of PTT Group's innovation.

To ensure the sustainability of PTT's innovation, the Institute operates a knowledge management unit that advances the capacity of researchers and staff to ensure that innovation generation is systematic and efficient. The unit handles general support including public dissemination of research outcomes and innovation, community relations work, procurement, and the overall administration of the Institute itself.

PTT Innovation Institute is certified ISO 14001 for its environmental management system, ISO 45001 by the Management System Certification Institute (Thailand) (MASCI), and TISI 17025 from the Thai Industrial Standards Institute (General Requirement for the Competence of Testing and Calibration Laboratories).

1.3 Shareholding Structure of PTT Group

1.3.1 Shareholding Structure of PTT Group

PTT is a fully integrated national petroleum and petrochemical company with the mission to ensure national energy security, economic prosperity, and organization sustainability in parallel with socio-environmental stewardship.

Our operations cover the energy industry's entire business value chain from upstream to downstream activities with an emphasis on value added to its businesses as well as creating energy innovation. PTT has its own business operations and operates through subsidiaries. The following structure illustrates the integration of our operations.

Business Structure of PTT Group Companies

Upstream Petroleum and Gas Business Group

Gas Business
- Supply and Distribution
- Gas Separation Plant
- Distribution Pipeline
- NGV
- Commercial and Marketing Management

Gas Transmission Business

PTT LNG Co., Ltd. (PTTLNG)	100.00%
PTT Exploration and Production Plc. (PTTEP)[1/]	63.79%
PTT Natural Gas Distribution Co., Ltd. (PTTNGD)[3/]	58.00%
Trans Thai-Malaysia (Thailand) Co., Ltd. (TTM(T))[3/]	50.00%
Trans Thai-Malaysia (Malaysia) Sdn. Bhd. (TTM(M))[3/]	50.00%
Map Ta Phut Air Products Co., Ltd. (MAP)[3/]	49.00%

International Investment Business

PTT Energy Resources Co., Ltd. (PTTER)	100.00%
PTT Green Energy Pte. Ltd. (PTTGE)	100.00%
PTT Global Management Co., Ltd. (PTTGM)	100.00%

Downstream Petroleum Business Group

International Trading Business
- Crude oil and condensate
- Refined oil product and LPG
- LNG and alternative products
- Petrochemical product, chemical and solvent
- Derivatives
- International Chartering

PTT International Trading Pte. Ltd. (PTTT)	100.00%
PTT International Trading London Ltd. (PTTT LDN)	100.00%
PTT International Trading USA Inc. (PTTT USA)	100.00%

Petrochemical and Refining Business

PTT Global Chemical Plc. (GC)[1/]	45.18%
Thai Oil Plc. (TOP)[1/]	45.03%
IRPC Plc. (IRPC)[1/]	45.05%
PTT Tank Terminal Co., Ltd. (PTT TANK)	100.00%

Oil and Retail Business

PTT Oil and Retail Business Plc. (OR)[1/]	75.00%

New Business and Infrastructure Group

- Innovation and New Ventures
- Engineering and Infrastructure
- Innovation Institute

Energy Complex Co., Ltd. (EnCo)	50.00%
PTT Energy Solutions Co., Ltd. (PTTES)	40.00%
Global Power Synergy Plc. (GPSC)[1/]	47.27%
District Cooling System and Power Plant Co., Ltd. (DCAP)	35.00%
PTT Digital Solutions Co., Ltd. (PTT DIGITAL)	20.00%
InnoSpace (Thailand) Co., Ltd. (InnoSpace)	13.61%
HG Robotics Co., Ltd. (HG ROBOTICS)	9.47%
Baania (Thailand) Co., Ltd. (Baania)	2.73%
Sunfolding, Inc. (Sunfolding)	5.81%
Luminar Technologies, Inc. (Luminar)	0.07%
Ample, Inc. (Ample)	1.13%
Shenzhen Immotor Technology Co., Ltd. (Immotor)	3.05%
NTG Holdings Pte. Ltd. (NT)	14.51%

Other Businesses

PTT Treasury Center Co., Ltd. (PTT TCC)	100.00%
Business Services Alliance Co., Ltd. (BSA)[2/]	25.00%
Sarn Palung Social Enterprise Co., Ltd. (SPSE)	20.00%
Dhipaya Group Holdings Plc. (TIPH)[1/]	13.46%
Veolia Sustainable Solution (Thailand) Co., Ltd. (VSS)	40.00%

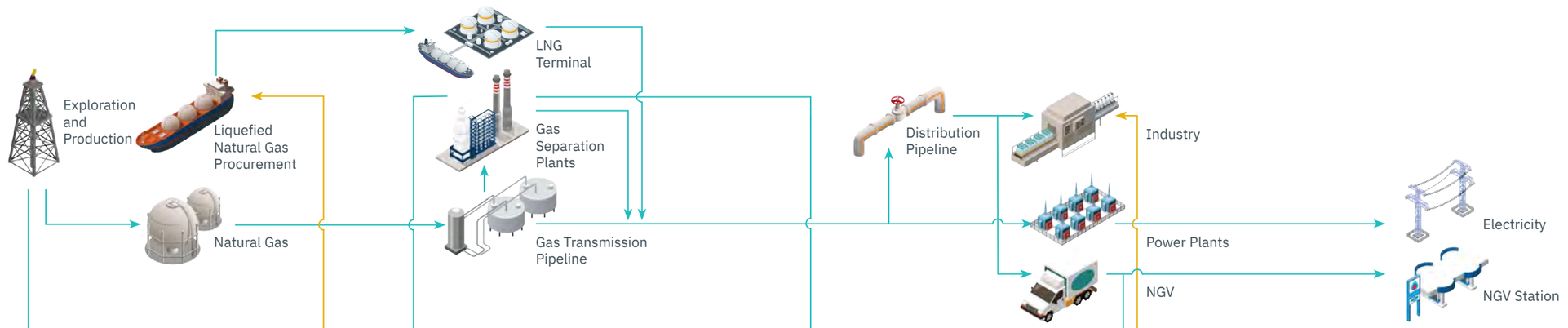
Own Operations | **Investment in PTT Group**

Remarks:
Information as of December 31, 2022. (All figures are presented by PTT's portion.)
1/ These 7 listed companies registered in The Stock Exchange of Thailand.
2/ BSA is a wholly owned subsidiary as PTT holds all common shares of BSA.
3/ Shareholding in these subsidiaries is a joint investment in other businesses. Details are in Supplementary of 56-1 One Report for year 2022.

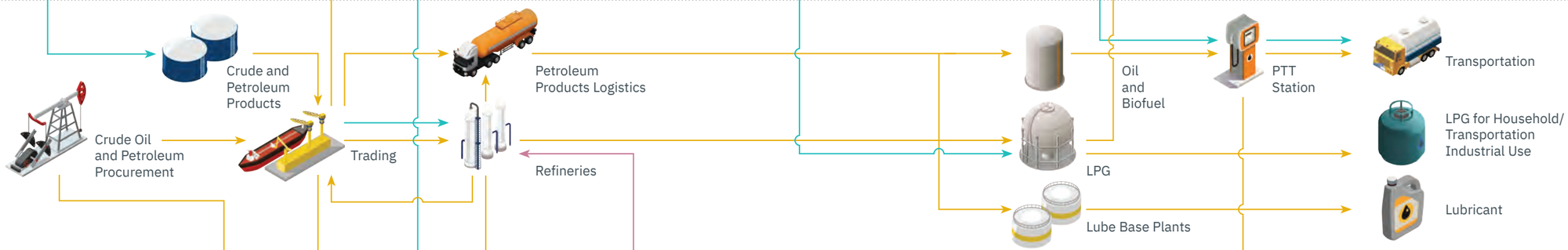
Create Value through Business Chain

UPSTREAM | INTERMEDIATE | DOWNSTREAM | END CUSTOMERS

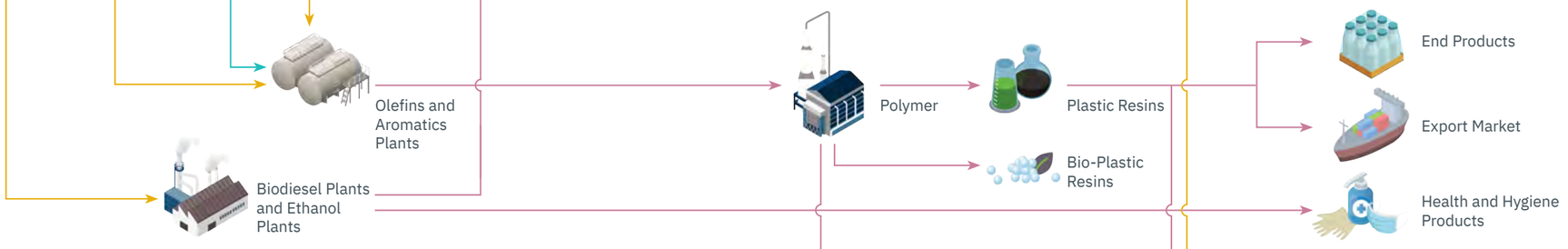
LNG & GAS CHAIN



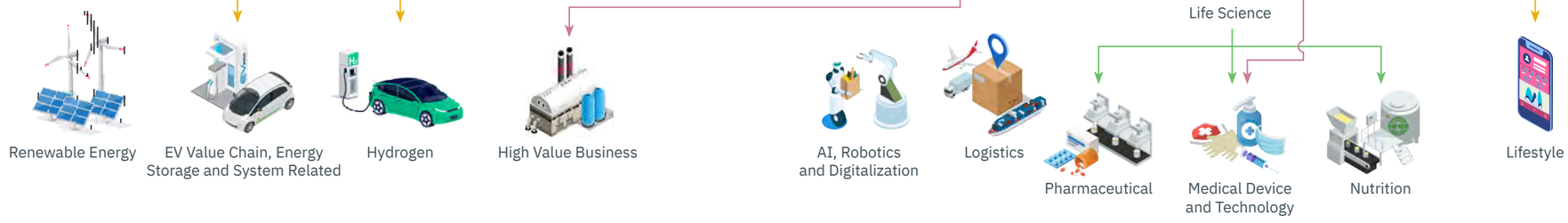
PETROLEUM & OIL CHAIN



PETROCHEMICAL CHAIN & OTHERS



NEW BUSINESS



INFRASTRUCTURE

1.3.2 Parties with Conflict of Interest

-None-

1.3.3 Relations with Major Shareholders' Business Group

PTT is a state enterprise, with the government through the Ministry of Finance as its major shareholder, under the supervision of the Ministry of Energy. Its business operations must also comply with the National Energy Policy Council Act B.E. 2535 (1992) with the supervision of the National Energy Policy Council (NEPC). As a state enterprise, the public sector can supervise its operations in compliance with national energy, economic and social policies.

1.3.4 Shareholders

The following table illustrates PTT's shareholding structure as of September 29, 2022, the record date for the 2022 interim dividend payment.

Item	Shares (million)	THB million	%
Registered Capital	**28,562.9**	**28,562.9**	-
Paid-up capital (as of September 29, 2022)	**28,562.9**	**28,562.9**	**100.00**
• Ministry of Finance	14,598.9	14,598.9	51.111
• Vayupak Fund 1 by MFC Asset Management Plc.	1,736.9	1,736.9	6.081
• Vayupak Fund 1 by Krungthai Asset Management Plc.	1,736.9	1,736.9	6.081
• Institutions and public investors	10,490.2	10,490.2	36.727
Unpaid Capital	-	-	-

Top 10 shareholders (as of September 29, 2022) are as follows:

No.	Name	Shares	%
1.	Ministry of Finance	14,598,855,750	51.111
2.	Vayupak Fund 1 by MFC Asset Management Plc.	1,736,895,500	6.081
3.	Vayupak Fund 1 by Krungthai Asset Management Plc.	1,736,895,500	6.081
4.	Thai NVDR Co., Ltd.	1,505,258,636	5.270
5.	SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED	539,426,743	1.889
6.	Federation of Savings and Credit Cooperative of Thailand Ltd.	441,088,900	1.544
7.	Social Security Office	440,198,900	1.541
8.	STATE STREET EUROPE LIMITED	392,348,364	1.374
9.	THE BANK OF NEW YORK MELLON	330,507,375	1.157
10.	Electricity Generating Authority of Thailand Saving and Credit Cooperative Ltd.	310,198,700	1.086
	Total	**22,031,674,368**	**77.134**

Remarks:

- *Number 5 is a nominee account. PTT's investigation at Thailand Securities Depository Co., Ltd. (TSD) found that the ultimate shareholder's names could not be disclosed. However, the Ministry of Finance remained the sole majority shareholder on behalf of the State, which in part dictates PTT's management policy. The ministry nominated directors to the Board for approval by the shareholders. Other substantial shareholders, including Number 5 exercise no influence over PTT's management policy formulation, including director nomination.*
- *Shareholders of Thai NVDR Co., Ltd., who hold non-voting depository receipts (NVDR) in No. 4, are ineligible for voting at shareholders' meetings except when exercising their voting rights on delisting the shares from SET.*

1.4 Registered and Paid-up Capital

1.4.1 Common Shares

As of December 31, 2022, PTT's registered capital totaled THB 28,562,996,250, consisting of 28,562,996,250 common shares at THB 1 per share. These shares represented THB 28,562,996,250 in paid-up capital, or 28,562,996,250 common shares.

1.4.2 Other Shares with Different Terms or Rights from Common Shares

-None-

1.4.3 PTT's Shares or Convertible Securities as Underlying Securities for Issuing Mutual Funds for Foreign Investors

-None-

1.5 Issuance of Other Securities

1.5.1 Convertible Securities

-None-

1.5.2 Debt Securities

Bonds and Debentures

As of December 31, 2022, PTT had THB 158,354 million of Baht-denominated debentures and US-dollar denominated debentures issued by PTT and PTT Treasury Center Co., Ltd. (PTT TCC), which are guaranteed by PTT, equivalent to THB 54,491 million. The detail is summarized as follows:

Debentures	Amount (THB million)	Redemption Date	Guarantee
Domestic debentures[1/]	158,354	2023 - 2110	None
Foreign debentures[2/ 3/]	54,491	2035 - 2070	None
Total	**212,845**		

Remarks:

1/ Fitch Rating's national rating of long-term PTT debentures at "AAA (tha)".

2/ Moody's rating of foreign PTT and PTT TCC debentures at "Baa1".

3/ S&P's international rating of foreign PTT and PTT TCC debentures at "BBB+".

Unsecured, Unsubordinated Domestic Debentures

Symbol	Issuance Date	Maturity Date	Tenor	Amount (THB million)	Annual Coupon Rate (%) (payment frequency)	Terms
PTTC232A	Aug. 6, 2021	Feb. 6, 2023	1.5 years	4,000	1.5 years compounded THOR + 0.18 (once at the end of redemption period)	-
PTTC237A	Jul. 24, 2020	Jul. 24, 2023	3 years	2,000	2.25 (semi-annually)	-
PTTC239A	Sep. 13, 2013	Sep. 13, 2023	10 years	10,000[1/]	6.58 (once at the end of redemption period)	-
PTTC243A	Mar. 6, 2009	Mar. 6, 2024	15 years	14,967[2/]	Year 1 - 5, 5.00 Year 6 - 8, 6.20 Year 9 - 15, 6.80 (semi-annually)	• Debenture holders can redeem at the end of the 8th year.
PTTC247A	Jul. 31, 2009	Jul. 31, 2024	15 years	9,387[3/]	Year 1 - 5, 5.00 Year 6 - 8, 6.20 Year 9 - 15, 6.80 (semi-annually)	• Debenture holders can redeem at the end of the 10th year.
PTTC248A	Aug. 6, 2021	Aug. 6, 2024	3 years	15,000	0.96 (semi-annually)	-
PTTC254A	Apr. 8, 2022	Apr. 8, 2025	3 years	8,000	1.79 (semi-annually)	-
PTTC257A	Jul. 2, 2020	Jul. 2, 2025	5 years	3,000	2.05 (semi-annually)	-
PTTC268A	Aug. 6, 2021	Aug. 6, 2026	5 years	15,000	1.31 (semi-annually)	-
PTTC277A	Jul. 24, 2020	Jul. 24, 2027	7 years	13,000[4/]	2.85 (semi-annually)	-
PTTC27OA	Apr. 8, 2022	Apr. 8, 2027	5.5 years	3,000	2.45 (semi-annually)	-
PTTC288A	Aug. 6, 2021	Aug. 6, 2028	7 years	5,000[5/]	1.79 (semi-annually)	-
PTTC295A	May 27, 2022	May 27, 2029	7 years	20,000	3.25 (semi-annually)	-

Symbol	Issuance Date	Maturity Date	Tenor	Amount (THB million)	Annual Coupon Rate (%) (payment frequency)	Terms
PTTC307A	Jul. 2, 2020	Jul. 2, 2030	10 years	2,000[6/]	2.84 (semi-annually)	-
PTTC318A	Aug. 6, 2021	Aug. 6, 2031	10 years	8,000	2.37 (semi-annually)	-
PTTC344A	Apr. 8, 2022	Apr. 8, 2034	12 years	9,000	3.47 (semi-annually)	-
PTTC357A	Jul. 2, 2020	Jul. 2, 2035	15 years	6,000	3.20 (semi-annually)	-
PTTC457A	Jul. 2, 2020	Jul. 2, 2045	25 years	7,000	3.74 (semi-annually)	-
PTTC10DA	Dec. 2, 2010	Dec. 2, 2110	100 years	4,000[7/]	5.90 (semi-annually)	• Debenture holders can redeem at the end of 50th and 75th years and other cases as defined in the Indentures.
Total				**158,354**		

Unsecured, Unsubordinated Foreign Debentures

Symbol	Issuance Date	Maturity Date	Tenor	Amount (THB million)	Annual Coupon Rate (%) (payment frequency)	Terms
USD Bond 2005[8/]	Aug. 3, 2005	Aug. 3, 2035	30 years	1,851[11/]	5.875 (semi-annually)	• Debenture holders have right to exercise put option in the event that (i) the Thai Government, directly or indirectly, ceases to own and control at least 50% of PTT's issued and outstanding capital stock and (ii) within 180 days from the date of such decrease in ownership, PTT's Credit Ratings is reduced below such Credit Rating immediately prior to the occurrence of such change of control as defined in debentures prospectus and related documents.

Symbol	Issuance Date	Maturity Date	Tenor	Amount (THB million)	Annual Coupon Rate (%) (payment frequency)	Terms
USD Bond 2012[9/]	Oct. 25, 2012	Oct. 25, 2042	30 years	8,354[12/]	4.50 (semi-annually)	• Debenture holders have right to exercise put option in the event that (i) the Thai Government, directly or indirectly, ceases to own and control at least 50% of PTT's issued and outstanding capital stock and (ii) within 180 days from the date of such decrease in ownership, PTT's Credit Ratings is reduced below such Credit Rating immediately prior to the occurrence of such change of control as defined in debentures prospectus and related documents. • PTT has right to exercise call option (Make-whole Redemption) as defined in debentures prospectus and related documents.
USD Bond 2019[8 - 10/]	Oct. 24, 2019	Aug. 3, 2035	15 years 9 months 10 days	8,508[13/]	5.875 (semi-annually)	• Debenture holders have right to exercise put option in the event that (i) the Thai Government, directly or indirectly, ceases to own and control at least 50% of PTT's issued and outstanding capital stock and (ii) within 180 days from the date of such decrease in ownership, PTT's Credit Ratings is reduced below such Credit Rating immediately prior to the occurrence of such change of control as defined in debentures prospectus and related documents.
	Oct. 24, 2019	Oct. 25, 2042	23 years 1 day	11,465[14/]	4.50 (semi-annually)	• Debenture holders have right to exercise put option in the event that (i) the Thai Government, directly or indirectly, ceases to own and control at least 50% of PTT's issued and outstanding capital stock and (ii) within 180 days from the date of such decrease in ownership, PTT's Credit Ratings is reduced below such Credit Rating immediately prior to the occurrence of such change of control as defined in debentures prospectus and related documents. • PTT has right to exercise call option (Make-whole Redemption) as defined in debentures prospectus and related documents.

Symbol	Issuance Date	Maturity Date	Tenor	Amount (THB million)	Annual Coupon Rate (%) (payment frequency)	Terms
USD Bond 2020[10/]	Jul. 16, 2020	Jul. 16, 2070	50 years	24,313	3.70 (semi-annually)	• Debenture holders have right to exercise put option in the event that (i) the Thai Government, directly or indirectly, ceases to own and control at least 50% of PTT's issued and outstanding capital stock or PTT ceases to own and control, directly or indirectly, at least 99% of PTT TCC's issued and outstanding capital stock and (ii) within 180 days from the date of such decrease in ownership, PTT's Credit Ratings is reduced below such Credit Rating immediately prior to the occurrence of such change of control as defined in debentures prospectus and related documents. • PTT has right to exercise call option (Make-whole Redemption) as defined in debentures prospectus and related documents.
Total				**54,491**		

Remarks:

1/ PTT engaged in an interest rate swap from Baht-denominated debentures worth THB 10 billion at a fixed rate to a lower rate. The swap will end on September 13, 2023.

2/ PTT engaged in an interest rate swap from Baht-denominated debentures worth THB 2 billion at a fixed rate to a floating rate of THBFIX + a fixed rate per year on the Baht-denominated principal. The swap will end on March 6, 2024.

3/ PTT engaged in an interest rate swap from Baht-denominated debentures worth THB 6 billion at a fixed rate to a floating rate based on a long-term USD reference rate. The swap will end on August 15, 2024.

4/ PTT engaged in an interest rate swap from Baht-denominated debentures worth THB 13 billion at a fixed rate to a floating rate of Compounded THOR + a fixed rate per year on the Baht-denominated principal. The swap will end on August 3, 2027.

5/ PTT engaged in an interest rate swap from Baht-denominated debentures worth THB 5 billion at a fixed rate to a floating rate of Compounded THOR + a fixed rate per year on the Baht-denominated principal. The swap will end on August 15, 2028.

6/ PTT engaged in an interest rate swap from Baht-denominated debentures worth THB 2 billion at a fixed rate to a lower rate. The swap will end on July 2, 2030.

7/ PTT engaged in an interest rate swap from Baht-denominated debentures worth THB 4 billion at a fixed rate to a floating rate of Compounded THOR + a fixed rate per year on the Baht-denominated principal. The swap will end on December 11, 2031.

8/ In 2019, PTT exercised liability management by repurchasing its USD bonds (USD Bond 2005) in the amount of USD 244.955 million, and PTT TCC reissued new USD bonds (USD Bond 2019), guaranteed by PTT in the same amount of USD 244.955 million. The current PTT's USD bonds 2005's outstanding is USD 53.297 million.

9/ In 2019, PTT exercised liability management by purchasing its USD bonds (USD Bond 2012) in the amount of USD 330.09 million, and PTT TCC reissued new bonds (USD Bond 2019) guaranteed by PTT. The current USD bond 2012's outstanding is USD 240.51 million.

10/ PTT TCC issued the bonds guaranteed by PTT. The guarantee's maximum liability will be capped at an amount equal to 125% of the outstanding of PTT TCC's bond. The guarantee amount for USD Bond 2019 series maturity on August 3, 2035 and October 25, 2042 are USD 306 million and USD 413 million respectively. Also, USD 875 million is the maximum guarantee for USD Bond 2020 with maturity on July 16, 2070.

11/ PTT engaged in a cross-currency swap from dollar-denominated debentures worth USD 53.297 million to Baht-denominated ones worth THB 1,749.21 million at a fixed rate to a lower rate on the Baht-denominated principal. The swap will end on August 3, 2035.

12/ PTT engaged in an interest rate swap from dollar-denominated debentures worth USD 240 million at a fixed rate to a floating rate based on the long-term USD reference rate. The swap will end on November 7, 2025.

13/ PTT engaged in an interest rate swap from dollar-denominated debentures worth USD 100 million from a fixed to floating interest rate referenced to LIBOR, which will end on August 3, 2024, and entered into a cross-currency swap worth USD 144.955 million to Baht-denominated ones worth THB 4,486.50 million, with a fixed interest rate to a floating rate of Compounded THOR and THBFIX + a fixed rate per year on the Baht-denominated principal which will end on August 10, 2035.

14/ PTT engaged in an interest rate swap of USD 200 million from a fixed to a floating rate of Compounded SOFR + a fixed rate per year on USD principal and the long-term USD reference rate which will end on November 8, 2030.

Short-Term Bills of Exchange

As of December 31, 2022, there was no outstanding of short-term bill of exchange.

1.6 Dividend Policy

PTT

PTT pays out dividends of no less than 25% of its net income after deducting all provisional reserves required by law and PTT. While the net income is based on the consolidated financial statements, dividend payment is subject to future investment plans, necessities, and suitability. Once the Board has decided on annual dividend payment, it must seek approval from the shareholders' meeting. An exception is for interim dividend payment, which the Board can approve and report to the next shareholders' meeting.

Subsidiaries

Each subsidiary may proceed with dividend payment by taking into account its remaining cash flow in comparison with the investment capital. If the cash flow is substantial enough after legal provisions, the subsidiary may consider proceeding with dividend payment on a case-by-case basis.

PTT Dividend Payment

	2020	2021	2022
Earnings per share (THB/share)	1.32	3.79	3.20
Dividend per share (THB/share)	1.00	2.00	2.00
Dividend payout ratio (%)	76	53	63

2. Risk Management

2.1 Risk Management Policy and Plans

Risk Management

Recognizing the value of risk management under changing circumstances that may affect businesses due to internal and external factors, PTT relentlessly complied with the principles and approaches of COSO-ERM 2017 (Committee of Sponsoring Organization of the Treadway Commission), an international standard on risk management. PTT regards risk management as a critical component of all its business processes that must be comprehensively connected, so it has integrated Governance, Risk and Compliance (GRC) and defined an enterprise risk management policy for everyone to observe. A Governance, Risk and Compliance Management Committee (GRCMC), an Enterprise Risk Management Committee (ERMC), and a Corporate Plan and Risk Management Committee (CPRC) were thus appointed to steer overall risk management for maximum effectiveness.

Risk Management Structure

Corporate risks are systematically managed through PTT's various management committees. Risk management must be integrated with the formulation of enterprise plans to give risk management plans effectiveness and efficiency in line with corporate goals and strategies. Operational risks fall under the supervision of executives responsible for a given function. All units are responsible for managing and controlling risks to manageable levels and this has been spelled out in the job descriptions of all units.

Risk Management Tools

PTT has studied and applied various risk management tools, including the definition of risk appetite, risk assessment, and risk prioritization using a risk map, mitigation plan, and key risk indicator (KRI). The Monte Carlo Simulation technique has also been adopted to identify possible impacts on business results, known as Value at Risk (VaR). In addition, it monitors key changes in external factors and emerging risks to develop proactive risk management measures before such risks harm PTT's business.

Risk Management Culture

PTT cultivates risk management awareness among all its employees along with nurturing risk management ambiance and culture, focusing on due resource allocation and provision of assorted supports by integrating risk management with key processes to promote effective risk management. For continuous improvement of corporate risk management efficiency, an organization-wide risk management manual has been published on a website accessible to all employees, along with communication sessions and risk management training courses, as well as an annual survey of personnel's opinions and understanding of corporate risk management. In 2022, cultural-building activities were organized. For example, monthly GRC Talk at the PTT Management Committee meeting (PTTMC) and a regular agenda in every line meeting; GRC Camp focusing on creating GRC culture for employees through experience transfer from executives and external guest speakers; publicizing the GRC policy and knowledge, risk management, as well as promoting various GRC and risk management training courses; reinforcement activities to promote and encourage employees to understand and have continuous behavior (Momentum) on GRC through communication, media, and various online activities.

2.2 Risk Factors Facing PTT's Businesses

PTT analyzes the risk universe - internal and external circumstances as well as various trends (economic, social, political, technological, industrial, competitor, and others) to arrive at corporate risk factors grouped as follows:

2.2.1 Current and Emerging Risks Facing Businesses of PTT or PTT Group

Strategic Risks

Strategic Direction

With dynamic innovation or technological progress resulting in disruptive technology as well as global environmental awareness, creating energy transition concepts from conventional energy consumption to new forms of clean energy that change customers' needs and current business flows, PTT values the determination of PTT Group's business strategic directions to accommodate changing directions of the economy, society, energy, technology, and consumers' behavior that align with global megatrends. If PTT's strategies cannot promptly cater to such changes, it could suffer from impacts on businesses and performance.

During the energy transition, PTT has a strategy to operate businesses related to liquefied natural gas (LNG) by operating the LNG supply chain and aiming to build a portfolio of 9 million tons per year within the year 2030. However, due to the fluctuating economic conditions and trends in consumer behavior change, energy demand is highly uncertain, resulting in fluctuations in energy prices in the world market, especially the LNG price because LNG has now played an increasing role as a fuel that helps maintain energy security for the country. The government, therefore, has the policy to liberalize the natural gas business. Currently, Thailand is in phase 2 of natural gas business liberalization. The government approved 7 more natural gas supply and wholesale licenses, which may affect PTT's natural gas market share. To reduce the impact, PTT needs to increase its competitiveness by expanding the LNG market both domestically and internationally, including maintaining the market share. PTT set up PTT Group's LNG commercial committees and working groups to promote cooperation and drive operations to achieve goals.

Creating new S-Curve to seek opportunities and develop new business models such as investing in the Electric Vehicle business, Renewable Energy, Life Science, Logistics & Infrastructure, and Artificial Intelligence, Robotics and Digitalization may be at risk of delaying the implementation of the strategic plan directions and achieve concrete business success. PTT has prepared personnel to efficiently support business expansion to cope with upcoming changes vision, direction and future business strategies have been mapped out by an annual Top Executive Thinking Session (TTS) and a Strategic Thinking Session (STS) among senior PTT Group executives. The resulting business strategies then translate into five-year business plans, which are then integrated with risk management plans. In addition, PTT holds a meeting of PTT Group executives every month to monitor all affiliates' performance and share ideas to modify short-term business plans and strategies to ensure planned performance outcomes.

As for Environment, Social and Governance (ESG) risks, PTT requires the assessment of material issues for the corporation each year, embracing risks and their likelihoods while considering the severity of impacts of all stakeholders' decisions and those on the company. Such material issues are then managed by various processes and mechanisms, namely corporate strategies and corporate risk management processes and regular processes of process owners.

Investment Risks

PTT not only continuously grows its businesses but also seeks new investment schemes for itself and PTT Group. Doing so exposes PTT to risks of lower-than-targeted returns on investment, project delays, and project cost overruns.

PTT has therefore developed criteria for investment and investment budget management by PTT and PTT Group and applied PTT's affiliate governance approach to screen decisions, monitor, and steer PTT's and PTT Group's investment. The process is known as SIM (Strategic Investment Management), in which a Strategic Investment Management Committee, made up of executives with assorted expertise, screens investment, monitors, and reports on PTT's investment to support decision-making by the PTT Management Committee (PTTMC) and the Board. Investments with massive value or those with significant risks must be presented to the ERMC for comments before the Board's decision.

Once a given investment has secured the Board's approval, monitoring takes place for reporting to the Strategic Investment Management Committee, the PTTMC, and the Board every quarter to ensure PTT's most useful and efficient capital. In addition, PTT regularly monitors and analyzes PTT's and PTT Group's investment portfolios to improve performance and revise investment plans while valuing critical path management to minimize project risks so that projects are completed in time, within budget, with suitable characteristics, and in due compliance.

Personnel Development to Sustain Business Growth

PTT has been experiencing swift expansion due to the growth in investment here and abroad together with its pursuit of new business opportunities through new business investment, the introduction of advanced technology and innovations to drive business operations. As a result, unless PTT can groom an adequate supply of skillful and experienced personnel in time, this could harm its businesses and long-term goal achievement.

Digital technological reform affecting business disruptions in several industries has prompted PTT to encourage and urge employees to be aware of and understand technology/ digital trends and cybersecurity as well as support the adoption of various technologies in the work.

PTT has adjusted its Core Competency to be in line with the vision, strategy, and direction of the organization, such as adaptability, customer orientation, etc. PTT Group Leadership and Learning Institute (PLLI) is responsible for developing the potential of employees with such competency through various training courses, including functional competency development of each business through the Functional Academy. The redevelopment program provides training and in-depth skills of each business with on-site practical training.

In addition, to accommodate the execution of strategic directions by each business unit, PTT has laid down a structure supporting work and allocated personnel required to meet the needs of each business unit. At the same time, personnel management proceeds through the mechanism of career path management. Each career path features a manpower review where key positions are identified along with individual development plans to develop specialized skills for each career path as well as leadership development and promotion of overall learning for PTT Group. These moves ensure that PTT will constantly command an adequate supply of quality executives and employees.

However, for new businesses in which PTT personnel do not have enough experience or expertise, PTT will recruit knowledgeable and experienced personnel from outside with direct expertise in that business to add more troops for faster and more efficient business operations and expansion.

Climate Change Risks

Today's investors have included risk management and opportunities related to climate as an investment factor in businesses affecting the environment amid the global community's keener awareness of climate change, as seen in the Paris Agreement, an accord under the United Nations treaty on climate change defining measures to lower carbon dioxide emissions in the 26th Conference of the Parties (COP), in which Thailand declared the Net Zero Emissions. In PTT's case, the policy has been passed on via the Ministry of Energy, and as our focus is on hydrocarbon-based energy businesses, PTT's measures to control and mitigate impacts consist of the following:

- Study and implementation of the Task Force on Climate-related Financial Disclosures (TCFD) to assess the impacts of climate change strategic implementation or various climate scenarios on PTT before transparently disclosing information to investors.
- Declaration of intent to aim for Carbon Neutrality by the year 2040 and Net Zero Emissions within the year 2050.
- Determining the direction of the Low Carbon Society strategy and setting a goal to reduce greenhouse gas emissions by 15% within 2030, compared to 2020, supporting the Clean Growth goal, which is 1 of 3 long-term goals of PTT Group.
- Establishment of PTT Group Net Zero Task Force: G-NET) in collaboration with PTT Group to set a clear target frame to raise the level of solving climate change problems, setting goals, and implementing them through supporting mechanisms to effectively achieve Net Zero Emissions.
- The application of the Carbon Price Mechanism in investment considerations can help increase the likelihood of investment decisions in projects that contribute to reducing greenhouse gas emissions and promote environmentally friendly investments.
- Modification of investment criteria in support of greenhouse gas reduction projects or more control of projects with greenhouse gas emissions.
- Changing business direction focusing on future energy business or beyond such as expanding investments in renewable energy and other low-carbon businesses according to PTT's vision, etc.

Reputation Risks

Today's environment is rapidly changing and increasingly interconnected, causing various operations including corporate reputation risks, to inevitably affect each other. The business sector must rethink how to sustain growth and manage risks in the long run. In addition to generating good turnover, businesses must be adaptive to appropriately and timely keep up with the needs and expectations of all stakeholders to achieve the goals.

In looking after stakeholders under its mission, PTT efficiently manages stakeholders and relentlessly revises and develops its implementation by pushing through stakeholder engagement by the AA 1000 SES international standard and the State Enterprise Assessment Model (SE-AM), which takes into account comprehensive stakeholder engagement. PTT also spells out stakeholders' key issues and addresses issues of importance to stakeholders according to the SE-AM for PTT's sustainable growth whilst gaining the trust of society.

PTT compiles and analyzes stakeholders' needs and expectations by surveying and researching stakeholders along with megatrends to serve as key data in developing crucial issues among stakeholders. Once these issues are captured, PTT assigns related units to develop a stakeholder management plan and then reports the outcomes to the ERMC quarterly so that its comments and recommendations may find their way into work improvement. Around the year-end, PTT assesses stakeholders' engagement for a review before the following year's activities.

This year, PTT revised its plans to embrace transformation in stakeholders' expectations due to constant changes in circumstances to address their needs faster while lowering risks to its reputation and promotes the good image of the organization as well as reflecting the determination to contribute to society in all dimensions side by side with the country to get out of the crisis well through the implementation of various projects.

- PTT Group Smiling Innovation Project 2022 by appropriately applying knowledge, expertise, innovation, and technology to support farmers to become Smart Farmers, increasing to 45 areas (29 provinces) from 24 areas (19 provinces) in 2021, including continuously developing and upgrading more than 267 SKUs of community products and six community tourist attractions across the country to meet international standards.
- The Restart Thailand project which in 2022 helped communities and 23,000 new graduates through employment that focuses on creating jobs, generating income and building professional skills for new generations in every region.

- Giving Chance for the Youth Project 2022 helped students and youths who were at risk of falling out of the education system to receive continuous education by granting scholarships and establishing a THB 171 million fund for more than 103,000 under privileged youths and economically affected by COVID-19 across the country through PTT Virtual Run activities to transform walking or running steps into scholarships, which people from all sectors could join.
- PTT Group Model School Project is an educational development plan for 204 schools located in 17 provinces nationwide. PTT Group has mobilized its strengths and knowledge to develop education under the concept of "STEEM 4E" in collaboration with Kamnoetvidya Science Academy and Vidyasirimedhi Institute of Science and Technology to develop children with academic skils (Science, Technology, Engineering, Mathematics (STEM) and English (E) = STEEM) and encourage schools to apply them in teaching and learning or 4E, including ethics and growth mindset, entrepreneurship, energy literacy, and environmental awareness.
- "Breath for the City" project supports BMA's goal of creating green area for BMA by planting one million trees. PTT will jointly plant 100,000 perennial trees, long-lived shrubs, and vines with wood in PTT and BMA areas to help absorb carbon dioxide, trap dust and pollution as well as reduce the temperature around planting areas, providing shade, and increasing the livability of urban society.

Operational and Business Risks

Diminishing Natural Gas Outputs and Continuity of Gas Production

After more than 30 years of production, reserves of natural gas from production fields in Thailand and Myanmar have been largely depleted. Some fields have gradually entered the "Post-Plateau" period, the period stipulated in the Gas Sales Agreements where producers are permitted to slash the daily contract quantity or the daily amount of natural gas to be delivered. Under these circumstances, the chance of getting the same delivery volume as written in the agreements is getting slim. In addition, the gas sales agreements for the Bongkot (G2/61) and Erawan (G1/61) fields will end in 2022 - 2023, respectively, with the government bidding on the G1/61 and G2/61 under the Production Sharing Contract (PSC) regime, which stipulates a minimum combined delivery volume of 1,500 MMSCFD for the entire agreement period of 10 years. PTTEP Energy Development Co., Ltd. (PTTEP ED) (operator) won the bid and was granted the right for petroleum exploration and production. In April 2022, PTT completed the signing of natural gas purchase agreements for G1/61 and G2/61 fields. However, as the concessionary of the G1/61 block has been changed to PTTEP, the concession block handover may deviate from the plans. There could be impacts on the continuity of gas production from the gas fields, which would affect the business performance of PTT.

In addition, instability overseas such as the unrest in Myanmar may result in the risk of natural gas delivery disruption from fields in Myanmar to Thailand. PTT has thus arranged risk management and business continuity plans by establishing a team to work with relevant agencies to monitor the situation and setting operating guidelines including continuously reporting the situation to the Ministry of Energy. This will ensure that natural gas supply and delivery will not be interrupted or the volume may not be continuous or may be decreased.

PTT has prepared an additional liquefied natural gas (LNG) procurement to replace natural gas that may reduce. Currently, the LNG Map Ta Phut Terminal 2 (LMPT2) at Ban Nong Fab, Map Ta Phut subdistrict, Mueang district, Rayong province was completed and was commercially run in December 2022 to support the increasing LNG procurement at 7.5 million tons per year. PTT has sought new natural gas resources and additional natural gas from the Gulf of Thailand and the Thai-Malaysia Joint Development Area to maintain gas supply and delivery without affecting the power sector and the country's energy security.

Risks of Significant Changes in Prices and Volume of Petroleum and Petrochemical Sales

Domestic and international factors influencing demand for petroleum and petrochemical products, such as the economy, natural disasters, epidemics, trade wars, and geopolitical unrest, have a direct impact on price and sales volume, affecting PTT and PTT Group operations. Furthermore, the rise and fall in the production volume of natural gas, crude oil, condensate, petroleum, and petrochemical products, which affects the change in raw material prices and distribution prices, as well as the spread both domestically and internationally, which is highly volatile, may affect PTT's and PTT Group's operating results and return on investment in the future.

In order to mitigate the impact of such volatility, PTT Group has implemented price risk management tools to help manage and prevent the potential impact of price changes. Business operations are thus stabilized, and operating results do not fluctuate dramatically in response to the volatile market situation. PTT Group companies have their own risk management policies in place.

PTT's price risk management policy and procedures are formulated and approved by Enterprise Risk Management Committee, PTT Management Committee, and Hedging Committee. For PTT Group companies, PTT management serves as a representative on each company's corporate risk management committee to oversee risk management procedures that are consistent with PTT Group Policy. PTT is in charge of defining corporate risk factors in terms of oil price risk management and monitoring PTT Group companies to report PTT Group's price risk management results to PTT Group Management Committee, Enterprise Risk Management Committee, and PTT Board of Directors on a quarterly basis.

In addition, to efficiently handle the impact of volatile energy prices, PTT has established price risk management by formulating a business plan to support a variety of scenario planning in various oil price situations, promptly responding to changes and uncertainties that may occur in the future. Price Strategy and Risk Management team has been appointed under the Petrochemical and Refining Integrated Synergy Management (PRISM), responsible for analyzing world oil price movement and jointly carrying out price hedging management among PTT Group companies for the greatest benefit. Today, PTT Group engages in hedging through derivative contracts in both petroleum and petrochemical prices. To this end, meticulous, prudent data analyses are conducted while suitable risk management tools are chosen to fit periods and objectives.

Also in place is a structure and process for supervising risk management with checks and balances of international standards by the International Trading Business Unit. Similarly, a Value at Risk (VaR) is defined for each commercial transaction. A risk status summary report is regularly required for relevant executives and units to control and monitor PTT Group's price risks beyond what is acceptable. Moreover, in the current higher-risk situation, the International Trading Business Unit needs to have tighter risk controls. International trade staff must closely monitor the market situation to adjust strategies accordingly, along with upgrading measures to control risks in relation to trading partners to prevent the possibility of default due to a lack of liquidity in business operations. For example, changing payment terms from Open Credit to collateral calls as soon as negative information is received on the credit status of business partners, establishing measures to warn and monitor abnormalities in various aspects, including financial credibility and other sanction measures as well as halting or avoiding transactions involving trading partners or countries at risk, etc. Technology for sharing market information has also been applied to enable market situation monitoring for controlling and monitoring to prevent PTT and PTT Group from having higher price risks than the appropriate level.

Compliance with Applicable Policies, Laws, and Regulations

The complexities of laws and regulations relevant to PTT's operations e.g. laws relating to energy business operations, laws on trade competition, the Public Procurement and Supplies Management Act, state fiscal discipline act, anti-corruption law, Personal Data Protection Law, cybersecurity law, and laws whose interpretation is unclear which can affect the business performance of PTT, causing a discrepancy in compliance as well as its corporate image and reputation.

To fully comply with relevant laws, PTT is committed to its Compliance Policy, which governs all activities' compliance with state laws and PTT's rules and regulations, and the Compliance Framework, an operating guideline to ensure full compliance with state laws and regulations of PTT. Regular reviews are in place to align with the business and execution context as well as changes in laws. PTT has also created a Risk Appetite Statement to define the risk level that the company is willing to take. Compliance risk associated with PTT's business operations is one of the risks that are focused on for their prevention. Also, in place now is the Compliance Department's process, working along side the 2nd Line of Defense Alliance. A responsible unit of PTT closely monitors the development of new laws with proactive participation, including analyzing and clarifying issues of doubt or obstacles to PTT and occasionally seeking clarification on certain legislation to align PTT's business with these new laws and regulations to be enforced in the future. The process of collecting and monitoring laws enacted and related to PTT's business operations, and the employee communication to raise awareness of the workplace rules, including the process of managing non-compliance with laws and regulations to follow up, reexamine and find a proactive approach for protecting and preventing any situation from being repeated in the future. Moreover, PTT has integrated Governance, Risk and Compliance (GRC) so that its business may command good governance in line with the corporate governance code, adequate internal control, comprehensive risk consideration, and compliance of operations to lower non-compliance risks. Performance reports are duly made to the Governance Risk and Compliance Management Committee (GRCMC) and the Corporate Governance and Sustainability Committee (CGSC) respectively. PTT continuously promotes the culture of the PTT Group Way of Conduct to all staff throughout PTT Group to have all activities performed in the same conduct, standard, and direction, including compliance.

Risks Arising from Public and Applicable Government Agencies' Policies

The National Energy Policy Council (NEPC) endorsed an approach to promote competition in the natural gas business on July 31, 2017, to give natural gas users improved service and to breed more efficient competition in gas supply procurement while stimulating procurement efficiency. In addition, prices of natural gas, a key component of national energy cost, could drop in line with fuel prices. The Ministry of Energy has divided the operations of this competition promotion policy into 3 phases. At present, the NEPC has approved the approach for Phase 2, where many natural gas operators compete in the LNG supply competition, while the ERC previously approved natural gas procurement and wholesale licenses (Shipper License) to 7 new operators.

The Phase 2 natural gas business restructure may shrink PTT's domestic gas market share. Yet, PTT is managing such a change to remain the steward of energy security by procuring enough fuels for domestic demand and raising its competitiveness with new operators in addition to planning business growth. An instance is its internal restructuring to accommodate PTT's roles and duties for business agility and competitiveness with new players together with business growth to accommodate regional demand, notably the LNG Regional Hub. For the greater competition to be among the New Supply players in Phase 2, PTT Group was granted a shipper license.

In 2022, as energy prices soared due to the Russian-Ukrainian conflict, the government had the policy to use other fuels to replace natural gas for power generation such as fuel and set the Energy Pool Price namely calculation and implementation criteria regarding natural gas prices under the supervision of the ERC by including the cost of other alternative fuels in the pool gas price, making the production cost of electricity and industrial sectors the same. To use other fuels to replace natural gas, PTT has prepared Demand-Supply data to efficiently manage energy demand and to procure sufficient LNG to meet the country's needs. PTT worked with relevant agencies through the Execution Operation Team for situation management during the energy price crisis.

With more than 40 years of experience in the natural gas business, PTT continues to be able to supply natural gas sufficiently for the country's security as well as maintain its competitiveness in the midst of market fuel price volatility including government policies.

Disruption of Production and Business Operations

With its several sites worldwide, PTT is exposed to disruptions of production and business operations resulting from human errors, malfunctioning machinery, catastrophes, threats of political instability, together with terrorist activities, epidemics, and other hazards. All these could prove detrimental to PTT and could wreak damage to its major infrastructure. PTT, therefore, values Process Safety Management (PSM) by focusing on systematically managing and controlling operating risks through the introduction of engineering technology and sophisticated international standards, the application of suitable tools and management systems, and preparedness for emergencies and incident management. An instance is the PTT Group Oil Spill Remediation Guidelines, formulated to prevent and mitigate environmental impacts and rapidly restore the ecology and biodiversity and also the PTT Group Oil and Chemical Spill Response Guideline, resulting in the ability to do business even if such incidents occur. To lower the likelihood and impacts of such threats, PTT activates PTT Group Security, Safety, Health, and Environmental Management Standard and the PTT Group Business Continuity Management System Standard (BCMS) for all business units and PTT Group to leverage in developing and linking up with both common systems. PTT not only safeguards value-adding activities at sites but does so in every stage of work to prevent disruption and prevent value-adding activities under PTT's business chain from being disrupted. In addition, PTT reviews, amends, and develops BCMS to ensure a practical connection between business units and stages integrated corporate BCM drills, human resource preparation plans (process to locate key personnel), backup office preparation plans (Work from Anywhere), and information system preparedness plan to ensure BCMS recertification under ISO 22301.

Following best practices in the petroleum and petrochemical industries, PTT has taken out insurance policies to protect its core business assets from business disruption to further insurance coverage for operation suspension. Such a subscription may not be all-inclusive since no insurance company offers such comprehensive insurance. Alternatively, sometimes it could prove uneconomic to buy excessively high-coverage insurance. While PTT believes that its affiliates have insurance policies that are of industrial standards, PTT cannot control the ceilings of PTT Group's insurance policies to cover possible damage. In other words, should properties not be significantly or fully covered, or should insurance companies face severe financial problems causing them to go out of business due to such events, PTT's financial position, business performance, and business opportunities could face grave repercussions.

Risks from Work-Related Accidents

PTT focuses on the management and control of safety risks for its operations systematically and continuously by setting long-term goals to control incidents that cause losses and affect lives, property, and the environment. Targets for accidents that cause injuries to employees and contractors until work stoppage; safety, production, and transportation accidents must be zero. Risk control processes from hazard indications, risk assessments, risk control measures, and impact reduction are defined by setting work standards equivalent to international standards and creating a safety culture for employees and contractors through education and activities to raise awareness of safety. Engineering principles and tools following international standards are adopted to prevent serious accidents in manufacturing processes, transportation, together with safety assessment to find risk points, hazardous points, and corrective actions before an accident. Safety management systems such as personnel safety, production process safety, and transportation safety are fundamental to the organization-wide and continuous improvement of operations.

Cybersecurity Risks

Cybersecurity threats are rapidly on the rise these days, with impacts seen in various forms including data breaches, ransomware and cyber extortion, image and reputation loss, and possible disruption to business interruptions.

PTT continuously prioritizes cybersecurity as a corporate risk with close monitoring and outcome measurement, as well as plans to increase efficiency to reduce risk and impact levels on an ongoing basis. The plans include investment in technology, increasing process efficiency, as well as raising awareness of cyber threats to employees:

- Mandatory use of two-factor authentication (2-FA) for e-mail access and VPN to use internal systems.
- Regularly conduct a vulnerability assessment to find and close system vulnerabilities, including a Red Team Assessment by experts to find vulnerabilities and measure the efficiency of the protection systems within the organization, covering both Information Technology (IT) and Operation Technology (OT).
- Install privileged access management for administrators to raise the system accessibility security at the Admin level to a higher standard.
- Use AI technology to help find corporate vulnerabilities exposed to the internet world in order to further analyze and manage risks.
- Provide knowledge through various channels such as PR e-mails and training courses to create awareness about cyber threats to employees at all times, including testing employees' knowledge and understanding through phishing test campaigns regularly etc.

PTT assigns PTT Digital Solutions Co., Ltd. (PTT DIGITAL) to operate and provide cybersecurity services to PTT Group, with the Cyber Security Operation Center (CSOC) responsible for monitoring abnormalities from cyber attacks, providing PTT Group 24-hour service with high-technology tools such as machine learning, along with personnel with international certifications, and Security Incident Response, including coordination with the Thailand Computer System Security Coordination Center (ThaiCERT) and other international communities to exchange information of cybersecurity incidents.

Risks Arising from COVID-19

Personnel Health and Safety

- PTT COVID-19 Monitoring and Surveillance Center (Palungjai Center) manages personnel's physical and mental safety. Stringent preventive and control measures are in place for COVID-19 infection together with regular provision of news and information along with easy access to the hub, including vaccination to build immunity for employees and their families by continuously monitoring the number of infected people and people at risk, continuously announcing measures and guidelines from relevant government agencies to determine measures and guidelines to prevent and reduce the risk of infection in PTT's work areas, including compliance with such universal preventions as wearing a mask at all times, washing or cleaning hands, maintaining social distance.

Financial Risks

Volatility of the Baht

Changes in the exchange rate between the Baht and the US dollar, directly and indirectly, affect the bulk of PTT's revenue because prices of natural gas, petroleum, and petrochemical products are tied to the world (USD-linked) market prices. In other words, PTT's revenue varies with the value of the Baht. Yet, changes in the Baht value also affect PTT's margin since the majority of its profits are fixed in the Baht currency whereas costs are in the dollar denomination which is tied to world market prices, as are prices.

Fluctuation of the Baht affects PTT's net book profit/loss because of PTT's and subsidiaries' outstanding foreign loans. Yen-denominated loans leverage participating swaps to convert loans into dollars to agree with dollar-denominated revenue. That way, PTT manages to counter most of the risks of yen fluctuation against the dollar.

To ease risks of Baht fluctuation, PTT balances its foreign currency loans with its foreign-currency revenue (that is, taking a natural hedge) while managing its foreign-currency deposits and purchasing forward foreign currencies for smart repayment and commercial transactions including imported natural gas and crude oil, trading of domestic products in Baht but USD-linked in value, and appropriate product exports. PTT has also developed a finance policy as an efficient, uniform guideline for itself and PTT Group, which includes terms for various risk management practices which could affect PTT's financial position.

Financial Support to Affiliated Companies

To promote relentless growth, PTT invests in new projects, grows its businesses, or adjusts its operations. Sometimes such investment is undertaken through new companies or linkups with strategic partners or through PTT Group companies or all of these. Some of these companies may still be starting up projects or may not yet be financially strong, so shareholders and PTT still need to extend cost overrun support to allow them to operate under the strategies and business policies of PTT Group as a whole. Some may need cash support during commercial operations, which may result from force majeure or business down-cycles, thus calling for financial help from shareholders. Such financial help may be provided through sponsor support agreements, subordinated debt, equity, trade credit, shareholder loan or a combination of these.

PTT will consider extending loans or commercial credit or both, to individual affiliates in the hope that such a policy and action would foster sustainable strength for PTT and PTT Group. PTT subscribes to such policies and actions.

In extending such financial support to these affiliates via subordinated loans, commercial credit or loans from the shareholders, PTT cannot guarantee that these companies will be able to repay such loans or credit, that they will not face financial woes again, or that they will not need financial support from PTT again. Any such possibilities could hurt PTT's performance and financial position. Besides, if PTT or any member of PTT Group becomes a defaulting party under any agreement on shareholder support, some creditors may accelerate debt repayment. Therefore, PTT cannot guarantee that it will not raise its own shareholding or raise its shareholding to more than half or take over such a company if such action is considered more beneficial. If any of this should happen, the Thai financial reporting standards require PTT to consolidate the financial statements of the company in question with those of PTT, effective from the date of such control. In short, such consolidation could undermine PTT's overall financial position.

At any rate, PTT commands a process to screen and approve its investment together with close monitoring of PTT Group's performance through various committees, including the Investment Committee and the finance and accounting cooperation management committee. PTT Group Way of Conduct is cascaded to all in PTT Group to ensure uniform management under international standards and guidelines, timely risk management, and minimized impacts on PTT Group.

Securing of Funds

The businesses of PTT and PTT Group require massive pre-paid capital investment. Although PTT closely monitors and manages business risks, the actual investment capital required could deviate from projected plans.

Thanks to PTT's and PTT Group's business conduct that focuses on fostering long-term growth and corporate governance, PTT plans to invest in prudent business growth with due regard for sources of capital, particularly capital structuring to duly maintain crucial financial ratios on a par with peer companies. Continuous monitoring of factors for investment capital sourcing has assured PTT that it can secure sufficient funds for future business expansion at a suitable cost of funds.

2.2.2 Investment Risks for Shareholders

Risks from the Major Shareholder's Management

As of December 31, 2022, the Ministry of Finance was PTT's major shareholder with 14,598,855,750 shares, or 51.11% of all issued and paid-up capital, which entitles it to vote at the AGM. Yet, most significant agenda items are required by PTT's Articles of Association to pass with three-quarters of the AGM votes, including amendments to the memorandum of association and the articles of association, capital increase or decrease, debenture issuance, company mergers, company liquidation, company sale or transfer (whole or partial), acquisition or transfer of other companies (public or private), engagement in, amendment, or termination of lease agreements for entire or partial company business, delegation of other parties to manage the business, mergers with other parties to share profits or losses, and voting to dismiss any director ahead of term completion. If an agenda item concerns a matter in which the ministry as a major shareholder has vested interests, including related transactions, acquisition, or sale of assets from or to the ministry, the ministry cannot vote on such an item. In addition, PTT has required independent directors to account for at least half of the Board; it currently has 11 out of 15 on the Board, who must command expertise and useful experience to PTT and must engage in no conflicts of interest with PTT. It also appointed the Audit Committee (made up of three independent directors without vested interests in PTT) to monitor its business and look after shareholders' interests so that the business may proceed transparently in line with PTT's corporate governance code.

Risks of Uncertain Returns on Investment for Shareholders

PTT's share prices may rise or fall in a volatile fashion, subjected to several factors beyond its control, including

- Prices of petroleum, petrochemicals, or other reference product prices
- Change in policies, regulations, requirements, or terms affecting the industry
- Economic situation, crisis, or abnormal situation, including COVID-19 and the oil price war

These factors could depress share prices below what investors paid for or higher than their sold portions, or both, putting investors at risk from uncertain returns on investment.

Risks from Dividend Affordability below Investors' Expectation

PTT's affordability is subject to several factors, including capital budget and capital reserve for business growth, loan repayment, and cash flow from operating activities. If these factors affect PTT's affordability of the annual dividends or interim dividends or both, it could risk payment of dividends at lower rates than investors' expectations. Yet, PTT's dividend policy is at least 25% of net profit after deducting all reserves under the law and company regulations.

2.2.3 Risks Facing Investing in Foreign Securities (If the Issuer is a Foreign Company)

-None-

3. Driving Business towards Sustainability

Key Sustainability Performance

Environment

Greenhouse Gas Emissions

Both Scope 1 and Scope 2

PTT:

9.99

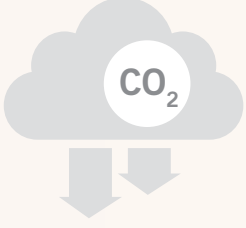
million tons of CO_2 equivalent, (Target: ≤ 12 million tons of CO_2 equivalent)

PTT Group:

(domestic and overseas)

45.40

million tons of CO_2 equivalent, (Target: ≤ 52.5 million tons of CO_2 equivalent)



3P Decarbonization Pathways

Pursuit of Lower Emissions

Conduct a project to capture and store carbon dioxide from production processes in the Gulf of Thailand and study the feasibility of carbon dioxide storage in the near-eastern coast as the pioneer in domestic under the cooperation of PTT Group

Portfolio Transformation

Divest all investment in coal business, and committed to investment in alternative energy and electric vehicle business

Partnership with Nature and Society

Increase green area to enhance nature-based solution for carbon dioxide emission absorbed by foresting and maintain forest in collaboration with government and local communities

Social

Conducted "Giving Breath Project" with PTT Group's budget of

over THB **3,982** million

To support communities in solutions and impact mitigation against COVID-19 pandemic

- **Lost Time Accident (LTA) of employees and contractors at zero**
- **Total Recordable Injury Rate (TRIR) per 200,000 hours worked of employees at 0.063 and contractors at 0.038**
- **Major Truck Accident Rate per 1,000,000 kilometers at zero,** for the 2nd consecutive year

Proportion of donation compared against total budget on social initiatives, totals to

29%*

* If donation includes COVID-19 relief budget and financial aid, it would amount to 42.6%

Human Capital Index (HCI)

Governance

Set 2030 long term strategic targets, consisting of Business Growth, New Growth, and Clean Growth

No significant non-compliance with the laws has been identified

Received an **A** level for the Integrity and Transparency Assessment (ITA) by a government agency

Human Rights

Identify and assess risks according to Human Rights Due Diligence covering activities of PTT and PTT Group, comprises 17 companies across 21 countries. This is an equivalent to a total of

50 areas.

Zero complaints on Human Rights

Honorable ESG Indices/ Awards

Member of
Dow Jones Sustainability Indices
Powered by the S&P Global CSA

THSI THAILAND SUSTAINABILITY INVESTMENT 2022 · SET AWARDS 2022 · HONOR Sustainability Excellence · LCSB

Rating

MSCI ESG RATINGS A

- S&P Global Ratings: ESG Credit Indicators
- MOODY'S
- FTSE Russel
- Climate Action 100+
- Sustainalytics

3.1 Policies Commitments and Targets for Responsible Business Conducts

Under the vision of "Powering Life with Future Energy and Beyond", PTT has committed to conduct business towards sustainability, in tandem with maintaining social and environmental responsibility, according to the resolves stipulated in different policies, as follows;

Sustainability Management Policy

To reflect the commitment in managing sustainability material topics across the three dimensions, consisting of Environment, Social, and Governance by integrate it into every process of business activities, PTT established **"PTT Sustainability Management Policy".** The policy was signed by PTT Chairman of the Board of Directors, jointly with President & CEO. Following the policy's content and performance effectiveness reviews by PTT Board of Directors in 2022, it was confirmed that the policy continues to address PTT's sustainability material topics thoroughly and is effectively cascaded to implementation throughout PTT through sustainability management process.

Human Rights Statement

PTT commits and respects human rights in every business activity process throughout the value chain and developed **"PTT Human Rights Statement"**, as signed by President & CEO. This demonstrates the determination to respect human rights principles according to the laws, conventions, standards, and international practices, for all key stakeholder groups: employees, local communities, business partners and their employees.

PTT human rights management has been integrated into sustainability management process systematically. Human rights risks and issues are one of the impacts to be considered in PTT's sustainability material topics. Therefore, impact mitigation measures would then be developed.

Corporate Governance Policy

To demonstrate commitment in business conducts in good governance, outstanding management, while simultaneously create values for every sector of stakeholders equally. PTT Board of Directors has announced **"PTT Corporate Governance Policy",** signed by PTT Chairman of the Board of Directors. A six-point key principle for PTT good governance has been set up, consisting of Accountability, Responsibility, Equitable Treatment, Transparency, Vision to Create Long-term Value and Ethics. Directors, executives and employees may vigorously adhere to and implement. Following the annual policy review by PTT Board, the content is deemed appropriate and relevant.

Furthermore, PTT has demonstrated commitment in managing each material topic in numerous topic-specific policies, such as Risk Management Policy, Internal Control Policy, Compliance Policy, Anti-Fraud and Anti-Corruption Policy, as well as Quality, Security, Safety, Health and Environment (QSHE) Policy. Additional information regarding each policy is available on PTT website.

Cascading Policies into Practice

PTT has driven policies into practice throughout its supply chain through three mechanisms and methods, as follows;

Mechanisms and Methods	2022 Key Performance
1 Embedding in the development of strategic direction, enterprise plan, enterprise risk management and KPIs setting process	Climate change risks and opportunities as part of the commitment within sustainability management policy, has been considered as key input factor in PTT's 2030 long term target reviews, strategic direction and enterprise plan 2023 - 2027 development, enterprise risk management and State Enterprise Assessment Model (SE-AM) KPI development, which is part of the President & CEO's performance indicator, as well as Corporate KPI for performance evaluation of senior executive vice president. Management review by Management and Board levels is also conducted.
2 Integration into the PTT Sustainability Management Masterplan for social and environmental responsibility 2021 - 2025	The commitment in managing sustainability material topics has been integrated and deployed explicitly in PTT Sustainability Management Masterplan for social and environmental responsibility 2021 - 2025 (Revised version 2022)
3 Management by policy owner	Policy owner set mechanisms, methodology or documents to facilitate the efforts in turning policies to practice, such as • Set up governance structure, process, and internal control both at management level and PTT Board of Directors level. • Set up regulations and management approach documents, such as PTT regulation on grievance, whistleblowing on fraud, and non-compliance, Corporate governance manual, and Code of conduct and Business Ethics • Set relevant Corporate/ Functional KPI • Develop projects or initiatives with clear action plan • Training to raise understanding and communicate in various forms • Monitor and report to relevant committee

PTT Sustainability Management Master Plan for Social and Environmental Responsibility 2021 - 2025 (Revised version 2022)

In 2022, relevant functions have reviewed sustainability strategic direction, short/ medium term goals, KPIs, strategies, and action plans at various levels which received approval by PTT Board of Directors. Corporate KPIs measured the performance of senior executives and relevant business function and quarterly report to the governance committees. The details for sustainability strategic direction are as follows;

1 Environmental Strategic Direction "Sustainable Production and Consumption"

comprises two strategies:

- Develop low-carbon society and environmentally friendly business
- Enhance effectiveness of resource utilization based on circular economy principle

2 Social Strategic Direction "People's Well-being"

comprises three strategies:

- Promote safe working environment and respecting human rights principles
- Co-create values and enhance society and community's quality of life
- Foster employees' readiness to accommodate future business growth

3 Governance Strategic Direction "Corporate Governance and Performance Excellence"

comprises two strategies:

- Operate with good governance and integrity
- Adapt readily to changes, accelerate growth, and drive the economy

Key Enablers for Success

- Technology and innovation promotion
- Supply chain management
- Stakeholder management

PTT intend to review and assess the quality and effectiveness of sustainability management process, including policy deployment, as well as sustainability material topics management process and report to the governance committee quarterly. Additional information on policy deployment, sustainability material topics management, as well as the performance of sustainability strategic direction are available in topic 3.4 sustainability material topics management and PTT website.

Key Performance According to Sustainability Strategic Direction

Sustainability Strategic Direction		Performance Target: Indicators	Performance Target: Short-Term within 2022	Performance Target: Long-Term	Performance against 2022 Targets	Performance Progress per 2022 Target	Support 20-Year National Strategy	Support SDGs: Integrated into Core Business	Support SDGs: Collaborate with Other Stakeholders	Additional Information
Environment "Sustainable Production and Consumption"	Develop low-carbon society and environmentally friendly business	Limit PTT and PTT Group's Greenhouse Gas Emissions (GHG scope 1 and scope 2 domestic and overseas)	**PTT Group:** ≤ 52.5 million tons of CO_2 equivalent **PTT:** ≤ 12 million tons of CO_2 equivalent	**PTT:** To achieve Carbon Neutrality by 2040 and Net Zero Emissions by 2050 under the boundary of PTT owned-operations, including wholly owned subsidiaries of PTT **PTT and PTT Group:** To reduce emission 15% by 2030 compares to 2020 greenhouse gas emissions	**PTT Group:** 45.40 million tons of CO_2 equivalent **PTT:** 9.99 million tons of CO_2 equivalent	☆	**The 5th National Strategy:** Eco-Friendly Development and Growth	7.1 7.2 7.3 13.1 13.2 13.3 9.4 15.2	17	Page 158 Additional information
	Enhance effectiveness of resource utilization based on circular economy principle	Apply the principle of circular economy in the PTT Group's business operation to achieve the level of circular economy application according to British Standards Institution: Framework for implementing the principles of the circular economy in organizations – Guide (BS 8001: 2017)	**PTT Group:** Level 1.67	**PTT Group:** Level 3 within 2030	**PTT Group:** Level 2.67	☆	**The 5th National Strategy:** Eco-Friendly Development and Growth	6.3 6.4 6.5 6.6 12.2 12.5	17	Additional information
Social "People's Well-being"	Promote safe working environment and respecting human rights principles	Lost Time Accident (LTA)					**The 4th National Strategy:** Social Cohesion and Just Society	3.6 8.5 8.7 8.8	5.1 5.2 10.4	Page 167 Additional information
		Employees	0	0 within 2030	0	☆				
		Contractors	0	0 within 2030	0	☆				
		Total Recordable Injuries Rate per 200,000 hours worked								
		Employees	≤ 0.053	0 within 2030	0.063	⊘				
		Contractors	≤ 0.064	0 within 2030	0.038	☆				
		Process Safety Event according to API RP 754								
		Tier 1	0	0 within 2030	0	☆				
		Total case of Tier 1 and Tier 2	≤ 1	0 within 2030	1	☆				
		Human rights complaints	0	0 within 2030	0	☆				
	Co-create shared value, elevate society and community's quality of life	Social project's budget compares to net profit	1 - 3%	1 - 3% within 2025	1.34%[1]	☆	**The 3rd National Strategy:** Human Capital Development and Strengthening **The 4th National Strategy:** Social Cohesion and Just Society	3.8 3.b 12.b 6.1 13.3 7.1 7.2 14.2 8.3 8.5 8.6 8.9 15.2 9.5	1.1 1.5 10.1 10.2 2.3 2.4 11.6 11.7 11.a 4.1 4.3 4.4 17	Page 173 Additional information
		Portion of public donation compares to overall social project's budget	≤ 30% of the overall budget	≤ 30% of the overall budget within 2025	29%[1]	☆				
		Assess social returns and social returns on investment compares to the financial budget	Achieve target or surpass financial budget	Achieve target or surpass financial budget within 2025	Achieve all projects	☆				
		Net income increase compared to baseline income	≥ 10% of Baseline income of target group	-	-	↻				
	Enhance employees' readiness to facilitate future business growth	Human Capital Index (HCI)	≥ 76	≥ 80	78	☆	**The 3rd National Strategy:** Human Capital Development and Strengthening	8.2 8.5 9.5	4.4 5.1 5.5	Additional information
Governance "Corporate Governance and Performance Excellence"	Operate with good governance and integrity	Zero non-compliance with legal, rules, and regulations including recurrence	**PTT:** Zero case	**PTT and PTT Group:** Zero case by 2025	Non-significant impact case in compliance with legal, rules, and regulations	☆	**The 6th National Strategy:** Public Sector Rebalancing and Development	16.5 16.6 16.10	17	Additional information
	Adapt readily to changes, accelerate business growth and drive the economy	Foster growth by increase investment portion in future energy and beyond energy businesses	-	Net profits from mentioned business group is over 30% in 2030	-	↻	**The 2nd National Strategy:** National Competitiveness Enhancement	7.2 9.4 8.1	17	Page 184 Additional information
		Increase renewable energy production capacity	-	12 Gigawatts by 2030	-	↻				

1 PTT increases the budget for supporting and mitigating impacts from COVID-19. Consequently, social project's budget compares to net profit is at 1.66%, and portion of public donation compares to overall social projects budget is at 42.60%

Remarks: ☆ Achieved ↻ Work in progress ⊘ Not achieve target
Additional information is available within this report
Additional information is available on PTT website

Supporting the Sustainable Development Goals

All 17 United Nations Sustainable Development Goals (SDGs) have been considered as key factors in the development of PTT's strategic direction and enterprise plan development, especially SDGs in **Integrated into Core Business group**. All ten goals are reflected in key action plans/ projects, as well as projects supporting sustainability material topics. All remaining seven goals in the **Collaborate with Other Stakeholders groups** are considered in the analysis and development of stakeholder engagement plan. This helps amplify results with relevant partnership networks and stakeholders. Additional information on performance progress in supporting 17 SDGs is available in the related sustainability material topics section.

Integrated into Core Business

The ten goals integrated into PTT's operations are as follows;

SDG 3 - Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG 6 - Clean Water and Sanitation: Ensure availability and sustainable management of water and sanitation for all.

SDG 7 - Affordable and Clean Energy: Ensure access to affordable, reliable, sustainable and modern energy for all.

SDG 8 - Decent Work and Economic Growth: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

SDG 9 - Industry, Innovation and Infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

SDG 12 - Responsible Consumption and Production: Ensure sustainable consumption and production pattern.

SDG 13 - Climate Action: Take urgent action to combat climate change and its impact.

SDG 14 - Life below Water: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

SDG 15 - Life on Land: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

SDG 16 - Peace, Justice and Strong Institutions: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

Collaborate with Other Stakeholders

The seven goals amplifying performance with relevant partnership networks and stakeholders are as follows;

SDG 1 - No Poverty: End poverty in all its forms everywhere.

SDG 2 - Zero Hunger: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

SDG 4 - Quality Education: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG 5 - Gender Equality: Achieve gender equality and empower all women and girls.

SDG 10 - Reduce Inequalities: Reduce inequality within and among countries.

SDG 11 - Sustainable Cities and Communities: Make cities and human settlements inclusive, safe, resilient and sustainable.

SDG 17 - Partnerships for the Goals: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.

"PTT has good sustainability performance and clear disclosure, as well as demonstrates linkages between material topics and each SDG".

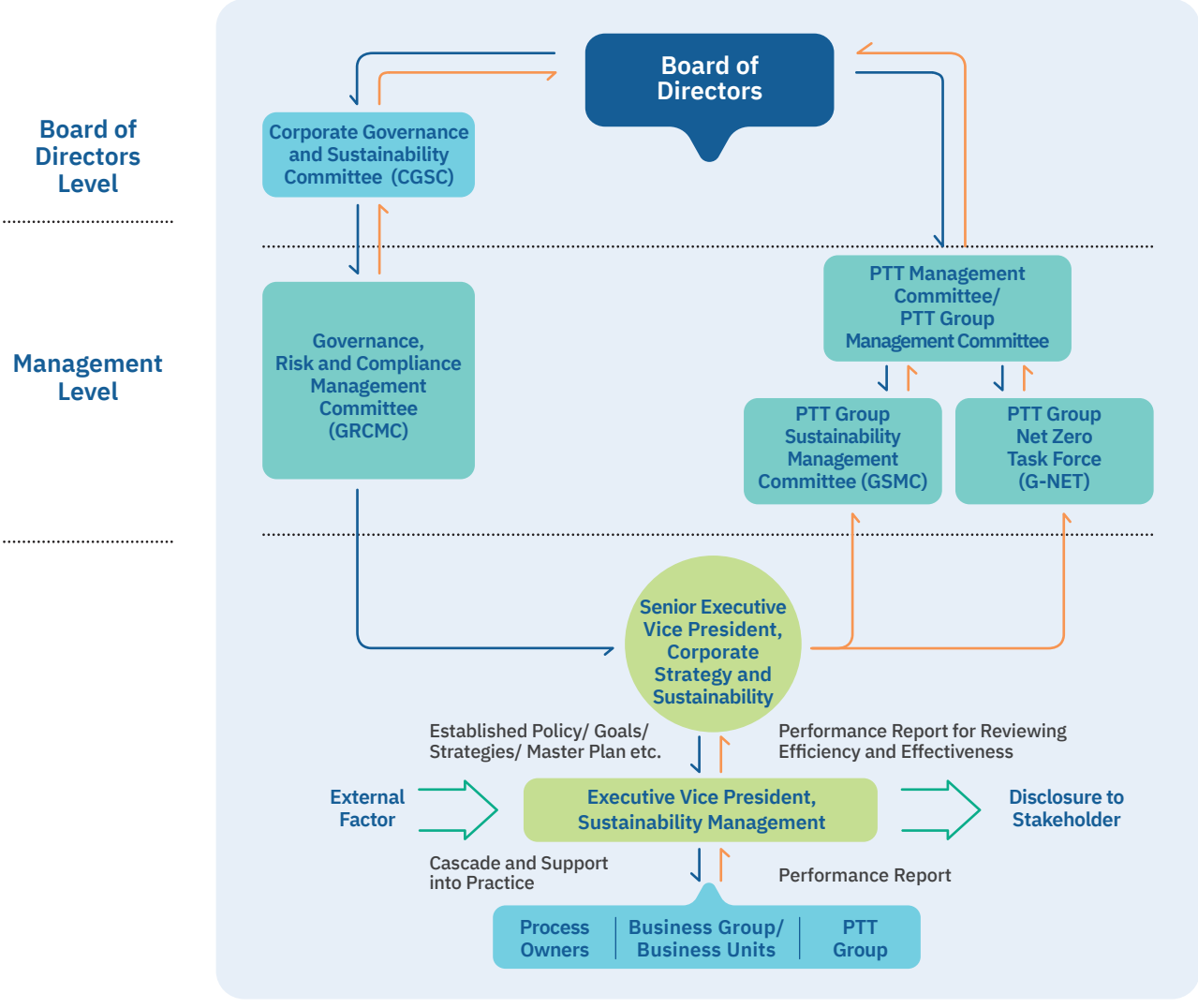
Assistant Professor Dr. Orapan Yolrabil
Associate Dean for Acadamic Affairs and Alliance Network, Thammasat Business School, Thammasat University

Dr. Worapong Janyangyuen
Director of Bachelor's Degree in Business Administration (International Program) (BBA), Thammasat Business School, Thammasat University

Sustainability Governance Structure

PTT Board of Directors assigned **Corporate Governance and Sustainability Committee (CGSC)** to govern and manage sustainability according to commitments demonstrated in responsible business policies. Management-level committee comprises **Governance Risk and Compliance Management Committee (GRCMC)** and **PTT Group Sustainability Management Committee (GSMC)** have the responsibilities to consider and make initial reviews. **Executive Vice President, Sustainability Management Function**, Under Senior Executive Vice President, Corporate Strategy and Sustainability is responsible for communicating policies, strategic directions, masterplan and action plans to be implemented throughout PTT, in collaboration with related policy owners responsible for each sustainability material topics, jointly drive, monitor, analyze and summarize progress and performance to report the Board of Directors as governance structure below on a quarterly basis. This enables reviews and provision of recommendations to achieve targets effectively and efficiently. Furthermore, PTT Board of Directors also reviewed and approved sustainability material topics assessment results, as well as the entire 56-1 One Report disclosure.

Sustainability knowledge and capacity for PTT Board, all of which are highly capable with tremendous corporate management experience in sustainability from various organizations, are continuously fostered. Upon being appointed as PTT Board's member and designated as CGSC committee, PTT arranges to communicate the overview and process of PTT sustainability management again. Furthermore, there were additional trainings provided, as well as the Board's performance evaluation. Details are available in Section 2 Governance.



Additional information on committee who responsed for sustainability material topics, is available on PTT sustainability material topics table, page 152 - 155 and PTT website.

3.2 Stakeholder Analysis in Business Value Chain

The six of PTT Stakeholder groups

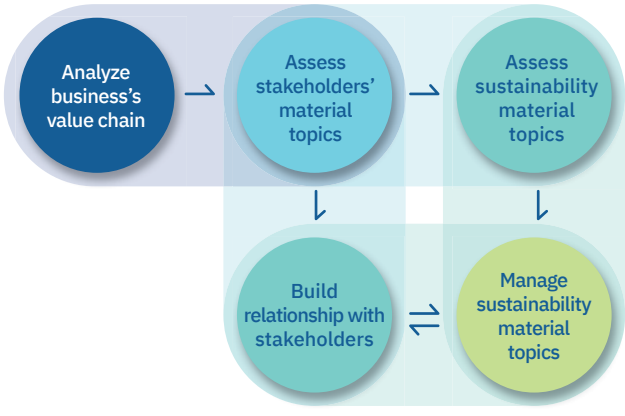
Public Sector | Investors | Customers
Society and Communities | Suppliers and Partners | Directors and Employees

Stakeholder Engagement's Objectives

To provide opportunities for stakeholders to share opinions and engage in PTT operations, by equally care for every stakeholder group who is the crucial partners in business operation, PTT is committed to engage stakeholders in material topics and response to the stakeholders' needs, expectations and concerns appropriately and promptly. PTT stakeholder engagement is in accordance with AA1000 Stakeholder Engagement Standard 2015 (AA1000 SES), as well as stakeholder and customer-centric assessment criteria according to State Enterprise Assessment Model (SE-AM) in order to operate orderly systematic and have the efficiency to accommodate PTT sustainable growth align with maintaining stakeholders' trust.

Stakeholder Impact Management in Business Value Chain

PTT has set an approach to analyze and manage material topics, or positive and negative actual and potential impacts from business operations and activities, in the past, present and future, as occurred and may happen in the future from PTT's own operations and stakeholders in the business value chain. This includes both stakeholder aspect and sustainability, encompassing economic, social, and human rights impact. The approach is as follows;



Analyzing the Business Value Chain

Value chain analysis result of each work line in 2022, can be summarized as follows;

In 2022, PTT analyzed the value chain of three main business groups and support function following PTT re-structure into 15 work lines. Both internal and external stakeholders were identified to use in the analysis of stakeholders impacts, whether from operations, products and/or services throughout PTT value chain. This address impacts on economic, environment, social and human rights aspect, as well identifying stakeholders' needs, expectations, concerns, in order to identify work line's topics that align with PTT's own.

At PTT-level, there were ten topics, as follows;

Brand & Trust
Brand refers to PTT's image and the stakeholders' perception towards PTT, or product and services; whereas Trust refers to credibility, reliability, and confidence.

Climate Change
Climate change, whether occurred from natural fluctuation or anthropogenic activities

Compliance/ Transparency
Compliance refers to legal and regulatory compliance. Transparency refers to clarity of corporate disclosure, whether positive or negative information.

Customer Experience
Interactions between the customers and PTT, as well as business relations to build awareness, trainings, support, purchases and services.

Energy Transition
Shifting towards new energy infrastructure

Financial Performance
Financial-centric performance of operation

Future Business
New businesses, such as Renewable Energy, Energy Storage, EV Value Chain, Hydrogen Technology, Life Science, AI, Robotics and Digitalization, etc.

Information Security & Data Privacy
Information Security refers to data security. Data Privacy refers to protection of personal data, by provide protection and comply with the laws.

Organization & Employee
Development of PTT and employees

Safety, Health & Environment
Security, safety, occupational health and environment

Annual value chain analysis result of each business functions in 2022

Stakeholders' corporate topics in sustainability	Upstream Petroleum and Natural Gas Business Group Natural Gas Business Function	Downstream Petroleum Business Group • Downstream Petroleum-Strategic Management Business Function • International Trade Business Function	New Business and Infrastructure Business Group Innovation and New Business Function	New Business and Infrastructure Business Group Engineering and Infrastructure Business Function	Financial Management Business Function	Organization Effectiveness and Corporate Governance Business Function	Corporate Strategy and Sustainability Business Function	Other Support Units*
Environment								
Safety, Health & Environment	●	●	●	●				
Climate Change			●				●	
Social								
Safety, Health & Environment	●	●	●	●				
Brand & Trust	●	●	●		●	●	●	●
Organization & Employee						●		
Governance								
Future Business	●		●	●			●	
Brand & Trust	●	●	●	●	●	●	●	●
Financial Performance	●	●			●			
Compliance/ Transparency	●		●	●	●		●	●
Energy Transition	●				●			
Customer Experience	●	●	●	●				
Information Security & Data Privacy			●					●
Organization & Employee	●	●				●		
Key stakeholders								

* Remark: Other support function comprises Office of Corporate Legal (In 2023, the name is changed to be Office of General Counsel), Internal Control Office, Corporate Reputation Management and Social Responsibility, as well as Company Secretary and Corporate Relations

Key stakeholders Public Sector · Society and Communities · Investors · Customers · Suppliers and Partners · Directors and Employees

Building Stakeholder Relationships

PTT consolidates and analyzes needs, expectations, and concerns expressed in stakeholders survey towards PTT operations, and from employees who contact directly with stakeholders, as well as global trends. This serves as key information for the development of material topics to PTT's stakeholders.

Once the business function prioritize stakeholders and stakeholders' topics, aligned with corporate-level topics, a stakeholder engagement plan is developed. Performance is monitored on a quarterly basis. Corporate-level Topics are monitored and reported to Corporate Plan and Risk Management Committee, as well as Enterprise Risk Management Committee quarterly. Recommendations from the Committees' are integrated to improve performance. There are also assessments of stakeholder relationship and engagement annually, which will be used to review performance afterwards.

In 2022, there were a total of four corporate-level topics being monitored, which are

1) Future Business
2) Climate Change
3) Safety, Health & Environment
4) Brand & Trust

The topics are align with PTT's new vision of "Powering Life with Future Energy and Beyond," with the plan to increase investment in "Future Energy and Beyond" to achieve profits of over 30% by 2030, reduce greenhouse gas emissions by 15% by 2030, and achieve Carbon Neutrality by 2040 and achieve Net Zero Emissions by 2050 under the boundary of PTT owned-operations including wholly owned subsidiaries of PTT. Communication is made, both internally and externally, to create employee engagement to achieve future goals, establish a framework to create joint changes, and drive investment plan to propel Thai economy forward.

Stakeholder engagement score

	2019	2020	2021	2022
Target	≥80	≥80	≥80	≥80
Performance	83	83	86	86

The target of stakeholder engagement score was set at Excellent (≥ 80), with average score from 2019 to 2022 at 85, thus exceeding the target. This reflects PTT overall performance in engaging with stakeholders at Excellent level.

Stakeholder Engagement Result

	Public Sector	Investors	Customers
Stakeholder Engagement Channel	• Monthly consultation meetings with the public sector • Quarterly update meetings with the public sector • Information disclosure via PTT website and other online media	• Online meetings • PTT Group's operation site visits • Annual general meeting of shareholders • Opportunity Day • Digital roadshow with international investors via online channels	• Online meetings and discussion • Customer visits to raise awareness and foster correct understanding • PTT NGV Station Application • 1365 Contact Center • Online media, such as LINE : PTT Natural Gas and PTT NGR Website : Customer Service Center
Stakeholders' Needs/ Expectation	**Future Business** • Continuously build new business together. • Conduct business that supports and aligns with the public sector policies **Climate Change** • Engage and provide helpful feedback/ information • Be a leader in greenhouse gas management **Safety, Health & Environment** • Safe guarding lives and property. • Minimize environmental impacts from operations and control the operations according to various standards. **Compliance/ Transparency** • Energy security and support the public sector policies • Sufficient and prompt information disclosure • Communicate issues clearly and thoroughly • Promote fair competition and free trade	**Energy Transition** • Expand to new businesses • Performance reflecting the shifts in future energy business • Investment in companies adding values to society and the environment **Financial Performance** • Invest in companies with good performance, security, growth, with good returns • Solvency • An appropriate investment plan with future growth • Good governance in management	**Future Business** • Environmentally friendly consumption and production • Develop clean energy at fair prices • Scale up EV, EV Charging stations/ NGV/ LPG nation-wide **Customer Experience** • Received quality products and services which are environmentally friendly • Operational system is convenient and flexible
Examples of Key Performance	**Future Business** • Communicate and raise awareness of PTT's new business operations **Climate Change** • Make suggestions for membership criteria of Thailand Carbon Nuetral Network (TCNN), which PTT is a co-founder of this network. Besides, PTT also collaborates with public sector in reforestation and restoration projects. **Safety, Health & Environment** • Organize a public hearing to collect the public sector's opinions relating to PTT's projects and implement the feedback for improvement • Collaborated with the public sector and communities leaders to open for community concerns and suggestions. The company also monitor and fairly follow up on solutions. **Compliance/ Transparency** • Participate in meetings/ discussion with public sector to take suggestions and provide feedback beneficial to various projects • Deliver information to governing public sector agency promptly upon request, such as data classification, and data disclosure process	**Energy Transition** • Communicate PTT's new energy development direction and performance **Financial Performance** • Communicate PTT strategic direction to gain confidence for investors, through shareholder meetings and online channels • Disseminate data and information to bondholders on financial status, and key financial ratio, including communicate with investors, analysts, and fund managers through Analyst Meeting, as well as Roadshow, both domestic and international	**Future Business** • Build relationships and business collaboration **Customer Experience** • Elevate customer experience by analyzing business weakness from business with PTT to continuously identify recommendation • Customer visits, communication, and organize trainings as customers' request • CRM and CSR activities of PTT to build customer engagement

Society and Communities

Stakeholder Engagement Channel

- Community visits for engagement
- Public hearing for communities per work plans
- 1365 Contact Center
- PTT website or email: pttvoice@pttplc.com
- Report grievance via email: grchelpdesk@pttplc.com or pttvoice@pttplc.com
- Online media, such as

PTT Group	PTT News/ We love PTT/ GODJI	@pttplc_ official	godji_ pttgroup	godji_ pttgroup

Stakeholders' Needs/ Expectation

Brand & Trust
- Develop the society, quality of life, and the environment
- Promote and contribute to solving national economic issues
- Credible, transparent management with good governance

Safety, Health & Environment
- Security of life and property
- Communicate issues and resolve community's challenges quickly
- Reduce air pollution from construction project

Examples of Key Performance

Brand & Trust
- "PTT Group Innovation for Society Project", which applies knowledge, expertise, innovation and technology to develop farmers into smart farmers across 45 sites (29 provinces). This includes development and promotion of 267 community products, as well as continuously developing community-based tourisms at six sites nation-wide.
- "Restart Thailand" supports communities and new graduates through employment, focusing on work opportunities, generate income, and build vocational skills for new generations in every regions. In 2022, there were approximately 23,000 participants joining the project.
- In 2022, "Giving Chance for the Youth Project" helps students and youths who originally are at risk of dropping out of education system, to gain continuous education access.
  Scholarships and funds of THB 171 million was set up and provided to support youths from low-income families, and those affected by COVID-19.
  The recipients total over 103,000 nationwide, through PTT Virtual Run activity, which converted every walk and run to scholarships. People in any sectors would join the event.
- "PTT Group Model School" is an education development plan for 204 schools across 17 provinces nationwide. PTT collects knowledge and expertise, develops education under the Concept "STEEM 4E" in collaboration with Kamnoetvidya Science Academy, and Vidyasirimedhi Institute of Science and Technology.
  The objective is to develop academic STEM and English Skills. The teaching applies 4E, which are
  1. Ethics and Growth Mindset
  2. Entrepreneurship
  3. Energy Literacy
  4. Environment Awareness
- Promote the development of green area with communities
- Communicate and take actions on material topics, continuously build understanding of PTT vision
- The "Giving Breath for the City Project" project supports the goal of creating Bangkok green area, by planting one million trees. PTT will join in growing 100,000 trees with BMA in Bangkok, aiming for perennial trees, long-lasting shrubs or woody vines to absorption of carbon dioxide, reduce dust and air pollution, as well as lowering the temperature around plantation areas by providing shade and enhance livability for urban areas.

Safety, Health & Environment
- Visit sites to build community's confidence in safety measures, preparation against emergencies, and take feedback to improve operations.
- Visits/ discuss with communities leaders to monitor complaints and requests systematically, promptly, and fairly. PTT also listens to their feedback, and foster community's confidence.
- Communicate information and construction plans in the areas to communities, listen to suggestions and concerns.

Suppliers and Partners

Directors and Employees

Stakeholder Engagement Channel

- Annual supplier seminar
- Supplier communication channel, such as procurement website and emails
- PTT Online procurement and vendor system, comprises
  - PTT e-purchase system
  - PTT e-bidding
  - ESG Self-Assessment for suppliers for PTT and PTT Group suppliers

- Monthly Relation Affairs Committee meetings
- Joint social activities between executives and employees
- Business functions meetings
- PTT Board meeting

Stakeholders' Needs/ Expectation

Future Business
- Build new business and future collaboration continuously, as well as providing consultation/ correction information on starting new businesses
- Promote national economy

Brand & Trust
- Develop capacity for long-term business collaboration
- Accessibility for procurement information, with suppliers confident in PTT's transparent procurement process

Compliance/ Transparency
- Comply with rules and regulations
- Transparent and traceable good governance. Clearly communicate work process and utilize technology

Organization & Employee
- Security, promotion, good welfare and compensation
- Work with an organization that is agile, accelerate growth, and apply technology for greater operational efficiency
- Capability building to support future business
- Build understanding and trust in PTT operations

Information Security & Data Privacy
- Data storage and usage security
- Understand and comply with Personal Data Protection Act (PDPA)

Examples of Key Performance

Future Business
- Build relationships and business collaboration

Brand & Trust
- Communicate performance
  1) Investment to accommodate future growth
  2) Maintain performance during a slower economy and COVID-19
  3) Manage partnerships in PTT Group through supply chain management

Compliance/ Transparency
- Implement Digital Procurement system in procurement process, enabling suppliers to operate via online channels effectively, promptly and fitting of present-day
- Communicate PTT procurement process and advise various system usage to enhance suppliers' understanding in supplier conference and other communication channels, such as procurement websites and emails

Organization & Employee
- Review attributes, forms of skills, knowledge and capacity of employees which align with new business operations
- Improve welfare to be sufficient to economic conditions, and competitive with peers
- Improve compensation to align with performance, becoming more performance-driven in approach
- Organize joint activities with PTT Board to build understanding of PTT Group's business operations

Information Security & Data Privacy
- Provide knowledge and raise awareness regarding cyberthreats
- Provide compliance knowledge on PDPA and data management according to the laws

Additional information about vision and stakeholder strategic direction in PTT website

3.3 Stakeholder Impact Management in Business Value Chain

Sustainability Materiality Assessment

PTT materiality assessment process is in accordance with the Global Reporting Initiatives (GRI) Universal Standards 2021 and the International Integrated Reporting Council (IIRC) to identify environmental, social, and governance material topics with actual and potential impacts that could be positive and/or negative of significance in value creation for stakeholders throughout the organization's value chain. Due diligence materiality assessment is conducted annually to review the change of impacts according to the contexts, internal/ external factors, changing circumstances, with the key procedures as follows:

Step 1: Understand the organization's context

Analyze both internal factors (such as vision, strategic objective, organizational operation, etc.) and external factors (such as relevant standards, requirements, guideline, global trends and risks, etc.), as well as consider material topics from PTT Group and industry sector. Additionally, PTT also analyzes stakeholders' needs and expectations from all 15 business functions, as well as key stakeholder survey, to consolidate and categorize material topics.

Step 2: Identify actual and potential impacts

Identify actual and potential impacts, both positive and negative, in Environmental, Social, Governance dimensions with the consideration of human rights impacts throughout the organization's operations. It starts from actual and potential negative impacts that may happen in the future. This includes those the organization causes, contributes to, or is directly linked to for business benefits from the organization's value chain. Next, identify the positive impacts that have occurred and have potential in the future to deliver value for sustainable development. Lastly, positive and negative impacts cannot be offset by each other.

Step 3: Assess the significance of the impacts

Negative impacts: Assess the significance of actual negative impacts, by considering severity, scale, and irremediable character. This includes assessing the significance of potential negative impact, by considering the initial severity and likelihood.
Positive impacts: Assess the significance of actual positive impacts, by considering the scale and scope of impacts. This includes assessing the significance of potential positive impact, by considering the scale, the initial scope, and likelihood.

Step 4: Prioritize the most significant impacts for reporting

Prioritize the significance of all impacts and select the top three material topics, ranked by high and critical/ extreme, following both positive and negative impact assessment, for reporting. The assessment result has been jointly reviewed by relevant functions and experts, all under the governance and approval of the management-level committee and PTT Committees, Governance, Risk and Compliance Management Committee, as well as Corporate Governance and Sustainability Committee, respectively. Furthermore, the material topics have also been verified with experts and external parties to ensure comprehensiveness, accuracy, credibility and transparency. PTT has taken notes of observation from experts and external parties to continuously improve the operational process and disclosure.

Materiality Assessment Result

Actual and Potential Negative Impacts

Critical
- Climate Action

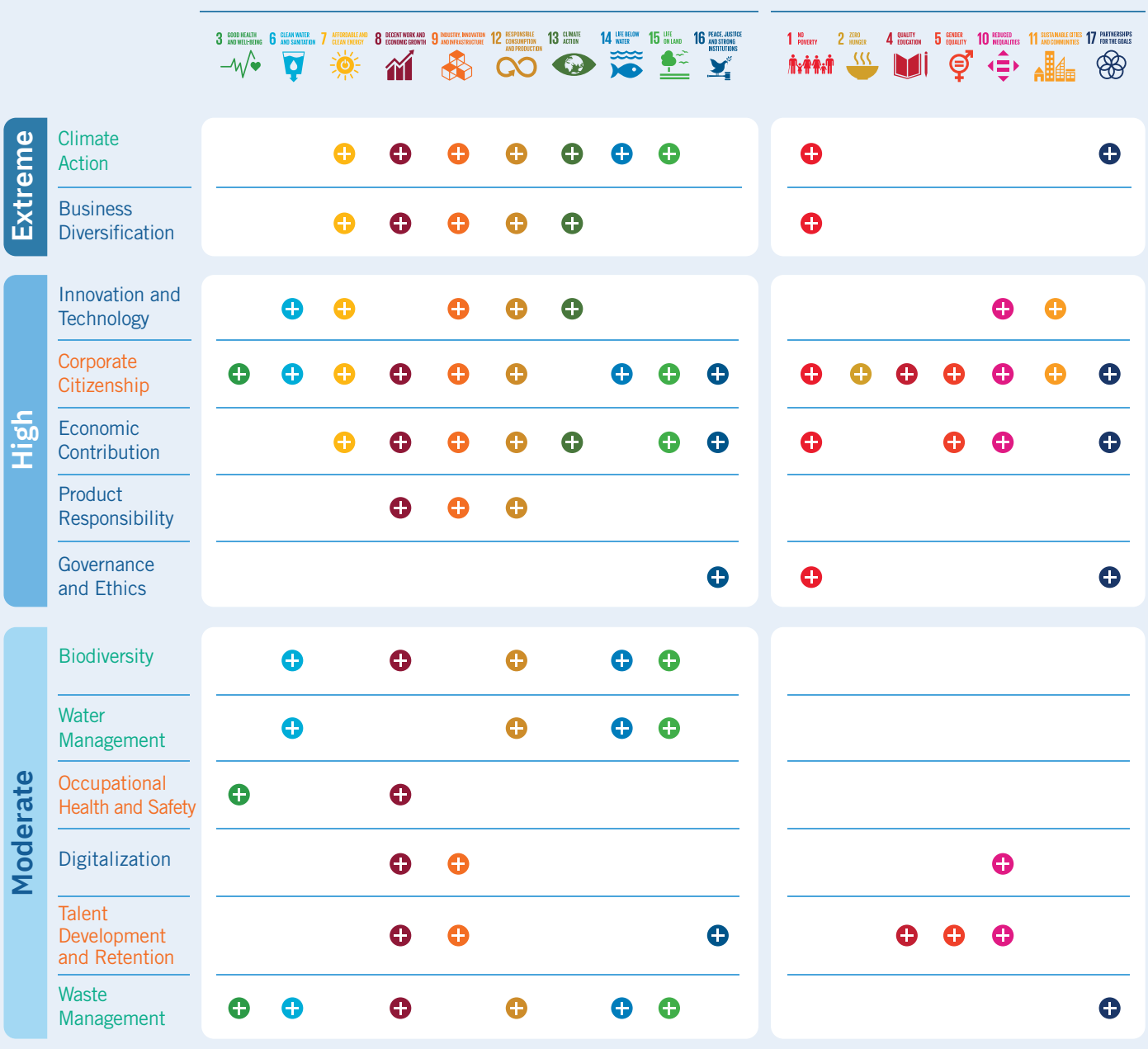
High
- Occupational Health and Safety

Moderate
- Spills
- Water Management
- Economic Contribution
- Biodiversity
- Corporate Citizenship
- Waste Management
- Emissions
- Talent Development and Retention

Low
- Governance and Ethics
- Supply Chain Management
- Product Responsibility

Remarks: Material topics with increased priority compared to 2021
Material sub-topic 2022 reviewed from the previous year

Actual and Potential Positive Impacts



Following PTT's 2022 materiality assessment, the top five material topics from high to critical/ extreme levels, are as follows:

- **Climate Action** continued to rank first following the previous year, as it remains an internationally significant agenda requiring concerted efforts from various sectors, as well as the business sector to achieve the goal of limiting global temperature at no more than 1.5 ℃ and Net Zero Emissions around mid-century.
- **Business Diversification** became more focused corresponding to PTT Vision's "Powering Life with Future Energy and Beyond" to diversity into newer businesses beyond the conventional energy, adjust the investment portfolio and move towards the low carbon.
- **Innovation and Technology** had a high impact following the business expansion, which is related to the innovation and technology development for products and services, to accommodate new business opportunities.
- **Occupational Health and Safety** became less significant, considering PTT was able to systematically and effectively manage COVID-19 pandemic, enabling employees and contractors to take appropriate actions and promptly received aids when needed.
- **Corporate Citizenship** played an important role as communities and society expect PTT to support public health safety amidst COVID-19 pandemic, to generate jobs, revenues and restore national economy following aforementioned impacts.

Materiality Assessment Result

Climate Action

- Direct and indirect greenhouse gas emissions
- Greenhouse gas emissions intensity
- Methane emission
- Climate change adaptation
- Climate change mitigation
- Energy
- Financial implications and risks and opportunities due to climate change
- Net Zero Emissions

Page 158 Additional Information

Governing Committees in PTT

Management Level
- Governance, Risk and Compliance Management Committee (GRCMC)
- PTT Group Sustainability Management Committee (GSMC)
- Corporate Plan and Risk Management Committee (CPRC)
- PTT Management Committee (PTTMC)

Board of Directors Level
- Corporate Governance and Sustainability Committee (CGSC)
- Enterprise Risk Management Committee (ERMC)
- PTT Board of Directors

Waste Management

- Waste management (reuse, recycling and disposal)
- Circular economy for waste management

Additional Information

Governing Committees in PTT

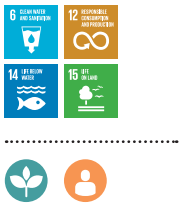
Management Level
- Governance, Risk and Compliance Management Committee (GRCMC)
- PTT Group Sustainability Management Committee (GSMC)
- Corporate Plan and Risk Management Committee (CPRC)
- PTT Management Committee (PTTMC)

Board of Directors Level
- Corporate Governance and Sustainability Committee (CGSC)
- PTT Board of Directors

Water Management

- Water conservation, consumption and accessibility
- Wastewater impact management
- Water withdrawal from shared sources
- Circular economy

Additional Information



Emissions

- Emission management such as VOCs, NOx, SOx, etc.
- Other pollution such as light pollution, vibration, magnetic interference, radiation, etc.

Additional Information

Governing Committees in PTT

Management Level
- Governance, Risk and Compliance Management Committee (GRCMC)
- PTT Group Sustainability Management Committee (GSMC)
- Corporate Plan and Risk Management Committee (CPRC)
- PTT Management Committee (PTTMC)

Board of Directors Level
- Corporate Governance and Sustainability Committee (CGSC)
- PTT Board of Directors

Spills

- Oil, gas, and chemical spills

Additional Information

Governing Committees in PTT

Management Level
- Governance, Risk and Compliance Management Committee (GRCMC)
- PTT Group Sustainability Management Committee (GSMC)
- PTT Management Committee (PTTMC)

Board of Directors Level
- PTT Board of Directors

Biodiversity

- Biodiversity protection and ecosystem restoration
- Sustainable land and natural resource use
- Environmentally conscious development of urban and rural areas

Additional Information

Remark: Additional information is available within this report | Additional information is available on PTT website | Dimension of Impact: Governance, Environment, Social

Talent Development and Retention

- Labor management relations
- Freedom of association and collective bargaining
- Discrimination and harassment incidents
- Fair compensation
- Forced or compulsory labor
- Child labor
- Modern slavery
- Performance appraisal & career management
- Talent management: attraction & retention
- Employee engagement

Additional Information

Governing Committees in PTT

Management Level
- Human Capital Management Committee
- PTT Human Capital Management Committee
- Structure, Remuneration and Manpower Committee
- Talent Management and Scholarship Committee
- Human Capital Collaboration Management

Board of Directors Level
- PTT Board of Directors

Corporate Citizenship

- Indirect economic impacts to the society and communities
- Relationship fostering, education, and engagement with communities
- Preservation/ encouragement of culture and education
- Employment and skill development
- Developing and supporting community's technology accessibility
- Health promotion and public health campaigns
- Security personnel trained in human rights policies or procedures
- Indigenous rights

Page 173 Additional Information

Governing Committees in PTT

Management Level
- Governance, Risk and Compliance Management Committee (GRCMC)
- PTT Group Sustainability Management Committee (GSMC)
- PTT Management Committee (PTTMC)

Board of Directors Level
- Corporate Governance and Sustainability Committee (CGSC)

Occupational Health and Safety

- Occupational health and safety management system, risk assessment, investigate incidents, services related to health, consultation and communication with operators, trainings, and health promotion
- Safety, occupational health, and work environment, that may cause occupational injury/ safety to employees and operators
- Process safety
- Travel/ Truck and ship transportation
- Community's security
- Manage crisis, emergencies and business continuity to prevent impacts on business, communities and the environment

Page 167 Additional Information

Governing Committees in PTT

Management Level
- Governance, Risk and Compliance Management Committee (GRCMC)
- PTT Group Sustainability Management Committee (GSMC)
- PTT Management Committee (PTTMC)

Board of Directors Level
- PTT Board of Directors

Remark: Additional information is available within this report | Additional information is available on PTT website | Dimension of Impact: Governance, Environment, Social

Governance and Ethics

- The organization's structure and governance process
- Fair operating practice
- Anti corruption and transparency
- Risk management
- Tax strategy and policies
- Compliance with applicable laws, regulations and relevant requirement
- Stance in supporting new rules, regulations and policies
- The Board and Management's remuneration policies

Additional Information

Governing Committees in PTT

Management Level

- Governance, Risk and Compliance Management Committee (GRCMC)

Board of Directors Level

- Corporate Governance and Sustainability Committee (CGSC)

Supply Chain Management

- Safety Supply chain management
- Sustainability risk management from suppliers' procurement and operations
- Partnership and create shared values with suppliers and contractors
- Procurement process according to government procurement policy

Additional Information

Governing Committees in PTT

Management Level

- Strategic Planning, Product and Service Procurement Committee
- Vendor Selection Committee
- Governance and Procurement Monitoring Committee

Digitalization

- Digital technology adaptation to transform the organization's business process and activities
- Information technology, cybersecurity, and privacy protection

Additional Information

Governing Committees in PTT

Management Level

- PTT Group Digital Committee

Business Diversification

- Set sustainability business direction in response to future changes, such as energy transition, and climate change
- Seek/ develop new businesses
- Improve value chain management from key global trends

Page 184 Additional Information

Governing Committees in PTT

Management Level

- Corporate Plan and Risk Management Committee (CPRC)
- Investment Management Committee
- PTT Management Committee

Board of Directors Level

- PTT Board of Directors

Remark: Additional information is available within this report | Additional information is available on PTT website | Dimension of Impact: Governance, Environment, Social

Product Responsibility

- Fair marketing, accurate and unbiased information, and compliance to fair agreement
- Protect consumers' health and safety
- Service, support, and resolve grievances and disputes for consumers
- Protect data and privacy of consumers
- Provide knowledge and raise awareness
- Responsibility to impact, risk management for products and services delivered to customers
- Response to emerging customer needs

Additional Information

Governing Committees in PTT

Management Level

- PTT Customer-Centric Committee

Innovation and Technology

- Technology research and development, innovation development process, and expansion to business development
- Promote innovation and application of process, product, and service technology

Page 188 Additional Information

Governing Committees in PTT

Management Level

- PTT Research and Innovation and Screening Committee
- PTT Innovation Management Committee
- PTT Group Technology Committee
- PTT Group Digital Committee
- PTT Management Committee (PTTMC)

Board of Directors Level

- Enterprise Risk Management Committee (ERMC)

Economic Contribution

- Create and share economic values, such as revenues, operation budget, employee compensation and welfare, annual dividend, taxes for the government, and social investment
- Financial support for business from government
- Ability to generate business returns
- Support government policy
- Political support

Additional Information

Governing Committees in PTT

Management Level

- PTT Management Committee (PTTMC)

Creating Values towards Sustainability

Input

Financial Capital

- Number of shares issued and additional paid-in capital 28,562,996,250 shares
- Revenue from product and services THB 2,258,818 million in 2021
- EBITDA (Earnings Before Interest/ Tax/ Depreciation) THB 427,956 million in 2021

Manufactured Capital

- Production and research facilities
- Fundamental infrastructure, such as natural gas pipeline and petroleum terminals
- Six Gas Separation plants with a total production of 2,870 million cubic feet/ day (in 2021, the gas separation plants' capacity was at 2,660 million cubic feet/ day per the Gulf of Thailand's natural gas quality (CO_2 proportion)
- Natural gas pipeline network spanning approximately 4,566 kilometers

Intellectual Capital

- Intellectual properties
- Licensed technology, innovations and other initiatives
- THB 871 million for Research funding

Human Capital

- 3,540 PTT Employees
- Skills and experiences of employees, suppliers and business partners
- Average training for executives and employees: 44.20 hours
- Average training cost for executives and employees: THB 29,502 per person
- Proportion of female executives and employees to total number of employees at 38.31%

Social and Relationship Capital

- Relationship between PTT and stakeholders
- Brand and reputation
- Investment in social development THB 1,086 million
- Stakeholder engagement

Natural Capital

- Renewable and non-renewable natural resources
- Natural capital investment THB 443 million

PTT Operations

Value Creation

- Revenue from sales product and services THB 3,367,203 million
- EBITDA (Earnings Before Interest/ Tax/ Depreciation) THB 491,288 million
- Net Debt/ EBITDA ratio 1.71 times
- Basic earnings per share THB 3.20 per share
- Dividend from annual performance THB 57,126 million
- Income tax payment to the Government for national development and management THB 50,251 million

- Production and research facilities **ALL**
- Fundamental infrastructure, such as natural gas pipelines and petroleum terminals **ALL**
- Six Gas Separation plants with a total production of 2,870 million cubic feet per day (in 2022, the gas separation plants' capacity was at 2,660 million cubic feet per day from the Gulf of Thailand's natural gas quality (CO_2 proportion) **ALL**
- Natural gas pipeline network spanning approximately 4,573 kilometers **ALL**

- Develop 27 new products with 26 patents
- Direct and indirect earnings from research and development THB 720,198,420

- Human capital return on investment 333 times
- Employee engagement score 79%
- Employee turnover rate Male employees 0.65 Female employees 0.65
- Employee succession rate 100%

- 100% engagement with communities in operational areas
- Stakeholder engagement score at 86 **ALL**
- No community conflicts

- Greenhouse gas emissions of PTT **ALL**
  - Direct greenhouse gas emissions (Scope 1) 9.71 million tons of CO_2 equivalent
  - Indirect greenhouse gas emissions (Scope 2) (Market-based) 0.28 million tons of CO_2 equivalent
- Greenhouse gas emissions of PTT Group **ALL**
  - Direct greenhouse gas emissions (Scope 1) 44.54 million tons of CO_2 equivalent
  - Indirect greenhouse gas emissions (Scope 2) (Market-based) 0.86 million tons of CO_2 equivalent
- Volume of water recycled and reused (freshwater) per total amount of water withdrawal by PTT 8.11%
- Reforestation project of one million Rai in honor of His Majesty King Bhumibol Adulyadej to offset an average of 2.14 million tons of CO_2 equivalentper year, valued at over THB 280 million per annum

3.4 Sustainability Material Topic Management

Under deployment of policy commitments for responsible business conduct for implementation via material topics management process, detailed in 3.1 - 3.3, PTT discloses the overall goal, action plans, performance and highlight projects' progress in 2022 of top five material topics in this 56-1 One Report, comprising of Climate Action, Occupational Health and Safety, Corporate Citizenship, Business Diversification and Innovation & Technology. Additional information on other material topics are available on PTT website, under the section of Sustainability.

Positive and Negative Impacts

PTT is fully aware that operations, products, and services in oil and natural gas industry, which is PTT's primary business, releases direct and indirect greenhouse gas throughout the value chain. This inevitably causes negative impacts in various dimensions, from environmental dimension contributing to global warming and climate change, to various other complicated and diverse issues continuously. Issues include biodiversity and social impacts for changing livelihood and quality of life. Presently, every sector, globally and nationally, prioritizes and elevates efforts in resolving climate change issue as an urgent agenda. This affects PTT's business directly in 2021, PTT integrated risks and opportunities from climate change as a key factor in setting strategic direction and long-term targets in 2030. The targets comprise Business Growth, New Growth, and Clean Growth which reflecting the commitment in transitioning business to low carbon society aiming to achieve Net Zero Emissions by 2050 under the boundary of PTT owned-operations including wholly owned subsidiaries of PTT. In 2022, the incredibly result in investment expansion into future energy and beyond energy business. Apart from generating positive environmental impacts, it also serves as the country's economic driving force, promotes employment, builds good quality of life for citizens and society, as well as enhances new business' employees' capacities and skills. It may even receive tax subsidies.

Material Topic Management

Indicators	Performance Targets		Performance against Short-Term Targets
	Short-Term within 2022	Long-Term	
o SE-AM KPI and Corporate KPI* **o Functional KPI** **o KPI for PTT Sustainability Management Masterplan for Social and Environmental Responsibilities 2021 - 2025** **o QSHE indicator in 2022 for PTT and PTT Group's performance** * *SE-AM KPI and Corporate KPI measures Eco-efficiency performance, calculates from greenhouse gas emissions and PTT-specific product*	PTT: ≤ 12 million tons of CO_2 equivalent PTT Group: ≤ 52.5 million tons of CO_2 equivalent	PTT: Aim for Carbon Neutrality by 2040 and Net Zero Emissions by 2050 PTT Group: Reduce by 15% within 2030 compares to greenhouse gas emissions in 2020	PTT: 9.99 million tons of CO_2 equivalent PTT Group: 45.40 million tons of CO_2 equivalent

Key Work Plans/ Projects for 2022

Projects in 3P Decarbonization Pathways
- Pursuit of Lower Emissions
- Portfolio Transformation
- Partnership with Nature and Society

Overall Management Approach

From the commitment to drive all towards a low-carbon society, PTT is determined to manage both positive and negative climate change impacts in every step of the business operations by integrated into PTT's strategic direction since 2021. Hence, PTT is now ready to transition to future energy business and beyond in order to reduce greenhouse gas emissions by setting the short, medium and long-term targets, and deploy throughout the value chain is as follows;

- Set **2030 long-term target** reflecting the commitment for business diversification, comprises Business Growth, New Growth and Clean Growth. Additional information is available in the section Business Diversification
- Set **Carbon Neutrality target by 2040 and Net Zero Emissions by 2050** under the boundery of PTT owned operations including wholly owned subsidiaries of PTT, enabled by supporting from the public sector to drive Thailand towards a low carbon society, achieving Carbon Neutrality by 2050 and Net Zero Emissions by 2065.
- Set **"3P Decarbonization Pathways"** connecting to the organization's 2030 long-term target, which serves as a collaboration framework in PTT Group. Key work plans/ projects are as follows;

NET ZERO 2050 ptt

3P Decarbonization Pathways

Pursuit of Lower Emissions

Link with Clean Growth Target to reduce as much greenhouse gas emissions as possible

Key Performance

- Carbon Capture and Storage (CCS)
- Carbon Capture and Utilization (CCU)
- Use renewable energy and hydrogen in operation areas
- Energy efficiency and optimization projects

Portfolio Transformation

Build growth from future energy business, with the increase in green portfolio proportion and hydrocarbon portfolio management

Key Performance

- Achieve business growth from future energy business
- Increase the ratio of renewable energy generation
- Reduce investment proportion in fossil fuel
- Promote the use of electric vehicles in Thailand

Partnership with Nature and Society

Increase volume of absorption and storage of carbon dioxide by nature-based solutions, through reforestation, forest protection, and increasing green area

Key Performance

- Protect one million Rai of forest from permanent reforestation project under the Royal Patronage, commenced since 1994
- Continuously grow one million Rai of new forests, and another one million Rai with PTT Group

- Establish **PTT Group Net Zero Task Force (G-NET)**, which comprises of senior executives of PTT Group companies. The task force aims to manage the key greenhouse gas reduction projects, such as Carbon Capture & Storage (CCS), Carbon Capture & Utilization (CCU), Renewable Energy (RE), and Hydrogen Energy. This supports Thailand in achieving Carbon Neutrality and Net Zero Emissions goals. The objectives include driving for the business diversification according to strategic directions and business plans, and reporting progress to Corporate Governance and Sustainability Committee on a quarterly basis. Management of climate change risks is a part of the enterprise risks to be handled by Corporate Plan and Risk Management Committee and reported to Enterprise Risk Management Committee quarterly. Furthermore, the **PTT Group Clean & Green committee**, comprises operation-level representatives from PTT Group, is responsible in monitoring and controlling greenhouse gas emission volume to meet the target, jointly track performance and measure results of eco-efficiency.

- Deploy targets as **SE-AM and Corporate KPIs**, which is measured for performance evaluation of the President & CEO, as well as senior level executives, cascading to the related business functions, respectively.

Progress of Work Plan/ Key Projects

Thailand's first Carbon Capture and Storage Project from Production in the Gulf of Thailand and Feasibility Study for Carbon Capture in the eastern coast

13.2 13.3 7.1 9.4 9.5 17.16

Joint operations within PTT Group comprise two parts, as follows;

- **Offshore:** The two plitots of Carbon Capture and Storage Project operated by PTTEP, which are Arthit and Lang Lebah offshore gas field. CCS at Arthit gas field is Thailand's first CCS project, which expecting to reduce greenhouse gas emissions by as much as one million tons of CO_2 equivalent per annum. Currently, the project is in the process of conducting feasibility studies and anticipated to commence its operation in 2027.
- **Nearshore:** Develop an MOU in PTT Group to jointly study "PTT Group CCS Hub Model" in exploring and capturing CO_2 within PTT Group, CO_2 transportation to coastal storage locations, and development of relevant regulations and management of potentially affected stakeholders. The project will anticipate to commence in 2030.

Furthermore, PTT Group collaborated with leading academic institutes, private enterprises, government agencies, and public organizations establish "Thailand CCUS Consortium" for the collaboration to develop carbon capture, utilization and storage technology in Future Energy Asia 2022.

Carbon Capture and Utilization (CCU)

13.2 13.3 7.1 9.4 9.5

Rayong Gas Separation Plant, PTT Innovation institute, and OR collaboratively conducted feasibilities study in the development and marketing of Sodium Bicarbonate product. It uses carbon dioxide from the natural gas separation plant as the initial substance, and utilized for multi-purposes, including food industry, medical industry, feed industry and industrial chemicals. In addition, it is distributed to customer in food industry, pharmaceutical industry, animal feed industry, and chemical industry, both national and international. This enriches business capability of PTT Group, reduces greenhouse gas emissions, minimizes import raw materials and products from overseas, as well as fosters business conducts in tandem with safeguarding the environment securely and sustainably.

Apart from Sodium Bicarbonate Projects, PTT continuously conducts feasibilities studies of other products, such as methanol, which requires imports from overseas in a higher proportion than in the country, valuing over THB 10,000 million annually (reference the import statistics report for Thai customs in 2021). It was used as an initial substance for glue and resin production in the furniture industry and primarily used for biodiesel production. If methanol from carbon dioxide is produced domestically, the import volume of carbon dioxide will be reduced and replaced, result in decrease trade deficit. Presently, commercial feasibility is underway.

Renewable Energy in Operation Sites

13.2 13.3 7.1 9.5

PTT started solar panel installation to use as renewable energy instead of grid electricity, such as Natural Gas Transmission System in Area 1, Area 2, Area 3, Area 6, Area 8, Area 9, Area 10 and Area 11, as well as PTT Natural Gas Transmission Operation Center in Chon Buri province, the maximum power production was 441 KW. Besides, Innovation Institute area's maximum electricity generation was approximately 40 KW and the Eastern Economic Corridor of Innovation (EECi) or Wangchan Valley has the maximum power production capacity at approximately 639 KW, which was registered for Thailand Voluntary Emission Reduction Program (T-VER). At PTT Innovation Institute, PV Solar Cells were also installed. The maximum production capacity was approximately at 1.68 MW. It is anticipated that PTT's projects altogether can reduce as much as 1,295 tons of CO_2 equivalent of indirect greenhouse gas emissions (Scope 2).

Furthermore, PTT has started transitioning for electric vehicles instead of internal combustion engine vehicles. There was a total of 14 Battery Electric Vehicles (BEV), which were expected to reduce as much as 127 tons of CO_2 equivalent. There are also plans to increase the number of electric vehicles.

Energy Efficiency

13.2 13.3 7.3

In 2022, PTT conducted GSP5 & GSP6 AGRU Performance using Rigorous Modeling Technique Phase 2, with in-depth studies and discovered portion of amine solution appropriate in CO_2 removal. The improvement reduced energy consumption by over 220,000 MMBTU per annum, or an equivalent to greenhouse gas emissions reduction of 15,000 tons of CO_2 equivalent.

Furthermore, PTT promotes employees' participation in PTT Productivity Improvement Circle Project, with the objective for process improvement to enhance productivity, decrease expense, increase revenues and minimize loss time. In 2022, PTT added more objectives to focus on process improvement and align with the three key perspectives of corporate strategic direction, which are 1. Optimum use of water resource in the process, 2. Business investment for low carbon society, 3. Optimum resource use according to circular economy principle and waste management. A total of over 30 projects were presented by employees. This includes projects on reduction of electricity consumption and heat, as well as equipment modification in the production process to reduce greenhouse gas emissions.

Hydrogen Fuel Project

13.2 13.3 7.1 9.4 9.5 17.16

There are several benefits from the use of hydrogen as a fuel in vehicles or use together with fuel cells and electrochemical processes to generate power. One of the benefit is that it is clean energy with zero pollution and has the utility capacity equivalent to fossil fuel. PTT has founded Hydrogen Thailand group to drive Hydrogen technology and fossil fuel as an alternative energy for the future towards low carbon society.

In 2022, PTT Innovation Institute developed a strategy plan to build hydrogen business port. This was approved by PTT Board of Directors, and a Hydrogen Business Development Working Committee was developed to drive towards goals. Currently, the investment opportunity for Green Hydrogen is being studied in collaboration with both domestic and international suppliers. Furthermore, there has been a collaboration with PTT Oil and Retail Business Plc., Bangkok Industrial Gas Company Limited (BIG), Toyota Daihatsu Engineering & Manufacturing (TDEM) and Toyota Motor Thailand Co., Ltd. (TMT) to study and develop projects for energy of the future. Thailand's first Hydrogen Refueling Station (HRS) for Fuel Cell Electric Vehicles (FCEV) was launched at Bang Lamung district, Chon Buri province. Toyota's fuel cell electric vehicles, 'Mira', was tested in Thailand in the form of shuttle bus between U-Tapao Airport, Chon Buri province for tourists and passengers. Technical data were collected from actual use enables building awareness and scale-ups in the future.

Investment Direction Transformation

There are several key performances, such as divesting in coal business by selling PTT Mining Limited (PTTML) shares to Astrindo in Indonesia, and fostering renewable usage and electric vehicles through companies. PTT holds 100% shares, which comprise ReAcc Company Limited (ReAcc), EVME PLUS Company Limited (EVME) and ARUN PLUS Company Limited (ARUN PLUS), etc. Additional information is available in Business Diversification section.

Internal Carbon Price Mechanisms for PTT Investment Consideration

13.2 13.3

Internal carbon price mechanisms scheme is considered one of the tools that PTT used upon investment decision making process for projects related to minimize greenhouse gas emissions, reduce climate change impacts, as well as facilitating PTT business towards low carbon society. This was use by the Strategic Investment Management Committee and PTT Management Committee. PTT uses shadow price as internal carbon price mechanism with the price at USD 20 per tons of CO_2 equivalent. It was applied with a project valuation for carbon reduction projects such as renewable project in operation sites.

Partnership with Nature and Society

Collaboration with the Public Sector to Increase Green Area

13.1 13.2 13.3 15.1 15.3 17.16

PTT's determination in increasing green area started since 1994, when PTT volunteered to reforest one million Rai in the project for permanent forests under The Reforestation Campaign in Commemoration of the Royal Goden Jubilee Project, celebrating the 50th anniversary of his reign. PTT has restored and replanted damaged forest areas, with the target areas distributed throughout every region of Thailand. This includes development of sustainable forest conservation and protection network, such as Forest Protector Volunteer Network, including Environmental Network for soil, water and forest stewardship, among others.

Presently, PTT has developed policies to increase green area to absorb greenhouse gas emissions by nature-based solution. This was achieved through reforestation and forest protection with the public sector and communities in the city. PTT has plans to plant another one million Rai of both land forests and mangrove forests in 2030. This includes continuous maintenance plans. In 2022, PTT joined forces with the public sector in site surveys and reforestation across regions. In tandem, PTT worked with ARV, which is a subsidiary under PTTEP, to utilize satellite imaging and drone for surveys and data analytics to choose potential area.

Collaborations within Value Chain

13.1 13.2 13.3 17.16

PTT signed MOU with Chiang Mai University and CPP Company Limited to work on Thailand Voluntary Emission Reduction Program (T-VER), an extrapolation of a certification for compressed bio-methane gas development from wastewater and palm oil industrial plant's waste. This resulted in renewable fuel NGV gas in NGV station, Prachuap Khiri Khan province, operating since 2017. It is anticipated that CPP's greenhouse gas emissions will be reduced by approximately 10,000 tons of CO_2 equivalent annually. From this collaboration, PTT receives a share of 45% carbon credits from this project.

Collaboration with Public Sector and other Networks

13.1 13.2 13.3 17.16

PTT collaborated with Ministry of Natural Resources and Environment, Office of Natural Resources and Environmental Policy and Planning (ONEP), Department of Environmental Quality Promotion (DEQP), and Thailand Greenhouse Gas Management (TGO) in organizing Thailand Climate Action Conference for the first time in Thailand. This tangibly drives greenhouse gas emissions reduction and sustainably transition Thailand to low carbon society. Furthermore, PTT also joined Climate Action Leader Forum under the Ministry of Natural Resources and Environment, in tandem with TGO, ONEP, Mahidol University and United Nations Development Programme (UNDP). The Forum invited leaders from every sectors to exchange opinions, experience and participate in preventing global warming, and facilitating towards sustainable development.

Additionally, PTT, as the lead of Thailand Carbon Neutral Network (TCNN), founded by TGO, collaborated with over 300 members from various sectors: public sector, private sector, academic institute, business association, international organizations, and various foundations, in order to drive implementation through four sub-committees. The sub-committees address climate change policy, carbon market, climate finance, as well as technology and innovation. This builds sustainable growth in a society that is climate change friendly, aiming towards Net Zero Emissions. The implementation plan is to elevate greenhouse gas emissions standards to international standards, serve to enable the network towards "Thailand's leading network to achieve Carbon Neutrality and Net Zero." Furthermore, PTT also joined Climate Action Leading Organization and Climate Neutral Now of United Nations Framework Convention on Climate Change (UNFCCC).

Greenhouse Gas Data Collection Improvement

In 2022, PTT improved greenhouse gas emissions, accounting and reporting included reduction, emission and removal by address, both direct emission (Scope 1), indirect emission (Scope 2), and other indirect emission (Scope 3), as follows;

- Expand the accounting scope to cover both domestic and international operations. The Emission Factor (EF) was calculated from each activity's operation, with reference from API, IPCC, and EPP

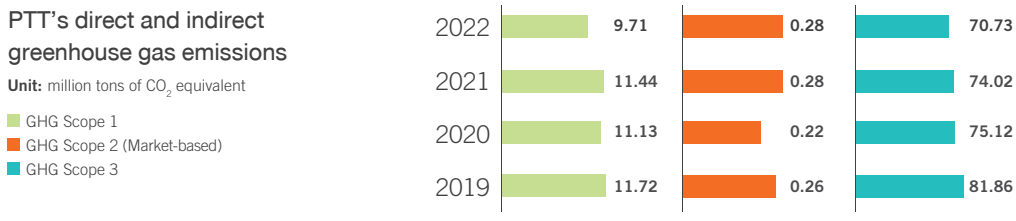
- Adjust Global Warming Potential (GWP) per AR6 IPCC of CH_4, N_2O and HFCs, PFCs to calculate for PTT Group's greenhouse gas emissions. This has been utilized in individual corporate and PTT Group's reporting since 2020, ensuring alignment with PTT Group's target, which set 2020 as a baseline year.
- Expand the reporting scope of PTT Group's indirect greenhouse gas emissions (Scope 3) from originally reporting only combustible fossil fuel products sold by PTT and OR, to now cover products also sold to consumers of other companies in the Group, such as TOP, GC, and IRPC

Key Performance

Figure 1

PTT's direct and indirect greenhouse gas emissions

Unit: million tons of CO_2 equivalent



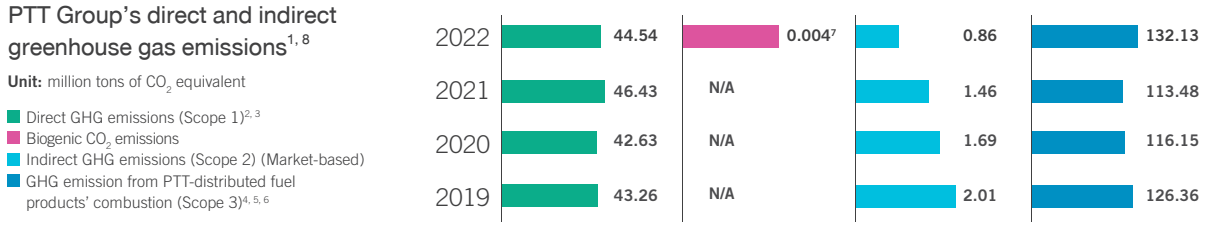
Remarks:

- *Greenhouse Gas Emissions (scope 1 and Scope 2) of PTT includes the emission from PTT operated asset only.*
- *Scope 3 emissions includes the combustion of fuel sold by PTT only.*
- *PTT's indirect energy consumption solely comes from electricity purchase and electricity from solar panel on InI, PO10 and 11, and NGV.*
- *Scope 2 emission (location-based) (market-based) includes electricity consumption from national grid and GPSC*
- *Source of the emission factors and the global warming potential (GWP) rates used, or a reference to the GWP source*
- *Standards, methodologies, assumptions, and/or calculation tools used (GHG Protocol and API Compendium)*

Figure 2

PTT Group's direct and indirect greenhouse gas emissions[1, 8]

Unit: million tons of CO_2 equivalent



Remarks:

1 *Data boundary according to operational site control covers companies which PTT holds more than 20% direct share and is a major shareholder or holds 100% indirect shares, including joint ventures with equal shareholding. GHG under these companies cover companies with more than 20% direct shares and is a major shareholder or holds 100% indirect share, including joint ventures with equal shareholding.*

2 *Direct and indirect GHG emission includes GC's operations overseas, whose emission was expected to be at 0.31 million tons of CO_2 equivalent approximately and 0.01 million tons of CO_2 equivalent, respectively (forecasted from 2020 operational performance)*

3 *2018 - 2022 Data of PTT Group was recalculated, due to the following reasons:*
- *Organization Boundary, due to operation in PTTEP's G2 area in 2022, expanded reporting coverage of ThaiOil Group's companies (TLB, TOPSPP, TPX, LABIX) and GC (BPE, EOEG, GCL, GCME, GCMP, GCO, GCP, BPA, Phenol, GCS, ME I&II, NPS S&E, TPRC, TTT), the merge between ThaiOil and ThaiOil Power in 2021 in Thailand, a GPSC's acquisition for GLOW Group's electricity and stream generation in 2019,*
- *Operational Boundary, due to the increased ORP, HGP report, office usage of EnCo, Rayong, Lab, Innovation, and Workshop of GC, IRPC inventory and container yards, LPG Cylinder Songkhla, and OR's Bangpakong lubricant distribution center,*
- *Additional activity with electricity generators starting at PTT LNG site in 2020*

4 *Indirect GHG emission (Scope 3) data covers combustible fuel-products that PTT and OR distribute (natural gas, benzene, diesel, aviation fuel, stove oil, LPG and Kerosene). PTT manages indirect GHG emission (Scope 3) by setting PTT's direct and indirect GHG emission (Scope 1 and 2) per volume of products sold. This is under the state enterprise quality assessment system.*

5 *Data boundary of indirect GHG emission (Scope 3) 2019 - 2021 covering PTT and OR*

6 *Data of indirect GHG emission of PTT Group in 2022 came from fuel combustion distributed by PTT, GC, TOP, IRPC, and OR.*

7 *Started reporting on Biogenic CO_2 emission*

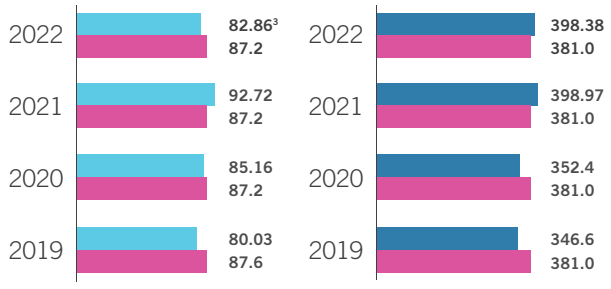
8 *Reporting the organization's GHG emission is in the midst of expanding GHG emission data collection to ensure coverage across operations. Notably, upon the improvement is completed, the data disclosed would be adjusted afterwards.*

Figure 3

GHG Emission Intensity[1,5]

Unit: Kilogram CO_2 per barrel of crude oil equivalent

- Direct and indirect GHG emission from PTT activities (Scope 1 and 2)[2]
- Direct and indirect GHG emission from PTT activities, as well as combustible fuel products PTT distributed (Scope 1, 2 and 3)[3, 4]
- Targets



Remarks:

1 *Data boundary according to operational site control covers companies which PTT holds more than 20% direct share and is a major shareholder or holds 100% indirect shares, including joint ventures with equal shareholding. GHG under these companies cover companies with more than 20% direct shares and is a major shareholder or holds 100% indirect share, including joint ventures with equal shareholding.*

2 *GHG emission calculated from PTT group and revenues from PTT, OR.*

3 *GHG emission calculated from data boundary according to the organizational boundary in 2022 annual report*

4 *Calculated PTT Group direct and indirect GHG emission with other indirect GHG emission and revenues from PTT and OR according to organization boundary between 2019 - 2021*

5 *Reporting the organization's GHG emission is in the midst of expanding GHG emission data collection to ensure coverage across operations. Notably, upon the improvement is completed, the data disclosure would be adjusted afterwards.*

Figure 4

Reduction of energy consumption due to energy management project

Unit: Gigajoule per ton production

- Intensity of energy consumption

Remarks:

1 *Data scope covering Rayong natural gas separation plant, PTTEP, GC, TOP and IRPC*

2 *Data scope covering Rayong natural gas separation plant, Kanom gas separation plant, PTTEP, GC, TOP and IRPC*

3 *Energy consumption reduction performance from 2021 is an approximation from the 1st - 3rd quarterly performance*

Additional details in PTT website.

Future Plans

Construction of the 7th Gas Separation Plant (GSP7) on approximately 112.5 Rais in Map Ta Phut Industrial estate, Rayong province, has the objective in replacing the production capacity of the 1st Gas Separation Plant (GSP1), which has been operating for over 30 years. GSP7 has designed to accommodate a maximum of 460 million cubic feet of natural gas daily. The gas' components would be separated into gas products, comprised of methane, ethane, propane, LPG and natural gasoline. Products from GSP7 would send back to Rayong Gas Separation Plant through product pipeline system network for quality control, and further distributes to gas users in diverse sectors afterwards. The construction process was commenced in 2022 and completed by 2024. Upon completion, it is expected that the production process' energy consumption, comparing with GSP1, would reduce and be forecasted to minimize greenhouse gas emissions by approximately 0.112 million tons of CO_2 equivalent per annum.

"PTT has received awards for low carbon and sustainable business, which is under TGO's Low Carbon and Sustainable Business for four consecutive years. PTT has announced the target for Net Zero Emissions in 2050, and established KPIs, as well as innovation and technology for implementation in processes for minimized greenhouse gas emissions."

Mr. Kiatchai Maitriwong
Executive Director
Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)

Positive and Negative Impacts

PTT highly prioritizes the management of occupational health and safety, encompassing Personal Safety, Process Safety, Transportation Safety, and Emergencies and crises resulting from activities and operations under PTT's own management and under contractors such as maintenance contractors, product transportation service provider, etc.

PTT is aware that the organization's activities and operations may cause negative impacts on operators, communities, and external stakeholders. In the event of accident or emergency that involves injury/ illness, death, or property damage may affect the business costs. Thus, PTT has implemented management system standards and engineering tools in compliance with laws, regulations, and international standards to identify potential hazards, assess risks and determine measures to systematically control, prevent, and mitigate risks to an acceptable level in all activities and work areas—from the design stage, production process, storage, usage, maintenance, inspection, testing, and transportation or movement of products which included hazardous chemicals. PTT adopts appropriate management methods and tools as a preventive action that reduces negative impacts and promotes positive impacts. These methods and tools consequently protects the labor rights as they have to assess a decent and safe working environment according to international standards. Besides, Communities and society also benefit by having better health and quality of life.

Material Topic Management

Indicators	Performance Targets		Performance Against Short-Term Targets
	Short-Term within 2022	Long-Term	
o Corporate KPI/ SE-AM KPI **Safety Management Effectiveness:** • Lost Time Accident (LTA) for employees and contractors • Total Recordable Injuries Rate (TRIR) (per 200,000 hours worked) for employees and contractors • Process Safety Event: PSE (Tier 1) **o Indicators in the Sustainability Management Master Plan for Social Responsibility, and Environment 2021 - 2025** • LTA • TRIR • PSE **o Indicators in QSHE targets** • LTA • TRIR • PSE • Total Recordable Occupational Illness Rate (TROIR) per 200,000 working hours for employees • Major Truck Accident Rate (per 1,000,000 kilometers)	• LTA (persons) (employees, contractors) is zero • TRIR per 200,000 hours worked (employees ≤ 0.053 and contractors ≤ 0.064) • PSE (case) Tier 1 is zero; Total case of Tier 1 and 2 ≤ 1 • TROIR per 200,000 hours worked (Employees ≤ 0.096) • Major Truck Accident Rate (case per 1,000,000 kilometers) is zero	The 2030 Targets: the following key indicators are zero: • LTA (employees and contractors) • TRIR per 200,000 hours worked (employees and contractors) • TROIR per 200,000 hours worked (employees) • PSE Tier 1 and a total case of Tier 1 and 2 • Major Truck Accident Rate (case per 1,000,000 kilometers)	Performance according to the key indicators for 2022 mostly met the targets with the exception of TRIR per 200,000 hours worked for employees = 0.063

Key Work Plans/ Projects for 2022

- Promote safety awareness and build behavior-based safety culture
- Strengthen PTT Life Saving Rules Execution
- PTT Health Surveillance and Fitness to Work Assessment
- PTT Group Bow Tie Implementation and Barrier Validation
- Uplift PTT Vehicle Safety Management
- Integration of business continuity management and emergency plan Drill

Overall Management Approach

PTT has established the **PTT Group Quality, Security, Safety, Health, and Environment (QSHE) Policy**. The policy was recently reviewed and revised in 2022 to demonstrate the company's commitment and provided a framework for managing potential QSHE risks and impacts at all stages in business operations. It has been deployed to employees and contractors throughout the PTT supply chain, as well as align with the organizational regulations and guidelines, international standards, and relevant commitment. More information is available on the PTT website.

In addition, PTT has set annual targets, the long-term goals for 2030, and established action plans according to the Sustainability Management Master Plan for Social Responsibility, and Environment 2021 - 2025. In order to execute effectively, PTT determined Safety Management Effectiveness indicator as Corporate KPI, consisting of LTA, TRIR and PSE to evaluate safety management competency of senior executive vice president and cascaded down to line manager. Progress report of QSHE performance is reported quarterly to responsible governance committees, both at management and Board of Directors levels. PTT transparently disclosed the outcomes and performance to stakeholders to create understanding and awareness. In order to review and continuously improve, the company also listens to stakeholders' needs and expectations, and provides opportunities to employees and contractors to participate in giving advice.

Progress of Work Plan/ Key Projects

Safety Management, Occupational Health, and Environment in Workplace

3.4 3.8 8.8

In addition to the Occupational health and safety management systems that all PTT's main operating areas have implemented and certified according to ISO 45001, PTT has continuously awarded the outstanding Model Operator for Occupational Health, Safety, and Work Environment (National Level) in The National Occupational Health And Safety Award. PTT believed that operational safety could be achieved effectively and tangibly when employees and contractors are aware of potential hazards and risks and strictly follow the specified operating procedures and safety measures. Thus, PTT has continually focused on building a safety culture. In 2022, key work plans/ projects were carried out as follows;

- **Promote safety awareness and build behavior-based safety culture**
  through training courses that comply with the laws for all employees and contractors, and follow the safety rules, including continuously implementing the Incident Injury Free (IIF) project at the Natural Gas Separation Plant, using an integrated process (IIF five steps) to solve problems, which are Planning, Assessment, Engagement, Skills, and sustainable project implementation. In addition, PTT has expanded implementation safety culture to the natural gas pipeline business area. According to lastest assessment, the cultural assessment score is 4.16 out of 5 levels. Thus, improvement plan was established to continuously develop the level of safety culture, and to raise awareness and good safety behavior.

- **Strengthen PTT Life Saving Rules Execution**
  by organizing training, communicating through various media, and reviewing the operational procedure, hazard identification, risk assessment, and reporting of substandard conditions and actions. The objective is to raise awareness and educate PTT Basic Life Saving Rules to employees and contractors, in order to prevent accidents. As a result, there was no Lost Time Accident (LTA) occurred in 2022. Under the safety rules, PTT allows employees and contractors to refuse to work when found performing potentially dangerous and unsafe work without being considered an offense. Furthermore, authority to halt work is granted when found to be performing potentially hazardous work.

- **Health Surveillance and Fitness to Work Assessment**
  PTT hires occupational physicians to conduct a survey of the work area, interview employees and contractors. They also review health risk assessment to include all hazards, environment checklist, occupational health checklist, sampling method, and submitting samples. Other related activities are establishing control measures to reduce health risks and organizing occupational health checks for employees annually. In addition, there are ongoing health promotion projects to encourage employees and contractors to have good health and well-being.

Process Safety

3.9 8.8

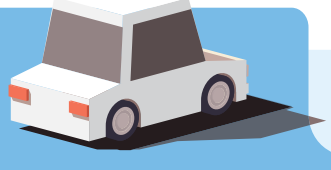
PTT and PTT Group consistently implemented Bow Tie Analysis and Barrier Validation to analyze and manage safety risks in the production process to control Major Accident Event (MAE) in operation. In 2022, the implementations have been expanded to many areas in PTT, such as Saiyok Compressor Station, Ratchaburi Compressor Station, Ethane Separation Plant, Natural gas separation plant unit 3, product storage, and utility systems, among others. In addition, Barrier Validation is implemented to one of PTT Group company which is PTT Tank Terminal Company Limited. This is an important process that examines both equipment-type control measures and person-type control measures, as well as promoting the development and elevation of safety standards in the production process in PTT and PTT Group's operating areas to prevent and reduce severe impacts from serious accidents such as fires, explosions, and hazardous chemical leaks, among others. In 2022, 80% of PTT's operational areas with high risk have implemented the Bow Tie Analysis technique and have a plan to implement it in all areas in the future.

In addition, PTT and PTT Group also consistently share knowledge and experience in process safety management and the use of Bow Tie Analysis techniques in PTT Group's Process Safety Management Taskforce and PTT Group's Bow Tie Committee.

Product Transportation Safety Management by Trucks and Ships

3.6 8.8 11.2 17.6

PTT commits to enhancing the safety of transportation of petroleum products on roads, rails, and marine transportation to achieve the Zero Accident goal by 2030. In 2022, PTT developed the standard/ manual and implemented and organized campaigns to reduce the potential negative impact on operators and contractors, and relevant communities. The detailed information is as follows;



PTT corporate vehicle

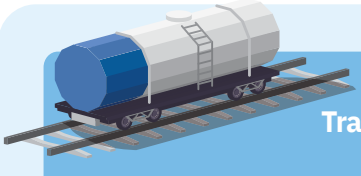
Stakeholders: executives, employees, and contractors such as drivers

- Provided performance vehicles and support technology for safe driving
- Installed Advanced Safety Vehicle (ASV), a driving behavior processing system
- Organized the 2022 Safe Driving Challenge for employees and contractors who drive PTT corporate vehicle, using the ASV system to assess and monitor driving behavior and rewarded those who have safe driving behavior according to the specified criteria with automatic renewal of PTT driving license for 335 people, representing 57% of all project participants.

Product Transportation by Truck

Stakeholders: Transportation Company

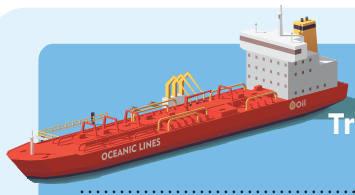
- Managed product transportation contracts including conditions of safety, occupational health, and environment, and organized supplier audit according to the PTT Group Road Safety Management Guideline (RSMG). Additional 11 transportation companies were audit in 2022.
- Managed Transportation Control Center (TCC) to monitor driving behavior and manage transportation accidents
- Organized Risk in Road Safety campaign, to promote transport safety awareness in Petroleum transportation service providers. The steps are as follows;
  - Transportation service providers need to report risk spot found along their routes of transportation by specifying the hazard that may occur in the area.
  - PTT examines information and evaluate the risk reports based on the severity and statistics of accidents occured in that area. In case of high risk, PTT will survey the area and conduct a detailed risk assessment.
  - PTT uses the results from the risk assessment to determine the mitigation and preventive measures.
  - The risk report will be communicated to other service providers via the PTT Group Transportation Safety Management Taskforce
  - Transportation service providers and drivers are awarded based on PTT criteria. In 2022, there were 65 people participated in the project, an increase of 30% from 2021. Additionallly, 95 risk spots were reported, which were kept in the database and reported in the PTT Group Transportation Safety Management Taskforce meeting.



Product Transportation via Rail

Stakeholders: State Railway of Thailand

- Co-developed the manual in goods Transport Safety Management with the State Railway of Thailand and reviewed the standard to be in line with the Regulation Concerning the International Carriage of Dangerous Goods by Rail (RID)



Product Transportation via Ship

Stakeholders: Shipping Company

- Supported and promoted the implementation of Marine Terminal Information System (MTIS), and organized sharing sessions on safety excellence in PTT Group Transportation Safety Management Task Force regularly.

Safe Driving for the Community

Stakeholders: People in Rayong province

In 2022, PTT continuously organized the “Good Drive Good Life” project in Rayong province. The activities are divided into two parts as follows;

- Provided training on safe motorcycle riding techniques and test for obtaining a driver’s license for students and public. There were 437 participants in the program. PTT also developed an application called “Smart Rider”, these application accumulates safe driving distances and giving rewards to those who drive safely according to the specified criteria. The activity winners commented that the project made them aware of their own motorcycle driving behavior and hence able to change to safer driving behaviors.
- Expanded the Risk in Road Safety activity by taking in information and analyzed data of the accident blackspot in Rayong province from the Office of Disaster Prevention and Mitigation (Rayong province), and accident data for the past three years from affiliates involved in road safety, both in public and private sectors. It appeared there were five accident blackspots. Thus, risk mitigation measures were developed to set up a solution and prevent further accidents.

Emergency, Crisis and Business Continuity Management

3.6 3.9 8.8 17.6

PTT revised PTT's Emergency and Crisis Management Plan in line with the 2021 National Disaster Prevention and Mitigation Plan to integrate, cooperate and connect various information with relevant government agencies accordingly and efficiently. In 2022, PTT participated in emergency and crisis drills at the provincial level. The objective was for the executives and all departments to understand the role, be able to systematically integrate emergency and crisis management processes, and become efficient in managing the business to continuously operate. The activity was organized two drills, the details are as follows;

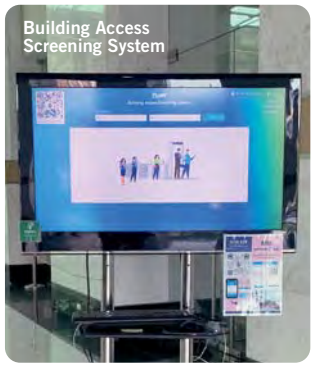
- The first drill was in May 2022 in the area of Map Ta Phut Industrial Estate, Map Ta Phut district, Rayong province. The case was a backhoe hit a GC's 16-inch Ethane gas pipeline, 16-inch fuel gas pipe and PTT propane pipe, resulting in gas leaked and fire. In the training, the Chief Operating Officer, Upstream Petroleum and Gas Business Group, was the director, and the Chief Operating Officer, Downstream Petroleum Business Group was the deputy director according to the PTT Group Emergency Management Center (GEMC). During the training, the PTT Group Emergency Management Center (GEMC) had communicated to Emergency Management Center Business Area (EMC BA) and the company's GC's emergency management center via the VDO Conference.

- The second drill was in August 2022, in Wang Krachae subdistrict, Sai Yok district, Kanchanaburi province. The case was a road construction worker drilled into a 42-inch natural gas pipeline, resulting in gas leaked and caught fire. Therefore, the PTT Emergency Management Center was activated and coordinated with the Emergency Management Center of the natural gas pipeline system via a VDO Conference.

In addition, PTT Group Business Continuity Management System Standard has been reviewed, improved, and developed. The company also practiced business continuity management plans in the case of the Erawan Central Processing Platform (ERCPP) and Erawan Riser Platform (ERP) damaged by the typhoon, resulting in the inability to deliver natural gas to natural gas separation plant. The Chief Executive Officer and President was the chairman, and other executives, according to the Critical Management Center (CMC) structure, also participated in the exercise. The exercise coordinated with the business group's emergency management center, including PTTEP and GC, via VDO Conference. In 2022, PTT was certified for business continuity management according to the ISO22301 by Management System Certification Institute (Thailand).

Occupational Health and Safety Management in the Situation of the COVID-19 Pandemic

3.8 8.8



PTT Surveillance Center for Emerging Diseases, COVID-19 (Palungjai Center) was managed for the health and safety of employees and contractors. The center sets strict disease prevention and control measures and consistently communicates news to various channels as well as giving advices and help with health-related problems via Call Center, LINE Official, and official email. The company also provided COVID-19 vaccination to employees, contractors, and their families. Besides, the company closely monitored trends of the pandemic situation, the number of infected people and risk groups, and continuously announced measures and guidelines from relevant government agencies. The data is used to define appropriate measures and guidelines to prevent and reduce the risk of infection in PTT's workplace that correspond to the situation of the pandemic. Personnel were required to follow basic measures such as always wearing a mask, always wash or cleaning hands, and maintaining social distancing etc. After the pandemic situation has transited, PTT required employees and operators to return to work as usual and announced the termination of operations of the Palungjai Center on December 31, 2022. During October 31 - December 31, 2022, only 2% of employee were infected at workplace, which reflected the effectiveness of the Palungjai Center quickly responded to the needs of employees and supported PTT employees and operators and their families.

Key Performance

PTT monitored operations according to targets, plans, and indicators and reported to the executives at the operational level, business function, and business unit to review the effectiveness and efficiency according to the specified agenda. In 2022, there were key performances according to safety, occupational health, and environment in the workplace as follows;

Occupational Health and Safety Performance against PTT's targets

Indicators		2019	2020	2021	2022
Lost Time Accident (LTA) (persons)					
Target	Employees	0	0	0	0
	Contractors	0	0	0	0
Performance	Employees	0	1	0	0
	Contractors	2	2	0	0
Total Recordable Injury Rate (TRIR) (per 200,000 hours worked)					
Target	Employees	≤ 0.080	≤ 0.066	≤ 0.066	≤ 0.053
	Contractors	≤ 0.080	≤ 0.080	≤ 0.080	≤ 0.064
Performance	Employees	0.061 or counted as 0.305 per 1 million hours worked	0.089 or counted as 0.445 per 1 million hours worked	0 or counted as 0 per 1 million hours worked	0.063 or counted as 0.315 per 1 million hours worked
	Contractors	0.038 or counted as 0.190 per 1 million hours worked	0.109 or counted as 0.545 per 1 million hours worked	0.038 or counted as 0.210 per 1 million hours worked	0.038 or counted as 0.190 per 1 million hours worked
Total Recordable Occupational Illness Rate (TROIR) (case per 200,000 hours worked)					
Target	Employees	≤ 0.12	≤ 0.12	≤ 0.108	≤ 0.096
Performance	Employees	0 or counted as 0 per 1 million hours worked	0 or counted as 0 per 1 million hours worked	0 or counted as 0 per 1 million hours worked	0 or counted as 0 per 1 million hours worked
Process Safety Incidents Tier 1* (Case)					
Target		0	0	0	0
Performance		0	2	1	0
Process Safety Incidents Tier 2* (Case)					
Target		≤ 6	≤ 1	≤ 1	N/A**
Performance		0	0	0	1
Major Truck Accident Rate* (per 1,000,000 kilometers)					
Target		0.040	0.027	0.014	0
Performance		0.047	0	0	0

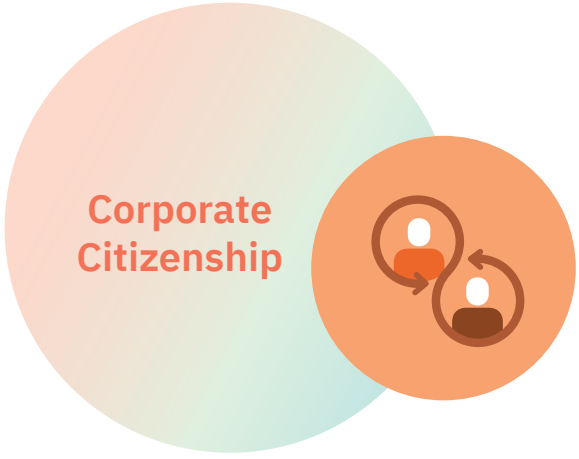
Remarks:

** PTT Group's process Safety Incidents Tier 1 and Tier 2 report is in accordance with the American Petroleum Institute standards (API) API RP 754. And large-scale (Catastrophic) and Major level of production process safety incidents that occurred with the natural gas pipeline system outside the operational area.*

*** In 2021, PTT Group changed the indicator from Tier 2 to the total number of Tier 1 and Tier 2.*

Future Plans

PTT is committed to safety management and set a goal of zero accident workplace to gain trustworthy for all stakeholder groups, by focusing on promotion of employee and contractor engagement. In 2023, there are key action plans such as the expansion plan to create safety culture in the natural gas pipeline system, the PSM implementation for PTT's operations, the development of PTT Health Reporting System, and a project to develop an accident forecasting system for NGV transport vehicles, etc. Additional information is available in PTT website.



Positive and Negative Impacts

PTT has a mission to maintain energy security as the national energy company with Good Corporate Citizenship. This is accomplished through responsible business practices by collaborating with companies in the PTT Group, alliance networks, and community networks across the country in both public and private sectors to reinforce a positive impact on society. The examples of project are developing labor skills to create careers and supporting marketing for the local enterprises, conservation and restoration of natural resources along with circulating knowledge and generating income for the community, promoting education for youth by developing teacher skills and leveraging the teaching and learning system of educational institutions, supporting the underprivileged for improving the quality of life. Besides, PTT also prevents any negative impacts that may affect the communities surrounding PTT operations, i.e. disregard to project after accomplished, or not cover all PTT's operations area, which may affect community relations, etc. PTT has taken all aspects into consideration regarding the needs, expectations, and concerns of all stakeholder groups. PTT has driven to achieve these goals to create shared values, as well as establish good relationships and maintain a balance of benefits between organization and communities. These will lead to the path towards sustainability.

Material Topic Management

Indicators	Performance Targets		Performance Against Short-Term Targets
	Short-Term within 2022	Long-Term	
o Corporate KPI/ SE-AM KPI			
• The number of graduates from KVIS and VISTEC	• KVIS: 71 graduates • VISTEC: 20 graduates		• KVIS: 71 graduates • VISTEC: 20 graduates
• The number of research outputs from VISTEC	• Increase in research outputs each academic year		• 338 research projects
• The number of employment from the Restart Thailand project	• 23,000 positions		• 23,354 positions
o Functional KPI			
• Number of areas that are developed from the "Giving Smile for Communities Project"	• 45 areas nationwide		• 45 areas nationwide (from 45 farmer groups)
• Net Income of every household/ group that participated in the "Giving Smile for Communities Project" (that can now generate income)	• Increase (from PTT's operations) at least 10% of the baseline		• Increase (from PTT's operations) 10% of the baseline (33 areas from 45 areas)
• Net income (deducted from the purchases from PTT) from supporting community distribution channels through the "Giving Smile for Communities Project"	• More than THB 25.5 million		• THB 28.4 million
• The number of underprivileged people who benefit from improved quality of life through the operations of Sarn Palung Social Enterprise Company Limited.	• 348 persons	• 800 persons within 2027	• 348 persons
o Indicators according to the PTT's Sustainability Management Master Plan to demonstrate Social, and Environment Responsibility for 2021 - 2025			
• Social investment	• At least 1 - 3% of net operating profit		• 1.34% of net operating profit
• The proportion of the public donation budget to the total social investment	• Not exceeding 30% of the total budget		• 29%* of the total budget
• Social Impact Assessment (SIA) or Social Return on Investment (SROI)	• SROI is not less than 1.3 times of WACC in all projects under PTT SE Sandbox (Not included pilot projects under PTT SE Sandbox operation)		• All six projects has SROI more than 1.3 times of WACC

* *In case of included budget on support and mitigate impacts from COVID-19, the budget proportion is at 1.66% and 42.60% respectively.*

Key Work Plans/ Projects for 2022

- Participation in supporting the development of long-term educational projects in science and technology through the Kamnoetvidya Science Academy School (KVIS) and Vidyasirimedhi Institute of Science and Technology (VISTEC)
- "Restart Thailand"
- "PTT Group Innovation for Society Project"
- Participation in supporting the development of the quality of life of the underprivileged and creating economic opportunities for farmers through the operations of Sarn Palung Social Enterprise Company Limited.

Overall Management Approach

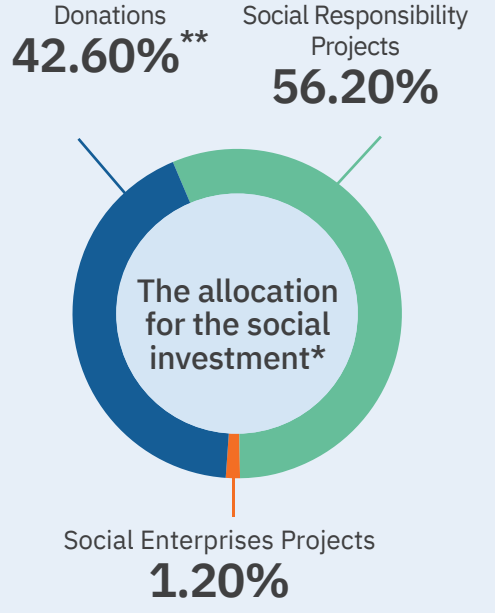
PTT aims to create shared values for society, communities, and the country by utilizing the employees' capability, technology, and cooperating with various networks according to the approach to social operations in two dimensions. These include **the development of human resources, communities, and society; and the dimension of the promotion of conservation and restoration of natural resources and the environment**, along with creating participation and managing the impact of business operations on communities surrounding the establishment. The objective is to create a holistic result in social wellness. The management details are as follows;

- Set up a specific operating structure, including the workstream of Executive Vice President, Corporate Reputation, and Social Responsibility, as well as supervising Sarn Palung Social Enterprise Company Limited, and Power for Sustainable Future Foundation to work in social enterprises in each dimensions, along with building a good reputation and corporate image.
- Social projects are implemented through various processes, including support in the form of donations, Corporate Social Responsibility (CSR) to uplift the level of creating social shared value in the form of Creating Shared Value (CSV) and operated as a Social Enterprise (SE) with the aim of maximizing the positive impacts to the society.
- Set long-term goals for 2019 - 2023, with key indicators such as a donation ratio which not exceeding 30% and social responsibility in the form of projects with social enterprises is not less than 70%.

Progress of Work Plan/ Key Projects

In 2022, PTT allocated a total expense of 1,086.40 million Baht for social investment, accounting to 1.66% of net operating profit (according to the budget allocation policy for the social investment of at least 1 - 3% of net profit), divided into support and assistance in the form of donations 42.60% (including COVID-19 support and mitigation expenses. If excluded, spending contributes 29%), social responsibility projects 56.20%, and social enterprises projects 1.20%. In 2022, the performance from social investments encompassing operations in all dimensions as specified and in accordance with the specified targets. In addition, when the situation of the COVID-19 pandemic began to subside, most of the operations aligned with the annual operating plans that were initially planned. Nonetheless, the PTT Group continued to carry on their operations to carry on social responsibility, continuously. Since 2021, PTT has implemented the **"Giving Breath Project"** to enhance the capability of the public health system to solve the situation, which affected the economy at both the macro level and the micro level. The **"Giving Chance for the Youth Project"** has established through the PTT Virtual Run activity, creating opportunities for over 103,000 youths to return to the education system, along with continuing to partake in restoring the economy by increasing the employment rate through the "Restart Thailand". The skills development to created careers for farmers and communities through the "Giving Smile for Communities Project". These project contributed to make PTT as organization with a Corporate Reputation Score remain the same as 2021 at 86 points, according to the survey of stakeholders on PTT's business operations in 2022.

total spending of
THB **1,086.40** million for social investment* = **1.66%** of net operating profit



* *The spending was included COVID-19 relief budget and financial aid*

** *If not included COVID-19 relief budget and financial aid, it would amount to 29%*

Progress in the dimension of human resource, community, and social development

Participation in supporting the development of long-term educational capacity in science and technology through Kamnoetvidya Science Academy (KVIS) and Vidyasirimedhi Institute of Science and Technology (VISTEC)

4.1 4.3 4.4 9.5

Implementation

PTT Group sponsored the budget for developing long-term educational capacity in science and technology through Kamnoetvidya Science Academy (KVIS) and Vidyasirimedhi Institute of Science and Technology (VISTEC) since the establishment in 2015 and continuing according to the memorandum of the agreement until 2031 to build a foundation in progressing Thailand forwards through developing research and building world-class science and technology personnel.

Benefits to Stakeholders

- The number of students graduating high school from the Kamnoetvidya Science Academy (KVIS) in 2022 is 71 people (a total of five cohorts of 353 people). The proportion of the 5th cohort students who graduated in 2022 of students who were studying abroad are 44%. Students who are studying in the country are 56% and those studying in science, technology, engineering and mathematics are 76%.
- The number of Master and Doctoral degrees from Vidyasirimedhi Institute of Science and Technology (VISTEC) in 2022, two people and 18 people respectively (accumulated a total of 80 persons).

Benefits to PTT

- A total of research projects from Vidyasirimedhi Institute of Science and Technology (VISTEC): 338 research projects,
- The number of graduates from Vidyasirimedhi Institute of Science and Technology (VISTEC) who have worked in companies in the PTT Group since 2017 is a total of 33 graduates.

"Restart Thailand Project" (ongoing for the 2nd year)

8.5 8.6

Implementation

PTT Group take part in revitalizing the economy and helps communities through the employment of personnel; these include new graduates. The initiative continues for the second consecutive year., An increase from the previous year were a total of 23,354 positions, an accumulated total of 48,843 positions. The project focuses on job creation, income generation, and vocational skills for the new generation in all regions, along with strengthening local communities and the Thai economy.

Benefits to Stakeholders

- Hiring 20,700 workers through the PTT Group network for the objectives of business expansion and various construction projects.
- Hiring 2,172 new graduates with vocational certificates, high vocational certificates, and bachelor's degrees who pass the selection criteria and are domiciled in the area of work in a 12-month employment contract, providing income and opportunities to practice vocational skills.
- Recruiting additional employees for 482 vacancies to drive business operations forward according to the targets.
- Employment value for employees and new graduates is a total of THB 4,314

Benefits to PTT

- Creating a good reputation of participation in community development towards sustainability for PTT through the potential of new graduates residing in different areas. PTT Group has organized training to enhance skills and knowledge through social development projects for local communities in all three areas, consisting of the development of quality education for youth, local community capacity development, and environmental development to conserve marine resources.
- Reduction the risk of labor shortages through the hiring of new employees and human capability development in each area such as operations in social enterprises.

PTT Group Innovation for Society Project

2.3 2.4 7.1 7.2 8.3 8.5 8.6 8.9 10.1 12.b

Implementation

PTT Group participated in solving community economic problems by increasing revenues and reducing expenses, as well as strengthening the local economy through the application of networks, knowledge, innovation, technology, public relations channels, and all available expertise. There are two main areas of operation, namely Smart Farming and Smart Marketing.

Benefits to Stakeholders

- 45 areas across the country (from 45 farmer groups), including 20 provinces were supported to become Smart Farmers.
- 31 SKU of community products, from 18 community groups, had been developed and elevated—in the form of designs, packaging, and quality, as well as promoting public relations channels and distribution channels.
- Six community-based tourist attractions (CBT) in areas nationwide are developing to raise the standard and be accepted internationally, which include:
  - Mae Tha subdistrict, Mae On district, Chiang Mai province
  - Phiman subdistrict, Na Kae district, Nakhon Phanom province
  - Ban Luang subdistrict, Chom Thong district, Chiang Mai province
  - Na Haeo subdistrict, Na Haeo district, Loei province
  - Lamsin subdistrict, Srinakarin district, Phatthalung province
  - Koh Mak subdistrict, Pak Phayun district, Phatthalung province
- Increase income and reduce expense more than 10% in 33 areas in 2022, and will expand to all 45 areas in 2023.

Benefits to PTT

- Created good corporate image for the organization by being a part of restoring the economy and supporting the communities to get through the crisis situations.
- Enhanced good relations with communities in more than 45 areas nationwide.
- Granted license to operate in PTT's operating areas.

"Giving Smile for Communities Project"

Implementation

2.3 8.3

The project helped communities and Thai farmers across the country in distributing goods and services by encouraging communities to be self-resilience in the long term by combining knowledge and capacity in innovation, science, and technology, as well as public relations strategies that focus on promoting public relations channels. The project also created Community Marketing using online public relations channels to build awareness and promote marketing opportunities for PTT network community products. The community can distribute products via online channel and access the consumer market. PTT was a consultant, and helped enhance business knowledge, marketing communication, and energy management at the community level in order to raise the level of products and create business opportunities for the community in the future.

Benefits to Stakeholders

- In 2022, THB 28,375,482 of revenue received by the community from distribution channels supported by PTT.

Benefits to PTT

- Created a good image for PTT by being a part of helping society and communities for economic sustainability.
- Enhanced good relationship with 412 network communities across the country in the development of more than 1,243 SKU community products.
- Granted license to operate in PTT's operating areas.

Natural Disaster Relief

1.5

Implementation

PTT Group assist affected people in various disaster situations both in the area around the business facilities, and other areas across the country. The supports include budget, survival bags, fleet cards, as well as specialized equipment necessary to mitigate the impact of that situation. PTT also supports the PTT Group's emergency rescue and response team (PTT Group SEALs), who trained rescue skills and experiences. Thus, the victims can get through the crisis and return to normal life as soon as possible. In 2022, the impacts of Storm Noru caused flooding in many areas. PTT Group supported the PTT Group SEALs team along with providing approximately 15,000 survival bags nationwide.

Benefits to Stakeholders

- 15,000 natural disaster victims received reliefs from PTT

Benefits to PTT

- Created a good image for the organization by improving the community's well-being.
- Encouraged executives and employees in packing survival bags through the facilitation from PTT Group's Phalang Thai Jai Arsa Club (PTT Volunteers club). Besides, PTT Group SEALs, who specialized training, also conducted fieldwork.
- Demonstrated the commitment of PTT and PTT Group to assist the communities and contribute to societies.

Participated in improving the quality of life of the underprivileged and creating economic opportunities for farmers through the operations of Sarn Palung Social Enterprise Company Limited

1.1 2.3 8.5 10.1

PTT Group, consists of PTT, PTTEP, GC, TOP, IRPC, GPSC, and OR established Sarn Palung Social Enterprise Company Limited (SPSE) in 2017. SPSE manages and operates the business of selling products or providing services for society. It manages the business of selling products or providing social services as a centralized enterprise that will be able to help and support society, community, and environment continuously and sustainably. The performance in 2022 are as follows;

1. Café Amazon for Chance

1.1 4.4 4.5 8.5

The objective is to create job opportunities for vulnerable people, such as those with hearing difficulties and individuals with learning difficulties, to have a regular job with a regular income. This includes training the individuals in the coffee business. Currently, there are eight branches of Café Amazon for Chance.

Benefits to Stakeholders

- Created full-time jobs of 23 positions to the underprivileged groups, with earning more than 50% from what they received. In 2022, earning on the average increase of THB 7,000 per month per person. The total value is THB 1,848,000.
- Upskilled for underprivileged groups in a barista training course at Amazon Inspiring Campus (AICA) training center, and internship at Café Amazon for Chance.
- Created understanding for society to live with the underprivileged groups through communication in the Café Amazon for Chance.
- Social Return on Investment (SROI) is 7% or 0.57 times

Benefits to PTT

- Created a good corporate image for PTT by promoting the well-being of the underprivileged in communities.
- Received the Outstanding Workplace Award from the Ministry of Social Development and Human Security (MSDHS) for employing the elderly.

2. Community Coffee Sourcing

1.1 2.3 4.5 6.3 8.5

The project increases coffee beans selling channels to farmers at a fair price, and promote coffee cultivation and production under a sustainable natural resource conservation system. The project developed and promoted professional skills in growing and producing coffee with quality standards as well as promoting the strong unity of the community. Currently, there are farmers from 14 communities in Huai Chomphu subdistrict, Mueang district, Chiang Rai province, and in Mae Salong Nai subdistrict, Mae Fah Luang district, Chiang Rai province. A total of 255 participants. The total coffee plantation area is approximately 2,850 Rais. In 2022, PTT purchased 327 tons of coffee beans from farmers to processing into coffee products in the amount of 247 tons and will buy coffee beans from community enterprises in the amount of 553 tons and distribute them to Café Amazon in the amount of 800 tons.

Benefits to Stakeholders

- 255 household of farmers participated in the project. Because of the project, their income increased by 10,000 - 20,000 Baht per year per household or an average increase of 10%, equivalent to THB 2,783,028.
- Provided training to farmers on quality Arabica coffee processing to ten groups of farmers in Chiang Rai province.
- Planted trees to the project area since 2018 until the present, a total of 2,000 trees.
- Social Return on Investment (SROI) is 22.4% or 3.17 times

Benefits to PTT

- Created a good corporate image for the organization by helping society and communities in terms of economic contribution.
- Able to efficiently deliver more than 800 tons of ingredients to Café Amazon, which increased the company's operational efficiency in terms of supply.

3. PTT Group Lounge Project

1.1 8.5

The shop provides lounges and shower rooms at Charoensuk Mongkolchit Cycling Stadium, Suvarnabhumi Cycling Lane. The objective of this project is to support the employment of the elderly who still have to earn money to support themselves, and build human dignity and self reliance.

Benefits to Stakeholders

- Created full-time jobs for a total of six elderly people and have an average income increase of THB 13,000 per month per person, equivalent to THB 780,000.
- Built self-esteem of being self-reliant
- Social Return on Investment (SROI) is 10% or 1.39 times

Benefits to PTT

- Created a good corporate image for PTT by promoting the well-being of the underprivileged in communities.

4.PTT Day Care

1.1 8.5

The project creates a career and stable income for the housewives' group of the State Railway of Thailand, and being a prototype for other government and private sectors. PTT Day Care was opened on September 1, 2019 until the end of December 2022, there were 27 children in the daycare service.

Benefits to Stakeholders

- Created regular jobs for underprivileged women with lack of education in the total of three people. The average increase of income was THB 11,000 per month per person, and one elderly nurse earns THB 30,000 per month, a total of THB 756,000
- Selected by National Council for Child and Youth Development under the Royal Patronage of HRH Princess Mahachakri Sirindhorn (NCYD) as a model of childcare center in the name "Miracle of the First 1000 Days of Life Project".
- Social Return on Investment (SROI) is 10% or 1.39 times

Benefits to PTT

- Created a good corporate image for PTT by promoting the well-being of the underprivileged in communities.

5. PTT SE Sandbox

5.1 Thanyaporn Home for Girls

1.1 8.5

The project promotes and develops skills for the underprivileged by hiring them to work in restaurants. The project purchased products from the Ministry of Social Development and Human Security (MSDHS) and sold in PTT's office. The project also purchased products from agricultural demonstration plots, The products were used in cooking in the restaurant, and sold to retail customers. The past operations generated income from product consignment, approximately THB 5,000 per month.

Benefits to Stakeholders

- Girls from Thanyaporn Home for Girls are employed by PTT in a total of two positions
- Social Return on Investment (SROI) is 63% or 19.4 times

Benefits to PTT

- Created a good corporate image by promoting the well-being of the underprivileged person in communities.

5.2 "Giving Smile for Communities Project"

2.3 8.3 8.9 10.1

To increase distribution channels for local products through "Giving Smile for Communities Project" in PTT head office with total budget of THB 400,000.

Benefits to Stakeholders

- Sell more than 60 products from 55 community enterprises
- Sale revenue more than THB 180,000 with monthly average of 60,000 from July to September 2022.
- Social Return on Investment (SROI) is evaluated to be 10% or 0.1 times

Benefits to PTT

- Created a good corporate image for PTT by promoting the well-being of the underprivileged in communities.

Progress in the dimension of conservation and restoration of natural resources and the environment

Participation in the increasing and maintaining green areas in the Khung Bang Kachao

11.6 11.7 11.a 15.2

Implementation

PTT, together with the Chaipattana Foundation, network partners in both the private sector and the public sector, and educational institutions continued to restore the green area of Khung Bang Kachao. In this regard, OUR Khung BangKachao project by the Chaipattana Foundation and the Royal Forest Department signed a memorandum of understanding for collaboration in the development and restoration of royal green areas under the supervision of the Royal Forest Department Maha Nakhon Central Park Project, Phra Pradaeng district, Samut Prakan province. Besides, the Royal Forest Department and PTT also signed a memorandum of cooperation on green area restoration and learning management projects, Chaloem Phrakiat Park, His Majesty the King's 80th Birthday Anniversary, Song Khanong subdistrict, Phra Pradaeng district, Samut Prakan province, to develop learning a center. In 2022, PTT carried out with cooperation in developing and managing the learning projects of the Chaloem Phrakiat Park uninterruptedly. As a supporter of the green area operation of the OUR Khung BangKachao project, it has restored 1,276 Rais of Ratchaphatsadu land (royal property) green area and personal land for 530 Rais.

Benefits to Stakeholders

- 1,806 Rais of green area that has been rehabilitated from the beginning of the project until 2022. benefiting surrounding communities, a total of 273 households.

Benefits to PTT

- In 2022, 251.81 tons of CO_2 equivalent per annum that can be stored.
- Built a good relationship to promote conservation and restoration of the environment with the government, private and public sectors.

Three PTT Nature Learning Centers

13.3 14.2 15.2

Implementation

Three PTT Nature Learning Centers are operated through PTT Reforestation and Ecosystem Institute, which was established to build on the Reforestation Campaign in Commemoration of the Royal Golden Jubilee Project's original mission of one million Rais of permanent forest planting since 1994 by conserving, restoring forests, and sharing knowledge and experience of reforestation to the public as well as to raise awareness of the conservation of natural resources and the environment through the PTT Natural Learning Centers, which are:

1. PTT Metro Forest, Bangkok
2. Sirinath Rajini Mangrove Ecosystem Learning Center, Prachuap Khiri Khan province
3. Wang Chan Forest Learning Center, Rayong province

Benefits to Stakeholders

- In 2022, there were 54,442 visitors to all three centers, which generated an income of THB 453,759 per annum for surrounding communities.

Benefits to PTT

- In 2022, 66,291 tons of CO_2 equivalent per annum that can be stored.
- Promote good relations in promoting environmental conservation and restoration.

Partake in managing the award ceremony for Green Globe Institute

14.2 15.2

Implementation

PTT established the "Green Global Institute" in 1999 after participating in honor of His Majesty the late King Bhumibol Adulyadej of one million Rai of permanent forest planting. From experience, PTT found that to maintain sustainable forestry, people's mindsets must also be changed. Hence, the Green Globe Award was organized.The objective is to select and award people, communities, and youth with achievements in the conservation and preservation of forests and the environment. Awards are to praise, honor, and give encouragement to those groups.

The project was later elevated to the "Green Globe Institute" to continue awards those who work in the environmental and natural resources fields and continue with elevated missions—such as developing a research network and managing knowledge from the Green Globe Award as an example of conservation and successful management of natural resources and the environment. The knowledge gained is useful for other communities to replicate, and thus they can effectively adapt to change (the 21st Green Globe Awards ceremony has been postponed to 2023).

Benefits to Stakeholders

- Encouraged the network of environmental and natural resources.
- Continued the work and knowledge of conservation, and restoration of natural resources from a community to another community, and linking the operating network at the national level.

Benefits to PTT

- Created a good corporate image for PTT by promoting environmental conservation networks nationwide.
- Supported the goal of Net Zero Emissions for PTT Group.

"Giving Breath Project" and "Giving Chance for the Youth Project"

3.8 3.b 4.1 4.2

Implementation

PTT Group has continuously supported people affected by the COVID-19 pandemic situation through the "Giving Chance for the Youth Project" since 2021—by sponsoring the budget, medical equipments, establishing field hospitals, and a proactive deployment of mobile vaccination units in vulnerable and high-risk areas (along with managing the Restart Thailand project to contribute to the economy by creating more jobs and income for individuals). Beside, the company also maximized the capacity of assistance by cooperation with the Ministry of Public Health. PTT also established a disease screening unit and comprehensive field hospitals (End-to-End). The PTT Group further established the End-To-End Mobile @1745 service to enhance the capacity of the public health system to cope with the situations which affected the economy at the macro level to the micro level. Therefore, many students are also at risk of dropping out of the education system because of the pandemic. Hence, in response, PTT established the "Giving Chance for the Youth Project". The project was raised out by the cooperation of PTT and the Equitable Education Fund (EEF), which wants to return children to the education system and back to school in the 2022 academic year, as well as give students and youth the opportunity during their vulnerable years. The goal is to provide scholarships valued at THB 150 million through the Equitable Education Fund to more than 60,000 youths from low-income households who are affected by

the economic downturn across the country through the PTT Virtual Run activity. The project converts walking or running activities into scholarships with the goal of 600,000 kilometers. Every ten km distance is converted as THB 2,500 scholarship, which can return one child back to school in the past May. The success of the first 600,000 kilometers was completed in a short time, inspiring PTT to continue the activities with a new and greater goal—which was converted 20 million Godji (PTT's mascot) steps into a budget of THB 20 million to build a fund for establishing a center to help children and youth during their crisis period of falling out of the education system. The project helps children who are at risk of breaking out of the system.

Benefits to Stakeholders

- People affected by COVID-19 pandemic has more access to the public health system and receive economic assistance and support in education.

Benefits to PTT

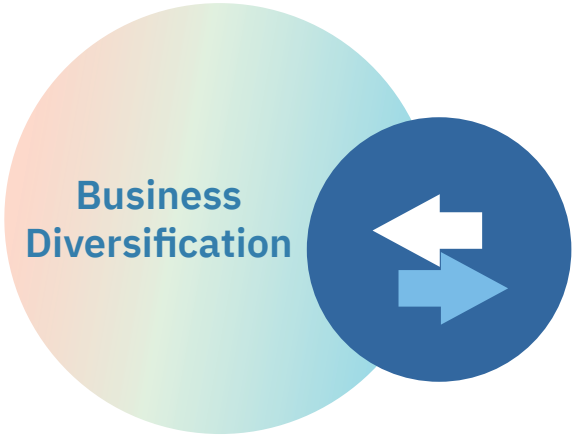
- Created a good corporate image for PTT by generating community engagement with a total of 93,061 participants.
- Total accumulated distance of 7,425,061 kilometers which PTT funded THB 171 million.
- Reflected PTT's determination to contribute to society in all dimensions and standing side by side with the nation throughout the crisis as a good corporate citizenship, in addition to its role as a national energy company whose main mission is to create energy security for Thai people.

Future Plans

According to PTT's announcement the target of Carbon Neutrality and Net Zero Emissions, which is faster than the target of Thailand. PTT has set strategies, indicators, and action plans to support the targets, along with joining forces with PTT Group's business strengths in accordance with the 3P Decarbonization Pathways, namely the Pursuit of Lower Emissions, Portfolio Transformation, and Partnership with Nature and Society. The last P refers to increasing the amount of greenhouse gas emissions absorbed from the atmosphere with nature-based solution. PTT cooperates with various agencies. This enables the absorption of at least 20% of PTT's total greenhouse gas emissions.

Since 1994, PTT has volunteered to restore more than 1.1 million Rais of degraded forests across the country. Currently, these forest areas are more than 80% restored and capable of absorbing up to 2.14 million tons of CO_2 equivalent per annum. Or equivalent to offsetting carbon dioxide emissions from personal cars, an average of 460,000 cars per annum and releasing more than 1.55 million tons of oxygen per annum. It also creates economic benefits for the community up to THB 280 million per annum. Implementation of the forest sector is another significant mechanism to achieve the Net Zero Emissions goal. PTT Group aims to restore additional forests of a total of two million Rais by 2030, divided into operations by PTT one million Rai and cooperation with companies in the PTT group for another one million Rai. PTT and PTT Group will apply advance technology to explore growth and analyze greenhouse gas absorption data efficiently. In the future, these forest areas will have the potential to absorb more than 4.15 million tons of CO_2 equivalent per annum, and also create values for the environment and local economy and continually strengthen the good quality of life for Thai people and the global society. PTT operates under the vision of "Powering Life with Future Energy and Beyond," aiming to improve the quality of life with the power of the future.

Additional information is available in PTT website.



Positive and Negative Impacts

Since 2021, PTT has set long-term goals for 2030, and strategic directions in accordance with the new PTT vision. It reflects the effort and determination to start changing the direction of doing business from oil and natural gas to future energy business ,and new business (Beyond energy business). The enterprise plan is formulated based on the goals and strategic directions and has been implemented in 2022—which created a positive impact on Thailand's low-carbon society, reduced greenhouse gas emissions over the long term, and supported PTT's and Thailand's Carbon Neutrality and Net Zero Emissions goals, as well as reducing the impact of global warming, which is becoming more severe, affecting individuals on rights quality of life and security. PTT is aware of the challenges and negative impacts that may arise from rapid business transformation to future directions. PTT, therefore, expands its business in consideration of systematic and efficient change management, in order to prepare and develop employees to have the necessary knowledge and capability to respond to business growth and to avoid any negative impacts on PTT's performance and related stakeholders.

Material Topics Management

Indicators	Long-Term Targets in 2030	Performance against Long-Term Targets
○ **Corporate KPI/ SE-AM KPI** ○ **Functional KPI** ○ **Indicators according to the Sustainability Management Master Plan for Social and Environmental Responsibility for 2021 - 2025**	• **Business Growth:** The target for the main business; LNG business investment at least 9 million tons per annum; conventional power at least 8 GW, and renewable energy at least 12 GW. • **New Growth:** Future energy and beyond energy businesses must generate more than 30% of net income in 2030. • **Clean Growth:** Target to reduce greenhouse gas emissions by 15% compared to the baseline emissions in 2020.	• **Business Growth** 1. Supply volume of the LNG portfolio is 4.5 million tons. 2. Thermal power generation capacity is 5.2 GW 3. Renewable energy power generation capacity is 2.8 GW • **New Growth** PTT invested in the Future Energy and Beyond businesses as plan. More details are in the Progress of Work Plan/ Key Projects section. • **Clean Growth** PTT operated in accordance with the 3P Decarbonization Pathways. Find more information in Climate Action topic.

Key Work Plans/ Projects for 2022

- Increase the LNG trade volume in the portfolio from three million tons in 2021 to nine million tons in 2030 through investments in the LNG Value Chain, and build an LNG Portfolio by procuring in the form of Long-Term Contract and Spot LNG.
- Increase power generation capacity from 5.2 GW in 2021 to 8 GW in 2030, focusing on natural gas or LNG-powered power plants as fuels.
- Increase renewable energy capacity from 2.7 GW in 2021 to 12 GW in 2030 through domestic and oversea investment.
- Increase the proportion of profit from the Future Energy and Beyond to 30% in 2030 by expanding investments in EV Value Chain, Energy Storage, Life Science, Lifestyle, HVB, Logistics and Infrastructure, and AI, Robotics and Digitalization.
- Reduce PTT Group's greenhouse gas emissions by 15% from 2020 by 2030.

Overall Management Approach

The integration of climate change which is key material topics to the process of setting corporate's long-term targets for 2030 (the goals in Business Growth, New Growth, and Clean Growth) and strategic directions, demonstrates PTT's readiness to change–from the traditional business (Hydrocarbon-based) to the development and acceleration of new business model, such as Future Energy and Beyond to compensate for the growth in the hydrocarbon supply chain business. All of this has been conveyed in the business units' business plan and other supporting departments, as well as companies in the PTT Group. PTT has set performance indicators at the corporate/ functional level in order to drive concrete actions, and create the same direction throughout the corporation. PTT requires a summary of the progress of the business plan and performance according to targets and indicators—that shall be reported to the committee at the business unit level. PTT also summarizes the overall report of the corporation to the Corporate Plan and Risk Committee (CPRC) at the management level, and the PTT Board of Directors on a quarterly basis.

During 2022 - 2026, the PTT Group has prepared a five-year investment plan with a budget of approximately THB 990 billion to create energy security, maintain competitiveness, and generate business growth for PTT Group, as well as to drive forwards the country's target industries. In addition, the goal and direction of the investment portfolio have been set for 2030 by focusing on investing in high-yielding assets, and accelerating investments in the energy sector of the future energy and beyond energy businesses. PTT has put forth efforts to transform business operations to create sustainable growth in new businesses.

In this regard, in order to efficiently invest and expand the business, which is both invested by PTT and PTT Group, PTT has prepared a guideline for the investment criteria of PTT and PTT Group , and a guideline for managing investments in companies in which PTT holds shares—there is a Strategic Investment Management Committee (SIMC) at the management level to take into considerations of the guideline and screening for investments according to the specified criteria before proposing to the relevant committees according to the type and size of investment for approval. The investment progress is monitored both in the period of Execution and Operation on a quarterly basis.

Additional information about the strategic directions and goals of the corporation in section 1.1.1, page 42 - 43.

BUSINESS GROWTH

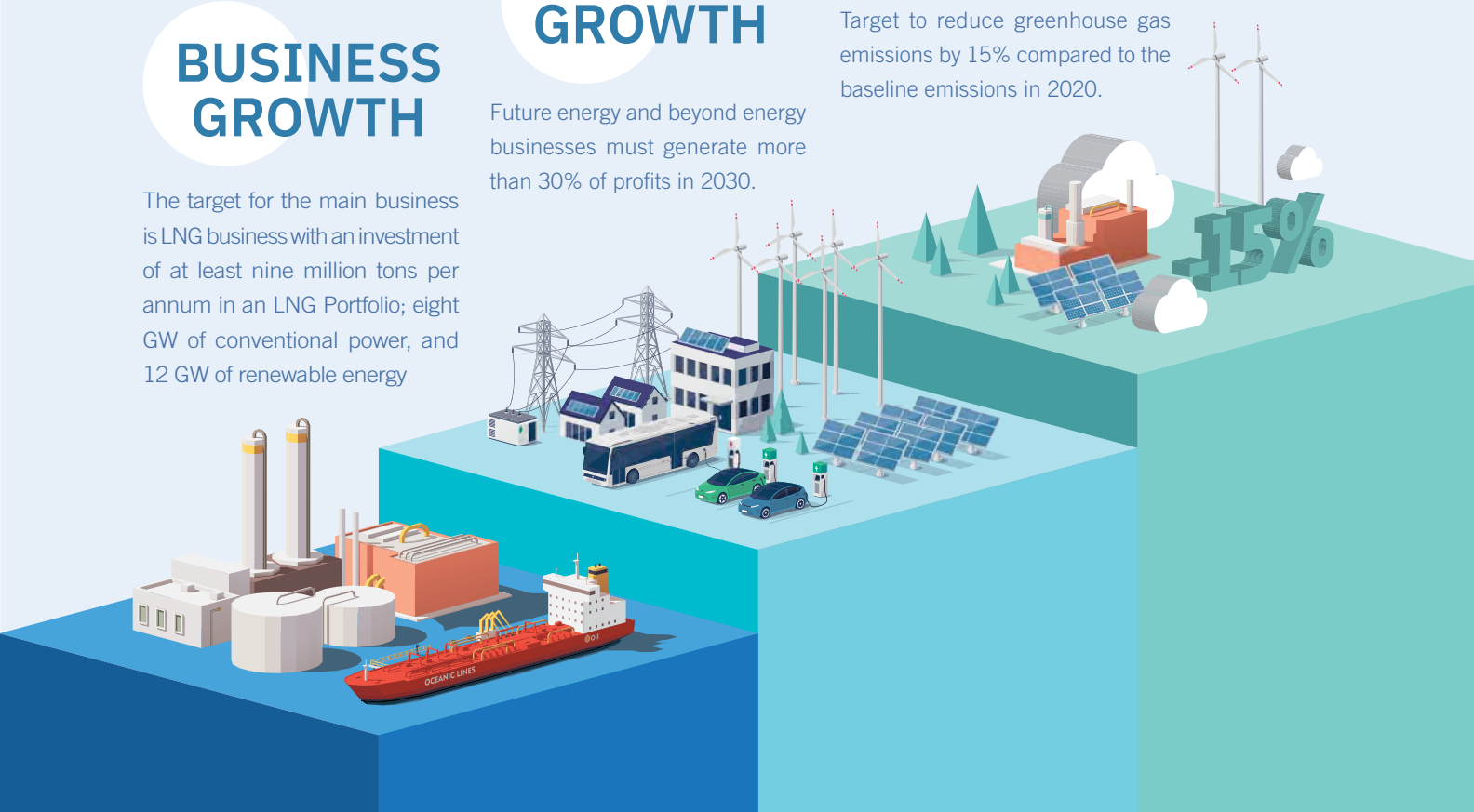
The target for the main business is LNG business with an investment of at least nine million tons per annum in an LNG Portfolio; eight GW of conventional power, and 12 GW of renewable energy

NEW GROWTH

Future energy and beyond energy businesses must generate more than 30% of profits in 2030.

CLEAN GROWTH

Target to reduce greenhouse gas emissions by 15% compared to the baseline emissions in 2020.



Progress of Work Plan/ Key Projects

The strategic change to the future energy business and other new businesses

- **Renewable Energy Business:** operated through GPSC, in 2022, the proportion of investment in renewable energy in 2030 was adjusted to 60%. The plan is to expand the production capacity of renewable energy to 12 GW by 2030 through both domestic and oversea investments, including business expansion through Avaada in India.
- **Electric Vehicle Business:** PTT established ARUN PLUS Company Limited (ARUN PLUS) (PTT's 100% owned subsidiary) and operated the company from upstream to downstream. The company encompasses the construction of an electric vehicle factory within the country, development of digital platform, electric vehicle rental business, EV Charger business, and Battery-Swapping electric motorcycle business. Besides, PTT also has a business in Energy Storage & Smart Energy Platform by established NUOVO PLUS Company Limited (NUOVO PLUS). The company develops energy storage system, optimize energy management, and reduce the cost of electricity, including developing the ReAcc platform that can support the trading of renewable energy certificates etc.
- **Life Science Business:** Innobic (Asia) was established to develop a health business to respond to the trend of aging society in Thailand. Innobic (Asia) is a company that researches and develops raw materials for the production of pharmaceuticals, nutrition, and medical device and technology, such as medical gloves and surgical masks, which are an extension to the petrochemical industry.

  Future Plans:
  - Production of pharmaceuticals: PTT invests in Lotus Pharmaceutical Company Limited, for the production of Active Pharmaceutical Ingredient in Thailand, along with expanding business opportunities with the goal to be a leading life science company in the region to enhance the quality of life.
  - Nutrition Products: Product development and establishment of a Research & Development Center as well as a manufacturing plant for nutrition products, along with the creation of the Innobic Nutrition brand.
  - Medical Materials: PTT seeks investment opportunities in Medical Technology and strengthening Medical Supply for Innopolymed Company Limited, as well as establishing a Molecular Diagnostic Center in Thailand.
- **High Value Business (HVB):** with GC as the main responsibility. The company acquired Allnex Holding GmbH (Allnex) in Germany. The company produces Coating Resins, which is in response to the growing demand of Megatrend.

  Future Plans: Accelerate the increase of investment portion in the HVB business to create growth in the Advanced Materials and Specialty Chemicals segment. In addition, the company will continuously drive the growth of the Coating and Adhesive Group,and pushing Thailand to be the industry leader in the region.
- **Logistic and Infrastructure Business:** PTT established joint venture with the public and private sectors, and support the development of Laem Chabang Port Phase 3, including logistics projects through rail systems. PTT also established Global Multimodal Logistics (GML) to operate a logistics business by focusing on connecting all transportation networks in the country and internationally with the main services, such as transportation via rail, sea, land, air and cold storage warehouse management, including the management and rental of movable properties, and real estate related to logistics business.

  Future Plans: PTT aims to become a Third-Party Logistics (3PL), which will cover warehouse management and management of transportation of value-added service (e.g., Packing, Assembly, etc.). Besides, PTT aims to be freight forwarder, which will integrate international logistics services.

- **Mobility and Lifestyle Business:** Implementation through PTT Oil and Retail Business Public Company Limited (OR) to transform the Oil Ecosystem business into Energy Solution Ecosystem businesses. This aims to create seamless mobility, and transform the business from an Food & Beverage (F&B) Ecosystem business to One-Stop Solution Ecosystem match with consumer behavior trends and needs.

  Future Plans: Transforming businesses in the food and beverage ecosystem to create a comprehensive business ecosystem, including strengthening the Café Amazon business, developing the internal brand of the food and beverage business, and expanding into the Ready-to-drink beverage business (RTD) as well as investment to businesses related to Tourism, Health & Wellness
- **AI, Robotics and Digitalization Business:** Operations are carried out through companies in the group, such as MEKHA Tech's cloud backup services and businesses that support core businesses, e.g., drones, and PTTEP's underwater robots, etc.

  Future Plans: PTT aims to be a leader in AI and Robotics in future energy-related businesses and beyond energy businesses in Asia. PTT focuses on operations in four main areas, consisting of AI in the electric business, AI in automotive, AI in health care, and AI in the gaming business.

Preparation to support the changes in business strategy

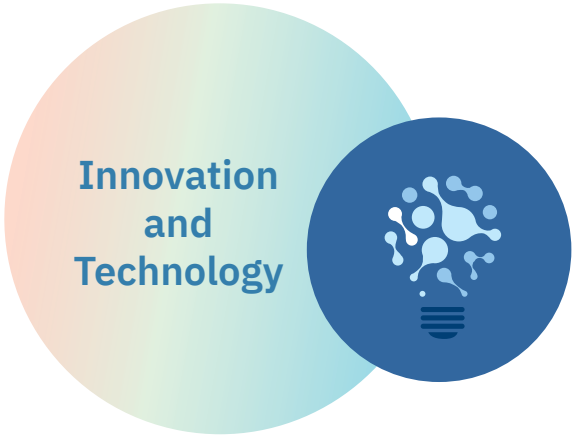
To efficiently and sustainably conduct strategic and business transformations that do not negatively impact the corporation and operators, PTT has prepared Change Management Guideline to frame procedures and operational guidelines for operators to assess and determine measures to minimize risks and impacts that may occur. There are actions to support the significant adjustments as follows;

- o Restructure and establishing department to support operations in new businesses, such as restructuring the department of the Chief New Business and Infrastructure Officer.
- o Allocate employees together with develop knowledge and capabilities to work in new businesses.
- o Adjust the new business model, including the way of work and employee performance measurement, to align with future directions, as well as being ready to support all situations that are least likely to occur.
- o Develop operational practices for providing services and support in case of setting up a new company. The practices include a to-do list after company registration, and implementation of human resource systems to be able to operate smoothly and efficiently. The company also implement standardization practiced throughout the PTT Group, and having a continuous development, such as procurement work systems.

Additional information about Sustainable Human Resources Management is available in PTT website.

Key Performance

Additional information in the section on the summary of the successful implementation of PTT's strategy in 2022



Positive and Negative Impacts

Innovation and technology is one of the key factors that play a significant role in enhancing business efficiency and competitiveness. In the past, PTT established the PTT Innovation Institute to invent, research, and develop innovations to improve and optimize production and work processes, reduce pollution and environmental problems, as well as elevate the quality of products and services. This has a direct positive impact on businesses, consumers, society, and the environment. In 2022, PTT Innovation Institute generated positive business impact with direct income of THB 88,700,007, and indirect income of THB 631,498,413. However, the development of innovation and technology that cannot meet the needs of businesses and expectations from customers and stakeholders may have a negative impact. For example, budgets and investments are used in a way that does not create value or increase the competitiveness of the business, or in case of pollution from innovations that may affect the environment and society, such as batteries. PTT, therefore, conducts strategies and guidelines for innovation development to align with the strategic direction, goals, and new vision, which aims to transform into the future energy and beyond energy businesses. PTT focuses on in-depth analysis for research and development of innovations and technologies that meet the needs and expectations from customers, consumers, and stakeholders, as well as reducing the impact on the environment and society throughout the life cycle. In addition, PTT also focuses on research and innovation that improve commercial products, and the creation of innovation to replace imports from foreign countries by seeking and selecting business partners both internally and externally that will enhance long-term competitiveness.

Material Topics Management

Indicators	Performance Target		Performance against Short-Term Target
	Short-Term within 2022	Long-Term	
∘ **Corporate KPI/ SE-AM KPI** PTT New Business ∘ **Functional KPI** Research & Development (R&D) Impact value per OPEX	• Expenses for innovation development are not less than 10% of net profit in 2021. • Registered at least 23 patents	• Profit from in-house innovation will generate not less than 7% of net profit in 2030.	• Expenses for innovation development are 11% of net profit in 2021. • 26 patents registered

Key Work Plans/ Projects for 2022

Plans according to PTT strategies in innovation management:

- Fostering a corporate culture in the area of innovation-focused.
- Enhancing employees' knowledge and competence in innovation.
- Innovation Process Development
- Development of innovation database
- Corporate Innovation Road Map
- Allocating resources for innovation development.

Overall Management Approach

To develop, manage, and promote innovation systematically, PTT has developed the **PTT Innovation Management Policy** which signifies great importance in the support for creativity and innovation development within the corporation, both in terms of product innovation and service innovation, innovation in the work process, and innovation in new businesses. The objective is to enhance the operation's efficiency and effectiveness and build capability for business competitiveness, as well as to expand to new businesses for sustainable growth. All the executives and employees have the duty to support, drive progress, operate according to the policy, and be good role models in supporting sustainable innovation management.

For deployment the policy into practice, **PTT Innovation Management Master Plan 2022 - 2026** has been developed. It consists of targets, directions, strategies as well as specific and measurable action plans, which have been approved by the Enterprise Risk Management Committee and PTT Board of Directors respectively. The progress is reported to specified governing committees in management and Board of Directors level on a quarterly basis. Besides, the **PTT Innovation Management Framework** is created to integrate the process of invention and the creation of ideas and innovations in various forms. Apart from invention, research, and development by PTT Innovation Institute, PTT has organized creative contests to drive employees' participation in exploring new business ideas, and sought new and suitable innovations/ technology from the outside of the corporation for immediate implementation through business development. All the ideas and innovations will be compiled and made into an overall innovation portfolio, and presented to the Board of Directors which will review, improve, and plan the management. The Board of Directors may need to add or reduce the project, adjust processing time, modify the technology import model, or create additional expertise in the field that they want to create as the core technology of the corporation. They also ensure that the technology is ready to be further developed into a business plan, in which business units or companies in the PTT Group will be responsible for further business development.

Additional information about PTT Innovation Management Policy and Master Plan in PTT website.

PTT Innovation Management Master Plan 2022 - 2026

consists of three main strategic topics as follows;

1st Strategy — **Nurturing People**

Focus on enhancing the knowledge and understanding of innovation management of personnel in the corporation and embed innovation as part of corporate culture through innovation knowledge enhancement and knowledge management development.

2nd Strategy — **Embracing Innovative Process**

Focus on systematic development of innovation processes that lead to sustainable innovation management.

3rd Strategy — **Winning Innovation Strategy**

Focus on determining the direction of operations, indicators, and the evaluation of innovation management through the preparation of the PTT Innovation Roadmap and resource allocation for Portfolio Management.

Progress of Work Plan/ Key Projects

PTT commits to develop **"Innovation and Technology for Sustainability"** in response to the needs of relevant stakeholders and creating shared value and maximized benefits in all dimensions by dividing innovations to change the future into two areas, namely **innovations to sharply reduce causes of global warming** such as hydrogen energy, CCU, CCS, among others, which can be read in more details in the topic "Climate Action." Another area is **innovations to improve the quality of life** to support new businesses beyond energy which has made significant progress that can be summarized as follows;

Innovation in the Electric Vehicle Business Value Chain

PTT EV Charger and Charging Platform

7 7.1 7.2 | 8 8.3 | 9 9.4 9.5
11 11.6 | 12 12.2 | 13 13.2

PTT Innovation Institute has invented and researched EV Charger and Charging Platform before the world community has turned its focus on climate change problems. Currently, the product has been developed into marketed in a commercial market. It is one of the innovations that propel PTT towards a fully integrated electric vehicle business.

PTT EV Charger and Charging Platform have a system for determining the quota to fill up electricity, and a system for collecting data on usage to support the service of charging points at various locations, displaying results through the Administration Application on computers and mobile application. They are able to manage energy and increase convenience for business operators who provide electricity top-up service, including electric train users. The EV Charger is also designed to be a smart device that works with the Cloud Server system that controls, sends, and manages the EV Charger's energy consumption data in the network. It can be easily connected to the platform of those who want to do electricity top-up business and promote the rapid and widespread distribution of electric refueling service points, as well as strengthen the use of electric vehicles in Thailand. EV Charger has now received a patent and passed the safety system test to prevent leakage and overload according to EV Charger IEC 61851 standard. In addition, the Normal EV Charger was registered in the Thai innovation account in 2019. There are plans to register the Smart EV Charger in the Thai innovation account for 2022. PTT also received SET AWARDS for 2022 in the category of Best Innovative Company Awards for the 2nd consecutive year.

EVme Digital Platform

Innovation in digital platforms provides comprehensive electric vehicle service in the form of subscriptions. The platform is the first in Thailand. The objective is to promote and create a business ecosystem for the widespread use of electric vehicles, such as electric vehicle rental services, information about electric charging stations, and electric vehicle maintenance station. There are currently more than 500 vehicles available.

ReAcc Platform

Innovation in digital platforms serves as a trading for clean energy and Climate Neutrality for companies that have goals in renewable energy and want to purchase renewable energy, i.e. the Renewable Energy Certificates (RECs) trading system, the Corporate Power Purchase Agreement (CPPA) system, and using renewable energy for electric vehicles.

Innaqua Wound Dressing

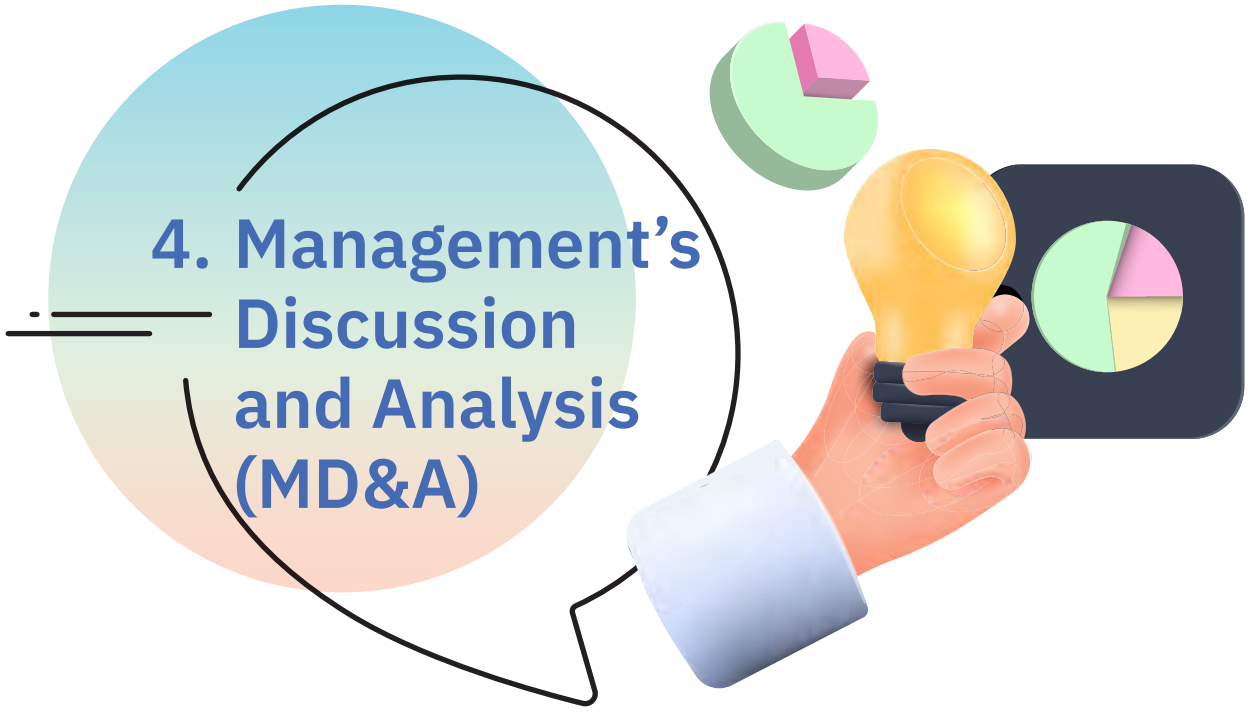
3.8 9.2 9.5 12.2

PTT Innovation Institute has researched and developed bio-cellulose wound dressing. The product passed the product safety test according to the standards of the Food and Drug Administration (FDA). The product has been commercialize under the trade name “Innaqua” by appointing Jack Chia Industries (Thai) Public Company Limited, a manufacturer and distributor of tiger brand plasters. The company becomes the official distributor of Innaqua products.

Innaqua wound dressing products are considered the first step in PTT Group’s entry into the life sciences business with the goal of developing businesses that directly affect lives, increase the opportunity to access quality medicines and medical supplies, and improve people's quality of life in the country.

Future Plans

PTT will implement the strategies specified in the innovation management master plan. A significant plan for 2023 is to complete the process development as stated in the PTT Innovation Framework, to raise employee competencies to drive innovation, and assess the Innovation Maturity Level of the corporation and make further improvement plans. PTT is in a transitional period, and it is necessary to specify the Core Technology that is necessary for doing business in the future. Besides, the company needs to build expertise and infrastructure aligned with innovation development plans in new businesses, which will have specific goals and proportions of expertise identified, including the creation of PTT Innovation Institute area, Wang Noi district, Phra Nakhon Si Ayutthaya province as a demonstration area for the technology.



4. Management's Discussion and Analysis (MD&A)

In reading Management's Discussion and Analysis (MD&A), investors are advised to study the supporting documents, including the consolidated financial statements, revised financial information, overall past or revised performance, together with notes to financial statements and this document.

4.1 Management's Discussion and Analysis (MD&A) and Operating Results for Year 2022

Overall Performance of PTT and Its Subsidiaries

Unit: THB million

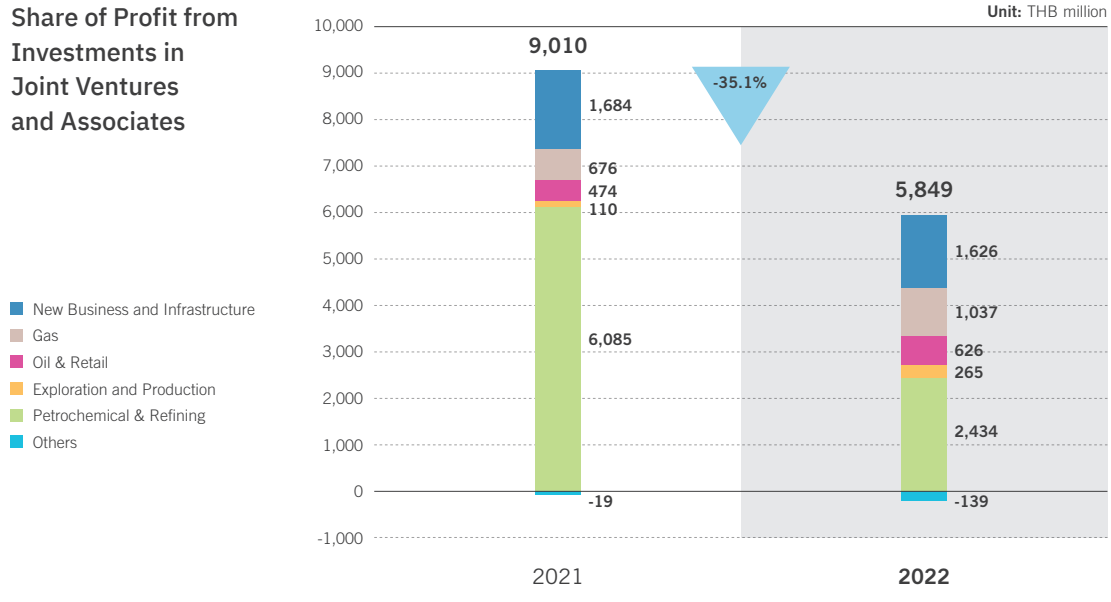
	2021	2022	% Inc. (Dec.)
Sales Revenue	2,258,818	3,367,203	49.1
EBITDA	427,956	491,288	14.8
Net Profit	**108,363**	**91,175**	**(15.9)**
Earnings per share (THB/share)	3.79	3.20	(15.6)

In 2022, sales revenue of PTT and its subsidiaries was reported at THB 3,367,203 million increased from 2021 by THB 1,108,385 million or 49.1% from all businesses. Sales revenue of International Trading business, Petrochemical and Refining business, Oil and Retail business and Exploration and Production business increased due to higher average selling price and overall sales volume according to the recovered economic activities. Sales revenue of Gas business increased due to higher average selling price following pool gas price and referenced prices, while sales volume decreased from lower supply of gulf gas during the transition of operator for G1/61 concession.

EBITDA in 2022 was THB 491,288 million, increased by THB 63,332 million or 14.8%. This was mainly from the increase in Exploration and Production business performance from higher average selling price and average sales volume. In addition, performance of coal business increased following higher average selling price. However, Gas business's performance decreased from higher gas cost owning to higher pool gas price. Petrochemical and Refining business's performance decreased mainly from petrochemical due to lower most of petrochemical product spreads and material. Meanwhile, Refining business's performance improved as Market GRM increased from USD 2.9 per barrel in 2021 to USD 10.7 per barrel in 2022 due to the increase in overall product spreads, while PTT Group's stock gain decreased approximately THB 42,000 million following the decrease in crude oil price in 2H2022. The depreciation and amortization expenses of 2022 were THB 167,330 million, increased by THB 20,540 million or 14.0% mainly from PTTEP as a result of first production of G1/61 and Malaysia Projects which had higher sales volume, GC as a result of acquisition of Allnex Holding GmbH (Allnex) in December 2021 and PTTGM primarily from investment in pharmaceutical business in April 2022.

Figure 1

Share of Profit from Investments in Joint Ventures and Associates



In 2022, the share of profit from investments in joint ventures and associates was THB 5,849 million, decreased by THB 3,161 million or 35.1%. This was primarily from lower performance of joint venture in Petrochemical and Refining business.

In 2022, loss on derivatives increased by THB 42,956 million, from loss on derivatives of THB 31,958 million in 2021 to loss on derivatives of THB 74,914 million in 2022 mainly from loss on oil and commodities price hedging transactions from P&R business due to actual oil price and products spread were higher than hedged price.

Gain on foreign exchange rate increased by THB 12,021 million from loss THB 6,469 million in 2021 to gain THB 5,552 million in 2022 mainly from decrease in unrealized loss on US currency loans as THB lower depreciation compared to the same period last year. (Thai baht depreciation in 2022 closed of THB 1.14 per USD, while Thai baht depreciation in 2021 closed of THB 3.38 per USD).

In 2022, there were loss recognition of non-recurring items (PTT's portion) after tax approximately THB 10,200 million. Meanwhile, in 2021 there were the loss recognition approximately by THB 6,900 million (Details as table).

The Majority of Non-recurring Items after Tax (PTT's Portion) Table

Business	Item	2021	2022
Exploration and Production Business	Impairment loss on Mozambique Area One Project	~ (3,600)	~ (4,300)
	Impairment loss on Yetagun Project	~ (400)	
	Recognition partial write-off of the assets in the exploration project in Brazil	~ (2,900)	
	Gain from a bargain purchase of Oman Block 61 Project	~ 7,000	
	Impairment loss on assets held for sales from PTTEP BL		~ (2,300)
	The provision for the Class Action settlement from Montara incident		~ (3,000)
	Loss after reclassifying net assets of Block 17/06 Project (Angola)		~ (350)
	Income from adjustment of contingent liabilities of Oman Block 61 project		~ 1,600
Gas Business	Impairment loss on NGV business	~ (3,500)	
	Write-off on obsolete materials and supplies of PTT	~ (800)	
	The return of Take or Pay benefit from Myanmar gas fields	~ (2,700)	
	Gain on divestment of gas pipeline business in Egypt of PTTER	~ 1,400	
	PTT's benefit from lawsuit	~ 1,000	
	Benefit from discount from production shortfall	~ 1,700	~ 3,400
	Contribution to oil fund during energy crisis		(3,000)
Petrochemical and Refining Business	Impairment loss on US Petrochemical of GC	~ (1,000)	
	Loss from restructuring of Emery Group of GC	~ (1,000)	
	GC's tax on divestment of GPSC	~ (2,300)	
	TOP's tax on divestment of GPSC		~ (2,100)
New Business and Infrastructure	Gain on Ichinoseki Solar Power 1 GK divestment of GPSC		~ 350
Coal Business	PTTGM's loss on impairment on coal mine project in Madagascar		~ 400

Finance costs was THB 37,091 million in 2022 increased by THB 8,928 million from 2021 mainly from the increase of loan of GC, PTTEP and PTT.

The corporate income taxes in 2022 was THB 90,462 million, increased by THB 22,872 million or 33.8% mainly from PTTEP and TOP following higher performance, while corporate income taxes of GC and PTT decreased in line with lower performance.

As aforementioned, this was resulted in PTT Group's net profit in 2022 amounting to THB 91,175 million, decreased by THB 17,188 million or 15.9% from the net profit amounting to THB 108,363 million in 2021.

Financial Performance of PTT Group by Business

Unit: THB million	2021	2022	% Inc. (Dec.)
Sales revenue	**2,258,818**	**3,367,203**	**49.1**
Exploration & Production	219,068	331,350	51.3
Gas	464,038	708,852	52.8
Coal	16,983	33,599	97.8
Oil & Retail	513,895	791,745	54.1
International Trading	1,146,564	2,172,566	89.5
Petrochemical & Refining	1,037,276	1,473,678	42.1
New Business & Infrastructure	81,262	148,424	82.6
Others	3,558	4,063	14.2
EBITDA	**427,956**	**491,288**	**14.8**
Exploration & Production	164,365	253,973	54.5
Gas	86,497	61,207	(29.2)
Coal	7,158	18,347	> 100.0
Oil & Retail	20,807	20,962	0.7
International Trading			
- Excluding effect of FX and derivatives	10,740	13,897	29.4
- Including effect of FX and derivatives	5,436	8,735	60.7
Petrochemical & Refining	120,733	109,719	(9.1)
New Business & Infrastructure	20,918	16,392	(21.6)
Others	(3,349)	(3,263)	2.6
Depreciation and amortization expenses	**146,790**	**167,330**	**14.0**

Unit: THB million	2021	2022	% Inc. (Dec.)
Operating income	**281,166**	**323,958**	**15.2**
Exploration & Production	94,303	171,031	81.4
Gas	67,768	42,905	(36.7)
Coal	5,404	16,509	> 100.0
Oil & Retail	14,899	14,614	(1.9)
International Trading			
- Excluding effect of FX and derivatives	10,536	12,943	22.8
- Including effect of FX and derivatives	5,232	7,781	48.7
Petrochemical & Refining	81,788	66,181	(19.1)
New Business & Infrastructure	10,182	3,440	(66.2)
Others	(3,801)	(3,719)	2.2
Share of net income from investments in joint ventures and associates	**9,010**	**5,849**	**(35.1)**
Loss on impairment of assets	**13,286**	**12,609**	**(5.1)**
Gain (loss) on derivatives	**(31,958)**	**(74,914)**	**< (100.0)**
Gain (loss) on foreign exchange	**(6,469)**	**5,552**	**> 100.0**
EBIT	**247,821**	**249,653**	**0.7**
Finance costs	**28,163**	**37,091**	**31.7**
Income taxes	**67,590**	**90,462**	**33.8**
Net income	**108,363**	**91,175**	**(15.9)**
Earnings per share (THB/share)	**3.79**	**3.20**	**(15.6)**

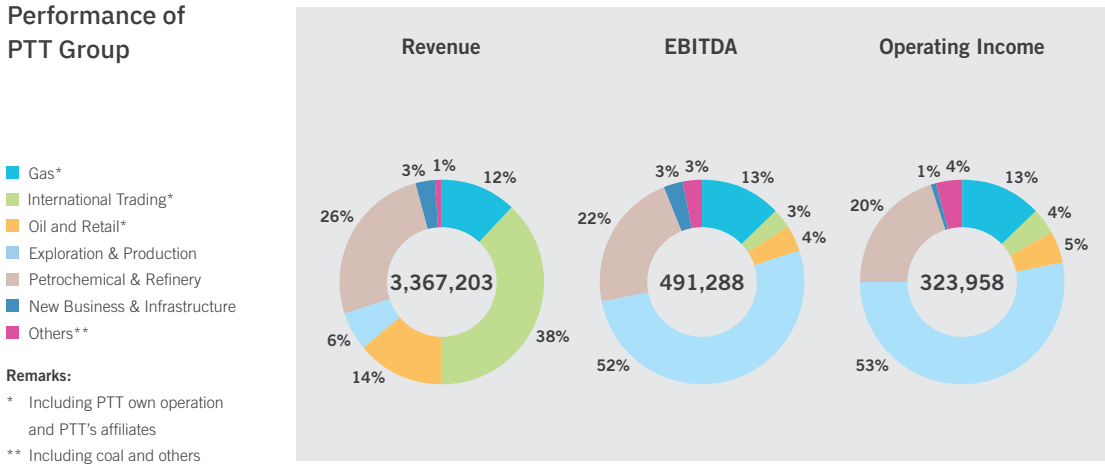
Segmentation Performance of PTT Group

The details of revenue, Earnings before Interest, Tax, Depreciation and Amortization (EBITDA) and operating income by segmentation of 2022 are as follows.

Figure 2

Segmentation Performance of PTT Group

Unit: THB million



Remarks:

* Including PTT own operation and PTT's affiliates

** Including coal and others

Upstream Petroleum and Gas Business Group

Petroleum Exploration and Production Business: PTT Exploration and Production Plc. (PTTEP)

	2021	2022	% Inc. (Dec.)
Average selling price (USD/BOE)	43.5	53.4	22.8
Average sales volume (BOED)	416,141	468,130	12.5

In 2022, sales revenue of PTTEP was THB 331,350 million, increasing by THB 112,282 million or 51.3% from 2021 as the average selling price increased by 22.8% from USD 43.5 per BOE in 2021 to USD 53.4 per BOE in 2022. In addition, the average sales volume increased by 12.5% from 416,141 BOED in 2021 to 468,130 BOED in 2022 primarily from first production of G1/61 Project since the end of April 2022, full year production of Oman Block 61 Project, as well as Arthit Project due to higher gas nomination from buyer.

EBITDA in 2022 was THB 253,973 million, increasing by THB 89,608 million or 54.5% from 2021 mainly due to an increase in sales revenue as aforementioned. However, operating expenses increased primarily from first production of G1/61 and G2/61 Projects, together with Malaysia Project due to higher sales volume and maintenance activities. While, depreciation, depletion and amortization increased primarily from first production of G1/61 and Malaysia Projects which had higher sales volume, offset with the decrease in sales volume of Bongkot Project. In addition, petroleum royalties increased primarily from higher revenue from sales in Thailand and Malaysia. As a result, the operating income in 2022 was THB 171,031 million, increasing by THB 76,728 million or 81.4% from 2021.

The overall performance of Exploration and Production business increased following the increase in operating income as aforementioned, despite income taxes increased by THB 30,767 million mainly from projects in Thailand and Oman following higher earnings before tax, as well as in 2022 there were loss recognition of non-recurring items approximately THB 13,000 million. While, in 2021 there were gain approximately THB 100 million (Details as the majority of non-recurring items after tax (PTT's portion) table as aforementioned).

Gas Business Group

The details of all product sales volume from GSPs are as follows:

Unit: ton	2021	2022	% Inc. (Dec.)
LPG	3,113,277	3,301,907	6.1
Ethane	2,181,272	1,752,287	(19.7)
Propane	953,395	1,139,217	19.5
NGL	617,011	504,133	(18.3)
Pentane	43,057	48,803	13.3
Total	**6,908,012**	**6,746,347**	**(2.3)**

The details of reference product prices of GSPs are as follows:

Unit: USD per ton	2021	2022	% Inc. (Dec.)
LPG[1/]	639	736	15.2
LDPE[2/]	1,516	1,428	(5.8)
LLDPE[2/]	1,200	1,208	0.7
HDPE[2/]	1,181	1,203	1.9
Propane	648	737	13.7

Remarks:

1/ Global Gas Price (Contract Price Saudi Aramco) as a reference for selling prices of petrochemical customers, LPG calculated from the proportion of Propane and Butane by 50 : 50

2/ South East Asia - Spot Price

In 2022, gas business reported sales revenue of THB 708,852 million, increasing by THB 244,814 million or 52.8%. This resulted mainly from S&M business, the sales revenue of S&M business increased due to the higher average selling price following pool gas price. In addition, the average selling price for industrial customers increased from the higher average fuel oil referenced prices as well as the implementation of new procedure which using the selling price to Small Power Producer (SPP) in the previous month as referenced price instead if the fuel oil referenced selling price below those SPP price since August 2022. However, average sales volume (calculated at heating value of 1,000 BTU per cubic feet) decreased by 247 MMSCFD or 5.6% from 4,437 MMSCFD in 2021 to 4,190 MMSCFD in 2022 mainly from lower supply of gulf gas and maintenance shutdown of some production fields

resulted in the electrical customer sector adjustment of fuel management plan by calling the higher electricity generation from hydropower plants following the higher water level in 2022. Moreover, some power plants have operated with diesel instead of natural gas. In addition, GSP gas utilization decreased following the turndown of GSP's production to in line with lower output of gulf gas.

Sales revenue of GSP business rose due to the higher average selling price of almost products in accordance with the higher petrochemical referenced prices despite lower GSP's sales volume (including NGL derived from Dew Point Control units) from 6,908,012 tons in 2021 to 6,746,347 tons in 2022 or decreased by 2.3%, mainly from Ethane due to major planned maintenance shutdown of Ethane Separation Plant (ESP) and the turndown of GSP's production to in line with lower supply of gulf gas together with lower demand of petrochemical customer following the economic situation.

In addition, sales revenue of Transmission Pipeline business decreased mainly from revised gas pipeline tariff since August 2022 onwards.

In 2022, EBITDA of gas business was reported at THB 61,207 million, decreasing by THB 25,290 million or 29.2%. The operating income was reported at THB 42,905 million, decreasing by THB 24,863 million or 36.7%. This was mainly from industrial customers as the gas cost increased following the pool gas price and the incremental costs according to Energy Pool Price (EPP) policy. The gas cost increased in the higher extent compared to the increase in average selling price, resulting in the decrease in gross margin of S&M. However, in 2022 there was the shortfall discount and compensation approximately by THB 3,400 million. In 2021, there was the return of Take or Pay from Myanmar gas supply offset with shortfall approximately by THB 1,000 million. Performance of NGV business also decreased from higher gas cost together with NGV retail price which has been capped for the taxi in Bangkok Metropolitan Area (NGV for the Giving Breath Project) at THB 13.62 per kilogram from November 1, 2021 to March 15, 2023, and the NGV retail price for other vehicles have been capped at THB 15.59 per kilogram from November 16, 2021 to September 15, 2022 and the price increased by THB 1 per kilogram to THB 16.59 per kilogram from September 16, 2022 to December 15, 2022 and THB 17.59 per kilogram since December 16, 2022 onwards to easing Thai people's burden on energy price. However gross profit of GSP business rose from higher average selling price of all products in accordance with the referenced prices despite the decrease in sales volume and higher gas cost in line with higher gulf gas price.

Coal Business

	2021	2022	% Inc. (Dec.)
Newcastle index price (USD/Ton)	137.3	360.2	> 100.0
Average selling price (USD/Ton)	83.0	156.4	88.4
Cash cost (USD/Ton)	49.2	74.7	51.8
Sales volume (million tons)	6.1	6.1	-

In 2022, sales revenue of Coal business was THB 33,599 million, increasing by THB 16,616 million or 97.8% compared with 2021 mainly due to the increase in average selling price by USD 73.4 per ton or 88.4% from USD 83.0 per ton in 2021 to USD 156.4 per ton in 2022 following the increase in Newcastle referenced price which increase more than 100.0% while sales volume was close to 2021 following the production plan.

EBITDA in 2022 was THB 18,347 million, increasing by THB 11,189 million or more than 100.0% from 2021 mainly due to the increase in gross profit following higher average selling price despite higher mining cost following higher coal and fuel prices, higher royalty rate, and the farther Over Burden distance. Operating income in 2022 was THB 16,509 million, increasing by THB 11,105 million or more than 100.0% in accordance with the increase in EBITDA, resulting in an increase in overall performance.

Downstream Petroleum Business Group

Oil Business Group

	2021	2022	% Inc. (Dec.)
Average Sales Volume* (Unit: million liters)	**23,145**	**26,846**	**16.0**
Average Selling Prices (Unit: USD per barrel)			
Gasoline	80.3	115.2	43.5
Aviation	75.1	126.6	68.6
Diesel	76.0	130.6	71.8

Remark:
** The average sales volume of domestic oil segment only*

In 2022, sales revenue of Oil and Retail business group was THB 791,745 million, increasing by THB 277,850 million or 54.1% from 2021 mostly due to higher average selling price following higher global oil price. In addition, the overall sales volume increased by 3,701 million liters or 16.0% from 23,145 million liters or equivalent to 398,851 barrels per day in 2021 to 26,846 million liters or equivalent to 462,629 barrels per day in 2022, mainly from diesel, aviation, and fuel oil, as the recovery of travel sector and service sector. Additionally, sales volume of fuel oil and diesel increased from power plant sector which switched to use diesel instead of natural gas, and increased from international marine vessel sector. Non-oil business' revenue increased from the increasing sales volume which resulted from expanding food and beverage stores network.

EBITDA in 2022 was THB 20,962 million, slightly increased from 2021 by THB 155 million or 0.7% from increasing Non-oil business's gross margin according to higher sales and services revenue of food and beverage business as well as other retail business. While EBITDA of Oil business decreased from lower gross margin following lower overall average gross margin per liter mainly from averge cost of gasoline and diesel which increases from importing the products in 4Q2022 during domestic main oil refinery turnaround period. The operating income in 2022 was THB 14,614 million, decreasing by THB 285 million or 1.9% in line with lower EBITDA of Oil business. As a result, the overall performance of Oil and Retail business has declined slightly from the previous year.

International Trading Business Group

Unit: million liters	2021	2022	% Inc. (Dec.)
Average sales volume	79,134	127,082	60.6

Sales revenue of International Trading business in 2022 was THB 2,172,566 million, increased by THB 1,026,002 million or 89.5% from 2021 due to higher sales volume by 47,948 million liters or 60.6% from 79,134 million liters or equivalent to 1,363,694 barrels per day in 2021 to 127,082 million liters or equivalent to 2,189,968 barrels per day in 2022. This was mainly from the higher volume of LNG imports to fulfill lower supply of gulf gas and LPG imports as a result of higher customer demand as well as higher volume of crude imports for domestic refineries following the higher demand and the higher volume of crude and refined product out-out tradings as a result of the economic activities recovery from the reopening of the countries in many regions around the world. In addition, product selling price increased following the rise in global oil prices.

EBITDA, adjusted by the impact from foreign exchange rate and derivatives, in 2022 was THB 8,735 million, increased by THB 3,299 million or 60.7% primarily from the higher margin per unit of international crude and refined product following product spread as well as the increase in sales volume as aforementioned. The operating income, adjusted by the impact from foreign exchange rate and derivatives in 2022 was THB 7,781 million, increased by THB 2,549 million or 48.7%.

Petrochemical and Refinery Business Group

Unit: USD per barrel	2021	2022	% Inc. (Dec.)
Market GRM	2.9	10.7	> 100.0
Inventory Gain (Loss) excl. NRV	3.3	0.0	(100.0)
Hedging Gain (Loss)	(1.1)	(5.8)	< (100.0)
Accounting GRM	5.1	4.9	(3.9)
Refinery Utilization Rate (%)	95.2	94.1	(1.1)

Remark:
** From 3 Refineries: TOP, GC and IRPC*

Unit: USD per ton	2021	2022	% Inc. (Dec.)
Olefins			
Naphtha (MOPJ)	646	785	21.5
HDPE	1,181	1,203	1.9
LDPE	1,516	1,428	(5.8)
LLDPE	1,200	1,208	0.7
PP	1,321	1,206	(8.7)
Aromatics			
Condensate	596	830	39.3
PX (TW)	859	1,103	28.4
PX (TW) – Condensate	263	273	3.8
BZ	914	1,028	12.5
BZ – Condensate	318	198	(37.7)

In 2022, sales revenue of Petrochemical and Refining business was THB 1,473,678 million, increasing by THB 436,402 million or 42.1% primarily due to Refinery business from the increase in average selling price following crude oil price, overall sales volume also increased following economic recovery.

The sales revenue of petrochemical business also increased from Olefins and Aromatics business despite the decrease in sales volume due to production plan adjustment aligning with market conditions and refinery major turnaround in 4Q2022.

EBITDA of Petrochemical and Refining business in 2022 was THB 109,719 million decreasing by THB 11,014 million or 9.1% from THB 120,733 million in 2021. There was operating income of THB 66,181 million in 2022, decreasing by THB 15,607 million or 19.1% compared to THB 81,788 million in 2021 details as follows:

- Petrochemical performance decreased mainly from both Olefins business and Aromatics business due to the decrease in most of product spread and the decrease in sales volume as aforementioned.
- However, Refinery performance increased due to the higher Market GRM from USD 2.9 per barrel in 2021 to USD 10.7 per barrel in 2022 mainly from the increase in most of petroleum product spreads as well as the increase of sales volume. However, there is lower stock gain in this year.

New Business and Infrastructure Group

	2021	2022	% Inc. (Dec.)
Power Sales Volume (GWh)	20,148	21,531	6.9
Steam Sales Volume (thousand tons)	15,090	14,509	(3.9)

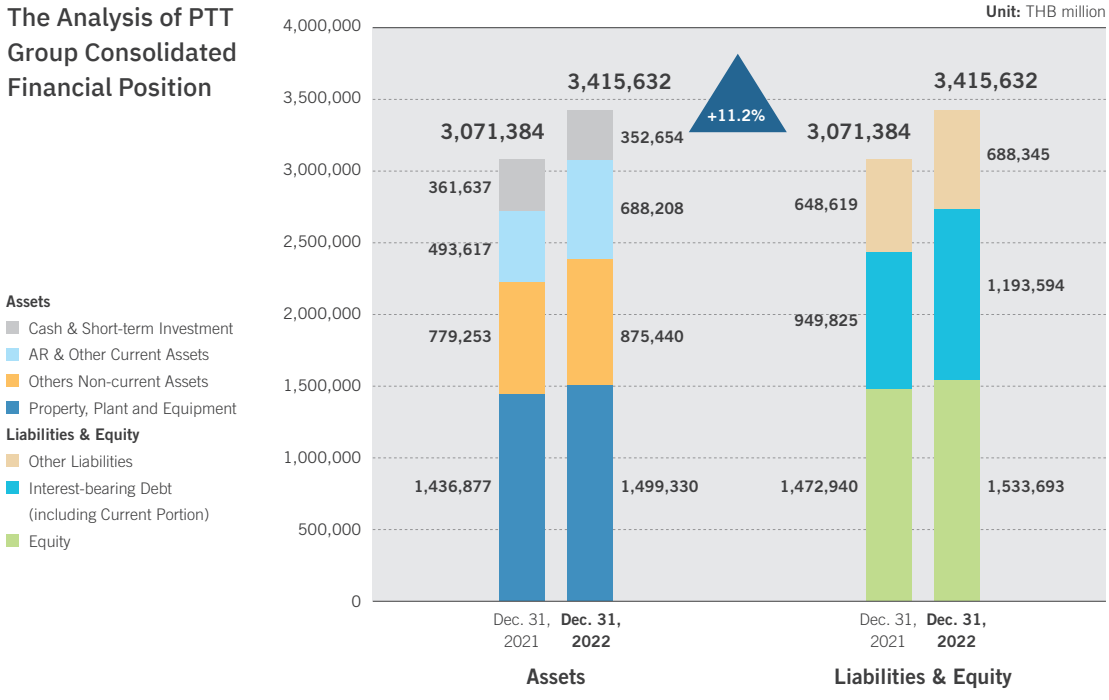
In 2022, sales revenue of New Business and Infrastructure group was THB 148,424 million, increased by THB 67,162 million or 82.6%. This was mainly from GPSC which has higher revenue of SPP power plants due to the increase in average electricity and steam selling prices, together with higher EP revenue of IPP power plants due to higher dispatch sales volume to EGAT. In addition, PTTGM started to recognize revenue from pharmaceutical business of LOTUS since April 2022.

EBITDA in 2022 was THB 16,392 million, decreased by THB 4,526 million or 21.6% mainly from lower gross profit of GPSC following lower gross profit of SPP power plants. This was due to the significant increase in natural gas and coal costs, resulting in a decrease of profit margin on electricity sales to industrial customers, while Ft has yet to adequately catch up with the rising fuel cost. Nevertheless, IPP power plants' gross profit improved from using diesel as alternative fuel instead of natural gas. In this regard, in 2022, operating income was THB 3,440 million, decreased by THB 6,742 million or 66.2% in accordance with lower EBITDA. As a result, the overall performance of New Business and Infrastructure group decreased mainly from lower performance of GPSC, despite recognized higher share of profit from Xayaburi Power Plant due to higher water level compared to 2021.

The Analysis of PTT Group Consolidated Financial Position as of December 31, 2022 Compared with December 31, 2021

Figure 3

The Analysis of PTT Group Consolidated Financial Position



Assets

As of December 31, 2022, total assets of PTT Group were THB 3,415,632 million, increasing by THB 344,248 million or 11.2% compared with December 31, 2021 from following:

- Cash and cash equivalents and short-term investments decreased by THB 8,983 million or 2.5% mainly from PTT Group's investing activities.
- AR & Other Current Assets increased by THB 194,591 million or 39.4% mainly from the following:
  - Inventories increased by THB 51,525 million due to overall higher price and inventory level mainly from TOP, PTT, IRPC, GC and GPSC.
  - Trade accounts receivables increased by THB 22,812 million mainly from overall higher average selling price following market price of PTT, OR and GPSC.
- Other non-current assets increased by THB 96,187 million or 12.3% mainly from
  - Long-term investments increased by THB 43,865 million from the increased investment in associates mainly from GPSC's investment in CI Changfang and CI Xidao, the purchasing additional shares in Vinythai (VNT) of GC as well as the increase in long-term investments in financial assets in Contemporary Amperex Technology Co., Ltd. (CATL) of PTTGM.
  - Right-of-use assets increased by THB 43,664 million mainly from G1/61 Project and G2/61 Project of PTTEP.
- Property, plant, and equipment (PPE) increased by THB 62,453 million or 4.4% mainly from PTTEP's exploration and evaluation assets of G1/61 Project and G2/61 Project and TOP's additional construction in progress of Clean Fuel Project (CFP).

Liabilities

As of December 31, 2022, PTT Group had total liabilities of THB 1,881,939 million, increasing by THB 283,495 million or 17.7% from December 31, 2021, mainly from the following:

- Other liabilities increased by THB 39,726 million or 6.1% mainly from the increase in trade accounts payables due to the increase in purchasing volume and prices mainly from PTT as well as the increase in commodity derivatives primarily from PTTT and the increase in provision for decommissioning costs of G1/61 Project and G2/61 Project of PTTEP.
- Interest-bearing debt increased by THB 243,769 million or 25.7% due to the increase in long-term loans and bond by THB 124,308 million mainly from GC, PTT, TOP and GPSC as well as the increase in short-term loans by THB 79,798 million mainly from TOP, IRPC and GC.

Equity

As of December 31, 2022, PTT Group had total shareholders' equity of THB 1,533,693 million, increasing by THB 60,753 million or 4.1% from December 31, 2021 as PTT Group performance reported 2022 net income amounting to THB 91,175 million offset with dividend payment from the operating results of the second half of 2021 amounting to THB 0.80 per share and the first half of 2022 amounting to THB 1.30 per share which total amount is approximately THB 60,000 million. Additionally, non-controlling interests increased by THB 14,859 million mainly from higher net income of subsidiaries.

Liquidity

For the year-ended December 31, 2022, PTT Group liquidity had net increase in cash and cash equivalents amounting to THB 27,324 million. There was cash and cash equivalents at the beginning of the period of THB 312,730 million. As a result, cash and cash equivalents at the end of the period was THB 340,054 million. Details of cash flow by activities are as follows:

Unit: THB million

	PTT Group
Net cash provided by operating activities	191,700
Net cash used in investing activities	(186,690)
Net cash provided by financing activities	50,668
Effects of exchange rates on cash and cash equivalents	697
Exchange differences on translation	(20,287)
Cash and cash equivalents classified as held for sale	(8,764)
Net increase in cash and cash equivalents during the year	27,324
Cash and cash equivalents at the beginning of the year	312,730
Cash and cash equivalents at the end of the year	**340,054**

Net cash provided by operating activities of THB 191,700 million was derived from THB 212,562 million of profit before income taxes, adjusted to net cash provided by (used in) operating activities. The increase in net cash flow from operating activities mainly resulted from THB 167,330 million of depreciation and amortization expenses, THB 37,091 million of finance costs, THB 12,304 million of loss on impairment of assets, THB 11,649 million of loss on foreign exchange rate, THB 10,243 million of loss on derivatives, THB 7,920 million of unrealized loss on fair value of commodity contracts. The decrease in net cash flow from operating activities mainly resulted from THB 5,849 million of share of profit from investments in joint ventures and associates, and the change in net operating assets resulting in the decrease in cash flow of THB 178,970 million while income taxes paid of THB 85,482 million.

Net cash used in investing activities was THB 186,690 million mainly resulted from the following:

- The cash outflow of investments in property, plant and equipment, investment property, intangible assets, and exploration and evaluation assets amounting to THB 171,813 million, mainly due to additional investment in exploration and production assets in G1/61 Project, G2/61 Project, Zawtika Project, Bongkot Project, and S1 Project of PTTEP, additional investment of TOP in CFP and expand the capacity of electricity and steam of TOP SPP Co., Ltd. (TOP SPP), GC's Olefins I4/2 Modification project, the 7th Gas Separation Plant, Bang Pakong - South Bangkok power plant transmission pipeline project, the 5th transmission pipeline project of PTT, GSP Logistics Management, and LNG receiving terminal at Nong Fab of PTT LNG Co., Ltd. (PTTLNG).
- The cash outflow of business acquisition and long-term investments amounting to THB 60,905 million, mainly from CATL of PTTGM, GPSC's investment in CI Changfang and CI Xidao, as well as the purchasing additional shares in VNT of GC.
- The cash inflow from short-term investment in financial assets totaling THB 37,031 million, mainly from maturity of fixed deposits of OR and GC.

Net cash provided by financing activities was THB 50,668 million, mainly from the following:

- The net cash inflow of short-term and long-term loans amounting to THB 171,139 million mainly from GC, PTT, TOP and IRPC.
- Dividend payment amounting to THB 85,923 million mainly from PTT, PTTEP and GC.
- Finance costs paid amounting to THB 36,198 million mainly from GC, TOP, PTT and PTTEP.

Managements of the COVID-19 Pandemic Situation

The COVID-19 pandemic and government measures have affected the petroleum and petrochemical businesses. PTT Group has risk management in place for both short and long-term crises, and has consistently maintained the Group's competitiveness and strength through the PTT Group Vital Center which includes the following by PTT COVID-19 Monitoring and Surveillance Center (Palungjai Center) manages personnel's physical and mental safety. Stringent preventive and control measures are in place for COVID-19 infection together with regular provision of news and information along with easy access to the hub, including vaccination to build immunity for employees and their families by continuously monitoring the number of infected people and people at risk, continuously announcing measures and guidelines from relevant government agencies to determine measures and guidelines to prevent and reduce the risk of infection in PTT's work areas, including compliance with such universal preventions as wearing a mask at all times, washing or cleaning hands, maintaining social distance.

4.2 Factors that May Impact Future Operations

4.2.1 Factors on Environmental and Social Trend and Impact

PTT identifies and evaluates key sustainability issues from its operational activities, products, and services that can have a positive and negative impact on various dimensions, including the economy, environment, individuals, and human rights. These issues are collected and analyzed from the value chain, internal and external factors, trends, direction, and standard modification. These materiality inputs are integrated into corporate strategic planning and risk assessment procedures. In 2022, climate change remains one of the key materiality issues, which is analyzed as the main input factor in the strategic direction process and corporate risk management through various scenario simulations by setting Carbon Neutrality targets, Net Zero Emissions, and corporate long-term goals in 2030 which reflect efforts to reduce and mitigate risks, as well as increase business opportunities from the obvious effects of climate change.

As for other important sustainability issues such as corporate governance, risk management, internal control and compliance, efficient use of resources, pollution prevention, occupational health and safety, personnel development and retention, etc., PTT has clearly defined the responsible units for management with monitoring and report of performance progress to the management-level committee and the Board of Directors according to the governance structure to continuously review efficiency and effectiveness. Further details are available under the heading "Driving Business towards Sustainability" and PTT's website in "Sustainability."

4.2.2 Financial Support to Affiliated Companies

As of December 31, 2022, PTT provided the following financial support to affiliated companies.

Unit: THB million/ USD million

Company	Currency	Amount	Outstanding Balance		Available Balance
			Shareholder Loan	Others	
Companies with lower than 100% shares					
Total	USD	-	-	-	-
	THB	-	-	-	-
Wholly owned Company					
PTT Treasury Center Co., Ltd. (PTT TCC)	USD	-	-	-	-
	THB	135,679[1/]	57,428	-	77,033
Total	USD	-	-	-	-
	THB	**135,679**	**57,428**	-	**77,033**
Total	USD	-	-	-	-
	THB	**135,679**	**57,428**	-	**77,033**

Remark:

1/ According to the Shareholder Loan Agreements between PTT and PTT TCC dated December 18, 2019, January 4, 2021, May 21, 2021, June 22, 2021, November 23, 2021, February 28, 2022, May 27, 2022, August 15, 2022 and October 18, 2022, the total amount is THB 135,679 million to support the investment of PTT Group companies.

PTT will consider providing financial support in the form of loan, capital and/or trade credit as necessary with conditions comparable to the market, and for long-term benefits of PTT and PTT Group. Such a policy and practice are believed to strengthen PTT Group.

Inter-Company Borrowing and Lending (ICBL)

Unit: THB million

Company	Credit lines PTT can lend to affiliated companies	Credit lines PTT can borrow from affiliated companies	Supported	
			Outstanding balance from PTT	Outstanding balance to PTT
PTT Exploration and Production Plc.	5,000	5,000	-	-
PTT Global Chemical Plc.	10,000	3,500	-	-
Thai Oil Plc.	2,100	2,100	-	-
IRPC Plc.	10,000	1,500	-	-
PTT Oil and Retail Business Plc.	2,500	1,500	-	-
Global Power Synergy Plc.	1,500	500	-	-
Total	**31,100**	**14,100**	**-**	**-**

As for affiliated companies which PTT has less than 100% stakeholding, PTT has managed short-term liquidity in form of Inter-Company Borrowing and Lending (ICBL) either in THB and/or USD currency under Uncommitted & Unsecured Short Term Loan.

PTT and 5 affiliates, namely PTT Exploration and Production Plc., PTT Global Chemical Plc., Thai Oil Plc., IRPC Plc., and PTT Oil and Retail Business Plc., extended ICBL contracts after the contracts expired on December 19, 2022, for another period of 1 year starting from December 20, 2022 to December 19, 2023. In addition, PTT and Global Power Synergy Plc. entered into an ICBL agreement effective from December 20, 2022 to December 19, 2023.

4.2.3 Policy and Term of Trade Credit (Credit Term)

Credit management policy of PTT is stipulated with credit criteria and procedures of each business unit that are competitive and comparable to competitors with compatible collection and payment periods and no impact on financial liquidity. Cost and financial risks from foreign exchange are also taken into account.

Financial ratios related to trade credit period during the past 3 years are as follows:

Unit: Day

Financial Ratio	2020	2021	2022	3-year Average
AR days	31.77	25.30	22.79	26.62
AP days	33.45	31.23	27.90	30.86

4.2.4 Future Investment Plans

The 5-year (Year 2023 - 2027) investment plan of PTT and its wholly owned subsidiaries in an aggregate amount of THB 100,227 million, are detailed as follows:

Unit: THB million

Business	2023	2024	2025	2026	2027	Total
Gas	10,023	17,069	4,271	4,901	58	36,322
Transmission	7,503	8,800	1,687	668	330	18,988
International Trading and Downstream	863	857	738	683	175	3,316
New Business and Infrastructure and Head Office	2,440	4,089	926	767	606	8,828
Investment in wholly owned Subsidiaries	12,515	5,931	4,193	6,603	3,531	32,773
Total	**33,344**	**36,746**	**11,815**	**13,622**	**4,700**	**100,227**

PTT has invested in the core businesses to ensure national energy security, accounting for 55% of PTT's total five-year investment plan. Projects include Gas Separation Plant (GSP) unit 7 to replace GSP unit 1, GSP unit 8 (Liquefied Natural Gas (LNG) extraction for ethane and LPG with ethane storage and receiving facilities to enhance its ethane import capacity), Bang Pakong - South Bangkok Power Plant Transmission Pipeline project, 5th Pipeline, and the investment through its wholly owned subsidiaries i.e. EV Value Chain business, Map Ta Phut Industrial Port Development Phase 3, and Laem Chabang Port Phase 3 Project.

Additionally, PTT has prepared provisional capital expenditure for the next 5 years amounting to THB 302,168 million mainly for the investment expansion into new businesses to align with PTT's vision with the focus on clean energy businesses towards a low-carbon society i.e. investment in EV Value Chain business: covering from upstream to downstream, Logistics and Infrastructure businesses: focusing on connecting all transportation networks throughout the country, Life Science: driving Life Science industry in Thailand and the ASEAN, as well as the investment in Renewable Energy: achieving PTT Group's renewable energy target of 12,000 MW within year 2030. Furthermore, there is investment expansion in gas business which is the transition fuel with the focus on the expansion of pipeline network and the investment in LNG value chain both in Thailand and overseas.

4.2.5 PTT's Future Major Projects

EV Manufacturing Project through HORIZON PLUS Co., Ltd. (HORIZON PLUS)

Project Progress as of December 2022: HORIZON PLUS Co., Ltd. purchased 313-rai land at Rojana Industrial Park, Nong Yai district, Chon Buri province, in the Eastern Economic Corridor (EEC), for the establishment of an EV manufacturing factory with expected production of 4-wheel EVs (personal cars) to the market by 2024 with a production capacity of 50,000 units per year in the first phase. The production capacity will be expanded to 150,000 units per year by 2030 to meet the continuously growing demand for EVs both within the country and the ASEAN.

Transmission Pipeline

- **The 5th Transmission Pipeline (Rayong - Sai Noi - North/ South Bangkok Power Plants)**
  - Total Project Progress as of December 2022: 95.26% (Including 3 phases construction)
  - COD: within 2023
- **Natural Gas Pipeline System Project (Bang Pakong - South Bangkok Power Plants)**
  - Total Project Progress as of December 2022: 18.74%
  - The meeting of ERC (June 1, 2022), EPPO (November 28, 2022), and CEPA (December 13, 2022) approved the agenda of the meeting to revise the investment for Bang Pakong Pipeline to be increased from THB 11,000 million to THB 13,590 million.
  - The National Environment Board (NEB) approved the EIA of the project on December 23, 2022.
  - COD: within 2025

Gas Separation Plant Unit 7 (GSP#7)

PTT is constructing the Gas Separation Plant Unit 7 (GSP#7) in Map Ta Phut Industrial Estate, Rayong province to replace gas separation plant Unit 1 (GSP#1) and to increase the efficiency of the gas separation plant's production process. The GSP#7 is designed to have a maximum capacity of 460 MMSCFD. It is scheduled to COD in the first quarter of 2024.

Gas Separation Plant Unit 8 (GSP#8)

- Project Progress as of December 2022: PTT is in the process of preparing Front End Engineering Design and hiring a contractor in 2023.

LNG Receiving Facilities for LNG Procurement/ Impact

Currently, PTT have long term LNG contracts with Qatargas, Shell, BP, and Petronas at 5.2 MTA and has a capability to procure LNG in order to fulfill the country demand growth in the future.

In addition, PTT procures additional 1 MTA of long-term LNG contract from PTT Global LNG Co., Ltd. (PTTGL) to further enhance national energy security. The first gas delivery will be in 2026.

- **LNG Receiving Terminal 2:**
  - Total Project progress as of December 2022: 100%
  - Total capacity of 7.5 MTA be approved by the Cabinet meeting on April 11, 2017
  - The capacity of 2.5 MTA is already COD since July 2022 and fully COD with capacity 7.5 MTA since November 24, 2022.
  - As of December 31, 2022, PTT Group's LNG terminal capacity is total at 19 MTA.
- **Other LNG Receiving Terminal Project (LNG Receiving Terminal 3):**
  - On September 24, 2019, the Cabinet approved the private entity selection, negotiations and the draft of the contract between Public Private Partnership (PPP) and the Industrial Estate Authority of Thailand (IEAT) on the development of Map Ta Phut seaport phase III (Section 1) as proposed by the Eastern Economic Corridor Office. Gulf MTP LNG Terminal Co., Ltd., a new joint venture company between PTT Tank Terminal Co., Ltd. (PTT TANK) and Gulf Energy Development Plc. (GULF) with shareholding of 30%, and 70%, respectively, is to proceed land reclamation with the investment cost of approximately THB 12,900 million which is expected to be completed by 2024, as well as having the right to construct LNG terminal 3 phase 1 with the capacity not less than 5 MTA. The LNG terminal 3 phase 1 has an investment cost approximately THB 28,000 million which is expected to be completed by the year 2027.

Summary Planned Shutdown for Gas Separation Plants in 2022

Plant	1Q2022	2Q2022	3Q2022	4Q2022
GSP#1			**SD** (Aug. 6 - 19: 14 days)	
GSP#2		**TD** (May 10 - Jun. 1: 23 days)		
GSP#3		**TD** (May 10 - Jun. 1: 23 days)	**SD** (Aug. 21 - 26: 6 days)	
GSP#4			**Major SD** (Sep. 1 - 20: 20 days)	
GSP#5			**TD** (Sep. 1 - 30: 30 days)	**TD** (Oct. 1 - 15: 15 days) **Major SD** (Dec. 5 - 19: 15 days)
GSP#6			**SD** (Jul. 9 - 12: 4 days)	
ESP		**Major SD** (May 10 - Jun. 1: 23 days)		

Summary Planned Shutdown for Gas Separation Plants in 2023

Plant	1Q2023	2Q2023	3Q2023	4Q2023
GSP#1			**SD** (Jul. 20 - 27: 8 days)	
GSP#2			**TD** (Sep. 1 - 30: 30 days)	**TD** (Oct. 1 - 4: 4 days) **Major SD** (Nov. 1 - 18: 18 days)
GSP#3			**Major SD** (Nov. 1 - 18: 18 days)	**TD** (Nov. 1 - Dec. 4: 34 days)
ESP			**TD 50%** (Sep. 1 - 30: 30 days)	**TD 50%** (Oct. 1 - 4: 4 days) **TD 50%** (Nov. 1 - Dec. 4: 34 days)

Remarks:
** TD: Turndown*
*** SD: Shutdown*

Container Terminal

The Cabinet meeting on November 9, 2021 approved the private entity selection, result from negotiations, and the draft of the contract between Public Private Partnership (PPP) with the Port Authority of Thailand (PAT) for a period of 35 years for the development project of Laem Chabang Port, Phase 3 in the part of Terminal F as proposed by the Eastern Economic Corridor Office (EEC) by letting GPC International Terminal Co., Ltd. (GPC), a joint venture company between PTT Tank Terminal Co., Ltd. (PTT TANK), Gulf Energy Development Plc. (GULF) and CHEC OVERSEA INFRASTRUCTURE HOLDING PTE. LTD. (CHEC OVERSEA), with 30%, 40% and 30% shareholding, respectively, to be the operator. The purpose of this joint venture is to operate a port business, mooring, docking, loading, and unloading services for marine vessels, including a warehouse for container transportation of at least 4,000,000 TEUs per year (TEU is equivalent to a 20-foot container). The joint investment value in the development of the port structure amounts to THB 30,871 million. Construction of the F1 Terminal is expected to commence in 2023 and commercial operation in 2025. Construction of the F2 Terminal is expected to begin in 2027 and commercial operation in 2029.

4.3 Important Financial Information

Presented financial position and performance consist of financial performance for the year ended December 31, 2022 audited by certified public accountant, EY Office Ltd., compared with financial position and performance from financial statements for the year ended December 31, 2021 and December 31, 2020.

4.3.1 Statement of Financial Position

Unit: THB million

Statement of Financial Position	2020 (Audited)	2021 (Audited)	2022 (Audited)
Assets			
Current assets			
Cash and cash equivalents	332,032	312,730	340,054
Short-term investments in financial assets	84,889	48,907	12,600
Trade accounts receivable	110,528	196,243	219,054
Other accounts receivable	51,699	64,752	142,266
Short-term lending	1,718	1,580	2,174
Inventories	93,527	170,823	222,348
Supplies	36,252	41,416	49,507
Current derivative assets	1,629	4,073	14,764
Other current financial assets	1,216	2,034	1,924
Other current assets	4,678	9,985	13,592
Assets held for sale	2,763	2,711	22,580
Total current assets	**720,931**	**855,254**	**1,040,863**

Unit: THB million

Statement of Financial Position (Continued)	2020 (Audited)	2021 (Audited)	2022 (Audited)
Non-current assets			
Other long-term investments in financial assets	23,055	46,464	54,093
Investments in joint ventures	48,932	52,280	60,357
Investments in associates	26,749	76,499	104,658
Long-term lending	9,632	8,624	8,046
Investment properties	8,026	10,459	10,736
Property, plant and equipment	1,292,717	1,436,877	1,499,330
Right-of-use assets	70,831	80,389	124,053
Goodwill	106,994	182,854	188,964
Other intangible assets	68,473	123,496	137,051
Exploration and evaluation assets	86,945	104,595	106,161
Deferred tax assets	54,694	63,795	50,760
Non-current derivative assets	3,515	2,594	1,633
Other non-current financial assets	7,950	11,168	11,424
Other non-current assets	14,739	16,036	17,503
Total non-current assets	**1,823,252**	**2,216,130**	**2,374,769**
Total assets	**2,544,183**	**3,071,384**	**3,415,632**

Unit: THB million

Statement of Financial Position (Continued)	2020 (Audited)	2021 (Audited)	2022 (Audited)
Liabilities and shareholders' equity			
Current liabilities			
Bank overdrafts and short-term loans from financial institutions	4,223	11,632	90,757
Trade accounts payable	108,189	213,944	230,366
Other accounts payable	66,684	103,851	88,322
Current portion of long-term borrowings	73,778	87,649	73,237
Current portion of lease liabilities	7,653	10,742	16,191
Short-term borrowings	-	111	784
Income tax payable	19,230	33,423	30,846
Short-term provision for decommissioning costs	1,890	8,898	10,889
Current derivative liabilities	3,719	4,412	23,013
Other current financial liabilities	3,864	5,925	6,070
Other current liabilities	7,220	10,978	16,714
Liabilities directly associated with assets held for sale	1,576	2,085	5,351
Total current liabilities	**298,026**	**493,650**	**592,540**
Non-current liabilities			
Long-term borrowings	664,732	786,224	924,943
Lease liabilities	45,117	53,468	87,681
Deferred tax liabilities	57,904	89,314	90,972
Provisions for employee benefits	34,199	36,895	32,356
Long-term provision for decommissioning costs	96,771	84,696	99,162
Deposits on LPG cylinders	11,874	12,157	12,684
Non-current derivative liabilities	5,429	3,715	7,643
Other non-current financial liabilities	20,073	12,223	4,662
Other non-current liabilities	24,213	26,102	29,296
Total non-current liabilities	**960,312**	**1,104,794**	**1,289,399**
Total liabilities	**1,258,338**	**1,598,444**	**1,881,939**

Unit: THB million

Statement of Financial Position (Continued)	2020 (Audited)	2021 (Audited)	2022 (Audited)
Shareholders' equity			
Registered share capital	28,563	28,563	28,563
Issued and fully paid-up share capital	28,563	28,563	28,563
Share premium	29,211	29,211	29,211
Surplus (deficit) from the change in the ownership interests in subsidiaries	(31,518)	3,096	10,068
Retained earnings			
Appropriated - legal reserve	2,857	2,857	2,857
Appropriated - self-insurance fund reserve	1,265	1,273	1,294
Unappropriated	869,260	922,092	957,167
Other components of shareholders' equity	(17,598)	19,605	23,431
Equity attributable to owners of the Company	882,040	1,006,697	1,052,591
Non-controlling interests of the subsidiaries	403,805	466,243	481,102
Total shareholders' equity	**1,285,845**	**1,472,940**	**1,533,693**
Total liabilities and shareholders' equity	**2,544,183**	**3,071,384**	**3,415,632**

4.3.2 Statement of Income

Unit: THB million

Statement of Income	2020 (Audited)	2021 (Audited)	2022 (Audited)
Sales and service income	1,615,665	2,258,818	3,367,203
Cost of sales and services	1,446,649	1,882,251	2,906,726
Gross profit	**169,016**	**376,567**	**460,477**
Other income	18,312	28,940	24,420
Loss on derivatives	2,266	(31,958)	(74,914)
Gain (loss) on foreign exchange rates	9,270	(6,469)	5,552
Profit before expenses	**198,864**	**367,080**	**415,535**
Selling and distribution expenses	27,199	27,246	46,212
Administrative expenses	68,792	83,045	98,015
Petroleum royalties	13,399	17,978	27,504
Operating profit	**89,474**	**238,811**	**243,804**
Share of profit from investments in joint ventures and associates	4,178	9,010	5,849
Profit before finance costs and income taxes	**93,652**	**247,821**	**249,653**
Finance costs	28,536	28,163	37,091
Profit before income taxes	**65,116**	**219,658**	**212,562**
Income tax expenses	25,166	67,590	90,462
Profit for the year	**39,950**	**152,068**	**122,100**
Profit attributable to			
Equity holders of the Company	37,766	108,363	91,175
Non-controlling interests of the subsidiaries	2,184	43,705	30,925
	39,950	**152,068**	**122,100**
Basic earnings per share (THB/share)	**1.32**	**3.79**	**3.20**

4.3.3 Statement of Comprehensive Income

Unit: THB million

Statement of Comprehensive Income	2020 (Audited)	2021 (Audited)	2022 (Audited)
Profit for the year	39,950	152,068	122,100
Other comprehensive income (loss)			
Other comprehensive income to be reclassified to profit or loss in subsequent periods			
Exchange differences on translation of financial statements in foreign currency	(828)	45,680	9,952
Gain on measurements of available-for-sale investments	-	-	-
Income taxes related to available-for-sale investments	-	-	-
Loss on debt investments measured at fair value through other comprehensive income	(22)	(2)	(27)
Income taxes related to debt investments measured at fair value through other comprehensive income	4	-	5
Gain (loss) on cash flow hedges	(1,488)	951	(38)
Income taxes related to cash flow hedges	447	(222)	62
Share of other comprehensive income (loss) of joint ventures and associates	758	494	(1,512)
Other comprehensive income not to be reclassified to profit or loss in subsequent periods			
Gain (loss) on remeasurements of defined benefits plans	(630)	4,503	5,800
Income taxes related to remeasurements of defined benefits plans	116	(1,482)	(1,332)
Gain (loss) on equity investments designated at fair value through other comprehensive income	(2,907)	9,254	(4,393)
Income taxes related to equity investments designated at fair value through other comprehensive income	67	(2,579)	1,038
Share of other comprehensive income (loss) from joint ventures and associates	(226)	76	503
Other comprehensive income (loss) for the years, net of income taxes	(4,709)	56,673	10,058
Total comprehensive income for the year	**35,241**	**208,741**	**132,158**
Total comprehensive income attributable to			
Equity holders of the Company	34,485	147,818	97,178
Non-controlling interests of the subsidiaries	756	60,923	34,980
	35,241	**208,741**	**132,158**

4.3.4 Statement of Cash Flows

Unit: THB million

Statement of Cash Flows	2020 (Audited)	2021 (Audited)	2022 (Audited)
Cash flows from operating activities			
Profit before income taxes	65,116	219,658	212,562
Adjustment of profit before income taxes to net cash provided by (used in) operating activities:			
Depreciation and amortization expenses	139,880	146,790	167,330
(Gain) loss on disposal of assets	318	121	(1,085)
(Gain) loss on disposal of investments	(2)	1,153	(801)
Gain on change in status of investments	-	(504)	(848)
Gain on bargain purchase	(125)	(10,694)	-
(Reversal of) loss on impairment of assets	11,908	13,287	12,304
Loss on impairment of investment	9	-	305
Share of profit from investments in joint ventures and associates	(4,178)	(9,010)	(5,849)
Provision for employee benefits	2,554	3,398	2,931
(Gain) loss on exchange rates	(3,683)	18,978	11,649
(Gain) loss on derivatives	3,606	(1,703)	10,243
Unrealized loss on fair value of commodity contracts	838	269	7,920
(Gain) loss on investments measured at fair value though profit and loss	156	(53)	(277)
(Reversal of) expected credit loss of accounts receivable and other assets	600	(1,604)	298
Write-off exploration assets	1,943	6,764	1,178
(Reversal of) allowance for changes in value of inventories	(469)	(163)	5,886
(Reversal of) allowance for obsolete supplies	611	1,438	(361)
Dividend income	(620)	(457)	(467)
Interest income	(3,933)	(2,522)	(3,920)
Finance costs	28,536	28,163	37,091
Others	224	31	63
Profit from operating activities before changes in operating assets and liabilities	243,289	413,340	456,152
Net operating assets (increase) decrease	19,156	(40,267)	(178,970)
Cash received from operating activities	262,445	373,073	277,182
Income taxes paid	(43,853)	(50,648)	(85,482)
Net cash provided by operating activities	218,592	322,425	191,700

Unit: THB million

Statement of Cash Flows (Continued)	2020 (Audited)	2021 (Audited)	2022 (Audited)
Cash flows from investing activities			
Cash payment of property, plant and equipment and investment properties	(143,344)	(135,678)	(161,874)
Cash payment of intangible assets	(3,609)	(2,466)	(7,469)
Cash payment of exploration and evaluation assets	(2,929)	(4,200)	(3,336)
Cash payment of right-of-use assets	(457)	(281)	(566)
Cash payment for other long-term investments in financial assets	(7,293)	(12,243)	(15,013)
Net cash payment for business acquisition	(1,615)	(207,569)	(14,508)
Cash payment for contingent considerations from business acquisition and participating interest in a joint venture	-	(1,745)	(33)
Decrease in cash from loss of control in a subsidiary	-	-	(537)
Cash payment of investments in joint ventures and associates	(2,570)	(50,379)	(35,299)
Cash payment of long-term lending	(3)	(9,650)	(2,126)
Cash payment for derivatives	(774)	(31)	(190)
Cash proceeds from disposals of property, plant and equipment, intangible assets, investment properties and right-of-use assets	253	373	1,433
Cash proceeds from disposals of other long-term investments in financial assets	15,186	4,467	3,269
Cash proceeds from business restructuring	-	1,560	-
Net cash proceeds from asset acquisition	-	382	-
Cash proceeds from disposals of investments in subsidiaries	-	-	1,407
Cash proceeds from disposals of investments in joint ventures and associates	1,182	1,774	-
Cash proceeds from long-term lending	2,275	1,222	903
Cash proceeds from derivatives	730	34	-
Cash proceeds from cancellation of leasehold in gas stations	2	-	-
Increase in short-term lendings	-	(12,384)	(44)
Decrease (increase) in short-term investments in financial assets	(53,765)	34,304	37,031
Interests received	2,865	2,008	2,826
Dividends received	5,282	5,194	7,436
Net cash used in investing activities	(188,584)	(385,308)	(186,690)

Unit: THB million

Statement of Cash Flows (Continued)	2020 (Audited)	2021 (Audited)	2022 (Audited)
Cash flows from financing activities			
Cash proceeds from issuance of ordinary shares of subsidiaries	268	53,800	9,034
Cash proceeds from resale of treasury shares of subsidiaries	-	1,354	-
Cash proceeds from long-term borrowings	210,693	207,296	289,780
Cash proceeds from derivatives	-	58	85
Cash payment for decrease in share capital of subsidiaries	-	-	(258)
Cash repayment of long-term borrowings	(73,027)	(104,120)	(181,105)
Cash payment for lease installments	(8,372)	(9,416)	(15,022)
Cash payment for derivatives	(481)	(180)	(1,668)
Cash payment for redemption of subordinated capital debentures	(965)	-	(4,988)
Cash payment for change in ownership in subsidiaries	-	(29)	(554)
Increase (decrease) in short-term borrowings	(1,125)	109	718
Increase (decrease) in bank overdrafts and short-term loans from financial institutions	(40,368)	5,539	76,767
Finance costs paid	(26,939)	(29,752)	(36,198)
Dividends paid	(51,624)	(78,469)	(85,923)
Net cash provided by financing activities	8,060	46,190	50,668
Effects of exchange rates on cash and cash equivalents	1,433	2,737	697
Exchange differences on translation	105	(5,015)	(20,287)
Cash and cash equivalents classified as held for sale	(116)	(331)	(8,764)
Net increase (decrease) in cash and cash equivalents	39,490	(19,302)	27,324
Cash and cash equivalents at the beginning of year	292,542	332,032	312,730
Cash and cash equivalents at the end of year	**332,032**	**312,730**	**340,054**

4.3.5 Financial Result by Business Group: EBITDA and Operating Profit by Segment

Unit: THB million

Earnings before Interest Expenses, Tax, Depreciation and Amortization Expenses, and Operating Profit (Loss) by Segment	2020 (Audited)	2021 (Audited)	2022 (Audited)
Gas business group			
Natural gas procurement, gas transmission and distribution, and gas separation businesses			
Sales and service income	403,626	464,038	708,852
Cost of sales and services	340,201	367,917	639,484
Gross profit	63,425	96,121	69,368
Selling and administrative expenses	9,338	10,586	10,826
Other operating income	855	962	2,665
Earnings before depreciation and amortization expenses, finance costs and tax expenses (EBITDA)	54,942	86,497	61,207
Depreciation and amortization expenses	19,246	18,729	18,302
Total segment operating profit	35,696	67,768	42,905
Petroleum exploration and production business group			
Sales and service income	160,401	219,068	331,350
Cost of sales and services	26,152	28,069	40,464
Gross profit	134,249	190,999	290,886
Selling and administrative expenses	12,577	13,963	17,152
Petroleum royalties	12,798	16,995	24,139
Other operating income	1,170	4,324	4,378
Earnings before depreciation and amortization expenses, finance costs and tax expenses (EBITDA)	110,044	164,365	253,973
Depreciation and amortization expenses	65,009	70,062	82,942
Total segment operating profit	45,035	94,303	171,031

Unit: THB million

Earnings before Interest Expenses, Tax, Depreciation and Amortization Expenses, and Operating Profit (Loss) by Segment	2020 (Audited)	2021 (Audited)	2022 (Audited)
Coal business group			
Sales and service income	10,779	16,983	33,599
Cost of sales and services	6,681	7,905	11,722
Gross profit	4,098	9,078	21,887
Selling and administrative expenses	379	793	555
Petroleum royalties	600	984	3,367
Other operating income (expenses)	57	(143)	382
Earnings before depreciation and amortization expenses, finance costs and tax expenses (EBITDA)	3,176	7,158	18,347
Depreciation and amortization expenses	1,873	1,754	1,838
Total segment operating profit	1,303	5,404	16,509
Total segment operating profit of upstream petroleum and gas business group	82,034	167,475	230,445
Oil business group			
Sales and service income	430,605	513,895	791,745
Cost of sales and services	395,240	475,532	750,740
Gross profit	35,365	38,363	41,005
Selling and administrative expenses	19,729	19,863	22,748
Other operating income	2,462	2,307	2,705
Earnings before depreciation and amortization expenses, finance costs and tax expenses (EBITDA)	18,098	20,807	20,962
Depreciation and amortization expenses	5,385	5,908	6,348
Total segment operating profit	12,713	14,899	14,614
International trading business group			
Sales and service income	656,218	1,146,564	2,172,566
Cost of sales and services	655,526	1,133,967	2,155,382
Gross profit	692	12,597	17,184
Selling and administrative expenses	11,612	6,415	10,500
Other operating income	10,154	4,558	7,213
Earnings before depreciation and amortization expenses, finance costs and tax expenses (EBITDA)	(766)	10,740	13,897
Depreciation and amortization expenses	288	204	954
Total segment operating profit (loss)	(1,054)	10,536	12,943

Unit: THB million

Earnings before Interest Expenses, Tax, Depreciation and Amortization Expenses, and Operating Profit (Loss) by Segment	2020 (Audited)	2021 (Audited)	2022 (Audited)
Petrochemicals and refining business group			
Sales and service income	728,568	1,037,276	1,473,678
Cost of sales and services	688,341	888,953	1,324,979
Gross profit	40,227	148,323	148,699
Selling and administrative expenses	22,622	30,002	41,876
Other operating income	3,033	2,412	2,896
Earnings before depreciation and amortization expenses, finance costs and tax expenses (EBITDA)	20,638	120,733	109,719
Depreciation and amortization expenses	37,192	38,945	43,538
Total segment operating profit (loss)	(16,554)	81,788	66,181
Total segment operating profit (loss) of downstream petroleum business group	(4,895)	107,223	93,738
New business and infrastructure business group			
Sales and service income	76,226	81,262	148,424
Cost of sales and services	52,442	59,700	124,080
Gross profit	23,784	21,562	24,344
Selling and administrative expenses	2,666	3,716	9,655
Other operating income	1,042	3,072	1,703
Earnings before depreciation and amortization expenses, finance costs and tax expenses (EBITDA)	22,160	20,918	16,392
Depreciation and amortization expenses	10,457	10,736	12,952
Total segment operating profit	11,703	10,182	3,440
Other businesses group			
Sales and service income	3,439	3,558	4,063
Cost of sales and services	3,423	3,759	4,257
Gross profit	16	(201)	(194)
Selling and administrative expenses	4,170	4,717	4,929
Other operating income	1,485	1,569	1,860
Earnings before depreciation and amortization expenses, finance costs and tax expenses (EBITDA)	(2,669)	(3,349)	(3,263)
Depreciation and amortization expenses	430	452	456
Total segment operating loss	(3,099)	(3,801)	(3,719)
Total segment operating profit before unallocated income (expenses) and intercompany elimination	85,743	281,079	323,904
Add (less) intercompany elimination	49	87	54
Total operating profit by segment	85,792	281,166	323,958

4.3.6 Financial Ratios

Financial Ratios and Earnings per Share	Unit	2020 (Audited)	2021 (Audited)	2022 (Audited)
Liquidity Ratios				
Current ratio	Times	2.42	1.73	1.76
Quick ratio	Times	1.77	1.13	0.96
Accounts receivable turnover	Times	11.33	14.43	16.01
Collection period	Days	32.21	25.30	22.79
Inventory turnover	Times	13.69	14.24	14.79
Average inventory period	Days	26.65	25.63	24.69
Accounts payable turnover	Times	10.76	11.69	13.08
Payment period	Days	33.92	31.23	27.90
Cash cycle	Days	24.95	19.70	19.58
Profitability Ratios				
Gross profit margin	%	10.46	16.67	13.68
Net profit margin	%	2.47	6.73	3.63
Return on equity	%	4.29	11.47	8.85
Activity Ratios				
Return on asset	%	1.59	5.42	3.76
Return on fixed assets	%	3.09	11.14	8.32
Total asset turnover	Times	0.64	0.80	1.04
Solvency Ratios				
Debt to equity[1/]	Times	0.62	0.64	0.78
Interest coverage	Times	7.91	15.20	13.25
Earnings per share				
Earnings per share[2/]	THB/Share	1.32	3.79	3.20

Remarks:

[1/] Debt to equity = Interest bearing debt divided by Total shareholder's equity

[2/] Calculated by the weighted average number of ordinary shares as of December 31, 2020, December 31, 2021 and December 31, 2022 amounting to 28,563.00 million shares

5. General Information and Other Important Information

General Information

5.1 Other Important Information

Juristic persons whose shares are held by the Company: Details as specified under 1.3 PTT Group's Shareholding Structure.

5.2 Legal Disputes

As of December 31, 2022, the legal disputes over issues in which PTT is involved (as illigant) are lawsuits that have not been finalised and have significant impacts on PTT's business or do not arise from the ordinary course of business are in detail as follows.

5.2.1 NACAP Asia Pacific (Thailand) Co., Ltd. exercised its rights under the contract by submitting a statement of claim in the arbitration process in relation to the Sai Noi - North/ South Bangkok Power Plant Gas Transmission Pipeline Contract

NACAP Asia Pacific (Thailand) Co., Ltd. filed claims with the Thai Arbitration Center demanding damages from PTT on the grounds of change orders, additional work, and others under the Sai Noi - North/ South Bangkok Power Plant Gas Transmission Pipeline Contract. PTT viewed that such claims were incompliant with the contract but also involved the assignment of the rights that had not been settled. Then NACAP Asia Pacific (Thailand) Co., Ltd. was ordered by the Central Bankruptcy Court to be under absolute receivership and adjudged bankrupt. The official receiver then assumed the proceeding of the arbitral dispute on behalf of NACAP Asia Pacific (Thailand) Co., Ltd. In such a bankruptcy case, PTT as a creditor has applied for debt repayment. Regarding the arbitral dispute, PTT filed a statement of defense to completely deny all claims made by NACAP Asia Pacific (Thailand) Co., Ltd. together with a counterclaim for damages from NACAP Asia Pacific (Thailand) Co., Ltd. Subsequently, the arbitral tribunal rendered an award that PTT to make a partial payment of damages to NACAP Asia Pacific (Thailand) Co., Ltd. However, PTT viewed that such an arbitral award was erroneous both on factual and legal grounds, and accordingly PTT filed a motion to set aside the arbitral award. NACAP Asia Pacific (Thailand) Co., Ltd. then filed a motion to enforce the arbitral award with the Civil Court. On October 17, 2017, the Civil Court issued an order to enforce the arbitral award with a reduction of the amount to be paid. Nevertheless, PTT filed an appeal with the Supreme Court to appeal the order of the Civil Court. On December 18, 2019, the Supreme Court issued an order not to accept the appeal of PTT. As a consequence, the case became final, and PTT, therefore, was required to pay for damages under the order of the Civil Court. On January 8, 2020, PTT deposited THB 4,543.5 million with the Civil Court for debt payment under the court's judgment. However, NACAP Asia Pacific (Thailand) Co., Ltd. had an objection that PTT's deduction of the withholding tax from the payment was incorrect. At present, the matter is under the Supreme Court's consideration.

5.2.2 Official Receiver in charge of NACAP Asia Pacific (Thailand) Co., Ltd. submitted a statement of claim to arbitration in relation to the Third Onshore Gas Transmission Pipeline Laying Project

As a result of NACAP Asia Pacific (Thailand) Co., Ltd. being ordered by the Central Bankrupt Court to be under absolution receivership and adjudged bankrupt as specified in 5.2.1, the official receiver filed a statement of claim with the Thai Arbitration Center demanding that PTT make payment for wages and damages on the ground of breaches of contract under the contract of the Third Gas Transmission Pipeline Project (Onshore). PTT viewed that such claims were incompliant with the contract but also involved the assignment of the rights that had not been settled and PTT had contentions and claims against NACAP Asia Pacific (Thailand) Co., Ltd. Accordingly, PTT filed a statement of defense to completely deny all claims made by NACAP Asia Pacific (Thailand) Co., Ltd. together with a counterclaim for damages from NACAP Asia Pacific (Thailand) Co., Ltd. Subsequently, on November 30, 2018, the arbitral tribunal rendered an award to dismiss the statement of claim filed by NACAP Asia Pacific (Thailand) Co., Ltd. and to dismiss the counterclaim of PTT. The parties to the dispute had the right to file a motion to set aside the arbitral award with a competent court within 90 days from the date of receipt of a copy of the arbitral award. As for the bankruptcy case, PTT has applied for debt repayment which is under the process of the bankruptcy case. On March 8, 2019, the official receiver of NACAP Asia Pacific (Thailand) Co., Ltd. filed a motion to set aside the arbitral award with the Civil Court and PTT filed an objection. Then on October 6, 2020, the Civil Court rendered a judgment to dismiss the motion to set aside the petition filed by the official receiver of NACAP Asia Pacific (Thailand) Co., Ltd. On January 6, 2021, the official receiver of NACAP Asia Pacific (Thailand) Co., Ltd. filed an appeal with the Supreme Court to appeal the judgment of the Civil Court. On March 30, 2021, PTT, by the public presecutor, filed the defence to the appeal with the Supreme Court. On August 2, 2022 the Civil Court announced the Supreme Court's judgement, in which the Supreme Court dismissed the official receiver's appeal. The case was final by the Supreme Court's judgement.

5.2.3 Punj Lloyd Ltd. filed a lawsuit against PTT with the Civil Court on the grounds of termination of the Contract of the Fourth Gas Transmission Pipeline Project

On February 25, 2014, Punj Lloyd Ltd., the construction contractor of the Fourth Gas Transmission Pipeline Project, as a plaintiff, filed a lawsuit against PTT as a defendant with the Civil Court, alleging that PTT had wrongfully terminated the contract and was in breach of the contract, and demanding that PTT pay outstanding wages and damages. PTT viewed that all of its actions had been in compliance with the contract and therefore forwarded the case to the Office of The Attorney General for consideration to argue the case for PTT and the public prosecutor filed an answer with the Civil Court. Subsequently, the Civil Court issued an order to transfer the case to the Central Administrative Court for consideration and judgment because the Civil Court and the Central Administrative Court jointly agreed that this case was an administrative case. The Civil Court has already transferred the case to the Central Administrative Court. At present, the case is under the consideration of the Central Administrative Court. Should the Central Administrative Court rule that PTT was not liable as alleged in the complaint of Punj Lloyd Ltd., the Central Administrative Court shall render a judgment to dismiss the case. On the contrary, should PTT be found liable, the court shall render a judgment that PTT makes the payment for outstanding wages and/or wages for additional works and/or damages, the amount of which are within the discretion of the Central Administrative Court.

5.2.4 PTT filed a lawsuit against Punj Lloyd Ltd. with the Central Administrative Court to claim damages under Contract of the Fourth Gas Transmission Pipeline Project

After PTT had terminated the contract with Punj Lloyd Ltd., PTT continued the construction of the Fourth Gas Transmission Pipeline Project until its completion. On June 20, 2018, PTT, represented by the public prosecutor, filed a lawsuit with the Central Administrative Court to demand that Punj Lloyd Ltd. pay damages for breach of contract and abandonment of work under the Contract of the Fourth Gas Transmission Pipeline Project. Then on October 15, 2020, the Central Administrative Court issued an order of joinder that this case be tried together with the case filed by Punj Lloyd Ltd. (specified in 5.2.3). At present, the case is under the consideration of the Central Administrative Court.

On September 25, 2019, Punj Lloyd Ltd. filed a statement of fact with the Central Administrative Court that on March 8, 2019, the National Company Law Tribunal of India had ordered that Punj Lloyd Ltd. be under the Corporate Insolvency Resolution Process. Subsequently, Punj Lloyd Ltd. has been brought into the liquidation process under the Law of India and the PTT also filed a petition to request the payment of debt in accordance with the Law of India. At present, the matter is under the proceedings. Regarding the Central Administrative Court's case, the Court is in consideration of the proceeding of the case.

5.3 Secondary Market

-None-

5.4 Regularly Contacted Financial Institutions

Bangkok Bank Plc.
333 Silom Road, Silom,
Bang Rak, Bangkok 10500
Krungthai Bank Plc.
35 Sukhumvit Road, Klong Toei Nuea,
Watthana, Bangkok 10110
Kasikornthai Bank Plc.
400/22 Phahon Yothin Road, Sam Sen Nai,
Phaya Thai, Bangkok 10400
Siam Commercial Bank Plc.
9 Ratchadaphisek Road,
Chatuchak, Bangkok 10900
Bank of Ayudhya Plc.
1222 Rama III Road, Bang Phongphang,
Yan Nawa, Bangkok 10120

Section 2

Corporate Governance

6. Corporate Governance
7. Governance Structure and Key Data on the Board of Directors, Specific Committees, Management, Employees and Others
8. Corporate Governance Milestones
9. Internal Control and Connected Transaction

6. Corporate Governance

6.1 Overview of CG Policy and Guidelines

As the national energy company with a state-owned enterprise and a listed company on The Stock Exchange of Thailand (SET), PTT recognizes its vital mission of good management with transparency, establishing equitability among all stakeholders while striving to develop itself into Corporate Governance (CG) role model. It is convinced that CG under good management will lead to fairness and investors' confidence, create a long-term value for shareholders, boost stakeholders' confidence, and give the corporation the most suitable, efficient, and effective management system while enhancing its competitiveness for sustainable growth.

Ever since its privatization into PTT Plc. and distribution of its shares on SET in late 2001, the Board of Directors has adopted CG as its guiding principles by requiring the preparation of business ethics policy and ethics of the Board, senior executives, management, and employees in compliance with CG practices as its code of conduct for organizational standards and proper guidelines. PTT has issued its CG policy and CG Handbook and delivered to directors, management, and employees to sign, acknowledge and comply with. The handbook has been regularly revised to improve the standard of operations to comply with SEC and SET's CG for listed companies (CG Code) as well as comments and recommendations from IOD's CG Assessment Report, including the Organization for Economic Cooperation and Development, the ASEAN Corporate Governance Scorecard (ASEAN CG Scorecard), and the Dow Jones Sustainability Indices (DJSI) together with best practices of leading international companies. The "Corporate Governance, Ethical Standards and Code of Business Ethics Handbook" or CG Handbook is in its 5th revision.

PTT has defined that corporate governance is part of the vision, mission, and values of the organization. The goal is to be a company with sustainable business of continuous growth that drives every life for national economy promotion, according to the vision "Powering Life with Future Energy and Beyond." PTT is ready to meet the future lifestyle, promotes the development of innovation and technology (Technology for All) along with creating business cooperation (Partnership and Platform) based on corporate governance (CG), transparency and sustainability.

Corporate Governance Policy

PTT duly reviewed its CG Policy and handbook to suit prevailing laws and good practices, economic and social circumstances and requires all directors, management, and employees to acknowledge it in writing and observe all policies in the course of their works to illustrate the commitment to the practical application of such policy and code of conduct to their jobs. The Board's policy on CG is as follows:

1. The Board of Directors (The Board), management, and all employees shall commit to PTT's six Good Corporate Governance Principles, namely Accountability, Responsibility, Equitable Treatment, Transparency, Vision to Create Long-term Value, and Ethics with an organizational structure that fairly balances the roles of the Board, management, and shareholders.
2. The Board shall perform their duties with dedication, responsibility, and independence, and there shall be clear segregation between the role and responsibilities of the Chairman and the President & CEO. The Board shall also define the Board's structure, composition, and qualifications for efficient and effective performance.

3. The Board and management shall play a vital role in formulating PTT's vision, strategies, policies, and key plans while taking into consideration risk factors and impacts, and shall oversee, monitor, define and establish appropriate risk management with proper resource allocation, as well as ensure the reliability of accounting systems, financial reports, and accounting audits. PTT shall be engaged in ethical businesses with good corporate citizenship while encouraging innovation to adjust itself amid changes and strengthening sustainable long-term competitiveness.
4. The Board and management shall be the role models for ethics and perform duties under PTT's good corporate governance guidelines as well as oversee and resolve conflicts of interest and connected transactions.
5. The Board may appoint specific committees as deemed appropriate, to assist in prudently reviewing critical matters.
6. The Board shall perform an annual self-assessment to be used as a framework for reviewing the Board's performance.
7. The Board shall establish the PTT's Corporate Governance, Ethical Standards, and Code of Business Ethics Handbook which the Board, management, and all employees must adhere to in parallel with PTT's Articles of Association, regulations, and rules.
8. The Board, management, and employees shall arrange for disclosure of PTT's information, both financial and non-financial, to be carried out adequately, credibly, and timely so that shareholders and all stakeholders may receive such information in a fair and equitable manner. Corporate Communication and Investor Relations shall be responsible for providing the information to investors and the public.
9. PTT's shareholders shall receive equitable treatment and have equal rights to access PTT information and appropriate communication channels with PTT. The Board, management, and employees shall also advocate shareholders' engagement with PTT.
10. The Board shall ensure an appropriate system for the selection and appointment of all key management positions under a fair and transparent nomination process.
11. The Board shall establish an efficient Anti-Fraud and Corruption principle to ensure that the management recognizes and takes Anti-Fraud and Corruption actions, as well as conforming to such measures.

PTT has published the latest version of "Corporate Governance, Ethical Standards, and Code of Business Ethics Handbook" on its intranet and website in Thai and English for the benefit of and reference for Thai and foreign investors and interested parties together with stakeholders.

Policy and Guidelines for the Board

PTT's Board of Directors shall comprise the person who has knowledge, expertise, and experience considered beneficial to the company. They shall devote their time to their duties and endeavor to perform them well. The Board is appointed by shareholders to oversee the company's operations. The Board, in turn, appoints a management team responsible for business operations, the specific committees to oversee the delegated specific matters, the company's auditor, and shall assign the Company Secretary to manage meetings and compliance with laws and regulations. The policy and guidelines for the Board are as follows:

1. Composition, Qualifications and Appointment of the Board

The Board of Directors, led by the Chairman of the Board, shall direct and control management to ensure the effectiveness and efficiency of operations, achievement of the company's targets and adding value for shareholders, the government, the public, and other stakeholders.

2. Independence of the Board

The Board shall consider, express opinions on, and vote for activities under their authority. If a decision is made under pressure from work, family, or any conflict of interest, it may be made in bias to benefit the directors in question, their family, or other contacts. The independence of the Board must be emphasized to protect the shareholders and the company's benefit. Therefore, any director who is not entirely independent shall not make decisions.

3. Role, Responsibilities and Authority of the Board

The Board shall act professionally on behalf of shareholders with high responsibility and accountability in order to steer the company in the right direction, make decisions on important matters with care and loyalty, and protect the benefits of all stakeholders. Therefore, the board must perform its duties independently from management. Responsibilities of the Board also include, but are not limited to, overseeing management's operations and results, managing risks, and determining remuneration.

4. Role and Responsibilities of the Chairman

- The Chairman is independent of the management and has not been involved in routine management with clear segregation of roles between the Chairman and the management.
- The Chairman shall regulate the board for ensuring highly efficient operations. Also, the Chairman shall support and provide assistance to the management's operations under the authority delegated by the Board for the achievement of the company's objectives and targets.
- The Chairman shall encourage directors to perform their duties within the scope of duties and authority with due responsibility for shareholders and stakeholders while adhering to PTT's Corporate Governance, Ethical Standards and Code of Business Ethics. The Chairman shall also advocate directors' efforts for promoting a corporate culture of ethics, and good corporate governance.
- The Chairman shall determine, together with the President & CEO, the Board's meeting agenda.
- The Chairman shall serve as an efficient chairman of the board's meetings and the shareholders' meetings.
- The Chairman shall allocate sufficient time for the management to propose topics and for directors to express their opinions on significant matters in a prudent manner. The Chairman shall also promote constructive relations among directors as well as between the Board and the management.

5. Establishment of Specific Committees

To ensure a thorough and efficient examination of the key operation, the Board has established the following 5 specific committees, namely the Audit Committee, Nominating Committee, Remuneration Committee, Corporate Governance and Sustainability Committee, and Enterprise Risk Management Committee.

6. Board Meetings and Receipt of Relevant Documents and Information

Every board member should regularly attend board meetings. Office of the President is responsible for coordinating the meetings, arranging the venue, and preparing appropriate documents. Each director shall be informed in advance of the date and agenda of each meeting and receive supporting information.

7. Company Secretary

The Board appoints a Company Secretary, responsible for arranging board meetings and shareholder's meetings to ensure that they are transparently organized in compliance with applicable laws and regulations.

8. Evaluation of the Performance of the Board

The Board shall evaluate its performance annually to be used as a framework for evaluating the board's performance, and consider, review and analyze its performance for further improvement.

9. Remuneration of Directors and the President & CEO

The Board and the President & CEO shall not remunerate themselves due to a conflict of interest. However, the board through the Remuneration Committee shall be responsible for determining the remuneration. The remuneration of directors shall propose to shareholders for approval. (Details on remuneration for directors and management are reported under Section 2: **"7.4.2 Policy on Remuneration for Management"** and **"8.1.2 (2) Remuneration for the Board")**.

10. Succession Plan

The Board must ensure that PTT has an appropriate nomination process for key management positions at all levels. The President & CEO will be selected through a nomination process that will consider both internal and external candidates, which follows the Standard Qualifications of Directors and State Enterprise Officer Act. PTT has taken steps to develop its executives and set up Group Leader Development to lay down a succession plan for personnel when the time comes for assuming higher positions that become vacant, namely: the President & CEO, Senior Executive Vice President or equivalent, Executive Vice President or equivalent, and Vice President or equivalent.

11. Directors' Development

PTT desires that the directors shall develop their knowledge, competencies, and skills in terms of business operation, good corporate governance, and other curriculum that are beneficial to their performance. To this end, PTT shall support and encourage their training with the Thai Institute of Directors Association (IOD) and other institutions in applicable courses throughout the year, as well as organize regular in-house briefings by inviting experts and consultants to present helpful data for business and directors' performance. For new directors, PTT arranges an orientation program and provides each with a Director's Handbook, documents, and useful information. Lectures on introduction to PTT's business and site visits to PTT's operations are provided within three months of their appointment to establish mastery of the business and various operations' knowledge needed, including policies and practices of good corporate governance.

12. The Criteria for Serving in Various Positions of PTT Group's Executives

Principles for holding a position of director, advisor, qualified person, or holding any position in a company, agency, or other juristic persons of PTT Group's executives are detailed in line with the policies and guidelines of PTT Board of Directors, which are in PTT's Corporate Governance, Ethical Standards, and Code of Business Ethics Handbook, in Thai and English, on PTT Intranet and PTT website.

Governance of Subsidiaries and Associated Companies

Governance Mechanisms

PTT defined a governance policy for PTT Group by preparing the "PTT Group Way of Conduct" guidelines, which compile work procedures in various aspects of PTT Group so that their work procedures shall be in conformity and unity as a governance tool for PTT and affiliates. All are required to practice and drive towards the same standard across PTT Group through PTT's representatives assigned as directors, management, and officers. This way, PTT Group commands unity in action, leading to synergy, enhanced capability, and strength in international competition for PTT Group to in turn lead to joint growth in a transparent and sustainable way.

Below is the scope of PTT Group management, which consists of five governance principles:

1. **Definition of Key Strategic Positions for PTT's executives and employees,** based on the joint agreement of PTT Group or other business terms.
2. **Rules and Regulations,** including directives that form part of the governance designed to drive linkages between PTT Group's policy governance and its successful implementation. Such rules, regulations, policies, and directives are to be put into practice and driven towards a uniform standard throughout the group by PTT's representatives assigned to serve in these companies as directors, top executives, management, and officers.
3. **Reporting Line and Performance Management:** PTT Group must report implementation updates under assorted policies to PTT management and/or the Board.
4. **Multi-level Governance:** This is to proceed through PTT Group Way of Conduct from PTT direct to subsidiaries. PTT authorizes this governance through its executives serving as the top executives there. To this end, such companies must develop their own group governance to convey the PTT Group Way of Conduct concept to its affiliates so that a single standard may govern the entire PTT Group.
5. **Management Committee:** Such as PTT Group Management Committee (PTTGMC) and other policy committees play a key role in driving the efficiency of PTT Group governance since they represent a forum for consultation and joint definition of business directions. In place is regular performance reporting under PTT Group Way of Conduct by PTT Group to PTTGMC to track business efficiency and effectiveness. PTT also defined the key roles and duties under PTT Group Way of Conduct as follows:

Roles of the Shareholder:

- Appointing the Board to work on their behalf.
- Defining the Company's business direction or deciding on matters of significant impact through shareholders' meetings.
- Attending to exercise their voting rights at shareholders' meetings to appoint or remove directors, appoint the external auditor, and consider matters affecting the company, including dividend payout allocation, definition, or amendment of the articles of association or memorandum of association, capital increase or decrease, and approval of extraordinary items.
- Auditing the board's performance.

Roles of the Board:

- Steering the company for sound management by defining objectives and goals, strategies, policies, and allocating key resources for objective and goal achievement, including monitoring, assessing, and ensuring performance reporting.
- Creating sustainable value for the business, leading to competitiveness and outstanding performance outcomes with due regard for long-term impacts. Engaging in business with ethics and respect for rights while exercising responsibility for shareholders and stakeholders, among others.
- Ensuring that all directors and management execute their duties of care, loyalty, obedience (compliance with the law, corporate objectives, articles of associations, resolutions of the Board and shareholders' meetings), and of disclosure (of accurate, complete, transparent, and timely information).
- Assigning explicit scopes of duty to the President and management and monitoring execution as assigned.

Roles of Top Management:

- Managing the company as assigned by the board, specifically by strictly managing the company under the plan and budgets approved by the Board with integrity and honesty, and prudently while acting in the company's and shareholders' best interests.
- Providing linkage of strategies and policies between the company and PTT Group through tangible implementation.
- Executing duties of care, loyalty, obedience (compliance with laws, corporate objectives, articles of associations, resolutions of the Board and shareholders' meetings), and of disclosure (of accurate, complete, transparent, and timely information).
- Executing Governance, Risk, and Compliance (GRC) and providing cooperation to internal audit.

Policy on Serving as Directors in Other Companies of Directors and Management

In 2022, PTT had 35 affiliated companies, six of which are SET-listed flagships. PTT, therefore, adopted PTT Group management structure for synergy and alignment of policies. To achieve this, the Board of Directors appointed directors or management team members as directors in these companies to supervise policies and business management which aligned with PTT's policies for the benefit and value addition of all stakeholders. The objectives of such appointments are:

1) To ensure that the management of a given company aligns with the policies of PTT Group, monitor its overall business performance to align with PTT's policy and institute comparable standards.
2) To establish synergy for the business of PTT Group and add value to all related parties, including Thailand as a whole.
3) To apply specific expertise in support of business, including financial know-how to improve accounting and financial processes to enable a given company to grow robustly. This includes assistance to companies outside PTT Group. The resulting application of the knowledge and expertise gained from serving in such leading companies will enhance the benefit to PTT and foster cordial relations and business alliances with PTT.
4) This is part and parcel of the responsibility of the directors and management of PTT.

PTT ensures its consideration of executives or outsiders from the Ministry of Finance's (Director's Pool) for appointment within PTT Group, regarded as a state enterprise, based on the Act on Standard Qualifications of State Enterprise Directors and Employees. Chosen directors from the pool must make up no less than one-third of other directors of a given state enterprise. As of December 31, 2022, PTT had 20 members who belonged to the Director's Pool. It also ensures that PTT executives and such outsiders who serve as directors of PTT affiliates serve on no more than 3 PTT affiliates or other state enterprise affiliates. This is designed to lower risks of conflicts of interest and ensure conformance to applicable laws, as well as to the Cabinet resolution of January 24, 2011, on fraud preventive measures at state enterprises, entitled "The appointment of senior government officials or persons as directors on multiple state enterprises", as proposed by NACC.

In addition, the Board defined guidelines and criteria for serving in various positions by PTT Group's executives. In 2015, the Board decided to adopt them as part of the CG Handbook.

Policy and Guidelines Related to Shareholders and Stakeholders

1) Shareholders' Rights

As the owners, shareholders are entitled to determine PTT's business direction or decide on matters of significant impact. Shareholders' meetings, therefore, serve as their key forums for the expression of views, questioning, and voting apart from the election of directors to supervise PTT's operations on their behalf. Shareholders are entitled to attend shareholders' meetings, take adequate deliberation time, and acknowledge meeting minutes.

Shareholder's Meeting

PTT schedules an Annual General Meeting (AGM) within 4 months of the annual closing date of its accounting books. For urgent matters that affect or involve shareholders' interests or involve conditions, regulations, or laws that require shareholders' approval, however, it can call an extraordinary meeting of the shareholders (EGM).

In 2022, the AGM was scheduled for April 8, 2022, at the PTT Auditorium, 2nd floor, PTT Head Office, 555 Vibhavadi Rangsit Road, Chatuchak, Bangkok 10900 by strictly complying with measures to prevent the spread of COVID-19 and the guidelines of the AGM Checklist of prepared by the Thai Investors Association (TIA), Thai Listed Companies Association (TLCA), and Securities and Exchange Commission (SEC). In 2022, PTT received a full score of 100 points for the 10th consecutive year and no Extraordinary General Meeting of Shareholders was called.

Delivering Meeting Notices

For the 2022 AGM, the Board meeting No. 2/2565 (2022) on February 17, 2022, resolved to call a meeting on April 8, 2022. Its decision, meeting date, and meeting agenda were disclosed in detail ahead of time by announcing on SET's website to notify shareholders before sending meeting notices. PTT assigned Thailand Securities Depository Co., Ltd. (TSD), its securities registrar, to mail the notices together with agenda details and accompanying documents, supplementary and supporting information for decision-making, opinions of the Board, complete minutes of the last meeting, Form 56-1 One Report, meeting documents, and proxy forms with complete instruction for shareholders more than 14 days before the meeting date. The meeting notices were sent on March 17, 2022, and 3 days before the meeting, the invitation was announced through one Thai and one English newspaper, each for 3 consecutive days (March 30 - 31 and April 1, 2022), to allow shareholders enough time to prepare themselves for the meeting.

The AGM meeting notice and supporting documents were made available at PTT's website 30 days before the meeting date (starting on March 8, 2022).

On the Meeting Date

Before the meeting, the Chairman of the meeting introduced the directors, management, the external auditor, and the legal advisers who served as neutral parties and witnesses. The Chairman then elaborated on the voting and ballot counting for individual agenda items under PTT's Articles of Association as well as voting procedures for each item. Once the information had been provided on each item, the Chairman gave a chance for all attendees to comment or provide recommendations and ask questions, allowing adequate time for debate. For good public hygiene, PTT provided paper and question forms online for shareholders instead of using microphones. The Chairman and management answered all questions clearly and precisely, treating all questions with due respect. For the election of directors, individual votes were required.

The Chairman ensured that the meeting proceeded by the order of the agenda and did not add any item without notifying shareholders in advance. If the meeting should decide to change the order of the agenda, it would need, under PTT's Articles of Association, at least two-thirds of the votes of the shareholders in attendance. Alternatively, the shareholders with at least one-third of all subscribed shares may ask the meeting to consider other matters not mentioned in the meeting notice. At the 2022 AGM, the order of the agenda was not changed, and there was no request to consider any other matter.

At every meeting, the minutes must be completely and accurately recorded with the vote tally on each applicable agenda item. As a rule, a shareholders' meeting lasts 3 - 4 hours. The 2022 AGM began at 1:30 p.m., with registration beginning at 11:00 a.m. At the meeting's opening, a total of 1,954 shareholders registered, of whom 71 were shareholders and 1,883 were proxy holders, holding a total of 23,169,003,723 shares, or 81.1155% of the total, which exceeded one-third of all PTT's subscribed shares of 28,562,996,250. Below is a description of meeting attendants and those responsible for issue clarification:

- All 14 PTT directors attended the meeting (Due to Mr. Don Wasantapruek pass away on March 14, 2022, representing as 100% of the Board attend the meeting). The Chairman presided as the Chairman of the meeting with the specific committee chairmen, members, the President & CEO, Chief Operating Officer - Upstream Petroleum and Gas Business Group, Chief Operating Officer - Downstream Petroleum Business Group, Chief New Business and Infrastructure Officer, and Chief Financial Officer together provided supporting information on stage and through electronic channel. The Senior Executive Vice Presidents, Executive Vice Presidents, and Management of PTT Group attended at the front rows to provide information for relevant questions. Independent directors served as proxies for minor shareholders.
- Auditors from EY Office Limited are Miss Waraporn Prapasirikul and Mr. Kittiphun Kiatsomphob.
- Legal advisers from Weerawong, Chinnavat & Partners Ltd. (witnesses in charge of the examination of voting disputes throug out the meeting): Mrs. Veeranuch Thammavaranucupt and Miss Pratumporn Somboonpoonpol.

Shareholder Count (as the AGM adjourned at 3:30 p.m.)

A total of 2,006 shareholders, 91 shareholders and 1,915 proxy holders attended the AGM, representing a total of 23,208,062,206 shares or 81.2522% of the total shares.

Practical Guidelines for Reporting Conflicts of Interest

As specified in PTT CG Handbook, all directors, management, and employees must prepare reports on conflicts of interest, consisting of annual reporting forms and a new interim reporting format in case of changes. At a given meeting, those with vested interests or conflicts of interest with PTT must inform the meeting to excuse themselves and abstain from voting on each such matter.

At each shareholders' meeting, any director with vested interests or involvement in any agenda item must inform the meeting to excuse themselves and abstain from voting on each applicable agenda item.

Disclosure of Shareholders' Meeting Results

For the 2022 AGM, PTT submitted a summary of AGM resolutions to SET and SEC on the evening of the meeting date (April 8, 2022). It also submitted the minutes of the AGM (each agenda clearly separated, the number of directors in attendance absence, questions raised by shareholders, and answers from directors, together with the voting tallies of each agenda item) to SET and SEC within 14 days of the meeting. Meeting information, videorecording, photos, and audio-recording are accessible through PTT's website.

2) Equitable Treatment of Shareholders

PTT treats all shareholders fairly despite their different shareholding proportions and corresponding voting power. Shareholders' fundamental rights are conserved regardless of their gender, age, race, nationality, religion, belief, social status, physical impairment, or political inclination. Information on the shareholders' meeting was announced ahead of the meeting in Thai and English. Directors with vested interests in any agenda item must excuse themselves from the meeting on that item. All shareholders have equal rights to take part in PTT's activities.

Proposing Additional Meeting Agenda Items and Nominating Directors

To enable minor shareholders to take part in business oversight, for the 2022 AGM, PTT has defined the criteria and consideration process for entitling them to propose meeting agenda items or nominate directors in advance, or both, so as to deliberate agenda items that could prove useful to PTT, including the selection of qualified directors to perform their duties efficiently in the best interests of PTT, shareholders, and stakeholders. In practice, shareholders with a combined holding of at least 5% of the total eligible votes or at least 1 million shares held uninterrupted for at least one year could propose agenda items or nominate directors before the AGM from September to November 2021, in case the nomination of directors needed the approval of the State Enterprise Policy Committee (SEPC), under the guidelines for the appointment of state enterprise directors under the resolution of the Cabinet of August 6, 2019.

For the 2022 AGM, PTT posted such criteria on its website and an announcement on SET's website from September 1 to November 30, 2020. However, this attracted no recommendation of such agenda items or nomination of directors, and the Company Secretary duly informed the Board meeting on the matter. In addition, PTT informed shareholders to submit questions in advance for the 2022 AGM via 3 channels, namely acknowledgment mail sent together with the invitation letter, electronic mail at corporatesecretary @pttplc.com and facsimile number 0-2537-3887. In the 2022 AGM, there were shareholders who sent questions in advance through the aforementioned channels and PTT clarified the details to them and disclosed in the Minutes of the Meeting.

Facilitating Shareholders at the Meeting

Though the AGM was convened during the COVID-19 pandemic, when the safety and health of attendees were crucial, PTT did its best to facilitate all shareholders by manning officers to welcome and take care of them and providing adequate convenience under social distancing measures. Security precautions and emergency contingency plans were in hand. The web-live broadcast was provided on PTT's website. Examination of registration credentials was available seven days in advance. Officers provided photocopying services and verified documents. On the meeting day, registration opened two and a half hours early and was extended until the period before the last meeting agenda. A barcode system facilitated registration and voting.

Since most shareholders at the AGM were Thais, it was conducted in Thai. However, for the benefit of foreign shareholders, PTT commissioned the translation of shareholders' meetings, supplementary documents, and relevant documents into English. Its website is also bilingual. It also provided officers with a good command of English on hand at meetings to facilitate foreign shareholders. If shareholders cannot communicate in Thai but want to pose queries or discuss topics at the meeting, PTT arranges for suitable communication and provides translation into Thai for both queries and answers for the benefit of other shareholders to preserve their rights and ease communication needs for foreign shareholders.

Appointing Proxies

To maintain the rights of those who could not attend the 2022 AGM in person, they could appoint proxies or delegate their votes to any independent director in attendance. To this end, PTT has specified these independent directors' names on proxy forms defined by the Ministry of Commerce for voting on behalf of shareholders without conditions. PTT treats proxies as if they were shareholders. As a rule, 30 days before each meeting, PTT discloses the proxy form, attached with details and procedures, on its website. Shareholders may make further inquiries about this by phone or through other channels such as PTT's website and e-mail.

3) Roles towards Stakeholders

As the national energy company, PTT accounts for all stakeholders' rights and interests by establishing guidelines for addressing the needs of each group in and outside the corporation, as well as its own responsibility for society and the environment. Stakeholders fall into six groups with a different mission targeted for each group in response to their different needs:

Public Sector

Ensuring long-term energy security by providing sufficient high-quality energy supply at fair prices to support economic growth.

Society and Communities:

Maintaining an excellent corporate standing in Thai society by exercising environmental stewardship of internationally accepted standards and improving the quality of life for communities and the wider societies.

Investors:

Operating profitable businesses that lead to sustainable growth while generating optimum returns.

Customers:

Ensuring customer satisfaction and loyalty by delivering world-class quality products and services at fair prices.

Suppliers and Partners:

Conducting fair business practices with all partners while promoting trust, good relationships, and cooperation to expand business capability and increase efficiency in long-term business partnerships.

Directors and Employees:

Promoting capability building professionally and ensuring employees' well-being is level with other leading companies in order to strengthen employee engagement.

Treatment of Six Main Stakeholder Groups

1. Public Sector

As the national energy entity with a crucial mission to drive Thailand under the national strategies and tasked with a mission to achieve long-term energy security through the supply of energy of sufficient volumes, standard quality, at fair prices, and in support of public policy to promote national economic growth, PTT conducts major operations as listed below.

1) **Building energy security on PTT and companies 100% owned by PTT with 5-year investment plan (2022 - 2026) on core businesses:** worth THB 102,165 million was detailed as follows: 45% in Gas Business Unit i.e. Gas Separation Plant (GSP) Unit 7 to replace GSP Unit 1 and GSP Unit 8 to convert liquefied natural gas (LNG) into ethane and LPG, including ethane product storage tanks and receiving terminal to increase ethane import capacity; 20% in Natural Gas Transmission Pipeline Business Unit, including Bang Pakong - South Bangkok Power Plant and the 5th onshore natural gas pipeline projects; 2% in International Trading Business and Downstream Petroleum Business; 8% in New Business and Infrastructure, and Head Office; 25% in PTT's wholly-owned companies, namely expand the capacity of the 2nd LNG receiving terminal (Nong Fab), Map Ta Phut Industrial Port Development Project Phase 3, and Laem Chabang Port Development Project Phase 3.
2) **Emphasis on new business in line with future world trends both in energy and other areas, with provisional capital expenditure:** over the next 5 years in the amount of THB 238,032 million according to the vision framework Powering Life with Future Energy and Beyond focusing on the clean energy business. The goal is to produce electricity from renewable energy to 12,000 megawatts within 2030 and invest in the integrated electric vehicle business, as well as expanding investment in the natural gas business which is a transition fuel with a focus on expanding the natural gas pipeline network (which is under consideration by the government) and expanding investment in the LNG Value Chain both domestically and internationally. In addition to investing in existing businesses to maintain energy security, PTT also expands investments in other businesses. to cope with the changes in disruptive technology and support modern behaviors or lifestyles, such as Life Science business (pharmaceutical, nutrition, medical equipment and diagnostics) to drive life science business in Thailand and the ASEAN. including logistics and infrastructure business.
3) **Being a "low-carbon and sustainable organization" ready to drive Thailand towards Net Zero:** PTT Group has announced short-term and long-term goals, aiming to reduce greenhouse gas emissions by 15% by 2030, achieve Carbon Neutrality by 2040 and Net Zero Emissions by 2050, faster than the target of the country. PTT Group has set up PTT Group Net Zero Task Force (G-NET) to formulate proactive strategies, aiming to achieve greenhouse gas emission reduction goals that are consistent with the context of business operations in 3 main approaches: "Accelerate Adjustment - Accelerate Change - Accelerate Planting" or the 3 Ps principles, namely (1) "Accelerate Adjustment": Pursuit of Lower Emissions, Reduction of the maximum of greenhouse gas emission in the process through important projects of PTT Group, (2) "Accelerating Change": Portfolio Transformation to increase the proportion of investment by focusing on clean energy business and growth in new businesses beyond energy, (3) "Accelerating Planting": Partnership with Nature and Society, Collaborating with the government and communities to plant terrestrial and mangrove forests to increase green areas and naturally capture carbon dioxide. In addition, PTT has been given a mission to chair the Thailand Carbon Neutral Network (TCNN), a national network of 275 leading organizations from the public, private and local communities with the goal of being "Thailand's Leading Network Achieving Carbon Neutrality and Net Zero Goals" driving the participation of various sectors in reducing greenhouse gas emissions, as well as speeding up the preparation of policy proposals for submission to the public sector, aiming to elevate the country's greenhouse gas reduction standards to be equivalent to international standards for sustainable growth in a climate-friendly society and push forward the Net Zero goal of the country from all sectors together.

4) **Public policy support for economic growth and mitigation of COVID-19 impacts along with support for the national grassroots economy closely with the public sector.** The key actions are as follows:
   - **"Restart Thailand":** PTT Group helps communities and new graduates through employment that focuses on creating jobs, generating income, and building career skills for the new generation in all regions, totaling more than 25,000 service points in 2021. The project is still operating for the 2nd year in 2022 because despite the better overall economic picture, but still not back to normal. Approximately 23,000 service points participated in the project.
   - **State welfare card project - LPG for low-income earners:** Support of partial LPG subsidy, a project under the Ministry of Energy and the Ministry of Finance, was extended to low-income earners, hawkers, and food stalls with state welfare cards by reducing the cooking gas (LPG) price in the amount of THB 100 per person per month until December 31, 2022, to reduce their cost of living, promote low-income earner business and extend the country's economic breath during the COVID-19 pandemic. PTT has supported that discount since October 2019, worth more than THB 21 million.
   - **NGV for the Giving Breath Project** is a project that maintains the retail NGV price for taxi drivers in Bangkok and the perimeter to reduce the impact on taxi drivers and to alleviate public suffering from economic slowdown during and after the spread of COVID-19. PTT has supported the project from November 1, 2021 - December 31, 2022, worth THB 11,080 million
   - **Giving Chance for the Youth Project:** Supporting the Equitable Education Fund to help students and youths at risk of dropping out of the education system in 2022 to continue their education through activities with PTT, walk-run accumulated distance from May 15 to June 30, 2022, totaling 45 days, to convert into scholarships worth THB 151 million, helping more than 103,000 children and youths to have the opportunity to return to the education system. In addition, another THB 20 million was contributed to founding the "Initial Fund for Children and Youths in Education Crisis" through the Equitable Education Fund. The total support budget was THB 171 million.
   - **Giving Breath for the City Project:** Supporting the goal of creating green areas for Bangkok by planting 1 million trees, PTT has participated by planting 100,000 perennial plants. long-lived shrubs and vines with wood in the areas of PTT and Bangkok Metropolitan Administration (BMA) to help absorb carbon dioxide, trap dust and pollution as well as reduce the temperature around the planting area, providing shade and increasing the livability of urban society.
   - **PTT Group Model School:** It is an educational development plan in the form of PTT Group for all 204 schools under its supervision located in 17 provinces across the country. PTT has gathered strengths and knowledge of PTT Group to develop education under the concept of "STEEM 4E" in collaboration with Kamnoetvidya Science Academy and Vidyasirimedhi Institute of Science and Technology to develop children with academic skills (Science, Technology, Engineering, Mathematics (STEM) and English (E) = STEEM) and encourage schools to apply them in teaching and learning or 4E, including Ethics and Growth Mindset, Entrepreneurship, Energy Literacy, and Environment Awareness.

2. Society and Communities

PTT is committed to driving Thailand through enhanced national energy security and economic growth in parallel with a better quality of life for society and communities by applying the Sustainable Development Goals (SDGs) of the United Nations, the 2018 - 2037 National Strategies, the result of surveys of PTT Group stakeholders', societies' and communities' needs, information on significant economic, social and environmental directions, including anticipated impacts after COVID-19, and PTT Group's expertise as guidelines for social development endeavor. PTT emphasized **implementation in two aspects: human resources, communities, and social development** through educational development in sciences and technology fields, including the 21st Century essential skills to support a smooth transition into the future as well as skill development to elevate the life quality of the community to self-reliance through occupational promotion of community projects and businesses, and the promotion of green energy; and **Natural resource and environmental conservation** through increasing and conserving of rural and urban green space and forests with emphasis on community participation in the designing process to maintaining process to reduce impacts of climate change and conserve the eco-system.

Details are as shown in Section 1: Business Operations and Performance **"3. Driving Business towards Sustainability."**

3. Investors

PTT remains committed to being an organization that contributes to economic growth, enhances national competitiveness, develops society, and improves the quality of life while creating innovation and implementing technology in all sectors as well as being a driving force in people's way of life, society, communities, environment to move through change under the new vision through the implementation of 4R strategies (Resilience, Reenergize, Reimagination, and Reform). This would ensure investors of PTT's optimum returns and sustainable growth.

Investors' Activities (Common Shareholders)

Since 2006, PTT has arranged ongoing trips for minor investors to visit its operations, update information, and meet management as well as participate in PTT's CSR activities in Rayong province.

In 2022, due to the continuous outbreak of the COVID-19 pandemic, PTT decided to halt the company site visit to prevent the spread of COVID-19 for the safety of participants.

Shareholders interested in taking part in the visits next year (2023) can follow project updates and details on PTT's website. PTT reserves the right to invite only those who have never taken part in this activity.

Activities for Institutional Investors and General Investors

In 2022, due to the continuous COVID-19 pandemic, PTT organized activities for institutional investors and general investors via online networks, using modern technology systems for the convenience, speed, and efficiency of 24-hour information access of analysts and institutional investors. In addition, PTT is backing to organize regular activities.

Investors' Activities (Debenture/ Bond Holders)

PTT has issued and offered debentures to shareholders since 2003. In 2022, PTT redeemed a total of THB 40,000 million debentures. At year-end, PTT's Baht-denominated debentures holders numbered 21,882. Since 2010, PTT has staged ongoing debenture holders' activities to serve as a channel for maintaining cordial relations with them and repay them for their confidence in PTT bonds over the long term. This year's activities were modified to align with the relaxation of government measures during the COVID-19 pandemic for the safety of participants by maintaining a diversity of activities to meet the needs of bondholders, and advanced technology was used to organize various seminars through online channels by live streaming. Happiness Activity was created in the form of a brochure to reduce the use of paper and support the country's direction towards a low-carbon society. Bondholders can also access all event details via online channels.

PTT continues to strive to increase efficiency and enhance the satisfaction of bondholders by developing the service through PTT Debenture Line Official Account and Mobile Application. At year-end, over 7,000 bondholders joined the membership of various systems.

4. Customers

PTT divides its market into domestic and overseas with two major groups of customers: Business to Business (B2B), which consists of customers in gas, international trading, and infrastructure businesses, and Business to Customer (B2C), with customers in the vehicles and gas business, where the core products are natural gas, crude oil, petroleum products, petrochemicals, and chemicals.

PTT listens to customer needs and expectations to analyze them through assorted channels, including customers visits, seminars both onsite and online, opinion surveys, and customer informations via online channels for instance, developed official website of international Trading Business Unit which connect to 5 affiliates and agencies under business units globally as well as, developed Customer Service Center Website (CSC website) which also provide information on competitors, state of competition and technology, customers' behavioral trends and lifestyles, market environment, and future needs of customers. All input is reviewed together with other information, namely situations, and trends of energy economics, public policies, regulations, technological innovations, and financial and economic information for the design of products and services that match the needs and expectations of current and future customers.

PTT constantly developed supporting systems to facilitate and ensure customers' accurate, timely and correct transactions with PTT, including Robotic Process Automation (RPA) in the e-Billing and e-Payment, SMART Deal Recap to support trading processes, and added a new communication channel (LINE Official) to ease contact. In addition, an online training platform was developed for knowledge sharing and experience exchange, where customers can attend various courses online at any time.

The Internet of Things (IOT) has been introduced with energy management and energy use enhancement for customers. All of these can foster good relations with customers, leading to repurchases and words of mouth, resulting in engagement with PTT.

PTT also developed a service standard manual and procedure manual that are comprehensive, including manuals on service station standards, gas customers, pipeline emergency response plans, gas pipelines for industrial factories, and procedures for gas metering. It provided its services in compliance with the standard controlled by the Energy Regulatory Commission of Thailand and regularly reported its operations to the commission as required or, in the case of violation of the standard, within the specified period.

In place is PTT satisfaction, dissatisfaction, and engagement assessment versus competitors via the annual satisfaction survey, featuring constant query development. Customers' satisfaction and dissatisfaction have been regularly compiled and analyzed for product and service proposals or prompt problem-solving.

PTT has kept a high level of customers satisfaction despite the impact of the volatile and competitive gas market by planning for customers after-sales service activities such as seminars to meet with customers and clarify the gas situation, providing technical services, listening to problems and complaints to develop improvement plans, and regularly sending information to customers. Among these initiatives is the development of GASTALKTH.COM, an online classroom service platform that collects news about various types of fuels, maintenance techniques for gas pipeline systems and equipment, energy efficiency laws, and techniques for industrial factories transferred by PTT experts. Those interested can enroll in an unlimited number of classes, with PTT and its customers collaborating on social activities such as organizing a Virtual 30 Days Challenge exercise and accumulating calories to convert into scholarships for local students. Tree planting activity in the customer's neighborhood and the Khung Bang Kachao area.

PTT classifies complaints by severity of impact, by defining Service Level Agreements for each type of complaint. Related units must resolve problems within a given period. All complaints must be initially addressed within 24 hours, and after problem resolution, an inquiry into customer satisfaction with PTT's problem-solving will be made. At the same time, customers will learn of PTT's long-term problem-solving plans for their confidence and satisfaction to ensure customers' continued buying of PTT's products and services.

Customer Satisfaction Survey (%)

	Natural Gas					Trading
	Natural Gas	Power Plants and Wholesale	Industry	Petroleum and Petrochemical Products	NGV	
2022	92.2	90.0	92.9	89.9	90.6	90.8
2021	92.2	90.8	92.6	91.3	90.2	99.3
2020	91.8	89.9	92.4	91.7	88.4	95.6

5. Suppliers and Partners

Since suppliers and partners are keys to business success through mutual support, PTT values and treats them fairly through fair competition, mutual respect, and good cooperation. PTT strictly complies with contracts and procurement processes since they are vital to the determination of expenses and the quality of PTT products and services. A clear procurement procedure is in place to ensure transparency, accountability, and maximum benefit.

To achieve its resolution, PTT is committed to doing business for sustainable growth in parallel with good governance for communities, society, and the environment. It, therefore, values supply chain management such that it is clearly in place by developing risk management processes and mitigation of impacts arising from business partners' conduct to support the success of supply chain management. The key factors for the drive are as follows:

1. Business policy and directions

This means PTT's policies and strategies are key factors for forging awareness among employees and society of PTT's commitment and business direction. Therefore, PTT issued a **PTT Group policy on procurement and sustainable supplier management** in 2015.

To provide PTT's business partners with guidelines for conducting business in line with the corporate sustainable management concept, PTT revised the **PTT Supplier Sustainable Code of Conduct (SSCoC)** and announced its fourth edition on November 1, 2022, by setting the content and scope to be under the requirements, regulations and relevant laws. This will help to drive PTT's suppliers to operate ethically, respect human rights, occupational health care, and the safety of employees, including the importance of sustainable environmental management, issues that PTT pays attention to, consisting of 4 main topics as follows:

1. Business Integrity
2. Corporate Social Responsibility
3. Safety
4. Environmental Management

2. Sustainable supplier selection and management process development

For supply chain management to be in line with the organization's direction, PTT has established guidelines for supplier management that take into account Environment, Social and Governance (ESG) impacts. Assessing risks and impacts from the perspectives of the environment, society, and oversight of goods and services groups, PTT divides business partner management into Critical, Key, and Managed (in order of potential severity of impacts) levels. For those in the Critical group, management actions will be more intensified than in the other groups. Besides, formally acknowledging PTT Supplier Sustainable Code of Conduct, they must respond to the Sustainability Performance Assessment Form. After self-assessment, if they fail, they will need to formulate ESG Corrective Action Plans. PTT reserves the right to audit business partners' self-assessment outcomes. In 2022, PTT team in conjunction with a third-party agency conducted sustainability assessments of 8 "Critical" business partners. Overall, their scores passed the criteria set by PTT. A project designed to develop suppliers' sustainable operation caliber was launched, under which PTT selected major business partners whose operations involved ESG for training on sustainability capability development and practices and sustainability capability self-assessment for development planning in line with PTT's policy. In addition, PTT has PTT Green Procurement policy conforming to the public sector. A system was developed in support of green procurement through the PTT Vendor Management System, which compiles green spending data. As of the year-end, 21 tasks were related to such green spending and green products, valued at some THB 345 million.

PTT and PTT Group seriously take the reduction of risks in product/ service supply, boosting of confidence in supplier services, and sustainable procurement of international standards of PTT Group. In 2022, PTT prepared PTT Group Sustainable Procurement Manual in line with the standard criteria of ISO 20400:2017 Sustainable Procurement and applied the ISO 20400:2017 criteria with the joint procurement of 3 groups among PTT Group. It planned to extend this practice to cover all business groups in 5 years.

In addition, to illustrate PTT's transparency and confidence in business operations, PTT joined public agencies in preventing and suppressing corrupt practices by signing a memorandum of cooperation on driving such actions with the Office of the National Anti-Corruption Commission (NACC), State Enterprise Policy Office (SEPO), and other state enterprises to ensure that the national strategy on prevention and suppression of corrupt practices, relevant measures, relevant government policies, and action plans are successfully driven to implementation in state enterprises under CG. To this end, for the provision and disclosure of information on procurement, PTT disclosed related data in compliance with the announcement of the Official Information Commission on the requirement that information on the outcomes of procurement deliberation of public agencies must be opened to the public under Section 9 (8) of the Public Information Act of B.E. 2540 (1997). Disclosure is to be done monthly through www.pttplc.com for public examination. Note that PTT's procurement information disclosure is subjected to annual assessment through a project on State Enterprise Integrity and Transparency Assessment (ITA), sponsored by NACC. In 2022, score for PTT was 100% on procurement information disclosure, based on the assessment of visual evidence inspection.

Since August 24, 2017, PTT has complied with the Public Procurement and Supplies Administration Act, B.E. 2560 (2017). It amended its own processes by requiring the disclosure of its annual procurement plan for interested parties to join price bidding contests at PTT and manage their bidding readiness. PTT has disclosed its 2021 annual procurement plan via three channels: www.pttplc.com, e-Government Procurement (e-GP) of the Comptroller General's Department, and bulletin boards at PTT offices.

PTT has appointed Procurement Governance and Audit Committee to ensure transparency of procurement, both those requiring compliance with Public Procurement and Supplies Administration laws and those direct commercial procurement requiring compliance with PTT regulations already approved by the Public Procurement and Supplies Administration Policy Committee. The committee consists of executives from procurement and legal units and the Office of Corporate Audit, charged with roles and responsibility for governing and audit procurement processes to ensure compliance with laws, regulations, criteria, and relevant processes. Annually, the committee inspects procurement processes randomly to detect deficiencies, causes, and preventive measures. In 2022, the management was committed to the vision of being a transparent organization and requested each department to set KPIs for procurement compliance to ensure that procurement is worth the value, transparency, fairness, efficiency, effectiveness, and audit.

In addition, PTT has developed PTT Bid Submission system to support the request/ purchase of procurement documents and submitting proposals and prices through online channels, including plans for integrating (PTT Vendor Master System: PTT VMS) to be a part of PTT Vendor Management (PTTVM) system to link PTT's vendor information into a single database. Data can be accurately linked to SAP and the Smart Procurement system used in PTT's internal procurement process, and establishing an ESG assessment system for vendors to self-assess their sustainable business operations, which is the same standard throughout PTT Group. This allows the scope of the ESG Self-Assessment assessment system to be expanded, thereby providing an opportunity for general traders to participate in sustainable supply chain development, Apart from PTT Approved Vendor List (PTT AVL), suppliers in PTT Group can use it together without the need for multiple assessments. PTT AVL's bid acceptance system including general bidding events has also been improved for more efficiency.

3. Capability development of relevant parties

Since the mastery and caliber of relevant parties represent another key factor driving the success of this matter, **PTT values capability development on procurement and management of business partners** by PTT's own executives and employees in a systematic and suitable way. This is achieved through training, communication, and knowledge management (KM), to achieve the sustainability objectives of business partner management. PTT and PTT Group conduct annual reviews and plans for the development of employees in the procurement profession to empower employees to effectively support the transformation of the organization. The focus is on enabling employees to apply information technology systems in conjunction with expertise in working under the Digital Procurement program, developed by PTT for the systematic and flexible operation of the goods and services procurement process, thereby reducing work time in order to increase employee efficiency and effectiveness. Furthermore, to enhance their understanding of laws and practices which are related to the procurement process to empower them to carry out procurement operations more accurately, quickly, and efficiently.

In 2022, PTT organized additional training courses, such as a sustainable procurement guideline workshop in line with ISO 20400:2017 Sustainable Procurement to provide employees with knowledge and understanding of sustainable procurement principles according to international standards, development of PTT Group ESG Auditors to equip employees with knowledge and understanding of assessment criteria, basic auditing principles, guidelines and processes of a good auditor, which can be adapted or integrated into the sustainability vendor audit process, as a guideline for developing each business partner to sustainably conduct business in the environment, society, economy together with PTT Group.

To create an exchange of information and knowledge among PTT and business partners and develop their potentials to be ready to support PTT in terms of operating results, business continuity as well as social responsibility, PTT organized a supplier seminar every year. In 2022, PTT communicated the direction of its business operations, giving opportunities to business partners who are important stakeholders of PTT to exchange procurement information. PTT has applied technology in the procurement process for transparency while developing various systems under the Digital Procurement project, to prepare for and be aware of the world's movements that may affect business operations by focusing on educating suppliers to develop their operational potential in sustainability. In addition, PTT also focuses on responding to the needs and treating all groups of stakeholders with equality, transparency, and fairness, especially those business partners throughout the supply chain that PTT attaches great importance to by developing, supporting, promoting growth, and moving forward together sustainably. Supplier Seminars were organized 4 times for the areas of Head Office, Rayong Gas Separation Plant, Natural Gas Transmission, and Natural Gas for Vehicles.

PTT requires bidders to strictly conform to the rules of work safety and handling of tools, as well as other regulations, particularly the types of work affecting health, safety, and the environment. PTT visits business partners' sites to assess their capabilities, particularly those on the Safety, Security, Health, and Environment side. In addition, business partners' employees must undergo the do's and don'ts on PTT's sites in addition to conforming to the requirements for entering sites to work, as described for each.

PTT Approved Vendor List (PTT AVL) is prepared for the benefit of procurement through bidding to ensure that, under the process to determine business groups and procedures or methods of selecting business partners to register for PTT AVL, business partners are efficient and deliver products/ services that meet PTT's requirements and foster sustainable partnership with PTT. In 2022, PTT AVL consisted of 297 companies from 24 business groups.

To ensure efficient preparation of PTT AVL, PTT considers the criteria, conditions, and qualifications of business partners who apply to PTT AVL in each business group. The initial qualifications of the business partners must meet the following requirements:

1. Business partners must never have abandoned the work of PTT, the public sector, state enterprises, and government agencies.
2. If business partners were removed from the Vendor List, they would have no right to apply for registration in that particular business group for 3 years from the day of revocation. An exception applies if the removal was the result of abandoning the work of PTT, state enterprises, and public agencies, in which case PTT will not accept them to PTT AVL until PTT receives a letter proving the cancelation of such removal.
3. Business partners must understand and acknowledge PTT Suppliers' Sustainable Code of Conduct (SSCoC).

Apart from these initial criteria, PTT assesses business partners' operations and sustainable implementation in parallel.

After business partners deliver products/ services in each allotment, PTT will assess and notify them of the strengths/ improvements to make in operation for future supplier development.

In addition, PTT supports Thai suppliers of goods and services and gives them top priority. Past procurement information reveals that PTT has procured about 94% of local products, generating cash flow in the Thai economic system, promoting procurement of products from the areas where PTT sites are located, and promoting jobs and generating income for people in the communities.

6. Directors and Employees

Employees data are reported under Section 7: Corporate Governance Structure, Topic **"7.5 Employees."**

Respect for Universal Human Rights Principles (Code)

With the rollout of the human rights management system in 2016, PTT has clearly demonstrated its commitment to conducting business with respect for human rights principles in PTT's Human Rights Statement, PTT's Sustainability Management Policy, and PTT's Compliance Policy. PTT has reviewed risk aspects on human rights covering PTT Group's business operations under PTT Group Way of Conduct of 17 companies in 21 countries, or a total of 50 areas. What the Group found were aspects that represented core operational risks: security and occupational health of

employees and contractors, labor rights, suppliers' workplace conditions, community living standards, and the rights of natives. Control measures have been developed and applied along with human rights management plans to keep risks manageable along with raising the management level to be better and quarterly follow-up on plan implementation and report to the relevant committees for acknowledgment and comments as an assurance of maximum effectiveness. In order to be efficient and to achieve the required effectiveness. In 2022, no human rights complaints arose. Constantly, PTT disclosed operating information under the 10 Principles of the United Nations Global Compact. Finally, PTT enrolled in the effectiveness assessment of operating outcomes on human rights organized by Corporate Human Rights Benchmark, with the outcomes also encouraging, and was awarded the Outstanding Role Model Organization Human Rights Award 2022 in the State Enterprise sector by the Rights and Liberties Protection Department, Ministry of Justice for the 2nd consecutive year.

Significant Disputes with Stakeholders

This appears under Section 1: Business Operations and Performance, "**5.2 Legal Disputes.**"

Policies and Guidelines for Stakeholders' Personal Data Protection

PTT attaches great importance to the protection of personal information of all groups of stakeholder. To ensure that relevant stakeholders, PTT will protect and treat personal data under PTT's control in line with the Personal Data Protection Act B.E. 2562 (2019) (PDPA), which became effective on June 1, 2022. PTT has established a personal data protection policy and practice within the organization for PTT's operations related to personal data of various groups of stakeholder, including personal data of customers, partners, and business relations to be equipped with a regulatory process and appropriate as well as concise operational guidelines in line with the law and for PTT's personnel to know how to treat personal data and be able to correctly perform their duties according to such laws. It covers both the collection, use, and disclosure of personal information and keeping personal information safe and secure as well as provides a "Privacy Center" on PTT's website at pttpdpa.pttplc.com as a channel for various groups of stakeholder who own personal data to know the details of the personal data processing, whether it is a notification form about personal information, purposes of collection, use and disclosure, as well as informing the right to personal information, exercise of privacy rights and communication channels with PTT. Stakeholders can also contact PTT regarding personal data processing by contacting the Personal Data Protection Officer at e-mail: pttdpo@pttplc.com.

Disclosure and Transparency

Disclosure of information is a key index of operating transparency, a crucial factor for confidence among investors and stakeholders. PTT values accurate, precise disclosure of assorted information and creates numerous channels of disclosure so that all stakeholders can gain easy access to information. It promotes awareness among directors, management, and employees of the importance of information disclosure and transparent operations, and creates appropriate avenues for complaints while providing fair treatment to whistleblowers and those complained against as follows:

Financial and Non-financial Reports

PTT disclosed its sustainability reports and performance, taking into consideration all stakeholders' interests, covering Environmental, Social and Governance (ESG) aspects, through the annual information disclosure form/ annual report (Form 56-1 One Report) under "Driving Business towards Sustainability" and included information on the outcomes of sustainability implementation in risk management, management's discussion and analysis (MD&A), and CG, as well as publicized via PTT's website under Sustainability topic. The sustainability performance reporting was based on Global Reporting Initiative (GRI) Sustainability Reporting Standard GRI 11: Oil and Gas Sector Disclosure 2021 (OGSD), Integrated Reporting (IR) model of the International Integrated Reporting Council (IIRC), The United Nations Global Compact (UNGC), and Measuring Stakeholder Capitalism: Towards Common Metrics and Consistent Reporting of Sustainable Value Creation of the World Economic Forum (WEF) and illustrating PTT's commitment to supporting the UN

Sustainable Development Goals (SDGs). Furthermore, PTT applied the Recommendation of the Task Force on Climate-related Financial Disclosures (TCFD) to report performance on climate change. There also was a report review to validate the information by an external party regularly.

Investor Relations

Ever since PTT's privatization in October 2001 and share trading on SET in December 2001, Investor Relations has centralized essential information to investors and shareholders, with financial data like the quarterly performance and financial statements, quarterly Management's Discussion and Analysis (MD&A), corporate strategies, and outlooks of PTT, which are regularly, fairly, and thoroughly disclosed. Investors may call Investor Relations at 0-2537-3518-9, e-mail: ptt-ir@pttplc.com, and log on to the PTT website at www.pttplc.com, which is regularly updated, for information in Thai and English, which includes:

- Company information
- Form 56-1 One Report
- Information for common shareholders
- Information and activities for debenture holders
- Presentations and Webcasts
- Roadshow/ Conference
- Analyst Research
- Activity Calendar
- Code of Conduct for Investor Relations
- Major investment project information
- Policy and business direction statements by management
- Compliance with public policies
- Key plans
- Corporate Governance Policy
- Financial performance
- Non-financial performance
- Highlights of CSR activities
- Procurement
- Name and contact number of Investor Relations.

Through the years, PTT has valued disclosure of information that is accurate, complete, transparent, and comprehensive, as well as continual direct and indirect presentation of performance while keeping investors, shareholders, and relevant parties informed of its data. Highlights appear below:

- **Direct:** PTT regularly reports performance, capital budgets, and industry outlooks to analysts, institutional investors, and employees at Quarterly Analysts' Meetings. In 2022, they were organized through virtual conference (Microsoft Team and Facebook live), in Thai and English, in parallel with regular meetings; conference calls; local and international roadshows/ conferences organized by securities companies/ or those directly contacted with IR; virtual conferences with analysts, institutional investors and/or related parties such as credit rating agencies; continuous application of digital technology e.g. via PTTIR Line Chatbot to provide information to analysts and institutional investors to access operating results, prices of oil, petroleum and petrochemical products, schedules of AGM and Analyst Meeting of PTT Group; dividend payment schedules of PTT Group; via response with autonomous text conversation; press meetings to discuss performance outcomes and investment projects; knowledge sharing e.g. natural gas and new businesses i.e. life science, pharmaceutical, nutrition, medical equipment and diagnostics, EV Value Chain; PTT Group in-depth business analysis from upstream to downstream, a cooperation of PTT Group via PTT Group ESG Day and PTT Group Investor Day for Thai fund managers; participation in SET's Opportunity Day via virtual conferences (Microsoft Team); global institutional investors quarterly meeting via a digital platform (SET Digital Roadshow) to inform investors and analysts of directions and opportunities of PTT business operations according to the new vision. In 2020 - 2022, the following key activities took place:

Activity	2020 (Times)	2021 (Times)	2022 (Times)
Analyst Meetings via Facebook Live/ Webex/ MS Team	4	4	4
Conference Calls (presentations of quarterly performances, capital investment, and other key events (if any))	4	4	4
Domestic roadshows/ conferences (including provision of basic PTT business knowledge, and via virtual conferences)	15	14	12
International roadshows/ conferences (including virtual conferences)	9	11	12
Company Visits/ Conference Calls (Upon Request)	56	69	65
Credit Rating Reviews	4	3	3
Press Meetings	2	3	2
Company visit by analysts and institutional investors	-	-	1
E-mails/ phone calls	10 - 12 times a day	10 - 12 times a day	10 - 12 times a day
Quarterly SET Opportunity Days and SET in the City	4	4	4
Participation in SET Digital Roadshows (organized by SET)	4	4	4
Minor investors' meetings with management and company visits	Two debenture holder visits (2 groups) (October 6 - 8, November 24 - 26) No common shareholder visit in 2020, due to COVID-19	No common shareholder visit in 2021, due to COVID-19	Two debenture holder visits (2 groups) (August 23 - 25, October 4 - 6) No common shareholder visit in 2022, due to COVID-19
Relations activities with debenture holders	15 (5 via online channel)	12 (via online channel)	14 (3 via online channel)

- **Indirect:** Information about PTT, its performance, financial statements, and reports filed with SET is found at www.set.or.th, www.pttplc.com, the "Happiness" magazine for debenture holders (via PTT Debenture Application).
- Investors and interested parties can also mail inquiries to Investor Relations at Tel. 0-2537-3518-9, through e-mail at ptt-ir@pttplc.com, or www.pttplc.com. In addition, PTT has constantly publicized news, business activities, operations, and project updates apart from addressing questions and facilitating contacts for the media and the public. In 2020 - 2022, the activities appear below:

Activity	2020 (Times)	2021 (Times)	2022 (Times)
E-mails	117	292	747
News/ photo releases	117	292	261
Press conferences	6	4	2
Media visits to operations (domestic and international)	2	1	3
Welcoming and providing information to visiting agencies for assorted purposes	7 groups (483 persons)	-	5 groups (168 persons)

4) The Use of Inside Information

PTT has defined guidelines in its CG handbook for all employees on best practices, for the use of inside information and guarding of confidential information. They must guard PTT's inside information or confidential information not yet publicly available, and must not share with other parties inside information learned during the course of their duties or use it to fraudulently seek profit or to cause damage to PTT's interests.

In addition, PTT has a policy for the Board, management, and personnel with the privilege to inside information to refrain from insider trading of PTT stocks as well as those of PTT Group. If necessary, they must report such trading to the Company Secretary at least 2 days in advance. All PTT personnel will be reminded to refrain from using inside information through PTT's contact channels, in particular, upon important events such as capital increase or debenture issuance.

5) Conflicts of Interest

PTT requires information disclosure to prevent conflicts of interest and illegal, improper activities. Under the Board's policy, business decisions made by management and employees must be solely in PTT's best interests. All staff must not only avoid engaging in financial and other relationships with external parties that would lead to financial losses for PTT or a conflict of loyalty or interest but must also not compromise the efficiency of business operations. Those staff with interests or related businesses that may require PTT's reviews and decisions must report their relationships and connection with potential conflicts of interest. PTT is to disallow such connected persons from exercising their authority for and involvement in such transactions.

Reporting Transactions of Potential Conflicts of Interest with PTT

PTT has required the directors, management, and all employees to disclose potential conflicts of interest through a specific disclosure form for suspected conflicts of interest with PTT. In addition, any approval of such items must not contain special conditions or specifications that are out of the ordinary, which form part of PTT's internal controls. PTT's Office of Corporate Audit and the Audit Committee have been entrusted with the monitoring and resolution of issues related to conflicts of interest.

Reporting Vested Interests of Directors, Management, and Related Parties

In the first quarter of 2022, the Board reported a form for reporting the vested interests of directors as basic information to manage the vested interests of directors and senior management. The directors and management are to report such matters every year and with every change in circumstances. The Company Secretary is to compile and submit the copy to the Chairman of the Board and the Chairman of the Audit Committee to check and manage conflicts of interest. In 2022, however, no such cases have arisen.

In addition, newly appointed directors must report their vested interests with directors, executives, and related persons and notify the Company Secretary for further collection and submission to the Chairman of the Board and the Chairman of the Audit Committee within 7 days.

Reporting Changes in Share Portfolios

As part of the oversight of inside-information measures, all PTT directors and management, including their spouses and children under the legal age, must report any changes in their PTT share ownership to SEC under Article 59 of the Securities and Exchange Act B.E. 2535 (1992) and its amendments within 3 days of the date of sale, purchase, disposal, or receipt of such shares. PTT defines a policy of disclosing or reporting the sale, purchase, disposal, or receipt of such shares, changes in share ownership of the directors and management to the monthly Board meeting, contained in advance as a regular agenda item.

Moreover, a week before the closing of the quarterly and yearly financial statements, the Office of the President issues a letter to the directors, management, or units with the privilege to inside information, forbidding them to disclose such information to external parties or unrelated parties, and to buy or sell PTT shares within 45 days (for quarterly statements) and 60 days (for the annual statements) of the last effective date of the financial statements to the notification date of the statements to SET, ahead of the public dissemination of the statements to prevent insider trading.

Filing of Assets and Debts to the National Anti-Corruption Commission (NACC)

Under the Organic Act on Anti-Corruption B.E. 2561 (2018), PTT's directors and top executives, including directors and top executives in the companies where PTT holds more than 50% shares, are required to file a list of their own assets and debts, including those of their spouses both registered and unregistered, living together as husband and wife, and children under the legal age, to the NACC to verify the transparency of assets and liabilities. PTT has reported in the Online Declaration Registration System: ODRS of the NACC when there is a change in appointment or transfer of those responsible for filing assets and liabilities. PTT issues a reminder to each of the directors and senior management as required through a letter, direct notification, and a notification system.

Declaring Vested Interests at Meetings

The Board of Directors has established a policy on Vested Interests in every Board meeting and any other meeting. The Chairman reminds directors to conform to the policy on conflicts of interest on all agenda items, which requires those with vested interests to declare themselves to the meeting to abstain from voting or giving any views so that other meeting attendees have the opportunity to consider, analyze and criticize without the influence of stakeholders. In 2022, there were 11 agendas to inform the Chairman of the Board (a total of 21 meetings).

Review of Connected Transactions

The Audit Committee reviews related transactions and those with potential conflicts of interest that could undermine PTT's businesses to ensure conformance to the law and SET's criteria, all of which must be reported to the Board for approval.

6) Right of Shareholders

PTT has defined guidelines on the rights of shareholders and equitable and fair treatment and has a written policy and guidelines for the rights and equitable treatment of shareholders for directors, management, and employees to comply with under PTT's "Corporate Governance, Ethical Standards, and Code of Business Ethics Handbook".

7) Anti-fraud and Corruption

PTT is committed to run its businesses with integrity, transparency, fairness, and adherence to the CG Code, and resisting all forms of fraud and corruption, direct or indirect. Relevant implementations and developments included:

- PTT prepared its annual work plan to be in line with the National Strategy (2018 - 2037), which aims to balance and develop the public administration system to be transparent and free from corruption and misconduct. PTT joined forces through PTT's Corporate Governance and Anti-Fraud and Corruption strategies aiming to elevate PTT Group to be a trusted company, adhering to transparent business management under corporate governance, risk management, Anti-Fraud and Corruption, adequate control and compliance with laws, rules, and regulations.
- PTT realizes that fraud and corruption is a critical problem that causes damage to the country. It is thus important to integrate work and develop anti-corruption networks with government and private agencies to push forward the fight against fraud and corruption in a concrete manner through various cooperation, such as the establishment of PTT's Anti-Corruption Operations Center in State Enterprises, joining Thai Chamber of Commerce Anti-Corruption and Ethics Promotion Committee, National Anti-Corruption Day and International Anti-Corruption Day, participating in discussions to exchange ideas in various forums organized by public and private sectors, etc.
- In 2012, PTT joined the United Nations Global Compact (UNGC) to show its desire to apply to its business the principles of human rights, labor rights, environmental preservation, and Anti-Corruption at the international level.

PTT has presented an update of its compliance with the 10 elements of UNGC on PTT's website www.pttplc.com under Section Sustainability, Subheading: Sustainability Governance, Topic: Sustainability Network.

READ MORE

- PTT enlisted in the declaration of intention to join Thai Private Sector Collective Action Against Corruption (CAC), an endeavor of IOD with the support of the government and NACC. As one of the first 27 companies to do so, PTT underwent the certification process and became a certified member in 2014. PTT won approval for CAC recertification for a third term on March 31, 2021.
- Since 2014, PTT has begun enforcing PTT's and PTT Group's Anti-Corruption Policies. The policies, revised in 2021, contain the essence and practice in line with the laws, practices, and standards of leading companies, including revising the definition of corruption to be clearer and more complete. PTT's Anti-Fraud and Corruption Policy was defined as part of the Corporate Governance, Ethical Standards, and Code of Business Ethics Handbook, and PTT Group's Anti-Fraud and Corruption Policy as a part of PTT Group Way of Conduct so that PTT Group observes the same standards and management approaches and that all companies achieve synergy under the investment objective.

Details of PTT Group's Anti-Fraud and Corruption Policy are as shown at https://www.pttplc.com/uploads/CG/PTTGroupAntiFraudandCorruptionPolicy2022_EN.pdf

READ MORE

- PTT's Anti-Fraud and Corruption Policy forbids PTT's employees to carry out or not participate in corrupt practices as well as all forms of bribery offer or acceptance (direct and indirect). They must seriously observe the Anti-Corruption Policy, which covers various processes, including donations to charities, HR administration, procurement, and internal control.

Details of PTT's Anti-Fraud and Corruption Policy are as shown at https://www.pttplc.com/uploads/CG/PTT AntiFraudandCorruptionPolicy2021_EN.pdf

READ MORE

- In 2015, PTT declared its "No Gift Policy" for any festive period, and enforced practical guidelines under PTT Group's policy on gifts, entertainment, or other benefits to establish a higher standard for business practices in the hope of having all employees do their best without expecting benefits. To this end, a letter was sent to business partners and external agencies, and signboards were put up on the premises of PTT along with assorted PR channels. PTT was the prototype company of Thailand to truly enforce this policy.
- PTT has developed a Fraud and Corruption Risk Assessment Manual for all units to use as a guideline for fraud and corruption risk assessment in their work processes (Process Level) in order to have an adequate and appropriate internal control process and set to be reviewed regularly. In 2022, the manual was reviewed to align with PTT's Anti-Fraud and Corruption Policy and Enterprise Risk Management Manual (ERM Manual), as well as comparable to the COSO Fraud and Corruption Risk Management Framework 2016 and best practices of leading companies.
- PTT places great importance on conducting business based on transparency, fairness, accountability, and compliance with the law, with an effective risk management and internal control system. The third-party screening program has thus been set up for auditing and supervising the transparency of transactions with third parties to create a standard for examining the qualifications of those who enter into transactions with PTT to be rigorous and appropriate.
- PTT communicates its Anti-fraud and Corruption Policy and guideline to its subsidiaries, associates, and other PTT-controlled companies, business partners, and stakeholders as well as the public through assorted channels including letters, e-mails, website, PTT intranet, seminars, and exhibitions so that all stakeholders may acknowledge and conform to PTT's guidelines.
- PTT communicates with its employees and provides training to ensure their understanding of Anti-Fraud and Anti-Corruption measures, PTT's expectation, and disciplinary actions for non-compliance. The training includes an orientation session, morality courses, and e-Learning, and supports its executives' and staffs' participation in public courses on Anti-Fraud and Anti-Corruption.
- PTT applies information technology as a means for its personnel to express their transparency, such as in e-Trading, which shows pre-order trading of PTT and PTT Group's stocks to prevent insider trading, and a reporting system on receiving/ offering customary gifts, assets, and others benefit under the No Gift Policy; PTT personnel who have to receive and cannot return a gift must report and give it to the Good Governance and Corporate Ethics Department to collect and donate for public use.
- Oversight and monitoring of performance:
  - The Board ensures that PTT commands an efficient system for Anti-Fraud and Corruption to ensure that management recognizes and values Anti-Fraud and Corruption and abides by Anti-Fraud and Corruption measures.
  - The Audit Committee reviews the efficiency and effectiveness of corporate governance, risk management and internal control processes; financial reporting, and other procedures concerning Anti-Corruption measures to ensure such measures are adequate and effective. The committee also regularly reports internal audit outcomes regarding Anti-Corruption measures to the Board and provides best practices to the Board and the executives.

- The Corporate Governance and Sustainability Committee endorses objectives, goals, strategies, and management framework and grants Anti-Fraud and Corruption Policy and implementation directions. The committee annually provides recommendations and guidelines, monitors, and assesses performance, and steers and advocates risk management practices concerning Anti-Fraud and Corruption and process-level corruption by assessing fraud and corruption risk and reviewing Anti-Fraud and Corruption measures for adequacy and suitability.
- Executives establish risk assessment for business processes that may lead to corrupt practices, review the efficiency and effectiveness of internal control processes and measures, and personify proper behavior as well as communicate it to all employees and related parties.
- PTT establishes procedures for maintaining auditable documents and records to confirm the accuracy and suitability of financial reports. The internal control of accounting processes and information storage is audited to verify the effectiveness of Anti-Fraud and Corruption processes and ensure that the entry of financial items is well-evidenced for audit.
- The Office of Corporate Audit reviews items of potential conflicts of interest, the likelihood of corruption, and corporate efficiency for managing risks arising from corporate corruption and those at the operating level. The office also reviews business ethics principles and the code of conduct for executives and employees. It reviews actions and reports to the Audit Committee and top executives immediately when encountering items or actions that could undermine PTT's performance outcomes, including corruption.

8) Disciplinary Measures for Non-Compliance with Policies, Regulations and Guidelines

- Measures, scope, and tools for whistleblower protection:
  - PTT's HR administration process echoes its commitment to Anti-Corruption measures. Although refusal to take part in corruption may deprive PTT of business opportunities, its policy is not to demote, punish, or harm those that do so.
  - PTT's employees should not ignore actions in potential conflicts with Anti-Fraud and Corruption measures. PTT has established channels for whistleblowing and the protection of whistleblowers or those that need advice about conformance to Anti-Fraud and Corruption measures.
  - PTT has established rules on "complaint-filing and whistleblowing on corruption and non-compliance with laws and corporate regulations" to define applicable criteria and guidelines that are suitable and uniform throughout the corporation. Protective measures and fair treatment are in place for whistleblowers or those that provide information.
- Punishment
  - PTT has established a suitable and fair process for punishing violators of Anti-Corruption measures. Any violation of this policy, direct or indirect, will be calls for disciplinary review under PTT's regulations, consisting of fact-finding, investigation, punishment, and appeal. They could also lead to punishment by law. Employees must therefore master and strictly conform to the Anti-Fraud and Corruption Policy in every step of their work.

6.2 Code of Conduct

Code of Conduct and Code of Business Ethics

PTT has its written policy and a code of conduct included in the "Corporate Governance, Ethical Standards, and Code of Business Ethics Handbook" (CG Handbook), based on international standards. The handbook compiles the format, scope of standard behaviors, and actions that the directors, management, and employees must comply with during the course of business and in their duties with ethics, integrity, fairness, and equality. The code maintains PTT's image as an organization of sustainable growth. Supervisors are responsible for the monitoring and promotion of CG compliance among their subordinates. Violators of the code are subject to disciplinary action.

The essential aspects of the code are included below:

1. Respect and compliance with laws and regulations, and human rights principles
2. Anti-money Laundering
3. Political neutrality
4. No vested interests or conflicts of interest
5. Maintaining information confidentiality and refraining from using inside information for personal gain
6. Responsibility to customers their needs
7. Free and fair business competition
8. Transparent procurement and fair treatment of business partners (suppliers)
9. Community, Social and Environmental responsibility
10. Support of employees' rights and promotion of their engagement
11. Stringent, transparent, and equitable observance of contracts/ agreements with creditors
12. Internal control system and efficient internal audit
13. Guidelines for receiving and offering customary gifts, assets, and other benefits
14 Safety, occupational health, and the environment
15. Respect for intellectual properties and proper application of information and communication technology
16. Study, understand, verify information accuracy, and communicate responsibly

Details of the complete information on Corporate Governance, Ethical Standards, and Code of Business Ethics are shown at https://www.pttplc.com/uploads/CG/Publication/CGHandbookforOneReport/PTTCG Handbook_Revision5.1.1_EN.pdf

READ MORE

6.3 Milestone Development on the CG Policy, Guidelines, and System during the Year

In 2022, the Board approved the review and revision of the essence of the CG Policy, guidelines, monitoring system, and the CG Handbook as follows:

- Improving the roles and responsibilities of the Corporate Governance Committee to be the Corporate Governance and Sustainability Committee to make sustainability management roles and responsibilities clearer, and in line with the best practices according to the Corporate Governance Report of Thai Listed Company: CGR).
- Updating the CG Handbook, Revision 5th, with significant improvements as follows:
  - Improved details of trading prohibition of the company's securities, to be in line with the SEC's guidelines for disclosing and maintaining information that affects securities prices.
  - Revised examples of predicate offenses under the money laundering law in line with changes in the law (Constitutional Court ruling No. 8/2021).

- Improved the definition of any other benefits in line with the announcement of the National Anti-Corruption Commission Regarding Criteria for Receiving Property or Any Other Benefits by the Ethics of State Officials, B.E. 2563.
- Improved PTT's regulations relating to auditing and supervising processes for transparency in transactions with third parties (Third Party Screening Program) to be in line with the specified process.

In addition, in 2022, the PTT Management Committee (PTTMC) approved the review of significant improvements to policies, guidelines, and corporate governance systems, namely:

- Amendments to PTT's regulations regarding complaints and whistleblowing malpractice, misconduct, and non-compliance with the law, and organization rules to consider complaints related to malpractice and misconduct in a transparent, fair, and efficient manner in line with Corporate Governance Principles.
- Amendments to PTT's regulations relating to audit and supervision processes for transparency in transactions with third parties (Third Party Screening Program) and announcement of PTT's regulations Regarding Criteria and Examination of Persons Conducting Transactions with PTT to create a standard for examining the qualifications of persons conducting transactions with PTT to be concise and appropriate, with risk management and risk management systems in place and effective internal control.

Other Implementation under CG Code

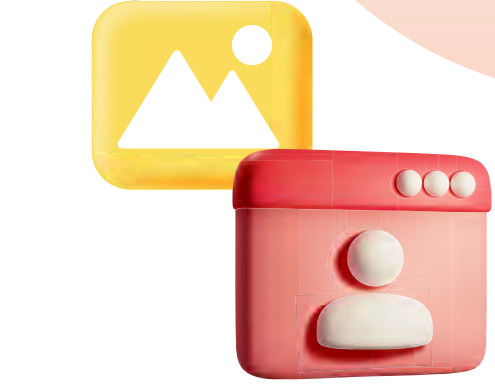
A survey on PTT's CG conducted by the Thai Institute of Directors Association (IOD) under the Corporate Governance Report of Thai Listed Companies for 2022 ranked PTT as "Excellent", with an average score overall and by category higher than the average score of 750 other companies surveyed and higher than the average score of companies in the SET50 group. The survey was based on publicized information in 2022. PTT's other guidelines which might be useful to other listed companies are:

- PTT's current Chairman of the Board is an independent director, so he independently delegates policy and oversees PTT's operations.
- PTT requires that Independent directors must consist of at least half of the directors in office.
- PTT limits the number of listed companies in which each director can hold positions in no more than 3 companies.
- The Corporate Governance and Sustainability Committee Meeting No. 4/2022 dated December 8, 2022, and the PTT Board Meeting No. 12/2022 dated December 15, 2022, considered the "Corporate Governance Principles for Listed Companies 2017" (CG Code) prepared by SEC, and the "Corporate Governance Principles and Guidelines for State Enterprises 2019" prepared by the State Enterprise Policy Office (SEPO), Ministry of Finance. They were of the opinion that PTT's policy, measures, and operational processes are comparable with these two and that PTT also commanded short-term and long-term plans to develop PTT's CG system to suit business directions and trends of other international leading companies.

In 2022, PTT complied with CG principles but did not cover the criteria under the Corporate Governance Report of Thai Listed Companies regarding the composition of the Board, which shall consist of 5 - 12 members. Under PTT's Articles of Association, the Board shall consist of a minimum of 5 but not exceeding 15 directors. The current Board consists of 15 directors, which complies with the Articles of Association and suits operations in the petroleum businesses, which need qualified experts in assorted fields essential for PTT business operations. The Board also appointed 5 specific committees to assist it in screening crucial matters: the Audit Committee, Nominating Committee, Remuneration Committee, Corporate Governance and Sustainability Committee, and Enterprise Risk Management Committee.

(Meeting attendance of the committees is detailed under Section 2: **"8.1.2 (1) Board Meetings"**).

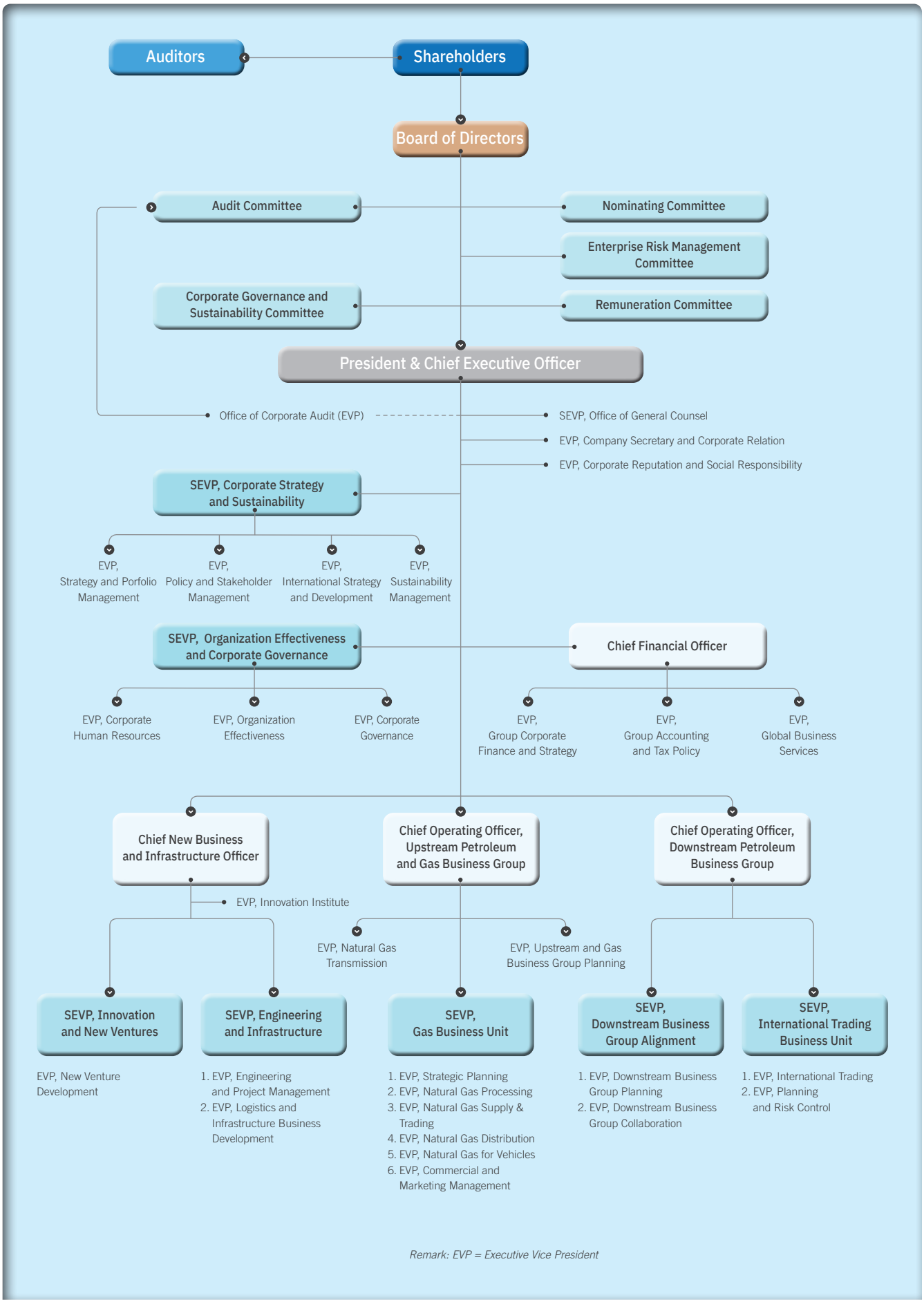
7. Governance Structure and Key Data on the Board of Directors, Specific Committees, Management, Employees and Others



7.1 Governance Structure

PTT Public Company Limited's management structure as of December 31, 2022, comprises the Board of Directors and five specific committees to consider significant matters: Audit Committee, Nominating Committee, Remuneration Committee, Corporate Governance and Sustainability Committee, and Enterprise Risk Management Committee. The President & CEO (President) is the top executive who manages PTT's business groups through 3 groups of 53 management committees.

Structure



Remark: EVP = Executive Vice President

7.2 Board of Directors

7.2.1 Composition of the Board

Under PTT's Articles of Association, the Board consists of:

- 5 - 15 persons
- A minimum of 3 independent directors (PTT's CG requires independent directors account for no less than one-half of the Board.)
- At least 1 director must be knowledgeable in accounting and finance.

According to the certification of the Ministry of Commerce dated January 3, 2023, the PTT Board consisted of 15 directors as follows:

- 14 non-executive directors (93.33% of the entire Board)
- 11 independent directors, which exceeds half of the Board (73.33% of the entire Board)
- 1 executive director
- Female directors (none)

7.2.2 Information of the Board and Authorized Directors

The Board of Directors as of December 31, 2022, consisted of:

No.	Name	Position	Date of Appointment
1.	Professor Dr. Thosaporn Sirisumphand	Independent Director/ Chairman of the Board (Appointed as an Independent Director effective from November 6, 2020, and Chairman effective from November 18, 2020)	November 6, 2020 (First term) April 8, 2022 (Second term)
2.	POL. GEN. Rungroj Sangkram	Independent Director/ Chairman of the Audit Committee	July 3, 2020 (First term)
3.	Mr. Danucha Pichayanan	Independent Director/ Chairman of the Nominating Committee	April 12, 2018 (First term) April 9, 2021 (Second term)
4.	GEN. Teerawat Boonyawat	Independent Director/ Chairman of the Remuneration Committee	April 11, 2019 (First term) April 8, 2022 (Second term)
5.	Mr. Jatuporn Buruspat	Independent Director/ Chairman of the Corporate Governance and Sustainability Committee	April 9, 2021 (First term)
6.	M.L. Chayotid Kridakon	Independent Director/ Chairman of the Enterprise Risk Management Committee	December 16, 2020 (First term) April 8, 2022 (Second term)
7.	Mr. Krishna Boonyachai	Independent Director/ Member of the Audit Committee (Having adequate knowledge and experience to review the reliability of financial statements)	July 3, 2020 (First term)

No.	Name	Position	Date of Appointment
8.	Associate Professor Dr. Chayodom Sabhasri	Independent Director/ Member of the Audit Committee (Having adequate knowledge and experience to review the reliability of financial statements)	April 9, 2021 (First term)
9.	Mr. Payong Srivanich	Independent Director/ Member of the Nominating Committee/ Member of the Corporate Governance and Sustainability Committee	April 9, 2021 (First term)
10.	Mr. Phongsthorn Thavisin	Director/ Member of the Nominating Committee	October 8, 2021 (First term)
11.	Mr. Krisada Chinavicharana	Director/ Member of the Remuneration Committee	October 1, 2021 (First term) April 8, 2022 (Second term)
12.	Associate Professor Dr. Narongdech Srukhosit	Independent Director/ Member of the Corporate Governance and Sustainability Committee/ Member of the Enterprise Risk Management Committee	October 8, 2021 (First term)
13.	Mr. Chansin Treenuchagron	Independent Director/ Member of the Remuneration Committee	May 14, 2022 (First term)
14.	Dr. Prasert Sinsukprasert	Director	December 26, 2022 (First term)
15.	Mr. Auttapol Rerkpiboon	Director and Secretary to the Board (President & CEO)	May 13, 2020 (First term) April 9, 2021 (Second term)

Remarks:
In 2022, the Board/ the Annual General Meeting (AGM) appointed new directors to replace those who had either completed their terms and/ or resigned as follows:

- *No. 6: M.L. Chayotid Kridakon changed his position from a director to an independent director with effect from November 18, 2022.*
- *No. 13: Mr. Chansin Treenuchagron was appointed as an independent director with effect from May 14, 2022, replacing the vacant position of Mr. Don Wasantapruek who passed away on March 14, 2022.*
- *No. 14: Dr. Prasert Sinsukprasert was appointed as a director with effect from December 26, 2022, replacing Mrs. Premrutai Vinaiphat who resigned with effect from November 1, 2022 (Dr. Prasert Sinsukprasert was appoint as Member of the Enterprise Risk Management Committee with effect from January 25, 2023)*

7.2.3 Authorities, Duties, and Responsibilities of the Board

Authorities of the Board

- The Board is authorized to supervise and oversee PTT's management's compliance with applicable laws, objectives, articles of Association, and resolutions of shareholders' meetings.

- The Board is authorized to select one director to serve as Chairman and may select a Vice Chairman if appropriate.
- The Board is authorized to appoint the President & CEO who has been nominated under the nomination process and procedures under relevant laws and regulations. The President & CEO shall be a director and secretary to the Board of Directors.

Duties and Responsibilities of the Board

- The Board is authorized to supervise and manage PTT under PTT's Articles of Association to ensure that PTT abides by laws, objectives, articles of association, and resolutions of shareholders' meetings in addition to policies or policy guidelines.
- The Board shall emphasize and devote time to the formulation of the corporate vision, mission, strategies, policies, and business plans. In addition, they shall pursue helpful information for such formulation; review potential risks; ensure management's ability to transform such vision, mission, strategies, policies, and key work plans into efficient and effective fruition, complete with competitiveness and proper performance results with due regard for long-term impacts. PTT must conduct business with ethics; respect shareholders' and stakeholders' rights with responsibility; steer good corporate citizenship with corporate resilience; and encourage innovation within the company. The Board shall review corporate vision, direction, and strategies annually.
- The Board shall review and endorse the company's strategies, policies, and business plans in addition to objectives, financial targets, and budgets as well as key resource allocation to enable objective and goal achievement.
- The Board shall regularly provide oversight, control, monitoring, and review of management performance to ensure that they are performing according to the approved business plans in line with the company's direction and strategy at least annually. To this end, the Board shall advocate corporate culture to achieve the mission, objectives, targets, strategic plans, and business policies.
- The Board shall review and approve significant transactions that create obligations for PTT Group in line with laws, articles of association, policies, regulations, or operational authority, including connected transactions and key transactions. To this end, transaction approval processes shall comply with legal requirements with an emphasis on the optimal interests of shareholders and stakeholders as a whole. The Board shall oversee and resolve potential conflicts of interest and connected transactions.
- The Board shall ensure that the company's accounting systems, financial reporting, and account auditing are reliable, and the assessment processes for internal control and internal audit are effective and efficient.
- The Board shall establish clear and written policies on principles and business approaches for the Board, management, and employees, including the Corporate Governance Policy, Ethical Standards, Code of Business Ethics, and Internal Control Policy. The Board shall ensure communication among the Board, management, and employees so that they all may be kept thoroughly informed and apply with true understanding; as well as monitor and assess the implementation while regularly reviewing policies and implementation effectiveness.
- The Board shall ensure that potential risk factors are considered and the risk management policies for the whole of PTT are established with regular review. The management is obliged to implement the policies and report the results thereof regularly to the Board. The Board shall review and evaluate the risk management processes and effectiveness of risk management by emphasizing the potential signs or irregularity while seeking potential business opportunities arising from such risks.
- The Board shall establish an appropriate remuneration system or mechanism for management to motivate both short-term and long-term performance.
- The Board shall conduct a self-assessment and the assessment on the performance of each specific committee annually to examine its own performance, and disclose the results in the 56-1 One Report.
- The Board shall assign authority and responsibility to the President & CEO for daily management of PTT's operations, ensuring that the operations are alignment with strategic plans, business directions, objectives, policies, and budget approved by the Board. In addition, the President & CEO's performance shall be appraised on a regular basis.

- The Board shall review and approve the remuneration of the President & CEO in keeping with PTT's short-term and long-term performance outcomes.
- The Board shall provide appropriate communication channels for shareholders and the disclosure of information shall be monitored to ensure high standards of accuracy, clarity, transparency, and reliability.
- The Board shall be leaders and role models for excellent performance, compliance with laws and in line with PTT's principles of good corporate governance, and encourage PTT's culture underlined by the commitment to business ethics.
- When the company gains sufficient profits and does not retain cumulative loss, the Board shall propose the distribution of dividends for shareholders' approval at the Shareholders' Meeting.
- The Board shall set up an appropriate regulatory framework for digital technology development in line with changing internal and external factors, including the use of information technology to increase opportunities and develop operations to achieve PTT's key goals and objectives.
- The Board shall consider and approve the master plan and annual action plan on digital technology development.

The Board's Additional Authorities Include:

- Approve long-term investments, such as common stocks, preferred stocks, bonds, debentures, warrants, or other financial instruments.
- Approve financial support, including funds, common stocks, preferred stocks, loans, or others as appropriate for PTT-invested companies.
- Approve debt financing and issuance of debt instruments such as debentures.
- Approve the annual budget.
- Approve procurement and other related matters if the limits exceed the CEO's approval authority.
- Consent to employ, appoint, transfer, or promote employees serving as senior executive vice presidents or equivalent upward. And consent to appoint, transfer or promote employees serving as executive vice presidents or equivalent upward.
- Appoint the Company Secretary.

Authorized Director to Sign and Bind for PTT

According to PTT's Articles of Association, as of January 3, 2023, the directors whose signatures are authorized to sign and bind PTT are either (1) Mr. Auttapol Rerkpiboon, President & CEO, to sign and affix PTT's seal, or (2) M.L. Chayotid Kridakon, and Mr. Phongsthorn Thavisin, jointly sign and affix PTT's seal.

Appointment and Dismissal of Directors

1. The Board consists of 5 - 15 persons who are appointed at shareholders' meetings. In addition, the Board consists of a minimum of 3 independent directors and at least half of the directors must reside in the Kingdom. At least 1 of them must be knowledgeable in accounting and finance. The Nominating Committee also seeks to maintain an appropriate balance and take into account board diversity for consideration including expertise, skills, and qualification without discrimination of gender, race, or religion in the appointment. All directors must have qualifications as specified by law and the Articles of Association. Since 2004, the Board has decided that independent directors must consist of at least half of the Board, a requirement that remains effective until the present. As of December 31, 2022, the Board had 11 independent directors, all of them resided in Thailand. 7 directors are experts in accounting and finance, namely: Mr. Danucha Pichayanan, Mr. Krishna Boonyachai, M.L. Chayotid Kridakon, Associate Professor Dr. Chayodom Sabhasri, Mr. Payong Srivanich, Mr. Krisada Chinavicharana, and Mr. Chansin Treenuchagron.
2. The shareholders' meetings are to appoint qualified directors whom the Nominating Committee has elected and proposed to the Board under the following criteria:
   (1) Each shareholder has one vote per share held.
   (2) Each shareholder exercises all votes applicable under (1) in electing one or more persons as directors, provided that no vote is divisible.
   (3) Candidates with the highest number of votes are to be appointed directors up to the number required at the meeting.
   (4) If candidates get equal votes, which makes the number of successful candidates exceed that of directors to be elected, the Chairman of that meeting will cast the decisive vote.

3. At the AGM, one-third of the directors or if the number is not a multiple of three, then the number nearest to one-third - will retire from directorship. The directors retiring in the first and second year after PTT was listed are to be drawn by lots. For subsequent years, those with the longest terms are to retire.
4. If a director's seat is vacated for reasons other than term completion, the Board may elect a qualified person without the prohibitions stipulated by PTT's Articles of Association to fill the vacancy at the next Board meeting unless the remaining term of the vacated director is less than two months. The acting director must secure at least three-quarters of the votes of the remaining directors. He or she can also stay in office only for the remaining term of the predecessor.
5. Any director who wishes to resign from directorship must tender his or her resignation to PTT. Such resignation will take effect from the date the resignation letter reaches PTT.
6. For voting to remove any director from the directorship before the completion of his or her term, a three-quarter vote of eligible shareholders present at the meeting is required as well as at least half of the total number of shares represented by the eligible shareholders present at the meeting.

Qualifications of Directors

Directors must be duly qualified, without the prohibitions stated in the Public Company Limited Act and the Standard Qualifications of State Enterprise Directors and Officials Act B.E. 2518 (1975) and its amendments, as well as relevant Cabinet resolutions, including:

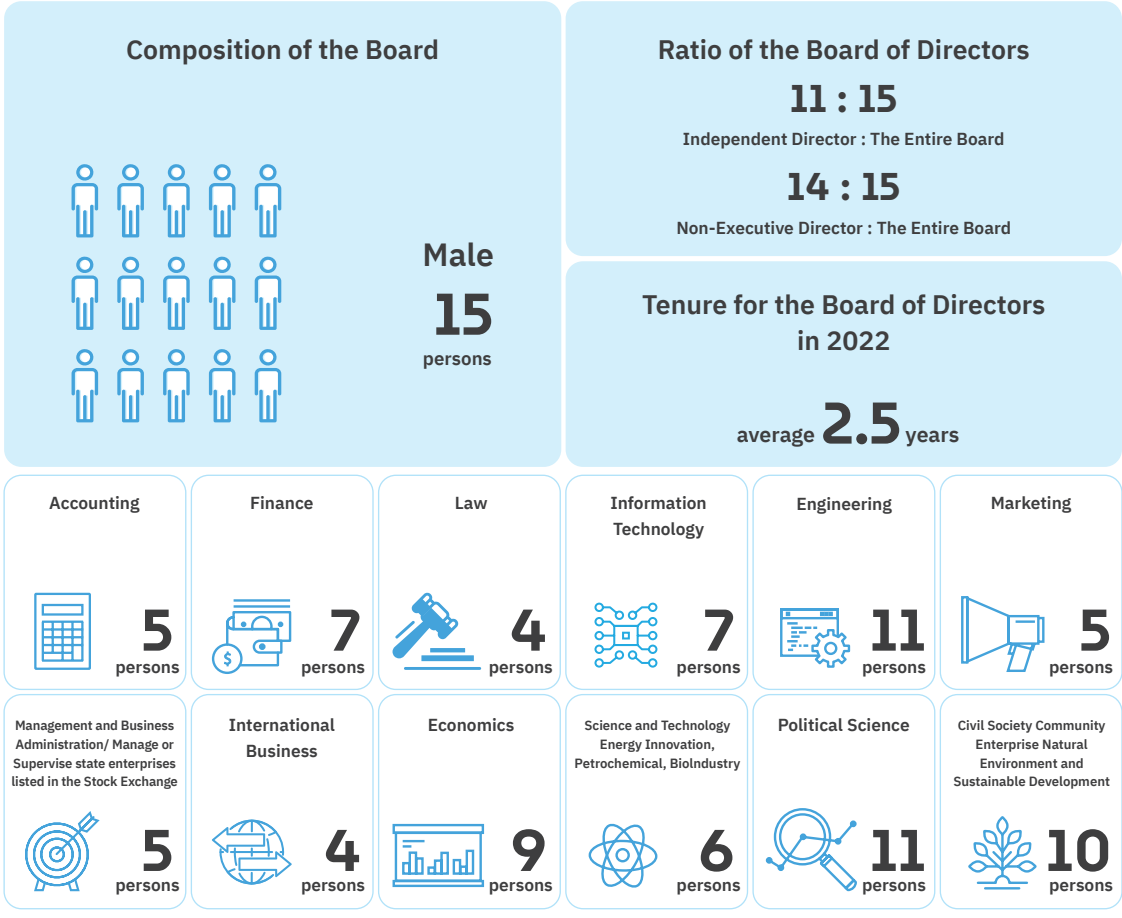
- Must not be over 65 years of age.
- Must not hold more than three directorships in state enterprises or juristic persons in which state enterprises hold shares, including appointments due to their positions and those due to acting assignments.
- Independent directors must command independence as required by SET's Notification on the Qualifications and Scope of Work of the Audit Committee.
- Must not be sentenced to imprisonment, except for violations of the law by negligence or a petty offense.
- Must not be a political official, except for holding a director position under a provision of law.
- Must not hold any position in a political party or be an official of a political party.
- Must not be expelled, dismissed, or removed from a position because of malfeasance.
- Must not be a shareholder of such state enterprise or a shareholder of a juristic person in which such state enterprise holds shares. Exceptions apply to directors of state enterprises who are not government officials, government employees, or wage earners with positions or position salaries of centralized, provincial, or local government, or other government agencies. Also, such state-enterprise directors can hold no more than 0.5% of the paid-up capital of the state enterprise in which they serve as directors or juristic persons where the state enterprise in question holds shares.
- Must not hold any position in a juristic person in which such state enterprise holds shares, except where entrusted by the boards of directors of such state enterprise to hold a directorial position or other position in the juristic person in which such state enterprise holds shares.
- Must not be a director or an executive or person with authority over the management or an interest in a juristic person who is a concessionaire or joint-venture party, or having an interest in the undertakings of such state enterprise, except for being a chairperson of the board of directors, director or executive by entrustment of such state enterprise.

In addition, the Corporate Governance, Ethical Standards, and Code of Business Ethics Handbook, Revision 5, defines the term holding of a director with the following limits:

1. A maximum of three directorships in the state enterprises/ juristic persons of which the state enterprise is a shareholder.
2. A maximum of three directorships in SET-listed companies provided that the directorships under (2) do not contradict (1). Such directorships in (1) and (2) must not exceed five.

In addition, independent directors and members of specific committees shall serve no more than nine consecutive years.

In compliance with the law, PTT ensures that at least one-third of the Board is listed in the Director's Pool of the Ministry of Finance. As of December 31, 2022, 15 out of 15 PTT directors' names were listed in the Director's Pool.



7.3 Specific Committees

PTT's specific committees as follows:

(1) The Audit Committee

Each quarter the Audit Committee, together with the Financial and Accounting functions and the external auditor (EY Office Limited), reviews PTT's financial reports. The Board is accountable for PTT Group's consolidated financial statements as well as other financial information presented in the annual report. The financial reports are prepared under generally accepted accounting principles and are audited and certified by Miss Waraporn Prapasirikul, C.P.A. No. 4579, of EY Office Limited. Material information, financial and non-financial, is accurately, completely, and consistently disclosed.

The Board approved the appointment of the Audit Committee on October 1, 2001, which consisted of directors with the qualifications specified by SEC laws and SET. The committee must consist of at least three directors. As of December 31, 2022, it consisted of three independent directors as follows:

Name	Position in the Audit Committee	Position in the Board
1. POL. GEN. Rungroj Sangkram	Chairman	Independent Director
2. Associate Professor Dr. Chayodom Sabhasri	Member	Independent Director
3. Mr. Krishna Boonyachai	Member	Independent Director

The Executive Vice President, Office of Corporate Audit served as secretary.

Remarks:

1. *POL. GEN. Rungroj Sangkram was appointed Chairman with effect from June 17, 2021.*
2. *Associate Professor Dr. Chayodom Sabhasri was appointed member with effect from May 20, 2021. He commands sufficient expertise and experience to review and ensure the accuracy and credibility of financial statements.*
3. *Mr. Krishna Boonyachai was appointed member with effect from July 3, 2020. He commands sufficient expertise and experience to review and ensure the accuracy and credibility of financial statements.*

Duties and Responsibilities

1. Review and reassess the adequacy of the Audit Committee Charter annually in accordance with PTT strategic objectives. Final approval of the charter resides with PTT Board of Directors.
2. Review the effectiveness and efficiency of governance, risk management, and control processes.
3. Review and ensure that PTT financial statement is accurate and reliable.
4. Review and ensure that PTT business processes are in line with the Securities Law, the Stock Exchange's regulations, policy, rules, ordinances, the Articles, the Cabinet Resolutions, and the relevant laws.
5. Review and ensure that PTT internal audit system is appropriate including the sufficiency of the internal audit budget, resources, and the organizational independence of the internal audit activity.
6. Consider any connected or Conflict of Interest transaction or fraud occurrence that may affect PTT business in accordance with the Stock Exchange's regulations and rules.
7. Review and ensure that the business processes are in accordance with the State Enterprise Assessment Model (SE-AM), including monitoring the implementation of the relevant observations/ recommendations.
8. Recommend to PTT Board of Directors, the Chief of Corporate Audit appointment, removal, and performance.
9. Recommend to PTT Board of Directors, the external auditor nomination, appointment, or termination including its fee.
10. Coordinate with the external auditor and may purpose to review or assess any significant accounting and reporting issues.
11. Receive complaints through the channels and methods identified in PTT's Rule on Complaints and Whistleblowing against Fraud, Malpractice, Misconduct, and Non-Compliance with Laws or Organizational Regulations.
12. Report to PTT Board of Directors the Audit Committee performance at least one time quarterly. For the fourth quarter, the Audit Committee's Annual Report must be prepared and submitted to responsible Ministry of government agencies and the Ministry of Finance.

13. Report to PTT Board of Directors the Audit Committee performance on internal audit activity assessment at least one time annually.
14. Disclose the Audit Committee Annual Report and the external auditor annual fee in the PTT annual report.
15. Either the Chairman or a member of the Audit Committee must attend the PTT annual general shareholder meeting.
16. If competent advice or assistance is needed to perform internal audit activity or other Audit Committee tasks, the Audit Committee can propose PTT Board of Directors to appoint any independent consultant or expert. The costs and expenses of such services or invitations shall be on PTT's account.
17. Inform the CEO any breach of the Securities Law, the Stock Exchange's regulations, policy, rules, ordinances, the Articles, the Cabinet Resolutions, and the relevant laws to resolve the issue.
18. Meet at least one time quarterly and must hold a private meeting with the external auditor at least one time annually.
19. Officially meet with the managements at least one time annually.
20. Perform any designated tasks by the laws or PTT Board of Directors under the Audit Committee's duties and responsibilities.

These are in line with the guidelines of PTT Public Company Limited's ordinance on the Audit Committee and the Internal Audit Unit, B.E. 2564 (2021).

In 2022, the Committee held 18 meetings and duly reported its findings to the Board. In addition, it participated in quarterly audits along with the external auditor and the Chief Financial Officer functions.

The Audit Committee disclosed its annual performance in the Report of the Audit Committee.

(2) The Nominating Committee

The Board approved the appointment of the Nominating Committee on October 1, 2001, by appointing three directors. As of December 31, 2022, it consisted of 3 members.

Name	Position in the Nominating Committee	Position in the Board
1. Mr. Danucha Pichayanan	Chairman	Independent Director
2. Mr. Payong Srivanich	Member	Independent Director
3. Mr. Phongsthorn Thavisin	Member	Director

The Company Secretary served as secretary.

Remarks:

1. *Mr. Danucha Pichayanan was appointed the Chairman of the Nominating Committee with effect from April 8, 2022 (replacing Mr. Don Wasantapruek, who passed away on March 14, 2022).*
2. *Mr. Payong Srivanich was appointed a member with effect from April 9, 2021.*
3. *Mr. Phongsthorn Thavisin was appointed a member with effect from October 8, 2021.*

Duties and Responsibilities

1. Determine procedures and criteria for nomination of PTT's directors so as to ensure transparency.
2. Select director nominees to fill vacancies (due to resignation or term completion) for the Board's or the shareholders' meeting's consideration and appointment with due regard for the composition of the Board, expertise, competencies, and experience that would be useful to PTT in compliance with PTT's Board Skill Matrix and the Director's Pool of the Ministry of Finance and Thai Institute of Directors Association (IOD). Equally important, nominees must have no conflict of interest with PTT, and the qualifications of desirable directors must prove compatible with PTT's business strategies.
3. Appoint the suitably qualified directors to perform duty as Specific Committee, taking into account the compositions of committees in question, suitability, qualifications, knowledge, and competencies. Then, purpose the list to the Board for approval, except for the Nominating Committee which is being appointed directly by the Board.
4. Be directly accountable to the Board, while the Board is accountable for PTT's businesses to all stakeholders.
5. Appraisal performance of the Nominating Committee and report to the Board of Directors in order to disclose them in the annual report.
6. Disclose its performance in the annual report.
7. Hold at least two meetings a year.
8. Perform other Board-assigned tasks.

The procedures and criteria for the nomination of directors are as follows:

1. The Committee defines the qualifications needed for replacements to ensure that new directors meet the criteria and qualifications required by applicable laws and regulations and align with PTT's strategy and operations.

According to the Corporate Governance, Ethical Standards, and the Code of Business Ethics Handbook, the Board should consist of experts from a variety of disciplines needed for the administration of PTT businesses. Specifically, its composition should consist of at least three experts in the petroleum business, one expert in the law, and one expert in finance and accounting. Currently, PTT's Board Skill Matrix consists of Accounting/ Finance/ Laws/ Information Technology/ Engineering/ Marketing/ Business Administration and Management/ Listed State Enterprise Management and Supervision/ International Business/ Economics/ Science and Technology/ Energy Innovation/ Petrochemical/ Biological Industry/ Digital/ Automation/ Artificial Intelligence or Robotics/ Political Science/ Security/ Crisis Risk Management/ Social, Community, Natural Resources and Environmental Activities, Sustainable Development, and Life Science.

2. The Committee summarizes the result of the nomination process and presents a shortlist of qualified candidates for the directorship along with supporting rationale to the Board.
3. The Board considers and selects qualified candidates from the list prepared by the committee and submits their names to the shareholders' meeting for approval. The list must also be endorsed by the State Enterprise Policy Office (SEPO) in conformance with the guidelines on the appointment of state enterprise directors under the Cabinet resolution of August 6, 2019.

In 2022, the committee held 15 meetings, with all committee members at the time in attendance. The Company Secretary served as secretary.

The Nominating Committee disclosed its annual performance in the Report of the Nominating Committee.

(3) The Remuneration Committee

The Board approved the appointment of the Remuneration Committee on October 1, 2001, by appointing three directors. As of December 31, 2022, it consisted of:

Name	Position in the Remuneration Committee	Position in the Board
1. GEN. Teerawat Boonyawat	Chairman	Independent Director
2. Mr. Krisada Chinavicharana	Member	Member
3. Mr. Chansin Treenuchagron	Member	Independent Director

The Company Secretary served as secretary.

Remarks:

1. *GEN. Teerawat Boonyawat was appointed Chairman with effect from April 11, 2019.*
2. *Mr. Krisada Chinavicharana was appointed member with effect from October 1, 2021.*
3. *Mr. Chansin Treenuchagron was appointed member with effect from May 14, 2022.*

Duties and Responsibilities

1. Define the criteria for remuneration and propose fair, sensible remuneration of directors and specific committees to the Board and the shareholders' meeting for approval.
2. Propose guidelines for assessing performance outcomes and remuneration for the President & CEO to the Board for approval.
3. Acknowledge and recommend on organization restructuring and job levels ncluding appraisement remuneration for senior executive vice presidents.
4. Be directly accountable to the Board, while the Board is accountable for PTT's businesses to all stakeholders.
5. Assess its performance outcomes and report to the Board for acknowledgment and disclose them in the annual report.
6. Disclose its performance in the annual report.
7. Hold at least two meetings a year.
8. Perform other Board-assigned tasks.

In 2022, the Committee held 6 meetings, with all committee members at the time in attendance. The Company Secretary served as secretary.

The Remuneration Committee disclosed its annual performance in the Report of the Remuneration Committee.

(4) The Corporate Governance and Sustainability Committee

The Board approved the appointment of the Corporate Governance Committee on June 24, 2004, and approved the restructuring to be the Corporate Governance and Sustainability Committee on October 27, 2022, by appointing three independent directors. As of December 31, 2022, it consisted of:

Name	Position in the Corporate Governance and Sustainability Committee	Position in the Board
1. Mr. Jatuporn Buruspat	Chairman	Independent Director
2. Associate Professor Dr. Narongdech Srukhosit	Member	Independent Director
3. Mr. Payong Srivanich	Member	Independent Director

Senior Executive Vice President, Organization Effectiveness and Corporate Governance, served as secretary, and Executive Vice President, Corporate Governance, Executive Vice President, Company Secretary and Corporate Relation, and Executive Vice President, Sustainability Management, served as assistant secretaries.

Remarks:

1. *Mr. Jatuporn Buruspat was appointed a member with effect from April 9, 2021, and appointed Chairman with effect from April 8, 2022. (From June 17, 2021 - April 7, 2022, Mr. Danucha Pichayanan was the Chairman of the Corporate Governance Committee.)*
2. *Associate Professor Dr. Narongdech Srukhosit was appointed a member with effect from October 8, 2021.*
3. *Mr. Payong Srivanich was appointed a member with effect from April 8, 2022.*

Duties and Responsibilities

1. Corporate Governance, operational risk and internal control, and compliance (GRC), and Anti-fraud and corruption
   - Formulate objectives, targets, strategies, management framework, and assign policy and operational guidelines in line with PTT's strategies and targets as well as laws, regulations, national and international practices, and require annual review.
   - Provide advice and recommendations to the Board and management on matters dealing with PTT's Corporate governance, operational risk and internal control, and compliance (GRC), and Anti-fraud and corruption, regarding good corporate governance principles, for the formulation of the organization's policies and guidelines in compliance with relevant laws, regulations, criteria, standard, national and international practices.
   - Establish the policy and define scope of guidelines for the supervision, support, and monitoring of PTT's whistleblowing mechanism dealing with fraud and corruption, and non-compliance with laws and corporate regulations.
   - Supervise and monitor the implementation of PTT's Corporate governance, operational risk and internal control, and compliance (GRC), and Anti-fraud and corruption, as well as PTT's whistleblowing, and report the outcome to the Board.
2. Sustainability Management (SM)
   - Formulate objectives, targets, policies, master plan, strategies, guideline, and sustainability management plan based on Environmental, Social and Governance (ESG) to be in line with PTT's strategies and targets, including standards, national and international practices, and require annual reviews.
   - Formulate objectives, targets, strategies, management framework on Corporate Social Responsibility (CSR) and assign policy and operational guidelines in line with PTT's strategies and targets as well as international practices, and require annual reviews.

- Provide advice and recommendations, be a role model, and support PTT's operation to comply with PTT's Sustainability Management Policy and successfully fulfill targets, as well as support the Board, management, and employees to efficient comply with PTT's Sustainability Management Manual.
- Supervise and monitor the implementation of PTT's Sustainability Management (SM) and Corporate Social Responsibility (CSR), and report the outcome to the Board.

3. Establish the policy of allowing minority shareholders to nominate directors and propose Annual General Meeting's agenda items.
4. Advise and provide consultation to the Governance, Risk and Compliance Management Committee (GRCMC).
5. Perform other Board-assigned tasks.
6. Hold at least one meeting each quarter.

In 2022, the Committee held 6 meetings with all committee members at the time in attendance. The Senior Executive Vice President, Organization Effectiveness and Corporate Governance, and the Senior Executive Vice President, Office of General Counsel*, served as joint secretary.

The Corporate Governance and Sustainability Committee disclosed its annual performance in the Report of the Corporate Governance and Sustainability Committee.

Remark:

** On October 27, 2022, PTT's approved the restructuring of the Corporate Governance and Sustainability Committee with Senior Executive Vice President, Organization Effectiveness and Corporate Governance, serving as secretary to the Committee.*

(5) The Enterprise Risk Management Committee

The Board approved the appointment of the Enterprise Risk Management Committee (ERMC) on October 25, 2013, by appointing at least three directors, at least one of whom must be an independent director. As of December 31, 2022, it consisted of:

Name	Position in the Enterprise Risk Management Committee	Position in the Board
1. M.L. Chayotid Kridakon	Chairman	Independent Director
2. Associate Professor Dr. Narongdech Srukhosit	Member	Independent Director

Senior Executive Vice President, Corporate Strategy and Sustainability tasked as Chief Risk Officer (CRO) and Chief Stakeholder Officer (CSO) served as secretary.

Remarks:

1. *M.L. Chayotid Kridakon was appointed Chairman with effect from May 1, 2021.*
2. *Associate Professor Dr. Narongdech Srukhosit was appointed member with effect from April 8, 2022.*
3. *Mrs. Premrutai Vinaiphat was appointed member with effect from July 3, 2020, and resigned from directorship with effect from November 1, 2022.*
4. *Dr. Prasert Sinsukprasert was appointed member with effect from January 25, 2023.*

Duties and Responsibilities

1. Define and review PTT's risk management and corporate stakeholder management policies and scopes.
2. Supervise and support risk management and stakeholder management practices in line with strategies and business goals as well as prevailing circumstances.
3. Provide recommendations, monitor, and evaluate risk management and stakeholder management for further implementation of the Corporate Plan and Risk Management Committee (CPRC) (management level).
4. Review risk management outcome reports and provide recommendations on risks, including specifications of control measures or mitigation plans and development of the risk management system to CPRC for continued efficiency.
5. Review reports of corporate stakeholder management outcomes and provide recommendations on relevant plans to extend positive outcomes or minimize/ offset potential impacts on stakeholders, including the development of a stakeholder management system for CPRC to ensure continued efficiency.
6. Support the Chief Risk Officer (CRO) and Chief Stakeholder Officer (CSO) in achieving PTT's corporate risk management and stakeholder management goals.
7. Report risk management and stakeholder management outcomes to the Board at least every quarter. For factors or events with potentially significant impacts on PTT, the Board must be notified immediately.
8. Screen and comment before submitting for the Board's approval contractual items that are complicated businesswise and contain risks potentially affecting PTT or potentially and significantly affecting PTT's stakeholders, as endorsed by PTT Management Committee.
9. Screen and comment on investment agendas:
   - PTT's and PTT Group's wholly-owned investment projects with investment values exceeding THB 5 billion presented to the Board for approval.
   - PTT's investment projects in companies where it holds less than 100% shares and those not SET-listed, with investment values exceeding THB 5 billion, presented to the Board for approval before PTT's representative votes in the shareholders' meetings or board meetings in question.
   - Investment with risks potentially significantly impacting PTT or its stakeholders, as endorsed by PTT Management Committee.
10. Define and review the corporate innovation policy.
11. Provide recommendations and guidelines for the monitoring and assessment of the long-term and annual innovation management master plan for further implementation.
12. Supervise and promote implementation under the innovation policy and master plan to ensure that the annual operation plan can achieve its goals.
13. Report the results of the implementation outcomes of creative thinking and innovation to the Board for acknowledgment at least every quarter.
14. Define and review the customer and market management framework.
15. Supervise, promote, and support operations under the customer and market management framework to achieve the set goals according to the business direction.
16. Report the performance of customer and market management to the Board for acknowledgment at least every quarter.
17. Hold at least one meeting each quarter.
18. Perform other Board-assigned duties.

The reviewing of the risk management system remains the duty of the Audit Committee and the Office of Corporate Audit.

In 2022, the Committee held 13 meetings with all committee members at the time in attendance. The Senior Executive Vice President, Corporate Strategy and Sustainability, served as secretary.

The Enterprise Risk Management Committee disclosed its annual performance in the Report of the Enterprise Risk Management Committee.

7.4 Management

7.4.1 Management Team Members as of December 31, 2022

(PTT Management Structure as in the organization chart **"7.1 Governance Structure"**)

Name	Position
1. Mr. Auttapol Rerkpiboon	President & CEO
2. Mr. Wuttikorn Stithit[1/]	Chief Operating Officer, Upstream Petroleum and Gas Business Group
3. Mr. Noppadol Pinsupa[2/]	Chief Operating Officer, Downstream Petroleum Business Group and Acting President & CEO of Thai Oil Plc.
4. Dr. Buranin Rattanasombat[3/]	Chief New Business and Infrastructure Officer
5. Miss Pannalin Mahawongtikul	Chief Financial Officer
6. Mr. Terdkiat Prommool	Senior Executive Vice President, Corporate Strategy and Sustainability
7. Mr. Chadil Chavanalikikorn[4/]	Senior Executive Vice President, Organization Effectiveness and Corporate Governance
8. Miss Peangpanor Boonklum	Senior Executive Vice President, Office of General Counsel
9. M.L. Peekthong Thongyai[5/]	Senior Executive Vice President, Gas Business Unit
10. Mr. Prasong Intaranongpai[6/]	Executive Vice President, Acting Senior Executive Vice President, Downstream Business Group Alignment
11. Mr. Cherdchai Boonchoochauy[7/]	Senior Executive Vice President, Innovation and New Ventures
12. Mr. Chansak Chuenchom	Senior Executive Vice President, Engineering and Infrastructure
13. Mrs. Nivadee Jaroensitipun[8/]	Executive Vice President, Acting Senior Executive Vice President, Government Relations
14. Mr. Montri Rawanchaikul	Senior Executive Vice President, seconded to CEO, PTT Exploration and Production Plc.
15. Dr. Kongkrapan Intarajang[9/]	Senior Executive Vice President, seconded to President & CEO, PTT Global Chemical Plc.
16. Mr. Kris Imsang[10/]	Chief Operating Officer, seconded to President & CEO, IRPC Plc.
17. Mr. Worawat Pitayasiri	Senior Executive Vice President, seconded to President & CEO, Global Power Synergy Plc.

Name	Position
18. Mr. Suchat Ramarch[11/]	Senior Executive Vice President, seconded to President, PTT Oil and Retail Business Plc.
19. Mrs. Chanamas Sasnanand	Executive Vice President, Group Corporate Finance and Strategy
20. Miss Jaroonsri Wankertphon[12/]	Executive Vice President, Global Business Services, Acting Executive Vice President, Group Accounting and Tax Policy

Remarks:
Nos. 1 - 5 are "Management" under SEC's notification.
1/ Appointed on October 1, 2022, replacing Mr. Atikom Terbsiri who retired.
2/ Appointed on October 1, 2022, replacing Mr. Kris Imsang, who was appointed Chief Operating Officer, seconded to President & CEO, IRPC Plc.
3/ Appointed on October 1, 2022, replacing Mr. Noppadol Pinsupa, who was appointed Chief Operating Officer, Downstream Petroleum Business Group and Acting President & CEO, Thai Oil Plc.
4/ Appointed on October 1, 2022, replacing Mr. Suchat Ramarch, Senior Executive Vice President, seconded to President, PTT Oil and Retail Business Plc.
5/ Appointed on October 1, 2022, replacing Mr. Wuttikorn Stithit, who was appointed Chief Operating Officer, Upstream Petroleum and Gas Business Group.
6/ Appointed on October 1, 2022, replacing M.L. Peekthong Thongyai, who was appointed Senior Executive Vice President, Gas Business Unit.
7/ Appointed on October 1, 2022, replacing Dr. Buranin Rattanasombat, who was appointed Chief New Business and Infrastructure Officer.
8/ Appointed on November 1, 2022
9/ Changed the position name to President & CEO with effect from January 1, 2022.
10/ Appointed on October 1, 2022, replacing Mr. Chawalit Tippawanich who retired.
11/ Appointed on October 1, 2022, as Senior Executive Vice President, seconded to President, PTT Oil and Retail Business Plc.
12/ Assigned to the position of Executive Vice President, Global Business Services, Acting Executive Vice President, Group Accounting and Tax Policy, with effect from October 1, 2022, replacing Miss Wilaiwan Kanjanakanti who was appointed Executive Vice President, seconded to Senior Executive Vice President, Finance, PTT Oil and Retail Business Plc.

Newly Appointed Management/ Position Change in January 2023

Name	Position
1. Mr. Pongpun Amornvivat	Senior Executive Vice President, International Trading Business Unit Effective from January 1, 2023. (Replacing Mr. Disathat Panyarachun who early retirement with effect from December 1, 2022.)
2. Mr. Bandhit Thamprajamchit	Senior Executive Vice President, seconded to President & CEO, Thai Oil Plc., with effect from January 1, 2023.
3. Mr. Noppadol Pinsupa	Chief Operating Officer, Downstream Petroleum Business Group (Off duty from Acting President & CEO, Thai Oil Plc., with effect from January 1, 2023.
4. Miss Peangpanor Boonklum	Changed the position name to Senior Executive Vice President, Office of General Counsel.

Duties and Responsibilities of the President & Chief Executive Officer (President)

Under the Articles of Association, the President is authorized and responsible for managing the Board-assigned and PTT's overall business, which must be strictly and prudently managed with integrity under the Board-approved plans or budget in the best interests of PTT and its shareholders. The President's authority and responsibilities include:

- Operate or manage day-to-day business or both.
- Hire, appoint, remove, transfer, promote, demote, deduct the salaries or wages of, punish and dismiss any employee under the Board's regulations.
- Ensure the preparation and submission of business policies, including operational plan and budget estimation, for the Board's approval, and report the performance outcomes to the Board every three months.
- Ensure implementation of the Board-approved policies, plans, and budgets.

The Board authorized the President to manage PTT's business under the following scope:

- Manage the overall business under the objectives, Articles of Association, policies, rules and regulations, directives, and resolutions of the Board and/or shareholders' meetings.
- Order, contact, command, implement, and sign juristic acts, agreements, orders, announcements, or correspondence with government agencies, state enterprises, or other parties and engage in any essential and suitable action to facilitate this duty.
- Command all employees, including hiring, appointing, removing, promoting, demoting, deducting the salary or wages of, taking disciplinary action against, or dismissing any employee under the rules, regulations, and directives of the Board. For employees serving as advisers, senior executive vice presidents, or equivalent upward, prior approval of the Board is required. The President is also authorized to specify employment conditions for employees and issue rules for PTT's operations provided that they do not contradict the rules, regulations, and directives of the Board.
- Assign the power of attorney or delegate specific tasks to other persons, or both, provided that the action complies with the document on the power of attorney or rules, regulations, or directives of the Board or PTT, or both.

The authority and duties of the President stated above are invalid for any conflict of interest with PTT in any form resulting from the President's exercise of the authority. In 2022, no such cases have arisen.

The Management Committee

The PTT Management Committee (PTTMC) was appointed on October 1, 2001, with the mandate of operating PTT's business. As of December 31, 2022, the Committee consisted of 15 members as follows:

Name	Position
1. President & CEO	Chairman
2. Chief Operating Officer, Upstream Petroleum and Gas Business Group	Member
3. Chief Operating Officer, Downstream Petroleum Business Group	Member
4. Chief New Business and Infrastructure Officer	Member
5. Chief Financial Officer	Member
6. Senior Executive Vice President, Gas Business Unit	Member
7. Senior Executive Vice President, International Trading Business Unit	Member
8. Senior Executive Vice President, Downstream Business Group Alignment	Member
9. Senior Executive Vice President, Innovation and New Ventures	Member
10. Senior Executive Vice President, Engineering and Infrastructure	Member
11. Senior Executive Vice President, Organization Effectiveness and Corporate Governance	Member
12. Senior Executive Vice President, Office of General Counsel*	Member
13. Senior Executive Vice President, Government Relations	Member
14. Senior Executive Vice President, Corporate Strategy and Sustainability	Member and Secretary
15. Executive Vice President, Company Secretary and Corporate Relation	Assistant Secretary

Remark:

** Changed the position name to Senior Executive Vice President, Office of General Counsel, effective from January 1, 2023.*

The Management Committee meets at least twice a month. In 2022, there were altogether 52 meetings (46 regular and 6 special meetings).

Duties and Responsibilities of PTT Management Committee (PTTMC)

Provide advices and recommendations to the President on significant issues regarding corporate strategy and business directions, long-term planning, business performance, investment plans, budgets, allocation of resources to PTT and its affiliates, and ensure the uniformity of PTT's operations. PTTMC also provides consultation and recommendations to the President & CEO and promotes operation on the following matters:

- Set the visions and key missions for PTT Group.
- Establish directions, strategies, and business targets for PTT Group along with the performance targets of business units and the group as a whole.
- Define a direction for corporate governance monitoring and integration of Governance, Risk and Compliance of PTT Group.
- Consider the capital allocation structure (budgets and resources) to support future investment and operations of PTT and PTT Group (PTT Group's Capital Allocation Structure).
- Consider the investment management of PTT and PTT Group (PTT Group's Portfolio Management).
- Consider and monitor PTT Group's extension to international investment.
- Establish a policy on human resource management, prepare and develop the group's management of level 14 up in a systematic, professional way for its future missions in line with the Leadership Affiliation and Alignment Program.
- Screen and provide opinions and recommendations on the establishment of standards/ mechanisms for the systems of business administration, human resources, and information, as well as business processes and organizational structures of PTT and its affiliates to be a corporation of sustainability excellence.
- Consider, screen, define policies and principles for PTT Way of Conduct, and ensure desirable direction.
- Rank significant matters about the allocation of human and financial resources of PTT and its affiliates.
- Jointly resolve significant conflicts between PTT's upstream and downstream petroleum and new business and infrastructure businesses.
- Follow up on progress and assess the performance of the Group against KPIs (PAs & KPIs).
- Scrutinize risk management in the business operations of the Group.
- Screen meeting agendas before presenting to the Board.
- Prioritize Board decisions to ensure effective implementation.
- Appoint sub-committees or working groups, or both, to assist PTTMC's tasks.
- Perform other work as may be assigned by the President & CEO.

To efficiently manage PTT Group to drive the strategies and operations to achieve their goals, PTT has divided its committees into three groups, as of December 31, 2022, as follows:

1. Strategy Committees

Consider, screen, define strategies/ policy, business directions, and operational plans of PTT/ PTT Group in various management aspects, comprising:

1.1 PTT Group Management Committee (PTTGMC)
1.2 PTT Management Committee (PTTMC) (mentioned above)
1.3 Minor PTT Group Management Committee (Minor PTTGMC)
1.4 Corporate Plan and Risk Management Committee (CPRC)
1.5 Gas Business Strategic Alignment Committee (GBSC)
1.6 Downstream Petroleum Business Group Strategic Alignment Committee (DBSC)
1.7 Trading Business Strategic Alignment Committee (TBSC)
1.8 Upstream Management Committee (UMC)

2. PTT Group Alignment Committees

Provide advice/ suggestions, push/ decide when cooperation between business units or PTT Group is required to enhance synergy and good collaboration, consisting of:

2.1 Upstream & Gas Business Group Alignment & Coordination Management Committee (UAC)
2.2 Downstream Business Group Alignment & Coordination Committee (DAC)
2.3 New Business and Infrastructure Group Alignment & Coordination Management Committee (NBIAC)
2.4 Finance & Accounting Group Alignment & Coordination Management Committee (FAAC)
2.5 Human Resources Group Alignment & Coordination Management Committee (HRAC)
2.6 PTT Group Core Values & KM Alignment Committee
2.7 PTT Group Operational Excellence Steering Committee (OpEx SteerCo.)
2.8 PTT Group Internal Audit Management Committee
2.9 PTT Group Corporate Social Responsibility Steering Committee, Rayong province
2.10 LNG Business Cooperation Committee (LBCC)
2.11 PTT Group Digital Steering Committee
2.12 PTT Group Technology Committee (PTTGTC)
2.13 Procurement Strategic Alignment Committee (PSAC)
2.14 Properties Acquisition and Utilization Committee (PAC)
2.15 International Business Development Committee (IBDC)
2.16 PTT Group Corporate Governance Committee
2.17 PTT Group ONE Project Committee
2.18 PTT Group Sustainability Management Committee (GSMC)
2.19 PTT Group Corporate Reputation and Social Responsibility Committee (PTT Group CRSR)
2.20 Petrochemical and Refining Integrated Synergy Management (PRISM Committee)

3. Corporate Management Committees

Responsible for overseeing, follow up on the progress of operations, approval/ screening/ giving opinions/ advice/ suggestions in various aspects of organization management, comprising:

3.1 Governance, Risk and Compliance Management Committee (GRCMC)
3.2 PTT Procurement Oversight Committee (KorTorJor.)
3.3 PTT Credit Committee
3.4 Upstream Petroleum and Gas Credit Committee
3.5 Trading Credit Committee (TCC)
3.6 Strategic Investment Management Committee (SIMC)
3.7 Upstream Petroleum and Natural Gas Business Group (USIM)
3.8 Support Function Budgeting Committee (SFBC)
3.9 Non-Life Insurance Fund Management Committee
3.10 PTT Innovation Management Committee (PTT IMC)
3.11 Information Security Management System Committee (ISMSC)
3.12 PTT Idea to Commercialization Gate Committee (PTT I2C Gate Committee)
3.13 Thailand Energy Academy Management Committee
3.14 Thailand Energy Academy Board
3.15 PTT Customer Excellence Committee (PTT CEC)
3.16 Social Enterprise Committee
3.17 Structure, Job Weight and Manpower Committee (SJMC)
3.18 Human Resources Management Committee (HRMC)
3.19 Corporate Human Resources Committee (HRC)
3.20 Screening Committee for the Request for the Royal Bestowment of the Most Exalted Order of the White Elephant and the Most Noble Order of the Crown of Thailand
3.21 Potential Pool and Scholarship Management Committee
3.22 Employee Welfare Fund Committee
3.23 Vendor Selection Committee
3.24 Trading Risk Management Committee (TRMC)
3.25 Gas Business Unit Hedging Committee (Gas HC)

Succession Plan

Because PTT is a state enterprise, the President must be nominated and appointed in accordance with the Standard Qualifications of Directors and State Enterprise Officer Act. Candidates must meet the qualifications outlined in Section 8 Ter and then go through the recruitment process outlined in Section 8 Quarter, in which the PTT Board appoints a nominating committee of five people who meet the qualifications and do not have any prohibited characteristics under the law. Applicants must be knowledgeable, have competent and relevant experience for PTT executives, have no prohibited characteristics under the law, not be a PTT director, except for executives who are directors by position and be under the age of 58 on the date of application submission. When the Nominating Committee selects a suitable candidate, he/she be recommended for appointment. This must be completed within one year of the former executive's departure from office. The employment contract has a term of no more than four years. If the Board of Directors decides to hire the former executive after the contract period has expired, no new recruitment process is required; however, the former executive may not be hired for more than two consecutive terms.

PTT has been grooming top management to become qualified candidates to replace the top management due to retire in the next 3 - 5 years. In 2007, PTT set up a Group Leader Development Program (GLDP) to develop a succession plan for potential leaders to assume higher positions in PTT Group that become vacant, namely:

- President & CEO
- Senior Executive Vice President (SEVP) or equivalent
- Executive Vice President (EVP) or equivalent
- Vice President (VP) or equivalent.

Management mechanisms are as follows:

- PTT Group Management Committee (PTTGMC)
- Minor PTT Group Management Committee (Minor PTTGMC)
- Human Resources Group Alignment & Coordination Management Committee: HRAC)
- Human Resources Management Committee (HRMC).

Performance in 2022

- Selection of SEVP pool members from potential EVPs (PTT Group)
  - 45 pool members (as of December 31, 2022)
  - 46 pool members already promoted (2008 - 2022).
- Selection of EVP pool members from potential VPs (PTT Group)
  - 113 pool members (as of December 31, 2022)
  - 94 pool members already promoted (2009 - 2022)
- Selection of VP pool members from PTT potential division managers (PTT)
  - 153 pool members (as of December 31, 2022)
  - 283 pool members already promoted (2009 - 2022)

Labor Disputes

No reports of labor disputes have been received over the past three years.

7.4.2 Management's Remuneration Policy

Management's Remuneration

Management's remuneration is set under the policy and regulations specified by the Board, aligning with the Company's Performance Agreement (PA) stipulated by the Ministry of Finance. The President & CEO and all executives together define Key Performance Indicators (KPIs) on annual performance targets.

The Remuneration Committee is responsible for considering the remuneration of the President & CEO to reflect his performance management, which is also in line with the principles and standards of other industrial peers, with clear criteria, transparency, and fairness. As a result, the annual salary increase and bonus payment would align with the results of KPIs, short-term and long-term performance of PTT. Overall, it should reflect his vision and long-term value-added and capacity enhancement for the Company. The principles and the appropriate remuneration must be presented to the Board for approval. To this end, key factors to evaluate the performance of the President & CEO were 1) PTT's performance under the State Enterprise Assessment Model (SE-AM), 2) the performance based on the vision presented to the Board, 3) management capability and leadership, and 4) 360° assessment.

According to the definition of "Management" defined by the Securities and Exchange Commission (SEC), 5 members included the President & CEO, Chief Operating Officer, Upstream Petroleum and Gas Business Group; Chief Operating Officer, Downstream Petroleum Business Group; Chief New Business and Infrastructure Officer; and Chief Financial Officer. The remuneration paid to management (excluding those seconded to PTT affiliates and those from PTT affiliates seconded to PTT) is detailed below:

Total Remuneration Paid to President & CEO in 2021 - 2022

Unit: THB

Remuneration	2021	2022
	Amount	Amount
Total	31,112,160	32,910,960
Bonus	9,671,211	10,532,951
Total	**40,783,371**	**43,443,911**

Remark:
*The remuneration of the President & CEO included an allowance for additionally assigned tasks, namely the positions of Chairman or Director (or both) of PTT's subsidiaries. He has duly **complied with** the terms of the employment contract as president.*

Total Remuneration Paid to 4 Top Management according to SEC's Definition (2021 - 2022)

Unit: THB

Remuneration	2021		2022	
	Management (under SEC's Definition)		Management (under SEC's Definition)	
	Person	Amount	Person	Amount
Salary	4	33,499,680	4	35,395,740
Bonus	4	16,815,875	4	17,685,657
Total		**50,315,555**		**53,081,397**

Remuneration Paid to Management (5 persons) (2019 - 2022)

Unit: THB

Remuneration	2019		2020		2021		2022	
	Person	Amount	Person	Amount	Person	Amount	Person	Amount
Salary	5	60,436,160	5	62,396,185	5	64,611,840	5	68,306,700
Bonus	5	24,474,078	5	22,296,874	5	26,487,086	5	28,218,608
Total		**84,910,238**		**84,693,059**		**91,098,926**		**96,525,308**

The remuneration paid to top 5 Management according to SEC's Definition as Chairman and Directors of PTT Group and Subsidiaries (2021 - 2022)

Unit: THB

Remuneration	2021		2022	
	Person	Amount	Person	Amount
Meeting Allowance and Monthly Allowance	5	15,505,165.32	5	15,373,229.17
Bonus	5	20,095,626.86	5	25,769,554.92
Total		**35,600,792.18**		**41,142,784.09**

Remark:

The remuneration paid to top 5 Management according to SEC's Definition as Chairman and Directors of PTT Group and Subsidiaries. In addition, the remuneration of the President & CEO has ***complied with*** *the employment term contract as president.*

Provident Fund Contribution to Management from 2019 - 2022

Unit: THB

Remuneration	2019		2020		2021		2022	
	Person	Amount	Person	Amount	Person	Amount	Person	Amount
Provident Fund Contributions		3,836,735.80	4	5,460,684.00	4	4,584,004.80	4	4,872,019.50

Additional information on the management:

Records have shown no violation of the law within the past 10 years regarding:

1. Being sentenced for criminal charges except for violations of traffic laws, petty charges, or similar charges,
2. Being sentenced to bankruptcy or having assets controlled,
3. Serving as an executive or an authority in a company or partnership sentenced to bankruptcy or whose assets are controlled.

7.5 Employees

Employees are essential to corporate operations, and their quality is a key to its business success. PTT, therefore, stresses the development of HR management systems compatible with technological advancement and international standards. It not only promotes both conscientious merit and business competence among its employees but also encourages them to actively take part in public service. It is indeed through employees that PTT focuses on its development into a sustainable organization to elevate competitiveness and respond to internal changes of a corporation in pursuit of national energy security.

Headcount and Remuneration

The employee headcount (including those seconded to PTT's affiliates) as of December 31, 2022, stood at 3,540 (Male 2,184/ female 1,356). PTT has continued to set its manpower plans in line with its operations under economic uncertainty. The focus is on allocating resources where significant value supplementation is likely or where continuing investment is needed.

The business-group headcounts from 2019 to 2022 were as follows:

Unit: person

Business Unit	2019		2020		2021		2022	
	PTT	PTT Group	PTT	PTT Group	PTT	PTT Group	PTT	PTT Group
1. Natural Gas	1,417	-	1,440	-	1,480	-	1,471	-
2. Petrochemicals and Refining	124	-	141	-	112	-	121	-
3. New Business and Infrastructure	394	-	429	-	462	-	478	-
4. Support Staff/ Secondees to PTT Affiliates	1,167[1/]	476[2/]	1,117[1/]	379[2/]	1,104[1/]	393[2/]	1,083[1/]	387[2/]
5. Subsidiaries and Jointly-Controlled Entities	-	27,511	-	29,042	-	29,372	-	30,241
Total	**3,102**	**27,987**	**3,127**	**29,421**	**3,158**	**29,765**	**3,153**	**30,628**

Remarks:

1/ Excluding PTT secondments

2/ PTT secondments

Remuneration for Personnel (excluding the President and management) from 2019 - 2022

Unit: THB

Remuneration	2019	2020	2021	2022
Salary	3,855,819,435.99	3,966,160,901.90	4,122,373,594.88	4,329,636,122.70
Bonus	1,915,330,097.81	1,628,293,859.46	2,078,579,310.45	2,163,016,469.28
Provident Fund Contributions	464,877,921.50	477,524,458.33	490,980,568.77	517,863,032.09
Others (if any)	3,629,328,277.20	2,077,146,865.96	2,593,728,683.64	2,982,723,913.24
Total	**9,865,355,732.50**	**8,149,126,085.65**	**9,285,662,157.74**	**9,993,239,537.31**

PTT sets the remuneration of employees based on the Company's short-term and long-term performance through Performance Management, a continuous and systematic process to drive the Company's performance to its achievement and in line with the Performance Agreement (PA) which is also linked to the corporate targets, business unit targets, and individual targets in the same direction, as well as PTT's strategic direction, to drive the operating results according to business plan targets.

PTT employees' annual salary increase is considered according to their performance. To this end, KPIs were applied to manage employee performance evaluation, which would be accordingly reflected in their salary increases and benefits. Employee KPIs could be divided into 2 key types: corporate KPIs and business/ operational/ personal (or functional KPIs). Individual KPIs must align with the four aspects of the balanced scorecard, namely finance, customers, internal process, and learning and developing. To achieve the Company's targets sustainably, PTT has added two more important aspects: products and personnel, to align with current performance results (short-term) and long-term business plans. Besides, PTT set a variable bonus aligned with the KPIs of PTT executives and employees of the management group to create motivation in achieving the annual targets.

Provident Fund

PTT has established and registered a provident fund called the "Provident Fund of PTT Public Company Limited and Affiliates" (the Fund). Employees of PTT and its joint ventures are eligible to participate in the scheme, and currently, 3,425 employees out of the total 3,467 employees of PTT, or 98.79%, have joined the Fund, managed by Krungthai Asset Management Public Company Limited and TISCO Asset Management Company Limited. The two companies disclosed related information in compliance with the Investment Governance Code (I Code).

The Fund engaged in investment with due regard for environmental, social, and governance (ESG) factors and jointly with the companies set a policy and assigned them to invest in entities with committed responsibility for all stakeholders: shareholders, employees, customers, business partners, society and the world. PTT has defined CG criteria and applied its decision-making process to ensure that the Fund makes the right investment in transparent businesses. Moreover, the Investment Committee required the fund managers to report PTT's current assets that are currently invested and compared them with the lists of SETTHSI index (Thailand Sustainability Investment) to learn of the ratio of its assets and the change whenever they submit investment performance.

Other Remunerations

PTT has instituted employee welfare and other remuneration programs apart from salary, bonus, and provident fund contributions for management and all employees. This is to keep up with economic conditions, the cost of living and other standards peer companies as well as PTT's current and future performance, achieved through constant revision and improvement. In addition, PTT has adopted a Flexible Benefits scheme, in response to the needs of individual employees. Each employee can choose to apply for flexible benefits by declaring his or her intention once a year under the period, conditions, and details prescribed by PTT, provided that such customized flexible benefits are not against the law, tradition, and good morals. However, mandatory employee benefits vital to the well-being of employees and in performing his or her duties will not be included as a choice.

HR System Development and Improvement

To become a sustainable organization, PTT continuously improves its HR management processes and mechanisms to ensure higher efficiency and realize the full potential of its employees, which will lead PTT towards its goals. PTT employees can fully demonstrate their competence, advance in their careers, and continue to grow with PTT.

PTT has focused on participation across the board in designing business plans to suit its direction and targets since this will efficiently align all its components. To this end, it has instituted a process in which senior PTT Group management along with support staff jointly define a vision and directions before propagating the agreed items for other units to apply in turning business strategies into business plans and budget plans in broad alignment. All PTT employees define individual objectives and KPIs, cascaded through the ranks from the corporate, department, to an individual level. Such objectives and indicators defined by employees then serve as a scope for performance and performance assessment standards to reflect individual performance.

PTT has applied Career Management guidelines to prepare and promote management and all employees with skills and knowledge to fit the PTT-designed model in coping with its missions and creating value for the organization. PTT has applied this model to the management and development of all its employees and, taking into account business direction to enhance corporate competitiveness, has divided them into two professional groups (senior management and employees), with clear, efficient interconnected systems for recruitment, assessment, and individual development planning (IDP) in place.

- Senior management (equivalent to vice presidents upward) undergoes Group Leader Development, which sustains the needs of senior executives in both quantity and quality. Management of this group is supervised by a panel of CEOs in PTT Group called the “PTT Group Management Committee (PTTGMC)”, responsible for defining directions and policies for development plans for senior management. Another team, called “Human Resources Group Alignment & Coordination Management Committee (HRAC)”, provides counseling and recommendations to the Senior Executive Vice President, Organization Effectiveness & Corporate Governance, to enhance decision-making on key coordination issues regarding human resource development strategies and directions of the PTT Group to align with those of PTT.
- Employees (division manager or equivalent and below): This internal management is specific to PTT or a PTT affiliate in developing employees to suit future operational needs. For PTT, Corporate Human Resources Committee (HRC) was established to promote and monitor career development planning to ensure goal achievement. Career Counseling Teams (CCT) for 16 professional groups take charge of defining and developing individuals, providing counseling and guidance, and monitoring and following up on implementation. An individual development plan is a tool for employees to set their goals and develop their career paths, thus adding value to their work in line with PTT’s directions and goals. Such employee development can be undertaken through proper training via success profiles or job rotation in line with their career paths. This will enable all employees to develop skills in their new positions, as will suitable appointments and promotions in line with their responsibilities and potential. With this development framework, employees will be qualified to assume top management positions in PTT Group and enable PTT to achieve its goals.
- To ensure that the policy defined and HR management align with and support the business directions of PTT Group, the Human Resources Management Committee (HRMC), appointed to define and propose policies and make decisions on HR management, provide recommendations on the preparedness and development of PTT’s current as well as future executives and employees, screen and give recommendations on the corporate structure and manpower, and approve or screen matters on HR management under the authority assigned.

In addition, PTT also pays attention to environmental training courses for related employees and those who are interested. In 2022, environmental training courses were organized as follows:

Course	Batch	Participants	Training Format
ESG Reporting	1	134	MS Team
Beyond COP26: Key Insights on the Paris Agreement Article 6	1	131	MS Team
Beyond COP26: Key Insights on the Paris Agreement Article 6 (e-Learning)	-	8	e-Learning
ESG Indices (Sustainability Indicators)	1	97	MS Team
Net Zero Awareness	1	124	MS Team
Net Zero Awareness (e-Learning)	-	13	e-Learning
Sustainable Decoupling: Important Factor for Thailand Inclusive Growth	1	51	MS Team
Sustainable Decoupling: Important Factor for Thailand Inclusive Growth (e-Learning)	-	4	e-Learning
SOFC Technology	1	12	MS Team
SOFC Technology (e-Learning)	-	3	e-Learning
Biocellulose production process flow	1	14	MS Team
Fuel cell modeling training	1	5	MS Team
Industrial Biotechnology (White biotechnology)	1	7	MS Team
Wind Farm Development in Thailand	1	12	MS Team
Customized Training of ANSYS Fluent Combustion Modeling	1	8	MS Team
Practical Energy Efficiency and Optimization for Process Industries	1	8	Classroom
Requirements and internal audits of the environmental management system and occupational health and safety management system (ISO 14001:2015 and ISO 45001: 2018)	1	31	MS Team
Deep Dive of Climate-related Financial Impact: TCFD and Internal Carbon Price	1	23	Classroom
Climate Action, NOT an Option: Accelerate Business Transformation Through the Global Warming Crisis	1	77	MS Team

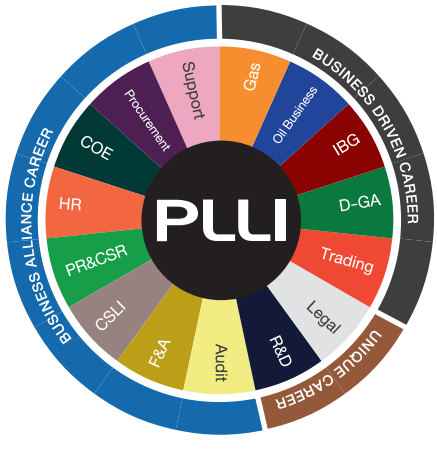
In 2022, PTT held the 8th "Young People to Globalization Program" (YP2G, Batch 8) to develop qualified personnel for overseas posting in line with PTT's strategies. These employees will be assigned challenging responsibilities through the following 4 core functions: Strategy & Planning, Business Development, Commercial & Marketing, and Engineering & Operation. These tasks will enable them to learn and accrue experience in business acumen through on-the-job training (OJT).

PTT continues to focus on career and competency management by preparing and reviewing success profiles, including career paths for each job position, and pushing for success profile assessment to be in line with the performance cycle in which supervisors have to discuss with employees (Two-Way) about their responsibilities at the beginning of the year with half-year and end-year follow-up and assessment to follow up and/or prepare an Individual Development Plan: IDP for employees.

PTT Group encourages and supports employees' learning through the "PTT Leadership and Learning Institute (PLLI)" with goals of establishing standards and developing employee capability through the management and implementation of compulsory courses for all PTT employees in the same direction.

PLLI has continuously developed management and employees of PTT and PTT Group to be both "good and talented" to support organization growth and develop personnel capabilities. In 2022, additional course contents have been developed to be consistent with the new core competencies with modern technology to meet stakeholders' needs including strategic challenges in line with PTT's new vision. In 2022, with the ongoing situation of the COVID-19 pandemic, PLLI continued to develop and upgrade the learning curriculum structure using hybrid learning tools to promote diversified learning of employees by changing classroom teaching style to a combination of both classroom training and virtual classroom, so that employees can still participate in real-time learning and have the opportunity to exchange knowledge, ideas and experiences with participants and speakers through the use of video conference via MS Team, Webex, Zoom, by managing training through PTT Learning Management System (LMS). In 2022, the LMS system has developed a Feature Playlist that organizes courses into categories, easier to find. This allows supervisors or employees to select courses of interest based on new core competencies to help promote the IDP for supervisors and subordinates. Experiential Learning has also been developed for employees to learn through online role play activities e.g. board game development for fun and interesting learning with the opportunity to practice resulting in more knowledge and understanding of business operations. It also develops digital learning materials in many different formats to meet employees' learning and needs, thereby responding to learning Anywhere, Anytime and Life Long Learning, such as e-Learning about organizational knowledge, rules, regulations, corporate policies. Online learning and learning resources selected by PTT from outside cover business, technology, soft skill, lifestyle, and more than 300 courses. PTT E-Library (E-Book, E-Magazine, Magazine, Book) is for employees to search, reserve, borrow, and return books, magazines, as well as read books online anywhere, anytime There are also podcasts, online audio programs, as another option for employee self-development with a variety of content both within and outside the organization to be consistent with business direction and strategy whilst maximizing benefits in terms of employee development and modern management. The curriculum structure of PLLI covers employee development at all levels from new employees to senior executives. The courses are divided into 3 main groups:

1. Leadership Development Program is designed to prepare and accelerate the development of high-potential management team members for skills, knowledge, and ability in people and business management through learning, knowledge-sharing, and experience-sharing with world-class instructors, including learning and experience-sharing with top management both internal and external. Participants of this program are potential management team members selected under the given criteria.
2. Core Programs are designed to develop the capacity of all employees at each level, position, and career. Supervisors must support employees in training under this program. The program comprises compulsory courses, direction/ assignment, essential program, and functional program.
3. Elective Programs are designed to develop the capacity of each individual's needs. The line supervisor and employee will together choose additional courses as suitable and necessary.



Summary of Human Resource Development

Unit: Hours per person per year

Training hours/person/year	2018	2019	2020	2021	2022
Employee	73.67	78.88	30.26	37.40	42.78
Management	73.91	89.15	45.93	34.25	64.93

Unit: THB per person per year

Expense/person/year	2018	2019	2020	2021	2022
Employee & Management	55,274.35	53,143.21	13,471.73	13,485.45	29,502.06

Fostering Relationship between Management and Staff in Search of Common Goal

Communication between management and staff comes in various forms. The President & CEO constantly holds regular meetings with employees, allowing them to learn of the Company's operation directions, obstacles, or emerging impacts during the development and efficiency enhancement each year. The focus is primarily on employees' participation and views.

Annual employee satisfaction and engagement survey is implemented for solution and improvement of satisfaction and engagement. PTT believes that proper communication and information exchange among staff and management will foster smooth relations and cooperation, thus driving the organization towards goal achievement. In addition, PTT surveys the basic human resource needs of management and staff through various committees such as the Human Resource Management Committee, PTT Labor Relations Committee, and Career Path Management Committee. An annual survey of staff opinions is undertaken by an external human resource management expert advisor. There was also cooperation with PTT Group to jointly develop a database of management as well as development plans for senior management.

The PTT Labor Relations Committee was established under the State Enterprise Labor Relations Act B.E. 2543 (2000). The committee consists of 19 members with the President (as PTT director) as Chairman, nine members representing the employer, and nine members representing the employees. The committee considers issues about employment conditions, employees' rights and benefits, as well as employee complaints. The committee meets monthly to monitor the progress of related issues with prudence.

Besides the monthly Labor Relations Committee meetings, PTT holds meetings of a working group on the study and development of employees' welfare and other benefits, appointed with the resolution of the Labor Relations Committee. Members comprised representatives from the employer and employees to jointly search and analyze information on employees' welfare and benefits of PTT Group in comparison with those of other leading businesses for use in the improvement of PTT's regular and probationary employees.

PTT also holds Joint Consultation Committee (JCC) meetings between its management team and staff of regional offices nationwide, e.g. Rayong Gas Separation Plant, Khanom Gas Separation in Nakhon Si Thammarat. The JCC comprising the top management of certain establishments as chairman and employee representatives would jointly consider every issue of proposals and complaints of both management and employees for employees' good standard of living in line with laws and PTT's regulations.

PTT Group Core Values

PTT Group defined its core values as SPIRIT, which is significant in molding PTT management and employees to command uniform work behavior. The SPIRIT (S: Synergy, P: Performance Excellence, I: Innovation, R: Responsibility for Society, I: Integrity & Ethics, and T: Trust & Respect) clearly reflects PTT's identity of smart, conscientious, and responsible for the company and the outside society alike.

Core values align with the corporate vision and future challenges by focusing on PTT Group employees as the driving force for Thailand to move through the transformation into a new future through SPIRIT values, namely:

- **Synergy:** Join forces to form alliances by focusing on employee knowledge sharing, and instigating collaborative power both inside and outside the company.
- **Performance Excellence:** Strive for excellence, focus on employees' readiness to quickly adapt to changes, and work hard to accomplish beyond-expectation results to create and deliver the best value to stakeholders.
- **Innovation:** Growing through innovation focus on employees to have a positive attitude. Seek opportunities for new ideas and dare to think creatively. Able to apply new digital technologies to increase work efficiency along with continuous learning and self-development.
- **Responsibility for Society:** Creatively build society and environment, focus on employees working with awareness taking into account the impact on stakeholders for sustainable development, develop an environmentally conscious business, and have volunteer spirit to do for the public, community, society, and the nation.
- **Integrity & Ethics:** Create the power of good acts by focusing on employees' ability to perform properly, transparently, and as excellent employees of the company, with honesty and ethics at the forefront.
- **Trust & Respect:** Build trust and confidence, focus on employees working together with trust and confidence, be open to opportunities and trust in others' potential capabilities, and be open to and respectful of others' diversity.

7.6 Other Key Information

Company Secretary

To comply with the corporate governance principles of listed companies under the category of directors' responsibilities and the terms of the Securities and Exchange Act, the Board appointed a Company Secretary to provide the Board with legal advice and remind them of assorted regulations that they need to know and comply with; hold meetings; supervise Board activities to enable them to perform efficiently and effectively in the best interests of PTT; prepare and maintain key documents, including directors' registration, Board meeting notices and minutes, annual reports; issue shareholders' meeting notices and minutes; and keep reports on vested interests reported by directors or management.

The Board has appointed Company Secretary since 2008. Since October 1, 2020, Mr. Nisit Phongvutiprapant has served as the Company Secretary. He is knowledgeable, capable, and experienced in company secretary work. He attended training courses that are important to his duties and is also a lecturer on matters related to his duties.

Company Secretary

Mr. Nisit Phongvutiprapant

Company Secretary
(October 1, 2020 - present)

Age: 52

Shareholding:
0.000003%

Education:
- Bachelor of Economics (Development Economics), Bangkok University

Company Secretary Training Record:
- Director Certification Program (DCP195/2014), Company Secretary Program (CSP 113/2020), Thai Institute of Directors Association (IOD)
- Advanced Management Program II (Class 1/2018), PTT Group Leadership and Learning Institute
- Leadership Development Program I (2013), PTT Group Leadership and Learning Institute
- Bain Academy Asia Pacific 2019 Program, Bain & Company SE Asia, Inc., Singapore
- Advanced Management Program (AMP) 3 - Business & People Management, PTT Group Leadership and Learning Institute

Professional Experience (past five years):
- October 1, 2020 - Present
  Senior Executive Vice President,
  PTT Oil and Retail Business Plc. (OR),
  seconded to Executive Vice President,
  Company Secretary and Corporate Relation, PTT Plc.
- June 1 - September 30, 2020
  Senior Executive Vice President, Corporate Strategy, Innovation and Sustainability, OR
- February 1 - May 31, 2020
  Vice President,
  Strategy and Portfolio Management, OR
- May 1, 2019 - January 31, 2020
  Vice President, OR,
  seconded to PTT Oil Myanmar Co., Ltd.
- July 1, 2018 - April 30, 2019
  Vice President, International Business Development and Planning, OR
- January 1, 2017 - June 30, 2018
  Vice President, International Business Development and Planning, PTT Plc.

Related Key Positions Held:
- -None-

Important Special Activities:
- -None-

Important Special Activities:
- Director, Executive Committee, Vidyasirimedhi Institute of Science and Technology
- Vice Chairman and Treasurer, Power of Innovation Foundation
- Director, Thai Company Secretary Club

The Person Supervising Accounting

The Executive Vice President, Global Business Services, PTT, is assigned by position to be directly responsible for PTT's accounting. Miss Jaroonsri Wankertphon has been holding the position since October 1, 2020, and is directly in charge of accounting management. She is qualified as an accountant under the criteria set by the Department of Business Development. **More profile details appear in Executive Profile in Attachment 1.**

Head of the Office of Corporate Audit

The Executive Vice President, Office of Corporate Audit, PTT, is by position assigned as Head of the Corporate Audit. Mr. Chayagorn Leangruenrom is the present Head of the Office of Corporate Audit. More profile details appear in Part 2 **"9. Internal Control and Connected Transactions"** and **details of the Head of the Office of Corporate Audit also appear in Attachment 3.**

Head of Compliance

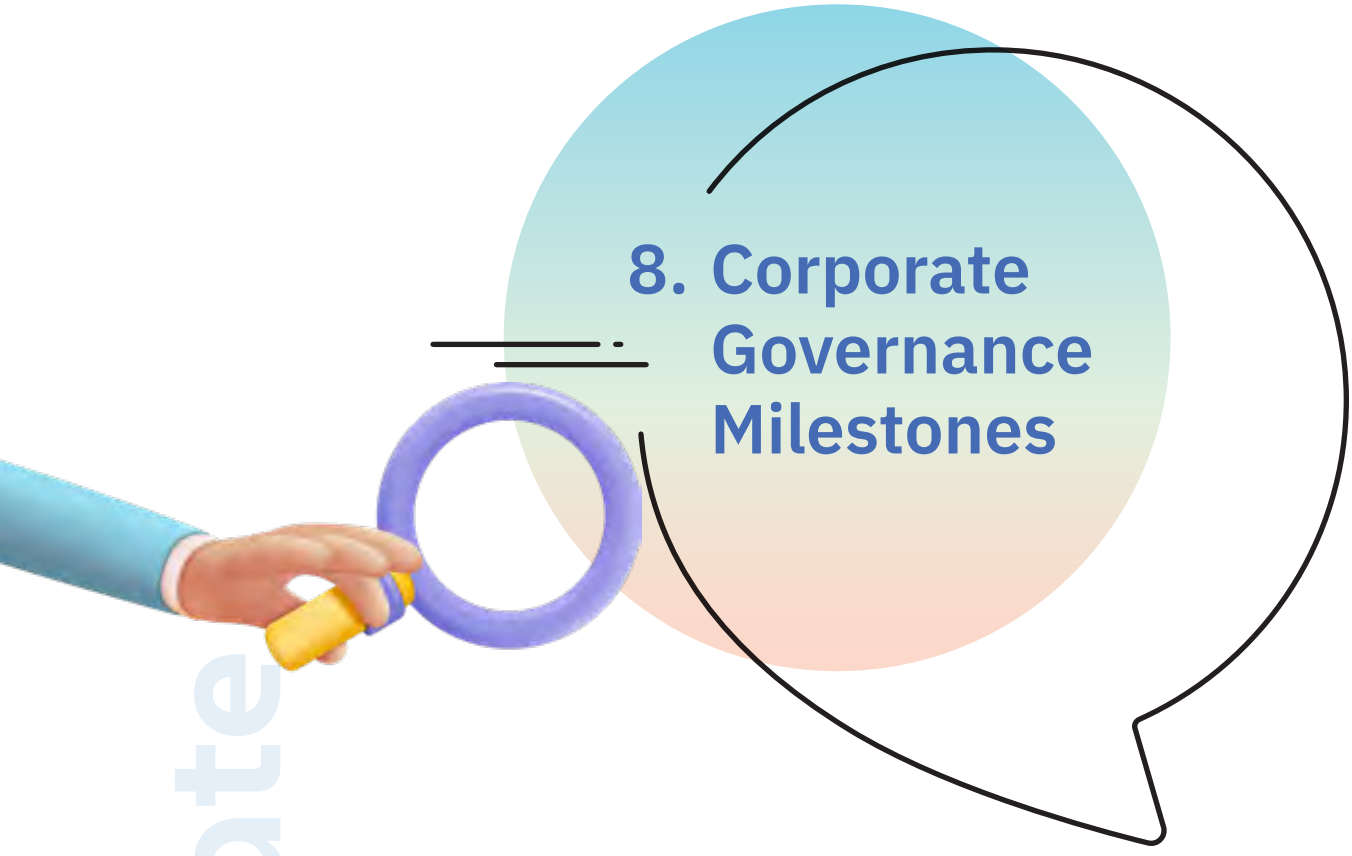
The Senior Executive Vice President, Organization Effectiveness and Corporate Governance, PTT, is by position assigned as Head of Compliance. Mr. Chadil Chavanalikikorn was appointed to the position and is currently responsible for PTT's compliance. More details about the Compliance Unit are presented in Part 2 **"9. Internal Control and Connected Transactions"** and **profile details of the Head of Compliance also appear in Attachment 1.**

Head of Investor Relations and Contact Information

Mr. Tanapon Prapapan, Investor Relations, was appointed Vice President, Investor Relations Department with effect from April 16, 2021, and can be contacted at Investor Relations, PTT, Tel.: 0-2537-3518-9, E-mail: ptt-ir@pttplc.com, or PTT's website (www.pttplc.com).

Audit Fee

In 2022, PTT and its subsidiaries paid a total of THB 327,984,459 (Three hundred and twenty-seven million nine hundred and eighty-four thousand four hundred and fifty nine baht) in audit fees to the office of the external auditors for the previous fiscal year. They also paid THB 47,668,234 (forty-seven million six hundred sixty-eight thousand two hundred and thirty four baht) for other services (non-audit fees) such as accounting consultant fee for financial due diligence, taxes service fees and other certification fees in the previous fiscal year.



8. Corporate Governance Milestones

Good Corporate Governance

8.1 Performance of the Board of Directors in 2022

8.1.1 Nomination, Development, and Performance Assessment of the Board

(1) Independent Directors

The Board of Directors, at Meeting No. 1/2013 on January 17, 2013, approved the revised definition of independence of directors, proposed by the Corporate Governance Committee which was more stringent than the criteria set by the Securities and Exchange Commission (SEC) and The Stock Exchange of Thailand (SET), and defined their roles, duties, and responsibilities. PTT published a handbook on their execution of duties and responsibilities, signed by the Chairman, on January 21, 2013. Board meeting No. 3/2021 dated March 18, 2021, approved the revision of roles and responsibilities of PTT's independent directors to be more updated and in line with regulation criteria of various agencies, which was signed by the Chairman of the Board on April 1, 2021. Essential elements of the revised handbook are:

Qualifications of independent directors

(1) Must not hold more than 0.5% of the total voting shares of PTT, its subsidiaries, associated and related companies of which PTT's major shareholders or PTT's controlling person, including the shares held by persons related to such an independent director.

(2) Must not be or have not been involved as the management, employee, staff member or adviser who earns a regular salary, or authorized controlling person of PTT, its subsidiaries, associated companies, related companies, or a juristic person of which PTT's major shareholders or PTT's controlling person during the period of two preceding years before the appointment. This forbidden characteristic excludes former government officials or consultants of the government agency which is PTT's majority shareholder or has a controlling interest in PTT.

(3) Must not have blood relationship or relationship through legal registration as parents, spouses, siblings, and children, including the spouse of the children, of any other directors, management, major shareholders, authorized controlling person, or any person to be nominated as a director, management, or authorized controlling person of PTT or its subsidiaries.

(4) Must never have engaged or not engage in a business relationship with PTT, its parent company, subsidiaries, associated or related companies, major shareholders, or controlling person in a way that could obstruct his or her exercise of independent discretion; including must never have been or be a significant shareholder or controlling person of parties with a business relationship with PTT, its parent company, subsidiaries, associated or related companies, major shareholders, or controlling person except where such an association has ended at least two years before his or her appointment as an independent director.

The business relationship in the preceding paragraph includes engagement in normal business transactions for operation, property rent, asset or service transactions, financial assistance involving borrowing, guaranteeing, provision of assets as collateral, and similar behavior that incurs debts on the part of PTT or its contract counterpart to each other amounting to 3% or more of PTT's net tangible assets or THB 20 million (whichever is smaller). Calculation of such debts is to follow the method for connected transactions under the announcement of the Capital Market Supervisory Board on connected transaction criteria mutatis mutandis; such debts must, however, include all debts incurred during the entire year before the business relationship with the same party begins.

(5) Must never have been or not be an auditor for PTT, its parent company, subsidiaries, associated or related companies, major shareholders, or controlling person, and must not be a significant shareholder, controlling person, or partner of an audit office in which an auditor of PTT, its parent company, subsidiaries, associate or related companies, major shareholders, or controlling person serves, except where such association has ended at least two years before his or her appointment as an independent director.

(6) Must never have been or not be a professional service provider, including legal or financial adviser with a fee of more than THB 2 million a year paid by PTT, its parent company, subsidiaries, associated or related companies, major shareholders, or controlling person, and must not be a significant shareholder, controlling person, or partner of the professional service provider in question, except where such association has ended at least two years before his or her appointment as an independent director.

(7) Must not be a director appointed to represent PTT, a major shareholder, or a shareholder connected to PTT's major shareholder.

(8) Must not engage in similar businesses that compete significantly with PTT or its subsidiaries and must not be a significant partner in partnerships or director participating in business management, staff, employee, adviser on payroll, or hold more than 1% shares of the total voting shares of other companies that are in similar businesses and compete significantly with PTT or its subsidiaries.

(9) Must not have any other qualification that may compromise the expression of independent views on PTT's businesses.

Independent directors with qualifications under (1) - (9) above may be assigned by the Board to decide on the business operations of PTT, its subsidiaries, associated companies, sister companies, juristic person, major shareholders, or controlling persons that could pose conflicts of interest; such decisions will be collective decisions.

If a person appointed by PTT as an independent director has or used to have a business relationship or professional service provision with PTT exceeding the value given under (4) or (6) of the previous paragraphs, PTT is allowed to relax such prohibitions on a business relationship or professional service provision with excessive value if it could secure the Board of directors' views regarding the criterion of Section 89/7 of the Securities and Exchange Act has illustrated that the appointment of such person will not affect his or her performance and independent expression of views. To this end, PTT must disclose the following information in the meeting notice to shareholders under the agenda item on consideration of independent director appointment:

(1) Business relationship or professional service provision depriving the qualifications of that person;
(2) Justification and necessity for appointing that person as an independent director;
(3) The PTT Board of directors' views on the appointment of that person as an independent director.

Under Nos. (5) and (6) of the previous paragraph, "partner" means a person assigned by the audit office or professional service provider to serve as a signatory of the audit report or professional service report (as applicable) on behalf of the company.

In addition, these qualifications must not contradict to the applicable laws.

Incidentally, if independent directors serve in this position in PTT, its subsidiaries, associated companies, or sister companies, PTT must also disclose information about such service and the total compensation of such directors in the 56-1 One Report.

- Business relationship or professional service provision of independent directors in the past fiscal year -None-

Roles, duties, and responsibilities of PTT's independent directors

(1) Recommend essential and beneficial matters to PTT, shareholders, and minor shareholders to the Board and/or the President and Chief Executive Officer.
(2) Advocate roles and responsibilities of the Board and provide views commonly expected of independent directors for the benefit of PTT, its shareholders, and minor shareholders.
(3) Review matters to ensure PTT's compliance with laws dealing with independent directors and duly revise the definition of independent directors for suitability and legal completeness.
(4) Perform other Board-assigned duties provided that these actions do not compromise their independence.
(5) An independent director's term begins once he or she fulfills all the requirements under the definition of PTT's corporate governance; it ends when he or she lacks qualifications or completes the PTT term.
(6) The independent directors must hold their own meeting at least once a year.

Segregation of the Chairman and the President & CEO

To segregate policy-making duties from those of day-to-day management and to enable directors to look after and assess performance effectively, PTT has required that the Chairman and the President & CEO are always two persons. This is because the Chairman needs to oversee management's performance, guide, and assist it, but not take part in or interfere with day-to-day management, which is the duty of the President & CEO under the authority delegated by the Board.

The current Chairman is an independent director. He exercises high-level leadership and ensures that directors do not fall under the influence of management by encouraging them to exercise their voting rights and strictly comply with CG principles.

Independence of the Chairman

Board Meeting No. 11/2020 on November 18, 2020, appointed Professor Dr. Thosaporn Sirisumphand, an independent director, as Chairman of the Board with effect from November 18, 2020. The appointment was endorsed by the State Enterprise Policy Office (SEPO) as required by the Cabinet resolution of August 6, 2019, on guidelines for the appointment of state enterprise directors, and the 2017 CG Code for Listed Companies. It would allow the work of the Chairman to be independent and boost confidence in the transparency of operations and fair treatment of all stakeholders.

(2) Nomination of Directors and the President & CEO

Nomination of Directors

In 2022, The Nominating Committee nominated to the Board to consider and appointed a new director to replace the director who resigned:

- Dr. Prasert Sinsukprasert
  Director

Moreover, The Committees nominated to the Board and the shareholder's meeting to consider and reappoint the directors who completed their terms at the 2022 Annual General Meeting (AGM) to another term, as follows:

- Professor Dr. Thosaporn Sirisumphand
  Independent Director
- Mr. Krisada Chinavicharana
  Director
- GEN. Teerawat Boonyawat
  Independent Director
- M.L. Chayotid Kridakon
  Director

In addition, The Committees nominated the qualified candidate for the Board and the shareholder's meeting to replace the vacant position of Mr. Don Wasantapruek at the 2022 Annual General Meeting (AGM) was:

- Mr. Chansin Treenuchagron
  Independent Director

Nomination procedures are reported under Section 2, Corporate Governance, **the topic of Proposing Additional Meeting Agenda Items** and **Nominating Directors, and Item 7.3 (2) The Nominating Committee.**

Nomination of the President & CEO/ Succession Planning

Nomination of the President & CEO/ succession planning is reported under Section 2 Corporate Governance, **Item 7.4 Information about executives.**

(3) Director Development

Training courses/ seminars/ engagement in PTT activities

The Board and management value regular participation in training and seminars concerning their competencies for their jobs. (Training details appear in directors' profiles in Attachment 1.) Most PTT directors (more than 90%) underwent training with the Thai Institute of Directors Association (IOD) and other leading entities and institutes as well as seminars on related topics.

At present, The Board were trained in courses related to director duties, namely 14 in the Director Certification Program (DCP) and 3 in the Director Accreditation Program (DAP), a total of 14 out of 15 directors, equivalent to 93.33%.

PTT supports and sponsors IOD membership for all directors to provide them with communication and more information channels which is useful for their directorships. PTT also delivers seminar information for directors to consider enrollment in curricula of their interest; this also applies to other continual seminars or curricula throughout the year. It regularly organizes in-house briefings by leading consultants' experts and expert from PTT Group on useful business data. Finally, it organizes company site visit for directors to other units or entities as seen fit to provide helpful insights for application to PTT's businesses for sustainable growth.

In 2022, training and seminars to foster their work knowledge and PTT's activities include the items below.

Name	Training/ Seminar/ Activity
Professor Dr. Thosaporn Sirisumphand	• In attendance at a visit by HRH Princess Maha Chakri Sirindhorn to VISTEC, KVIS, the Wangchan Valley Development Project, and the Nawat Agricultural Learning Center, EECi Wangchan Valley, Rayong province, November 14 - 16, 2022 • In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • In-house briefing on laws related to PTT's gas business operations • NBI Think Tank Lecture: "GEOPOLITICS: New World Order and Investment Strategies of Thailand and PTT Group" • In-house briefing on Update on Risk Insider Trading
POL. GEN. Rungroj Sangkram	• In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • In-house briefing on laws related to PTT's gas business operations • NBI Think Tank Lecture: "GEOPOLITICS: New World Order and Investment Strategies of Thailand and PTT Group" • In-house briefing on Update on Risk Insider Trading
Mr. Danucha Pichayanan	• In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • In-house briefing on Update on Risk Insider Trading
GEN. Teerawat Boonyawat	• Board Nomination and Compensation Program (BNCP 13/2022), Role of the Chairman Program (RCP 49/2022), Director Leadership Certification Program (DLCP 4/2022), Thai Institute of Directors Association (IOD) • In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • In-house briefing on laws related to PTT's gas business operations • NBI Think Tank Lecture: "GEOPOLITICS: New World Order and Investment Strategies of Thailand and PTT Group" • In-house briefing on Update on Risk Insider Trading
Mr. Jatuporn Buruspat	• In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • NBI Think Tank Lecture: "GEOPOLITICS: New World Order and Investment Strategies of Thailand and PTT Group" • In-house briefing on Update on Risk Insider Trading

Name	Training/ Seminar/ Activity
M.L. Chayotid Kridakon	• In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • In-house briefing on laws related to PTT's gas business operations • In-house briefing on Update on Risk Insider Trading
Mr. Krishna Boonyachai	• Financial Statements for Directors (FSD 47/2022), Thai Institute of Directors Association (IOD) • Super Series 3 Training "Leadership & Effective Corporate Culture", Institute of Research and Development for Public Enterprises (IRDP) • In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • In-house briefing on laws related to PTT's gas business operations • NBI Think Tank Lecture: "GEOPOLITICS: New World Order and Investment Strategies of Thailand and PTT Group" • In-house briefing on Update on Risk Insider Trading
Associate Professor Dr. Chayodom Sabhasri	• Digital Transformation Development Course for the Board: "The Cullinan: The Making of the Digital Board" Digital Economy Promotion Agency, in collaboration with the Thailand Management Association • In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • In-house briefing on laws related to PTT's gas business operations • NBI Think Tank Lecture: "GEOPOLITICS: New World Order and Investment Strategies of Thailand and PTT Group" • In-house briefing on Update on Risk Insider Trading
Mr. Payong Srivanich	• In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • NBI Think Tank Lecture: "Geopolitics: New World Order and Investment Strategies of Thailand and PTT Group" • In-house briefing on Update on Risk Insider Trading
Mr. Phongsthorn Thavisin	• In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • In-house briefing on laws related to PTT's gas business operations • NBI Think Tank Lecture: "GEOPOLITICS: New World Order and Investment Strategies of Thailand and PTT Group"
Mr. Krisada Chinavicharana	• In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs)

Name	Training/ Seminar/ Activity
Associate Professor Dr. Narongdech Srukhosit	• Directors Certification Program (DCP 315/2022), Financial Statements for Directors (FSD 47/2022), Thai Institute of Directors Association (IOD) • M&A in Practice, Trading and Merging and Acquisition, Chulalongkorn Law School Alumni Association • In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • In-house briefing on laws related to PTT's gas business operations • NBI Think Tank Lecture: "GEOPOLITICS: New World Order and Investment Strategies of Thailand and PTT Group" • In-house briefing on Update on Risk Insider Trading
Mr. Chansin Treenuchagron	• Role of the Chairman Program (RCP 49/2022), Director Leadership Certification Program (DLCP 4/2022), Thai Institute of Directors Association (IOD) • Director Orientation • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • In-house briefing on laws related to PTT's gas business operations • NBI Think Tank Lecture: "GEOPOLITICS: New World Order and Investment Strategies of Thailand and PTT Group" • In-house briefing on Update on Risk Insider Trading
Mr. Auttapol Rerkpiboon	• In attendance at a visit by HRH Princess Maha Chakri Sirindhorn to VISTEC, KVIS, the Wangchan Valley Development Project, and the Nawat Agricultural Learning Center, EECi Wangchan Valley, Rayong province, November 14 - 16, 2022. • In-house briefing on hydrogen-related technology and business • Knowledge Sharing: Rejuvenating DNA by Genetic Stability Molecule (RED-GEMs) • In-house briefing on laws related to PTT's gas business operations

The PTT Board also engaged in other corporate activities, such as business visits to PTT and PTT Group companies, Audit Committee's operation visit to GSM Shipper Control Center, PTT Inauguration Day, etc.

(4) Board Self-assessment

In compliance with the CG policy, PTT required the Board to conduct a self-assessment to scope its regular review of its performance. In 2022, PTT worked with PricewaterhouseCoopers ABAS Company Limited: PwC in reviewing and preparing the 2022 PTT Board Performance Assessment Form to ensure effective and up-to-date assessment of the Board's performance in line with the corporate governance principles of SEC, SET, SEPO, including other related criteria and guidelines in Thailand and international. The Board Meeting No. 9/2022 on September 15, 2022, approved all five self-assessment forms 2022 by revising, improving, and adjusting the questions to be clearer and more appropriate, including adding more issues that the Board should focus on, such as Environment, Social and Governance (ESG), cybersecurity and privacy, and talent and human capital.

This year, the five assessment forms are Assessment of the Board (Entire Board)/ Assessment of Individual Directors (Self-assessment)/ Individual Assessment of Other Directors (Cross-assessment)/ Assessment of Specific Committees (Self-assessment)/ and Assessment of Chairman's roles, duties, and performance along with satisfaction with specific committees and chairman of each committee. The five assessment forms stipulated the percentages corresponding to the levels of performance achieved in each topic with reference scoring criteria: 90 - 100 = excellent, 80 - 89 = very good, 70 - 79 = good, 60 - 69 = satisfactory, 510 - 59 = pass, and below 50 = not pass. The self-assessment findings were as follows:

1. **Assessment of the Board (Entire Board):** The assessment form consisted of four topics: Board composition and qualifications, Board roles and responsibilities, Meeting preparation and conducting, Board training and self-development.

   The overall results of the Assessment of the Board (Entire Board) indicated excellent performance, with an average score of 96.58%.

2. **Assessment of Individual Directors (Self-assessment):** The assessment form consisted of four topics: Board roles and responsibilities, Board meetings, Relationship with the Management, and Board self-development.

   The overall results of the Assessment of Individual Directors (Self-assessment) indicated excellent performance, with an average score of 97.64%.

3. **Individual Assessment of Other Directors (Cross-assessment):** The assessment form consisted of four topics as self-assessment of individual directors for direct comparison.

   The overall results of the Individual Assessment of Other Directors (Cross-assessment) in these four topics indicated excellent performance, with an average score of 98.58%.

4. **Self-assessment of Specific Committees (Entire Committees)** consisted of four topics: Specific Committee composition and qualifications, Specific Committee roles and responsibilities, Meeting preparation and conducting, training and self-development.

   The results of the Specific Committees on the four topics indicated excellent overall performance as follows:

   4.1 The Nominating Committee indicated excellent performance, with an average score of 99.72%.

   4.2 The Remuneration Committee indicated excellent performance, with an average score of 92.46%.

   4.3 The Corporate Governance and Sustainability Committee indicated excellent performance, with an average score of 100.00%.

   4.4 The Enterprise Risk Management Committee indicated excellent performance, with an average score of 98.93%.

5. **Chairman's Roles & Duties and Performance Assessment, Satisfaction of the Committees and the Chairman of each.** The assessment of the Chairman consisted of eight topics, and ten topics on work satisfaction assessment indicated excellent performance, with an average score of 98.13%.

Audit Committee's Performance Assessment: To comply with the best practices of The Stock Exchange of Thailand (SET) and the State Enterprise Policy Office (SEPO), as well as PTT's regulations on the Audit Committee and the Internal Audit Unit B.E. 2564 (2021), the Audit Committee must assess its audit performance by undertaking self-assessment at least once a year. The individual self-assessment or the entire committee's assessment is to be presented annually to the Board, specifying problems leading to unfulfilled objectives. This year, the Audit Committee's Meeting No. 9/2022 on September 13, 2022, endorsed its assessment forms, namely Assessment of the Committee (entire Committee), Assessment of Individual Directors (self-assessment), and Individual Assessment of Other Directors (cross-assessment). The Audit Committee Meeting No. 11/2022 on November 10, 2022, endorsed the assessment of its 2022 performance and submitted the results together with the performance improvement plan to Board Meeting No. 12/2022 on December 15, 2022. The results indicated good performance, with an average score of 99%.

PTT also analyzed the assessment topics to develop/ improve performance and formulated an annual plan for directorship efficiency enhancement to the Board for approval. In addition to developing the annual performance assessment forms for the Board, the Board has since 2017 begun gauging directors' efficiency and effectiveness by defining KPIs for their performance early in the year for measuring the Board's performance and determining their compensation.

Director Orientation

For new directors, PTT arranges an orientation program on its business policies, capital structure, shareholding structure, business performance, and information systems, as well as applicable laws and regulations. In addition, each director receives a Director's Handbook, with useful information for performing duties as PTT directors. The Director's Handbook/ Information for Directors consists of the following:

Director's Handbook:

1. Public Company Act
2. Securities and Exchange Act
3. Standard Qualifications of State Enterprise Directors and Employees Act
4. Emergency Decree on Electronic Meetings, B.E. 2563 (2020)
5. Company Registration Certificate
6. Company Certificate
7. Company Objectives
8. Articles of Association
9. Company Regulations (15 regulations)
10. PTT Corporate Governance, Ethical Standards and Code of Business Ethics Handbook
11. Manual for Directors of Listed Companies
12. Principles and Guidelines on Corporate Governance for Stated-Owned Enterprises B.E. 2562 (2019) (SEPO)

Information Kit for Directors:

1. Overview business presentation of PTT
2. List of directors, specific committees, and management structure
3. Director Fiduciary Duty Check List
4. CG Principles for Listed Companies (CG Code)
5. Connected Transactions of Listed Companies
6. Guidance on Providing Information for Listed Company Management
7. PTT Plc. Company Profile (short version)
8. Annual Registration Statement/ Annual Report (Form 56-1 One Report)
9. Annual Registration Statement/ Annual Report (Form 56-1 One Report) Financial Report
10. Corporate Governance
11. Debenture Magazine ("Happiness")
12. Article: "Truth about Privatization"
13. PTT GROUP WAY OF CONDUCT
14. PTT Technology and Innovation Management Operating System
15. PLLI Course Catalog

This year, in the briefing to the new directors, the President & CEO along with senior management presented information about PTT, its management structure, strategies and policies on business operations and performance, and relevant information for their overview of the business operations. The above-mentioned documents and handbook for new directors were handed over. In 2022, one director orientation was organized.

8.1.2 Meeting Attendance and Individual Directors' Compensation

(1) Board Meetings

PTT schedules its board meetings in advance for each month of the year. In 2022, the monthly meetings took place on the third Thursday of each month, with occasional special meetings on special agendas as seen fit. The Office of the President sends each director meeting notices, agenda with complete details and rationale, and supplementary documents with enough essential details for decision-making about seven days ahead of each meeting to give them time to study these. Directors consider the agenda through application software to streamline the process of agenda delivery and the paperwork involved, thus speeding up directors' work while efficiently providing them with adequate details for decision-making.

Since 2015, for each meeting, the Board has required a regular follow-up agenda on the updates of implementation of Board observations and comments to ensure the execution of PTT's strategies.

The Board's policy is that, for a given agenda item, if any director has potential conflicts of interests with PTT, the secretariat will not deliver such agenda item to that director, who will not attend the meeting and abstain from voting on such an agenda item. In voting, the minimum quorum of directors is two-thirds of all attending directors. If the quorum does not comply with this guideline, the discretion of the Chairman will be sought, a policy that is stated in the Corporate Governance Handbook.

For each agenda item, the minutes contain written comments and observations. The Board-certified minutes are filed for perusal by the directors and related parties. Each meeting normally takes 3 - 4 hours. In addition, the meeting schedule for the whole year has been set in advance, and directors have been informed of the meeting schedule at the end of the previous year or the beginning of the year.

In 2022, PTT held a total of 21 Board meetings, 12 regular meetings and 9 special meetings. Out of 21 meetings, 14 were physical meetings and 7 were electronic meeting (E-meeting) in observance of the COVID-19 safety and control measures. A special meeting is held annually to determine, review and approve PTT Group's vision, mission, directions, and strategies (five-year rolling). This year, the Board and management took part in reviewing such matters and approved the direction and strategy to scope and guide the work by business units, subsidiaries, and associates in developing enterprise and budgeting plans for 2023 - 2027. In addition, one non-executive meeting was held in June 2022 on the topic of PTT's businesses on various issues and recommendations to management for further business improvement, which is in line with the Principles and Guidelines on Corporate Governance for State-owned Enterprises B.E. 2562 (2019) as well as the guidelines given by the State Enterprise Policy Office. Management process after the meeting included disclosing the issues discussed and notifying the results of the meeting to the Board or the CEO for acknowledgment. One independent directors' meeting was held in November 2022 on the topic of "Update on risk insider trading". At every meeting, the Chairman allowed all directors to express their open and free views. The Board meetings are detailed below.

Attendance of the Board and Five Specific Committee Meetings for 2022

No.	Name	1/2022	Special 1/2022*	2/2022	Special 2/2022*	3/2022*	Special 3/2022*	Special 4/2022	4/2022*	5/2022	6/2022	Special 5/2022*	7/2022*	Special 6/2022	8/2022	Special 7/2022	Special 8/2022	9/2022	10/2022	11/2022	12/2022	Special 9/2022	Total (times)	%
1	Professor Dr. Thosaporn Sirisumphand	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21	100
2	POL. GEN. Rungroj Sangkram	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21	100
3	Mr. Danucha Pichayanan	/	/	/	/	/	/	/	/	/	/	X	/	/	/	/	/	/	/	/	/	/	20	95.24
4	GEN. Teerawat Boonyawat	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21	100
5	Mr. Jatuporn Buruspat	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	X	/	/	/	/	/	20	95.24
6	M.L. Chayotid Kridakon	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21	100
7	Mr. Krishna Boonyachai	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21	100
8	Associate Professor Dr. Chayodom Sabhasri	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21	100
9	Mr. Payong Srivanich	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	X	20	95.24
10	Mr. Phongsthorn Thavisin	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21	100
11	Mr. Krisada Chinavicharana	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	X	/	/	/	/	/	20	95.24
12	Associate Professor Dr. Narongdech Srukhosit	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	X	/	/	/	20	95.24
13	Mr. Chansin Treenuchagron	Appointed effective from May 14, 2022								/	/	/	/	/	/	/	/	/	/	/	/	/	13	100
	Mr. Don Wasantapruek	/	/	/	/	Passed away on March 14, 2022																	4	100
14	Dr. Prasert Sinsukprasert	Appointed with effect from December 26, 2022																						
	Mrs. Premrutai Vinaiphat	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	Resigned with effect from November 1, 2022.			18	100
15	Mr. Auttapol Rerkpiboon	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21	100
Total Attendance		15	15	15	15	14	14	14	14	15	15	14	15	15	15	15	13	15	14	14	14	13		
Total Directors		15	15	15	15	14	14	14	14	15	15	15	15	15	15	15	15	15	15	14	14	14		
%		100	100	100	100	100	100	100	100	100	100	93.33	100	100	100	100	86.67	100	93.33	100	100	92.86		

Remark:

** e-meeting totally 7 times.*

Directors	Board and Specific Committee Meetings in 2022						Appointment during the Year
	Board of Directors Total 21	Audit Committee Total 18	Corporate Governance and Sustainability Committee Total 6	Nominating Committee Total 15	Remuneration Committee Total 6	Enterprise Risk Management Committee Total 13	
1. Professor Dr. Thosaporn Sirisumphand	21/21	-	-	-	-	-	-
2. POL. GEN. Rungroj Sangkram	21/21	18/18	-	-	-	-	-
3. Mr. Danucha Pichayanan	20/21	-	1/1	11/11	-	-	-
4. GEN. Teerawat Boonyawat	21/21	-	-	-	6/6	-	-
5. Mr. Jatuporn Buruspat	20/21	-	6/6	-	-	5/5	-
6. M.L. Chayotid Kridakon	21/21	-	-	-	-	13/13	-
7. Mr. Krishna Boonyachai	21/21	18/18	-	-	-	-	-
8. Associate Professor Dr. Chayodom Sabhasri	21/21	18/18	-	-	-	-	-
9. Mr. Payong Srivanich	20/21	-	5/5	15/15	2/2	-	-
10. Mr. Phongsthorn Thavisin	21/21	-	-	15/15	-	-	-
11. Mr. Krisada Chinavicharana	20/21	-	-	-	6/6	-	-
12. Associate Professor Dr. Narongdech Srukhosit	20/21	-	6/6	-	-	8/8	-
13. Mr. Chansin Treenuchagron	13/13	-	-	-	4/4	-	May 14, 2022 (Replacing the vacant position of Mr. Don Wasantapruek who passed away)
14. Dr. Prasert Sinsukprasert	-	-	-	-	-	-	December 26, 2022 (Replacing Mrs. Premrutai Vinaiphat)
15. Mr. Auttapol Rerkpiboon	21/21	-	-	-	-	-	-

Attendance Record of Directors Who Retired/ Resigned in 2022 (Total: 2 directors)

Directors	Board and Specific Committee Meetings in 2022						Appointment during the Year
	Board of Directors Total 21	Audit Committee Total 18	Corporate Governance and Sustainability Committee Total 6	Nominating Committee Total 15	Remuneration Committee Total 6	Enterprise Risk Management Committee Total 13	
1. Mr. Don Wasantapruek	4/4	-	-	1/1	-	-	Passed away on March 14, 2022
2. Mrs. Premrutai Vinaiphat	18/18	-	-	-	-	11/11	Resigned with effect from November 1, 2022

Remark:
In 2022, a total of 21 Board meetings were held (12 regular and 9 special meetings).
* *Reasons for meeting absence were prior scheduled official engagements or other urgent meetings. Leave of absence letters were duly forwarded to the Chairman ahead of the meetings.*

(2) Remuneration of Directors

PTT fairly and sensibly specifies the remuneration of directors, by appointing the Remuneration Committee to review directors' proper compensation. This year, the Remuneration Committee adopted the consideration practices for directors and specific committees, taking into account practices of other listed peer companies, leading domestic as well as international companies, and state enterprise companies, the corporate governance principles, PTT's financial performance, responsibilities of the Board, and economic growth. Directors' compensation consists of monthly allowance, meeting allowance, and bonuses. Directors appointed to specific committees receive additional allowances for additional responsibilities. Shareholder-approved directors' compensation rates are as follows:

Remuneration of Directors

The Directors' Remuneration was approved at the 2022 Annual General Meeting (AGM) held on Friday, April 8, 2022, as follows:

1. Monthly Fee and Meeting Attendance Fee for 2022, the rates of which remained the same.

1.1 Monthly fee and meeting attendance fee of the Board:

- Monthly fee of THB 30,000 per month per director with the Chairman receiving twice the amount received by the director.
- Meeting attendance fee of THB 60,000 per meeting for those in attendance only and the Chairman shall receive 25% higher than the directors. The payment was limited to one meeting per month. Where necessary, the attendance fee may be paid for more than one meeting during a month but must not exceed 15 meetings per year.

1.2 Monthly fee and meeting allowance fee of specific committees shall be at **the same rate** as follows:

1.2.1 **The Audit Committee**

- Monthly fee of THB 15,000 per month per director with the Chairman of the Audit Committee receiving the same rate as the members.
- Meeting attendance fee of THB 45,000 per meeting for those in attendance only. The Chairman of the Audit Committee receives 25% higher than the members, and the secretary to the meeting receiving a monthly fee of THB 7,500 (the same rate as last year).

1.2.2 The remuneration for other committees, namely **the Nominating Committee, the Remuneration Committee, the Corporate Governance and Sustainability Committee, the Enterprise Risk Management Committee,** and other sub-committees that may be appointed by the Board as necessary and appropriate in the future, shall be **the same rate as last year** as follows:

- Monthly fee - None (same as last year)
- Meeting attendance fee of THB 30,000 per meeting for those in attendance only. The Chairman receives 25% higher than the members.

1.3 Other benefits - None (same as last year)

A vehicle was provided to the Chairman to facilitate his duties only.

Directors' Bonuses in 2022

Bonus payouts for directors, at 0.05% of the net profit of 2022, corresponded with PTT's performance and net profit, with a maximum limit of THB 60 million for the entire Board. Bonuses were prorated with each director's term, with the Chairman receiving 25% higher than members (same as previously).

The Remuneration for Directors in 2022

Unit: THB

No.	Name	Days of Service Jan. - Dec. 2022	Bonus 2022	Meeting Allowance (Inclusive of Monthly Allowance)	Meeting Allowance (Specific Committee)	Total Allowance	Total Remuneration
1.	Professor Dr. Thosaporn Sirisumphand	365	3,820,011.04	1,845,000.00	0.00	1,845,000.00	5,665,011.04
2.	POL. GEN. Rungroj Sangkram	365	3,056,008.83	1,260,000.00	855,000.00	2,115,000.00	5,171,008.83
3.	Mr. Danucha Pichayanan	365	3,056,008.83	1,260,000.00	300,000.00	1,560,000.00	4,616,008.83
4.	GEN. Teerawat Boonyawat	365	3,056,008.83	1,260,000.00	225,000.00	1,485,000.00	4,541,008.83
5.	Mr. Jatuporn Buruspat	365	3,056,008.83	1,260,000.00	300,000.00	1,560,000.00	4,616,008.83
6.	M.L. Chayotid Kridakon	365	3,056,008.83	1,260,000.00	412,500.00	1,672,500.00	4,728,508.83
7.	Mr. Krishna Boonyachai	365	3,056,008.83	1,260,000.00	720,000.00	1,980,000.00	5,036,008.83
8.	Associate Professor Dr. Chayodom Sabhasri	365	3,056,008.83	1,260,000.00	720,000.00	1,980,000.00	5,036,008.83
9.	Mr. Payong Srivanich	365	3,056,008.83	1,260,000.00	480,000.00	1,740,000.00	4,796,008.83
10.	Mr. Phongsthorn Thavisin	365	3,056,008.83	1,260,000.00	300,000.00	1,560,000.00	4,616,008.83
11.	Mr. Krisada Chinavicharana	365	3,056,008.83	1,260,000.00	180,000.00	1,440,000.00	4,496,008.83
12.	Associate Professor Dr. Narongdech Srukhosit	365	3,056,008.83	1,200,000.00	390,000.00	1,590,000.00	4,646,008.83
13.	Mr. Chansin Treenuchagron[1/]	232	1,931,683.80	707,419.35	120,000.00	827,419.35	2,759,103.15
14.	Dr. Prasert Sinsukprasert[2/]	6	49,139.87	5,806.45	0.00	5,806.45	54,946.32
15.	Mr. Auttapol Rerkpiboon[3/]	365	3,056,008.83	1,260,000.00	0.00	1,260,000.00	4,316,008.83
	Total		**42,472,940.67**	**17,618,225.80**	**5,002,500.00**	**22,620,725.80**	**65,093,666.47**

Remarks:

1/ No. 13 Mr. Chansin Treenuchagron was appointed as an independent director with effect from May 14, 2022.

2/ No. 14 Dr. Prasert Sinsukprasert was appointed as a director with effect from December 26, 2022.

3/ Mr. Auttapol Rerkpiboon has been in full compliance with the terms of his employment contract as President & CEO for the remuneration that he received as a director from January 1 to December 31, 2022.

The Remuneration for Directors Who Completed the Terms and/or Resigned in 2022

Unit: THB

No.	Name	Days of Service Jan. - Dec. 2022	Bonus 2022	Meeting Allowance (Inclusive of Monthly Allowance)	Meeting Allowance (Specific Committee)	Total Allowance	Total Remuneration
1.	Mr. Don Wasantapruek	72	589,677.94	312,580.65	37,500.00	350,080.65	939,758.59
2.	Mrs. Premrutai Vinaiphat	304	2,524,810.15	1,080,000.00	300,000.00	1,380,000.00	3,904,810.15
	Tota		**3,114,488.09**	**1,392,580.65**	**337,500.00**	**1,730,080.65**	**4,844,568.74**

Remarks:
No. 1 Mr. Don Wasantapruek passed away on March 14, 2022.
No. 2 Mrs. Premrutai Vinaiphat was appointed a Director on July 3, 2020, and resigned with effect from November 1, 2022.

Directors' Remuneration Profile, 2019 - 2022

Unit: THB

Remuneration	2019		2020		2021		2022	
	Person	THB	Person	THB	Person	THB	Person	THB
Meeting Attendance	15	21,787,467.74	15	24,215,338.71	15	24,182,451.62	15	24,350,806.45
Bonus	15	46,475,302.07	15	18,882,904.18	15	54,181,705.42	15	45,587,428.76
Total		**68,262,769.81**		**43,098,242.89**		**78,364,157.04**		**69,938,235.21**

Remark:
The 2019 - 2022 directors' remuneration shown in the table includes the remuneration of the President & CEO who has already complied with the terms of the employment contract as President & CEO.

Remuneration of PTT's Directors/ Independent Directors from being a Director/ an Independent Director of Subsidiaries* in 2022 (The table below presents remuneration paid to directors/ independent directors only for the period they served on PTT.)

Unit: THB

Name	Director Remuneration		Committee Meeting Allowance	Total Remuneration	Remarks
	Bonus**	Meeting Allowance and Monthly Allowance			
1. Professor Dr. Thosaporn Sirisumphand	-	665,000.00	-	665,000.00	Director/ Chairman of the Board, ARUN PLUS Co., Ltd. from January 1 to December 31, 2022
2. Mr. Don Wasantapruek	3,950,311.44	202,580.65	112,500.00	4,265,392.09	Independent Director/ Chairman of the Nomination and Remuneration Committee, PTT Global Chemical Plc. from January 1 to March 13, 2022 (He passed away on March 14, 2022.)
3. Mr. Danucha Pichayanan	-	460,000.00	-	460,000.00	Director, ARUN PLUS Co., Ltd. from January 1 to December 31, 2022
4. M.L. Chayotid Kridakon	-	460,000.00	-	460,000.00	Director, ARUN PLUS Co., Ltd. from January 1 to December 31, 2022
		699,032.26	135,000.00	834,032.26	Independent Director/ Member of the Corporate Governance and Sustainability Committee, PTT Global Chemical Plc. from May 14 to December 31, 2022

Name	Director Remuneration		Committee Meeting Allowance	Total Remuneration	Remarks
	Bonus**	Meeting Allowance and Monthly Allowance			
5. Mr. Auttapol Rerkpiboon***	3,934,426.00	1,380,000.00	-	5,314,426.00	Director, PTT Exploration and Production Plc. from January 1 to December 31, 2022
	3,166,633.82	1,122,000.00	-	4,288,633.82	Director/ Chairman of the Board, PTT Oil and Retail Plc. from January 1 to December 31, 2022.
	-	25,000.00	-	25,000.00	Director, ARUN PLUS Co., Ltd. from January 1 to February 15, 2022

Remarks:

* *According to the new International Financial Reporting Standards*

** *Directors have received the 2022 annual bonuses (for the 2021 performance) for serving with PTT Global Chemical Plc., and PTT Oil and Retail Business Plc., approved by the 2022 AGM of each company.*

*** *Mr. Auttapol Rerkpiboon has complied with the terms of his employment contract as President & CEO.*

8.1.3 Governance of Subsidiaries and Associates

The Corporate Governance and Sustainability Committee oversees, monitors, and assesses the corporate governance and Anti-fraud and Corruption performance of PTT and PTT Group through PTT Group Way of Conduct. The Committee provides policies and guidelines to the Governance, Risk and Compliance Management Committee: GRCMC), chaired by the Senior Executive Vice President, Organization Effectiveness and Corporate Governance. GRCMC is tasked with the supervision of conformance with good governance principles, operational risk management, internal control, and compliance with laws, rules, and regulations of the organization, including setting an action plan and annual goals, approved by the Corporate Governance and Sustainability Committee and PTT Board of Directors.

A summary of PTT's promotion of compliance with the policy and guidelines for the governance of subsidiaries and associates appears below:

1. Development of PTT Group Guideline for New Company to meet PTT's business operations and expansion, thereby accommodating newly established companies with different contexts, taking into account corporate governance, appropriate risk management and internal control, and compliance with laws, rules, and regulations, as well as consistent operating guidelines throughout PTT Group.
2. Development of PTT Group Way of Conduct Web Portal, which is a database and communication channel among policy owners and administrating units of affiliates and PTT Group companies in pursuit of standardized implementation.
3. Site visits aimed at efficient mobilization of PTT Group management approach, communication aimed at setting goals and GRC strategies, and counseling on PTT Group management approach for affiliates.

4. Strengthening of the mastery of GRC and emphasis on various guidelines through knowledge-sharing sessions and the following development programs for PTT Group companies:
   - MD on Board for senior management team members that are MDs or CEOs in PTT Group,
   - Secondment Development Program for PTT's executives and employees serving in affiliates.

8.1.4 Corporate Governance Policy and Guideline Compliance Control

(1) Internal Information Guideline

PTT provides notifications and campaigns against the use of insider information through PTT's communication channels, for example, internal e-mail and internal PR to refrain from purchase/ sale/ transfer of PTT's securities for 1 day during the financial statement closing date to the date of reporting the financial statement to the Stock Exchange of Thailand on a quarterly basis; and communicate good practices in the CG Handbook through CG Tips.

PTT has instituted a system for reporting trading of PTT Group's securities in advance. If PTT's personnel need to trade such securities, they must inform the Company Secretary through such a system at least two days in advance. In 2022, there was no reported transaction outside silent periods involving those whose jobs involved internal information; no major incidents occurred that impacted PTT and no accusations of using inside information by regulators.

(2) Conflicts of Interest

PTT requires disclosure of information towards off conflicts of interest with PTT to in turn prevent activities that could cause conflicts as well as illegal or improper activities.

Preparation of reports on potential conflicts of interest with PTT

To prevent conflicts of interest, PTT requires all employees to annually file reports to disclose possible items where employees or their relatives develop conflicts of interest with PTT each time this is discovered. In 2022, the Board, management, and all employees all filed their reports (100%) through the PTT intranet; no material cases were found. The disclosed items of conflicts of interest with PTT confirm acknowledgment that a breach of ethics and PTT's code of conduct is regarded as a disciplinary offense, subject to disciplinary actions according to disciplinary procedures and severity. This year, there was no case of a conflict of interest related to a disciplinary offense.

(3) Corporate Governance, Code of Conduct, and Anti-fraud and Corruption Activities

The Corporate Governance and Sustainability Committee (Board level) and the Governance, Risk and Compliance Management Committee (GRCMC) (Management level) provide oversight and monitor PTT's execution of corporate governance, operational risk management, internal control, and compliance. GRMC serves as PTT's Anti-Fraud and Corruption Operation Center for State Enterprises and is charged with steering and implementing plans for corporate governance and Anti-fraud and Corruption together with the definition of goals and KPIs approved by the Corporate Governance and Sustainability Committee and the Board. Besides its constant implementation and development as mentioned under Section 6 Corporate Governance on the topic of Anti-fraud and Corruption, this year PTT executed the following promotional activities on Corporate Governance, Code of Conduct, and Anti-fraud and Corruption:

- Launched the 5th Revision of CG Handbook and organized the signing ceremony for PTT Board and PTT Management Committee to be role models in accepting and implementing. 100% of directors, executives, and employees of PTT signed and implemented the 5th revision of the CG Handbook.
- Communicated the launch of the 5th Revision of CG Handbook to build an understanding of the content and details of the new CG Handbook for PTT management and employees through all function meetings.
- Communicated corporate governance and Anti-fraud and Corruption together with delivering the CG Handbook to all new employees for study and acknowledgment as their guidelines.
- Prepared three e-learning courses: 1) CG and Anti-Fraud and Corruption to comply with the 5th Revision CG Handbook, covering established good practices such as prevention of inside information use, prevention of conflicts of interest, and anti-corruption, etc. 2) Conflict of Interest; and 3) the Basic Knowledge on Organic Act on Anti-Corruption, B.E. 2561 (2018). Communicate to executives and employees for self-study in all work areas. The total number of PTT employees participating in the training was 95.16, 93.93 and 93.90%, respectively.

  Other PTT e-learning courses on corporate governance and Anti-fraud and Corruption for employee selection suitable for their operation e.g. Compliance Policy, Internal Control, etc.
- Organized a workshop on Operational Risk and Internal Control and a communication session on Fraud Risk Management for representatives of all functions in PTT to build an accurate understanding of the international principles of fraud and corruption risk management and related internal control measures, and to effectively formulate and apply anti-corruption guidelines in daily operations.

  In addition, PTT also organizes training and communications on Corporate Governance and Anti-fraud and Corruption from speakers inside and outside PTT, such as the COSO-Fraud Risk Management course, communicating criteria and verifying qualifications for entering into transactions with PTT, etc.
- Fostered an ambiance of awareness through PTT's various internal media, including GRC intranet/CG Intranet, GRC inquiries through GRChelpdesk@pttplc.com, CG reminders through CG Tips and Do-Don't, GRC PODCAST, GRC Short Video, GRC Lesson Learned via internal e-mail and PR, for everyone's information about CG/ GRC, and knowledge sharing as well as engagement in activities of interest. PTT also requires GRC Talk as the subject to be part of agenda-based meetings for all functions e.g. PTT Management Committed meeting, serving as a communication channel and promotional tool for CG/ GRC awareness.
- Organized a GRC Camp for the 9th consecutive year. The 2022's activities were a hybrid event, comprising discussion and experience sharing of GRC implementation by senior management team members of GRC and business functions titled "Trust" & "Inspired" by Digital Integrity so that employees may adapt the knowledge to their jobs, mutually create value as a company with good governance, strengthen PTT's integrity culture and together sustainably drive PTT's business domestically and internationally.
- Valued corporate governance among PTT Group in line with the PTT Group Way of Conduct by appointing PTT Group Corporate Governance Committee, whose goal is to upgrade corporate governance standards for PTT Group to comparable levels and define action plans and relentlessly proactive guidelines for public relations through PTT Group CG Day, a campaign to

promote and publicize corporate governance by PTT Group, namely PTT, PTTEP, GC, TOP, IRPC, GPSC and OR. Guests of honor from external agencies included representatives of SET, SEC, IOD, the Foundation of Anti-Corruption Networks, and the Office of the Ombudsman, along with business partners, the Boards, executives, and employees of PTT Group. In 2022, PTT Group CG Day: Togetherverse – CG Power for Sustainability & Beyond was organized as a hybrid event to illustrate the commitment to driving PTT Group with CG principles while remaining committed to business conduct with CG, prepared to cope with future changes and challenges to become a sustainable organization that builds trust among stakeholders.

- Strived to build transparent networks for a robust Thai society by strongly advocating its business partners' declaration of the intention to join Thai Private Sector Collective Action Against Corruption (CAC) to lower risks of corrupt practices across the supply chain. In 2022, PTT educated and urged business partners to join CAC at the annual suppliers' seminar and the annual supplier seminars for NGV and gas distribution pipeline functions.
- Promoted and shared knowledge with external agencies to upgrade corporate governance standards. Management team members served as speakers to share their CG experience and concept on various occasions. Welcomed public and private entities, including educational institutions, on-site visits, where the experience was shared, and observation was made on PTT's corporate governance practices.
- In 2022, PTT assessed corporate governance and anti-fraud and corruption performance to develop related tasks. It was found that 99.7% commanded good understanding, 97.1% were satisfied with good to very good GRC communication, and 96% were satisfied with related GRC implementation by PTT.

(4) Whistleblowing

All stakeholders can contact, learn, and provide clues either inside the corporation through the intranet web board or outside through PTT website, phone, written notification, e-mail to Investor Relations Department, Office of the President, Corporate Communication and Branding Department, Good Governance and Corporate Ethics Department, or Customer Relation Center as follows:

Phone : 1365 Contact Center, 0-2537-2000
LINE@ : @contact1365
Website : www.pttplc.com
Email : Customer Relations Center:
1365@pttor.com
Corporate Communication
and Branding Department:
corporate@pttplc.com
Office of the President:
corporatesecretary@pttplc.com
Investor Relations Department:
ptt-ir@pttplc.com
GRC Hotline:
GRChelpdesk@pttplc.com
Whistleblowing:
pttvoice@pttplc.com

All questions, comments, and recommendations are forwarded to related units to act or remedy through the whistleblowing system, with follow-ups made through alerts under the e-mail system under applicable service level agreements (SLA). If action is not completed, the next superior is reminded to take action. When the action is taken, the responsible unit informs the whistleblower and follows up again by inquiring about service satisfaction by a Contact Center officer. Executives monitor all information monthly to gauge trends and use them as guidelines for process and goods and service improvement to meet all stakeholders' needs. This year, excluding complaints about PTT Oil and Retail Business Plc. (OR), 6,202 questions, comments, and recommendations were filed, most dealing with NGV discount cards, NGV fleet cards, and requests for corrections to receipts, tax invoices, and other documents.

PTT enables the public to file grievances and complaints when coming across improper or unethical behavior of directors, executives, or employees. These are made known to PTT Board, the Audit Committee, President & CEO, Senior Executive Vice President, Organization Effectiveness and Corporate Governance. Senior Executive Vice President, Office of General Counsel, Executive Vice President, Corporate Human Resources, and Executive Vice President, Office of Corporate Audit. PTT listens to all complaints in an equitable, transparent, attentive, and fair manner, with suitable action periods and due safeguarding of confidential information and whistleblower protection.

To this end, Good Governance and Corporate Ethics Department is a center for grievances and whistleblowing, follow-ups of notifications, protection and fairness assurance for whistleblowers concerning corporate corrupt practices, including reports of investigation and punishment to management and relevant committees, apart from notification to related parties. In 2022, a total of 27 complaints were made through whistleblowing channels for fraud and non-compliance. After due consideration under the process,25 were found to be without grounds for fraud, and 2 were under fact-finding processes. If wrongdoing is found, disciplinary action or legal action will be taken, as well as informing suggestions to related agencies to consider improving the process or having measures to prevent a recurrence.

(5) The Reporting of Securities Holding Portfolio

In 2022, PTT, by the Office of the President, issued a reminder on four occasions to each of the directors and management team on forbidding the trading or transfer of PTT securities (1) from January 1 to February 28, 2022 (fiscal year 2021) or until the date PTT disclosed the 2021 financial statements to The Stock Exchange of Thailand; (2) from April 1 to May 15, 2022 (first quarter budget of 2022) or until the date PTT disclosed the financial statements of the first quarter budget of 2022 to The Stock Exchange of Thailand; (3) from July 1 to August 15, 2022 (second quarter budget of 2022) or until the date PTT disclosed the financial statements of the second quarter budget of 2022 to The Stock Exchange of Thailand; (4) from October 1 to November 16, 2022 (third quarter budget of 2022) or 1 day after PTT disclosed the financial statements of the third quarter budget of 2022 to The Stock Exchange of Thailand. In addition, PTT defined a policy of avoiding securities trading of PTT Group outside these periods. Directors and management strictly complied with this. If necessary to trade PTT Group securities, they must inform the Company Secretary at least two days ahead.

Securities Portfolios of Directors, 2021 - 2022

No.	Name	Number of Shares			Remarks
		As of Dec. 31, 2021	As of Dec. 31, 2022	Change during the Year (Shares)	
1.	Professor Dr. Thosaporn Sirisumphand	-	-	-	-
	Spouse and children under legal age	18,000	18,000	-	(No trading transaction of PTT shares in 2022)
2.	POL. GEN. Rungroj Sangkram	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
3.	Mr. Danucha Pichayanan	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-

No.	Name	Number of Shares			Remarks
		As of Dec. 31, 2021	As of Dec. 31, 2022	Change during the Year (Shares)	
4.	GEN. Teerawat Boonyawat	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
5.	Mr. Jatuporn Buruspat	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
6.	M.L. Chayotid Kridakon	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
7.	Mr. Krishna Boonyachai	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
8.	Associate Professor Dr. Chayodom Sabhasri	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
9.	Mr. Payong Srivanich	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
10.	Mr. Phongsthorn Thavisin	10,000	10,000	-	(No trading transaction of PTT shares in 2022)
	Spouse and children under legal age	-	-	-	-
11.	Mr. Krisada Chinavicharana	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
12.	Associate Professor Dr. Narongdech Srukhosit	-	-	-	-
	Spouse and children under legal age	1,399	1,399	-	(No trading transaction of PTT shares in 2022)
13.	Mr. Chansin Treenuchagron	N/A	-	-	Newly appointed on May 14, 2022 (No PTT share held)
	Spouse and children under legal age	N/A	-	-	-
14.	Dr. Prasert Sinsukprasert	N/A	-	-	Newly appointed on December 26, 2022 (No PTT share held)
	Spouse and children under legal age	N/A	-	-	-
15.	Mr. Auttapol Rerkpiboon	225,000	225,000	-	Information is shown in Securities Portfolio of Executives
	Spouse	43,000	43,000	-	-
	Children under legal age	-	-	-	-

Remark:

No PTT share was held by directors' spouses and children under legal age except those of No. 1, 12 and 15.

Securities Portfolios of Directors Who Completed Their Terms or Resigned in 2022

No.	Name	Number of Shares			Remarks
		As of Dec. 31, 2021	As of Dec. 31, 2022	Change during the Year (Shares)	
1.	Mr. Don Wasantapruek	-	N/A	N/A	Passed away on March 14, 2022. (No PTT share held during his directorship in 2022)
	Spouse and children under legal age	-	N/A	N/A	-
2.	Mrs. Premrutai Vinaiphat	-	N/A	N/A	Resigned, effective from November 1, 2022 (No PTT share held during his directorship in 2022)
	Spouse and children under legal age	-	N/A	N/A	-

Securities Portfolio of Executives, 2021 and 2022

No.	Name	Number of Shares			Remarks
		As of Dec. 31, 2021	As of Dec. 31, 2022	Change during the Year (Shares)	
1.	Mr. Auttapol Rerkpiboon	225,000	225,000	-	(No trading transaction of PTT shares in 2022)
	Spouse	43,000	43,000	-	-
	Children under legal age	-	-	-	-
2.	Mr. Wuttikorn Stithit	141,210	141,210	-	(No trading transaction of PTT shares in 2022)
	Spouse	90,960	90,960	-	-
	Children under legal age	-	-	-	-
3.	Mr. Noppadol Pinsupa	136,000	136,000	-	(No trading transaction of PTT shares in 2022)
	Spouse	298,000	298,000	-	-
	Children under legal age	-	-	-	-
4.	Dr. Buranin Rattanasombat	214,190	214,190	-	(No trading transaction of PTT shares in 2022)
	Spouse and children under legal age	-	-	-	-
5.	Miss Pannalin Mahawongtikul	288,120	288,120	-	(No trading transaction of PTT shares in 2022)
6.	Mr. Terdkiat Prommool	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
7.	Mr. Chadil Chavanalikikorn	N/A	-	-	Newly appointed executive on October 1, 2022 (No PTT share held)
	Spouse and children under legal age	N/A	-	-	-

No.	Name	Number of Shares			Remarks
		As of Dec. 31, 2021	As of Dec. 31, 2022	Change during the Year (Shares)	
8.	Miss Peangpanor Boonklum	-	-	-	(No PTT share held)
9.	Mrs. Nivadee Jaroensitipun	N/A	-	-	Newly appointed executive on November 1, 2022 (No PTT share held)
	Spouse and children under legal age	N/A	-	-	-
10.	M.L. Peekthong Thongyai	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
11.	Mr. Prasong Intaranongpai	N/A	20,750	-	Newly appointed executive on October 1, 2022 (No trading transaction of PTT shares in 2022)
	Spouse and children under legal age	N/A	-	-	-
12.	Mr. Cherdchai Boonchoochauy	N/A	-	-	Newly appointed executive on October 1, 2022 (No PTT share held)
	Spouse and children under legal age	-	-	-	-
13.	Mr. Chansak Chuenchom	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
14.	Mr. Montri Rawanchaikul	64,000	64,000	-	(No trading transaction of PTT shares in 2022)
	Spouse and children under legal age	-	-	-	-
15.	Dr. Kongkrapan Intarajang	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
16.	Mr. Kris Imsang	100,000	100,000	-	(No trading transaction of PTT shares in 2022)
	Spouse and children under legal age	-	-	-	-
17.	Mr. Worawat Pitayasiri	-	-	-	(No PTT share held)
	Spouse and children under legal age	-	-	-	-
18.	Mr. Suchat Ramarch	160,800	160,800	-	(No trading transaction of PTT shares in 2022)
	Spouse and children under legal age	-	-	-	-
19.	Mrs. Chanamas Sasnanand	130,000	130,000	-	(No trading transaction of PTT shares in 2022)
	Spouse and children under legal age	-	-	-	-
20.	Miss Jaroonsri Wankertphon	26,000	26,000	-	(No trading transaction of PTT shares in 2022)

Remark:
No PTT share was held by executives' spouses and children under legal age except those of No. 1, 2, and 3.

Securities Portfolios of Management Transferred/ Resigned/ Retired in 2022

No.	Name	Number of Shares			Remarks
		As of Dec. 31, 2021	As of Dec. 31, 2022	Change during the Year (Shares)	
1.	Mr. Atikom Terbsiri	-	N/A	N/A	Retired on October 1, 2022 (No trading transaction of PTT shares in 2022)
	Spouse and children under legal age	-	N/A	N/A	-
2.	Mr. Disathat Panyarachun	-	N/A	N/A	Early retirement on December 1, 2022 (No trading transaction of PTT shares in 2022)
	Spouse and children under legal age	-	N/A	N/A	-
3.	Mr. Wirat Uanarumit	159,000	N/A	N/A	Retired on October 1, 2022 (No trading transaction of PTT shares in 2022)
	Spouse	12,000	N/A	N/A	-
	Children under legal age	-	N/A	N/A	-
4.	Mr. Chawalit Tippawanich	10,000	N/A	N/A	Retired on October 1, 2022 (No trading transaction of PTT shares in 2022)
	Spouse and children under legal age	-	N/A	N/A	-
5.	Miss Jiraphon Kawswat	-	N/A	N/A	Retired on October 1, 2022 (No trading transaction of PTT shares in 2022)
6.	Miss Wilaiwan Kanjanakanti	36,990	N/A	N/A	Executive Vice President seconded to PTT Oil and Retail Plc. as Chief Financial Officer from October 1, 2022 (No trading transaction of PTT shares in 2022)

Remark:
PTT has issued and offered 60,000,000 warrants to the President, management, PTT employees, and employees of PTT Group companies seconded to PTT consisting of two batches: PTT-W1 (40,000,000 units), offered in 2005, with the last exercise date on August 31, 2010, and PTT-W2 (20,000,000 units), offered in 2006, with the last exercise date on September 28, 2011. All warrants were exercised, and no new ones have been issued.

Securities Portfolios of Management Transferred/ Resigned/ Retired in 2023

No.	Name	Number of Shares			Remarks
		As of Dec. 31, 2021	As of Dec. 31, 2022	Change during the Year (Shares)	
1.	Mr. Bandhit Thamprajamchit	N/A	N/A	N/A	Newly appointed executive on January 1, 2023
	Spouse and children under legal age	N/A	N/A	N/A	-
2.	Mr. Pongpun Amornvivat	N/A	N/A	N/A	Newly appointed executive on January 1, 2023
	Spouse and children under legal age	N/A	N/A	N/A	-

(6) Filing of Assets and Debts to NACC

Details appear in Section 6 Corporate Governance Policy **"Section 6.1 Overview of Corporate Governance Policy and Guidelines"**

(7) Declaration of Vested Interests in Meetings

Details appear in Section 6 Corporate Governance Policy **"Section 6.1 Overview of Corporate Governance Policy and Guidelines"**

(8) Deliberation and Review of Related Transactions

Details appear in Section 6 Corporate Governance Policy **"Section 6.1 Overview of Corporate Governance Policy and Guidelines"**

8.2 Reports of Specific Committees' Performance This Past Year

The Board of Directors values corporate governance and thus appoints five specific committees to consider significant matters: the Audit Committee, Nominating Committee, Remuneration Committee, Corporate Governance and Sustainability Committee, and Enterprise Risk Management Committee.

In 2022, PTT Board approved the improvement of authority, duties, and responsibilities of the Audit Committee to include the review of operations in line with the criteria of the State Enterprise Assessment Model (SE-AM) of the State Enterprise Policy Office and receiving of complaints and whistleblowing on fraud, malpractice, misconduct, and non-compliance. This is to comply with the guidelines set out in PTT Regulations on the Audit Committee and Internal Audit Unit B.E. 2564 (2021). Also, PTT Board approved the improvement of roles and responsibilities, and structure of the Corporate Governance Committee as the Corporate Governance and Sustainability Committee to make the roles and responsibilities of sustainability management clearer, and in line with the best practices according to the Corporate Governance Report of Thai Listed Company: CGR criteria.

8.3 Report of the Audit Committee for 2022

8.3.1 Report of the Audit Committee

Details can be found on pages 320 - 322

8.4 Report of the Specific Committees for 2022

8.4.1 Report of the Nominating Committee

Details can be found on pages 323 - 324

8.4.2 Report of the Nominating Remuneration Committee

Details can be found on pages 325 - 326

8.4.3 Report of the Corporate Governance and Sustainability Committee

Details can be found on pages 327 - 330

8.4.4 Report of the Enterprise Risk Management Committee

Details can be found on pages 331 - 333

Report of the Audit Committee

PTT Plc.'s present Audit Committee is made up of three knowledgeable independent directors, chaired by Police General Rungroj Sangkram, Mr. Krishna Boonyachai, and Associate Professor Dr. Chayodom Sabhasri serving as members. Serving as secretary to this committee is Mr. Chayagorn Leangruenrom, Executive Vice President, Office of Corporate Audit, in place of Mr. Chadil Chavanalikikorn, Senior Executive Vice President, Organization Effectiveness and Corporate Governance from November 1, 2022.

In 2022, the Committee executed its Board-assigned duties and those under its own charter, which agreed with SEC's best practices. It reviewed and advocated PTT's corporate governance, together with adequate risk management and internal control system. It ensured PTT's emphasis on being a transparent organization with efficient and effective internal audit activity, while aligning corporate goals, and enhancing the internal audit quality, the journey of Office of Corporate Audit to be a trustworthy partner for sustainable long-term value creation for PTT with due regard for satisfying stakeholders' expectations.

1. Advocated the elevation of the corporate governance, risk management, internal control, and compliance processes, with a focus on raising awareness of employees' careful and thoughtful actions, implementing Carrot and Stick incentive concept, including the review of rules and regulations related to the contextual operation together with the cautious supervision of operations in accordance with internal control process. Both short-term and long-term tangible measures and guidelines were defined to prevent the possibility of Non-compliance.

2. Encouraged management to focus on operational safety standards and cybersecurity as well as providing suggestions to the management to closely monitor global economic trends and carefully consider investments by adopting tools or indicators to manage both short-term and long-term risks, including critical early warning indicators to ensure that PTT operates professionally by appropriate and prompt monitoring and managing relevant risks.

3. Assigned a policy for strengthen PTT Group's internal audit quality to efficiently, effectively, and credibly accommodate stakeholders' expectations by focusing on performance audit practices and increasing the role of advisory that create more value for PTT and PTT Group. The Committee encouraged internal auditor professional certification and personnel development as well as improving the internal audit processes by applying more technology in internal audit activity.

In 2022, the Committee held 18 meetings, with all three members participating in all meetings.

Summary of Performance

1. Review of Financial Reports:

The Committee reviewed quarterly and annual financial reports together with consolidated financial reports with the Management, the Office of Corporate Audit, and the External Auditor. It asked the External Auditor about the accuracy and completeness of financial reports, adjustment of material account entries and accounting projections affecting such reports, adequacy, and suitability of account recording, audit scope, information disclosure that was accurate, complete, and adequate, as well as its own freedom. All these elements ensured that the preparation of financial reports abided by legal requirements as well as accounting standards under generally accepted accounting principles that were credible and timely, and that adequate information was disclosed for users' benefit.

2. Review of Risk Management Process:

In conjunction with the Management, the Committee regularly reviewed the efficiency and effectiveness of the risk management process as well as the policy, action plans, and risk management approach that affect PTT Group's operations. It also provided advice for process improvement and prompt actions for unforeseen events.

3. Review of Internal Control Process:

The Committee reviewed PTT's internal control with the Office of Corporate Audit every quarter by examining its operation, resource consumption, stewardship of properties, prevention or reduction of errors or damage, losses, waste, or potential of fraud, the credibility of financial reports, including compliance with laws, regulations, and Cabinet resolutions. No significant problems or material shortcomings were detected. This year's assessment outcomes of internal control against SET's best practices and the Ministry of Finance's Internal Control Standards for Government Agencies, B.E. 2561 (2018), according to PTT management, were that PTT had indeed designed adequate and appropriate control mechanisms, with ongoing compliance.

4. Review of Governance Process:

The Committee reviewed the process of compliance with applicable laws and regulations, business protocols, related party transactions or those with potential conflicts of interest and connected transactions among PTT Group to ensure sensible conformance to normal business terms. The Committee also reviewed the complaint handling and whistleblowing process.

5. Review of the Implementation According to the State Enterprise Assessment Model (SE-AM) of the State Enterprise Policy Office, Ministry of Finance:

The Committee reviewed PTT's operating process according to the SE-AM together with the Office of Corporate Audit and related agencies per year, covering eight Core Business Enablers i.e. corporate governance and leadership, strategic planning, risk management and internal control, stakeholder and customer management, digital technology, human capital management, knowledge management and innovation management, and internal audit by monitoring the implementation of relevant observations/ recommendations to ensure that PTT's operating process complied with the SE-AM, with continuous improvement.

6. Monitoring of Internal Audit Activity:

The Audit Committee reviewed the Office of Corporate Audit's strategic plan, annual and long-term audit plans, including audit results and performance according to the plans. To this end, it advised and monitored corrective actions for significant aspects of good governance and adequate internal control. It considered amending the internal audit charter. Also reviewed were the KPIs, the Office's budget adequacy, personnel, independence of the Office, and the annual merit consideration for the Executive Vice President heading the Office for further presentation to the Board. The Committee also supervised continuing quality assurance and improvement program of the Office of Corporate Audit.

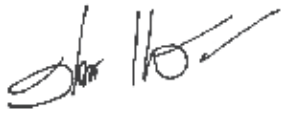
7. Maintaining the quality of the Audit Committee:

The Committee reviewed its own charter and assessed its own performance as a group and as individuals (self-assessment and cross-assessment) against SET's best practices to ensure efficient and fruitful performance. Overall assessment result was "good", and action plans for performance improvement were set. The Committee reported its performance outcomes to the Board every quarter.

8. Appointment of the External Auditor for 2023:

The Committee considered and endorsed the auditor from EY Office Company Limited to be the External Auditor of PTT for 2023 for the Board's concurrence and the shareholders' approval at the 2023 AGM, together with its audit fees. The Committee also met exclusively with the External Auditor on one occasion in absence of PTT management to discuss the audit scope, guidelines, and plans together with its performance freedom and comments with a focus on accurate, complete, and adequate presentation of data.

In summary, the Audit Committee executed its charter duties and responsibilities with due competence, care, prudence, and independence while providing comments and advice for the equitable benefit of all stakeholders. Its view is that PTT's financial statements are accurate, credible, and align with generally accepted accounting standards. In addition, PTT practiced compliance with applicable laws and business obligations, together with good governance, adequate risk management and internal control, conformance to rules along with efficient and effective internal audit activity.



Police General Rungroj Sangkram
Chairman of the Audit Committee

Report of the Nominating Committee

The Nominating Committee consists of three directors, chaired by Mr. Danucha Pichayanan, independent director, with Mr. Payong Srivanich, independent director, and Mr. Phongsthorn Thavisin, independent director, as members. The Company Secretary or the Executive Vice President, Company Secretary and Corporate Relation serves as its secretary.

In 2022, the Committee executed Board-assigned duties with due prudence, transparency, and fairness and improved its approach to align with up-to-date business strategies with due regard for shareholders' and stakeholders' best interests. This year, the Committee held 15 meetings as shown below:

January 1, 2022 to March 13, 2022

- Mr. Don Wasantapruek
  Chairman
  Attended 1 meeting
- Mr. Payong Srivanich
  Member
  Attended 1 meeting
- Mr. Phongsthorn Thavisin
  Member
  Attended 1 meeting

March 14, 2022 to April 7, 2022

- Mr. Payong Srivanich
  Member
  Attended 2 meetings
- Mr. Phongsthorn Thavisin
  Member
  Attended 2 meetings

April 8, 2022 to December 31, 2022

- Mr. Danucha Pichayanan
  Chairman
  Attended 11 meetings
- Mr. Payong Srivanich
  Member
  Attended 12 meetings.
- Mr. Phongsthorn Thavisin
  Member
  Attended 12 meetings.

The Nominating Committee considered the following important matters:

- Nominated directors to replace those who were due to retire by rotation, based on diverse information, from various professions with suitable qualifications under applicable laws and regulations, PTT's Articles of Association, and the corporate governance code. Nominated candidates must be duly competent, skillful, and qualified for PTT's business strategies, based on an analysis of the PTT Board Skill Matrix and the Director's Pool of the Ministry of Finance and Thai Institute of Directors Association (IOD). Their track records as well as past to present roles must ensure shareholders' confidence. Their background must also be unblemished experiences and without conflicts of interest with PTT. The names of qualified candidates were tabled for the Board's concurrence for appointment by the Annual General Meeting (AGM). Those names must also have the endorsement of a Sub-Committee for the Screening Committee for State Enterprise Committee along with the endorsement of the Chairman, State Enterprise Policy Committee, in keeping with the Cabinet resolution on state enterprise director's appointment guidelines dated August 6, 2019.
- Nominated directors to replace those resigning during the year. To this end, the Committee carefully tabled qualified names along with their profiles to the Board for the appointment. The names must also secure prior concurrence from the State Enterprise Policy Committee.
- Nominated directors for specific committees, based on their compositions, qualifications, expertise, competencies, related skills, and suitability (Skill Matrix) for the Board's appointment, except for the Nominating Committee itself, which is to be appointed by the Board. The suitability of specific committees must be considered in line with the company's vision, strategy, and sustainability goals.
- Reviewed the Board Skill Matrix as well as the matrix for the five specific committees and added skills, knowledge, and expertise in Life Science to align with PTT's vision and strategies. In addition, the goal of nominating at least two female directors was considered for Board structure and composition, as well as setting KPIs for Board performance assessment (in addition to the Board assessment) and tabling the reviews for the Board's comments.
- Considered and screened the appointment, transfer, and promotion of Executive Vice President levels and above, and provided guidelines for the appointment, transfer, or promotion of the management level for appropriateness, including considering the succession plan of senior executives for the continuous growth of the organization.
- Discussed the supervision/ driving of the Board's performance guidelines for sustainable development.
- Improved the roles and responsibilities of the Nominating Committee to be thorough and align with PTT's regulations. .

In addition, in 2022, the Board gave minor shareholders the opportunity to nominate directors, but no such nomination was put forward for the 2023 AGM. For transparency, other details appear in this 56-1 One Report.

Mr. Danucha Pichayanan
Chairman of the Nominating Committee

Report of the Remuneration Committee

In 2022, the Board of Directors appointed the Remuneration Committee, which consists mainly of independent directors. The Committee is chaired by General Teerawat Boonyawat, independent director, with Mr. Krisada Chinavicharana, director, and Mr. Chansin Treenuchagron, independent director, as members. The Company Secretary or the Executive Vice President, Company Secretary and Corporate Relation serves as its secretary.

The Committee performed its duties with prudence and care by screening and commenting on key issues for the Board's consideration. In 2022, the Committee held 6 meetings as shown below:

January 1, 2022 to April 7, 2022

- GEN. Teerawat Boonyawat
  Chairman
  Attended 2 meetings
- Mr. Krisada Chinavicharana
  Member
  Attended 2 meetings
- Mr. Payong Srivanich
  Member
  Attended 2 meetings

April 8, 2022 to May 13, 2022

- GEN. Teerawat Boonyawat
  Chairman
- Mr. Krisada Chinavicharana
  Member

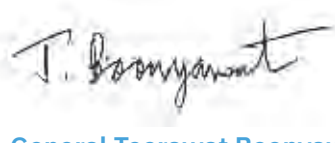
May 14, 2022 to December 31, 2022

- GEN. Teerawat Boonyawat
  Chairman
  Attended 4 meetings
- Mr. Krisada Chinavicharana
  Member
  Attended 4 meetings
- Mr. Chansin Treenuchagron
  Member
  Attended 4 meetings

The summary of performance is highlighted as follows:

- Considered the 2022 remuneration for the Board and its specific committees, based on PTT's performance and business size, practices of listed companies of the same industry and leading ones worldwide, along with Board responsibilities and the outcomes of Board assessment under various topics defined in the annual assessment forms. The remuneration was tabled for the Board's concurrence and subsequent proposal for approval at the 2022 AGM.
- Considered the assessment guidelines for determining remuneration for the President & CEO by taking into account factors and weights in various aspects such as performance which is linked to PTT's performance agreement with the Ministry in charge, the Ministry of Finance, his performance against the corporate vision, together with his managerial ability, leadership, self-assessment. Key recommendations were provided to improve the performance estimation guideline according to the State Enterprise Assessment Model (SE-AM),PTT uses as a reference in evaluating the President & CEO to have a comparable score with the assessment of the State Enterprise Policy Office (SEPO), as well as to be used as a reference evaluating executives and employees at all levels before tabling its views to the Board.
- Considered and made recommendations on organizational restructuring to be in line with corporate direction and strategy according to the new vision "Powering Life with Future Energy and Beyond", taking into account the revenue-generating functions and redundancy of work.
- Acknowledged and commented on the assessment of senior executive vice presidents.
- Monitored the progress of variable bonuses for employees and management by emphasizing that the management considers the performance appraisal mechanism to truly reflect employee performance, including periodically reporting to the Board for acknowledgment.

For transparency, the Remuneration Committee has disclosed the remuneration of all directors and specific committees together with management remuneration in this 56-1 One Report.



General Teerawat Boonyawat
Chairman of
the Remuneration Committee

Report of the Corporate Governance and Sustainability Committee

The Corporate Governance and Sustainability Committee is committed and persisted to drive PTT to be an organization with business capability managed with transparency, auditability, ethics, and integrity management, and zero tolerance to all fraud and corruption, adhering to the principles of governance, risk and compliance (GRC), anti-fraud and corruption, sustainability management (SM) and corporate social responsibility (CSR), which creates fairness and confidence for all stakeholders, and encourage important policies to companies in PTT Group through PTT Group Way of Conduct for sustainable growth throughout the value chain.

The current Corporate Governance and Sustainability Committee is made up of three independent directors, namely Mr. Jatuporn Buruspat (Chairman), Associate Professor Dr. Narongdech Srukhosit (member), and Mr. Payong Srivanich (member). Senior Executive Vice President, Organization Effectiveness and Corporate Governance is serving as secretary. In 2022, the Committee held 6 meetings, of which details are as follows:

January1, 2022 to April 7, 2022

- Mr. Danucha Pichayanan,
  Chairman
  Attended 1 meeting
- Mr. Jatuporn Buruspat,
  Member
  Attended 1 meeting
- Associate Professor Dr. Narongdech Srukhosit,
  Member
  Attended 1 meeting

April 8, 2022 to November 20, 2022

- Mr. Jatuporn Buruspat,
  Chairman
  Attended 4 meetings
- Associate Professor Dr. Narongdech Srukhosit,
  Member
  Attended 4 meetings
- Mr. Payong Srivanich,
  Member
  Attended 4 meetings

November 21, 2022 to December 31, 2022*

- Mr. Jatuporn Buruspat,
  Chairman
  Attended 1 meeting
- Associate Professor Dr. Narongdech Srukhosit,
  Member
  Attended 1 meeting
- Mr. Payong Srivanich,
  Member
  Attended 1 meeting

*Remark: * Improve the structure, duties, and responsibilities to be the Corporate Governance and Sustainability Committee*

The Corporate Governance and Sustainability Committee supervises, monitors, and evaluates the performance of the Company's operations, as highlighted below:

Information Disclosure and Transparency

- Prepared 56-1 One Report and disclosed PTT's quarterly performance and material information to shareholders, investors, and the public, complete with material, adequate, credible, and timely details through assorted channels, including SET's publicity channels and PTT website (www.pttplc.com). The core units taking charge of information distribution were Investor Relations Department and Corporate Communication and Branding Department.
- Disclosed 3-dimension sustainability performance information i.e. Environmental, Social and Governance (ESG) through 56-1 One Report under the topic of Driving Business towards Sustainability, Risk Management, Management's Discussion and Analysis, and Corporate Governance. The information was made public on PTT's website under the topic of Sustainability, by applying Global Reporting Initiative (GRI) Sustainability Reporting Standard, GRI 11: Oil and Gas Sector 2021, Integrated Reporting (IR) of The International Integrated Reporting Council (IIRC), The United Nations Global Compact (UNGC), and the Measuring Stakeholder Capitalism: Towards Common Metrics and Consistent Reporting of Sustainable Value Creation of the World Economic Forum (WEF). PTT's unwavering support for the UN Sustainable Development Goals (SDGs) was confirmed, as was the adoption of Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) in reporting its climate change operations. In addition, information disclosure was reviewed by independent external agencies on a yearly basis for entrusted confidence for the 12th consecutive year. PTT encouraged and supported PTT Group companies to disclose their information in compliance with SEC's and SET's directions that aspire listed companies to disclose their sustainability performance on a par with international practices.

Rights of Shareholders and Equitable Treatment of Shareholders

- Held the 2022 AGM and provided in advance adequate and timely information, as well as all information relevant to matters needing decisions at the AGM. Informed the shareholders about meeting rules and distributed such information on PTT's website before sending out meeting notices to give shareholders adequate time to study details. Facilitated their full exercising of meeting and voting rights under the safety measures in attending the AGM amid the COVID-19 pandemic. PTT thus achieved an "outstanding" score on the AGM Checklist assessment.
- Allowed shareholders to propose additional agenda items and nominate directors for election in advance from September 1 to November 30, 2022, under the criteria prescribed by PTT.
- Required all directors and executives to disclose vested interests of themselves and related parties for 2022 so that the Board might review PTT's transactions with potential conflicts of interest and decide in PTT's best interests. Required directors with potential vested interests in any meeting agenda items to abstain, refrain from commenting, and skip such agenda items.
- Required all directors, executives, and employees to report their conflicts of interest for 2022, which was fully implemented, and no significant conflicts were found.
- Required all directors and executives to report their securities portfolios as required by law and assigned the Company Secretary to compile and report these to the Board every quarter.

- Ensured enforcement of the Insider Trading Guidelines by asking the directors, management and personnel with privilege of inside information to refrain from PTT Group companies' securities trading. If such trading is necessary, for transparency they must notify the Company Secretary ahead of time, including providing a briefing on Insider Trading case studies to the Board by a consulting firm.

Responsibilities of the Board

- Assessed Board performance using 5 types of forms: overall, self-assessment, cross-assessment, specific committee assessment, duty and performance assessment of the Chairman, satisfaction with the performance of specific committees and chairman of each specific committee. The 2022 results were "outstanding."
- Encouraged directors to attend training courses to develop directorship competencies, such as courses hosted by the Thai Institute of Directors Association (IOD) and other relevant institutes, as well as holding in-house courses and sessions by inviting experts to provide information related to the Board's work.
- Studied business management practices in PTT Group and matters relevant to energy and related businesses.
- Held one meeting among the independent directors.
- Held one non-executive meeting.

Corporate Governance, Operational Risk Management and Internal Control, Compliance (GRC), and Anti-fraud and Corruption

- Endorsed Revision 5 of PTT's Corporate Governance, Ethical Standards and Code of Business Ethics Handbook, including the short-term (2022 Year Plan) and long-term GRC and anti-fraud and corruption action plans, as well as setting goals for further cascading for implementation, followed by continuous monitoring and recommendations to bring PTT's CG standards up to international par.
- Organized internal control assessments of operational processes of PTT and PTT Group by assessing risks, efficiency, and effectiveness of the control activities, including developing control activities to reduce the risks to an acceptable level.
- Continuously supported and pushed PTT's legal and regulatory compliance processes and managed the non-compliance practices to prevent and reduce the likelihood of repeated non-compliance in the future. In 2022, no incidents of non-compliance with substantial impacts on the organization were found.
- Supported the formulation of personal data protection policies and practices to ensure that PTT's operations related to the personal data of various groups of stakeholders have appropriate and concise governance processes and guidelines, including organizing training to educate the personnel on personal data practices and proper operations in line with the Personal Data Protection Act B.E. 2562 (PDPA).
- Supported the third-party screening program to establish standards for auditing the qualifications of those who enter into transactions with PTT to be rigorous and appropriate with effective risk management and internal control system.
- Provided policies and recommendations to management to formulate PTT Group governance policies by developing PTT Group Way of Conduct, a collection of management guidelines, principles, and work processes in various dimensions of PTT and PTT Group companies for alignment and harmony, including supporting the development of Guideline for New Company for small start-up companies with different business models.
- Advocated and urged PTT's business partners to declare their intention to join the Thai Private Sector Collective Action against Corruption (CAC).

Sustainability Management

- Determined strategic directions for sustainability management in 3 dimensions: environmental, social, and governance, with 3 enablers in the sustainability management master plan to demonstrate the social and environmental responsibility of PTT in 2021 - 2025:
    - **Environmental:** Sustainable Production and Consumption,
    - **Social:** People Well-being, and
    - **Governance:** Good Governance and Performance Excellence.

Enablers include:

- Innovation and Technology Promotion
- Supply Chain Management
- Stakeholder Management

- Considered and approved the 2022 sustainability management plan and related action plans to support the Master Plan on Sustainability Management, Social Responsibility, and the Environment 2021 - 2025 by continuous follow-ups and recommendations.
- Considered and approved the reviews of PTT's sustainability management policy, Master Plan on Sustainability Management, Social Responsibility, and the Environment 2021 - 2025 and Sustainability Management Practice Manual 2022. Corporate Social Responsibility and Sustainable Development

Corporate Social Responsibility and Sustainable Development

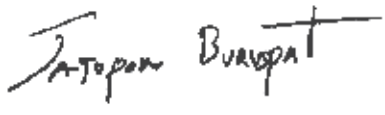
- Supported PTT's social contribution activities aiming for sustainable community development by applying PTT Group's potential and expertise along with building community engagement as a positive contribution to enhancing livelihood to increase income and reducing expenses by more than 10%, as well as creating important skills for the community self-reliance to achieve sustainability, as well as aiming to become a low carbon society and raising environmental conservation awareness of society. Key social projects implemented are as follows:

1. The "Giving Breath Project": Social assistance in the COVID-19 situation
2. Assistance to disaster victims
3. PTT Group Innovation for Society Project: Enhance community economic potential, develop the agricultural area, upgrade community products, and extend tourism development by the community.
4. Smiling Community Project: Promote community product distribution via online channels.
5. Enhancing education by focusing on science and technology, creating innovation for the country.
6. Conservation and enhancement of green spaces across the country by promoting planting and maintaining green spaces and promoting livelihood for communities around the country.
7. PTT's Forest Learning Center in 3 sites: PTT Metro Forest, Wangchan Forest Learning Center, and Sirinart Rajini Mangrove Ecosystem Learning Center to transfer knowledge on forest planting and maintenance, as well as create awareness about resource conservation and the environment.

Awards of Pride

Thanks to our firm commitment to operating businesses with CG, social responsibility, and sustainability management for continuous standard enhancement, in 2022, PTT earned extensive acclaim from domestic and international entities, as highlighted below:

- Passed S&P Global Sustainability Performance Assessment and was selected as a member of DJSI for the 11th consecutive year in the World Index group and Emerging Market Index group and the leader in the Oil & Gas Upstream & Integrated (OGX).
- Three ASEAN Corporate Governance Scorecard awards: ASEAN Asset Class PLCs for listed companies with a rating of 75% or more than 97.50 points, ASEAN Top 20 PLCs for ASEAN listed companies with the top 20 scores, Country Top 3 PLCs for listed companies with the top 3 scores in Thailand.
- Excellent ranking from the Corporate Governance Report of Thai Listed Companies 2022 for the 14th consecutive year.
- Integrity & Transparency Assessment (ITA) at the A level from the NACC according to the 2022 criteria.
- Two SET Awards 2022 for the 2 consecutive year: Sustainability Awards of Honor and Best Innovative Company Awards.
- Excellent Low Carbon and Sustainable Business Assessment Program (LCSB) from Thailand Greenhouse Gas Management Organization (Public Organization).



Mr. Jatuporn Buruspat
Chairman of the Corporate Governance and Sustainability Committee

Report of the Enterprise Risk Management Committee

The Enterprise Risk Management Committee of PTT consists of 2 members: M.L. Chayotid Kridakon, Chairman and Associate Professor Dr. Narongdech Srukhosit, Member, with Mr. Terdkiat Prommool, Senior Executive Vice President, Corporate Strategy and Sustainability, serving as secretary to the Committee. The tenure is as follows:

January 1, 2022 to April 7, 2022

- M.L. Chayotid Kridakon
  Chairman
- Mr. Jatuporn Buruspat
  Member
- Mrs. Premrutai Vinaiphat
  Member

April 8, 2022 to October 31, 2022

- M.L. Chayotid Kridakon
  Chairman
- Mrs. Premrutai Vinaiphat
  Member
- Associate Professor Dr. Narongdech Srukhosit
  Member

November 1, 2022 to December 31, 2022

- M.L. Chayotid Kridakon
  Chairman
- Associate Professor Dr. Narongdech Srukhosit
  Member

The Enterprise Risk Management Committee (ERMC) has supported the Board's performance under corporate governance principles to keep risk management efficient and effective for goal achievement while aligning with corporate vision and direction as well as mitigating impacts of business uncertainties and emerging risks that are increasingly complex and severe such as the COVID-19 pandemic, volatile world economy. The key is to ensure shareholders and stakeholders that PTT's risk management system can indeed handle these risks in all dimensions and obtain projected business goals.

In 2022, ERMC held a total of 13 meetings as highlighted below:

January 1, 2022 to April 7, 2022:
5 meetings

- M.L. Chayotid Kridakon
  Attended 5 meetings.
- Mr. Jatuporn Buruspat
  Attended 5 meetings.
- Mrs. Premrutai Vinaiphat
  Attended 5 meetings.

April 8, 2022 to October 31, 2022:
6 meetings
- M.L. Chayotid Kridakon
  Attended 6 meetings
- Mrs. Premrutai Vinaiphat
  Attended 6 meetings
- Associate Professor Dr. Narongdech Srukhosit
  Attended 6 meetings

November 1, 2022 to December 31, 2022:
2 meetings
- M.L. Chayotid Kridakon
  Attended 2 meetings
- Associate Professor Dr. Narongdech Srukhosit
  Attended 2 meetings

Performance Highlights

1. Steered Risk Management to Ease Business Impacts:

Key global situations that may affect PTT Group's business operations were monitored. PTT has proactive measures focusing on management to reduce the likelihood of all risk incidents, with reactive measures if a risk event occurs to minimize the impact on organizational goals. It defined comprehensive risk management plans for all situations. In 2022, the "Risk Appetite Statement" was adjusted to be in line with the changing circumstances to ensure that PTT's risk management process is appropriate and effectively implemented.

2. Oversaw Corporate Stakeholder Management:

This was designed to make such management complete and embrace comprehensive management of all stakeholders. ERMC endorsed the following matters:

2.1 Summary of 2021 Stakeholder Relationship Management comprising a summary of stakeholder management and stakeholder survey results
2.2 Stakeholder Management Quarterly Report (2022)
2.3 Stakeholder Strategy and Direction (2023 - 2027) comprises stakeholder management direction, objectives and scope, including corporate issues

This included the drive for implementation by all functions and monitoring of operations and outcomes of management assessment. ERMC also provided comments and advice for goal achievement.

3. Supervised the Management of Corporate Innovations:

To ensure a complete innovation management process with efficient and systematic innovation and technology management for increased innovation effectiveness that meets PTT's strategic objectives and core goals, as well as resource optimization, thereby contributing to sustainable growth, the following matters were endorsed by ERMC:

3.1 Innovation Management Quarterly Report (2022)
3.2 Innovation Management Policy
3.3 Innovation Management Master Plan (2023 - 2027)

This included driving, giving comments and suggestions for PTT's innovation management to achieve tangible results and leveraging business in line with the purpose.

4. Steered Customer and Market Management:

To manage in accordance with the customer and market management framework to meet the goals and business direction by endorsing the following matters:

4.1 Customer and Market Management Quarterly Report (2022)

4.2 Customer and Market Management Strategy (2023 - 2027)

4.3 Customer Support and Complaint Management

ERMC pushed and provided feedback and recommendation on PTT's customer and market management to enhance efficiency, and create long-term satisfaction and engagement for all customers, which will contribute to the sustainability of the business in the future.

5. Considered and Commented on Complex Business Contracts and Large-scale Investments:

ERMC rigorously considered risk issues and risk management practices, advised on the pros and cons of business decisions to make the investment worth the opportunity cost and suitable for the business context, as well as carefully commented on current and new businesses PTT wants to grow in the future in line with its strategic business direction before submitting for Board's approval.

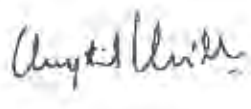
6. Closely Monitored Corporate Risk Management Every Quarter in 2022

ERMC advocated leading and lagging Key Risk Indicators (KRIs) and counseled management on the improvement of its management practices by revising risk management plans in line with prevailing business strategies and contexts. Finally, ERMC reported its performance results to the Board. This year, ERMC urged and closely monitored the outcomes of price hedging processes under highly volatile markets.

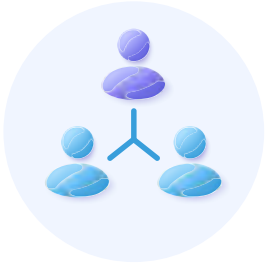
7. Screened the List of 2023 Corporate Risks and Sought Endorsement of the Board:

To this end, a list of corporate risk items and risk management plans was integrated with the preparation of the annual corporate plans. Risk management plans have thus become more explicit and aligned with corporate business directions, strategies, and objectives. Implementation was cascaded throughout the corporation to effectively address the risks.

On the whole, ERMC and PTT's risk management task force are committed to maintaining and developing the efficiency of risk management for effective and proper performance as well as keeping risks manageable. Ultimately, this would sustainably support long-term business goal achievement amid challenging circumstances.



M.L. Chayotid Kridakon
Chairman of the Enterprise Risk Management Committee



9. Internal Control and Connected Transaction

Internal Control

9.1 Internal Control

PTT prioritizes continuous improvement of internal control systems by adopting the international standard of the Committee of Sponsoring Organizations of the Treadway Commission (COSO) to achieve these objectives: Operation, Reporting, and Compliance.

At the Board Meeting No. 12/2022 on December 15, 2022, with all 14 directors (11 independent directors, 3 of whom were on the Audit Committee) in attendance, the Board assessed PTT's internal control system through screening and review of assessment results from the Corporate Governance and Sustainability Committee and the Audit Committee and concluded that the 5 elements of PTT's internal control system, namely Control Environment, Risk Assessment, Control Activities, Information and Communication, and Monitoring and Evaluation Activities are adequate and suitable. The Company has provided sufficient personnel for efficient operation, reports are accurately and reliably prepared. Business operations comply with relevant laws and regulations, with a system to protect the company's assets and PTT Group from being wrongfully used by directors or executives or without authority, including transactions with persons who may have conflicts and connected persons.

PTT has further improved its procedures and systems to support internal control and ensure the efficient and speedier system's detection of problems or risks. PTT's internal control system can be summarized by COSO components as seen below:

(1) Control Environment

PTT commands a sound overall control environment that is adequate for business efficiency and effectiveness. Its executives have promoted a corporate culture focusing on integrity and ethics as role models with the following implementations:

- The Board and executives take the control environment and corporate culture seriously by defining policies for internal control, risk management, corporate governance (CG), anti-fraud and corruption, compliance, and giving and receiving of gifts, assets, or other benefits. These policies are announced for all to acknowledge, observe and training both internal and external public relations about them are organized. Regular monitoring and assessment are in place. The Board, executives, and employees must acknowledge such guidelines in writing and conform to the Corporate Governance, Ethical Standards, and Code of Business Ethics Handbook (CG Handbook).
- Emphasizing integrity and ethics as a part of the SPIRIT corporate values to stress transparent business conduct and collaboration in the power of virtue, which explicitly embraces their everyday duties, decision-making, and treatment of all stakeholders, including suppliers and partners, customers, and third parties. PTT values equitable treatment based on fair competition, mutual respect of rights, and nurturing of relations and cooperation.
- Setting good corporate governance as a part of the organization's vision, mission, and values by considering the 3 aspects of balance which include Environment, Social, and Business Operation under Corporate Governance principles (ESG), and integrated management of stakeholders with the strategy of Trusted Brand with Business Integrity as a part of the operation.
- Company structure is based on the "Three Lines Model" management approach focusing on ensuring everyone's understanding and strictly complying with regulations, duties, and responsibilities. To this end, it aims at prevention and solution by those on the job, systematic operation with total segregation of authority for approval, review of the inspection, and verification and stewardship of assets, which results in effective checks and balances. In addition, the Office of Corporate Audit has a clear and independent reporting direct to the Audit Committee, which is marked by the decentralization of power to business units, thus giving due flexibility to communication for their duties and responsibility.
- PTT defines a written policy and procedure for human resource (HR) evaluation, development, including procedures for planning and administering the overall workforce in both short and long terms. In place are an annual analysis and revision of manpower, as well as analysis, planning, and definition of key succession processes by defining policies, regulations, tools, selection, assessment of potential, and plans for developing those in the Potential Pool for key positions. In addition, PTT has adjusted the Core Competency to align with the new vision for the potential of development plan and employee preparation in terms of necessary knowledge, skills, and experience to be able to drive the company to efficiently achieve the projected goals.

(2) Risk Assessment

PTT recognizes the importance of risk management to achieve business objectives as well as those of compliance and preparation of credible reports under changes that impact its businesses due to internal and external factors. It views risk management as a critical component of every business process that must be interconnected.

- PTT defines corporate risk management policy for all to conform to. At every level, risks are to be assessed, including those of anti-fraud and corruption. For corporate risks, management is systematically undertaken by its various management committees. Operational risks fall under the oversight of respective executives. The Enterprise Risk Management Committee (ERMC) steers and supports corporate risk management in line with business strategies and goals as well as shifting circumstances and provides advice on guidelines for monitoring and assessment to the Corporate Plan and Risk Management Committee (CPRC) to manage overall risks for maximum efficiency. It is the responsibility of all units to manage and control risks to manageable levels (risk appetite), as clearly stated in the functional descriptions of all units.
- The Business Continuity Management (BCM) process is applied to crisis management to assess guidelines for business, workforce communication, and preparation of resources and business processes for employees' uninterrupted and safe work without impacts on key goals. In addition, PTT holds annual crisis management and business continuity training to ensure the readiness of emergency management as well.

(3) Control Activities

PTT has set a variety of control activities to manage the Company's risks to an acceptable level. Control activities with technological systems are being developed. Expectations and procedures are defined for the implementation of established policies as follows:

- PTT Management Committee (PTTMC) reviews financial and non-financial reports of all business groups and regularly reviews performance to ensure conformance to regulations, protocols, and job manuals. PTT defines written policies and procedures. Portions of businesses have been identified for key risks, and mechanisms have been defined to control and minimize errors. Regularly performance reviews by the management are in place, including financial, procurement, and general administrative transactions.
- Systematic delegation of duties to personnel groups ensures proper checks and balances. Authority is duly and fully segregated for approval, information compilation, transaction recording, receipt and disbursement of cash, reviews of inspection, and stewardship of properties. In place is an internal control system for finance and accounting, with complete, accurate, and regular recording. Systematic and consistent storage of accounting documents both documents and information are in place to comply with the law. Should PTT engage in transactions with the major shareholder, directors, executives, or their related parties, it would apply strict measures to ensure that each such transaction secures the required approval every time and every transaction. Parties with vested interests will not take part in the approval of such an item. PTT also closely monitors subsequent actions.
- PTT Group Way of Conduct serves as a mechanism and guidelines for steering the policies and business conduct among PTT Group. Multi-level Governance ensures a single implementation standard for all. The internal control policy is grouped under strategic alignment, with a report submitted to PTT annually. Site visits to PTT Group companies are arranged to engage in sharing, counseling, and recommending ideas on internal control development, including GRC and PTT Group Way of Conduct. Guidelines for operations are prepared to ensure adequacy and suitability in line with business operations for newly established companies.
- Policies, regulations, and procedures are constantly reviewed to ensure their suitability, for example, PTT Corporate Governance Policy, PTT Anti-Fraud and Corruption Policy, Corporate Governance, Ethical Standards, and Code of Business Ethics Handbook (CG Handbook), Fraud and Corruption Risk Assessment Manual, regulations for finance and accounting, procurement, etc. to comply with law, rules, regulations, including risks and current situations.

- A third-party screening has been developed for greater efficiency and transparency to reduce the impact on the company's business, reputation and image, by designing process, analyze, assess suppliers, customers, partners and employees that is standardized and suitable for business operations, including an audit database to serve as an information center for risk assessments and transaction management, to foster credibility and confidence in engagement with business partners and stakeholders.
- PTT defines its requirement on the standard for compliance with the Digital Policy and IT Security Policy to control, develop, or execute change management to its computer work systems. The practical guidelines embrace various work procedures, including requesting, testing, and migrating for actual application, and major system maintenance, e.g., data backup. Also in place are policies IT Security Policy compliance for controlling key infrastructure, including the security of network systems and operation centers and access control to wireless networks.
- Operations controls by information technology system in line with regulations and requirements through ERP system, procurement, PTT Bid Submission system and expense disbursement system are designed. Robotic Process Automation (RPA) has been introduced to enhance efficiency, and reduce manual operation e.g. information verification before account closure, information review before billing.
- PTT values the steering of sustainability management together with security, safety, health, and environment (SSHE), all of which are likened to a vital shield against risks or impacts, and efficiently as well as effectively lowering potential losses suffered by all stakeholders, assets, work processes, data, and the surroundings. This would bring about business sustainability while extending performance in all aspects of excellence for vision and goal attainment. In 2022, tools and processes for sustainability management are defined in Section 9.2 Strategic Sustainable Development and Section 9.3 Sustainable Development Report in the "State Enterprise Assessment Mode: Core Business Enablers" required by the State Enterprise Policy Office. In the sustainability management governance structure, the Board supervises, monitors, and provides policies as well as recommendations on sustainability management and SSHE; the Corporate Governance and Sustainability Committee (CGSC) reviews, orders, and comments on the implementation outcomes of strategy, plan, key sustainability and SSHE goals and indicators every quarter. The PTT Management Committee, led by the President & CEO, monthly screens, orders, and comments, supported by subcommittees at the management level for specific matters and management practices at the strategic level and operating level for sustainability and SSHE, namely Governance, Risk and Compliance Management Committee (GRCMC), PTT Group Sustainability Management Committee (GSMC) and Corporate Plan and Risk Management Committee (CPRC). To this end, centralized departments are Good Governance and Corporate Ethics Department, Sustainability Strategy Department, and Corporate Planning and Budgeting Departments. **Details about sustainability management and SSHE management appear under Section 1 "Business Operations and Performance", Section 3 "Driving Business for Sustainability" of this 56-1 One Report, and "Sustainability" on PTT website.**

(4) Information and Communication

PTT values the quality of information and communication, an essential part that supports effective internal control with information disclosed and communicated via various channels to executives and employees at all levels and stakeholders outside PTT. PTT has channels for safely reporting information or clues about fraud or corruption. The guidelines for managing information and communication are as follows:

- Managing data by classifying levels of confidentiality; defining guidelines for storing key documents and control documents, and internal and external operation-supporting data to ensure that key information related to business is accurate, complete, adequate, and timely that an efficient data analytics and storage system is in place to ensure that the data used are credible and adequate for timely decision-making, including managing the use of personal data in line with the Personal Data Protection Act B.E. 2562.
- Formulating various internal communication channels, namely Town Hall, intranet communication, electronic mail, orientation, and Learning Management System.
- Creating communication channels with external stakeholders including PTT's website and social media. Directly responsible units regularly disclose key data to all stakeholders. PTT set up its 1365 Call Center to centralize data provision covering integrated goods and services for interested parties. Moreover, PTT allows shareholders to propose AGM agenda items and nominates directors in advance, thus promoting corporate governance under the rights of shareholders and equitable treatment.
- Improving the Rule on Complaints and Whistleblowing against Fraud, Malpractice, Misconduct, and Non-compliance with Laws and Organization Regulations B.E. 2565 (2022). This Rule covers whistleblowing channels through the Company's website, e-mail, and letter, and clearly specifies the protection of whistleblowers, witnesses, and confidentiality for employee's and outsider's confidence that complaints will be timely reviewed in a transparent, honest, fair, and confidential manner. Also revised are the complaint management process and guidelines for efficiency and stakeholders' trust.

In 2022, PTT has implemented more security enhancements, including the use of Multi-factor Authentication technology for two-factor authentication (2FA), verifying employees' personal computer standards connected to a VPN into PTT's network, covering Contract/Outsource staff, adding Privileged Access Management to increase the security of accessing the system at the level of the administrator (Admin) to a higher standard, including the use of AI technology to help find vulnerabilities that have been exposed to the Internet network in order to further analyze and manage risks.

In addition, the Company has increased the security of employee's accounts by setting a new password format according to best practices, as well as raising awareness of cybersecurity, and more concentrated Phishing Mail testing along with continuously building skills and understanding through cyber curriculum under the Digital Literacy Project.

To ensure that PTT has cybersecurity operations that meet standards and completeness to prevent potential risks, PTT has implemented the Information Security Management System (ISMS) according to the ISO/IEC 27001:2013 standard and the Personal Information Management System (PIMS) according to the ISO/IEC 27701:2019 standard. In addition, for PTT to have an information security system according to ISO 27001 standard, the Information Security Management System Committee (ISMSC) has been appointed, with a policy and systematic approach that completely covers key processes consisting of announcing digital standards related to information security, communication networks, and equipment, as well as management of abnormalities and information technology problems. The information security practice has been announced covering website security and internet use, security in work equipment, defining steps to manage cyber threats, as well as vulnerability assessment (VA) for all work systems. PTT monitors, measures, and supervises cybersecurity operations of the Cyber Security Operation Center (CSOC) by PTT Digital with monthly follow-up. Appropriate follow-up on the use of information technology resources is undertaken through the process of Strategic Investment Management and budgeting of information and communication technology which cover considering project redundancy, and determination of decision-making criteria for the resource utilization for the development of digital projects. Also taken into account were the worthiness of investing in digital projects, as well as the risks and rewards that will be received of which results are reported monthly and quarterly. In 2022, PTT allocated appropriate budget to support operations related to digital technology, which covers developing or improving digital projects to support the implementation of business strategies, investing in basic digital technologies, and developing PTT personnel to have more digital skills to keep up with the trend of using digital technology in today's competitive business situation.

(5) Monitoring & Evaluation Activities

PTT commands a process for monitoring and assessment the adequacy of internal control and defines guidelines for improvement to ensure system efficiency and effectiveness:

- Arranged for Conflict of Interest Report annually and when there is a case, and analysis with the Procure-to-Pay Process by using Continuous Control Monitoring and Auditing System (CCMS) in scrutinizing and monitoring irregularities.
- Regularly evaluated internal control efficiency and effectiveness at least once a year by requiring senior executives to conduct control self-assessment according to their roles and responsibilities assigned through the E - CSA form (Control Self-Assessment) and requiring all departments and direct-report divisions to conduct this self-assessment according to the GRC (Governance, Risk and Compliance) guidelines, as well as developing plans to improve internal controls in high-risk processes, and follow up on such improvements. Reports are to be regularly submitted to the Board.
- The Board and executives regularly monitor implementation reports of strategic plans, laws, rules, and regulations of PTT and PTT Group.

This year, the Office of Corporate Audit also reviewed internal control practices to ensure that they are adequate, suitable and consistently practiced. If a given item needed improvement, procedures would be discussed with management to define implementation guidelines along with improvement plans to prevent or minimize risks and monitor execution to ensure that audit and review findings are promptly remedied. This is reported every quarter to the Audit Committee, indicating that PTT's internal control system for this year is adequate, efficient, and effective, a view shared by the external auditor.

Internal Audit System

The Office of Corporate Audit is an independent unit that directly reports to the Audit Committee. It fosters assurance and provides advice to ensure that business processes are duly equipped with efficient good corporate governance (CG), risk management, and internal control practices in support of corporate objectives.

The Office commands an annual audit plan and three-year audit plans in line with PTT's business strategic direction and a risk-based approach to key corporate risks, encompassing PTT Group's domestic and international businesses. It reports findings to the Audit Committee for consideration and forwards them to the Board for acknowledgment every quarter. Regular monitoring is undertaken for actions in response to the office's recommendations. In its course of work, the office freely expresses its opinions. No conflicts have arisen between audited units and the office that cannot be resolved.

Head of the Office of Corporate Audit

At Meeting No. 10/2022 on October 27, 2022, the Board appointed Mr. Chayagorn Leangruenrom, Executive Vice President, Office of Corporate Audit, with effect from November 1, 2022, citing his mastery of PTT's business. Equipped with knowledge, skills, and experience in internal audit, he is familiar with the business undertaking, good governance, risk assessment, and internal control at the business and overall levels and was therefore regarded as suitable for the position. The Audit Committee approved the appointment, transfer, performance assessment, and annual merit pay increase of this position.

Biography of the Head of Corporate Audit

Mr. Chayagorn Leangruenrom

Age: 54

Education

- Bachelor of Engineering, King Mongkut's Institute of Technology Ladkrabang
- Master of Business Administration, Kasetsart University

Training

- Anti-Corruption for Executive Program (ACEP 7/2013), Corporate Governance for Executives Program (CGE 19/2022), Subsidiary Governance Program (SGP Online 1/2022), Thai Institute of Directors Association (IOD)
- Leadership Development Program II, PTT-Harvard Business School, PTT Leadership and Learning Institute (PLLI)
- Public-Private Partnerships for Executives Program (PEP) Class 8, Institute of Research and Development for Public Enterprises (IRDP)
- Corporate Governance for Directors and Senior Executives of Regulators, State Enterprises and Public Organizations (PDI) Class 24, King Prajadhipok's Institute
- Advanced Management Program (AMP) 3 - Business & People Management, PTT Leadership and Learning Institute (PLLI)
- Senior Executive Program, Capital Market Academy (CMA) Class 32

Working Experiences (Past 10 years)

- 2022 - Present
  Executive Vice President, Office of Corporate Audit, PTT
- 2020 - 2022
  Executive Vice President, Corporate Governance, PTT
- 2019 - 2020
  Vice President, Natural Gas Marketing Department, PTT
- 2016 - 2019
  Vice President, Project Director, Myanmar - Thailand LNG Receiving Terminal, PTT
- 2016 - 2016
  Vice President, Internal Audit Department, PTT
- 2013 - 2016
  Vice President, Subsidiary Audit Department, PTT
- 2011 - 2013
  Vice President, Internal Audit Department, PTT

Key Related Directorship

- -None-

Relations with the Management

- -None-

Compliance Unit

PTT has assigned "Compliance Department" to govern legal and regulatory compliance of PTT with detailed roles, duties, and responsibilities defined in the Compliance Charter, under the Executive Vice President, Corporate Governance, and supervised by the Senior Executive Vice President, Organization Effectiveness and Corporate Governance (biography shown in Information of Executives Section), and indirectly reporting to the Governance, Risk and Compliance Management Committee (GRCMC) and the Corporate Governance and Sustainability Committee (CGSC), respectively.

Compliance Department centralizes corporate compliance and oversees all personnel and all business units under PTT to fully comply with all external and internal laws, rules, regulations, directives, procedures, and announcements controlling all facets of PTT businesses. Compliance routinely works with the 2nd Line to collect and develop a data depository on laws and regulations governing PTT operations and businesses and is tasked to analyze and assess legal risks and impacts on the operational activities of PTT. Compliance's duties include providing consultations, support, supervision, and reviews of the 1st Line to ensure compliance of PTT with all laws and regulations. Compliance also constantly develops and nurtures compliance culture through the continuous organization of legal learning and development sessions, consultancy services, publications, and dissemination of data and information related to laws, rules, and regulations governing operations and businesses. In 2022, communication sessions on laws and regulations, as well as compliance behaviors and practices, were organized e.g., internal e-mails, online learning, infographics on key legal summaries, Compliance Policy publicity, and Compliance Framework guidelines. PTT personnel has also been promoted to adhere to laws and regulations, corporate governance, and business ethics through Tone from the top which communicated key messages from top management as food for thought, direction, or practices via video clips to promote compliance culture from top management.

In addition, management of non-compliance incidents is also undertaken by collecting, analyzing, reviewing non-compliance cases (if any), and follow-up to improve the operational process and find ways to prevent and reduce the chance of non-compliance repeated in the future. PTT also sets a goal of becoming a Zero Non-Compliance organization by reviewing and setting indicators for measuring results. The annual performance of various departments must comply with laws and regulations by setting up the Corporate KPI: Non-Compliance, which measures the result by not finding any material errors from the complaints (both inside and outside PTT) that are considered fraudulent, malpractice, or misconduct, serious disciplinary action and unlawful acts with final punishment orders or written notices of illegal acts by legal regulators. Additional measures include the learning of executives and employees, by having to pass 3 training courses on CG and Compliance and Ethics, namely (1) CG E-Learning, (2) Basic knowledge of the Organic Act on the Prevention and Suppression of Corruption, and (3) Conflict of Interest. In 2022, no non-compliance with a significant impact or legal liability to PTT in any way was found.

The aforementioned implementation of compliance supervision is aimed at fostering values and culture in compliance with laws and regulations, enhancing PTT personnel's knowledge and understanding of key laws related to their responsibilities and awareness of potential impacts of non-compliance with laws and regulations, including being able to work properly and adhering to strict compliance with laws and regulations, and to ensure that PTT's business operations will not be interrupted by legal compliance risks. The aim is to make PTT's operations sustainably achieve the goal of "Zero Non-Compliance".

9.2 Connected Transactions

The connected transactions in 2022 are summarized below:

READ MORE

Details of connected transactions during the past 3 years can be found from investor.pttplc.com/en/downloads/supplementary-one-report

9.2.1 Connected Transactions with Shareholders

In 2022, the company had no connected transactions with shareholders.

9.2.2 Connected Transactions between PTT and Parties with the Common Major Shareholder

Transactions for PTT's products sold/ services rendered to parties with the common major shareholder with potential conflicts

Party with the Common Major Shareholder	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Electricity Generating Authority of Thailand (EGAT)	110,538	Ministry of Finance, PTT's major shareholder, has control over EGAT.	–
State Railway of Thailand (SRT)	2,491	Ministry of Finance, PTT's major shareholder, has control over SRT.	–
Bangkok Mass Transit Authority (BMTA)	1,755	Ministry of Finance, PTT's major shareholder, has control over BMTA.	–
Port Authority of Thailand (PAT)	979	Ministry of Finance, PTT's major shareholder, has control over PAT.	–
Others	901		
Total	**116,664**		

Transactions for products/ services PTT bought/ received and other expenses from parties with the common major shareholder with potential conflicts

Party with the Common Major Shareholder	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Provincial Electricity Authority (PEA)	911	Ministry of Finance, PTT's major shareholder, has control over PEA.	PTT's director, Mr. Danucha Pichayanan, is a PEA director.
Electricity Generating Authority of Thailand (EGAT)	306	Ministry of Finance, PTT's major shareholder, has control over EGAT.	–
Metropolitan Electricity Authority (MEA)	38	Ministry of Finance, PTT's major shareholder, has control over MEA.	–
Export-Import Bank of Thailand (EXIM)	35	Ministry of Finance, PTT's major shareholder, has control over EXIM.	–
Others	125		
Total	**1,415**		

Interests received from parties with the common major shareholder with potential conflicts

Party with the Common Major Shareholder	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
TMBThanachart Bank Plc. (TTB)	45	Ministry of Finance, PTT's major shareholder, holds more than 10.00% shares in TTB.	–
Government Housing Bank (GHB)	22	Ministry of Finance, PTT's major shareholder, has control over GHB.	–
Total	**67**		

Trade accounts receivable, other accounts receivable, and advance payments to parties with the common major shareholder with potential conflicts

Trade Accounts Receivable

Party with the Common Major Shareholder	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Electricity Generating Authority of Thailand (EGAT)	16,010	Ministry of Finance, PTT's major shareholder, has control over EGAT.	–
State Railway of Thailand (SRT)	239	Ministry of Finance, PTT's major shareholder, has control over SRT.	–
Bangkok Mass Transit Authority (BMTA)	207	Ministry of Finance, PTT's major shareholder, has control over BMTA.	–
Port Authority of Thailand (PAT)	104	Ministry of Finance, PTT's major shareholder, has control over PAT.	–
Others	84		
Total	**16,644**		

Other Accounts Receivable

Party with the Common Major Shareholder	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
TMBThanachart Bank Plc. (TTB)	133	Ministry of Finance, PTT's major shareholder, holds more than 10.00% shares in TTB.	–
Electricity Generating Authority of Thailand (EGAT)	1	Ministry of Finance, PTT's major shareholder, has control over EGAT.	–
Total	**134**		

Advance Payment

Party with the Common Major Shareholder	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Export-Import Bank of Thailand (EXIM)	3	Ministry of Finance, PTT's major shareholder, has control over EXIM.	–
Total	**3**		

Trade accounts payable and other accounts payable to parties with the common major shareholder with potential conflicts

Trade Accounts Payable

Party with the Common Major Shareholder	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Industrial Estate Authority of Thailand (IEAT)	16	Ministry of Finance, PTT's major shareholder, has control over IEAT.	–
Total	**16**		

Other Accounts Payable

Party with the Common Major Shareholder	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
TMBThanachart Bank Plc. (TTB)	133	Ministry of Finance, PTT's major shareholder, holds more than 10.00% shares in TTB.	–
State Railway of Thailand (SRT)	131	Ministry of Finance, PTT's major shareholder, has control over SRT.	–
Industrial Estate Authority of Thailand (IEAT)	7	Ministry of Finance, PTT's major shareholder, has control over IEAT.	–
MCOT Public Company Limited (MCOT)	5	Ministry of Finance, PTT's major shareholder, has control over MCOT.	–
Others	7		
Total	**283**		

9.2.3 Connected Transactions among PTT and Subsidiaries, Joint Operations, Joint Ventures, Associates and Other Related Parties

Transactions for PTT's products sold/ services rendered to subsidiaries, joint operations, joint ventures, associates and other related parties

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31 , 2022)	Management (As of December 31, 2022)
Subsidiaries			
Thai Oil Plc. (TOP)	382,479	PTT Group owns 48.00% of TOP's shares.	- PTT's executives, namely Miss Pannalin Mahawongtikul, Mr. Terdkiat Prommool, Mr. Suchat Ramarch, Dr. Buranin Rattanasombat, are TOP's directors. - PTT's executive, Mr. Noppadol Pinsupa, is a director & the Board's secretary and Acting CEO & President of TOP.
PTT Global Chemical Plc. (GC)	376,062	PTT Group owns 48.18% of GC's shares.	- PTT's director, M.L. Chayotid Kridakon, is GC's director. - PTT's executives, namely Mr. Chadil Chavanalikikorn, Mr. Cherdchai Boonchoochauy are GC's directors. - PTT's executive, Dr. Kongkrapan Intarajang, is a director & the Board's secretary and President & CEO of GC.

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31 , 2022)	Management (As of December 31, 2022)
IRPC Plc. (IRPC)	240,239	PTT Group owns 48.05% of IRPC's shares.	- PTT's executives, namely Miss Peangpanor Boonklum, Mr. Chansak Chuenchom, and Mr. Prasong Intaranongpai, are IRPC's directors. - Mr. Kris Imsang, is a director & the Board's secretary and President & CEO of IRPC.
PTT International Trading Pte. Ltd. (PTTT)	58,665	Wholly owned by PTT Group.	- PTT's executive, Miss Jaroonsri Wankertphon, is PTTT's director.
PTT Oil and Retail Business Plc. (OR)	39,156	PTT Group owns 75.00% of OR's shares.	- PTT's director/ executive, Mr. Auttapol Rerkpiboon, is OR's Chairman of the Board. - PTT's executives, namely Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool, are OR's directors.
PTT MEA Ltd.	36,092	Wholly owned by PTT Group.	–
PTT International Trading USA Inc.	31,807	Wholly owned by PTT Group.	–
PTT International Trading London Ltd. (PTTT LDN)	27,636	Wholly owned by PTT Group.	–
Global Power Synergy Plc. (GPSC)	19,489	PTT Group owns 75.23% of GPSC's shares.	- PTT's executives, namely Mr. Wuttikorn Stithit, Mr. Noppadol Pinsupa, Miss Pannalin Mahawongtikul, M.L. Peekthong Thongyai and Dr. Kongkrapan Intarajang, are GPSC's directors. - PTT's executive, Mr. Worawat Pitayasiri, is a director & the Board's secretary and President & CEO of GPSC.
Others	68,770		

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31 , 2022)	Management (As of December 31, 2022)
Joint Ventures			
HMC Polymers Co., Ltd. (HMC)	7,992	PTT Group owns 41.44% of HMC's shares.	–
PTT Asahi Chemical Co., Ltd. (PTTAC)	5,337	PTT Group owns 50.00% of PTTAC's shares.	–
Nava Nakorn Electricity Generating Co., Ltd. (NNEG)	4,236	PTT Group owns 30.00% of NNEG's shares.	–
District Cooling System and Power Plant Co., Ltd. (DCAP)	3,279	PTT Group owns 35.00% of DCAP's shares.	–
Others	162		
Associates			
Bangpa-in Cogeneration Co., Ltd. (BIC)	5,720	PTT Group owns 25.00% of BIC's shares	–
AGC Vinythai Plc.	271	PTT Group owns 32.72% of AGC Vinythai Plc.'s shares.	
Vinythai Plc.	176	As of December 31, 2022, the company was merged into AGC Vinythai Plc.	–
Other Related Party			
Ratchaburi Power Co., Ltd. (RPCL)	4,671	PTT Group owns 15.00% of RPCL's shares.	- PTT's executive, Mr. Worawat Pitayasiri, is RPCL's director.
Total	**1,312,239**		

Transactions for products/ services PTT bought/ received from subsidiaries, joint operations, joint ventures, associates, and other related parties

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiaries			
PTT International Trading Pte. Ltd. (PTTT)	262,536	Wholly owned by PTT Group.	- PTT's executive, Miss Jaroonsri Wankertphon, is PTTT's director.
PTT Exploration and Production Plc. (PTTEP)	125,870	PTT Group owns 65.29% of PTTEP's shares.	- PTT's director/ executive, Mr. Auttapol Rerkpiboon, is PTTEP's director. - PTT's executive, Mr. Wuttikorn Stithit, is PTTEP's director. - PTT's executive, Mr. Montri Rawanchaikul, is a director and CEO of PTTEP.
PTTEP Energy Development Co., Ltd.	30,257	Wholly owned by PTT Group.	–
PTTEP Siam Ltd.	24,895	Wholly owned by PTT Group.	–
PTTEP International Ltd.	22,590	Wholly owned by PTT Group.	–
PTT Oil and Retail Business Plc. (OR)	18,789	PTT Group owns 75.00% of OR's shares.	- PTT's director/ executive, Mr. Auttapol Rerkpiboon, is OR's Chairman of the Board. - PTT's executives, namely Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool, are OR's directors.

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
PTT Global Chemical Plc. (GC)	12,894	PTT Group owns 48.18% of GC's shares.	- PTT's director, M.L. Chayotid Kridakon, is GC's director. - PTT's executives, namely Mr. Chadil Chavanalikikorn, Mr. Cherdchai Boonchoochauy are GC's directors. - PTT's executive, Dr. Kongkrapan Intarajang, is a director & the Board's secretary and President & CEO of GC.
PTT International Trading London Ltd. (PTTT LDN)	11,722	Wholly owned by PTT Group.	–
PTTEP SP Ltd.	9,649	Wholly owned by PTT Group.	–
PTT LNG Co., Ltd. (PTTLNG)	9,554	Wholly owned by PTT Group.	–
PTTEP Oman E&P Corporation	7,534	Wholly owned by PTT Group.	–
PTT MEA Ltd.	5,871	Wholly owned by PTT Group.	–
PTTEP MENA Ltd.	5,285	Wholly owned by PTT Group.	–
Others	3,943		
Joint Operations			
Moattama Gas Transportation Co., Ltd. (MGTC)	21,174	PTT Group owns 37.08% of MGTC's shares.	–
Andaman Transportation Ltd. (ATL)	14,037	PTT Group owns 80.00% of ATL's shares.	–
Others	10,541		–

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Joint Ventures			
Trans Thai-Malaysia (Thailand) Co., Ltd. (TTM(T))	1,598	PTT Group owns 50.00% of TTM(T)'s shares.	–
Map Ta Phut Air Products Co., Ltd. (MAP)	30	PTT Group owns 51.00% of MAP's shares.	–
Total	**598,769**		

Interests received from subsidiaries, joint operations, joint ventures, associates, and other related parties

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiaries			
PTT Treasury Center Co., Ltd. (PTT TCC)	1,829	Wholly owned by PTT Group.	- PTT's executive, Mrs. Chanamas Sasnanand, is PTT TCC's Chairman of the Board.
Others	23		
Total	**1,852**		

Interests paid by subsidiaries, joint operations, joint ventures, associates, and other related parties

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiaries			
PTT Treasury Center Co., Ltd. (PTT TCC)	2,269	Wholly owned by PTT Group.	- PTT's executive, Mrs. Chanamas Sasnanand, is PTT TCC's Chairman of the Board.
Others	59		
Joint Venture			
Trans Thai-Malaysia (Thailand) Co., Ltd. (TTM(T))	38	PTT Group owns 50.00% of TTM(T)'s shares.	–
Total	**2,366**		

Trade accounts receivable, other accounts receivable, advance payments, short-term loans, and long-term loans to subsidiaries, joint operations, joint ventures, associates, and other related parties

Trade Accounts Receivable

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiaries			
Thai Oil Plc. (TOP)	39,282	PTT Group owns 48.00% of TOP's shares.	- PTT's executives, namely Miss Pannalin Mahawongtikul, Mr. Terdkiat Prommool, Mr. Suchat Ramarch, and Dr. Buranin Rattanasombat, are TOP's directors. - PTT's executive, Mr. Noppadol Pinsupa, is a director & the Board's secretary and Acting CEO & President of TOP.

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
PTT Global Chemical Plc. (GC)	21,030	PTT Group owns 48.18% of GC's shares.	- PTT's director, M.L. Chayotid Kridakon, is GC's director. - PTT's executives, namely Mr. Chadil Chavanalikikorn and Mr. Cherdchai Boonchoochauy, are GC's directors. - PTT's executive, Dr. Kongkrapan Intarajang, is a director & the Board's secretary and President & CEO of GC.
IRPC Plc. (IRPC)	14,908	PTT Group owns 48.05% of IRPC's shares.	- PTT's executives, namely Miss Peangpanor Boonklum, Mr. Chansak Chuenchom, and Mr. Prasong Intaranongpai, are IRPC's directors. - Mr. Kris Imsang, is a director & the Board's secretary and President & CEO of IRPC.
PTT International Trading Pte. Ltd. (PTTT)	3,888	Wholly owned by PTT Group.	- PTT's executive, Miss Jaroonsri Wankertphon, is PTTT's director.
PTT Oil and Retail Business Plc. (OR)	2,452	PTT Group owns 75.00% of OR's shares.	- PTT's director/ executive, Mr. Auttapol Rerkpiboon, is OR's Chairman of the Board. - PTT's executives, namely Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool, are OR's directors.
Others	8,195		

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Joint Ventures			
PTT Asahi Chemical Co., Ltd. (PTTAC)	383	PTT Group owns 50.00% of PTTAC's shares.	–
Nava Nakorn Electricity Generating Co., Ltd. (NNEG)	308	PTT Group owns 30.00% of NNEG's shares.	–
District Cooling System and Power Plant Co., Ltd. (DCAP)	257	PTT Group owns 35.00% of DCAP's shares.	–
Others	144		
Associates			
Bangpa-in Cogeneration Co., Ltd. (BIC)	412	PTT Group owns 25.00% of BIC's shares.	–
AGC Vinythai Plc.	46	PTT Group owns 32.72% of AGC Vinythai Plc.'s shares.	–
Other Related Party			
Ratchaburi Power Co., Ltd. (RPCL)	719	PTT Group owns 15.00% of RPCL's shares.	- PTT's executive, Mr. Worawat Pitayasiri, is RPCL's director.
Total trade accounts receivable	**92,024**		

Other Accounts Receivable

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiaries			
IRPC Plc.	285	PTT Group owns 48.05% of IRPC's shares.	- PTT's executives, namely Miss Peangpanor Boonklum, Mr. Chansak Chuenchom, and Mr. Prasong Intaranongpai, are IRPC's directors. - Mr. Kris Imsang, is a director & the Board's secretary and President & CEO of IRPC.
PTT Treasury Center Co., Ltd. (PTT TCC)	265	Wholly owned by PTT Group.	- PTT's executive, Mrs. Chanamas Sasnanand, is PTT TCC's Chairman of the Board.
PTT Oil and Retail Business Plc. (OR)	239	PTT Group owns 75.00% of OR's shares.	- PTT's director/ executive, Mr. Auttapol Rerkpiboon, is OR's Chairman of the Board. - PTT's executives, namely Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool, are OR's directors.
PTT International Trading London Ltd. (PTTT LDN)	182	Wholly owned by PTT Group.	–
Thai Oil Plc. (TOP)	181	PTT Group owns 48.00% of TOP's shares.	- PTT's executives, namely Miss Pannalin Mahawongtikul, Mr. Terdkiat Prommool, Mr. Suchat Ramarch, Dr. Buranin Rattanasombat, are TOP's directors. - PTT's executive, Mr. Noppadol Pinsupa, is a director & the Board's secretary and Acting CEO & President of TOP.

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
TOP SPP Co., Ltd.	135	PTT Group owns 99.99% of TOP SPPs shares.	–
PTT International Trading Pte. Ltd. (PTTT)	123	Wholly owned by PTT Group.	- PTT's executive, Miss Jaroonsri Wankertphon, is PTTT's director.
Others	466		
Joint Ventures			
Nava Nakorn Electricity Generating Co., Ltd. (NNEG)	199	PTT Group owns 30.00% of NNEG's shares.	–
Others	63		–
Associates			
Thai Petroleum Pipeline Co., Ltd. (Thappline)	1	PTT Group owns 49.21% of Thappline's shares.	–
Total Other Accounts Receivable – Net	**2,139**		

Short-Term Advance Payment

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiary			
PTT Digital Solutions Co., Ltd. (PTT DIGITAL)	32	Wholly owned by PTT Group.	- PTT's executive, Mr. Terdkiat Prommool, is Chairman of the Board of PTT DIGITAL.
Total	**32**		

Short-Term Loans

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiary			
PTT Treasury Center Co., Ltd. (PTT TCC)	2,044	Wholly owned by PTT Group.	- PTT's executive, Mrs. Chanamas Sasnanand, is PTT TCC's Chairman of the Board.
Grand Total Short-Term Loans	**2,044**		

Long-Term Loans

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiary			
PTT Treasury Center Co., Ltd. (PTT TCC)	56,067	Wholly owned by PTT Group.	- PTT's executive, Mrs. Chanamas Sasnanand, is PTT TCC's Chairman of the Board.
Total Long-Term Loans	**56,067**		

Trade accounts payable, other accounts payable, loans, and liabilities under leases to subsidiaries, joint operations, joint ventures, associates, and other related parties

Trade Accounts Payable

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiaries			
PTT International Trading Pte. Ltd. (PTTT)	15,618	Wholly owned by PTT Group.	- PTT's executive, Miss Jaroonsri Wankertphon, is PTTT's director.
PTT Exploration and Production Plc. (PTTEP)	12,960	PTT Group owns 65.29% of PTTEP's shares.	- PTT's director/ executive, Mr. Auttapol Rerkpiboon, is PTTEP's director. - PTT's executive, Mr. Wuttikorn Stithit, is PTTEP's director. - PTT's executive, Mr. Montri Rawanchaikul, is a director and CEO of PTTEP.
PTTEP International Ltd.	3,876	Wholly owned by PTT Group.	–
PTT Oil and Retail Business Plc. (OR)	3,841	PTT Group owns 75.00% of OR's shares.	- PTT's director/ executive, Mr. Auttapol Rerkpiboon, is OR's Chairman of the Board. - PTT's executives,namely Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool, are OR's directors.
Others	10,896		

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Joint Operations			
Moattama Gas Transportation Co., Ltd. (MGTC)	3,380	PTT Group owns 37.08% of MGTC's shares.	–
Andaman Transportation Ltd. (ATL)	2,736	PTT Group owns 80.00% of ATL's shares.	–
Orange Energy Co., Ltd.	564	PTT Group owns 53.95% of Orange Energy Co., Ltd.'s shares.	–
B 8/32 Partners Ltd.	564	PTT Group owns 25.00% of B8/32 Partners Ltd.'s shares.	–
Joint Venture			
Trans Thai-Malaysia (Thailand) Co., Ltd. (TTM(T))	281	PTT Group owns 50.00% of TTM(T)'s shares.	–
Total	**54,716**		

Other Accounts Payable

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiaries			
PTT Oil and Retail Business Plc. (OR)	1,581	PTT Group owns 75.00% of OR's shares.	- PTT's director/ executive, Mr. Auttapol Rerkpiboon, is OR's Chairman of the Board. - PTT's executives, namely Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool, are OR's directors.

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
PTT Digital Solutions Co., Ltd. (PTT DIGITAL)	1,017	Wholly owned by PTT Group.	- PTT's executive, Mr. Terdkiat Prommool, is the Chairman of the Board of PTT DIGITAL.
PTT Treasury Center Co., Ltd. (PTT TCC)	877	Wholly owned by PTT Group.	- PTT's executive, Mrs. Chanamas Sasnanand, is PTT TCC's Chairman of the Board.
Others	1,063		
Joint Ventures			
Map Ta Phut Air Products Co., Ltd. (MAP)	5	PTT Group owns 51.00% of MAP's shares.	–
Nava Nakorn Electricity Generating Co., Ltd. (NNEG)	3	PTT Group owns 30.00% of NNEG's shares.	–
PTT Asahi Chemical Co., Ltd. (PTTAC)	2	PTT Group owns 50.00% of PTTAC's shares.	–
Others	3		
Associates			
Bangpa-in Cogeneration Co., Ltd. (BIC)	7	PTT Group owns 25.00% of BIC's shares.	–
Thai Petroleum Pipeline Co., Ltd. (Thappline)	2	PTT Group owns 49.21% of Thappline's shares.	–
Other Related Party			
Ratchaburi Power Co., Ltd. (RPCL)	32	PTT Group owns 15.00% of RPCL's shares.	- PTT's executive, Mr. Worawat Pitayasiri, is RPCL's director.
Total	**4,592**		

Short-Term Loans

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiaries			
PTT LNG Co., Ltd. (PTTLNG)	1,969	Wholly owned by PTT Group.	–
Siam Management Holding Co., Ltd. (SMH)	1,962	Wholly owned by PTT Group.	–
ARUN PLUS Co., Ltd. (ARUN PLUS)	1,957	Wholly owned by PTT Group.	- PTT's director, Professor Dr. Thosaporn Sirisumphand, is the Chairman of the Board of ARUN PLUS. - PTT's directors, namely Mr. Danucha Pichayanan, M.L. Chayothid Kridakon, are directors of ARUN PLUS. - PTT's executive, Mr. Cherdchai Boonchoochauy, is a director of ARUN PLUS.
PTT Tank Terminal Co., Ltd. (PTT TANK)	1,425	Wholly owned by PTT Group.	- PTT's executive, M.L. Peekthong Thongyai, is a director of PTT TANK.
Others	2,134		
Total	**9,447**		

Long-Term Loans

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiaries			
PTT Treasury Center Co., Ltd. (PTT TCC)	50,260	Wholly owned by PTT Group.	- PTT's executive, Mrs. Chanamas Sasnanand, is PTT TCC's Chairman of the Board.
Total	**50,260**		

Liabilities under Leases due within One Year

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiaries			
PTT Digital Solutions Co., Ltd. (PTT DIGITAL)	41	Wholly owned by PTT Group.	- PTT's executive, Mr. Terdkiat Prommool, is the Chairman of the Board of PTT DIGITAL.
EVME PLUS Co., Ltd. (EVME PLUS)	10	Wholly owned by PTT Group.	–
Others	6		
Joint Venture			
Trans Thai-Malaysia (Thailand) Co., Ltd. (TTM(T))	451	PTT Group owns 50.00% of TTM(T)'s shares.	–
Total	**508**		

Liabilities under Long-Term Leases

Related Party	2022 (THB million)	Relationship	
		Shareholding (As of December 31, 2022)	Management (As of December 31, 2022)
Subsidiaries			
PTT Digital Solutions Co., Ltd. (PTT DIGITAL)	140	Wholly owned by PTT Group.	- PTT's executive, Mr. Terdkiat Prommool, is the Chairman of the Board of PTT DIGITAL.
EVME PLUS Co., Ltd. (EVME PLUS)	55	Wholly owned by PTT Group.	–
Joint Ventures			
Trans Thai-Malaysia (Thailand) Co., Ltd. (TTM(T))	2,336	PTT Group owns 50.00% of TTM(T)'s shares.	–
Total	**2,531**		

9.2.4 PTT's Connected Transactions Resulted from the Following Agreements with Key Conditions Being Summarized below:

(1) Transactions between PTT and state enterprises

Transactions

- **Sales of natural gas**

PTT signed gas sales agreements (GSAs) with a state enterprise, the Electricity Generating of Thailand (EGAT). There were 2 GSAs as follows:

1. GSA between PTT and EGAT, dated June 19, 2020.
2. GSA for Nam Phong Power Plant between PTT and EGAT, dated September 20, 2021.

Remark: PTT has a liquefied natural gas purchase agreement with EGAT dated October 1, 2021, according to the ERC's resolution, which is applicable from October 2021 until the conclusion of EGAT's liquefied natural gas imports by 2021.

- **Sales of fuels and petroleum products**

The ministerial regulation prescribing state-promoted or state-supported supply and procurement procedures through the selection and specific procurement methods B.E. 2560 (2017), Division 7, required central and provincial government agencies and state enterprises (excluding EGAT) to purchase state-supported energy and natural resource supply of 10,000 liters or more by specific procurement methods from PTT, or otherwise, they can buy such supply through selection or invitation to bid. Currently, PTT sells fuels to the following state enterprises which still insisted on buying fuels from PTT: Bangkok Mass Transit Authority (BMTA), State Railway of Thailand (SRT), EGAT, and The Transport Co., Ltd. As for state enterprises having outstanding payments, PTT could charge interest at the rate according to the contractual terms.

(2) Transactions between PTT and PTT Exploration and Production Plc. (PTTEP) which is PTT's Subsidiary

Transactions

PTTEP and its subsidiaries produce and sell crude oil, natural gas, condensate, and liquefied petroleum gas (LPG). PTT was the major buyer of these in 2022 (68% by volume). PTT had a 15 - 30 year long-term natural gas purchase agreement with PTTEP, including annual minimum contractual volumes. PTT also engaged into crude oil and condensate supply agreements with PTTEP, while selling natural gas to PTTEP. PTT's petroleum product pricing to PTTEP is consistent with global market prices and identical to the project partners' selling prices to PTT. PTT obtains fuel from PTTEP at competitive standard reference prices and under sensible conditions.

Normal business transactions or those supporting normal business transactions

Item				Amount as of December 31, 2022	Justification and Sensibility
1.1	**Sale of petroleum products**			THB 227,961 million	Pricing of petroleum products aligns with global market prices and identical to the project partners' selling prices sold to PTT.
	Natural gas	682,177.59	million cubic feet		
	Crude oil	17.86	million barrels		
	Condensate	15.95	million barrels		
	Liquefied petroleum gas	63,357.00	metric tons		
1.2	**Natural gas as fuels**			THB 7.10 million	PTTEP's Board of Directors approved a 5-year (2019 - 2023) fuel supply agreement with PTT. The prices under the agreement were based on competitive standard reference market prices and sensible terms.
	Natural gas	14.48	million cubic feet		

(3) Transactions between PTT and Petrochemical and Refining Affiliates

Transactions

PTT signed crude oil, condensate and feedstock supply agreements, refined and petrochemical product purchase agreements and gas sales agreements for process feedstock with its petrochemical and refining affiliates. PTT also signed LPG sales agreement, service agreement for storage and distribution of refined products, leases and subleases of oil terminals for its subsidiaries in the oil and retail business. The purchase price is the market price.

(4) Transactions between PTT and its affiliates of the New Business and Infrastructure Business Group: Transactions and contracts with Global Power Synergy Plc. (GPSC)

Transactions

PTT signed a Gas Sales Agreement with GPSC to feed gas for power generation, which is considered a normal business transaction, with prices and conditions based on competitive standard referenced market prices.

9.2.5 Sensibility of Connected Transactions

Procurement of goods, raw materials, or services from related entities aims to maximize mutual benefits in business operations within PTT Group and support national energy security. Such transactions are regarded as normal business practices. The volume of goods or raw materials bought or sold by PTT or services provided or received by related parties are in accordance with PTT's needs and business operations. Such prices and services are as agreed in contracts, leading to commercial benefit to both PTT and related parties without any benefits transferring or irregular transaction.

9.2.6 Policy Relating to Future Connected Transactions

PTT's future connected transactions will be conducted as part of its normal businesses without special favors or transfers of benefit between PTT, subsidiaries, associated companies, related companies, and shareholders. Pricing policy will continue to be at arm's length, and the prices of products supplied by PTT's subsidiaries will be at the market-based. Disclosure of connected transactions are according to SEC's and SET's regulations and the accounting standard for related parties/ entities disclosures announced by the Federation of Accounting Professions.

9.2.7 Appraisal Price for Related Transactions

-None-

Section

3

Financial Report

Details of Financial Report, see in
56-1 One Report 2022
(Financial Report)
PTT Public Company Limited

Financial

Attachment

Attachment 1

Information of the Board of Directors, Executives, Controlling Persons and Company Secretary

As of December 31, 2022

Attachment

PTT Board of Directors

As of December 31, 2022

1

2

3

4

5

6

1. Professor Dr. Thosaporn Sirisumphand
   Independent Director/ Chairman
2. POL. GEN. Rungroj Sangkram
   Independent Director/
   Chairman of the Audit Committee
3. Mr. Danucha Pichayanan
   Independent Director/
   Chairman of the Nominating Committee
4. GEN. Teerawat Boonyawat
   Independent Director/
   Chairman of the Remuneration Committee
5. Mr. Jatuporn Buruspat
   Independent Director/
   Chairman of the Corporate Governance
   and Sustainability Committee
6. M.L. Chayotid Kridakon
   Independent Director/
   Chairman of the Enterprise Risk Management Committee/
   Authorized Director

7

8

9

10

11

12

13

14

15

7. Mr. Krishna Boonyachai
   Independent Director/ Member of the Audit Committee
8. Associate Professor Dr. Chayodom Sabhasri
   Independent Director/ Member of the Audit Committee
9. Mr. Payong Srivanich
   Independent Director/ Member of the Nominating
   Committee/ Member of the Corporate Governance
   and Sustainability Committee
10. Mr. Phongsthorn Thavisin
    Director/ Member of the Nominating Committee/
    Authorized Director
11. Mr. Krisada Chinavicharana
    Director/ Member of the Remuneration Committee
12. Associate Professor Dr. Narongdech Srukhosit
    Independent Director/ Member of the Corporate
    Governance and Sustainability Committee/
    Member of the Enterprise Risk Management Committee
13. Mr. Chansin Treenuchagron
    Independent Director/
    Member of the Remuneration Committee
14. Dr. Prasert Sinsukprasert
    Director/ Member of the Enterprise
    Risk Management Committee
15. Mr. Auttapol Rerkpiboon
    Director/ Secretary to the Board/ Authorized Director/
    President and Chief Executive Officer

PTT Executives

As of December 31, 2022

1

2

3

4

5

6

7

8

9

10

1. Mr. Auttapol Rerkpiboon
   President and Chief Executive Officer
2. Mr. Wuttikorn Stithit
   Chief Operating Officer, Upstream Petroleum and Gas Business Group
3. Mr. Noppadol Pinsupa
   Chief Operating Officer, Downstream Petroleum Business Group
4. Dr. Buranin Rattanasombat
   Chief New Business and Infrastructure Officer
5. Miss Pannalin Mahawongtikul
   Chief Financial Officer
6. Mr. Terdkiat Prommool
   Senior Executive Vice President, Corporate Strategy and Sustainability
7. Mr. Chadil Chavanalikikorn
   Senior Executive Vice President, Organization Effectiveness and Corporate Governance
8. Miss Peangpanor Boonklum
   Senior Executive Vice President, Office of General Counsel
9. M.L. Peekthong Thongyai
   Senior Executive Vice President, Gas Business Unit
10. Mr. Prasong Intaranongpai
    Executive Vice President Acting Senior Executive Vice President Downstream Business Group Alignment

11

12

13

14

15

16

17

18

19

20

21

22

11. Mr. Pongpun Amornvivat
    Senior Executive Vice President, International Trading Business Unit
    (Effective from January 1, 2023)
12. Mr. Cherdchai Boonchoochauy
    Senior Executive Vice President, Innovation and New Ventures
13. Mr. Chansak Chuenchom
    Senior Executive Vice President, Engineering and Infrastructure
14. Mrs. Nivadee Jaroensitipun
    Executive Vice President Acting Senior Executive Vice President, Government Relations
15. Mr. Montri Rawanchaikul
    Chief Executive Officer, PTT Exploration and Production Public Company Limited
16. Dr. Kongkrapan Intarajang
    Chief Executive Officer and President, PTT Global Chemical Public Company Limited
17. Mr. Bandhit Thamprajamchit
    Chief Executive Officer and President, Thai Oil Public Company Limited
    (Effective from January 1, 2023)
18. Mr. Kris Imsang
    President and Chief Executive Officer, IRPC Public Company Limited
19. Mr. Worawat Pitayasiri
    President and Chief Executive Officer, Global Power Synergy Public Company Limited
20. Mr. Suchat Ramarch
    President, PTT Oil and Retail Business Public Company Limited
21. Mrs. Chanamas Sasnanand
    Executive Vice President, Group Corporate Finance and Strategy
22. Miss Jaroonsri Wankertphon
    Executive Vice President, Global Business Services Acting Executive Vice President, Group Accounting and Tax Policy

Professor Dr. Thosaporn Sirisumphand
Independent Director/ Chairman
Age (Year) 62

- Appointed as Independent Director
  November 6, 2020
  April 8, 2022 (re-elected)
- Appointed as Chairman
  November 18, 2020

(%) of Share Possession

0.000063
(own 0;
spouse 0.000063)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	**Position**	**Organization/ Company**
Education • Bachelor of Public Administration (Honors), Chulalongkorn University • Master of Public Administration, Pi Alpha Alpha (National Honor Society for Public Affairs and Administration), Northern Illinois University, USA • Ph.D. in Policy Analysis, Public Administration and Comparative Politics, Northern Illinois University, USA **Certification** • Director Certification Program (DCP 80/2006), Finance for Non-Finance Directors (FND 30/2006), Director Certification Program Update (DCPU 4/2015), Thai Institute of Directors Association (IOD) • Capital Market Academy Leader Program, (Class of 10th), Capital Market Academy (CMA) • The Program for Senior Executives on Justice Administration, Batch 15, Judicial Training Institute, National Justice Academy	August 23, 2018 - November 30, 2020	Director and Chairman	Thai Oil Public Company Limited
	July 1, 2018 - September 30, 2020	Director and Chairman	Corporate Governance Committee Bank of Thailand
	June 29, 2018 - September 30, 2020	Secretary General	Office of the National Economic and Social Development Council (NESDC)
	October 2016 - June 28, 2018	Secretary General	Office of the Public Sector Development Commission (OPDC)
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	November 6, 2020 - Present	Independent Director, PTT Public Company Limited	
	November 18, 2020 - Present	Chairman, PTT Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	January 28, 2022 - Present	Chairman and Independent Director, Bangkok Genomics Innovation Public Company Limited	
	July 5, 2021 - Present	Chairman, ARUN PLUS Company Limited	
	June 28, 2021 - Present	Director, ARUN PLUS Company Limited	
	March 12, 2019 - December 29, 2022	Chairman of the Board, Tourism Authority of Thailand	

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• Certificate, Executive Program in Energy Literacy for a Sustainable Future, Class of 4th, Thailand Energy Academy (TEA) • Corporate Governance: Effectiveness and Accountability in the Boardroom 2014, Kellogg School of Management, Northwestern University, USA • IOD Chairman Forum: "The Role of Chairman in Leading Strategic Risk Oversight" • Global Anti-corruption and Integrity Forum 2018, OECD, Paris, France • Seminar: "How to Transform Your Business to Become an Exponential Company in a Digital Era", Faculty of Commerce and Accountancy, Chulalongkorn University • IOD Chairman Forum: "Leading Boardroom Through Disruption: What Directors Should Know?"	**Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)**		
	November 24, 2015 - Present	Member of Council of State	
	January 29, 2016 - Present	Member of Chulalongkorn University Council	
	July 29, 2020 - Present	Commission Member, Office of the Public Sector Development Commission (OPDC)	
	November 17, 2020 - Present	Director, National Science and Technology Development Board	
	December 1, 2020 - Present	Director, National Strategy Committee	

POL. GEN. Rungroj Sangkram
Independent Director/ Chairman of the Audit Committee
Age (Year) 63

- Appointed as Independent Director
  July 3, 2020
- Appointed as Chairman of the Audit Committee
  June 17, 2021

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	**Position**	**Organization/ Company**
Education • Bachelor of Art, Public Administration, Faculty of Social Science, (Class of 34th), Royal Police Cadet Academy • Master of Art, Faculty of Social Science, Kasetsart University **Certification** • Director Certification Program (DCP 298/2020), Risk Management Program for Corporate Leaders (RCL 23/2021) and Financial Statements for Directors (FSD 44/2021), Thai Institute of Directors Association (IOD) • Diploma, The National Defence Course (Class of 53rd), National Defence College • Advanced Police Administration Program (Class of 23rd), Institute of Police Administration Development	April 9, 2021 - June 17, 2021	Chairman of the Corporate Governance Committee	PTT Public Company Limited
	December 17, 2020 - April 9, 2021	Member of the Nominating Committee	PTT Public Company Limited
	July 3, 2020 - April 9, 2021	Member of the Remuneration Committee	PTT Public Company Limited
	2016 - 2019	Deputy National Police Chief	Royal Thai Police
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	July 3, 2020 - Present	Independent Director, PTT Public Company Limited	
	June 17, 2021 - Present	Chairman of the Audit Committee, PTT Public Company Limited	
	July 10, 2020 - Present	Independent Director/ The Corporate Governance Committee, Asset World Corp Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	-	-	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Mr. Danucha Pichayanan
Independent Director/ Chairman of the Nominating Committee
Age (Year) 52

- Appointed as Independent Director
  April 12, 2018
  April 9, 2021 (re-elected)
- Appointed as Chairman of the Nominating Committee
  April 8, 2022

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering, Chulalongkorn University • M.S. Engineering Management, George Washington University, USA **Certification** • Director Certification Program (DCP 211/2015), Thai Institute of Directors Association (IOD) • Certificate, Executive Program in Energy Literacy for a Sustainable Future (Class of 10th), Thailand Energy Academy (TEA) • Certificate, The Civil Service Executive Program for Senior Civil Servants (Class 78/2013), Office of the Civil Service Commission • Senior Executive Certificate in Anti-Corruption Strategic Management (Class 7/2016), Office of the National Anti-Corruption Commission	October 1, 2020 - Present	Secretary General	Office of the National Economic and Social Development Council (NESDC)
	May 20, 2021 - June 17, 2021	Member of the Nominating Committee/ Member of the Corporate Governance Committee	PTT Public Company Limited
	April 11, 2019 - May 20, 2021	Member of the Audit Committee	PTT Public Company Limited
	2019 - January 31, 2020	Director/ Member of the Risk Management Committee/ Chairman of the Steering Committee of TG MRO Campus Project and TG Business Development at U-Tapao Airport Project	Thai Airways International Public Company Limited
	April 25, 2018 - April 11, 2019	Member of the Enterprise Risk Management Committee	PTT Public Company Limited
	October 1, 2016 - September 30, 2020	Deputy Secretary General	Office of the National Economic and Social Development Council (NESDC)
	2016 - June 2019	Board Member	Broadcasting and Telecommunications Research and Development Fund for the Public Interest (BTFP)

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	2016 - June 2019	Sub-Committee of the Project Evaluation and Research Fund	Broadcasting and Telecommunications Research and Development Fund for the Public Interest (BTFP)
	2016 - June 2019	Sub-Committee of the Research Fund Policy and Strategic	Broadcasting and Telecommunications Research and Development Fund for the Public Interest (BTFP)
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	April 12, 2018 - Present	Independent Director, PTT Public Company Limited	
	April 8, 2022 - Present	Chairman of the Nominating Committee, PTT Public Company Limited	
	June 17, 2021 - April 8, 2022	Chairman of the Corporate Governance Committee, PTT Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	2013 - Present	Director, Provincial Electricity Authority	
	October 1, 2020 - Present	Director, Bank of Thailand	
	June 28, 2021 - Present	Director, ARUN PLUS Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	October 12, 2020 - Present	Board Member, The Board of Investment of Thailand (BOI)	
	2020 - Present	Director, National Science and Technology Development Board	
	2020 - Present	Member of EEC Policy Committee, Eastern Economic Corridor (EEC)	
	2020 - Present	Director, Government Pension Fund	
	2015 - Present	Member, Public Service Obligation Committee	

GEN. Teerawat Boonyawat
Independent Director/ Chairman of the Remuneration Committee
Age (Year) 62

- Appointed as Independent Director
  April 11, 2019
  April 8, 2022 (re-elected)
- Appointed as Chairman of the Remuneration Committee
  April 11, 2019

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	**Position**	**Organization/ Company**
Education • Bachelor of Science Program, Chulachomklao Royal Military Academy • Master of Business Administration, Kasetsart University **Certification** • Director Accreditation Program (DAP 169/2020), Director Certification Program (DCP 303/2021), Board Nomination and Compensation Program (BNCP 13/2022), Role of the Chairman Program (RCP 49/2022) and Director Leadership Certification Program (DLCP 4/2022) Thai Institute of Directors Association (IOD) • Diploma, The National Defence Course (Class of 58th), National Defence College • Joint War College (Class of 41st)	October 2020 - September 2021	Deputy Commander-in-Chief	Royal Thai Army
	October 2018 - September 2020	Member of Board of Directors	Defence Technology Institute
	October 2018 - September 2020	Secretary, General	Internal Security Operations Command (ISOC)
	2018 - September 2020	Chief of Staff	Royal Thai Army
	2017	Deputy Chief of Staff	Royal Thai Army
	2012 - September 2021	Royal Guard	
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	April 11, 2019 - Present	Independent Director/ Chairman of the Remuneration Committee, PTT Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	-	-	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Mr. Jatuporn Buruspat
Independent Director/ Chairman of the Corporate Governance and Sustainability Committee
Age (Year) 58

- Appointed as Independent Director
  April 9, 2021
- Appointed as Chairman of the Corporate Governance and Sustainability Committee
  April 8, 2022
  (Restructuring to be the Corporate Governance and Sustainability Committee on October 27, 2022)

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification

Education

- Bachelor of Arts in Political Science, Chulalongkorn University
- Master of Arts in Political Science, Chulalongkorn University
- Master of Science (Forest Resource and Environment Administration), Kasetsart University
- Honorary Doctorate Degree of Philosophy in Environmental Technology and Management, Kasetsart University
- Honorary Doctorate Degree of Philosophy in Political Science, Mahachulalongkornrajavidyalaya University

Certification

- Director Certification Program (DCP 129/2010), Thai Institute of Directors Association (IOD)
- Diploma, National Defence College, The National Defence Course (Class 55)
- The Executive Program in Energy Literacy for a Sustainable Future (Class of 15th), Thailand Energy Academy (TEA)

Working Experiences in the 5 Preceding Years (As of December 31, 2022)

Time Period	Position	Organization/ Company
2019 - Present	Permanent Secretary	Ministry of Natural Resources and Environment
2017 - 2019	Director-General	Department of Marine and Coastal Resources
August 11, 2015 - January 7, 2021	Director	TOT Public Company Limited
Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
April 9, 2021 - Present	Independent Director, PTT Public Company Limited	
April 8, 2022 - Present	Chairman of the Corporate Governance and Sustainability Committee, PTT Public Company Limited	
May 1, 2021 - April 8, 2022	Member of the Enterprise Risk Management Committee, PTT Public Company Limited	
April 9, 2021 - April 8, 2022	Member of the Corporate Governance Committee, PTT Public Company Limited	
Relevant Important Positions in Non-Listed Company (In the Previous Year)		
-	-	
Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
2019 - Present	Chairman of the Board, Forest Industry Organization	
2019 - Present	Director, Highland Research and Development Institute	
2019 - Present	Director, Biodiversity - Based Economy Development Office	
2019 - Present	Director, Thailand Greenhouse Gas Management Organization	

M.L. Chayotid Kridakon
Independent Director/ Chairman of the Enterprise Risk Management Committee/ Authorized Director
Age (Year) 55

- Appointed as Director
  December 16, 2020, April 8, 2022 (re-elected)
- Change from Director to Independent Director
  November 18, 2022
- Appointed as Chairman of the Enterprise Risk Management Committee
  May 1, 2021
- Appointed as Authorized Director
  June 17, 2021

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	**Position**	**Organization/ Company**
Education • BA (Hons) in South East Asian History, The School of Oriental and African Studies, University of London, UK **Certification** • Corporate Governance for Capital Market Intermediaries (CGI 12/2016), Thai Institute of Directors Association (IOD) • Top Executive Program (Class of 4th), Capital Market Academy (CMA)	January 5, 2021 - August 10, 2021	Chairman of the Board	National Telecom Public Company Limited
	May 11, 2007 - November 19, 2021	Member of Assets Management Committee	Vajiravudh College
	October 1, 2009 - November 18, 2020	Managing Director	JPMorgan Securities (Thailand) Limited
	October 1, 2009 - November 18, 2020	Director	JPMorgan Securities (Thailand) Limited
	October 1, 2009 - November 18, 2020	Senior Country Officer	JPMorgan Chase Bank
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	December 16, 2020 - Present	Independent Director, PTT Public Company Limited (Change from Director to Independent Director effective from November 18, 2022)	
	May 1, 2021 - Present	Chairman of the Enterprise Risk Management Committee, PTT Public Company Limited	
	May 14, 2022 - Present	Independent Director / Director to the Corporate Governance and Sustainability Committee PTT Global Chemical Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	21 December 2018 - Present	Director, Nimbus Capital Company Limited	
	26 February 2008 - Present	Director, Treasury Properties Development (Thailand) Company Limited	
	June 28, 2021 - Present	Director, ARUN PLUS Company Limited	
	August 1, 2004 - Present	Director, The Thai Silk Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	6 January 2022 - Present	Advisor to Prime Minister, acting as Thailand Trade Representative (TTR)	

Mr. Krishna Boonyachai
Independent Director/ Member of the Audit Committee
Age (Year) 58

- Appointed as Independent Director
  July 3, 2020
- Appointed as Member of the Audit Committee
  July 3, 2020

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	**Position**	**Organization/ Company**
Education • Bachelor of Economics, Faculty of Economics, Kasetsart University • Graduate Diploma Program of Management Project Management, Muban Chombueng Rajabhat University **Certification** • Director Certification Program (DCP 288/2020), Advanced Audit Committee Program (AACP 38/2020), Role of the Chairman Program (RCP 46/2020), Risk Management Program for Corporate Leaders (RCL 22/2021), Ethical Leadership Program (ELP 23/2021), Successful Formulation & Execution of Strategy (SFE 36/2021), and Director Leadership Certification Program (DLCP 3/2021), Thai Institute of Directors Association (IOD) • Top Executive Program (Class of 24th), Capital Market Academy (CMA) • Top Executive Program in Commerce and Trade (TEPCoT) (Class of 11th), Commerce Academy, The University of the Thai Chamber of Commerce • Super Series Batch 3: Leadership & Effective Corporate Culture, Institute of Research and Development for Public Enterprises (IRDP) & Judge Business School, University of Cambridge, UK	2020 - March 2, 2021	Independent Director/ Member of the Audit Committee	Primo Service Solutions Company Limited
	2010 - 2020	Chief Relationship Officer	Thai Management Association (TMA)
	2020 - July 2020	Sub-Committee on Corporate Governance and Corporate Social Responsibility	Metropolitan Waterworks Authority
	2014 - 2016	Director, Industrial Engineering	The Engineering Institute of Thailand Under H.M. The King's Patronage
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	July 3, 2020 - Present	Independent Director/ Member of the Audit Committee, PTT Public Company Limited	
	December 12, 2019 - Present	Independent Director/ Chairman / Member of Audit Committee, TQR Public Company Limited	
	December 14, 2022 - Present	Independent Director/ Chairman of Audit Committee/ Member of Nomination and Remuneration Committee, T.R.V. Rubber Products Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	May 1, 2021 - Present	Independent Director/ Chairman/ Member of the Audit Committee, Euroasia Total Logistics Public Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	2020 - Present	Chief Consulting Officer, Nuttabhum Foundation	
	2020 - Present	Chief Consulting Officer, TKI Perpetual Company Limited	
	2019 - Present	Sub-Committee on Supporting the Affairs of Commerce, Committee of Commerce and Industry, The Senate	
	2020 - Present	Sub-Committee on Monitoring National Reform on Economics, Committee on Monitoring National Reform on Economics, Monetary and Finance, The Senate	

Associate Professor Dr. Chayodom Sabhasri
Independent Director/ Member of the Audit Committee
Age (Year) 58

- Appointed as Independent Director
  April 9, 2021
- Appointed as Member of the Audit Committee
  May 20, 2021

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Economics (Second Class Honor), Chulalongkorn University • Diploma in Economics, The London School of Economics and Political Science, University of London, UK • M.Sc. Economics, The London School of Economics and Political Science, University of London, UK • Ph.D. Economics, University of Wisconsin-Madison, USA **Certification** • Director Accreditation Program (DAP 155/2018), Advanced Audit Committee Program (AACP 33/2019), Board Nomination and Compensation Program (BNCP 7/2019), Director Certification Program (DCP 271/2019), Driving Company Success with IT Governance (ITG 16/2021) and Ethical Leadership Program (ELP 23/2021), Thai Institute of Directors Association (IOD) • Senior Executive Program in Energy Science (Class of 14th), Thailand Energy Academy (TEA) • Diploma, National Defence College, The National Defence Course (Class of 57th)	1994 - Present	Professor in the Faculty of Economics	Chulalongkorn University
	2012 - 2016	Dean of the Faculty of Economics	Chulalongkorn University
	April 9, 2021 - May 20, 2021	Member of the Nominating Committee	PTT Public Company Limited
	2019 - 2020	Executive Director, Technology Development Fund for Education (EDTECH Fund)	Ministry of Education
	2015 - 2020	Investment Sub-Committee, Government Pension Fund (GPF)	Office of Government Pension Fund, Ministry of Finance
	2018 - 2019	Head of the Working Group for Review of Laws, Regulatory Guillotine Unit Projects	Thailand Development Research Institute (TDRI)
	2017 - 2019	Subcommittee of Personnel Management System Development in Higher Education Institutions	Office of the Higher Education Commission, Ministry of Education
	2019 - 2020	Sub-Performance Agreement Committee (Sub-PAC for SFIs)	State Enterprise Policy Office (SEPO), Ministry of Finance

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• Top Executive Program (Class of 17th), Capital Market Academy (CMA) • Corporate Governance for Directors and Senior Executives of State Enterprises and Public Organizations Program (Class of 6th), King Prajadhipok's Institute, State Enterprise Policy Office and Office of the Public Sector Development Commission • The Cullinan: The Making of the Digital Board, Thailand Management Association, in collaboration with the Digital Economy Promotion Agency	2016 - 2018	Sub-Performance Agreement Committee (Sub-PAC for SFIs)	State Enterprise Policy Office (SEPO), Ministry of Finance
	2012 - 2018	Performance Agreement Committee for State Owned Enterprises (PAC)	State Enterprise Policy Office (SEPO), Ministry of Finance
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	April 9, 2021 - Present	Independent Director, PTT Public Company Limited	
	May 20, 2021 - Present	Member of the Audit Committee, PTT Public Company Limited	
	April 22, 2021 - Present	Independent Director, Kiatnakin Phatra Bank Public Company Limited	
	April 21, 2022 - Present	Member of the Nomination and Remuneration Committee, Kiatnakin Phatra Bank Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	1999 - Present	Director, Meyer Industries Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	2020 - Present	Expert members on the Board National Urban Planning Policy, Ministry of Interior	
	2020 - Present	Subcommittee on the implementation of the Act, Private higher education institution 2003, Ministry of Higher Education, Science, Research and Innovation	
	2020 - Present	Subcommittee to consider the amendment of laws that impede people's occupation and business operations, Strategic Transformation Office	
	2020 - Present	Member of the Risk Oversight Committee, Academic Committee on Economic and Monetary Affairs, The Securities and Exchange Commission (SEC)	
	2019 - Present	Academic Committee on Economic and Monetary Affairs, Parliament (Senate)	
	2018 - Present	Honorary Committee, Member of the Public Debt Management Policy and Supervision Committee (MPO), Ministry of Finance	
	2017 - Present	Evaluation Committee, Thai Health Promotion Foundation	
	2016 - Present	Member of Chulalongkorn University Council, Chulalongkorn University	

Mr. Payong Srivanich
Independent Director/ Member of the Nominating Committee/
Member of the Corporate Governance
and Sustainability Committee
Age (Year) 54

- Appointed as Independent Director
  April 9, 2021
- Appointed as Member of the Nominating Committee
  April 9, 2022
- Appointed as Member of the Corporate Governance
  and Sustainability Committee
  April 8, 2022
  (Restructuring to be the Corporate Governance
  and Sustainability Committee on October 27, 2022)

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	**Position**	**Organization/ Company**
Education • BS in Industrial Engineering, University of Arizona, Tucson, Arizona, USA • MBA, University of Pittsburgh, Pennsylvania, USA **Certification** • Director Certification Program (DCP 223/2016), Thai Institute of Director Association (IOD) • Cybersecurity, Cyber Resilience & Privacy Risk in the Era of Digital Transformation 2018, ACIS Professional Center • Training and Development for High Executive Project, Royal Thai Police • TIJ Executive Program on the Rule of Law and Development: RoLD 2019, Thailand Institute of Justice (TIJ) • Security Awareness 2021, Krung Thai Bank Public Company Limited • Cyber Security Awareness 2022, Krung Thai Bank Public Company Limited	November 8, 2016 - Present	President	Krung Thai Bank Public Company Limited
	July 8, 2020 - March 9, 2021	Corporate Secretary	Krung Thai Bank Public Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	April 8, 2022 - Present	Member of the Corporate Governance and Sustainability Committee, PTT Public Company Limited	
	April 9, 2021 - Present	Independent Director/ Member of the Nominating Committee, PTT Public Company Limited	
	April 9, 2021 - April 8, 2022	Member of the Remuneration Committee, PTT Public Company Limited	
	November 8, 2016 - Present	Executive Director/ Member of the Risk Oversight Committee/ President, Krung Thai Bank Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	2020 - Present	Chairman, National Digital ID Company Limited	
	2017 - Present	Chairman, National ITMX Company Limited	
	2021 - Present	Director, KTB Advisory Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	2020 - Present	Chairman, Thai Bankers' Association	
	2020 - Present	Private Sector Committee, Board of the Office of SMEs Promotion, The Office of SMEs Promotion	
	2020 - Present	Director, National Strategic Committee, Office of the National Economic and Social Development Council	

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	2020 - Present	Director, Eastern Economic Corridor (EEC) Policy Committee, Eastern Economic Corridor (EEC)	
	2020 - Present	Director, Commission Policy on Private Participation in State Affairs, State Enterprise Policy Office	
	2020 - Present	Committee, The Board of Anti-Corruption Organization of Thailand Foundation, Anti-Corruption Organization of Thailand Foundation	
	2020 - Present	Advisor, Bureaucracy System Development Subcommittee about Studying and Setting Guidelines the Thailand National Digital Trade Platform, Office of the Public Sector Development Commission	
	2020 - Present	Committee, Capital Market Development Commission, Fiscal Policy Office	
	2020 - Present	Director, Payment Systems Committee (PSC), Bank of Thailand	
	2020 - Present	Board Member, Thailand Board of Investment (BOI)	
	2020 - Present	Co-Chairman, The Joint Standing Committee on Commerce, Industry and Banking (JSCCIB)	
	2020 - Present	Chairman, Development of Database Systems and Information Technology in Public Financial Institutions Subcommittee	
	2020 - Present	Director, The ASEAN Bankers Association (ABA)	
	2019 - Present	Senior Expert Committee, The National Financial Institution Development Board	
	2018 - Present	The MOF Big Data Steering Committee, Ministry of Finance	
	2021 - Present	Director, Board of Special Economic Development Policy	
	2021 - Present	Director, Supervisory Board of Minor Population Debt Relief	
	2021 - Present	Advisor, Executive Director of Global Compact Network Thailand Association	

Mr. Phongsthorn Thavisin
Director/ Member of the Nominating Committee/
Authorized Director
Age (Year) 63

- Appointed as Director
  October 8, 2021
- Appointed as Member of the Nominating Committee
  October 8, 2021
- Appointed as Authorized Director
  December 16, 2021

(%) of Share Possession

0.000035
(own 0.000035;
spouse 0)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Science (Petroleum and Natural Gas Engineering), The Pennsylvania State University, USA **Certification** • Director Certification Program (DCP 223/2016), Director Leadership Certification Program (DLCP 3/2021), Thai Institute of Directors Association (IOD) • Capital Market Leader Program (Class of 27th), Capital Market Academy • Energy Literacy Leadership Program (Class of 7th), Thailand Energy Academy • Senior Executive Program (SEP-19), Sasin Graduate Institute of Business Administration of Chulalongkorn University • Advanced Naval Studies Program (Class 40/2008), Institute of Advanced Naval Studies • PTT Group EVP Leadership Development, PTT • PTT Executive Leadership, General Electric, GE, New York, USA • Breakthrough Program for Senior Executive, IMD	October 1, 2020 - September 30, 2021	Chief Executive Officer	PTT Exploration and Production Public Company Limited
	October 1, 2018 - September 30, 2021	Director	PTT Exploration and Production Public Company Limited
	January 1, 2019 - September 30, 2020	Senior Executive Vice President, PTT, Reporting to Chief Operating Officer, Upstream Petroleum and Gas Business Group working on a secondment as President and Chief Executive Officer	PTT Exploration and Production Public Company Limited
	January 1, 2019 - September 30, 2020	Director/ President and Chief Executive Officer	PTT Exploration and Production Public Company Limited
	October 1, 2018 - December 31, 2018	Director/ Chief Executive Officer	PTT Exploration and Production Public Company Limited
	October 1, 2018 - December 31, 2018	Senior Executive Vice President, PTT, working on a secondment as Chief Executive Officer	PTT Exploration and Production Public Company Limited
	November 1, 2017 - September 30, 2018	President, Exploration and Production/ Acting Executive Vice President, Business Transformation and Organization Group	PTT Exploration and Production Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• The National Defense Course (2013 - 2014), Thai National Defense College • Director's Briefing - Corporate Strategy beyond the Crisis, a Chairman/ Board Perspective, Bain & Company, Inc. • CERAWeek 2019 in Houston, Texas, USA	January 1, 2016 - October 31, 2017	Chief Operating Officer, Production Asset and Operations Support Group/ Acting Executive Vice President, Operations Support Group	PTT Exploration and Production Public Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	October 8, 2021 - Present	Director/ Member of the Nominating Committee,	PTT Public Company Limited
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	-	-	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Mr. Krisada Chinavicharana
Director/ Member of the Remuneration Committee
Age (Year) 59

- Appointed as Director
  October 1, 2021
  April 8, 2022 (re-elected)
- Appointed as Member of the Remuneration Committee
  October 1, 2021

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • LL.B., Chulalongkorn University • MBA, University of New Haven, USA	2020 - Present	Permanent Secretary	Ministry of Finance
	January 28, 2021 - September 30, 2021	Director	Bangchak Corporation Public Company Limited
	2020 - September 30, 2021	Director	BCPG Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Certification • Director Certification Program (DCP 186/2014), Thai institute of Directors Association (IOD) • Executive Program (56/2017), Office of the Civil Service Commission • Thailand National Defence College Graduate of Year 2011 (Batch 54th) • Project of Senior Executives Improvement: Executive of State Agencies (ESA 2) 2010, Office of the Civil Service Commission • Financial Instrument and Markets 2004, Harvard Business School • Certificate, Leadership Program (Class 18th), Capital Market Academy • The Executive Program in Energy Literacy for a Sustainable Future TEA Class 11, Thailand Energy Academy • Proactive and Integrated Justice Management (Class 4/2006), Office of Justice Affairs • Year 2021, Security Awareness Program, Krung Thai Bank Public Company Limited by guest speaker	January 25, 2019 - January 20, 2021	Director/ Member of the Nomination Committee	Airports of Thailand Public Company Limited
	April 22, 2020 - January 20, 2021	Member of the Remuneration Committee	Airports of Thailand Public Company Limited
	2015 - 2021	Director	Erawan Hotel Public Company Limited
	2018 - 2020	Director General, Thai Customs	Ministry of Finance
	2017 - 2018	Director General, The Excise Department	Ministry of Finance
	2015 - 2018	Director	Bangchak Corporation Public Company Limited
	2014 - 2017	Executive Director	The Fiscal Policy Office, Ministry of Finance
	2017 - 2019	Director	Bank for Agriculture and Agricultural Cooperatives
	2015 - 2019	Director	Deposit Protection Agency (DPA)
	2018	Director	PTT Public Company Limited
	2016 - 2017	Director	Muang Thai Insurance Public Company Limited
	2014 - 2017	Director	Bank of Thailand
	2014 - 2017	Director	Aeronautical Radio of Thailand Ltd.
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	October 1, 2021 - Present	Director/ Member of the Remuneration Committee, PTT Public Company Limited	
	October 28, 2020 - Present	Chairman, Krung Thai Bank Public Company Limited	
	February 7, 2020 - Present	Director, Krung Thai Bank Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	-	-	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	2020 - Present	Director, Government Pension Fund	
	2020 - Present	Director, The Securities and Exchange Commission, Thailand	
	2020 - Present	Director, Office of Insurance Commission (OIC)	

Associate Professor Dr. Narongdech Srukhosit
Independent Director/ Member of the Corporate Governance and Sustainability Committee/
Member of the Enterprise Risk Management Committee
Age (Year) 45

- Appointed as Independent Director
  October 8, 2021
- Appointed as Member of the Corporate Governance and Sustainability Committee
  October 27, 2022
  (Restructuring to be the Corporate Governance and Sustainability Committee on October 27, 2022)
- Appointed as Member of the Enterprise Risk Management Committee
  April 8, 2022

(%) of Share Possession

0.000005
(own 0;
spouse 0.000005)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	**Position**	**Organization/ Company**
Education • Bachelor of Law (First Class Honours), Chulalongkorn University • LL.M., University of Cambridge, UK • Ph.D. (Law), University of Edinburgh, UK **Certification** • Director Certification Program (DCP 315/2022) and Financial Statements for Directors (FSD 45/2022), Thai Institute of Directors Association (IOD) • M&A in Practice, Chulalongkorn Law School Alumni Association	2001 - Present	Tenured Lecturer	Faculty of Law, Chulalongkorn University
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	October 8, 2021 - Present	Independent Director/ Member of the Corporate Governance and Sustainability Committee, PTT Public Company Limited	
	April 8, 2022 - Present	Member of the Enterprise Risk Management Committee, PTT Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	2016 - Present	Director, C & C International Venture Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	2019 - Present	Counsel (Administrative Law), The Stock Exchange of Thailand	
	2020 - Present	Director, Board of Student Development Policy Chulalongkorn University Council	
	2017 - Present	Director, Committee of Student Complaint and Appeal, Chulalongkorn University	
	2019 - Present	Director, Committee of Evaluation of University Executive Performance, Suan Dusit University Council	
	2018 - Present	Subcommittee on the Regulatory Screening Relating to Political Parties, The Election Commission of Thailand	
	2018 - Present	Subcommittee on Appeal Screening, Accounting Professions Governance Committee, Department of Business Development, Ministry of Commerce	
	2019 - Present	Subcommittee of Law, Neighbouring Countries Economic Development Cooperation Agency	

Mr. Chansin Treenuchagron
Independent Director/ Member of the Remuneration Committee
Age (Year) 62

- Appointed as Independent Director
  May 14, 2022
- Appointed as Member of the Remuneration Committee
  May 14, 2022

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Economics, Thammasat University • Master of Economics, Chulalongkorn University • Honorary Doctorate of Science (Technology Management), Thammasat University **Certification** • Director Certification Program (DCP 85/2007), Financial Statements for Directors (FSD12/2011), Director Accreditation Program (DAP 93/2011), Chartered Director Class (CDC 11/2015),The Role of the Board in IT Governance (2020), IT Governance and Cyber Resilience Program (ITG 18/2021), Role of the Chairman Program (RCP 49/2022), Director Leadership Certification Program (DLCP 4/2022), Thai Institute of Directors Association (IOD) • Law of Democracy Course, Class 8/2020, Office of The Constitutional Court	July 2, 2020 - July 1, 2021	Acting President	Thai Airways International Public Company Limited
	June 4, 2020 - June 15, 2021	Director and Plan Administrator	Thai Airways International Public Company Limited
	August 31, 2018 - May 12, 2020	President and Chief Executive Officer	PTT Public Company Limited
	2018 - 2020	Chairman	IRPC Public Company Limited
	2018 - 2020	Director	PTT Exploration and Production Public Company Limited
	2018	Chief Technology and Innovation Officer	PTT Public Company Limited
	2017 - 2018	Chairman	PTT Digital Solutions Company Limited
	2017 - 2018	Director/ Member of Risk Management Committee/ Member of Nomination and Remuneration Committee	Global Power Synergy Public Company Limited
	2016 - 2018	Member of the Risk Management Committee	IRPC Public Company Limited
	2017	Chief Operation Officer, Infrastructure and Sustainability Management Business Group	PTT Public Company Limited
	2017	Chairman	PTT Asahi Chemical Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• Certificate, Executive Program on Energy Literacy for a Sustainable Future (Class of 7th), 2015 - 2016, Thailand Energy Academy (TEA) • Diploma, The National Defence Course (Class 57/2014), National Defence College • Leadership Development Program III (LDP 3), Class 1/2014, PLLI, PTT Public Company Limited • Advance Senior Executive Program (ASEP-5), Class 5/2010, KELLOGG & SASIN, Chicago, USA • Senior Executive Program (SEP) (Class of 20th), Sasin Graduate Institute of Business Administration of Chulalongkorn University • Advanced Certificate Course in Public Economics Management for Executives (Class of 10th) King Prajadhipok's Institute • Leadership Excellence through Awareness and Practice (LEAP), INSEAD, Singapore and France • Air War College (Class 35/2006) • Executive Relationship Development Course (ERDC) (Class of 1st), Directorate of Civil Affairs • PTT Executive Leadership, General Electric, GE, New York, USA	**Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)**		
	June 15, 2021 - Present	Director and Director of the Plan Administrator, Thai Airways International Public Company Limited	
	May 14, 2022 - Present	Independent Director/ Member of the Remuneration Committee, PTT Public Company Limited	
	2020 - May 13, 2022	Independent Director and Director to the Corporate Governance and Sustainability Committee PTT Global Chemical Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	July 22, 2020 - Present	Chairman, Y.S.S. (THAILAND) Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	May 25, 2021 - August 1, 2022	Honorary Member of the University Council, Thaksin University	
	2018 - Present	Honorary Member of the University Council, Thammasat University	
	2019 - Present	President, Thammasat Association	

Dr. Prasert Sinsukprasert
Director/ Member of the Enterprise Risk Management Committee
Age (Year) 56

- Appointed as Director
  December 26, 2022
- Appointed as Member of the Enterprise Risk Management Committee
  January 25, 2023

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	**Position**	**Organization/ Company**
Education • Bachelor of Engineering (Electrical Engineering), Chulalongkorn University • Master of Science in Energy Conversion, Power and Transmission, George Washington University, USA • Doctor of Philosophy in Energy Management and Policy, University of Pennsylvania, USA **Certification** • Director Certification Program (DCP 229/2016) Thai Institute of Directors Association (IOD) • Capital Market Academy Leader Program, Class 29, Capital Market Academy • Senior Executive Fellows 2016, Harvard University, Boston, Massachusetts, USA • National Defence Course, Class 58, National Defence College • Top Executive Program in Commerce and Trade (TEPCoT), Commerce Academy, University of the Thai Chamber of Commerce • IOD National Director Conference 2021: "Leadership Behind Closed Door"	October 2020 - Present	Director General, Department of Alternative Energy Development and Efficiency	Ministry of Energy
	June 2020 - September 2020	Deputy Permanent Secretary	Ministry of Energy
	2017 - 2020	Inspector General	Ministry of Energy
	April 5, 2016 - February, 2020	Director	Bangchak Corporation Public Company Limited
	2014 - 2017	Deputy Director General, Energy Policy and Planning Office	Ministry of Energy
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	December 26, 2022 - Present	Director, PTT Public Company Limited (Appointed as Director/ Member of the Enterprise Risk Management Committee effective from January 25, 2023)	
	April 7, 2021 - November 30, 2022	Director, Thai Oil Public Company Limited	
	April 23, 2021 - November 30, 2022	Member of the Corporate Governance and Sustainability Committee, Thai Oil Public Company Limited	

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• STS Expert Session: "How H & R as a specialty marketer and refiner with primarily Group I refinery technology is planning to adapt to the changing refinery landscape", Hansen and Rosenthal Group (H & R Group) • "Strategy and Business Direction towards Quality and Sustainable Growth", PTG Energy Plc • 2021 PTIT Special Lecture "Thailand's Destiny in the Next 30 Years; Must Have A "New Think Through" to Propel the Country's Economy Forward"	**Relevant Important Positions in Non-Listed Company (In the Previous Year)**		
	-	-	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	October 2020 - Present	Member of Board of Directors, Thailand Greenhouse Gas Management Organization (Public Organization)	

Mr. Auttapol Rerkpiboon
Director/ Secretary to the Board/ Authorized Director/
President and Chief Executive Officer
Age (Year) 57

- Appointed as Director/ Secretary to the Board
  May 13, 2020
  April 9, 2021 (re-elected)
- Appointed as Authorized Director
  May 13, 2020
- Appointed as President and Chief Executive Officer
  May 13, 2020

(%) of Share Possession

0.000939
(own 0.000788;
spouse 0.000151)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering (Civil Engineering), Chulalongkorn University • Master of Economics Program, National Institute of Development Administration • Diploma of Petroleum Management, College of Petroleum Studies, Oxford University, UK (British Council Scholarship)	May 13, 2020 - Present	President and Chief Executive Officer	PTT Public Company Limited
	June 30, 2021 - December 31, 2021	Managing Director, Thai Red Cross Society 2021	Thai Red Cross Society
	September 29, 2020 - December 22, 2020	Advisor	Committee of Red Cross Lottery Tickets Supporting the Thai Red Cross Society 2020

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Certification • Director Certification Program (DCP 173/2013), Company Secretary Program (CSP 14/2005), Thai Institute of Directors Association (IOD) • Executive Development Program (EDP), (Class of 1st), Thai Listed Companies Association (TLCA) • The National Defence Course (Class of 58th), National Defence College • Advanced Certificate Course in Politics and Governance in Democratic System for Executives, (Class of 14th), King Prajadhipok's Institute • Capital Market Academy Leadership Program, (Class of 20th), Capital Market Academy (CMA) • Certificate, Executive Program in Energy Literacy for a Sustainable Future, (Class of 12th), Thailand Energy Academy (TEA) • Executive Program on Rule of Law and Development: RoLD (Class of 2nd), Thailand Institute of Justice (TIJ) • NIDA-Wharton Executive Leadership Program 2009, The Wharton School of the University of Pennsylvania, USA • PTT Executive Leadership, General Electric, GE, New York, USA • Rule of Law for Democracy (Class of 8th), College of the Constitutional Court	June 8, 2020 - July 20, 2021	Chairman	Power of Learning Foundation
	December 12, 2018 - May 12, 2020	Chairman	PTT Tank Terminal Company Limited
	May 1, 2018 - July 16, 2020	President	Marketing Association of Thailand
	April 11, 2018 - July 31, 2020	Director/ Chairman of the Risk Management Committee/ Member of the Nomination and Remuneration Committee	Thai Oil Public Company Limited
	October 6, 2017 - September 29, 2020	Director	The Royal Automobile Association of Thailand under Royal Patronage
	October 1, 2017 - May 12, 2020	Chief Operating Officer, Downstream Petroleum Business Group (October 1, 2017 - September 30, 2018 Acting Senior Executive Vice President, Downstream Business Group Alignment, PTT)	PTT Public Company Limited
	October 1, 2015 - October 1, 2018	Director/ Director to the Corporate Governance Committee/ Director to the Risk Management Committee	PTT Global Chemical Public Company Limited
	November 2015 - September 2017	Chairman	PTT Retail Management Company Limited
	October 1, 2015 - September 30, 2017	Senior Executive Vice President - Oil Business Unit	PTT Public Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	May 13, 2020 - Present	Director/ Secretary to the Board/ President and Chief Executive Officer, PTT Public Company Limited	
	August 1, 2020 - Present	Director, PTT Exploration and Production Public Company Limited	
	December 22, 2015 - Present	Chairman, PTT Oil and Retail Business Public Company Limited	

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	June 28, 2021 - February 15, 2022	Director, ARUN PLUS Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	November 8, 2022 - December 27, 2022	Advisory Board, Fund-Raising Committee for Contribution to a Charity Fund Started by the King, Thai Red Cross Society 2022, Chulalongkorn University	
	November 25, 2022 - Present	Honorary Advisor, The S.E.A. Write Award Organising Committee	
	November 19, 2022 - Present	Chairman Council Board, Thailand Carbon Neutral Network	
	October 31, 2022 - Present	Advisory Board, Committee of Lottery Tickets Red Cross Fair 2022, the National Council on Social Welfare of Thailand	
	October 17, 2022 - Present	Director, Steering Committee Friends in need of ("PA") 2022	
	October 10, 2022 - October 23, 2022	Chairman, Steering Committee King Chulalongkorn Day 2022, Chulalongkorn University Alumni Association	
	September 20, 2022 - Present	Member of the Raising Funds Committee for Building and Construction Maintenance, Suan Luang Rama IX Foundation	
	June 16, 2022 - Present	Committee Member, The General Prem Tinsulananda Historical Park	
	May 30, 2022 - Present	Advisor, IEEE Power & Energy Society	
	May 6, 2022 - Present	Director, Steering Committee According to Royal Initiative Projects, the Vetiver Grass Project	
	April 25, 2022 - Present	Advisory Board, Sirinart Rajini Mangrove Ecosystem Learning Center	
	April 19, 2022 - Present	Honorary Advisor, the Economic Reporters Association	
	March 2020 - Present	Expert Committee of NIDA Council, The National Institute of Development Administration (NIDA)	
	November 12, 2021 - December 27, 2021	Advisory Board, Fund-Raising Committee for Contribution to a Charity Fund Started by the King, Thai Red Cross Society 2021, Chulalongkorn University	

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	November 9, 2021 - Present	Promoting Social Cooperation Committee, Princess Maha Chakri Award Foundation	
	March 25, 2021 - Present	Director, Thai Foundation	
	October 9, 2020 - Present	Committee Member, Suan Luang Rama IX Foundation	
	October 2, 2020 - Present	Advisory Board, The Institute of Energy for Industry	
	August 24, 2020 - Present	Chairman, Power for Sustainable Future Foundation	
	August 31, 2020 - Present	Expert Committee of Vidyasirimedhi Institute Council, Vidyasirimedhi Institute of Science and Technology (VISTEC)	
	Jun 2020 - Present	Committee Member, Ruamchit Normklao Foundation for Thai Youth under the patronage of H.R.H. the Queen	
	June 8, 2020 -Present	Chairman, Power of Innovation Foundation	
	May 29, 2020 - Present	Member of Trustee, Petroleum Institute of Thailand	
	May 13, 2020 - Present	Vice Chairman, Thailand Energy Academy	
	May 2020 - Present	Committee Member, OUR Khung BangKachao	
	May 22, 2020 - Present	President, PTT Group Employee Association	
	May 13, 2020 - Present	Advisory Board, PTT Natural Gas Business Saving Co-Operative, Limited	
	May 13, 2020 - Present	Committee Member, Green Globe Institute	
	2019 - Present	Honorary Advisor, The National Institute of Development Administration Alumni Association under the Royal Patronage (NIDA)	
	July 27, 2018 - Present	Committee Member, Payment Systems Committee (PSC), Bank of Thailand	
	2018 - Present	Honorary Advisor, Thai-Laos Business Council	
	November 6, 2016 - Present	Vice President, Swimming Association Thailand	

Mr. Wuttikorn Stithit
Chief Operating Officer,
Upstream Petroleum and Gas Business Group
Age (Year) 58

- Appointed as Chief Operating Officer, Upstream Petroleum and Gas Business Group October 1, 2022

(%) of Share Possession

0.000812
(own 0.000494;
spouse 0.000318)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	**Position**	**Organization/ Company**
Education • Bachelor of Engineering (Electrical Engineering), King Mongkut's Institute of Technology Ladkrabang • Master of Science (Industrial and System Engineering), Ohio University, USA • Master of Business Administration (Finance and Banking), Kasetsart University **Certification** • Director Certification Program (DCP 158/2012), Thai Institute of Directors Association (IOD) • Leadership Development Program III (LDP III), PTT Leadership and Learning Institute (PLLI) • Leadership Succession Program (LSP), (Class 9/2018), Institute of Research and Development for Public Enterprises (IRDP) • Senior Executive Education Program, SIBA 2017, College of Management, Mahidol University • Power of the Kingdom, (Class 4/2015) (Bhumipalung Phandin), Chula Unisearch, Chulalongkorn University • Leadership Development Program II (LDP II), PTT Leadership and Learning Institute (PLLI)	October 1, 2022 - Present	Chief Operating Officer, Upstream Petroleum and Gas Business Group	PTT Public Company Limited
	February 1, 2019 - September 30, 2022	Senior Executive Vice President, Gas Business Unit	PTT Public Company Limited
	November 1, 2015 - January 31, 2019	Executive Vice President, Natural Gas Supply and Trading	PTT Public Company Limited
	March 30, 2015 - 2019	Chairman	Trans Thai-Malaysia (Thailand) Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	April 1, 2019 - Present	Director, Global Power Synergy Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	September 30, 2019 - December 31, 2022	Chairman, PTT Natural Gas Distribution Company Limited	
	2019 - December 31, 2022	Chairman, PTT Global LNG Company Limited	

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• Senior Executive Program (SEP) 2011, Sasin Graduate Institute of Business Administration of Chulalongkorn University (SASIN) • The Executive Program in Energy Literacy for a Sustainable Future TEA Class 16, 2022 Thailand Energy Academy • The National Defence Course, (Class of 62nd), National Defence College	**Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)**		
	October 1, 2022 - Present	Executive Director, Thailand Energy Academy	

Mr. Noppadol Pinsupa
Chief Operating Officer, Downstream Petroleum Business Group
Age (Year) 58

- Appointed as Chief Operating Officer, Downstream Petroleum Business Group October 1, 2022

(%) of Share Possession

0.001519
(own 0.000476;
spouse 0.001043)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering (Electrical Engineering), Chulalongkorn University • Master of Engineering (Electrical Engineering), Chulalongkorn University	October 1, 2022 - Present	Chief Operating Officer, Downstream Petroleum Business Group	PTT Public Company Limited
	September 30, 2022 - December 31, 2022	Acting Chief Executive Officer and President	Thai Oil Public Company Limited
	January 4, 2021 - October 18, 2021	Chairman	Global Renewable Power Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Certification • Director Certification Program (DCP 146/2011), Financial Statements for Directors (FSD 12/2011), Thai Institute of Directors Association (IOD) • Leadership Development Program III, PTT Leadership and Learning Institute • Breakthrough Program For Senior Executives International Leading Business School (IMD), Lausanne, Switzerland • Assessor Training Program, Thailand Quality Award (TQA) • Seminar "Briefing on International Anti-Corruption…International Cases and Practices" (October 14, 2015), Thai Institute of Director Association (IOD) • Mitsui-Harvard Business School Global Management Academy 2015 Japan - USA • G-20Y Summit 2015, France • Program for Senior Executive on Justice Administration, (Class of 19th/2014), Judicial Training Institute • Top Executives Program, (Class of 22nd/2016), Capital Market Academy (CMA) • The National Defence Course, (Class of 60th), National Defence College • Executive Program on Rule of Law and Development (RoLD Program), Thailand Institute of Justice (TIJ) (2017) • Certificate, Executive Program in Energy Literacy for a Sustainable Future, (Class of 14th/2019), Thailand Energy Academy (TEA)	October 1, 2021 - September 30, 2022	Chief New Business and Infrastructure Officer (Changed the name of the position from Chief Technology and Engineering Officer with effect from October 1, 2021)	PTT Public Company Limited
	October 1, 2021 - November 21, 2021	Director to the Nomination and Remuneration Committee	PTT Global Chemical Public Company Limited
	April 7, 2021 - September 30, 2021	Director/ Member of the Corporate Governance Committee	PTT Oil and Retail Business Public Company Limited
	March 3, 2021 - November 17, 2021	Member of the Executive Committee	Vidyasirimedhi Institute of Science and Technology
	January 20, 2021 - September 30, 2021	Director/ Member of the Nomination and Remuneration Committee	IRPC Public Company Limited
	December 4, 2020 - October 18, 2021	Director	Alpha Com Company Limited
	December 2, 2020 - January 30, 2021	Chairman	PTT Digital Solutions Company Limited
	December 1, 2020 - January 19, 2021	Director/ Member of the Corporate Governance Committee	IRPC Public Company Limited
	December 1, 2020 - September 30, 2021	Senior Executive Vice President, Innovation and Digital	PTT Public Company Limited
	July 3, 2020 - November 30, 2020	Senior Executive Vice President, PTT, reporting to Chief Operating Officer, Downstream Petroleum Business Group working on a secondment as President and Chief Executive Officer	IRPC Public Company Limited
	July 3, 2020 - November 30, 2020	Director/ Member of the Risk Management Committee/ President and Chief Executive/ Secretary of the Board of Directors	IRPC Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	April 2019 - January 2021	Chairman	IRPC Public Company Limited
	February 1, 2019 - July 3, 2020	Senior Executive Vice President, PTT, reporting to Chief Operating Officer, Downstream Petroleum Business Group working on a secondment as President	IRPC Public Company Limited
	February 1, 2019 - July 3, 2020	Director/ Member of the Risk Management Committee/ President/ Secretary of the Board of Directors	IRPC Public Company Limited
	May 2019 - November 2020	Chairman	IRPC Oil Company Limited
	March 2019 - November 2020	Director	IRPC Oil Company Limited
	March 2019 - December 2020	Chairman	IRPC A&L Company Limited
	March 2019 - November 2020	Chairman	IRPC Technology Company Limited
	March 2019 - December 2020	Chairman	iPolymer Company Limited
	January 2019 - November 2020	Director	UBE Chemicals (Asia) Public Company Limited
	August 2019 - November 2020	Vice Chairman	PTT Energy Solutions Company Limited
	February 1, 2019 - November 30, 2020	Executive Director	Thailand Energy Academy
	November 1, 2019 - December 24, 2020	Member of Vidyasirimedhi Institute Council	Vidyasirimedhi Institute of Science and Technology (VISTEC)
	2019 - 2021	Advisor (2019 - 2021)	Vidyasirimedhi Institute of Science and Technology (VISTEC)
	February 2019 - August 2019	Chairman	PTT Energy Solutions Company Limited
	October 2017 - January 2019	Chairman	PTT Global LNG Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	2017	Chairman	PTT LNG Company Limited
	2015 - January 30, 2019	Director/ Member of the Risk Management Committee	Thai Oil Public Company Limited
	October 1, 2015 - January 31, 2019	Senior Executive Vice President, Gas Business Unit	PTT Public Company Limited
	2014 - 2018	Chairman	PTT Natural Gas Distribution Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	September 30, 2022 - December 31, 2022	Director/ Member of the Risk Management Committee/ Acting Chief Executive Officer and President/ the Secretary to the Board of Directors, Thai Oil Public Company Limited	
	October 1, 2021 - September 29, 2022	Director, PTT Global Chemical Public Company Limited	
	November 22, 2021 - September 29, 2022	Director to the Corporate Governance and Sustainability Committee, PTT Global Chemical Public Company Limited (Changed the name of the committee from Corporate Governance Committee, effective from April 4, 2022)	
	November 1, 2021 - Present	Director/ Member of the Nomination and Remuneration Committee/ Chairman of the Risk Management Committee Global Power Synergy Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	June 28, 2021 - December 1, 2022	Director, ARUN PLUS Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	2022 - Present	Director, National Energy Technology Center, National Science and Technology Development Agency (NSTDA)	
	2022 - Present	Director, Chulalongkorn University Engineering Alumni, Chulalongkorn University	
	October 1, 2021 - Present	Executive Director, Thailand Energy Academy	

Dr. Buranin Rattanasombat
Chief New Business and Infrastructure Officer
Age (Year) 55

- Appointed as Chief New Business and Infrastructure Officer
  October 1, 2022

(%) of Share Possession

0.00075
(own 0.00075;
spouse 0)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Science, Faculty of Agro-Industry Prince of Songkhla University • Master of Business Administration (MBA), Chulalongkorn University • Ph.D. (Management), Silpakorn University **Certification** • Director Certification Program (DCP 174/2013), Company Secretary Program (CSP 40/2011), Thai Institute of Directors Association (IOD) • Top Executive Program (Class of 30th), Capital Market Academy (CMA) • Public and Private Chief Innovation Leadership, National Innovation Agency • Advanced Security Management Program, (Class of 10th), The National Defence College Association of Thailand (NDCAT) • PTT Leadership Development Program (IMD Business School), PTT Leadership and Learning Institute (PLLI)	October 1, 2022 - Present	Chief New Business and Infrastructure Officer	PTT Public Company Limited
	October 1, 2021 - September 30, 2022	Vice President, Innovation and New Ventures (Changed the name of the position from Senior Executive Vice President, Innovation and Digital with effect from October 1, 2021)	PTT Public Company Limited
	August 25, 2021 - October 8, 2021	Chairman	Nutra Regenerative Protein Company Limited
	April 23, 2021 - May 19, 2021	Member of the Risk Management Committee	Thai Oil Public Company Limited
	September 18, 2020 - April 23, 2021	Member of the Nomination and Remuneration Committee	Thai Oil Public Company Limited
	June 1, 2020 - September 30, 2021	Senior Executive Vice President, Downstream Business Group Alignment	PTT Public Company Limited
	2019 - May 2020	Senior Executive Vice President, Corporate Strategy, Innovation and Sustainability and Chief Transformation Officer (CTO)	PTT Oil and Retail Business Public Company Limited
	July 2019 - May 2020	Chairman	PTT (Cambodia) Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• Senior Executive Education Program on Strategy and Innovation, School of Management, MIT • Leadership Succession Program (LDP8), Institute of Research and Development for Public Enterprises (IRDP) • CMA-GMS International Program 2016, Capital Market Academy • Foreign Affairs Executive Programme (Class of 7th), Devawongse Varopakarn Institute of Foreign Affairs, Ministry of Foreign Affairs • PTT Leadership Development Program, Harvard Business School, USA • Advance Certificate Course in Public Administration and Law for Executives, King Prajadhipok's Institute (Class of 12th) • Executive Development Program, Thai Listed Companies Association • National Defence Course, Class 64, National Defence College	2018 - 2020	Secretary General	Marketing Association of Thailand
	August 2018 - June 1, 2019	Chairman	PTTOR China (Shanghai) Company Limited
	November 2019 - October 2020	Chairman	Thappline Company Limited
	April 2017 - October 1, 2021	Director	Thappline Company Limited
	October 2015 - March 2019	Chairman	Thai Lube Blending Company Limited
	2018 - 2019	Senior Executive Vice President, Lubricant Business	PTT Oil and Retail Business Public Company Limited
	2016 - 2018	Vice President	Marketing Association of Thailand
	2015 - 2018	Executive Vice President, Lubricant Business	PTT Public Company Limited
	May 2017 - November 2017	Chairman	PTT Oil Myanmar Company Limited
	August 2012 - March 2017	Director	PTT (Lao) Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	September 18, 2020 - Present	Director, Thai Oil Public Company Limited	
	May 19, 2021 - April 7, 2022	Chairman of the Risk Management Committee, Thai Oil Public Company Limited	
	April 23, 2021 - April 7, 2022 and April 29, 2022 - Present	Member of the Risk Management Committee, Thai Oil Public Company Limited	
	October 8, 2021 - Present	Director, PTT Oil and Retail Business Public Company Limited	
	October 27, 2021 - Present	Member of the Enterprise Risk Management Committee, PTT Oil and Retail Business Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	December 2020 - Present	Chairman, Innobic (Asia) Company Limited	
	January 2022 - Present	Chairman, HORIZON PLUS Company Limited	
	January 2022 - Present	Chairman, NUOVO PLUS Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	October 2022 - Present	Executive Director, Thailand Energy Academy	
	April 2022 - Present	President, Marketing Association of Thailand	
	April 2022 - Present	Executive of the Board, The Federation of Thai Industries	

Miss Pannalin Mahawongtikul
Chief Financial Officer
Age (Year) 58

- Appointed as Chief Financial Officer October 1, 2018
- The person supervising Finance and Accounting

(%) of Share Possession

0.001009
(own 0.001009)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Accounting, Thammasat University • Master of Business Administration, Thammasat University **Certification** • Director Certification Program (DCP 279/2019), Strategic Board Master Class (SBM 9/2020), Strategic Board Master Class (SBM 9/2020), Risk Management Program for Corporate Leaders (RCL 28/2022), Thai Institute of Directors Association (IOD) • Capital Market Academy Leader Program, (Class of 24th), Capital Market Academy (CMA) • Certificate, Executive Program in Energy Literacy for a Sustainable Future, (Class of 15th), Thailand Energy Academy (TEA) • Leadership Succession Program (LSP), (Class of 6th), Institute of Research and Development for Public Enterprises • CMA-Greater Mekong Subregion (CMA-GMS), (Class of 1st), Capital Market Academy • PTT-HBS Leadership Development Program II, Harvard Business School	October 1, 2018 - Present	Chief Financial Officer	PTT Public Company Limited
	May 8, 2018 - September 30, 2018	Director	PTTEP Energy Holding (Thailand) Company Limited
	January 1, 2016 - September 30, 2018	Executive Vice President, PTT, working on a secondment as Executive Vice President, Finance and Accounting Group	PTT Exploration and Production Public Company Limited
	January 1, 2016 - September 30, 2018	Director	Energy Complex Company Limited
	January 1, 2016 - September 30, 2018	Director	PTTEP Canada International Finance Limited
	January 1, 2016 - March 19, 2018	Director	PTTEP Australia International Finance Pty Ltd.
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	October 1, 2018 - Present	Director/ Member of the Risk Management Committee,	Thai Oil Public Company Limited
	December 1, 2022 - Present	Director,	Global Power Synergy Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• NIDA-Wharton Executive Leadership Program (ELP), The Wharton School, University of Pennsylvania • Executive Program for Senior Management (EX-PSM), (Class of 3rd), Fiscal Policy Research Institute Foundation • Executive Development Program (EDP) (Class of 2nd), Thai Listed Companies Association • Leadership Development Program (LDP) III, PTT Leadership and Learning Institute (PLLI) • E-learning CFO's Refresher Course 2020, The Stock Exchange of Thailand • The Resilient Leader (TIJ Executive Program on the Rule of Law and Development), RoLD 2020	**Relevant Important Positions in Non-Listed Company (In the Previous Year)**		
	June 30, 2022 - Present	Director, Lotus Pharmaceutical Company Limited (Listed Company in Taiwan)	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	October 1, 2018 - Present	Executive Director, Thailand Energy Academy	
	January 2019 - Present	Club President, Thai Investor Relations Club	
	November 1, 2019 - Present	Member of Vidyasirimedhi Institute of Science and Technology Council For Short: Member of VISTEC Council	
	March 3, 2021 - Present	Member of VISTEC Executive Committee	
	March 3, 2021 - Present	Chairman of VISTEC Finance and Budget Sub-Committee	
	April 27, 2021 - Present	Director/ Member of the Audit Committee, Thai Listed Companies Association (TLCA)	

Mr. Terdkiat Prommool
Senior Executive Vice President,
Corporate Strategy and Sustainability
Age (Year) 57

- Appointed as Senior Executive Vice President, Corporate Strategy and Sustainability
  October 1, 2021

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering in Chemical Engineering, Chulalongkorn University • Master of Engineering in Industrial & Manufacturing Systems Engineering, The University of Missouri, Columbia, USA **Certification** • Director Certification Program (DCP 223/2016), Thai Institute of Directors Association (IOD) • Leadership Succession Program (LSP), (Class 10/2019), Institute of Research and Development for Public Enterprises (IRDP)	October 1, 2021 - Present	Senior Executive Vice President, Corporate Strategy and Sustainability (Changed the name of the position from Senior Executive Vice President, Corporate Strategy with effect from October 1, 2021	PTT Public Company Limited
	March 3, 2021 - November 17, 2021	Member of the Human Resource Committee	Vidyasirimedhi Institute of Science and Technology
	October 1, 2020 - January 31, 2021	Chairman	Business Professional Solutions Recruitment Company Limited
	October 1, 2020 - September 30, 2021	Senior Executive Vice President, Organization Management and Sustainability	PTT Digital Solutions Company Limited
	2018 - September 30, 2020	Executive Vice President, PTT, working on a secondment as Managing Director	PTT Digital Solutions Company Limited
	2015 - 2018	Executive Vice President, Planning and Risk Control	PTT Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	August 10, 2022 - November 30, 2022	Director, Inter Pharma Public Company Limited	
	October 1, 2020 - Present	Director, Thai Oil Public Company Limited	
	April 23, 2021 - Present	Member of the Nomination and Remuneration Committee, Thai Oil Public Company Limited	
	December 26, 2022 - Present	Director, PTT Oil and Retail Business Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	October 1, 2018 - September 30, 2020, and February 1, 2021 - Present	Committee Member, PTT Digital Solutions Company Limited	
	April 1, 2021 - Present	Chairman, PTT Digital Solutions Company Limited	
	October 1, 2020 - January 31, 2022	Chairman, Business Services Alliance Company Limited	
	November 3, 2021 - July 31, 2022	Chairman, Alpha Com Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	November 23, 2021 - Present	Member of the Executive Committee, Vidyasirimedhi Institute of Science and Technology	
	October 1, 2021 - Present	Executive Director, Thailand Energy Academy	
	October 1, 2020 - Present	Executive Director, Global Compact Network Association of Thailand (GCNT)	
	August 10, 2021 - Present	Director, Thai Renewable Energy Association (RE100)	

Mr. Chadil Chavanalikikorn
Senior Executive Vice President,
Organization Effectiveness and Corporate Governance
Age (Year) 56

- Appointed as Senior Executive Vice President, Organization Effectiveness and Corporate Governance October 1, 2022
- The person supervising Compliance Unit

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	**Position**	**Organization/ Company**
Education • Bachelor of Engineering, Kasetsart University • Master of Business Administration, Kasetsart University • Certified Internal Auditor (CIA): The Institute of Internal Auditors **Certification** • Successful Formulation & Execution of Strategy (SFE 17/2013), Anti-Corruption the Practical Guide (ACPG 2/2013), Company Secretary Program (CSP 65/2015), Independent Observer Program (IOP 1/2016), Thai Institute of Directors Association (IOD) • Senior Energy Executive, Thailand Energy Academy, Ministry of Energy • Administrative Psychological Operation: Institute of Security Psychology, National Defence Studies Institute • High-Level Anti-Corruption Strategy Executives, NACC • Senior Executive Program (SEP): SASIN Graduate Institute of Business Administration • Leadership Development Program II, PTT-Harvard Business School: PLLI • Leadership Development Program III, PTT-IMD: PLLI • Leadership Succession Program (LSP): IRDP	October 1, 2022 - Present	Senior Executive Vice President, Organization Effectiveness and Corporate Governance (Acting Executive Vice President, Office of Corporate Audit in October 2022)	PTT Public Company Limited
	2019 - September 30, 2022	Executive Vice President, Office of Corporate Audit	PTT Public Company Limited
	2018 - 2019	Executive Vice President, Corporate Governance	PTT Public Company Limited
	2017 - 2018	Executive Vice President, Sustainability Management	PTT Public Company Limited
	2016 - 2017	Vice President, Internal Audit Department	PTT Public Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	December 19, 2022 - Present	Director/ Director to the Corporate Governance and Sustainability Committee, PTT Global Chemical Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	December 13, 2022 - Present	Director, Business Services Alliance Company Limited	
	November 4, 2022 - Present	Chairman, Business Professional Solutions Recruitment Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Miss Peangpanor Boonklum
Senior Executive Vice President, Office of General Counsel
Age (Year) 56

- Appointed as Senior Executive Vice President, Office of General Counsel
  October 1, 2017

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Laws (Second Class Honor), Chulalongkorn University • Master of Laws (Business Law), Chulalongkorn University • Master of Laws (LL.M.), Columbia University School of Law, New York, USA **Certification** • Director Certification Program (DCP 7/2001), Anti-Corruption: The Practical Guide (ACPG 38/2017), Ethical Leadership Program (ELP 15/2019), Risk Management Program for Corporate Leaders (RCL 18/2019), Board Nomination and Compensation Program (BNCP 7/2019), Thai Institute of Directors Assoction (IOD) • Certificate, Executive Program in Energy Literacy for a Sustainable Future, (Class of 15th), Thailand Energy Academy (TEA) • Leadership Development Program 3 (LDP3) (Class 4/2019), PTT Leadership and Learning Institute (PLLI)	October 1, 2017 - Present	Senior Executive Vice President, Office of General Counsel	PTT Public Company Limited
	January 20, 2021 - March 31, 2021	Member of the Corporate Governance Committee	IRPC Public Company Limited
	May 14, 2019 - December 31, 2020	Member of the Enterprise Risk Management Committee	PTT Oil and Retail Business Public Company Limited
	October 24, 2018 - December 31, 2020	Member of the Nomination and Remuneration Committee	PTT Oil and Retail Business Public Company Limited
	March 9, 2018 - December 31, 2020	Director	PTT Oil and Retail Business Public Company Limited
	2020	Lecturer, "Roles and Involvement of State Enterprises and Private Sectors in Reduction of Fraud", Anti-Corruption Strategic Management for Senior Executives (Class 11/2020)	Office of The National Anti-Corruption Commission (NACC)
	2020	Advisor, "The Capital Market Regulatory Guillotine Task Force"	The Securities and Exchange Commission, Thailand (SEC)

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• TIJ Executive Program on The Rule of Law and Development (TIJ RoLD 3/2019), Thailand Institute of Justice (TIJ) • TIJ Workshop for Emerging Leaders on the Rule of Law and Policy (Class 3/2019), Thailand Institute of Justice (TIJ) • Certificate in Anti-Corruption Strategic Management for Senior Executives (Class 9/2018), Office of the National Anti-Corruption Commission • TLCA Executive Development Program (Class 1/2008), Thai Listed Companies Association (TLCA)	2019	Lecturer, "Role of the Promotion, Prevention, and Respect for Human Rights", Certificate of Human Rights for Executives	King Prajadhipok's Institute
	December 4, 2019 - November 23, 2021	Chairman	Energy Complex Company Limited
	June 18, 2019 - August 18, 2021	Vice President	Chulalongkorn University Alumni Association Under the Royal Patronage of His Majesty the King (CUAA) (Term 2019 - 2021)
	April 27, 2019 - December 31, 2019	Member of the Corporate Governance Committee	Global Power Synergy Public Company Limited
	April 3, 2017 - December 31, 2019	Director	Global Power Synergy Public Company Limited
	October 30, 2017 - September 30, 2018	Director	East Mediterranean Gas Company S.A.E.
	February 2017 - January 2018	Member - Legal Expert	Finances and Assets Policy Committee, Srinakharinwirot University
	2013 - March 15, 2018	Advisor/ Lecturer	Investment Banking Club, Association of Thai Securities Companies
	July 1, 2017 - September 30, 2017	Executive Vice President, Office of Corporate Legal	PTT Public Company Limited
	February 3 - August 31, 2017	Independent Director/ Audit Committee	Bangkok Commercial Asset Management Public Company Limited
	March 2016 - June 2017	Senior Counsel	Weerawong, Chinnavat & Partners Company Limited (Former Company Name: "Weerawong, Chinnavat & Peangpanor Company Limited", Changed to the current name on April 3, 2017)

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	January 20, 2021 - Present	Director, IRPC Public Company Limited	
	April 1, 2021 - Present	Member of the Risk Management Committee, IRPC Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	December 4, 2019 - Present	Director, Energy Complex Company Limited	
	October 21, 2021 - Present	Chairman, Global Renewable Power Company Limited	
	November 8, 2021 - Present	Director, CU Engineering Enterprise Company Limited*	
	November 8, 2021 - Present	Director, Primate Enterprise Company Limited**	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	April 27, 2021 - Present	Expert Member, Subcommittee, The National Legal Education Council	
	October 28, 2021 - Present	Chairman, PTT Saving and Credit Cooperative Limited	
	November 19, 2021 - Present	President of Residence of Chulalongkorn University Alumni Association	
	August 31, 2021 - Present	Committee & Head of Legal, Chulalongkorn University Alumni Association Under the Royal Patronage of His Majesty the King (CUAA) (Term 2021 - 2023)	

Remarks:

** Owned by CU Enterprise Company Limited 99.97% and CU Enterprise Company Limited owned by Chulalongkorn University 99.99%.*

*** Owned by CU Enterprise Company Limited 99.97% and CU Enterprise Company Limited owned by Chulalongkorn University 99.99%.*

M.L. Peekthong Thongyai
Senior Executive Vice President, Gas Business Unit
Age (Year) 55

- Appointed as Senior Executive Vice President, Gas Business Unit
  October 1, 2022

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	**Position**	**Organization/ Company**
Education • Bachelor of Science (Petroleum Engineering), The University of Texas at Austin, USA • Master of Business Administration (Finance), Sasin Graduate Institute of Business Administration of Chulalongkorn University **Certification** • Director Certification Program (DCP 15/2002), Thai Institute of Directors Association (IOD) • APAC Energy Transition Leadership Program (A-ETLP/2022), GE Crotonville, USA • Leadership Development Program III, PTT Leadership and Learning Institute • Leadership Development Program II, PTT Leadership and Learning Institute	October 1, 2022 - Present	Senior Executive Vice President, Gas Business Unit	PTT Public Company Limited
	October 1, 2021 - September 30, 2022	Senior Executive Vice President, Downstream Business Group Alignment	PTT Public Company Limited
	October 1, 2019 - September 30, 2021	Director	Gulf MTP LNG Terminal Company Limited
	November 1, 2016 - September 30, 2021	Executive Vice President, Downstream Business Group Alignment, PTT, working on a secondment as Acting Managing Director	PTT Tank Terminal Company Limited
	January 28, 2016 - April 26, 2019	Director	PTT Energy Resources Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	December 1, 2022 - Present	Director, Global Power Synergy Public Company Limited	
	October 1, 2021 - October 31,2022	Director/ Director to the Risk Management Committee PTT Global Chemical Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	November 1, 2016 - December 31, 2022	Director, PTT Tank Terminal Company Limited	
	September 17, 2021 - November 30, 2022	Director, GPC International Terminal Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Mr. Prasong Intaranongpai
Executive Vice President Acting Senior Executive Vice President
Downstream Business Group Alignment
Age (Year) 54

- Appointed as Executive Vice President Acting Senior Executive Vice President Downstream Business Group Alignment October 1, 2022

(%) of Share Possession

0.000073
(own 0.000073;
spouse 0)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering (Industrial Engineering) Chiang Mai University • Bachelor of Laws, Sukhothai Thammathirat Open University • Master of Business Administration (General management) Kasetsart University **Certification** • Director Certification Program (DCP 287/2019) and Financial Statement for Directors (FSD 38/2019), Thai Institute of Directors Association (IOD) • Advanced Strategic Management (ASM) - Advanced SMCP, Class 1/2018, PTT • Advanced Management Program (AMP) 3 - (Year 2018), PTT • Leadership Development Program 3 (LDP3), Class 4 (Year 2019), PTT • Director Development Program (DDP) (Year 2021), PTT	October 1, 2022 - Present	Executive Vice President Acting Senior Executive Vice President Downstream Business Group Alignment (and assigned to work for ARUN PLUS Company Limited until December 31, 2022)	PTT Public Company Limited
	2021 - September 30, 2022	Executive Vice President, New Venture Development (Assigned to work for ARUN PLUS Company Limited)	PTT Public Company Limited
	October 12, 2020 - October 1, 2021	Director	PTT Energy Resources Company Limited
	May, 2020 - October 2021	Chairman	PTT Global Management Company Limited
	2017 - 2021	Executive Vice President, Strategy & Portfolio Management	PTT Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	December 1, 2022 - Present	Director / Member of the Risk Management Committee	IRPC Public Company Limited
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	September 27, 2019 - November 30, 2022	Director,	Sport Services Alliance Company Limited
	April 1, 2022 - November 30, 2022	Chairman,	Sport Services Alliance Company Limited
	October 26, 2021 - November 30, 2022	Director,	Alpha Com Company Limited
	July 22, 2021 - November 30, 2022	Chairman,	EVME PLUS Company Limited
	October 21, 2021 - November 30, 2022	Director,	Global Renewable Power Company Limited
	January 6, 2022 - December 13, 2022	Director,	Nuovo Plus Company Limited
	October 25, 2021 - November 30, 2022	Chairman,	PTT Raise Company Limited
	December 21, 2022 - Present	Director,	GPC International Terminal Company Limited
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Mr. Pongpun Amornvivat
Senior Executive Vice President,
International Trading Business Unit
Age (Year) 51

- Appointed as Senior Executive Vice President, International Trading Business Unit January 1, 2023

(%) of Share Possession

0.000028
(own 0.000028;
spouse 0)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering (Civil Engineering), Carnegie Mellon University, USA • Master of Engineering (Civil and Environmental Engineering), Massachusetts Institute of Technology (MIT), USA • Master of Business Administration, Sloan School of Management, Massachusetts Institute of Technology (MIT), USA • Master of Arts, Economic Law, Chulalongkorn University **Certification** • Director Certification program (DCP 225/2016) Thai Institute of Directors Association (IOD) • Top Executive Program (Class of 29th), Capital Market Academy (CMA) • Executive Program in good governance for Sustainable Development Class 1st, Office of the Public Sector Development Commission • Young Executive Program in Energy Literacy for a Sustainable Future (YTEA), Thailand Energy Academy	January 1, 2023 - Present	Senior Executive Vice President, International Trading Business Unit	PTT Public Company Limited
	2021 - December 31, 2022	Executive Vice President, Thai Oil Public Company Limited, working on a secondment as Executive Vice President, International Trading	PTT Public Company Limited
	April 2, 2021 - September 30, 2021	Director	Global Power Synergy Public Company Limited
	April 28, 2021 - September 30, 2021	Member of the Corporate Governance Committee	Global Power Synergy Public Company Limited
	2020 - 2021	Director	Thai Oil Power Company Limited
	2020 - 2021	Director	TOP SPP Company Limited
	2019 - 2021	Director	Thaioil Treasury Center Company Limited
	2019 - 2021	Director	TOP Ventures Hong Kong Limited
	2019 - 2021	Director	TOP Ventures America Limited
	2018 - 2020	Executive Vice President - Innovation and Digitalization (Act.)	Thai Oil Public Company Limited
	2018 - 2021	Director	PTT Digital Solutions Company Limited
	2017 - 2021	Executive Vice President Strategy	Thai Oil Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	2017 - 2021	Director	Ubon Bio Ethanol Public Company Limited
	2017 - 2020	Director	Sak Chaisidhi Company Limited
	2017 - 2020	Director	TOP Solvent Company Limited
	2017 - 2021	Director	Sapthip Company Limited
	2017	Vice President - Business Development	Thai Oil Public Company Limited
	2016 - 2021	Director/ Executive Director	Thai Petroleum Pipeline Company Limited
	2015 - 2021	Director	Thaioil Ethanol Company Limited
	2015 - 2018	Vice President - Project Development	Thai Oil Public Company Limited
	2011 - 2020	Director	Thaioil Marine International Pte. Ltd.
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	-	-	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	December 1, 2021 - Present	Director, PTT International Trading Pte. Ltd.	
	December 1, 2021 - Present	Director, PTT International Trading London Ltd.	
	June 1, 2022 - Present	Director, PTT Global LNG Ltd.	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Mr. Cherdchai Boonchoochauy
Senior Executive Vice President, Innovation and New Ventures
Age (Year) 55

- Appointed as Senior Executive Vice President, Innovation and New Ventures
  October 1, 2022

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Science (Chemical Technology), Chulalongkorn University • Master of Engineering (Chemical Engineering), Chulalongkorn University • Master of Business Administration, Chulalongkorn University **Certification** • Director Certificate Program (DCP 320/2022), Thai Institute of Director Association (IOD)	October 1, 2022 - Present	Senior Executive Vice President, Innovation and New Ventures	PTT Public Company Limited
	August 1,2021 - September 30, 2022	Executive Vice President, Strategy & Portfolio Management	PTT Public Company Limited
	October 1, 2019 - July 31, 2021	Executive Vice President, Natural Gas Supply & Trading	PTT Public Company Limited
	September 12, 2019 - September 27, 2021	Director	Trans Thai-Malaysia (Thailand) Limited
	September 12, 2019 - September 27, 2021	Director	Trans Thai-Malaysia (Malaysia) Limited
	August 13, 2019 - September 27, 2021	Director	TTM Sukuk Berhad
	April 29, 2019 - October 1, 2021	Director	PTT Natural Gas Distribution Company Limited
	October 1, 2018 - September 30, 2019	Executive Vice President, Strategic Planning, Gas Business Unit	PTT Public Company Limited
	May 1, 2017 - September 30, 2018	Vice President, Business Development, Gas Business Unit	PTT Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	December 19, 2022 - Present	Director/ Member of the Risk Management Committee,	PTT Global Chemical Public Company Limited
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	October 11, 2021 - Present	Chairman,	PTT Global Management Company Limited
	September 21, 2022 - Present	Chairman,	PTT Energy Resources Company Limited
	October 8, 2021 - Present	Director,	PTT Energy Resources Company Limited
	November 1, 2021 - Present	Chairman,	Sakari Resources. Ltd.
	November 2, 2022 - Present	Chairman,	Alpha Com Company Limited
	December 22, 2022 - Present	Director,	ARUN PLUS Company Limited
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Mr. Chansak Chuenchom
Senior Executive Vice President, Engineering and Infrastructure
Age (Year) 55

- Appointed as Senior Executive Vice President, Engineering and Infrastructure
  October 1, 2021

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering (Mechanical Engineering), Khon Kaen University • Master of Business Administration, Kasetsart University **Certification** • Director Certification Program (DCP 211/2015), Thai Institute of Directors Association (IOD) • Strategy and Innovation for Businesses in Asia (SIBA 9th) Training The College of Management, Mahidol University, in collaboration with Sloan School of Management, Massachusetts Institute of Technology (MIT)	October 1, 2021 - Present	Senior Executive Vice President, Engineering and Infrastructure (New position, Senior Executive Vice President, Engineering and Infrastructure with effect from October 1, 2021)	PTT Public Company Limited
	December 21, 2020 - November 30, 2021	Director	Veolia Sustainable Solutions (Thailand) Company Limited (Former company name: "Suez Environmental Services Company Limited", changed to the current name on June 6, 2022)
	April 23, 2018 - October 14, 2021	Director	Combined Heat and Power Producing Company Limited
	March 14, 2016 - February 25, 2021	Director	Thai Oil Power Company Limited (Liquidation on February 25, 2021)
	October 1, 2015 - September 30, 2021	Executive Vice President, Engineering and Project Management	PTT Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• Training course for senior anti-corruption strategists (NYPD 10) Office of the National Anti-Corruption Commission • Leadership Development Program, MDP III Business Management, MDP III People Management, Advanced Management Program (AMP) 3 - Business and People Management, PTT Leadership and Learning Institute • Leadership Develpoment Program II (LDP II), China	**Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)**		
	October 1, 2021 - Present	Director, IRPC Public Company Limited	
	December 1, 2022 - Present	Chairman of the Nomination and Remuneration Committee, IRPC Public Company Limited	
	April 5, 2022 - November 30, 2022	Member of the Risk Management Committee, IRPC Public Company Limited	
	October 1, 2021 - April 5, 2022	Member of the Nomination and Remuneration Committee, IRPC Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	April 23, 2019 - Present	Director, Energy Complex Company Limited	
	November 23, 2021 - Present	Chairman, Energy Complex Company Limited	
	September 29, 2022 - Present	Chairman, Global Multimodal Logistics Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	November 23, 2021 - Present	Member of the Executive Committee, Vidyasirimedhi Institute of Science and Technology	

Mrs. Nivadee Jaroensitipun
Executive Vice President Acting Senior Executive Vice President, Government Relations
Age (Year) 55

- Appointed as Executive Vice President Acting Senior Executive Vice President, Government Relations November 1, 2022

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Business Administration, Rajamangala Institute of Technology • Master of Arts (Political Science), Kasetsart University • Master of Arts (Communication Arts and Information), Kasetsart University	November 1, 2022 - Present	Executive Vice President Acting Senior Executive Vice President, Government Relations	PTT Public Company Limited
	November 1, 2021 - October 31, 2022	Executive Vice President attached to Senior Executive Vice President, Organization Effectiveness and Corporate Governance, PTT, secondment as Managing Director	Business Services Alliance Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Certification • Director Certification Program (DCP 316/2022) Thai Institute of Directors Association (IOD) • The Rule of Law for Democracy, Class 8, College of the Constitutional Court • Advanced Certificate Course in Public Economics Management for Executives, Class 5, King Prajadhipok's Institute • Certificate Course in Good Governance for Medical Executives, Class 7, King Prajadhipok's Institute and the Medical Council of Thailand. • PTT Leadership Development Program 1 for EVP Pool by Development Dimensions International (DDI)	June 1, 2021 - October 31, 2021	Vice President, PTTOR, secondment as Senior Executive Vice President, Service Business	Business Services Alliance Company Limited
	July 1, 2018 - May 31, 2021	Vice President attached Oil and Retail Business Academy	PTT Oil and Retail Business Public Company Limited
	October 1, 2015 - June 30, 2018	Vice President, Oil Business Academy	PTT Public Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	-	-	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	November 1, 2021 - Present	Director, Business Services Alliance Company Limited	
	November 25, 2021 - Present	Director, Business Professional Solutions Recruitment Company Limited	
	November 25, 2021 - Present	Director, Sport Services Alliance Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Mr. Montri Rawanchaikul
Chief Executive Officer,
PTT Exploration and Production Public Company Limited
Age (Year) 58

- Appointed as Chief Executive Officer,
  PTT Exploration and Production Public Company Limited
  October 1, 2021

(%) of Share Possession

0.000224
(own 0.000224;
spouse 0)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Science (Physics), Chiang Mai University • Master of Applied Science (Exploration Geophysics), University of New South Wales, Australia **Certification** • Leadership Development Program III (LDP III), PTT Leadership and Learning Institute • Certificate, Executive Program in Energy Literacy for a Sustainable Future, Thailand Energy Academy (TEA) • The Corporate Governance: Regulation and Disclosure Training, The Thai Institute of Directors Association • Leadership Development Program II (LDP II), PTT Leadership and Learning Institute • EP LEAD III Leadership Development Program, IMD • CMA 31, Capital Market Academy	October 1, 2021 - Present	Senior Executive Vice President, PTT, Reporting to Chief Operating Officer, Upstream Petroleum and Gas Business Group working on a secondment as Chief Executive Officer	PTT Exploration and Production Public Company Limited
	February 1, 2021 - September 30, 2021	Senior Executive Vice President, PTT, Reporting to Chief Operating Officer, Upstream Petroleum and Gas Business Group working on a secondment as President	PTT Exploration and Production Public Company Limited
	October 1, 2020 - January 31, 2021	Senior Executive Vice President, PTT, Reporting to Chief Operating Officer, Upstream Petroleum and Gas Business Group working on a secondment as President and acting as Executive Vice President, Production Asset Group	PTT Exploration and Production Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	January 8, 2020 - March 1, 2021	Director	PTTEP HK Offshore Limited
	January 1, 2020 - September 30, 2020	Executive Vice President, Production Asset Group	PTT Exploration and Production Public Company Limited
	September 13, 2019 - January 8, 2020	Director	PTTEP HK Holding Limited
	October 1, 2017 - December 31, 2019	Executive Vice President, Strategy and Business Development Group	PTT Exploration and Production Public Company Limited
	November 1, 2017 - September 30, 2018	Executive Vice President, Strategy and Business Development Group and Acting Senior Vice President, New Business Unit, and additional assigned as Project Champion, Spend Smart	PTT Exploration and Production Public Company Limited
	June 22, 2017 - September 30, 2021	Director	PTT Global LNG Company Limited
	October 16, 2016 - September 30, 2017	Acting Executive Vice President, Strategy and Business Development Group	PTT Exploration and Production Public Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	October 1, 2021 - Present	Director/ Chief Executive Officer, PTT Exploration and Production Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	-	-	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	October 1, 2021 - Present	Executive Director, Thailand Energy Academy	

Dr. Kongkrapan Intarajang
Chief Executive Officer and President,
PTT Global Chemical Public Company Limited
Age (Year) 55

- Appointed as Chief Executive Officer and President, PTT Global Chemical Public Company Limited October 1, 2019

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering (Chemical Engineering) (2nd Class Honor), Chulalongkorn University • Ph.D. Chemical Engineering, University of Houston, USA **Certification** • Director Certification Program (DCP 119/2009), Role of the Chairman Program (RCP 21/2009), Thai Institute of Directors Association (IOD) • Breakthrough Program for Senior Executives, IMD Business School • Diploma, The National Defence College of Thailand, (Class of 60th) (NDC) • The Executive Program in Energy Literacy for a Sustainable Future, (Class of 14th), Thailand Energy Academy (TEA) • Leadership Development Program (LDP 3), Class 4, PTT Leadership and Learning Institute (PLLI) • Capital Market Academy Leader Program, (Class of 30th), Capital Market Academy (CMA) • Executive Development Training Program, the Royal Thai Police	October 1, 2019 - Present	Senior Executive Vice President, PTT, reporting to Chief Operating Officer, Downstream Petroleum Business Group working on a secondment as Chief Executive Officer and President (Changed the name of the position from Chief Executive Officer, PTT Global Chemical Public Company Limited effective from January 1, 2022)	PTT Global Chemical Public Company Limited
	August 24, 2020 - March 25, 2021	Director	Sustainable Future Foundation
	November 2019 - September 2020	Director	Power of Innovation Foundation
	October 2019 - September 2020	Director	Power of Learning Foundation
	November 6, 2019 - October 20, 2020	Director	Global Green Chemicals Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	October 31, 2019 - August 31, 2020	Director	GC International Corporation
	September 9, 2008 - August 31, 2020	Director	PTTGC International Private Limited
	May 2017 - January 2020	Director	Thai Tank Terminal Limited
	April 2017 - September 30, 2019	Chief Operating Officer - Upstream Petrochemical Business	PTT Global Chemical Public Company Limited
	July 2015 - September 2019	Director/ President & CEO	PTTGC America Corporation
	April 2015 - September 2019	Director	PTTGC Innovation America Corporation
	February 2015 - September 2019	Director	PTTGC International (Netherlands) B.V.
	January 2015 - September 2019	Director	Vencorex Holding
	November 2008 - September 2019	Director	Emery Oleochemical (M) Sdn. Bhd.
	November 2008 - September 2019	Director	Emery Specialty Chemicals Sdn. Bhd.
	October 2014 - March 2017	Executive Vice President - International Business Operations	PTT Global Chemical Public Company Limited
	September 2014 - December 2018	Director	NatureWorks LLC
	September 2014 - December 2018	Director/ Vice President	GC International Corporation (Formerly, PTTGC International (USA) Inc.)
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	January 1, 2022 - Present	Director/ Secretary to the Board of Directors/ the Risk Management Committee/ President and Chief Executive Officer,	Global Power Synergy Public Company Limited
	October 21, 2020 - Present	Chairman,	Global Green Chemicals Public Company Limited
	October 1, 2019 - December 31, 2021	Director/ Secretary to the Board of Directors/ Director to the Risk Management Committee/ Chief Executive Officer,	PTT Global Chemical Public Company Limited
	August 15, 2017 - Present	Director/ Member of the Risk Management Committee,	Global Power Synergy Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	8 December 2021 - Present	Chairman, PTTGC International (Netherlands) B.V	
	September 1, 2020 - Present	Chairman, PTTGC International Private Limited	
	September 1, 2020 - February 15, 2022	Chairman, GC International Corporation (GCI)	
	July 1, 2015 - February 15, 2022	Chairman, PTTGC America LLC	
	July 1, 2015 - February 15, 2022	Chairman, PTTGC America Corporation	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	July 25, 2022 - Present	Adviser of Small and Medium Industrial Institute, The Federation of Thai Industries	
	December 29, 2021 - Present	Chairperson of Advisory Committee in relation to its investment in Allnex, PTTGC International (Netherlands) B.V	
	June 14, 2021 - Present	Director and Member of the Nomination Committee and Remunerating Committee, Thai Institute of Directors Association (IOD)	
	October 22, 2020 - Present	Director, Association of Capital Market Academy Alumni	
	October 1, 2020 - March 31, 2022	Advisor of the Member Relations, the Federation of Thai Industries	
	September 30, 2020 - Present	Director, The Federation of Thai Industries	
	March 11, 2020 - Present	Vice President (Supporting), Thailand Swimming Association	
	January 30, 2020 - Present	Member of Vidyasirimedhi Institute Council, Vidyasirimedhi Institute of Science and Technology (VISTEC)	
	October 30, 2019 - Present	Member of Trustee, The Petroleum Institute of Thailand (PTIT)	
	October 3, 2019 - Present	Council of Trustee, Thailand Business Council of Sustainable Development (TBCSD)	
	October 1, 2019 - Present	Executive Director, Thailand Energy Academy	
	August 15, 2019 - Present	Director, Kamnoetvidya Science Academy (KVIS)	
	July 2017 - Present	Co-Chairman, France-Thailand Business Forum	

Mr. Bandhit Thamprajamchit
Chief Executive Officer and President,
Thai Oil Public Company Limited
Age (Year) 52

- Appointed as Chief Executive Officer and President, Thai Oil Public Company Limited
  January 1, 2023

(%) of Share Possession

0.000424
(own 0;
spouse 0.000424)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering (Chemical Engineering) (1st Class Honours, Gold Medal), Chulalongkorn University • M.Sc. in Advanced Chemical Engineering (Distinction), Imperial College, University of London, UK • Master of Business Administration (Executive), Sasin Graduate Institute of Business Administration of Chulalongkorn University **Certification** • Director Certification Program (DCP 187/2014), Ethical Leadership Program (ELP 27/2022) Role of the Chairman Program (RCP 52/2022), Thai Institute of Directors Association (IOD) • National Defence Course, Class 63, National Defence College • The Executive Program in Energy Literacy for a Sustainable Future, Class 14, Thailand Energy Academy • Capital Market Academy Leader Program, Class 27 Capital Market Academy • Leadership Development Program III (LDP III), Class 4 PTT Leadership and Learning Institute (PLLI)	January 1, 2023 - Present	Senior Executive Vice President, PTT, reporting to Chief Operating Officer, Downstream Petroleum Business Group working on a secondment as Chief Executive Officer and President, Acting Senior Executive Vice President - Hydrocarbon and Acting Executive Vice President - Manufacturing	Thai Oil Public Company Limited
	January 1, 2023 - Present	Acting Managing Director	LABIX Company Limited
	January 2021 - December 2022	Senior Executive Vice President - Hydrocarbon and Acting Executive Vice President - Manufacturing	Thai Oil Public Company Limited
	May 2020 - Present	Chairman	Thai Lube Base Public Company Limited
	February 2020 - December 2020	Senior Executive Vice President - Petroleum & Petrochemical	Thai Oil Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• Leadership Development Program II (LDP II) (with INSEAD) Thailand & Singapore, PTT Leadership and Learning Institute (PLLI) • The Young Executive Program in Energy Literacy for a Sustainable Future, Class 2, Thailand Energy Academy • Executive Development Program (EDP), Thai Listed Companies Association • Executive Development Program, Fiscal Policy Research Institute Foundation, Thailand	October 2018 - January 2020	Senior Executive Vice President - Petroleum & Petrochemical and Acting Executive Vice President - Operation Excellence	Thai Oil Public Company Limited
	April 2018 - April 2021	Director/ Corporate Governance committee	Global Power Synergy Public Company Limited
	January 2017 - Present	Director	Thai Lube Base Public Company Limited
	July 2017 - September 2018	Senior Executive Vice President - Petroleum & Petrochemical and Acting Executive Vice President - Manufacturing	Thai Oil Public Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	January 1, 2023 - Present	Director/ Member of the Risk Management Committee/ Chief Executive Officer and President/ the Secretary to the Board of Directors	Thai Oil Public Company Limited
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	March 2020 - Present	Director	LABIX Company Limited
	November 2018 - Present	Chairman,	Thaioil Energy Services Company Limited
	January 2017 - Present	Director	Thaioil Energy Services Company Limited
	December 2015 - Present	Director	Thai Paraxylene Company Limited
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	March 2022 - Present	Board of Directors	The Federation of Thai Industries
	April 2021 - Present	Subcommittee on Petroleum Fuel and Greenhouse Gases Impact Assessment from EV Promotion Measures,	The National EV Policy Committee
	February 2019 - Present	Chairman, Petroleum Refining Industry Club,	The Federation of Thai Industries
	February 2019 - Present	Vice Chairman, Petrochemical Cluster,	The Federation of Thai Industries
	February 2019 - Present	Committee, Industrial Promotion and Support Function,	The Federation of Thai Industries
	February 2019 - Present	Committee, The Institute of Energy for Industries,	The Federation of Thai Industries

Mr. Kris Imsang
President and Chief Executive Officer,
IRPC Public Company Limited
Age (Year) 57

- Appointed as President and Chief Executive Officer, IRPC Public Company Limited
  October 1, 2022

(%) of Share Possession

0.000350
(own 0.000350;
spouse 0)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering (Civil Engineering), Chulalongkorn University **Certification** • The Role of the Board in IT Governance, Year 2020 and Director Certification Program (DCP 139/2010), Thai Institute of Directors Association (IOD) • Leadership Development Program III, (Class of 2nd), PTT Leadership and Learning Institute (PLLI) • Certificate in Top Executives in the PoomPalungPandin Program, (Class of 3rd), Chulalongkorn University • Top Executive Program, (Class of 23rd), Capital Market Academy (CMA) • Certificate, Executive Program in Energy Literacy for a Sustainable Future, (Class of 9th), Thailand Energy Academy (TEA) • Diploma, National Defence College, The National Defence Course, (Class of 62nd), Thailand National Defence College • Certificate Course in Good Governance for Medical Executives, (Class of 9th), King Prajadhipok's Institute and the Medical Council of Thailand	October 1, 2022 - Present	Chief Operating Officer reporting to Chief Operating Officer, Downstream Petroleum Business Group, PTT, working on a secondment as Chief Executive Officer and President	IRPC Public Company Limited
	June 1, 2020 - September 30, 2022	Chief Operating Officer, Downstream Petroleum Business Group	PTT Public Company Limited
	November 1, 2019 - May 31, 2020	Senior Executive Vice President, Downstream Business Group Alignment	PTT Public Company Limited
	August 9, 2019 - October 31, 2019	Executive Board	Green Globe Institute
	August 9, 2019 - October 31, 2019	Member	Green Globe Institute
	July 18, 2019 - October 31, 2019	Sustainable OUR Khung BangKaChao Working Team	OUR Khung BangKachao
	July 3, 2019 - October 31, 2019	Sustainable OUR Khung BangKaChao Advisory Board	OUR Khung BangKachao

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	July 2, 2019 - October 31, 2019	Strategic Committee	Anti-Corruption and Good Governance Enhancement (Term 2019 - 2020)
	March 2019 - January 18, 2021	Member of the Nomination and Remuneration Committee	IRPC Public Company Limited
	February 28, 2019 - July 13, 2020	Committee	Vidyasirimedhi Institute of Science and Technology
	January 23, 2019 - February 5, 2020	Vice Chairman	Power For Sustainable Future Foundation
	December 2018 - October 31, 2019	Director	Sport Services Alliance Company Limited
	November 8, 2018 - October 31, 2020	Chairman	Social Enterprise Club
	October 1, 2018 - October 31, 2019	Senior Executive Vice President, Corporate Governance and Regulatory Affairs	PTT Public Company Limited
	March 1, 2018 - October 31, 2019	Chairman	Water Resource Management Committee, Thailand Business Council for Sustainable Development (TBCSD)
	January 1, 2018 - September 30, 2018	Senior Executive Vice President, Organization Management and Sustainability	PTT Public Company Limited
	September 8, 2017 - October 31, 2019	Chairman	Sarn Palung Social Enterprise Company Limited
	2017 - 2019	Member of Central Committee	Chulalongkorn University Alumni Association
	2017 - 2019	Member of Corporate Governance Committee	IRPC Public Company Limited
	March 30, 2016 - August 31, 2019	Member of the Executive Committee	Kamnoetvidya Science Academy
	February 1, 2016 - December 31, 2017	Senior Executive Vice President, Human Resources and Organization Excellence	PTT Public Company Limited
	February 23, 2015 - November 30, 2019	Chairman	Energy Complex Company Limited
	2015 - 2017	Deputy Secretary General (Term 2015 - 2017)	Chulalongkorn University Alumni Association

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	December 2, 2017 - September 8, 2022 and October 1, 2022 - Present	Director, IRPC Public Company Limited	
	October 1, 2022 - Present	Secretary to the Board/ President and Chief Executive Officer, IRPC Public Company Limited	
	January 19, 2021 - April 5, 2022	Chairman, IRPC Public Company Limited	
	April 5, 2022 - September 8, 2022	Chairman of The Nomination and Remuneration Committee, IRPC Public Company Limited	
	January 21, 2021 - September 29, 2022	Director, Oil and Retail Business Public Company Limited	
	January 27, 2021 - September 29, 2022	Member of the Nomination and Remuneration Committee, PTT Oil and Retail Business Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	October 1, 2022 - December 29, 2022	Chairman, PTT Energy Solutions Company Limited	
	October 1, 2022 - Present	Director, UBE Chemicals (Asia) Public Company Limited	
	October 15, 2022 - Present	Director, IRPC Polyol Company Limited	
	October 4, 2022 - December 31, 2022	Director, IRPC A&L Company Limited	
	September 11, 2020 - September 29, 2022	Chairman, PTT Tank Terminal Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	December 16, 2022 - Present	Member of Vidyasirimedhi Institute of Science and Technology Council For Short: Member of VISTEC Council	
	October 1, 2022 - Present	Executive Director, Thailand Energy Academy	
	October 1, 2022 - Present	Director, Thailand Business Council for Sustainable Development	
	April 22, 2022 - Present	Secretary General, The Federation of Thai Industries	
	February 2021 - Present	Board of Trustees, Sirindhorn International Institute of Technology (SIIT)	
	August 20, 2020 - April 22, 2022	Vice President - FTI Academy Board Jobs, The Federation of Thai Industries (Term 2020 - 2022)	
	June 1, 2020 - Present	Executive Director, Thailand Energy Academy	
	August 22, 2019 - Present	Honorary Board Member, Social Enterprise Promotion Board	

Mr. Worawat Pitayasiri
President and Chief Executive Officer,
Global Power Synergy Public Company Limited
Age (Year) 56

- Appointed as President and Chief Executive Officer, Global Power Synergy Public Company Limited December 1, 2020

(%) of Share Possession

-None-

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering (Chemical Engineering), Chulalongkorn University • Master of Business Administration (Management), Thammasat University **Certification** • Director Certification Program (DCP 158/2012), Thai Institute of Directors Association (IOD) • Asia Petrochemical Industry Conference (APIC) (Class 2/2017), Japan Petrochemicals Industry Association • PTT Group VP Leadership Development Program, PTT Public Company Limited • NIDA-Wharton Executive Leadership Program, (Class of 2009), The Wharton School of the University of Pennsylvania, USA • Senior Executive Program, (Class 26/2012), Sasin Graduate Institute of Business Administration, Chulalongkorn University • Advanced Certificate Course Politics and Governance in Democratic Systems for High Level Executives, (Class of 22nd), King Prajadhipok's Institute • National Defence Course (NDC), (Class of 64th), Thailand National Defence College	December 1, 2020 - Present	Senior Executive Vice President, PTT, reporting to Chief New Business and Infrastructure Officer working on a secondment as President and Chief Executive Officer	Global Power Synergy Public Company Limited
	March 3, 2020 - November 29, 2020	Director	Alpha Com Company Limited
	February 27, 2020 - November 29, 2020	Chairman	PTT Raise Company Limited
	November 11, 2019 - November 29, 2020	Chairman	PTT Digital Solutions Company Limited
	November 2019 - February 17, 2020	Director	InnoSpace (Thailand) Company Limited
	September 3, 2019 - November 29, 2020	Director	PTT Digital Solutions Company Limited
	June 2019 - August 16, 2019	Director	PTT Energy Solutions Company Limited
	February 28, 2019 - November 30, 2020	Member of the Executive Board	Vidyasirimedhi Institute of Science and Technology
	September 16, 2018 - November 30, 2020	Senior Executive Vice President, Innovation and Digital	PTT Public Company Limited
	September 19, 2018 - November 30, 2020	Director/ Member of Risk Management Committee	IRPC Public Company Limited
	May 2018 - November 23, 2018	Director	PTT Tank Terminal Company Limited
	November 27, 2017 - November 4, 2019	Committee	Community Partnership Association

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	October 1, 2016 - September 15, 2018	Executive Vice President, Downstream Business Group Planning	PTT Public Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	December 1, 2020 - Present	Director/ Secretary to the Board/ Member of the Risk Management Committee/ President and Chief Executive Officer, Global Power Synergy Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	January 6, 2022 - Present	Director, Nuovo Plus Company Limited	
	July 13, 2021 - October 7, 2022	Director, Avaada Energy Private Limited	
	January 4, 2021 - Present	Director, Global Renewable Power Company Limited	
	December 1, 2020 - Present	Director, Xayaburi Power Company Limited	
	December 1, 2020 - Present	Director, Ratchaburi Power Company Limited	
	December 1, 2020 - Present	Director, Glow Energy Public Company Limited	
	December 1, 2020 - Present	Director, Glow Company Limited	
	December 1, 2020 - Present	Director, Glow SPP 2 Company Limited	
	December 1, 2020 - Present	Director, Glow SPP 3 Company Limited	
	December 1, 2020 - Present	Director, Glow IPP 2 Holding Company Limited	
	December 1, 2020 - Present	Director, Glow SPP 11 Company Limited	
	December 1, 2020 - Present	Director, Glow IPP Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	April 22, 2022 - Present	Director/ Executive Director, Board of The Federation of Thai Industries (FTI) (Term 2022 - 2024)	
	June 13, 2022 - Present	Vice President, Committee of the Institute of Industrial Energy (Term 2022 - 2024)	
	December 1, 2020 - Present	Executive Director, Thailand Energy Academy	
	December 1, 2020 - October 4, 2021	Advisory to the Board of Director, Alpha Com Company Limited	

Mr. Suchat Ramarch
President,
PTT Oil and Retail Business Public Company Limited
Age (Year) 54

- Appointed as President,
  PTT Oil and Retail Business Public Company Limited
  October 1, 2022

(%) of Share Possession

0.000563
(own 0.000563;
spouse 0)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering, Rajamangala University of Technology Krungthep • Master of Arts (Social Development Administration), National Institute of Development Administration (NIDA) **Certification** • Director Certification Program (DCP 176/2013), Thai Institute of Directors Association (IOD) • Corporate Governance for Directors and Senior Executives of Regulators, State Enterprises and Public Organizations (PDI), Class 22/2020, King Prajadhipok's Institute • Top Executive Program, Class 28/2019, Capital Market Academy (CMA) • Leadership Development Program III (2562), PTT Leadership and Learning Institute (PLLI) • Advance Certificate Course in Public Administration and Law for Executives, King Prajadhipok's Institute, Class 13/2014 • Management Development Program III (2013), PTT Leadership and Learning Institute (PLLI)	October 1, 2022 - Present	Senior Executive Vice President, PTT, reporting to Chief Operating Officer, Downstream Petroleum Business Group working on a secondment as President	PTT Oil and Retail Business Public Company Limited
	October 1, 2021 - September 30, 2022	Senior Executive Vice President, Organization Effectiveness and Corporate Governance (Changed the name of the position from Senior Executive Vice President, Organization Management and Sustainability with effect from October 1, 2021)	PTT Public Company Limited
	March 29, 2021 - September 29, 2021	Director	Pluk Phak Praw Rak Mae Company Limited
	November 20, 2020 - September 29, 2021	Chairman	Peaberry Thai Company Limited
	October 29, 2020 - April 5, 2021	Chairman	PTT Retail Management Company Limited
	September 30, 2020 - September 29, 2021	Chairman	PTTOR China (Shanghai) Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
• Advance Management Program II (2013), PTT Leadership and Learning Institute (PLLI) • Executive Development Program (2011), The Stock Exchange of Thailand • National Defence Course (NDC), (Class of 64th), Thailand National Defence College	2019 - September 30, 2021	Senior Executive Vice President, Non-Oil Retail Business	PTT Oil and Retail Business Public Company Limited
	2018 - 2019	Senior Executive Vice President, Non-Oil Retail Business	PTT Oil and Retail Business Public Company Limited
	2016 - 2020	Director	PTT Retail Management Company Limited
	2016 - 2018	Executive Vice President, Retail Marketing	PTT Public Company Limited
	2016 - 2017	Chairman	PTT Retail Management Company Limited
	2011 - 2017	Director	PTT (Lao) Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	October 1, 2021 - Present	Director, Thai Oil Public Company Limited	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	November 4, 2022 - Present	Chairman, PTT Retail Management Company Limited	
	February 4, 2022 - Present	Chairman, Business Services Alliance Company Limited	
	April 25, 2019 - Present	Director, Business Services Alliance Company Limited	
	November 26, 2021 - October 31, 2022	Chairman, Business Professional Solutions Recruitment Company Limited	
	April 25, 2019 - October 31, 2022	Director, Business Professional Solutions Recruitment Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	November 23, 2021 - October 31, 2022	Member of the Human Resource Committee, Vidyasirimedhi Institute of Science and Technology	

Mrs. Chanamas Sasnanand
Executive Vice President, Group Corporate Finance and Strategy
Age (Year) 53

- Appointed as Executive Vice President, Group Corporate Finance and Strategy January 1, 2021

(%) of Share Possession

0.000455
(own 0.000455;
spouse 0)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Administration, Chulalongkorn University • Master of Business Administration, University of South Carolina, USA **Certification** • TLCA Executive Development Program, Thai Listed Companies Association • Leadership Development Program II (LDP II), PTT Leadership and Learning Institute • EP LEAD III Leadership Development Program, IMD • Senior Executive Program, Sasin Graduate Institute of Business Administration of Chulalongkorn University • Audit Report Process, Federation of Accounting Professions Under The Royals Patronage of His Majesty The King • Audit process, Federation of Accounting Professions Under The Royals Patronage of His Majesty The King • Financial and Fiscal Management Program for Senior Executive – The Comptroller General's Department, Ministry of Finance • Advanced Master of Management Program, National Institute of Development Administration	January 1, 2021 - Present	Senior Vice President, PTT Exploration and Production Public Company Limited, working on a secondment as Executive Vice President, Group Corporate Finance and Strategy	PTT Public Company Limited
	August 1, 2020 - January 1, 2021	Director	PTTEP Treasury Center Company Limited
	January 1, 2019 - January 1, 2021	Director	PTTEP Treasury Center Company Limited
	January 2019 - December 2020	Senior Vice President, Finance Division	PTT Exploration and Production Public Company Limited
	April - December 2018	Senior Vice President, Internal Audit Division	PTT Exploration and Production Public Company Limited
	January - April 2018	Acting Senior Vice President, Internal Audit Division	PTT Exploration and Production Public Company Limited
	July 2014 - December 2017	Vice President, Capital and Investor Relations Department	PTT Exploration and Production Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	March 20, 2015 - January 1, 2018	Director	PTTEP Holding Company Limited
	March 20, 2015 - January 1, 2018	Director	PTTEP Offshore Investment Company Limited
	September 10, 2013 - January 1, 2018	Director	PTTEP HK Holding Limited
	April 22, 2011 - January 1, 2018	Director	PTTEP Romana Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	-	-	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	December 20, 2022 - Present	Chairman, T-Ecosys Company Limited	
	January 24, 2022 - Present	Director, T-Ecosys Company Limited	
	April 5, 2022 - Present	Chairman, Alvogen Emerging Markets Holdings Limited	
	January 11, 2021 - June 1, 2022	Director, PTT International Trading Pte. Ltd.	
	January 4, 2021 - Present	Chairman, PTT Treasury Center Company Limited	
	January 4, 2021 - March 15, 2022	Director, Alpha Com Company Limited	
	December 17, 2020 - Present	Director, Innobic (Asia) Company Limited	
	January 1, 2019 - Present	Director, AI and Robotics Ventures Company Limited	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Miss Jaroonsri Wankertphon
Executive Vice President, Global Business Services
Acting Executive Vice President, Group Accounting and Tax Policy
Age (Year) 57

- Appointed as Executive Vice President, Global Business Services October 1, 2020
- Appointed as Acting Executive Vice President, Group Accounting and Tax Policy October 1, 2022 (The person supervising Accounting)

(%) of Share Possession

0.000091
(own 0.000091)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Business Administration (Business Administration), Chulalongkorn University • Bachelor of Business Administration (Accounting), Krirk University • Master of Science (Financial Accounting), Thammasat University **Certification** • Director Certification Program (DCP 220/2016), Thai Institute of Directors Association (IOD) • TLCA Executive Development Program, Thai Listed Companies Association • Financial & Fiscal Management Program for Senior Executive, (Class 6/2019), The Comptroller General's Department • EP LEAD III Leadership Development Program, IMD **Continuing Professional Development 2020** • TFRSs Financial instruments: Implementation and analysis an non-financial institutions' financial statement - CPD (Accounting) 6 hours	October 1, 2022 - Present	Senior Vice President, attached to Executive Vice President, PTT Exploration and Production Public Company Limited, working on a secondment as Executive Vice President, Global Business Services Acting Executive Vice President, Group Accounting and Tax Policy	PTT Public Company Limited
	October 2020 - September 30, 2022	Senior Vice President, attached to Executive Vice President, PTT Exploration and Production Public Company Limited, working on a secondment as Executive Vice President, Global Business Services	PTT Public Company Limited
	March 20, 2015 - October 1, 2020	Director	PTTEP HK Holding Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Continuing Professional Development 2021 • Shared Service Centre Evolution - Key to agility after the pandemic • Recognizing and evaluating the value of trade account receivable in the "Looking forward concept" and differentiation between PAEs and NPAEs in practice • Estimation of discounted cash-flow for impairment according to TAS36 after relief measurement • TFRS9 IBOR Reformation Phase 2 and Related disclosure • RPA for Digital Accounting • F&A Knowledge Sharing: "M&A: Purchase Price Allocation (PPA) in practices" • PTT New Core Competencies: PTT New Vision • Mentoring Guidelines & Process **Continuing Professional Development 2022** • Strategic Management Accounting, (Class 2/2022) • Internal control of legal compliance for business sustainability • Derivatives and Hedging Accounting An Accountant with criteria Specified by the Department of Business Development	January 1, 2018 - October 1, 2020	Director	PTTEP Holding Company Limited
	April 22, 2011 - October 1, 2020	Director	PTTEP Sadang Limited
	February 28, 2019 - September 23, 2020	Director	Energy Complex Company Limited
	January 2019 - September 2020	Senior Vice President, Accounting Division	PTT Exploration and Production Public Company Limited
	October - December 2018	Senior Vice President, Accounting Division and Acting Vice President, Financial Accounting Department	PTT Exploration and Production Public Company Limited
	July 2016 - September 2018	Senior Vice President, Accounting Division	PTT Exploration and Production Public Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	-	-	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	June 1, 2022 - Present	PTT International Trading Private Limited Company	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Mr. Nisit Phongvutiprapant
Company Secretary
Age (Year) 52

- Appointed as Company Secretary
  October 1, 2020
- Appointed as Executive Vice President,
  Company Secretary and Corporate Relation
  October 1, 2020

(%) of Share Possession

0.000003
(own 0.000003;
spouse 0)

Family Relationship among Directors and Executives

-None-

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Economics (Development Economics), Bangkok University **Certification** • Director Certification Program (DCP 195/2014), Company Secretary Program (CSP 113/2020), Thai Institute of Directors Association (IOD) • Advanced Management Program II (Batch 1/2018), PTT Leadership and Learning Institute • Leadership Development Program I (2013), PTT Leadership and Learning Institute • Bain Academy Asia Pacific 2019 Program, Bain & Company SE Asia, Inc., Singapore • Advanced Management Program (AMP) 3 - Business & People Management, PTT Leadership and Learning Institute (PLLI)	October 1, 2020 - Present	Senior Executive Vice President, PTT Oil and Retail Business Public Company Limited, working on a secondment as Executive Vice President, Company Secretary and Corporate Relation	PTT Public Company Limited
	June 1, 2020 - September 30, 2020	Senior Executive Vice President, Corporate Strategy, Innovation and Sustainability	PTT Oil and Retail Business Public Company Limited
	June 5, 2020 - September 30, 2020	Director	Modulus Company Limited
	June 22, 2020 - September 30, 2020	Director	PTT (Cambodia) Limited
	November 29, 2019 - September 30, 2020	Director	Brighter Energy Company Limited (JV Terminal)
	August 30, 2019 - May 31, 2020	Director	Brighter PTT Oil and Retail Business Company Limited
	August 29, 2018 - January 31, 2020	Director	PTT Oil Myanmar Company Limited
	February 1, 2020 - May 31, 2020	Vice President, Strategy and Portfolio Management Department	PTT Oil and Retail Business Public Company Limited

Education/ Certification	Working Experiences in the 5 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
	May 1, 2019 - January 31, 2020	Vice President, PTT Oil and Retail Business Public Company Limited, working on a secondment as Managing Director	PTT Oil Myanmar Company Limited
	July 1, 2018 - April 30, 2019	Vice President, International Business Development and Planning Department	PTT Oil and Retail Business Public Company Limited
	May 17, 2017 - April 30, 2019	Director	PTT Philippines Corporation
	2012 - April 30, 2019	Director	PTT (Lao) Company Limited
	January 1, 2017 - June 30, 2018	Vice President, International Business Development and Planning Department	PTT Public Company Limited
	1992 - 2021	Managing Partner	Phuluang Kasetrungrueng (1992) Limited Partnership
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	-	-	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	-	-	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	November 23, 2021 - Present	Member of the Executive Committee, Vidyasirimedhi Institute of Science and Technology	
	November 17, 2021 - Present	Vice Chairman and Treasurer, Power of Innovation Foundation	
	November 1, 2020 - Present	Committee Member, Thai Company Secretary Club, Thai Listed Companies Association	

Attachment 2

Details of Directors and Subsidiaries

Positions Held by The Management and Authorized Controllers of PTT Public Company Limited, Subsidiaries, Joint Ventures, Associates and Other Related Companies for 2022

Company* (As of December 31, 2022) / PTT Executive (As of December 31, 2022)				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
				Professor Dr. Thosaporn Sirisumphand	POL.GEN. Rungroj Sangkram	Mr. Danucha Pichayanan	GEN. Teerawet Boonyawat	Mr. Jatuporn Buruspat	M.L. Chayotid Kridakorn	Mr. Krishna Boonyachai	Associate Professor Dr.Chayodom Sabhasri	Mr. Payong Srivanich	Mr. Phongsthorn Thavisin	Mr. Krisada Chinavicharana	Associate Professor Dr. Narongdech Sruktrakul	Mr. Chansin Treenuchagron	Dr. Prasert Sinsukprasert	Mr. Auttapol Rerkpiboon	Mr. Wuttikorn Sithit	Mr. Noppadol Pinsupa**	Dr. Buranin Rattanasombat	Ms. Pamtalin Maheawngtikul	Mr. Teridkiat Prommool	Mr. Chadil Chavanalikikorn	Miss Peangpanor Boonklurn***	Mrs. Nvadee Jaroensitipun	M.L. Peekthong Thongyai	Mr. Prasong Intaranongpai	Mr. Cherdchai Boonchoochauy	Mr. Chansak Chuenchom	Mr. Montri Rawanchaikul	Dr. Kongkrapan Interapong	Mr. Kris Imsang	Mr. Worawat Pitayasiri	Mr. Suchat Ramarch	Mrs. Chanamas Sasnanand	Miss Jaroonsri Wankwetphon
PTT Plc.			PTT	x	/	/	/	/	/	/	/	/	/	/	/	/	/	*O/	//	//	//	//	//	//	//	//	//	//	//	//	//	//	//	//	//	//
Subsidiaries	E&P Business	1	PTT Exploration and Production Plc.	PTTEP														/												*/						
	Natural Gas	2	PTT Natural Gas Distribution Co., Ltd.	PTTNGD															x																	
		3	PTT LNG Co., Ltd.	PTTLNG																																	
	International Business	4	PTT Green Energy Pte. Ltd.	PTTGE																																	
		5	PTT Energy Resources Co., Ltd.	PTTER																									x								
		6	PTT Global Management Co., Ltd.	PTTGM																									x								
	Oil & Retail	7	PTT Oil and Retail Business Plc.	OR														x			/		/												//		
	Petrochemical & Refining	8	PTT Tank Terminal Co., Ltd.	PTT TANK																							/										
		9	PTT Global Chemical Plc.	GC						/														/					/			*O/					
		10	Thai Oil Plc.	TOP																*O/	/	/	/											/			
		11	IRPC Plc.	IRPC																					/			/		/			*O/				
	International Trading	12	PTT International Trading Pte. Ltd.	PTTT																																	/
		13	PTT International Trading London Ltd.	PTTT LDN																																	
		14	PTT International Trading USA Inc.	PTTT USA																																	
	Others	15	Business Services Alliance Co., Ltd.	BSA																				/		/									x		
		16	PTT Treasury Center Co., Ltd.	PTT TCC																																x	
	New Business and Infrastructure	17	Global Power Synergy Plc.	GPSC															/	/		/					/					/		*O/			
		18	PTT Digital Solutions Co., Ltd.	PTT DIGITAL																			X														
		19	Energy Complex Co., Ltd.	EnCo																					/					x							
		20	PTT Energy Solutions Co., Ltd.	PTTES																																	

Company* (As of December 31, 2022)				PTT Executive (As of December 31, 2022)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
					Professor Dr. Thosaporn Sirisumphand	POL.GEN. Rungroj Sangkram	Mr. Danucha Pichayanan	GEN. Teerawat Boonyawat	Mr. Jatuporn Buruspat	M.L. Chayotid Kridakon	Mr. Krishna Boonyachai	Associate Professor Dr.Cheyodom Sabhasri	Mr. Payong Srivanich	Mr. Phongsthorn Thavisin	Mr. Krisada Chinavicharana	Associate Professor Dr. Narongdech Sruktrakul	Mr. Chansin Treenuchagron	Dr. Prasert Sinsukprasert	Mr. Auttapol Rerkpiboon	Mr. Wuttikorn Stithit	Mr. Noppadol Pinsupa**	Dr. Buranin Rattanasombat	Ms. Pannalin Mahawongtikul	Mr. Terdkiet Prommool	Mr. Chadil Chavanalikorn	Miss Peangpanor Boonklum***	Mrs. Nivadee Jaroensitipun	M.L. Peekthong Thongyai	Mr. Prasong Intaranongpai	Mr. Cherdchai Boonchoochauy	Mr. Chansak Chuenchom	Mr. Montri Rawanchaikul	Dr. Kongkrapan Interapong	Mr. Kris Imsang	Mr. Worawat Pitayasiri	Mr. Suchat Ramarch	Mrs. Charamas Sasnanand	Miss Jaroonsri Wankertphon
Joint Ventures, Associates and Other Related Companies	Natural Gas	21	Trans Thai-Malaysia (Thailand) Co., Ltd.	TTM(T)																																
		22	Trans Thai-Malaysia (Malaysia) Sdn. Bhd.	TTM(M)																																
		23	Map Ta Phut Air Products Co., Ltd.	MAP																																
	Others	24	Dhipaya Group Holdings Plc.	TIPH																																
		25	Sarn Palung Social Enterprise Co., Ltd.	SPSE																																
		26	Veolia Sustainable Solutions (Thailand) Co., Ltd.	VSS																																
	New Business and Infrastructure	27	District Cooling System and Power Plant Co., Ltd.	DCAP																																
		28	InnoSpace (Thailand) Co., Ltd.	InnoSpace																																
		29	Baania (Thailand) Co., Ltd.	Baania																																
		30	HG Robotics Co., Ltd.	HG ROBOTICS																																
		31	Sunfolding, Inc.	Sunfolding																																
		32	Luminar Technologies, Inc.	Luminar																																
		33	Ample, Inc.	Ample																																
		34	Shenzhen Immotor Technology Co., Ltd.	Immotor																																
		35	NTG Holdings Pte. Ltd.	NT																																

Notes:

- *Symbol X = Chairman - = Vice Chairman * = CEO O = President / = Director // = Executive*
- *The first four executives, excluding the President & CEO, under SEC's Announcement are Mr. Wuttikorn Stithit, Mr. Noppadol Pinsupa, Dr. Buranin Rattanasombat and Miss Pannalin Mahawongtikul.*

* *The Company has reclassified its subsidiaries according to the International Financial Reporting Standards No. 10 Consolidated Financial Statements, effective from January 1, 2015.*

** *Mr. Noppadol Pinsupa changed his position from Chief Operating Officer, Downstream Petroleum Business Group and Acting President & CEO of Thai Oil Plc. to Chief Operating Officer, Downstream Petroleum Business Group until December 31, 2022.*

*** *Miss Peangpanor Boonklum changed the position name to Senior Executive Vice President, Office of General Counsel, effective from January 1, 2023.*

Attachment 3

Detail of Head of the Office of Corporate Audit

Mr. Chayagorn Leangruenrom
Executive Vice President, Office of Corporate Audit
Head of the Office of Corporate Audit
Age (Year) 54

(%) of Share Possession
-None-

Family Relationship among Directors and Executives
-None-

Education/ Certification	Working Experiences in the 10 Preceding Years (As of December 31, 2022)		
	Time Period	Position	Organization/ Company
Education • Bachelor of Engineering, King Mongkut's Institute of Technology Ladkrabang • Master of Business Administration, Kasetsart University **Certification** • Anti-Corruption for Executive Program (ACEP 7/2013), Corporate Governance for Executives Program (CGE 19/2022), and Subsidiary Governance Program (SGP Online 1/2022), Thai Institute of Directors Association (IOD)) • Leadership Development Program II, PTT-Harvard Business School, PTT Leadership and Learning Institute (PLLI) • Public Private Partnerships for Executives Program (PEP) Class of 8th, Institute of Research and Development for Public Enterprises (IRDP) • Corporate Governance for Directors and Senior Executives of Regulators, State Enterprises and Public Organizations (PDI) Class 24, King Prajadhipok's Institute • Advanced Management Program (AMP) 3 - Business & People Management, PTT Leadership and Learning Institute (PLLI) • Top Executive Program, Capital Market Academy (CMA) Class 32	2022 - Present	Executive Vice President, Office of Corporate Audit	PTT Public Company Limited
	2020 - 2022	Executive Vice President, Corporate Governance	PTT Public Company Limited
	2019 - 2020	Vice President, Natural Gas Marketing Department	PTT Public Company Limited
	2016 - 2019	Vice President, Project Director, Myanmar - Thailand LNG Receiving Terminal	PTT Public Company Limited
	2016 - 2016	Vice President, Internal Audit Department	PTT Public Company Limited
	2013 - 2016	Vice President, Subsidiary Audit Department	PTT Public Company Limited
	2011 - 2013	Vice President, Internal Audit Department	PTT Public Company Limited
	Relevant Important Positions in Listed Companies – The Stock Exchange of Thailand (In the Previous Year)		
	-	-	
	Relevant Important Positions in Non-Listed Company (In the Previous Year)		
	-	-	
	Other Experiences/ Other Activities/ Other Organizations (In the Previous Year)		
	-	-	

Attachment 4

Business Assets and Details on Asset Valuation

-None-

Business Assets

Details are listed under **Section 1.2 Nature of Business**

Details of Asset Valuation

-None-

Attachment 5

Corporate Governance, Ethical Standards and Code of Business Ethics Handbook of PTT Public Company Limited, including Authorities, Duties and Responsibilities of the Board and Duties and Responsibilities of Specific Committees of PTT Public Company Limited

1. Corporate Governance, Ethical Standards and Code of Business Ethics Handbook of PTT Public Company Limited

PTT has announced its corporate governance principles and formulated the Corporate Governance, Ethical Standards and Code of Business Ethics Handbook (CG Handbook) for the acknowledgement and adoption of the Board of Directors, all executives, and employees as their practical guidelines at work to promote PTT as a company with efficient business operations, excellent corporate governance and management, integrity, transparency, and auditability. The Handbook is publicized on PTT's Intranet and web site.

Further details related to PTT's CG Handbook can be studied from PTT's website www.pttplc.com.

https://www.pttplc.com/en/Home.aspx Menu: About PTT, Topic: Corporate Governance or follow the link below:
https://www.pttplc.com/en/About/Corporate-Governance.aspx and
https://www.pttplc.com/uploads/CG/Publication/CGHandbookforOneReport/PTTCGHandbook_Revision5.1.1_EN.pdf

READ MORE READ MORE READ MORE

2. Charter of the Board of Directors and Charters of Specific Committees of PTT Public Company Limited

2.1 Charter of the Board

(Details are reported under Section 2 **"7.2.3 Roles and Duties of the Board."**)

2.2 Charters of the Audit Committee/ Nominating Committee/ Remuneration Committee/ Corporate Governance and Sustainability Committee and Enterprise Risk Management Committee

(Details are reported under Section 2 **"7.3 Information about Specific Committees."**)

Attachment 6

Report of the Audit Committee

Details are reported on page 320 - 322

About This Report

Part 3: Driving Business towards Sustainability Section 1: Business Operations and Performance

PTT has continuously disclosed information on sustainability performance to stakeholders through the Annual Report, Sustainability Report, and corporate website at www.pttplc.com in the section of Sustainability on an annual basis. In 2022, PTT disclosed sustainability performance to stakeholders in the "2022 Annual Registration Statement/ Annual Report (56-1 One Report)" by merging the 56-1 Form, Annual Report, and Sustainability Report into a single report. This is the 3rd consecutive year. The information on sustainability performance presented in Part 3: Driving Business towards Sustainability, Section 1: Business Operations and Performance covers sustainability management strategy in three dimensions, namely Environmental, Social, and Governance. The information is disclosed on the corporate website at www.pttplc.com under the section of Sustainability.

Scope of the Report

The information presented in Part 3: Driving Business towards Sustainability, Section 1: Business Operations and Performance in "2022 Annual Registration Statement/ Annual Report (56-1 One Report)" covers sustainability performance from January 1st to December 31st 2022 in all business groups of PTT. This comprises Upstream Petroleum and Natural Gas Business, Downstream Petroleum Business Group, New Business, Infrastructure Business Group, and Business Support Function, as well as the performance of PTT Group companies, namely PTT Exploration and Production Public Company Limited (PTTEP), PTT Global Chemical Public Company Limited (GC), Thai Oil Public Company Limited (TOP), IRPC Public Company Limited (IRPC), Global Power Synergy Public Company Limited (GPSC) and PTT Oil and Retail Business Public Company Limited (OR), as specified in the content of each topic. In addition, scope of 3P Decarbonization Pathway Implementation consists of PTT and flagship companies (PTTEP, GC, TOP, IRPC, GPSC and OR), and the scope of direct and indirect greenhouse gas emissions of the PTT Group covers companies that PTT holds more than 20% direct share and is a major shareholder or holds 100% indirect shares, including joint ventures with equal shareholder as well as companies that those companies hold shares in the same proportion. Relevant domestic and international reporting guidelines have been applied to determine the materiality and the presentation of the content, as follows;

56-1 ONE REPORT	Manual for preparing the Annual Registration Statement/ Annual Report (56-1 One Report) of the Securities and Exchange Commission or the SEC
GRI	Global Reporting Initiative (GRI) Sustainability Reporting Standards aligning with relevant indicators (GRI Standards 2021: Universal Standards and Topic Standards) and Sector Standard Project for Oil and Gas (GRI 11: Oil and Gas Sector 2021), with the content's comprehensiveness meeting the "Reporting in accordance with the GRI Standard."
IIRC	Reporting value creation of organization per International Integrated Reporting Council (IIRC)
UNGC	Reporting performance progress on the ten principles of the United Nations Global Compact (UNGC) at the Advanced level
TCFD	Reporting performance on climate change through the application of the Recommendation of the Task Force on Climate-related Financial Disclosures (TCFD)
SDGs	Reporting performance progress supporting Sustainable Development Goals (SDGs)
WEF	Reporting sustainability value creation per key indicators of Measuring Stakeholder Capitalism: Towards Common Metrics and Consistent Reporting of Sustainable Value Creation of World Economic Forum (WEF)
CHRB	Human rights performance ranking indicators from Corporate Human Rights Benchmark (CHRB)

Report Assurance

Sustainability performance information in all three dimensions, comprising Environmental, Social, and Governance (ESG), disclosed in Part 3: Driving Business towards Sustainability, Section 1: Business Operations and Performance of "2022 Annual Registration Statement/ Annual Report (56-1 One Report)", has been approved by the senior management of relevant departments. PTT's sustainability material topics have been verified by an independent assurer for the 12nd consecutive year in order to reassure stakeholders that the information disclosed is accurate, complete, correct, credible, consistent with the business operations, and traceable to the information source.

Readers can click or scan the QR Code in Part 3: Driving Business towards Sustainability, Section 1: Business Operations and Performance of the "2022 Annual Registration Statement/ Annual Report (56-1 One Report)" for further details of each topic, as well as visit www.pttplc.com on Sustainability section for PTT's sustainability performance.

PTT website (www.pttplc.com), Sustainability Section

ASSURANCE STATEMENT

SGS (THAILAND) LIMITED'S REPORT ON SUSTAINABILITY ACTIVITIES IN THE PTT PUBLIC COMPANY LIMITED'S 56-1 ONE REPORT FOR 2022

NATURE OF THE ASSURANCE/VERIFICATION

SGS (THAILAND) LTD. (hereinafter referred to as SGS) was commissioned by PTT Public Company Limited (hereinafter referred to as PTT) to conduct an independent assurance of the 56-1 One Report 2022 (hereinafter referred to as the Report) or referred to in the Report by way of hyperlinks to PTT's corporate website (hereinafter referred to as the Website) for the year ended December 31, 2022 in accordance with the reporting criteria.

INTENDED USERS OF THIS ASSURANCE STATEMENT

This Assurance Statement is provided with the intention of informing all PTT's Stakeholders.

RESPONSIBILITIES

The information in the Report and its presentation are the responsibility of the directors or governing body (as applicable) and the management of PTT. SGS has not been involved in the preparation of any of the material included in the Report.

Our responsibility is to express an opinion on the text, data, graphs and statements within the scope of verification with the intention to inform all PTT's stakeholders.

ASSURANCE STANDARDS, TYPE AND LEVEL OF ASSURANCE

The SGS Sustainability Report Assurance protocols used to conduct assurance are based upon internationally recognised assurance guidance and standards including the principles of reporting process contained within the Global Reporting Initiative Sustainability Reporting Standards (GRI Standards) GRI 1: Foundation 2021 for report quality, GRI 2: General Disclosure 2021 for organisation's reporting practices and other organizational detail, GRI 3: Material Topics 2021 for organisation's process of determining material topics, its list of material topics and how to manages each topic and the guidance on levels of assurance contained within the AA1000 series of standards and ISAE3000.

The assurance of this report has been conducted according to the following Assurance Standards:

- AA1000ASv3 Type 2 (AA1000AP Evaluation plus evaluation of Specified Performance Information) at **Moderate Level**
- ISAE 3000, Assurance Engagements other than Audits or Reviews of Historical Financial Information at **Limited Level**
- ISAE 3410, Assurance Engagements on Greenhouse Gas Statements at **Limited Level**
- ISO 14064-3:2019 Greenhouse gases — Part 3: Specification with guidance for the verification and validation of greenhouse gas statements at **Limited Level**

SCOPE OF ASSURANCE AND REPORTING CRITERIA

The scope of the assurance included evaluation of quality, accuracy and reliability of specified performance information as detailed below and evaluation of adherence to the following reporting criteria:

- GRI Standards 2021 (In Accordance with)
- AA1000 Accountability Principles (2018)
- ISO 14064-1:2018 Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals

SPECIFIED PERFORMANCE INFORMATION AND DISCLOSURES INCLUDED IN SCOPE

PTT's the Report and the Website are adequately in line with the Sustainability Reporting Standard and fulfills all the required content and quality criteria for the identified aspects of the following data expressed numerically or in descriptive text for the year ended 31 December 2022 listed as below;

a) Environmental dimension performance indicators
   - GRI 302-1 Energy consumption within organization
   - GRI 302-3 Energy intensity
   - GRI 303-3 Water withdrawal (2018)
   - GRI 303-4 Water discharge (2018)
   - GRI 305-1 Direct (Scope 1) greenhouse gas emissions
   - GRI 305-2 Energy indirect (Scope 2) greenhouse gas emissions
   - GRI 305-3 Other indirect (Scope 3) greenhouse gas emissions
   - GRI 305-4 Greenhouse gas emissions intensity
   - GRI 305-7 Nitrogen oxides (NOx), Sulfur oxides (SOx), and other significant air emissions (Volatile Organic Compounds : VOC)
   - GRI 306-3 Waste generated (2020)
   - GRI 306-4 Waste diverted from disposal (2020)
   - GRI 306-5 Waste directed to disposal (2020)
   - GRI 306-3 Significant spills

b) Social dimension performance indicators
   - GRI 403-9 Work-related injuries (2018)
   - GRI 403-10 Work-related ill health (2018)
   - GRI 404-1 Average hours of training per year per employee
   - GRI 405-2 Ratio of basic salary and remuneration of women to men

c) Economic dimension performance indicators
   - GRI 201-1 Direct economic value generated and distributed – Community Investment

ASSURANCE METHODOLOGY

SGS's assurance engagements are carried out in accordance with assurance procedure.
The assurance comprised a combination of

- PTT's Management interviews, including the Sustainable Management team with responsibility for performance in the areas within scope
- Interview with data owners and managers responsible for internal data collection and reporting databases
- Document review of relevant systems, policies, and procedures where available
- Understanding, analysing and sample testing the key data collection, aggregation, validation and reporting systems, processes, procedures, and controls
- Sampling evidence to confirm the reliability of the selected reporting standards, selected 3 sites for onsite visit and remote audit as below:
  - Rayong Gas Separation Plant
  - Ban Rong Po LPG Terminal
  - Region 12 Pipeline Operations Center.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

LIMITATIONS AND MITIGATION

Financial data drawn directly from independently audited financial accounts has not been checked back to source as part of this assurance process.

STATEMENT OF INDEPENDENCE AND COMPETENCE

The SGS Group of companies is the world leader in inspection, testing and verification, operating in more than 140 countries and providing services including management systems and service certification; quality, environmental, social and ethical auditing and training; environmental, social and sustainability report assurance. SGS affirm our independence from PTT, being free from bias and conflicts of interest with the organisation, its subsidiaries and stakeholders.

The assurance team was assembled based on their knowledge, experience and qualifications for this assignment, and comprised auditors experienced in one or more of the following standards; AA1000, GRI, ISO 9001, ISO 14001, ISO 45001, ISO 50001, ISO 14064-1, ISO 14067, ISO 26000, SA 8000, GHG Verification/ Validation and experience on the SRA Assurance service provisions.

FINDINGS AND CONCLUSIONS

ASSURANCE/ VERIFICATION OPINION

On the basis of the methodology described and the verification work performed, nothing has come to our attention that causes us to believe that the specified performance information included in the scope of assurance is not fairly stated and has not been prepared, in all material respects, in accordance with the reporting criteria.

We believe that the organisation has chosen an appropriate level of assurance for the selected indicators for the year ended December 31, 2022 included in their reporting.

ADHERENCE TO AA1000 ACCOUNTABILITY PRINCIPLES STANDARD (2018)

INCLUSIVITY

PTT has considered sustainability's issues related to stakeholders from viewpoints of various sources. The survey and direct two-ways communication with investors, employee, customers, suppliers and other stakeholders were implemented to receive the concerning issues and organization's understanding of stakeholders.

MATERIALITY

Material topics have been identified in consideration of the requirements of international guidelines and stakeholder engagement. The material identified topics are deliberated on by external experts and the Corporate Governance and Sustainability Committee under Board of Directors level also reviewed the process of materiality assessment and confirmed the validity. The topics that are material to each stakeholder group are reported in appropriateness, and reflected their important and priority.

RESPONSIVENESS

Initiatives that address material topics are reported to stakeholders by disclosure in the report. The report also shows the relationship between these topics and the SDGs. The targets and the results for identified topics are also disclosed in the Report and the Website.

IMPACT

Risk evaluation has been demonstrated to identify environmental, social and governance impacts. Performance results related to key issued are reported in the Report and the Website. Sustainability performances identified have been disclosed changes in data over time. Target setting and performance status in qualitative and quantitative have been measured and reported for material topics.

Signed:
For and on behalf of SGS (Thailand) Limited

Montree Tangtermsirikul
General Manager
100 Nanglinchee Road Chongnonsee Yannawa, Bangkok 10120 Thailand
7 March 2023

WWW.SGS.COM

AA1000
Licensed Report
000-8/V3-KMKGG

Readers can click or scan the QR Code for feedback Survey on the Overall Impression of 2022 Annual Registration Statement/ Annual Report (56-1 One Report) and Subsection 3: Driving Business towards Sustainability Section 1: Business Operations and Performance. For further information, please visit www.pttplc.com

Reader Feedback Survey

PTT Public Company Limited
555 Vibhavadi Rangsit Rd., Chatuchak,
Bangkok 10900, Thailand
Tel. 66 (0) 2537-2000
www.pttplc.com

PTT NEWS
WE LOVE PTT
PTT Group
@pttplc_official

This report uses environmentally friendly paper.