



GC CIRCULAR LIVING IN **ACTION**

ANNUAL REPORT 2019

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED





GC
CIRCULAR
LIVING

Rapid developments around the world are having detrimental environmental impacts. In recognizing the implications, GC has pledged to achieve business growth while maintaining a balance between economic, social and environmental sustainability. We believe that the Circular Living concept is a potential solution, and remain committed to creating products through a combination of creative ideas and innovations to ensure that our resources retain their value and continue to be recycled indefinitely. In the interim, we are ready to build partnerships and promote social engagement that contributes to positive change and strengthen our organizational role model leading to sustainable growth.



THAILAND'S FIRST RENEWABLE AND ADVANCED POLYMER MANUFACTURING FACILITY

ENVICCO Limited, a new joint venture established in a partnership involving GC and ALPLA, produces two high-performance polymers, rPET and rHDPE, with cutting-edge technology that meets international standards.

ENVICCO AIMS TO RECYCLE

60,000+

TONS OF PLASTIC WASTE INTO NEW MATERIALS PER YEAR

GC CIRCULAR LIVING

COLLABORATIONS MOVE CIRCULAR LIVING

GC is focused on being a global leader in the chemicals business, incorporating environmentally-friendly innovations and technologies in line with the concept of the Circular Economy, developing products that improve the quality of life of people in society, and providing continued value that fully integrates our social responsibility with the growth of our business.

MEMBER OF

Dow Jones
Sustainability Indices



In collaboration with a RobecoSAM brand

GC RANKED NUMBER ONE FOR SUSTAINABILITY IN THE DJSI IN THE CHEMICALS SECTOR

GC was recently rated number one in the world for sustainability in the 2019 Dow Jones Sustainability Indices (DJSI), and also ranked among the top 10 companies in the chemicals sector by the DJSI World Index and Emerging Markets Index for the seventh consecutive year.



IMPROVING PRODUCTION PROCESS EFFICIENCY THROUGH THE 5Rs

We support improved production process efficiency by increasing the use of renewable resources while reducing non-renewable resource use through the 5Rs throughout our value chain.

5Rs

THROUGHOUT
THE VALUE CHAIN



TOTAL SOLUTIONS FOR EVERYONE

We emphasize the efficient use of resources to maximize their benefits together with building both domestic and international partnerships to develop new ideas to support the circular economy and generate concrete outcomes.

UPCYCLING
by 



14
PET BOTTLES
= 1 T-SHIRT



The 'Upcycling the Oceans, Thailand' project is a collaboration involving three leading organizations, PTT Global Chemical Public Company Limited (GC), the Tourism Authority of Thailand (TAT), and the ECOALF Foundation. Together, we are committed to addressing the problem of plastic waste in Thailand's marine tourist areas by collecting and transforming waste into creative, value-added products that are environmentally-friendly. This initiative also promotes responsible tourism and supporting ocean conservation in Thailand.

UPCYCLING
THE OCEANS
THAILAND



Thailand 1st Collection,
made from waste plastic bottles from beaches and the sea around Koh Samet in Rayong province.

ThinkCycle
Bank

ธนาคาร ทิ้ง-ไซเคิล
ทิ้งแบบหมุนเวียน...เพื่อเปลี่ยนโลก

Recycled waste can be transformed into money

In 2019, the ThinkCycle Bank managed to collect and sort approximately 10,478 kilograms of waste.*

*Between January-November 2019



GC and Mahidol University teamed up to promote an education campaign on sorting recyclable waste and launched the ThinkCycle Bank involving 22 schools in Rayong and Chonburi. This initiative is developing a database on waste using a systematic approach, and was designed to educate teachers and students on how to effectively sort recyclable waste, and also earn an extra income while promoting a money saving habits.

The 'Kao Khon La Kao' Project, Positive Steps for Environmental Benefits



The 'Kao Khon La Kao' project's activities support lifestyles that reduce waste in five regions using medals made from recycled resin and compostable products such as drinking cups and T-shirt bags for runners. It also creates value from plastic waste by using water bottles collected from the event which are then upcycled into medal ribbons and Kao Khon La Kao T-shirts.

THIS FUNDRAISING PROJECT, WHICH TOOK PLACE IN THE NORTHEASTERN, SOUTHERN, AND NORTHERN REGIONS, COLLECTED

over
200,000
plastic bottles

which were made into a collection of value-added products, and used over 49,000 GC compostable cups instead of traditional plastic cups. The used GC Compostable cups were collected by GC and the Kao Khon La Kao project and donated to the Department of National Parks, Wildlife and Plant Conservation in the area to be used to plant sprouts.



60
PET BOTTLES
= 1 RECYCLED
MONK'S ROBE

Wat Chak Daeng and GC teamed up for the 'Turning Waste into Treasure' project in which PET plastic bottles were upcycled into saffron robes for Buddhist monks using cloth made from recycled polyester mixed with cotton and recycled antibacterial polyester zinc, which reduces odors. Thanks to their antibacterial properties, the robes are comfortable to wear, breathable, wrinkle-free, dry easily, and are dyed using colors that meet Buddhist regulatory standards.



THE GC COMPOSTABLE LABEL

Identifies a product or packaging made from compostable plastic resin.



FROM THREAT TO THREAD WITH A TOUCH OF THAI STYLE



X

JIM THOMPSON

We partnered with Jim Thompson to use silk yarn and fiber made from recycled plastic, which are woven to develop products that reflect the essence of Thainess.



PARTNER FOR SUSTAINABILITY



Having earned the trust and confidence of the Ministry of Foreign Affairs, GC was selected as a **Partner for Sustainability** at the ASEAN Summit 2019. GC provided iPad cases made from recycled Polyethylene (PE) plastic which were woven by communities in Rayong and presented as an official souvenir gift for the ASEAN leaders.

One recycled PE iPad case was made using 36 discarded plastic bags as the main raw material. This helped minimize greenhouse gas emissions by 1,124 grams of carbon dioxide which is equivalent to the carbon dioxide absorption from the atmosphere of 27 trees.



WASTE THIS WAY

#รักษ์โลกให้ถูกทาง...

This is the first time that the 74th Chula-Thammasat Traditional Football Match implemented effective waste management



GC partnered with Chulalongkorn University and Thammasat University to promote the everyday use of renewable resources, which supports the concept of GC Circular Living, and also committed to creating 'Total Solutions for Everyone' to support environmental conservation among the new generation by addressing the waste problem together with students from the two universities.

We worked with the organizing committee of the Traditional Football Match, consisting of students from both universities, in waste management in various ways that support the use of biodegradable bioplastic packaging (certified with the GC Compostable label) and upcycled products made from discarded plastic, such as T-shirts and survival bags, with an aim to build awareness on the need to efficiently use resources. In addition, each activity conducted at the traditional football match was designed to be measurable. For instance, greenhouse gas emissions were calculated in tons of CO₂ equivalent (eq) at the event.

CO₂eq

REDUCING GREENHOUSE GAS EMISSIONS BY

18,121

KILOGRAMS OF CO₂eq

OR PLANTING

= 2,013

TREES





A Proud Moment for Thailand on the International Stage

GC Rated Number One

in the World for Sustainability in the DJSI (Chemicals Sector)



MEMBER OF

**Dow Jones
Sustainability Indices**

In collaboration with



a RobecoSAM brand

PTT Global Chemical Public Company Limited (GC) was recently rated number one in world for sustainability in the 2019 Dow Jones Sustainability Indices (DJSI).

GC also ranked among the Top 10 in the chemicals sector for the seventh consecutive year. These rankings reflect GC's standards for excellence in its operations as a multinational organization, and as a company that strongly supports the environment, society, and its respective stakeholders. They also show that GC is becoming an important role model for sustainability.

CONTENT

Vision, Mission and Corporate Strategies	2
Financial Highlights	4
Awards and Recognitions	6
Major Events and Activities in 2019	8
Message from the Chairman	14

BUSINESS HIGHLIGHTS

Business Structure	18
Business Value Chain	20
Nature of Business and Performance	22
• Group Performance Center-Refinery and Shared Facilities	22
• Group Performance Center-Aromatics	23
• Group Performance Center-Olefins	24
• Polymers Business Unit	25
• EO-Based Performance Business Unit	26
• Green Chemicals Business Unit	27
• Phenol Business Unit	28
• Performance Materials and Chemicals Business Unit	29
• Services and Others	30
Economic and Market Overview in 2019 and Outlook On 2020	31
Management Discussion and Analysis	37
Risk Management and Risk Factors	48
Internal Control	58
Shareholding Structure in Subsidiaries and Affiliates	62
Revenue Structure	64
Connected Transaction	65
Shareholding Structure	73
Dividend Payment Policy	73

ORGANIZATION STRUCTURE

GC Board of Directors	76
GC Executives	84
Management Structure	101

GOOD CORPORATE GOVERNANCE

Good Corporate Governance	124
People Management and Development Policy	143
Report of the Corporate Governance Committee	148
Report of the Nomination and Remuneration Committee	150
Report of the Risk Management Committee	152

SUSTAINABLE DEVELOPMENT

Social Responsibility and Sustainable Development	156
Safety, Occupational Health and Environmental Management	159

FINANCIAL EXCELLENCE

Audit Committee Report	170
Report of the Board of Directors' Accountability to Financial Report	174
Report of the Independent Certified Public Accountants	175
Financial Statements	181
Notes to the Financial Statements	192
Audit Fee and Non-Audit Fee	282

APPENDIX

Company Information and Other Important Information	284
Technical Terms and Abbreviations	287

"Investor may search for more detail of Company information in Form 56-1 available at www.sec.or.th or Company website www.pttggroup.com"



VISION

TO BE A LEADING GLOBAL CHEMICAL COMPANY FOR BETTER LIVING

meaning

“LEADING GLOBAL” means GC Group, a world-class chemical company

“CHEMICAL COMPANY” means GC Group, producers of petrochemicals and chemicals throughout value chain integration through growing businesses via international investment, with a focus on high value-added products

“BETTER LIVING” means GC Group, producers striving to meet customers' needs with high-value products, producers with socio-environmental responsibility, and committed to improving the quality of life with chemicals consumed in the downstream market as well as green chemicals.

MISSION

- 1.** We deliver the best business performance through trustworthiness to create fair and sustainable value for shareholders.
- 2.** We engage and integrate society and the environment into our business, with responsibility and care for sustainable development.
- 3.** We provide superior solutions from innovative products and services to be the best choice for our business partners.
- 4.** We create a workplace that promotes learning and employee wellbeing to develop a workforce that is engaged and committed to professional excellence.

OBJECTIVES AND GOALS

PTT Global Chemical Public Company Limited (GC) systematically reviews its corporate vision, mission and direction annually for alignment with the current business context and long-term trends. It aspires to become a leader in 3 aspects as follow;

BUSINESS GROWTH



GC is committed to being a world-class petrochemical and chemical manufacturer with integrated production lines, fostering growth and yielding profits in a sustainable and uninterrupted manner. Its focus is on growing investment in performance and specialty chemicals, green businesses, and international investments.

RETURN ON INVESTMENT



GC is committed to achieving a return on investment with leading industry players in Asia-Pacific.

SUSTAINABILITY



GC is committed to operating its businesses under the framework of sustainability by consistently working towards international acceptance as a global leader in sustainability.

CORPORATE STRATEGIES

The focus of GC's direction and strategic plans lies in establishing and upholding competitiveness and sustainable business growth while grooming itself in all aspects to support future growth plans. To this end, GC has adopted these direction and plans as the operating framework and regularly monitors its performance for short-term and long-term corporate goal achievement.

GC also retains its instrumental role in driving the domestic country by supporting petrochemical projects with capable partners under the Eastern Economic Corridor (EEC) project, which raises the domestic petrochemical industry's competitiveness, establishes regional market connectivity, and bolsters investors' confidence. By investing over 100 billion baht in 2017-2019, GC made major strides towards the New S-Curve and the Circular Economy. GC is in the process of projects studying and decision-making worth over 110 billion baht. Finally, GC promotes bioeconomic development for sustainable development together with conscientious consumption of resources under the GC Circular Living project.

This year GC intensified and drove corporate strategic implementation in keeping with prevailing external circumstances, with the following four strategic focuses:

1. STEP CHANGE

GC maintains its competitiveness for current businesses as a fundamental for future growth by creating value from products and existing assets for growth in both domestic and Southeast Asian market. Below are key strategies:

- Enhancing MTP competitiveness by (1) improving operational efficiency through the MAX Infinity project on production, marketing, and product distribution, (2) creating synergy amongst Map Ta Phut plants through MTP integration throughout the supply chain, ranging from feedstock sourcing to product delivery to customers for reducing production costs, preventing losses, and adding value to products, (3) improving assets (plants and infrastructure) to accommodate variety of feedstock while promoting long-term feedstock security, and (4) investing in products value chain extension to support downstream industry's growth.
- Expanding the home base to Southeast Asia to foster long-term distribution security in high-growth markets, aiming at Indonesia and Vietnam. GC will begin with establishment of marketing and sales bases together with seeking opportunities of investments.
- Adding business value by entering high-value businesses to properly meet customers' needs and extending businesses to be in line with the industry's growth and world megatrends.

2. STEP OUT

GC's aspiration is to become a world-class petrochemical leader by setting strategies for building international production base which has competitive advantage in feedstock cost and interesting market growth rate, which would favor GC's growth in a situation where the cost structures face challenges arising from emerging technologies. GC is planning to study petrochemical complex project in USA and pursuing opportunities together with PTT Group.

3. STEP UP

GC heightens its sustainability operation for business connectivity in response to industrial trends as well as caring for the society and environment through the following key actions:

- **Smart Operating:** GC strives for maximum circulation throughout its processes, ranging from consumption of renewable resources, process improvement, minimization of process waste and greenhouse gas emissions reduction which in line with the climate change response approach.
- **Responsible Caring:** GC values the product design and development throughout its supply chain with innovation to reduce its environmental footprint, response to public policy on plastic waste management, and promote a circular economy. The key approaches consist of reducing single-use plastics production along with promoting compostable plastics.
- **Loop Connecting:** GC links its sustainability approach to business by preparing for establishing joint venture company to produce Recycled PET whose feedstock comes from cooperative projects engaging in establishing systems to sort and collect plastic waste. Furthermore, GC strives for creating broad cooperation from all sectors to promote the Plastic Circular Economy in Thailand.

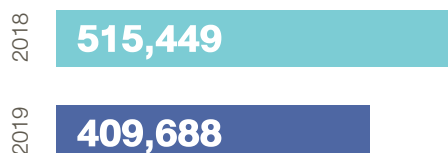
4. ENABLER AND GOVERNANCE

GC strives to strengthen corporate drivers to support operation following strategic plans for achievement in corporate long term goals, whether innovation excellence, preparation for entering in new businesses through venture capital, people and organization development, and digitalization management. At the same time, GC strives to strengthen governance, risk management & internal control and compliance (GRC) for full compliance and confidence amongst GC's stakeholders filled with transparency and accountability.

FINANCIAL HIGHLIGHTS

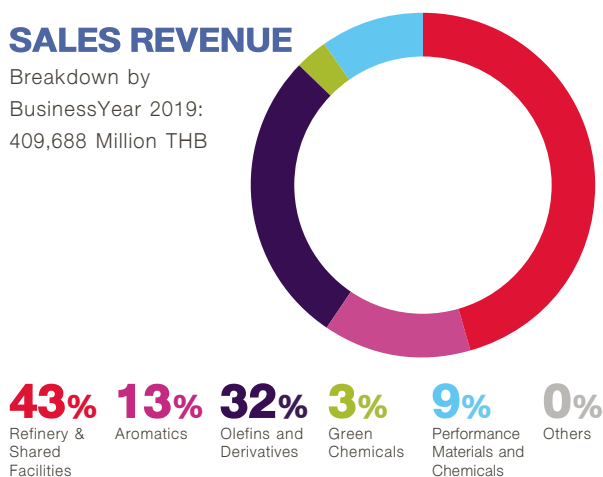
SALES REVENUE

Unit: Million THB



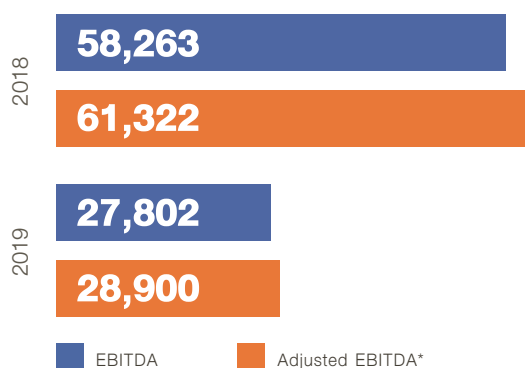
SALES REVENUE

Breakdown by Business Year 2019:
409,688 Million THB



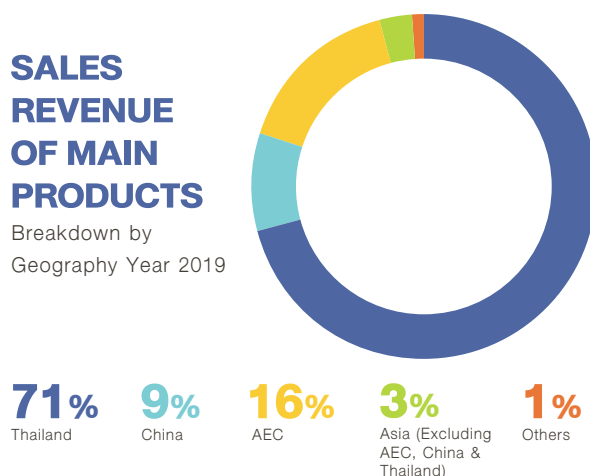
EBITDA & ADJUSTED EBITDA*

Unit: Million THB



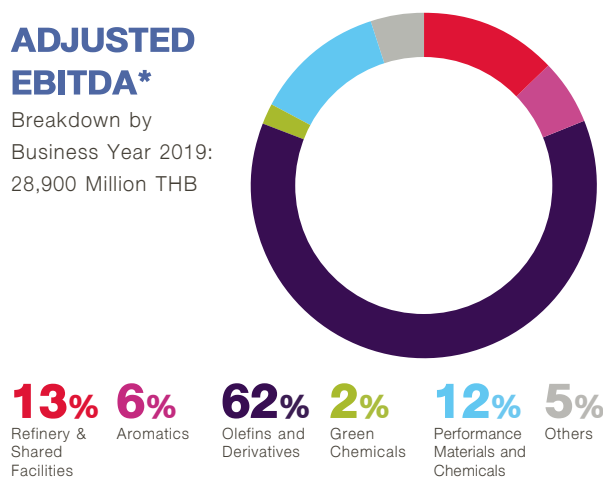
SALES REVENUE OF MAIN PRODUCTS

Breakdown by Geography Year 2019



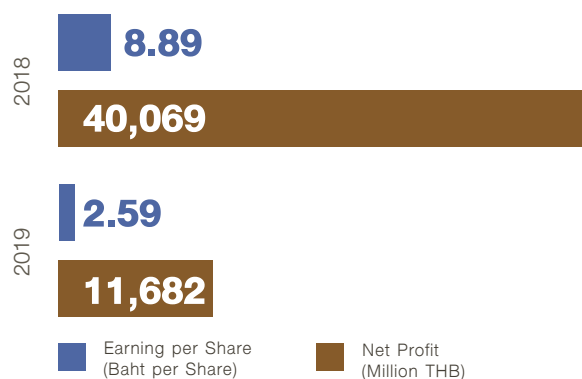
ADJUSTED EBITDA*

Breakdown by Business Year 2019:
28,900 Million THB



NET PROFIT

Unit: Million THB



Note: * Adjusted EBITDA refers to EBITDA excluding Stock Gain/(Loss), NRV and extra item

STATEMENT OF FINANCIAL POSITION (UNIT: MILLION THB)	2017	2018	2019
Total Assets	434,964	469,255	452,514
Cash and Cash Equivalents + Short-term Investment	55,050	53,562	25,560
Current Assets	85,688	90,748	78,934
Property, Plant and Equipment	219,689	250,330	264,564
Non-current Assets	74,537	74,615	83,457
Total Liabilities	154,700	165,773	158,919
Interest Bearing Debt (IBD)	97,813	96,907	107,087
Other Liabilities	56,887	68,866	51,832
Total Equity	280,264	303,482	293,595

STATEMENT OF FINANCIAL POSITION	2017	2018	2019
Current Ratio (times)	2.33	1.95	1.97
EBITDA to Total Revenues (%)	14.53	11.30	6.79
Net Profit to Total Revenues (%)	9.00	7.77	2.85
Return on Total Assets (%)	11.77	10.36	3.50
Return on Equity (%)	15.09	14.04	4.02
Interest Bearing Debt to Equity (times)	0.35	0.32	0.36
Net Interest Bearing Debt to Equity (times)	0.15	0.14	0.28
Net Interest Bearing Debt to EBITDA (times)	0.67	0.74	2.93

DIVIDEND PAID (BAHT/SHARE)	2017	2018	2019*
1 st HALF	1.75	1.75	1.00
2 nd HALF	2.50	2.50	1.00
FULL YEAR	4.25	4.25	2.00
Earning per Share (Baht/Share)	8.79	8.89	2.59
Dividend Payout Ratio (%)	49%	48%	77%

Note: * The Board of Directors' Meeting No. 2/2020 held on February 17, 2020, agreed to propose the Annual General Meeting of Shareholders to consider and approve on the dividend payment for the year 2019 operating performance of Baht 2.00 per share, or dividend payout ratio at 77% of the net profit of consolidated financial statements, of which Baht 1.00 per share was paid as interim dividend on September 13, 2019. The remaining dividend of Baht 1.00 per share is to be proposed to the 2020 Annual General Meeting of Shareholders for approval.

AWARDS AND RECOGNITIONS

Our efforts in conducting sustainable business in economic, social and environmental dimensions have been recognized by leading organizations both national and international. These represent our excellent performance.

MEMBER OF

**Dow Jones
Sustainability Indices**



In collaboration with

DOW JONES SUSTAINABILITY INDICES (DJSI)

GC has been ranked as the first in the 2019 Dow Jones Sustainability Indices (DJSI) in the chemicals sector and also ranked among the top 10 companies for the seventh consecutive year.



THE ASSET AWARDS

GC received two awards from the Asset Awards 2019, which were Platinum Award for ESG and Best CEO Award from The Asset magazine, a regional leading financial magazine.



UN GLOBAL COMPACT LEAD

GC is a signatory to UN Global Compact and it is the only one company in Thailand that has been recognized as Global Compact LEAD among other 37 organizations across the world.



MSCI ESG RATING

GC has been ranked as the world number five in the Commodity Chemicals sector for the BBB level assessment by MSCI. The assessment represents that GC has run the operations in accordance with Environmental, Social and Governance (ESG) principles.



CARBON DISCLOSURE PROJECT

GC has been rated environmental management in climate change management at Leadership Level (A-List) by CDP.



FTSE4Good

FTSE4GOOD INDEX

GC passed the evaluation criteria of FTSE and remains a constituent of the FTSE4Good Index Series for the fourth consecutive year. This demonstrates commitments in taking responsibilities on a basis of Environmental, Social and Governance (ESG).



THAILAND SUSTAINABILITY INVESTMENT

GC has been honored on a list of Thailand Sustainability Investment for the fifth consecutive year (2015-2019). This honor represents GC's efforts in creating a balance between the Environmental, Social and Governance that is in line with THSI assessment.



SET SUSTAINABILITY AWARDS OF HONOR

GC has won the SET Sustainability Awards for the third consecutive year. This award reflects GC's outstanding efforts in conducting sustainable business and disclosing sustainability performance data in complete and transparent manner.



AWARD OF HONOUR FOR NETWORK OF OUTSTANDING ORGANIZATIONS

GC received the award of honour from Ministry of Public Health. This award is given to the role model organizations for health promotion and disease prevention for working people.



ENVIRONMENTAL, SAFETY AND GOOD GOVERNMENTAL AWARD

GC Group received Golden Star Award in Environmental, Safety and Good Governmental Award from Industrial Estate Authority of Thailand. This represents the high standard of environmental and safety management for the fifth consecutive year.



THAILAND LABOR MANAGEMENT EXCELLENCE AWARD 2019

GC Group received eight awards from The Department of Labor Protection and Welfare, including, Occupational Health, Workplace Environment, and Thailand Labor Management Excellence Award.



LOW CARBON AND SUSTAINABLE BUSINESS INDEX (LCSi)

GC was recognized as a leading company in the Low Carbon and Sustainable Business Index (LCSi) with an Excellence Score by TGO. This demonstrates GC's commitment to gear toward low carbon business operation.



CSR-DIW CONTINUOUS AWARD

GC's subsidiaries received CSR-DIW Award from Department of Industrial Works, Ministry of Industry for the 12th consecutive year.



GREEN INDUSTRY

GC Group won 18 awards in the Green Industry Award and has received the green industry level 5 award for four consecutive years since 2016.



THAILAND VOLUNTARY EMISSION TRADING SCHEME (THAILAND V-ETS) CERTIFICATE

Two plants under GC Group received certification for pilot plant for Thailand Voluntary Emission Trading Scheme (Thailand V-ETS).

MAJOR EVENTS AND ACTIVITIES IN 2019

Supporting Strategies to Raise Competitiveness



January 9, 2019

GC inaugurated GC-M PTA plant – a major step under the strategy to invest in business chain expansion to add value to Paraxylene (PX) and Mono Ethylene Glycol (MEG)

GC joined the inauguration of the GC-M PTA plant after the Company and GC Glycol Co., Ltd. (Glycol), together with Mitsui Chemicals Co., Ltd. (MCI), successfully acquired 74% shares (both direct and indirect

shareholding) in Siam Mitsui PTA Co., Ltd. (SMPC), and Thai PET Resin Co., Ltd. (TPRC), an operator and distributor of Purified Terephthalic Acid (PTA) and Polyethylene Terephthalate Resin (PET). SMPC was then renamed GC-M PTA to reflect the cooperation of the two shareholders.

Such share acquisition is regarded as a major step forward by GC under the strategy to invest in business chain expansion to create higher value for PX and MEG. This would raise the Company's competitiveness in managing feedstock while ensuring stability of the business throughout the business chain. The move, moreover, helped strengthen GC Group's polymer market, enabling the Company to completely fulfill demand from PET bottle customers.



January 29, 2019

GC laid the foundation stone of GC Innovation: Performance Chemicals Building to grow downstream petrochemical business

As an auspicious start of operation, GC organized the foundation stone laying ceremony for its Innovation: Performance Chemicals Building at the construction site of GC Innovation, Rayong Office, Rayong. The new building will serve as a chemical laboratory and a prototype factory in support of the growth of GC's downstream petrochemical business. This is an expansion of the chemical value chain of such chemical groups as polyols and high value products in addition to lending support for joint venture partners.



January 29, 2019

GC laid the foundation stone of GC Oxirane's Propylene Oxide Project

GC organized the foundation stone laying ceremony under the Propylene Oxide Project under GC Oxirane Co., Ltd. (GCO), as an auspicious start of operation at the construction site of GCO in Map Ta Phut Industrial Estate, Rayong. This is considered a major investment under the government's Eastern Economic Corridor (EEC), which is planned to become the largest economic zone in ASEAN and one of the world's economic links, in a bid to move GC towards the New S-Curve.



February 27, 2019

GC and GE jointly extended a maintenance contract for power generators using GE's advanced technology to raise power process efficiency

GC signed a contract with General Electric (GE), on maintenance service for power generators using GE's advanced technology. The 10-year contract covers maintenance service for gas turbine power generators at GC's Olefins Plant Unit 1, located in Map Ta Phut Industrial Estate, Rayong. GC is GE's first customer in Thailand to have GE's Predix Asset Performance Management software installed, which is part of the application of GE's Total Plant and Digital Solutions. The signing ceremony took place at Centara Grand at Central Plaza, Ladprao, Bangkok.



April 26, 2019

GC and GPSC jointly invested in the Smart Energy Storage System

GC and Global Power Synergy Plc. (GPSC) jointly signed an agreement on co-investment in the Smart Energy Storage System (ESS). This is an ESS pilot project designed to enhance power generation from gas turbines and to increase power security for the Company's Rayong Office. System installation on the Company's Rayong office and Science & Innovation Center was completed in December 2019. ESS technology will later be applied on a Thailand's larger scale to enhance the power supply system for plant operation under GC Group. The signing ceremony was held at the Energy Complex, Bangkok.



September 3, 2019

GC joined Kuraray and Sumitomo in laying the foundation stone for specialty chemicals plants to produce advanced engineering plastic products, an expansion of new investment in EEC

GC, Kuraray Co., Ltd., and Sumitomo Corporation jointly held a ceremony to lay the foundation stone of an investment project for specialty chemicals to produce advanced engineering plastic products and to expand the new investment in EEC. The project encompasses two production plants, namely a thermoplastic rubber and specialty polyamide plant and butadiene and a downstream product plant. These two plants are to be operated by Kuraray GC Advanced Materials Co., Ltd. (KGC), and Kuraray Advanced Chemicals (Thailand) Co., Ltd. (KAC). The ceremony took place at the project site in WHA Eastern Industrial Estate (Map Ta Phut), Rayong.

Supporting Strategies to Foster Business Sustainability



January 11, 2019

GC signed an MOU with Silpakorn University on BioPBS packaging for making the World better

GC signed a memorandum of understanding with Silpakorn University in support of the production and application of environmentally friendly BioPBS packaging products in the forms of compostable bioplastic cups and straws. The cooperation is in line with the university's Be Smart Be Green policy and with GC's Circular Economy business trend, leading towards global sustainability. The signing ceremony took place at the Customer Solution Center, Energy Complex, Bangkok.



March 13, 2019

GC joined BJC for product development to expand sustainable business

GC signed a memorandum of understanding with Berli Jucker Plc. (BJC) on the cooperation to develop products, packaging, and raw materials in response to customers' current and future demand and in support of market expansion, both domestically and internationally. Projects under the cooperation include the sourcing of recycled plastics through the BJC business network; application of plastics and bioplastic products in the coffee, food, and retail businesses; and organization of social and environmental activities, such as product exhibition and CSR activities. The signing ceremony took place at BigC Extra, Rama IV branch, Bangkok.



January 26, 2019

Circular Factory by GC Pavilion at Bangkok Design Week 2019 showcased the new lifecycle of plastic products, underscoring the Circular Living concept

GC set up a pavilion to showcase Circular Factory by GC – a future factory which focuses on production and circular application of plastic products. This is to campaign for the GC Circular Living concept – a lifestyle marked by efficient use of limited resources. The concept also promotes knowledge about creative management of plastic products to safeguard the environment and foster awareness among society, creative thinkers, and plastic manufacturers. Innovation and creative designs showed how used plastic products can be turned into value-added lifestyle products to reduce plastic waste problems and ease environmental impacts. The pavilion was built at the Central Post Office building, Charoenkrung Road, Bangkok.



May 14, 2019

GC announced ambition of sustainability at the Dutch-Thai Sustainability Conference 2019

GC signed a contract with 14 organizations on business operation for sustainability, which focuses on responsibility for production processes and products. Through integrated cooperation with all sectors, tangible results that could drive the Circular Economy and create awareness of the correct use of plastics. This was part of the Dutch-Thai Sustainability Conference 2019, organized by the Netherlands Embassy at C Asean, Bangkok.



June 5, 2019

GC announced its intention to carry on plastic waste management in a sustainable manner under the PPP Plastic Project for 2019

At a press conference to report the performance of the Plastic Waste Management Subcommittee, GC took part in the announcement of the intention of Thailand Public-Private Partnership for Plastic and Waste Management (PPP Plastic Year 2). Under PPP Plastic Year 2, consumers and business operators in Thailand were encouraged to learn and adjust their behaviors, while nurturing awareness of the proper use of plastics in the interests of the environment and sustainability. PPP Plastic Year 2 aimed to reduce plastic waste in the Thai oceans by no less than 50% by 2027 while increasing waste sorting and recycling ratios, with a focus on shopping bags and plastic straws. This was to promote efficient consumption of resources according to the Circular Economy concept. Also, PPP Plastic Year 2 supported the establishment of Thailand's plastics database as a tool to measure the project's success, establishment of a clean city model on pilot areas of Bangkok and Rayong, and appointment of the project's ambassadors and volunteers. The press conference was held at the Impact Forum, Muang Thong Thani, Nonthaburi.



June 28, 2019

GC organized Circular Living Symposium 2019: Upcycling Our Planet, aiming to revolutionize efficient use of resources and advocate the Circular Economy to safeguard the world

GC organized the Circular Living Symposium 2019: Upcycling Our Planet, the first such conference to be held in collaboration with world-class media National Geographic to foster awareness of participation in natural resource and environmental conservation. The concept of GC Circular Living was promoted for adoption in everyday life. GC Circular Living encourages waste sorting and reduction, efficient use of plastics through reuse, creative and innovative use of recycled or upcycled products, and use of environmentally friendly products. Local and foreign creative thinkers and experts in the Circular Economy also gathered at the symposium to share their knowledge and views. The symposium was meant to be a medium for creating opportunities and for forming connections among different networks and sectors to drive Thailand's policy. The event was held at the Athenee Hotel, Bangkok.



July 8, 2019

GC took part in the launching of the first branch of Café Amazon Circular Living Concept, featuring shop decoration with coffee grounds and used plastics

GC, PTT Plc. (PTT), and PTT Oil and Retail Business Plc. (PTTOR) jointly launched the Café Amazon Circular Living Concept at PTT Station Samyan Branch – the first branch in Thailand to operate in response to the save the world concept and concern for the environment. At the café, coffee grounds and used plastics have been through the upcycling process to increase the value of modern shop furniture under the Circular Economy concept to conserve natural resources and the environment with a focus on efficient use of resources. GC pays attention to turning plastic waste into save the world products through joint creation with designers.

Supporting Strategies to Foster Business Sustainability



July 9, 2019

GC joined Sansiri to establish Thailand's first full-scale Green Society, showcasing leadership in Circular Living

GC announced cooperation with Sansiri Plc. in setting a new standard of responsibility for the environment in an earnest and sustainable way. The cooperation was materialized through the establishment of Green Society, based on the Circular Economy concept, which in turn stems from the cooperation between Sansiri and business allies to develop environmentally friendly furniture that can be used in Sansiri's property projects. This exhibits each other's vision that is consistent in developing a business towards sustainability. Piloting the project are Sansiri x GC: Fulfill Your Living through Innovation and cooperation with two other big brands, namely Pasaya and SB Furniture, in developing environmentally friendly furniture for display at 32 projects under Sansiri, which will result in the reduction of carbon dioxide by 664 kilograms during the initial stage of the project, equivalent to replanting 74 trees.



September 4, 2019

GC joined ALPLA to form joint venture company to produce high-quality recycled polymers, the first in Thailand

Mr. Piyasvasti Amranand, GC Chairman, presided over the contract signing between GC and Alpla Packaging, a world-class producer of recycled polymers, on the establishment of ENVICCO Limited, a joint-venture company located in the Asia Industrial Estate, Map Ta Phut, Rayong. The event took place at the St. Regis Bangkok. This joint venture company has been established to produce high-quality recycled plastic pellets, namely rPET and rHDPE. As the first such production plant in Thailand, ENVICCO will create added value for used plastics while providing jobs for the Rayong community. ENVICCO also has a plan to source raw materials through cooperation with local communities.



October 24, 2019

GC received 82,000 used plastic bottles and compostable cups from the project 'Kao Khon La Kao' in the South – an attempt to make an innovative journey for plastic waste and encourage a modern lifestyle that focuses on reducing plastic waste

GC received 82,000 used plastic water bottles from 'Kao Khon La Kao' – a run for charity project. These used bottles were intended for upcycling and reproducing into medal straps and T-shirts for sale in the project's run in another region. GC had earlier received 80,000 used water bottles from the run in the Northeast. After the completion of the runs in the Northeast and the South,

a total of 160,000 used plastic bottles were collected and turned into straps with medals and the project's T-shirts as well as some 9,000 GC compostable cups, which were presented to the Royal Forest Department for use as seed pots. The upcycling project supports efficient use of plastics by selling plastic products recycled from waste in Sarn Palung Social Enterprise shops. Part of the proceeds will go to society.

Supporting Strategy for Strengthening Support Units and Corporate Governance



June 19, 2019

GC and Chulalongkorn University jointly undertook a feasibility study on innovation to treat cancer patients using cellular and immune therapy

GC and Chulalongkorn University signed a memorandum of understanding on a feasibility study on cancer treatment using cellular and immune therapy, a new hope for terminal-cancer patients and those who have gone through other treatment methods. An investment plan has been drawn up to provide local cancer patients with an equal chance to access the treatment at reasonable costs. Under the MOU, treatment is to be included in the government's universal healthcare scheme and private health insurance schemes. The cooperation, moreover, provides a business opportunity to expand such technology to ASEAN countries, which will result in sustainable medical development in Thailand. The signing ceremony took place at the Customer Solution Center (CSC), Energy Complex, Bangkok.



September 9, 2019

GC signed a contract with NirvaMed Inc. on partnership and investment in medical technology for dealing with heart failures

At Siriraj Hospital's Medical Research Center, Faculty of Medicine, Mahidol University, GC and Siriraj Foundation together with local leading organizations in both public and private sectors jointly signed a contract with NirvaMed Inc. that encompasses cooperation on medical equipment development by Thai scientists. The cooperation aims to develop medical technology that can save lives, particularly millions of those with heart failures across the globe. This will be the first time that local medical research can revolutionize medical practices on a global scale, resulting in Thailand becoming a world leader in heart failure treatment.



MESSAGE FROM THE CHAIRMAN



Dear shareholders,

This year was yet another one of pride for PTT Global Chemical Public Company Limited (GC), thanks to our commitment to driving businesses for sustainability with economic, social, and environmental balance under the sustainability framework, together with adherence to the principles and guidelines of good corporate governance. In parallel was our relentlessly equitable and fair stewardship of all stakeholders. Perhaps not surprisingly, we achieved key national and international goals. To mention a few, membership of the Dow Jones Sustainability Indices (DJSI) with the top score worldwide on sustainable development in the Chemical sector; we were ranked at the prestigious LEAD level among members of the UN Global Compact; at home, accolades including the SET Sustainability Award of Honor for the third straight year.

This year external factors exerted unrelenting pressure on our operations, including tense commercial and economic situations arising from the trade war and highly volatile prices of oil and petrochemical products. Still, we successfully survived these crises. We posted Baht 412,810 million in revenues from sale of goods and rendering of services and Baht 11,682 million in net profit, equivalent to Baht 2.59 in earnings per share. These figures are fruits of efficiency management practices as well as the execution of performance improvement programs to ease the impacts of the above-mentioned factors, including management of production costs, incremental profit from plant reliability enhancement, Project Max and Max Infinity implementation, and strict control of operating expenditure.

Continue and Expand our Business into the 9th Year

We recognize plenty of challenges facing us in the future in view of the petrochemical industry trends that might see structural shifts, including cost breakthroughs of emerging technologies, a big influx of investment into the Asian region, geopolitical issues, and consumers' behavioral shifts – so evident in current campaigns to trim single-use plastics. All these send ripples going through future years' demand for petrochemicals, and so we are gearing up for these imminent scenarios to continue and expand our businesses into the 9th Year under the “3 Steps” strategies.

Step Change: Strengthen home base. We continue to enhance our business competitiveness and plant reliability together with expand into High Value Business

(HVB) and high-growth Southeast-Asia market base. This strategic element establishes long-term market security in parallel with the creation of added value with premium-value products.

Step Out: Leading at Global Level. We seek 2nd home base by establishing business platforms abroad where feedstock prices are competitive and markets are robust. We will strive for success of the US Petrochemical Complex Project before entering new businesses via joint ventures or M&As for fast-track growth.

Step Up: Become role model organization of sustainability. We enhance sustainability framework by the extension of the Circular Economy concept with socio-environmental responsibility and sustainability integration into core of business.

Commitment to Becoming a Circular Economy Role Model

With a commitment to becoming a Circular Economy role model – a crucial approach nowadays for resolving resource shortage and easing climate change alike – we take Circular Economy application most seriously. For it could effectively lessen waste and environmental impacts throughout the supply chain through key actions: Smart Operating (shaping new business models that apply technology to process improvement for more efficient natural resource consumption), Responsible Caring (design and green product development), and Loop Connecting (intensifying synergy with stakeholders to integrate businesses to achieve our goal of a true role model of sustainability).

On behalf of the Board of Directors, the management, and employees, I would like to express my heartfelt appreciation to the shareholders and stakeholders in all sectors for their continued wonderful cooperation and support. Our vision and strategies are clear. Thanks to all our personnel's total dedication through thick and thin, our strides will be made with vigor and stability, while we remain a leading chemical company for better living and an integral part of the drive of our national economy.



Mr. Piyasvasti Amranand

Chairman

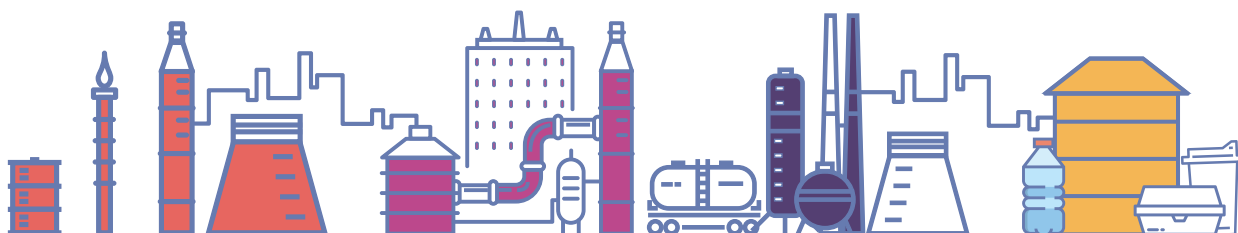
FROM TRASH TO **TRASHION**



BUSINESS HIGHLIGHTS

BUSINESS STRUCTURE

In 2019, GC, as a Chemical Flagship of PTT Group with a combined chemical/petrochemical capacity of 11.27 million tons per year and crude oil/condensate distillation capacity of 280,000 barrels per day. GC consists of 8 business groups and has other businesses and services which GC invested for supporting 8 business groups, summarized in the diagram as follows:



**REFINERY
& SHARED
FACILITIES**

AROMATICS

OLEFINS

POLYMERS

MAIN PRODUCTS

● LPG	● BENZENE	● ETHYLENE	● HDPE
● LIGHT NAPHTHA	● TOLUENE**	● PROPYLENE	● LDPE
● REFORMATE	● PARAXYLENE	● BUTADIENE	● LLDPE
● JET A1	● ORTHOXYLENE	● BUTENE-1	● PP
● DIESEL	● MIXED XYLENES**		● PTA
● FUEL OIL	● CYCLOHEXANE		● PET
			● PS
			● HEXENE-1**
			● Rotomolding Compound

CAPACITY*

● CRUDE OIL DISTILLATION 145,000 BARRELS/DAY	● CONDENSATE DISTILLATION 135,000 BARRELS/DAY	● ETHYLENE/ PROPYLENE 2,888 KTA	● POLYETHYLENE 1,950 KTA
	● AROMATICS 2,419 KTA	● BUTADIENE/ BUTENE-1 100 KTA	● POLYSTYRENE 90 KTA
			● POLYPROPYLENE 336 KTA
			● PTA 718 KTA
			● PET 109 KTA
			● HEXENE-1 34 KTA
			● Rotomolding Compound 31 KTA

OPERATED BY

● GC	● GC	● GC	● GC	● GC-MPTA
			● GCS	● TPRC
			● HMC	● RGL

SERVICES AND OTHERS

- Jetty and chemical tank farm
- Utility business
- Plant maintenance and engineering design services
- Safety, occupational health, and environmental, and security services
- Pipeline infrastructural services
- Information and Communication Technology Service
- Labor Outsourcing service
- Marketing and sales of Methyl Amine Derivatives, Plastic Compounds, Specialty Products, and Health and Nutrition Products

Operated by TTT
Operated by GPSC
Operated by GCME and PTES
Operated by NPC S&E and NPCSG

Operated by EFT
Operated by PTT Digital

Operated by BSA
Operated by Solution Creation

- Polymer sales services
- Logistics services
- GC Group's liquidity management and financing service
- Management Consultancy
- Manufacture procure, sell products and/ or provide services that contributes to society
- Plastic packaging development Support
- Land and property management
- Corporate Venture Capital investment

Operated by GCM (Polymers Business Unit)
Operated by GCL (Polymers Business Unit)
Operated by GCTC

Operated by PRS Rayong
Operated by SPSE

Operated by SPIG
Operate by GCEC
Operate by GCV and GCVA



EO-BASED
PERFORMANCE

GREEN
CHEMICALS

PHENOL

PERFORMANCE
MATERIALS AND
CHEMICALS

MAIN PRODUCTS

- ETHYLENE GLYCOL
- ETHANOLAMINE

- METHYL ESTER
- GLYCERIN
- FATTY ACID
- FATTY ALCOHOL
- ETHOXYLATE
- SPECIALTY OLEOCHEMICALS
- BIOPLASTIC

- PHENOL
- BISPHENOL A
- ACETONE

- HEXAMETHYLENE DISOCYANATE AND DERIVATIVES
- ACRYLONITRILE
- METHYL METHACRYLATE

CAPACITY*

● 473 KTA

● 917 KTA

● 954 KTA

● 250 KTA

OPERATED BY

- GLYCOL

- GGC
- PTTMCC
- EMERY
- NATUREWORKS

- PPCL

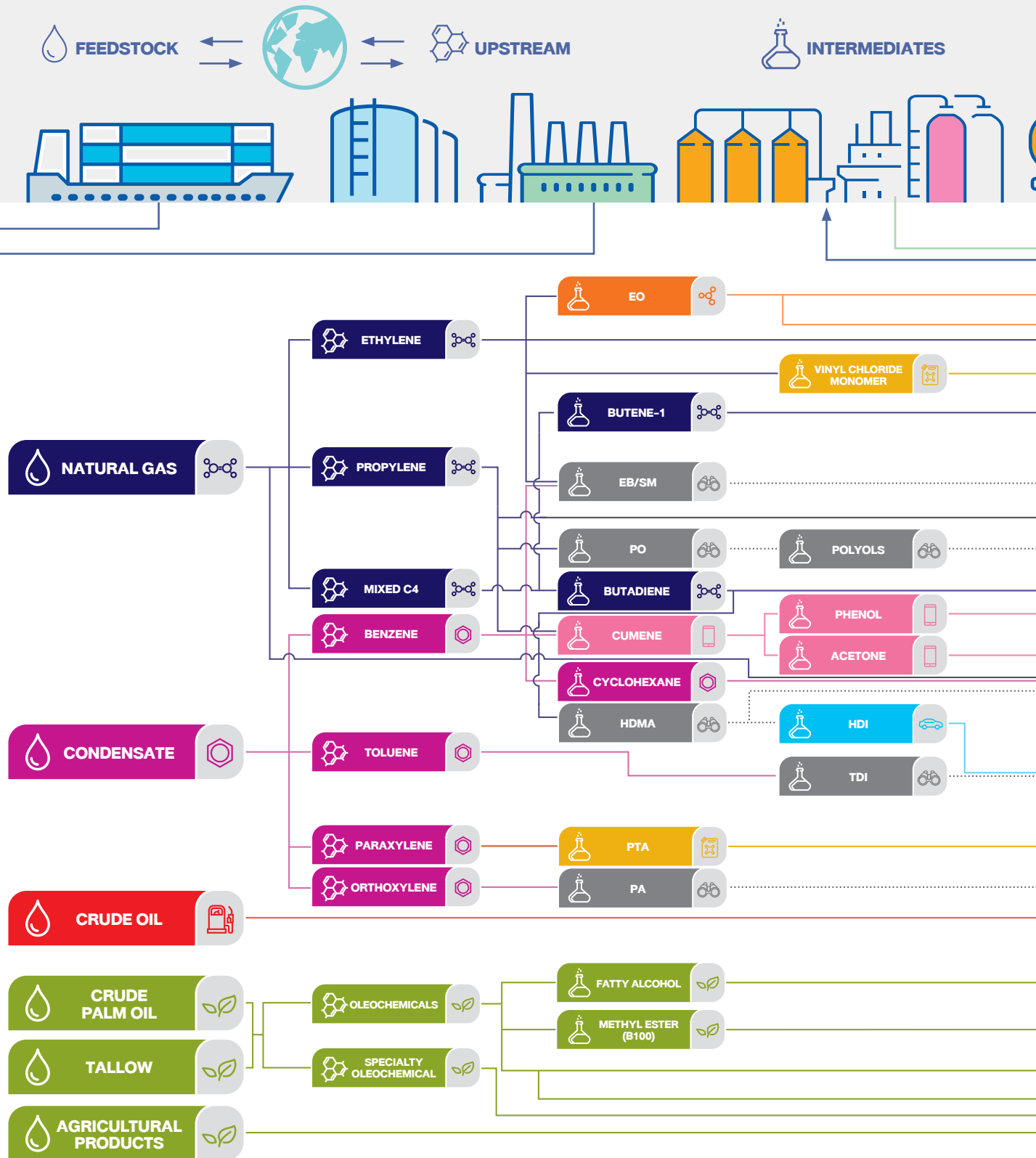
- VENCOREX
- PTTAC

Remarks:

* Only capacity that GC hold equal to or more than 25% share and calculate proportion by percent share.

** For internal use

BUSINESS VALUE CHAIN



Group Performance
Center-Refinery & Shared Facilities



Group Performance Center
Aromatics



Group Performance
Center-Olefins



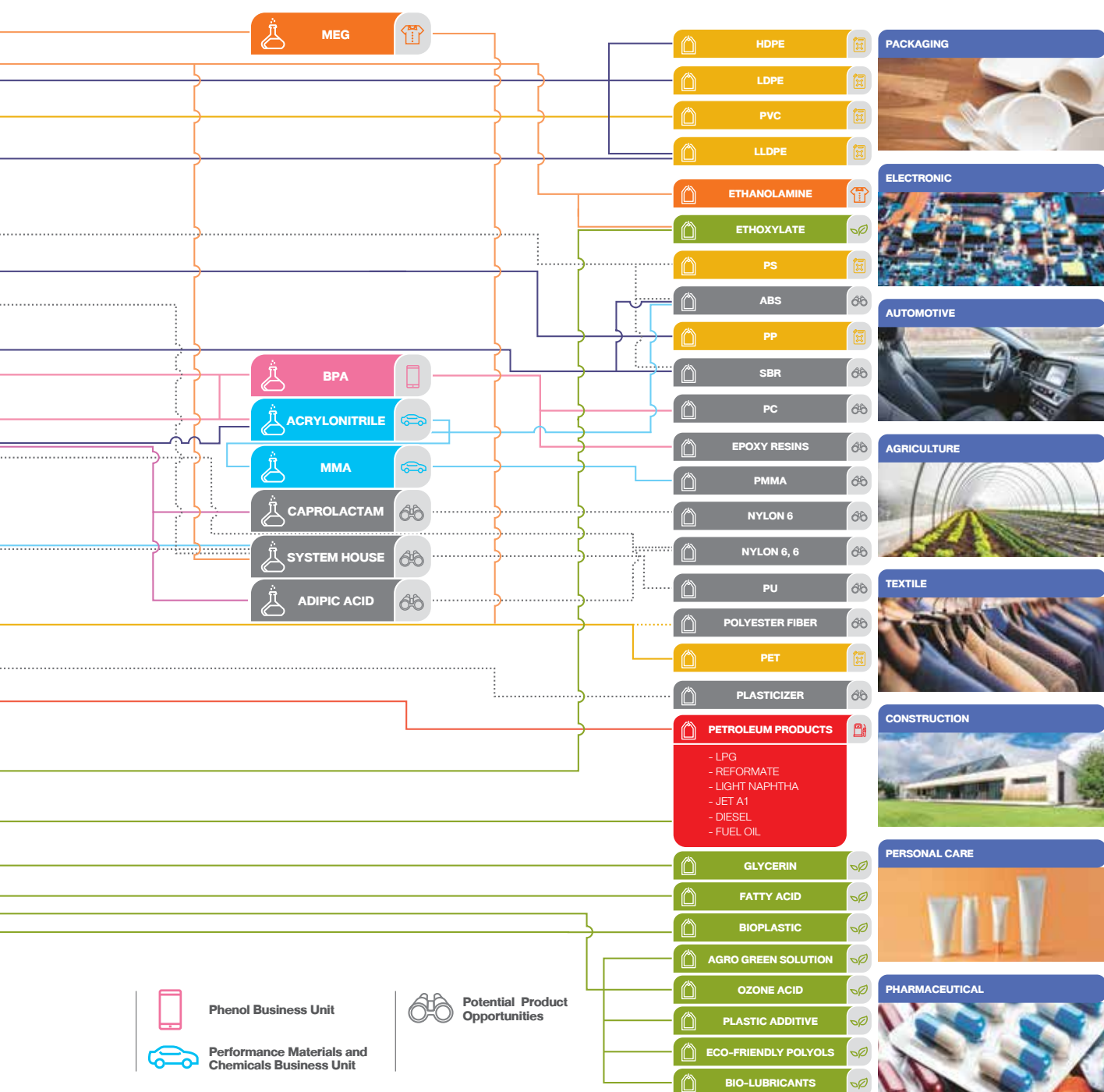
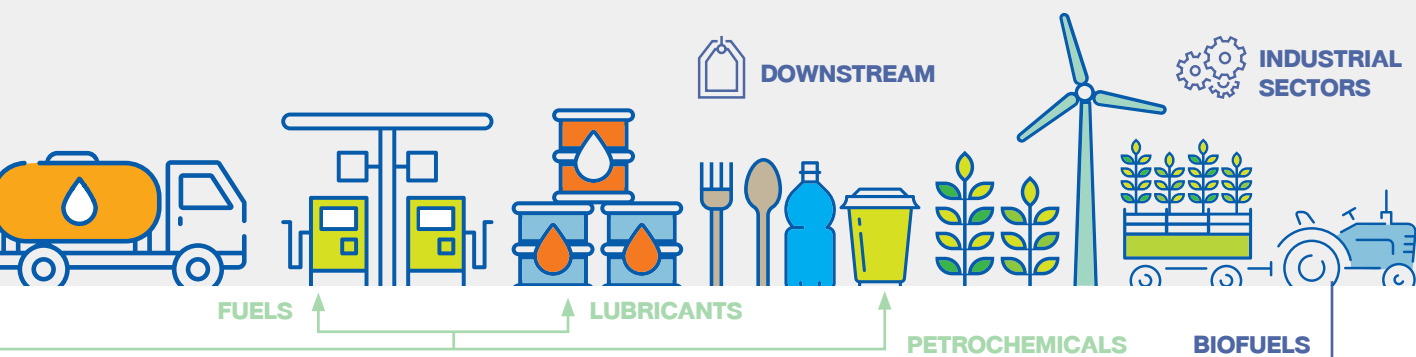
Polymers Business Unit



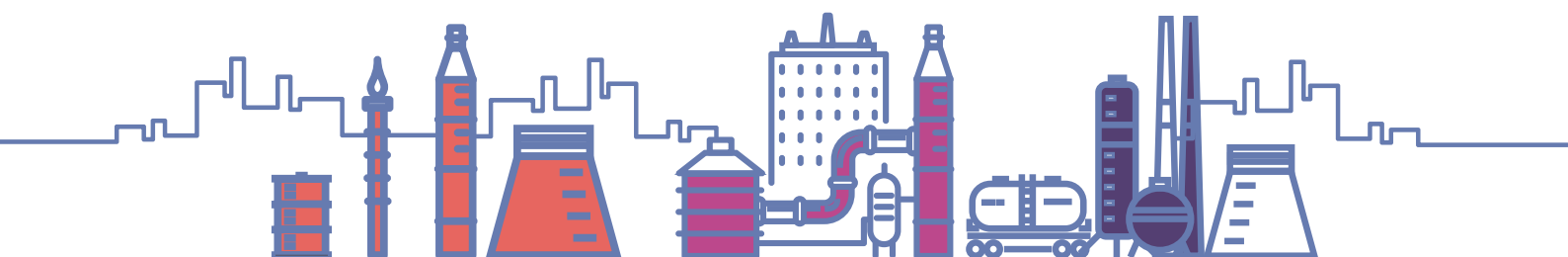
EO-Based Performance
Business Unit



Green Chemicals Business Unit



NATURE OF BUSINESS AND PERFORMANCE



GROUP PERFORMANCE CENTER – REFINERY AND SHARED FACILITIES

As Thailand's leading refiner and distributor of petroleum products, GC owns and operates a modern complex refinery equipped with hydrocracker and visbreaker units, capable of converting low-value

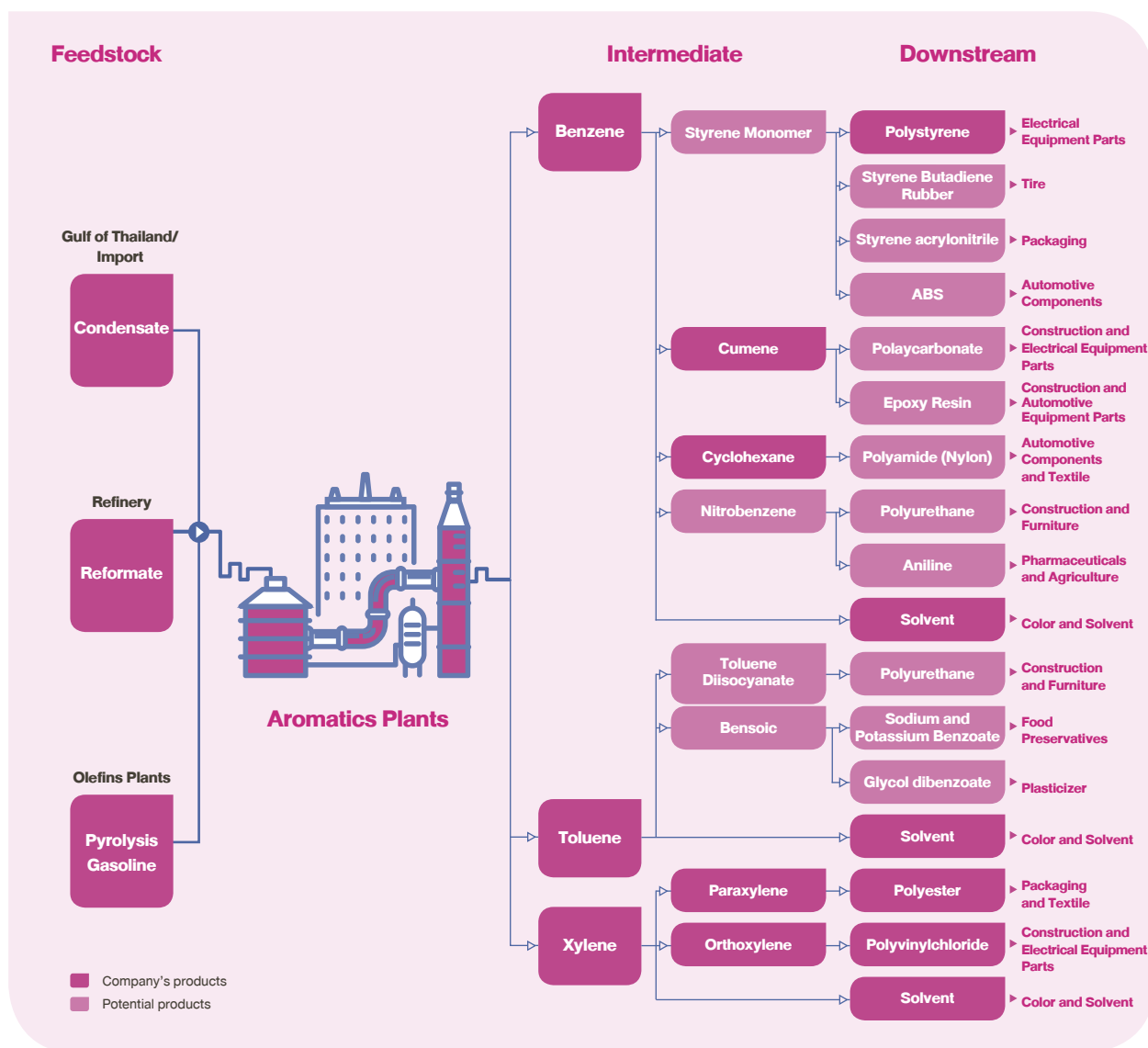
fuel oil to more valuable middle-distillate products. Our average refining capacity stands at 145,000 barrels per day of crude and 135,000 barrels per day of condensate. Additionally, our refining process is flexible, ready to be adjusted to accommodate customer demand and volatility in the market. Below is a summary of our refined products and their usage:

Petroleum Product		Usage
Light Distillate	Liquefied Petroleum Gas (LPG)	<ul style="list-style-type: none"> Fuel Petrochemical feedstock (Olefins plants)
	Light Naphtha	<ul style="list-style-type: none"> Gasoline blending component Petrochemical feedstock (Olefins plants)
	Reformate	<ul style="list-style-type: none"> Gasoline blending component Petrochemical feedstock (Aromatics plants)
Middle Distillate	Jet Fuel	<ul style="list-style-type: none"> Aviation fuel
	Diesel	<ul style="list-style-type: none"> Fuel for industrial and transport sectors
Heavy Distillate	Fuel Oil	<ul style="list-style-type: none"> Fuel for industrial sector and maritime transport

As of 2019, GC has a domestic middle-distillate market share of approximately 21 percent.

GROUP PERFORMANCE CENTER - AROMATICS

GC produces and distributes aromatics products, namely paraxylene, benzene, orthoxylene, mixed xylene, toluene, and cyclohexane. These products are used as feedstock in various industrial processes, detailed in the chart below:



Aside from these products, GC's aromatics plants yield multiple by-products, including liquefied petroleum gas (LPG), light naphtha, heavy aromatics, and condensate residue. LPG and light naphtha are

used as feedstock in our olefins plants, while heavy aromatics and condensate residue are used as feedstock in our refinery to produce jet fuel, diesel, and fuel oil.

GC currently operates two aromatics plants with a combined capacity of 2,419 thousand tons per year. The table below details the nameplate capacity of each product:

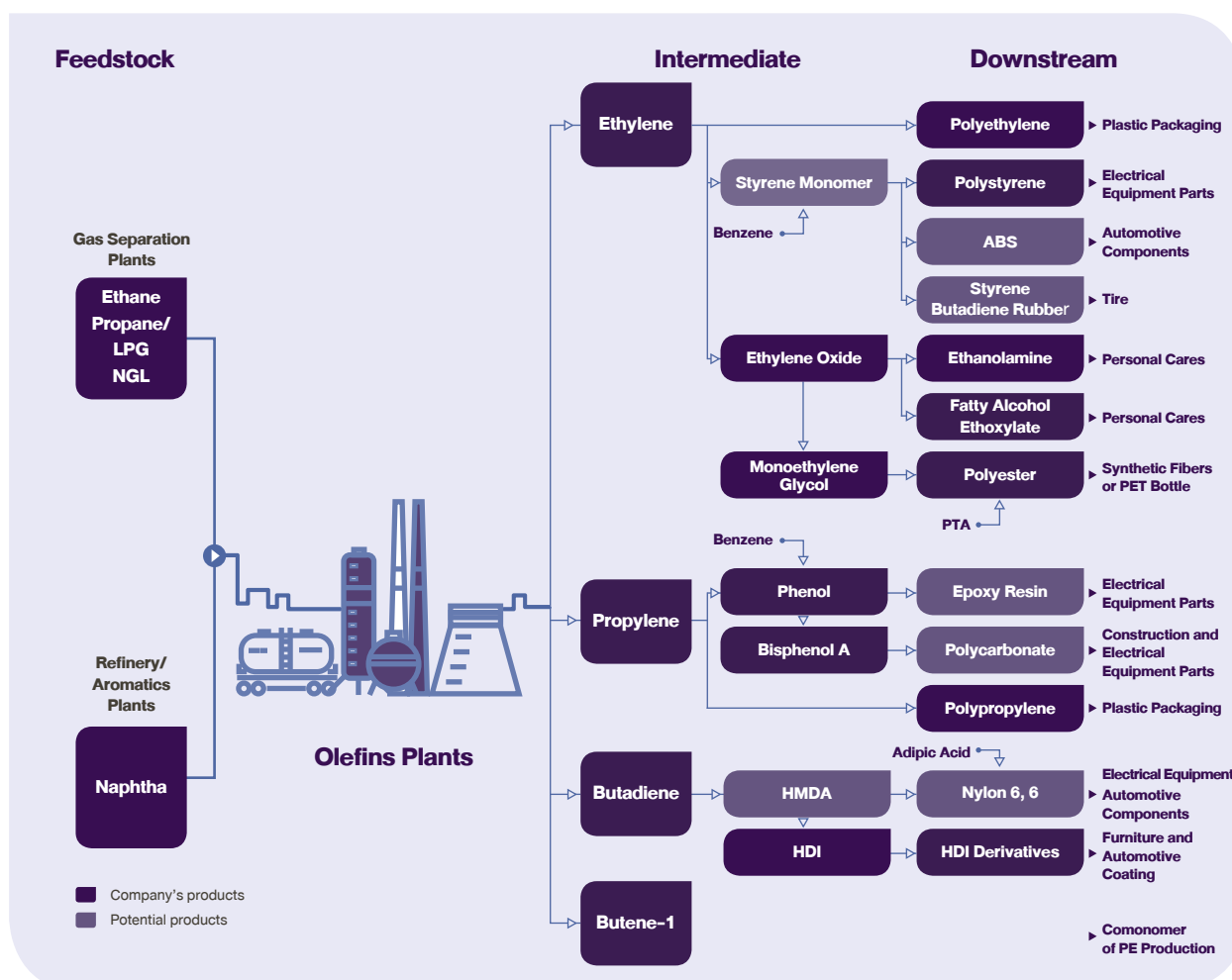
Company	Product	Nameplate Capacity (thousand tons per year)
GC	Benzene	697
	Toluene*	50
	Paraxylene	1,310
	Orthoxylene	86
	Mixed Xylene*	76
	Cyclohexane	200

Remarks: * Toluene and mixed xylene are currently used as feedstock at both aromatics plants.

As of 2019, GC has a domestic aromatics market share of approximately 70 percent.

GROUP PERFORMANCE CENTER - OLEFINS

Olefins products obtained from GC's olefins plants mainly consist of ethylene and propylene. The chart below shows the feedstock for the production and their sources, as well as intermediate and downstream products:



The olefins plants also yield various by-products, such as pyrolysis gasoline, mixed C4, tail gas, cracker bottom, and hydrogen. GC enriches the values of these by-products through synergy with the refinery and aromatics plants. For example, pyrolysis gasoline is turned into aromatics products; cracker bottom is distilled into petroleum products; hydrogen is used in the refinery as a substitute for hydrogen produced by the Hydrogen Manufacturing Unit (HMU), which otherwise requires a higher production cost; and mixed C4 is turned into butadiene and butene-1 at the by-product value-added plant.

At GC, we also produce utilities (electricity, steam, and industrial water) for our own use, which enhances our production capability and competitiveness. Surplus volumes of the utilities are sold to Electricity Generating Authority of Thailand (EGAT) and neighboring petrochemical plants.

GC has four olefins plants with a combined nameplate capacity of 2,988 thousand tons per year of ethylene, propylene, butadiene and butene-1. The table below shows a breakdown of their capacities:

Company	Product	Nameplate Capacity (thousand tons per year)
GC	Ethylene	2,376
	Propylene	512
	Butadiene	75
	Butene-1	25

As of 2019, GC has a domestic ethylene and propylene market share of approximately 35 and 30 percent, respectively.

POLYMERS BUSINESS UNIT

Polymers are downstream petrochemicals primarily used as feedstock for everyday plastic products. They are commonly molded into multiple shapes and forms of plastic packaging, such as bags, bottles, containers for food and general goods, lubricant containers, buckets, and crates. Polymers are also used as feedstock for other downstream industries, such as electrical appliances, polyester fibre, fishery, agriculture, and construction. Our key polymer products are as follows:

- High-density polyethylene (HDPE)
- Linear low-density polyethylene (LLDPE)
- Low-density polyethylene (LDPE)
- Polypropylene (PP)
- Purified terephthalic acid (PTA)
- Polyethylene terephthalate (PET)
- Polystyrene (PS)
- Rotomolding compound.

Polyethylene (PE) are produced by GC and sold under the InnoPlus trademark. Polypropylene (PP) are produced by HMC Polymers Co., Ltd., and sold under the Moplen, Purell, Clyrell, Adstif and Adsyl trademarks. Purified terephthalic acid (PTA) is produced by GC-M PTA Co., Ltd. (GC-M PTA), while polyethylene terephthalate (PET) are produced by Thai PET Resin Co., Ltd. (TPRC), and sold under the InnoPlus trademark. Polystyrene (PS), available as general-purpose polystyrene (GPPS) and high-impact polystyrene (HIPS), are produced by GC Styrenics Co., Ltd. (GCS), under the management of GC's Polymers Business Unit and sold under the DIAREX trademark. Rotomolding compound is produced by Revolve Group Limited (RGL) and sold under the Matrix Polymers trademark.

GC Group currently operates 18 commercial polymer plants in Map Ta Phut Industrial Estate and Pha Daeng Industrial Estate, Rayong. Rotomolding compound plants operate in Malaysia, the UK, Poland, Australia, and New Zealand. The capacities of major polymer products are shown in the table below:

Company	Product	Nameplate Capacity (thousand tons per year)
GC	HDPE	850
	LLDPE	800
	LDPE	300
	Hexene-1*	34
HMC	PP	810
GC-M PTA	PTA	970
TPRC	PET	147
GCS	PS	90
RGL	Rotomolding Compound	64

Remarks: * For internal use as feedstock for LLDPE (metallocene)

EO-BASED PERFORMANCE BUSINESS UNIT

To supplement value to current olefins products and satisfy rising demand from the industrial sector and general consumers, GC recognizes the need for high-value products which has not manufactured in Thailand yet. This is not only for import substitution, but also to raise Thailand's petrochemical competitiveness. GC has expanded businesses into ethylene-oxide-based performance products and downstream products. Our key EO-based performance products and their applications are described as follows:

A) ETHYLENE OXIDE (EO)/ETHYLENE GLYCOL (EG)

As a downstream product of ethylene, EO used as feedstock for EG and other downstream products. EG-based products consist of mono ethylene glycol (MEG), diethylene glycol (DEG), triethylene glycol (TEG), and polyethylene glycol (PEG). Among these

products, MEG is the main feedstock combined with PTA for the production of PET bottles and polyester textile.

B) ETHANOLAMINE (EA)

Derived from EO, EA primarily comes in either the monoethanolamine (MEA), diethanolamine (DEA), or triethanolamine (TEA) form. EA products are used as ingredients for the production of shampoos, hair conditioners, fabric softeners, and cosmetic products, as well as in pharmaceutical and cement industries, among others.

All of these EO-based products are produced by GC Glycol Co., Ltd. (Glycol).

In 2019, the EO-Based Performance Business Unit commercially operates two plants located in WHA Eastern Industrial Estate (Map Ta Phut), Rayong. The breakdown of production capacities appears in the table below:

Company	Product	Nameplate Capacity (thousand tons per year)
Glycol	MEG	423
	EA	50

GREEN CHEMICALS BUSINESS UNIT

Green chemicals are products manufactured from natural feedstocks such as palm oil, palm kernel oil, vegetable oil, animal fat, corn, sugar made from sugarcane, and cassava. These products can be used in various downstream industries, such as personal care, pharmaceuticals, food, biochemicals, and bioplastics industries. Our green chemical products are divided into two key categories as follows:

A) VALUE-ADDED OLEOCHEMICALS (VAO)

METHYL ESTER

Methyl ester is a basic oleochemical. Also known as B100, it can be blended into diesel to make biodiesel that meets EN14214 European standards for diesel engines. Methyl ester helps augment the efficiency of diesel, for both lubrication and combustion. It also increases an engine's lifespan and, more importantly, minimises environmental impacts of conventional diesel.

FATTY ALCOHOL

Fatty alcohol is a basic oleochemicals used as a feedstock in a number of different processes in the personal care industry. Also used as an ingredient or a component of many other products, including surfactants, plasticisers, solvents, aroma compounds for perfumes, detergents, foam stabilizers, lubricants, cosmetics, plastic intermediates, shampoos, as well as paints and coating products. They are also found in leatherwear and ink.

FATTY ALCOHOL ETHOXYLATE

Derived from fatty alcohol and EO, fatty alcohol ethoxylate is used as feedstock for shampoo, personal care, and home care products. In textiles, it is used as a scouring agent, which is part of the preparation process, and as softener, which is the last step in fibre preparation.

GLYCERIN

Glycerin, a by-product of methyl ester and fatty alcohol production, is used in pharmaceuticals, food, and personal care industries.

FATTY ACID

Fatty acid is a basic oleochemical product used for personal care production, such as soap and cosmetics, also used as a feedstock in specialty oleochemicals downstream production.

SPECIALTY OLEOCHEMICALS

Specialty oleochemicals are made from basic oleochemicals in a downstream process. These specialty products are used in multiple industries, including cleaning products, personal care products, plastic additives, construction, and oil well drilling. Examples of specialty oleochemicals are ozone acid, bio-lubricants, green polymer additives, agro-green solutions, and eco-friendly polyols.

B) BIOPLASTICS AND BIOCHEMICALS

Bioplastics and bio-based chemicals are derived from natural feedstock, including sugar from sugarcane, cassava, and corn. The feedstock, depend on type, is turned into chemicals such as, lactic and succinic acids. These two chemicals are used in the production of bioplastic such as polylactic acid (PLA) and polyesters such as polybutylene succinate (PBS), respectively.

The Company produces these value-added oleochemicals (VAO) through Global Green Chemical Public Company Limited (GGC), Emery Oleochemicals (M) Sdn. Bhd. (EOM) and Emery Specialty Chemicals Sdn. Bhd. (ESC) (EOM and ESC together called Emery), a joint venture between GC and Sime Darby Plantation (M) Sdn. Bhd., headquartered in Malaysia. Emery is a world-class producer and distributor of oleochemicals. Emery has plants in key regions across the globe, including Malaysia, Germany, and the U.S., and a worldwide network of subsidiaries to support trading and marketing. Its distribution agents are also present in all geographical regions.

GC operates the bioplastics and biochemicals business through NatureWorks LLC and PTTMCC Biochem Co., Ltd. (PTTMCC). NatureWorks, a joint venture with Cargill Inc. of the U.S., is the proprietor of a polylactic acid (PLA) technology with a commercial capacity of 150,000 tons per year. PTTMCC is a joint venture with Mitsubishi Chemical Corporation (MCC), established for the production and distribution of

polybutylene succinate (PBS), an environment-friendly product composable in ambient temperature. PTTMCC is the world's sole producer of bio-PBS, owning a plant in Rayong with a capacity of 20,000 tons per year.

The capacities of commercial plants in Thailand and abroad under the Green Chemicals Business Unit are shown in the table below:

Company	Product	Nameplate Capacity (thousand tons per year)
GGC	Methyl Ester	500
	Glycerin	31
	Fatty Alcohol	100
	Fatty Alcohol Ethoxylate	124
Emery	Basic Oleochemicals in US	291
	Basic Oleochemicals in Asia	260
	Specialty Oleochemicals in US	48
	Specialty Oleochemicals in Asia	53
	Specialty Oleochemicals in EU	46
NatureWorks	Polylactic Acid (PLA)	150
PTTMCC	Polybutylene Succinate	20

PHENOL BUSINESS UNIT

Phenol is used as feedstock for the production of downstream products, such as engineering plastics. These products are in high demand in high-growth industries, including automotive, electrical appliance and electronics, and construction. GC Group operates the phenol business through PTT Phenol Company Limited (PPCL) with key products listed below:

A) PHENOL

Phenol, an intermediate petrochemical derived from benzene and propylene, is a key feedstock for bisphenol A (BPA), phenolic resin, and various derivatives for the plastic, pharmaceuticals, and chemical industries.

B) ACETONE

Acetone, a by-product from phenol production, is a very common solvent in various industries, such as chemical, cosmetics, and medical industries. Acetone is also used as feedstock for bisphenol A and methyl methacrylate, used in plastics and coating industries, among others.

C) BISPHENOL A

Bisphenol A is an intermediate petrochemical and feedstock for polycarbonate (PC), an engineering plastic used in various industries, such as the automotive industry, electrical appliance and electronics industry, and construction industry. BPA is also a key feedstock for epoxy resin.

In 2019, PPCL operates three commercial plants located in WHA Eastern Industrial Estate (Map Ta Phut), Rayong, as detailed in the following table:

Company	Product	Nameplate Capacity (thousand tons per year)
PPCL	Phenol	492
	Acetone	304
	Bisphenol A	158

PERFORMANCE MATERIALS AND CHEMICALS BUSINESS UNIT

Performance materials and chemicals are major components in burgeoning downstream industries, such as the automotive, construction, and engineering plastic industries. Products under the business unit consist of:

A) HEXAMETHYLENE DIISOCYANATE (HDI) AND DERIVATIVES

HDI is an intermediate petrochemical used in the production of PU coating, which plays a prominent role in construction and automotive industries. PU coating can also be applied to wood, metals, plastics, furniture, and vehicles to enhance their glossy and scratch-resistant properties. GC produces HDI and HDI derivatives through Vencorex Holding France (Vencorex) in France.

B) ACRYLONITRILE (AN)

AN is an intermediate petrochemicals widely used as monomers for the production of acrylonitrile polymers, such as acrylic fibre and other synthetic fibres for component of garments and carpets production. AN is also used as feedstock for conducting acrylonitrile-butadiene-styrene (ABS). Thanks to its strength, resistance to scratch,

friction, wear and tear, and easy to clean properties, ABS is generally molded into exterior shells of electrical and electronics appliances. AN is also used as feedstock for nylon, which is popular in the automotive industry, particularly in car parts and joints, due to its superior hardness and toughness. Nylon parts can maintain their forms and withstand impacts; they can better resist friction, heat, and chemicals than ordinary plastics.

C) METHYL METHACRYLATE (MMA)

MMA is an intermediate petrochemical and the main feedstock for polymethyl methacrylate (PMMA) and PMMA acrylic sheets, which are components of furniture, commercial light boxes, smartphone screens, television screens, and computer screens. They are also an ingredient for emulsion and paint, commonly used in the construction industry.

GC produces AN and MMA through PTT Asahi Chemical Co., Ltd. (PTTAC), whose plant is located in WHA Eastern Industrial Estate (Map Ta Phut), Rayong.

Vencorex's plants are located in industrial estates in France, the U.S., and Thailand, while PTTAC's plant is located at WHA Eastern Industrial Estate (Map Ta Phut), Rayong. Their production capacities are shown below:

Company	Product	Nameplate Capacity (thousand tons per year)
Vencorex	HDI and HDI Derivatives	127
PTTAC	Acrylonitrile (AN)	200
	Methyl Methacrylate (MMA)	70

SERVICES AND OTHERS

In addition to the eight business units and performance centers, GC values businesses and activities that support business stability and comprehensiveness of the business chain. These various endeavors are listed below:

- 1) Jetty and Chemical Tank Farm:** Thai Tank Terminal Limited (TTT), provides terminals and liquid chemicals storage for industrial customers in Map Ta Phut Industrial Estate.
- 2) Utility Business:** GC has invested by holding Global Power Synergy Public Company Limited (GPSC) shares, GPSC produces and supplies electricity, steam, and industrial water to companies under PTT Group and other industrial plants.
- 3) Plant Management and Engineering Design Services:** GC Maintenance and Engineering Co., Ltd. (GCME), provides multiple services, including plant maintenance, design and engineering, construction, pipework, procurement, material work, and process administration are offered to petroleum and petrochemical operators in Map Ta Phut Industrial Estate, as well as other industries both in Thailand and Asia. GC has also joined hands within PTT Group in establishing PTT Energy Solutions Co., Ltd. (PTTES), to provide technical engineering consultation service.
- 4) Safety, Occupational Health, Environmental, and Security Services:** NPC Safety and Environmental Service Co., Ltd. (NPC S&E), provides integrated services concerning safety, occupational health and environmental training; design and installation of fire protection systems; and consultation on international standard management. Its subsidiary, NPC S&E Security Guard Co., Ltd. (NPCSG), provides security service, and safety consulting and training.
- 5) Pipeline Infrastructure Service:** EFT pipeline infrastructure service for petroleum and petrochemical operators in Map Ta Phut Industrial Estate and nearby areas through Eastern Fluid Transport Co., Ltd. (EFT).
- 6) Information and Communication Technology Service:** PTT Digital Solutions Co., Ltd. (PTT Digital), provides integrated ICT services. The service also covers design, development, and maintenance of ICT systems suiting corporate customers.
- 7) Outsourcing Service:** Business Services Alliance Co., Ltd. (BSA) supplies manpower and contractors to PTT Group.
- 8) Marketing and Sales of Methyl Amine Derivatives, Plastic Compounds, Specialty Products, and Health and Nutrition Products:** As GC's marketing arm, Solution Creation Co., Ltd., is in charge of selling GC products while seeking marketing opportunities in niche markets. It also works on product development to supplement value and satisfy the diverse demand of various industries, including packaging, household chemicals, electronics, textile, food and dietary supplements.
- 9) Polymer Sales and Marketing Service:** GC Marketing Solutions Co., Ltd. (GCM) takes charge of marketing and sales of polymer-based products. Currently, GCM has authorized dealers both in Thailand and in all regions of the world.
- 10) Logistics Service:** GC Logistics Solutions Co., Ltd. (GCL), takes charge of providing integrated logistics services for producers of polymers under GC Group.
- 11) GC Group's Liquidity Management and Financing Vehicle Service:** GC Treasury Center Co., Ltd. (GCTC), manages financial affairs and fund acquisition for companies under GC Group GCTC.
- 12) Management Consultancy:** Pracharath Rak Samakkee Rayong (Social Enterprise) Co., Ltd. (PRS RAYONG), offers advice on business administration in various areas, such as agriculture and trading.
- 13) Social Enterprise:** Sarn Palang Social Enterprise Co., Ltd. (SPSE), produces, buys and sells products and services of community, social, and environmental benefit.
- 14) Plastic Packaging Development Support:** S. P. Petpack Inter Group Co., Ltd. (SPIG), and TBPI & Myanmar Star Co., Ltd. (TPBIMS), fosters the development of plastic packaging in preparation for market growth in Myanmar.
- 15) Land and Property Management:** GC Estate Co., Ltd. (GCEC), manages land and property to support the company's investment and/or strategic joint ventures.
- 16) Corporate Venture Capital Investment (CVC):** GC Ventures Co., Ltd. (GCV), and GC Ventures America Corporation (GCVA) invest both direct and indirect in the form of corporate venture capital.

ECONOMIC AND MARKET OVERVIEW IN 2019 AND OUTLOOK ON 2020

ECONOMIC OVERVIEW

In 2019, global economic was slow down due to the uncertainty of U.S.-China trade war, Brexit, geopolitics in middle east region, Hong Kong protest, and strain between Japan and South Korea. These factors also impacted on petroleum and petrochemical industries.

PETROLEUM AND PETROCHEMICAL MARKET OVERVIEW

PETROLEUM

The situation of crude oil market in 2019 was highly volatile. In the first half of 2019, Dubai crude price was increased to 65 USD per barrel on average due to crude production cut policy (at 1.2 million barrels per day) from OPEC meeting on December 2018, the end of waiver grace period on May 2019 for 8 countries which imported crude from Iran, and US sanction on Venezuela which impacted to crude volume for export 0.5 to 0.8 million barrels per day. Although the extension crude production cut of OPEC and allies' policy was occurred, the chronic trade war and the increasing of US crude production (the highest record at 12.6 million barrels per day) on October 2019 still negatively impacted on the crude price. From these factors, the Dubai crude price in 2019 was 63.5 USD per barrel on average, declining 5.9 USD per barrel on average from previous year. Meanwhile, petroleum crack spread in 2019 was also highly volatile from weather fluctuation, concerning of economic slowdown, and the preparation for the new regulation of International Marine Organization (IMO) for banning fuel with high Sulphur content of marine ships. These were negatively impacted on petroleum crack spread compared to 2018.

AROMATICS

The situation of paraxylene market in 2019 was affected from new capacity and poor demand. From supply side, the new capacity was 6.4 million tons, increased global capacity in 2019 to 57.7 million tons.

The new capacity mainly came from China due to self-sufficiency policy which aimed to reduce import volume. From demand side, paraxylene derivatives were pressured by the trade war. Nonetheless, some producers, which use high feedstock cost such as Mixed Xylene, were stop their production due to no economic worth to run. With these factors, the market price spread between paraxylene and naphtha in 2019 was 378 USD per ton on average, declining 87 USD per ton on average from previous year.

The situation of benzene market in 2019 was affected same as the paraxylene market. From supply side, the benzene supply was increased from the additional paraxylene capacity (as discussed above), since benzene is a by-product. From demand side, benzene derivatives were also pressured by the trade war. However, the benzene production cut from high cost producers and the return from plant turnaround activities of styrene monomer producers were eased the situation of benzene market in the second half of 2019. With these factors, the market price spread between benzene and naphtha in 2019 was 118 USD per ton on average, declining 101 USD per ton on average from previous year.

OLEFINS

The situation of ethylene market in the beginning of 2019 was good due to the supply loss from unplanned shutdown of some producers in Europe and South Korea. However, since second quarter, the ethylene price was decreased significantly from many factors such as some producers in middle east reduced downstream's production and export ethylene more to Asia, additional capacity from North East Asia producers, the polyethylene resin export from U.S. to Asia, and the trade war. Therefore, the ethylene price of South East Asia (SEA) in 2019 was 823 USD per ton on average, declining 318 USD per ton from previous year. Meanwhile, the market price spread between ethylene and naphtha was 300 USD per ton on average, declining 227 USD per ton from previous year due to decrease of 28% in ethylene price.

The situation of propylene market in the first half of 2019 was weak due to additional capacities from North East Asia producers and propylene derivative plants maintenance. For the second half of 2019, the market situation was improved a bit from olefins plants including on-purpose propylene plants maintenance in North East and South East Asia. However, the market situation still had a negative impact from additional capacities from North East Asia producers. Therefore, the propylene price of South East Asia (SEA) in 2019 was 838 USD per ton on average, declining 150 USD per ton from previous year. Meanwhile, the market price spread between propylene and naphtha was 315 USD per ton on average, declining 59 USD per ton from previous year.

POLYMERS

The situation of PE market in 2019 was volatile continuously from 2018 due to the uncertainty of the trade war, which gave negative impacts on customers confidence and directly to manufacturers in China, and PE trade flow changing of US export from China to South East Asia. These factors including additional capacities suppressed PE price in South East Asia. Therefore, HDPE LLDPE and LDPE price of South East Asia in 2019 were 991 952 and 1,019 USD per ton on average, declining 339 229 and 188 USD per ton, respectively, from previous year. Meanwhile, the market price spread between PE and naphtha was 464 USD per ton on average, declining 161 USD per ton from previous year.

The situation of PP market in 2019 was weak compared to previous year due to the decreasing of PP demand in Asia Pacific, as a result of the economic slowdown and customer confidence, and crude oil price volatility. In 2019, the PP additional demand was 3 million tons while the PP additional capacity was 3.8 million tons from additional capacities of North East Asia and Malaysia producers. Therefore, PP price of South East Asia in 2019 was 1,101 USD per ton, declining 168 USD per ton from previous year. Meanwhile, the market price spread between PP and naphtha was 578 USD per ton on average, declining from previous year.

For the situation of PET in 2019, the demand growth was 5.1% per annum by additional demand at 1.2 million tons (total demand at 25 million tons per year) while additional capacity was 0.8 million tons (total capacity

at 32 million ton per year). PET market price was affected by the trade war and feedstock prices (PX, PTA, and MEG) declining due to the flooding of additional capacities. Therefore, PET market price in 2019 was 960 USD per ton on average, declining 276 USD per ton from previous year. For PTA, as a polyester's feedstock, it was also affected by the same factors as mentioned above. Furthermore, the manufacturers were careful about feedstock procurement in order to control feedstock inventory. So, the demand growth of PTA was declined from 11% to 5-6% per annum compared to the previous year. Therefore, PTA market price was 737 USD per ton on average in 2019, declining 119 USD per ton from previous year.

For the situation of PS in 2019, the global demand and global capacity increased to 10.7 and 15.2 million ton per year, respectively. However, the PS demand for both GPPS and HIPS was pressured by the buyer's concern from the trade war, therefore, PS producers had to compete in term of pricing. Meanwhile, the styrene monomer (SM) price was volatile following benzene and crude price. Therefore, the market price spread between PS and SM in 2019 was 235 USD per ton on average, increasing 51 USD per ton from previous year.

ETHYLENE OXIDES

In 2019, the MEG demand growth was slowdown compared to previous year due to the trade war, while, the MEG supply was increased from the additional capacity especially the new capacity from US which has cost competitiveness advantage comparing to others. Therefore, MEG China spot market price (ASP) in 2019 was 574 USD per ton on average, declining 332 USD per ton from previous year.

For EA market, the demand was impacted from the economic slowdown and the declining of ethylene price. Therefore, the EA China market price in 2019 was 1,002 USD per ton on average, declining 184 USD per ton from previous year.

GREEN CHEMICALS

The 2019 methyl ester market was up, driven by higher demand of 0.2 million tons from 2018 to 1.6 million tons per year, mainly due to the state promotional

measure for higher biodiesel consumption to absorb the surplus crude palm oil in the market and the state policy to promote B10 as alternative fuel for diesel, beginning in May 2019, by setting the price spread 1 Baht per litre below B7, and later 2 Baht per litre below B7 in October 2019. These measures were aimed to promote B10 to be national primary diesel grade, replaced B7, on January 1, 2020. The B20 diesel market became more and more popular after several diesel engine manufacturers certified the compatibility, and a price incentive of 5 Baht per litre discount to the B7 diesel. The daily B20 consumption surged to 7 million litres per day, surpassing the government target of 5 million litres per day. With a shift in government policy toward B10 as a national prime fuel, the Ministry of Energy slashed the discount incentive from 5 to 3 Baht per litre in October 2019, whilst the market was very competitive, driving down the retail margin amidst very high volatility of raw material prices and glut. The 2019 total production of methyl ester stood at 2.6 million tons, 0.5 million tons up from 2018. The 2019 price of methyl ester, fluctuating with the price of crude palm oil, equaled 25.85 Baht per kilogram, declining 2.07 Baht per kilogram or 7% from the average price of 27.91 Baht per kilogram in 2018.

The 2019 demand for natural fatty alcohols was relatively stable due to competitive pricing with alternative products, particularly synthetic fatty alcohols. However, demand from China was subdued by the trade war and the weakening RMB currency, whilst the supply also sank following the permanent closure of Shell Chemical's plant in England in early 2019 with a capacity of 120,000 tons of natural fatty alcohols per year and the exit of some producers in China disqualified by stricter environmental regulations, as well as the exit of producers in India with negative profit margins due to higher costs of crude palm oil imports after higher import tariffs. With the above demand and supply scenario, the 2019 price falling 318 USD per ton to 1,250 USD per ton, a 20% decline from 1,568 USD per ton in 2018, falling in line with the price of crude palm oil.

The 2019 ethoxylate fatty alcohols market growth was down from the previous year, following the sluggish economy impacted by the trade war inhibiting demand and affecting the home and personal care business. The ethoxylate fatty alcohols market was also under pressure from the pricing competition

adopted by other producers in Southeast Asia and other related factors, including volatility of exchange rates, particularly the continuously rising Baht currency against the U.S. dollar and neighbors' currencies, hurting export and overall competitiveness, as well as a volatile natural fatty alcohol price which effects to product cost management.

The demand for PLA in 2019 grew with higher environmental awareness and unique properties of bioplastics on natural raw materials and natural composable, which target mainly on packaging business, an industry with continuous growth. The target market was products that can be replaced by bioplastic with film extrusion injection and thermoforming processes.

PTT MCC Biochem Co., Ltd. a GC subsidiary, began its business development in 2018 with products specifically suited with unique properties and the pricing structure of PBS and turned into strategic applications, including marketing compatible with PBS and development of products with brand owners. These strategic applications became successful in early 2019 with end products like coffee capsules, tableware and cutlery, barrier film and paper coating. Notably these products are home compostable (single-use and naturally degradable).

PHENOL

The phenol market was relatively stable in early 2019, continuing from 2018, but slowed down in the latter half of 2019, due mainly to impacts of the trade war directly affecting downstream businesses, particularly the automotive industry. On the supply side in 2019, 200,000 additional tons per year from a new factory in India were added amidst shutdowns at several other producers, compared with 2018. The trade flow and profit margins of phenol producers exporting to China were squeezed after the anti-dumping measure launched by the Chinese government in May 2019. All the above cut the price spread between products and feedstock from 480 USD per ton to 340 USD per ton in 2019.

The acetone market in 2019 was affected same as phenol. However, demand rose in the last quarter of 2019 after start-up of MMA plant with a capacity of 235,000 tons per year and an isopropyl alcohol (IPA) factory, with a capacity of 50,000 tons per year in China, driving up the price of acetone in China's markets.

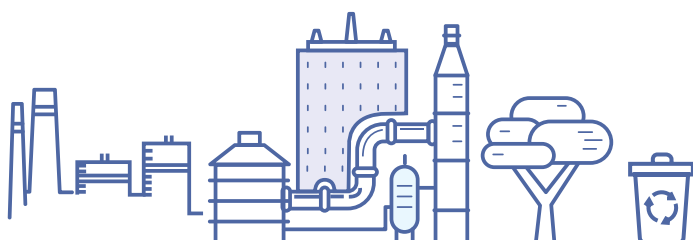
The 2019 bisphenol A (BPA) demand was slowdown from the trade war, especially that for polycarbonate products as automotive parts. In terms of supplier, there were two new plants in China with a total capacity of 255,000 tons per year, squeezing the bisphenol A business in the latter half of 2019. All the above drove the price spread between BPA products and feedstocks from 376 USD per ton down to 277 USD per ton in 2019.

PERFORMANCE MATERIALS AND CHEMICALS

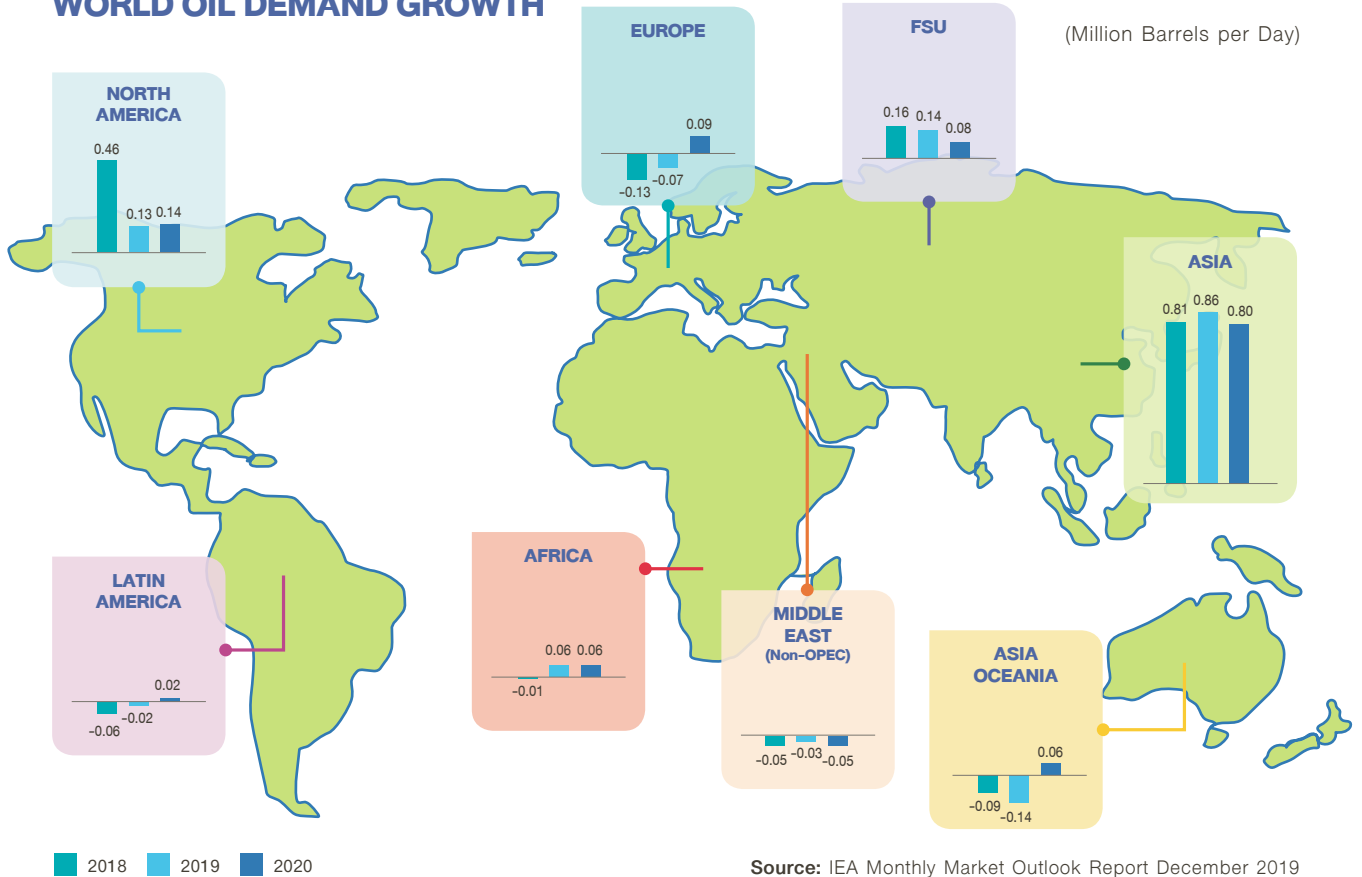
The 2019 global aliphatic diisocyanate market, including HDI and HDI derivatives, gained 7% from 2018 to 315,000 tons with Asia is the largest market. Vencorex is the Thailand's first manufacturer of HDI products with growth potential, while other big manufacturers in Asia and Europe are Covestro BASF and Wanhua.

The 2019 global AN demand was 6.1 million tons with an average global growth projection of 4% per annum, and with Northeast Asia as the world's largest market, accounting for 57% of the global consumption, equivalent to 3.5 million tons. AN is the monomer of several products: 39% for acrylonitrile butadiene styrene (ABS), 21% for acrylic fiber, 18% for acrylamide, and 8% for nitrile rubber. With continuous consumption growth of automobiles and electrical appliances in Asia, AN consumption is projected to soar. However, the ongoing trade war and geopolitical tension were still pressured the demand for AN products. The 2019 AN price equaled 1,626 USD per ton, down from 1,973 USD per ton in 2018.

The 2019 global market size of MMA was around 3.6 million tons and is projected to grow 3.6% per annum. The demand for MMA in Asia is currently around 2.1 million tons, accounting for 60% of global demand. Most of the MMA, 64% of total, is used for production of acrylic sheets and plastic MMA (PMMA) molding compounds, with demand growth in parallel with the construction industry, industrial goods and the automotive industry. However, the impact of trade war kept the MMA product price down from 2,592 USD per ton in 2018 to 1,818 USD per ton in 2019.

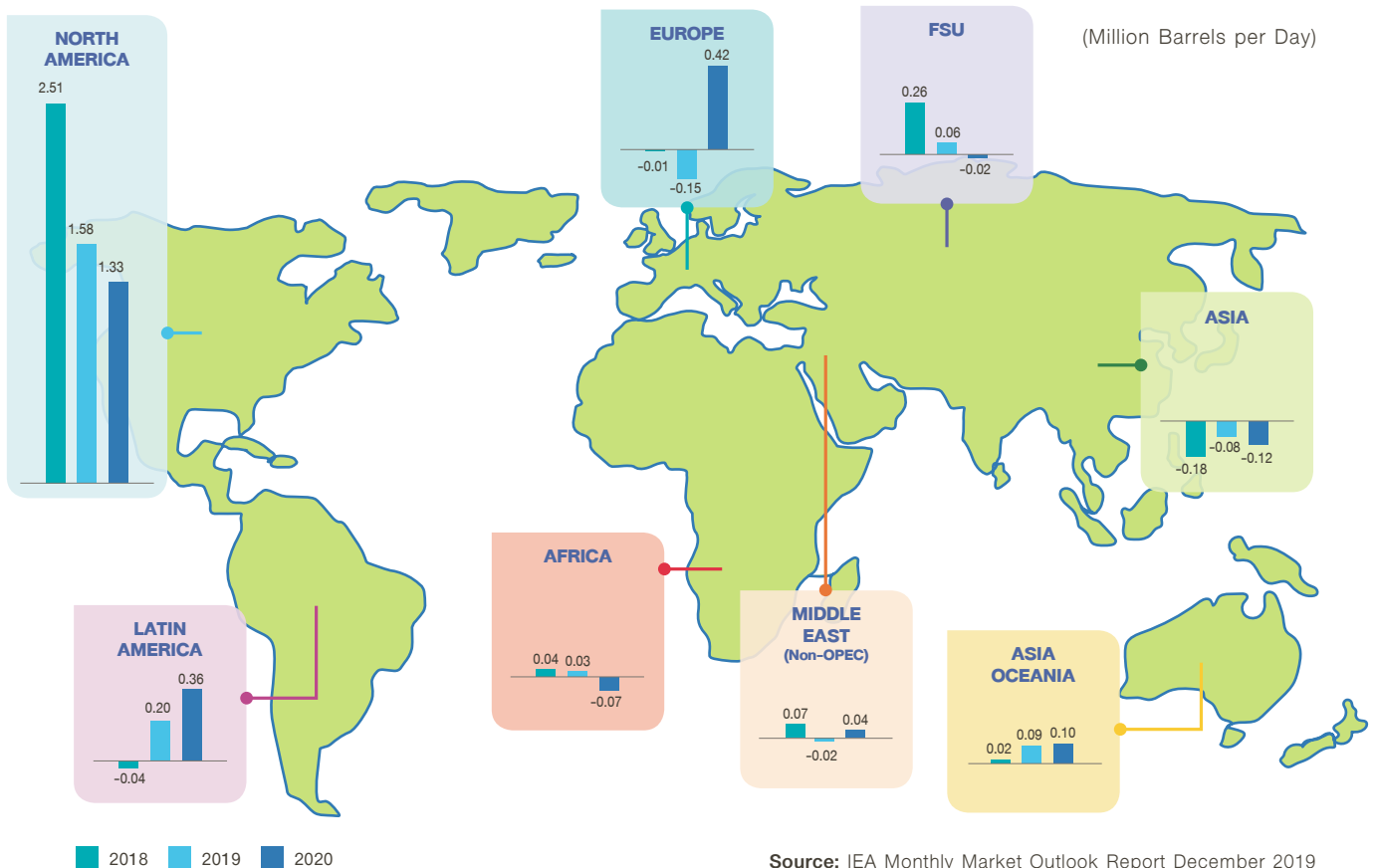


WORLD OIL DEMAND GROWTH



Source: IEA Monthly Market Outlook Report December 2019

WORLD OIL SUPPLY GROWTH



Source: IEA Monthly Market Outlook Report December 2019

2020 OUTLOOK

The 2020 global economic is likely to grow, leading by the emerging markets countries which drive global economic recovery. However, uncertainties do exist including the ongoing trade war, Brexit, and geopolitical tension in various regions, as well as concerns about economic recession. These uncertainties will continuously depress the overall global economic growth in 2020.

The International Energy Agency (IEA) issued a projection of global demand growth of crude oil in 2020 at 1.2 million barrels per day to 101.5 million barrels per day under the same set of concerns mentioned above. Despite the U.S. economic sanction on exports of crude oil from Iran and Venezuela, production from the U.S. would continue to rise. The OPEC and allies therefore decided on December 5, 2019, to develop a resolution to stabilize the global crude price.

The 2020 refining industry is set with a positive push from the International Maritime Organization (IMO)'s measure to set the use of fuel oil with sulfur contents

lower from 3.5% to 0.5% in weight, effective on January 2020. The enforcement will push up demand for diesel and low-sulfur fuel oil for marine vessels and slow the demand for high-sulfur fuel oil. The overall refining industry in 2020 is projected to perform better than in 2019.

The 2020 market for aromatics and its derivatives is projected to be comparable with the 2019 market. In addition to all the economic factors mentioned above, the market will still come under pressure from additional capacity mostly from China. This could be offset by lower production and shutdowns of high-cost producers who cannot sustain the profit margins and higher demand from derivatives product producers.

The 2020 market for olefins and its derivatives is expected to be comparable with the 2019 market. In addition to all the above economic parameters, demand is expected to grow. However, market still pressured by additional capacity from cost-competitive producers in the U.S. to the Asian market, generally in the form of polyethylene and the lower import of olefins into China under the state policy on self-sufficiency.



MANAGEMENT DISCUSSION AND ANALYSIS

For 2019 performance, PTT Global Chemical Public Company Limited (the Company) had total sales revenue at Baht 409,688 million, declined by 21% from the previous year, and had Net profit at Baht 11,682 million, declined by 71% from the previous year, which mainly due to the decrease in average product prices and lower sales volume. Average products prices decreased as a result of concerns on global economic impacted by U.S.-China trade tension throughout the year, total sales volume decreased due to planned maintenance shutdown of major businesses including Aromatics unit in Q2/2019, and Refinery unit in Q4/2019,

whilst Thai Baht continue its appreciation. These resulted to the declining in performance of major businesses. Furthermore, in 2019, the company had Share of Profit from Investments in JV and associates at Baht 4,570 million, when combining with Stock Loss net Reversal of NRV at Baht 114 million, Commodity Hedging gain at Baht 1,248 million, FX gain at Baht 2,007 million, and realized expenses on new regulation about employee benefit under Labor Protection Act at Baht 784 million (Net Deferred income tax), the Company recorded net profit at Baht 11,682 million (Baht 2.59 per share), decreased by 71% from 2018.

PERFORMANCE SUMMARY

(Unit: Million Baht)	2018	2019	YoY % +/-
Sales Revenue	515,449	409,688	-21%
EBITDA	58,263	27,802	-52%
EBITDA Margin (%)	11%	7%	-40%
Share of profit of investments in JV and Associates	6,932	4,570	-34%
Net Profit	40,069	11,682	-71%
EPS (Baht/Share)	8.89	2.59	-71%
Adjusted EBITDA*	61,322	28,900	-53%
Adjusted EBITDA Margin (%)	12%	7%	-5%

Remark: * Adjusted EBITDA refers to EBITDA excluding Stock gain/(loss), NRV and Extra item.

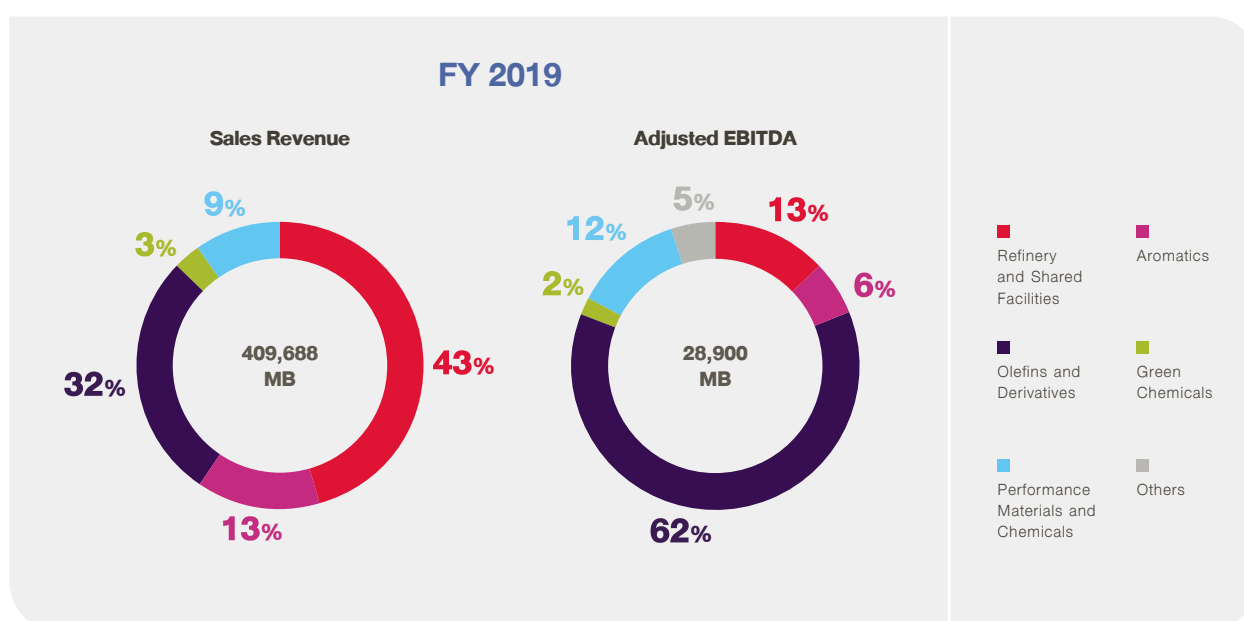
In 2019, Refinery's Market GRM declined from the previous year mainly due to the decrease of overall Refined products over Dubai crude oil spread which impacted by an uncertainty of global economic. The planned maintenance shutdown of Refinery plant led to lowering utilization rate from 102% to 87% in 2019 and this led to the declining in operating profit comparing with the previous year. Aromatics business performance was declined due to the decreasing of products over feedstock spread for both Paraxylene and Benzene, whilst Aromatics business BTX utilization rate decreased from 93% in 2018 to 88% in 2019

caused by planned maintenance shutdown to improve the production efficiency in Aromatics plant I in May and June 2019 for 49 days. Olefins and Derivatives business had an increasing in sales generated from the full year commercial operation of LLDPE II plant, whilst EO-based business sales volume also increased although the planned maintenance shutdown took place in 2019. However, Olefins and Derivatives performance declined since overall products prices declined. These contributed toward the Company's 2019 net profit of Baht 11,682 million.

ADJUSTED EBITDA MARGIN

% Adj. EBITDA Margin	2018	2019
Business Unit:		
Refinery and Shared Facilities	5	2
Aromatics	7	3
Olefins and Derivatives	26	15*
Green Chemicals	6	5
Performance Materials and Chemicals	15	10
Average	12	7

Remark: * If included PTA, PET, % Adj. EBITDA Margin in 2019 is 14%.



REFINERY & SHARED FACILITIES BUSINESS UNIT

CRUDE PRICE & PETROLEUM PRODUCT SPREADS

(Unit: USD per barrel)	2018	2019	YoY % +/-
Dubai Crude Oil	69.42	63.53	-8%
Gasoline-Dubai Crude Oil	10.53	8.96	-15%
Jet-Dubai Crude Oil	15.37	13.71	-11%
Diesel-Dubai Crude Oil	14.63	13.70	-6%
Fuel Oil-Dubai Crude Oil	-2.67	-4.91	-84%

The crude oil market situation in 2019 was highly fluctuated. In the beginning of 2019, the market was supported by an agreement of OPEC and its allies in December 2018 to balance the market by lowering their supply to 1.2 million barrel per day for 6 months until June 2019, the U.S. sanction on Iran and Venezuela which reduced crude oil export from those countries. The U.S. announced ending of sanctions waivers for Iran oil imports for 8 countries (China, India, Japan, South Korea, Taiwan, Turkey, Italy and Greece) since May 2, 2019 which raised the tension in the Middle East region. These factors supported crude oil market in short term and resulted in crude oil price average at 63.53 USD per barrel, 8% lower than 2018.

For 2019, the Petroleum products price and product spread over crude oil price had been fluctuated as well as crude oil price. The average Diesel over Dubai crude oil spread was 13.70 USD per barrel, decreased by 0.93 USD per barrel from previous year, due to the impact of U.S.-China trade tension and economic slowdown which led to declining in production activity. However, the preparation for the IMO implementation in January 2020 helped to support Diesel demand in the second half of 2019. The average high-sulfur fuel oil over Dubai crude oil spread was -4.91 USD per barrel, declined by 2.24 USD per barrel, which was under pressure from IMO implementation which most refineries tried to sell their high-sulfur fuel oil as much as possible before the implementation begins and the demand converts to low-sulfur fuel oil which led to increasing supply in high-sulfur fuel oil.

GROSS REFINERY MARGIN

(Unit: USD per barrel)	2018	2019	YoY % +/-
Market GRM	6.08	3.86	-37%
CDU GRM	6.46	3.61	-44%
CRS GRM	4.39	5.00	14%
Hedging Gain/(Loss)	0.11	0.26	144%
Stock Gain/(Loss) net NRV	-1.08	0.34	132%
Accounting GRM	5.11	4.46	-13%
Adjusted EBITDA (MB)	10,259	3,843	-63%
Adjusted EBITDA (%)	5%	2%	-3%
Utilization Rate	102%	87%	-15%

For 2019, Market GRM at 3.86 USD per barrel. As for 2019, CDU utilization rate was 87%, decreased by 15% from 2018 due to the planned maintenance shutdown in Q4/2019. The Company realized Stock Loss net Reversal of NRV at 0.34 USD per barrel due to decline in crude oil price in Q3/2019. The Company

recorded net gain from Commodity Hedging of 0.26 USD per barrel. These resulted in Refinery business Accounting GRM of 4.46 USD per barrel, declined from 2018. The Adjusted EBITDA of Refinery business in 2019 was Baht 3,843 million, 63% decreased from 2018. The Adjusted EBITDA Margin was at 2%.

AROMATICS BUSINESS UNIT

AROMATICS PRODUCT PRICES AND SPREADS OVER CONDENSATE

(Unit: USD per ton)	2018	2019	YoY % +/(-)
Condensate	606	544	-10%
Paraxylene (TW)	1,067	901	-16%
Paraxylene (TW)-Condensate	461	357	-23%
Paraxylene (FECF)	1,057	895	-15%
Paraxylene (FECF)-Condensate	451	351	-22%
Benzene (Spot Korea)	821	641	-22%
Benzene-Condensate	215	97	-55%
Naphtha-Condensate	8	-21	<-200%

PARAXYLENE

In 2019, Paraxylene (FECF) over Condensate spread declined by 22% from 2018 to the average at 351 USD per ton. Paraxylene price was under pressure from increasing of global supply by 6.4 million tons to 57.7 million tons which mainly come from China according to its self-sufficient economy policy that led to decrease import volume.

BENZENE

In 2019, Benzene over Condensate spread decreased by 55% to the average at 97 USD per ton. In the first half of 2019, Benzene market was under pressure from high inventory level in China and declining demand from downstream Styrene Monomer and Phenol due to planned maintenance shutdown of several plants in the region which mainly impacted to lower product spread and some producers decided to cut run or cease their operations. However, in the second half of 2019, Benzene demand picked up since Styrene Monomer producers completed their maintenances and also arbitrage window for exporters in Asia to North America helped to balance Benzene market in the region. Consequently, Benzene over Condensate spread improved in the second half of 2019.

AROMATICS MARKET P2F

(Unit: USD per ton)	2018	2019	YoY % +/(-)
Market P2F	197	130	-34%
Hedging Gain/(Loss)	-6.5	10.5	>200%
Stock Gain/(Loss) net NRV	-9.7	-8.0	17%
Accounting P2F	181	132	-27%
Adjusted EBITDA (MB)	6,492	1,721	-73%
Adjusted EBITDA (%)	7%	3%	-4%
Utilization Rate (%)	93%	88%	-5%

In 2019, BTX utilization rate was at 88% declined from 93% in previous year due to planned maintenance shutdown of Aromatics plant I in May and June 2019 for 49 days in order to change the catalyst and improve production efficiency. In addition, Aromatics products spread significantly declined in both Paraxylene and Benzene. Paraxylene over Condensate spread dropped by 22% whilst Benzene over

Condensate spread dropped by 55% which impacted to lower Market P2F per ton BTX to 130 USD per ton. Furthermore, the Company had Stock Loss net NRV at -8.0 USD per ton and realized hedging gain at 10.5 USD per ton, resulted in the Accounting P2F of 132 USD per ton. In 2019, the Company had Adjusted EBITDA of Baht 1,721 million and Adjusted EBITDA Margin at 3%.

OLEFINS AND DERIVATIVES BUSINESS UNIT

PRICES AND SPREADS OF OLEFINS AND DERIVATIVES

(Unit: USD per ton)	2018	2019	YoY % +/-
Naphtha (MOPJ)	614	523	-15%
Ethylene (SEA)	1,141	823	-28%
Propylene (SEA)	988	838	-15%
HDPE	1,330	991	-25%
HDPE-Naphtha	716	468	-35%
LLDPE	1,181	952	-19%
LLDPE-Naphtha	567	429	-24%
LDPE	1,207	1,019	-16%
LDPE-Naphtha	593	496	-16%
PP	1,269	1,101	-13%
PP-Naphtha	655	578	-12%
MEG (ACP)	1,108	754	-32%
MEG-0.65 Ethylene	367	219	-40%

As for the situation in 2019, Polyethylene market continued its fluctuation from 2018 which U.S.-China trade tension affected to the declining in Polyethylene price due to market buyers reacted to market condition by slowing down their purchasing, and the anticipation of the affect from new supply in the market. The average

price of HDPE, LLDPE, and LDPE in 2019 decreased to 991 USD per ton, 952 USD per ton, and 1,019 USD per ton respectively. MEG (ACP) was also pressured by similar factors as the Polyethylene market which led to lower product price by 32%.

ADJUSTED EBITDA OF OLEFINS AND DERIVATIVES

(Unit: Million Baht)	2018	2019	YoY % +/-
Adjusted EBITDA	35,353	17,800	-50%
Adjusted EBITDA (%)	26%	15%*	-11%
Utilization Rate Olefins (%)	101%	102%	1%
Utilization Rate Polymers (%)	100%	102%	2%

Remark: * If included PTA, PET, % Adj. EBITDA Margin in 2019 is 14%.

For the situation in 2019, Olefins business utilization rate improved as well as Polymers utilization rate, compared to the previous year, mainly due to less planned maintenance shutdown than in 2018. Olefins businesses utilization rate was at 102% and Polymers utilization rate was at 102% including the full year production of LLDPE II Plant which led to increasing polymers sales volume. In term of the price situation, overall products prices were under pressure from

lower price from the previous year which affected by global economic slowdown, uncertainty of U.S.-China trade tension, and the new supply in the market. These resulted in Adjusted EBITDA of Baht 17,800 million and Adjusted EBITDA margin of 15%. In term of feedstock volume in 2019, the portion of feedstock used of Gas and Naphtha were 88% and 12% respectively, equal to the previous year.

ADJUSTED EBITDA BY BUSINESS UNIT

Adjusted EBITDA (Million Baht)	2018	2019	YoY % +/-
Business Unit:			
Refinery and Shared Facilities	10,259	3,843	-63%
Aromatics	6,492	1,721	-73%
Olefins and Derivatives	35,353	17,800	-50%
Green Chemicals	860	632	-27%
Performance Materials and Chemicals	7,010	3,554	-49%
Services and Others	1,347	1,351	0%
Adjusted EBITDA* (MB)	61,322	28,900	-53%

Remark: * Adjusted EBITDA refers to EBITDA excluding Stock gain/(loss), NRV and Extra item.

OPERATING PERFORMANCE

Unit: Million Baht		2018	2019	YoY % + /(-)
Sales Revenue		515,449	409,688	-21%
Feedstock Cost		(400,501)	(325,677)	-19%
Product to Feed Margin		114,948	84,011	-27%
1	Variable Cost	(27,920)	(29,224)	5%
2	Fixed OH	(16,478)	(17,479)	6%
3	Stock Gain/(Loss) and NRV	(3,059)	(114)	96%
4	Gain/(Loss) on Commodity Hedging	(272)	1,248	>200%
5	Other Revenue	4,686	4,431	-5%
6	SG&A Expenses	(13,642)	(15,071)	10%
EBITDA		58,263	27,802	-52%
7	Depreciation & Amortization	(19,278)	(19,513)	1%
8	Loss from GGC's inventory**	(2,004)	232	-112%
9	Gain on Bargain Purchase	1,355	31	-98%
EBIT		38,336	8,552	-78%
10	Net Financial Expense	(2,418)	(2,131)	-12%
11	FX Gain/(Loss)	407	2,007	>200%
12	Share of Gain/(Loss) from Investment	6,932	4,570	-34%
13	Corporate Income Tax	(2,986)	(649)	-78%
14	Net Profit after Tax	40,271	12,349	-69%
Profit/(Loss) Attributable to:				
15	Non-controlling Interests	202	667	>200%
16	Owners of the Company	40,069	11,682	-71%
17	Adjusted EBITDA*	61,322	28,900	-53%

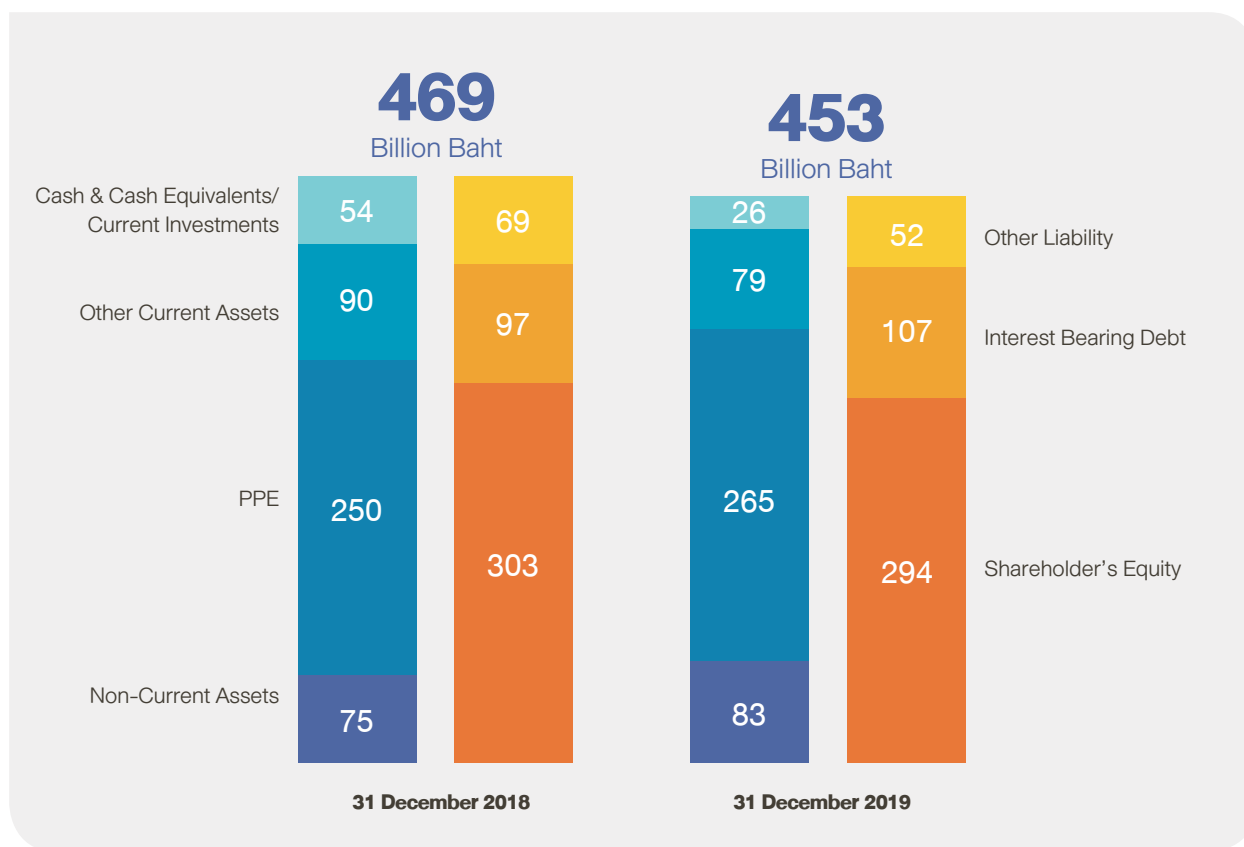
Remark:

* Adjusted EBITDA refers to EBITDA excluding Stock gain/(loss), NRV and Extra item.

** In 2018, effect from Inventory Loss per shareholding of 72.29% was 1,261 million baht.

STATEMENT OF FINANCIAL POSITION

Unit: Billion Baht



As of December 31, 2019, the company had Total asset of Baht 452,514 million, decreased by Baht 16,741 million from December 31, 2018. Total Current asset declined by Baht 39,816 million mainly due to decreasing of Cash and Cash Equivalents and Short-term investment by Baht 28,002 million, decreasing of Account receivables of Baht 7,834 million, decreasing of inventory by Baht 3,113 million, and decreasing of Other current assets by Baht 867 million. However, the company had higher Non-current assets by Baht 23,075 million which derived from increasing in Property, plant and equipment led by purchasing and construction of property within the period net amount of Baht 28,470 million, whilst other non-current assets increased by Baht 8,842 million as a result of increasing of Investment in Associate company, GPSC. For this period, the Company had total Shareholders' Equity of Baht 293,595 million, decreased by Baht 9,887 million from December 31, 2018 due to dividend payment during the year and the company recognized the difference arising from the change in the ownership interest in investment according to GPSC Tender offer which made payment for shares of GLOW.

Cash and Cash Equivalents and Current Investments decreased by Baht 28,002 million from the end of last year. The company had cash flow from operation of Baht 30,175 million while cash flow used in investment activities of Baht 41,780 million which mainly invested in the purchasing of property, plant and equipment and intangible assets on the projects such as Olefins Reconfiguration Project, Propylene Oxide by GC Oxirane Co., Ltd. and Polyols & PU System by GC Polyols Co., Ltd. and Cash payment invested in equity injection in GPSC of Baht 16,819 million. However, there was cash received from the sale of available-for-sale securities of Baht 10,369 million, the sale of short-term investments of Baht 4,246 million, from selling of private fund and in-house investment, and dividend income of Baht 2,248 million. The Company's cash flow used in financing activities of Baht 6,461 million mainly used for dividend payment of Baht 16,336 million, net Loan repayment of Baht 3,901 million, interest payment to financial institutions and hire-purchase contracts of Baht 3,094 million, and cash payment for treasury stock of Baht 1,188 million. However, the company had cash received from issuing

corporate bond net corporate bond redemption of 18,058 million, therefore, as of December 31, 2019 the company had total Cash and Cash Equivalents of Baht 18,840 million, including short term investment of Baht 6,720 million and long-term investment in private fund and in-house of Baht 2,337 million, the company had

totaling cash and cash equivalent and investment of Baht 27,897 million, decreased by Baht 32,468 million from the end of last year. Additionally, the Company had net interest-bearing debt to equity at 0.28 times and Net interest-bearing debt to EBITDA at 2.93 times.

KEY FINANCIAL RATIOS

Financial Ratios		2017	2018	2019
Liquidity Ratios:				
Current Ratio	(Times)	2.33	1.95	1.97
Quick Ratio	(Times)	1.60	1.29	1.13
Operating Cash Flow Ratio	(Times)	1.08	0.80	0.48
Account Receivables Turnover	(Times)	10.98	12.31	10.75
Account Receivable Days	(Days)	33.34	29.74	33.96
Inventory Turnover	(Times)	10.20	11.93	10.33
Days Sales in Inventory	(Days)	35.90	30.69	35.33
Account Payables Turnover	(Times)	13.03	14.01	13.02
Account Payables Days	(Days)	28.02	26.05	28.03
Cash Cycle	(Days)	41.22	34.37	41.26
Profitability Ratios:				
Gross Margin Ratio	(%)	11.16	10.78	4.65
EBIT/Sales Revenue	(%)	11.43	9.09	3.93
Cashflow from Operation/EBIT	(%)	124.11	114.47	187.21
Net Profits to Sales Revenue	(%)	9.00	7.77	2.85
Return on Equity	(%)	15.09	14.04	4.02
Efficiency Ratios:				
Return on Total Assets	(%)	11.77	10.36	3.50
Return on Fixed Assets	(%)	26.77	25.54	12.12
Total Asset Turnover	(Times)	1.03	1.14	0.89
Leverage Ratios:				
Interest Bearing Debt to Equity	(Times)	0.35	0.32	0.36
Interest Coverage Ratio	(Times)	16.67	16.39	10.17
Dividend Payout Ratio	(%)	49	48	77

PROJECT PROGRESS IN 2019

In 2019, the Company had an ongoing investments and under study as followed:

OLEFINS RECONFIGURATION PROJECT

The Company had approved an investment for the new Olefins plant (Olefins Reconfiguration Project) with the use of Naphtha and Liquefied Petroleum Gas (LPG) as major feedstocks. The plant will consists of Ethylene capacity of 500,000 tons per year and Propylene capacity of 250,000 tons per year. This project will increase the Company's total Ethylene capacity from 2,988,000 to 3,738,000 tons per year. The plant is expected to start commercial operation within year 2020. The total investment is USD 985 million or approximately Baht 36,000 million. The project has been on progressed for 85% (as of December 2019).

PROPYLENE OXIDE (PO) AND POLYOLS & PU SYSTEM PROJECT

The purpose of PO/Polyols Project is to expand toward downstream business of Polyurethane; a high value product. The Company has set up a wholly-owned, GC Oxirane Company Limited, to produce PO with the capacity of 200,000 tons per year and is expected to start commercial operation in 2020. The Company had also set up a joint venture, GC Polyols Company Limited, with shareholdings of GC 82.1%, with Polyols capacity of 130,000 tons per year and PU System products with the capacity of 20,000 tons per year. PO and Polyols Projects have been on progressed for 85% and 85% respectively (as of December 2019).

ESTABLISHMENT OF JOINT VENTURE COMPANY "ENVICCO LIMITED" TO MANUFACTURE HIGH-QUALITY RECYCLED PLASTICS

The Company and ALPLA, a world-class manufacturer of high-quality recycled plastic resins, have signed a cooperation agreement to establish a Joint venture company to be called ENVICCO Limited at Asia Industrial Estate in Rayong province. The joint venture company was established with the objectives to be Thailand's first manufacturer of high-quality recycled plastic resins, namely rPET and rHDPE, which will be able to create value added to used plastics. The Joint venture company was set up on February 3, 2020.

MARKET AND BUSINESS OUTLOOK IN 2020

For the global oil outlook in 2020, average Dubai crude oil price is expected to be 58-62 USD per barrel. The International Energy Agency (IEA) had estimated the crude oil demand (as of December 2019) in 2020 at 101.5 million barrel per day, increased by 1.2 million barrel per day. However, there are uncertainties from the prolonged US-China trade tension, which will impact the global economic condition, the economic slowdown in European Region in both manufacturing and service sector, the Britain's leaving the European Union (Brexit), the cooperation of OPEC and its allies to lower their crude oil production, and the expected crude oil export from the US which has continuously increased since Q4/2019. These factors can put pressure on the crude oil price.

For Petroleum product, the Company anticipates that products price and products spread will be supported from the International Marine Organization (IMO) implementation to control sulfur level in Fuel oil used in marine vessel which began on January 1, 2020. This led to increasing demand for Diesel and low-sulfur fuel oil (LSFO) as a fuel for vessel and results to expected Diesel over Dubai crude oil spread to be 14-15 USD per barrel while LSFO over Dubai crude oil spread to be 20-21 USD per barrel amid lower demand for high-sulfur fuel oil (HSFO). The HSFO over Dubai crude oil spread is expected to be -11 to -10 USD per barrel, whilst Gasoline will be under pressure from high inventory level and increasing production from high utilization rate of Refineries in North America region. The expected Gasoline over Dubai crude oil spread is 10-11 USD per barrel. As for the company's Refinery utilization rate, it will be operated around 101%.

For Aromatics product, Paraxylene over Naphtha spread, in 2020, is expected to be 250-300 USD per ton which steady from the previous year. Despite the new supply from China, the demand from Fiber and Filaments industries, Purified Terephthalic Acid (PTA), and PET Bottle Resin are expected to potentially grow supported by new capacities in these downstream products and the cut run from high cost producers. Benzene over Naphtha spread is expected to be 150-175 USD per ton which steady from the previous year since Benzene market will be supported by demand from new capacities of downstream products such as Styrene Monomer and Phenol. In 2020, the Company has a planned maintenance shutdown of Aromatics plant II in Q2/2020 in order to improve production efficiency. The company expects that utilization rate of 2020 will be 90%.

The outlook for Olefins and Derivatives product is expected to maintain from the previous year, even new supply is expected to be higher in 2020. However, from the situation in Q4/2019, Polyethylene price was at the lowest point in the last ten years and it is expected that high cost producers will reduce their operating rate. However, an uncertainty from a prolonged U.S.-China trade tension will continue, even some positive signs have been emerged since both parties have reached and already signed Phase 1 agreement in January 2020. The average Polyethylene price in 2020 is expected to be 910-1,030 USD per ton. For MEG market, MEG price is expected to be remained from the previous year. MEG supply is expected to increase from new capacities in the U.S. and China, but MEG will be supported by downstream demand especially Textile industry and Packaging industry which has potential to grow. The company expects that the average MEG (ASP) will be 550-580 USD per ton. In 2020, Olefins plants utilization rate will be around 98% since there are planned maintenance shutdown in Q1/2020 whilst Polymers plants utilization rate will be around 102%.



RISK MANAGEMENT AND RISK FACTORS

RISK MANAGEMENT

PTT Global Chemical Public Company Limited (GC) places great importance on continuously improving our risk management to ensure an integrated process covering all our operations. Information technology has been used to increase organizational efficiency. Our policies are geared towards ensuring that strategic growth is managed using effective risk management and that we can deal with current and future disruptive events while providing a framework within our risk appetite to seek potential business opportunities that support sustainable growth. We adhere to COSO (The Committee of Sponsoring Organizations of the Treadway Commission) or ERM COSO (2017) and ISO (International Organization for Standardization) or ISO 31000:2018 standards as well as the Corporate Governance Code and anti-corruption principles. We have also been certified as a member of the Private Sector Collective Action Coalition against Corruption (CAC) – Thailand's private-sector movement against corruption. We review our own compliance, with results presented to the Audit Committee, the Corporate Governance Committee, and the Board of Directors to ensure that we have processes in place to combat corruption, including adequate internal controls.

In 2019 GC was 1st ranked in the Dow Jones Sustainability Indices and stayed in the Top 10 global chemical companies for the seventh consecutive year. We also got the first rank in Risk and Crisis Management section in 2019. This achievement reflects our standards of risk and crisis management on a par with international standards.

RISK MANAGEMENT STRUCTURE

Our risk management is organized into three levels: corporate, business units, and operations. At the corporate level, the Board appointed Risk Management Committee (RMC) is responsible for defining the direction of risk management guided by the risk appetite, risk policy, and five risk management frameworks: corporate, foreign exchange, price-and-

spread, subsidiaries, and investment. The Enterprise Risk Management Committee (ERMC) is comprised of executive officers from each function responsible for regularly monitoring risk management progress.

For specific business risk, GC defines risk management for business units and functions or for specific committees as explained below.

- **THE VALUE CHAIN MANAGEMENT (VCM) Committee** is responsible for closely monitoring and managing pricing, foreign exchange, and supply chain risk weekly using a risk management framework approved by the Risk Management Committee.
- **GC GROUP'S SUSTAINABILITY DEVELOPMENT COMMITTEE (SDC)** is responsible for overall monitoring and follow-up on sustainable development issues as well as ensuring an appropriate direction for managing our long-term sustainability risk.
- **THE INVESTMENT COMMITTEE (IC)** is responsible for governance and considers investment projects aligned with our strategy as well as ensuring effective risk assessment and mitigation for maximum investment efficiency and optimal benefits.
- **OTHER COMMITTEES** include the GC Operational Excellence Committee; the Safety, Health, and Environmental Governance Committee; the Digital and Technology Governance Committee; and the Water Management Task force.

For the business units' level, the heads of business units apply the corporate risk direction to their units. At the operations level, results of the Control Self-Assessment (CSA) and Operational Risk Management (ORM) are applied to appropriately manage process risk. As for GC's subsidiaries, there are the GC Way of Conduct harmonizes governs the risk management direction.

RISK MANAGEMENT TOOLS

GC has studied and adopted several risk management tools. Risk has been assessed and prioritized on a risk map, with progress followed up using mitigation plans

and key risk indicators. The Monte Carlo simulation technique has also been employed to model impacts to our operating results using value at risk (VaR) as a metric. Furthermore, we have identified emerging risk using an early warning system (EWS) to increase preparedness, resulting in a proactive approach to risk mitigation.

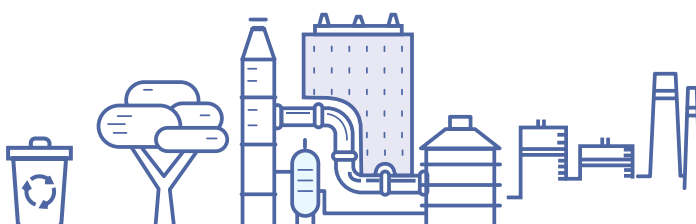
RISK MANAGEMENT CULTURE

We have promoted a risk management culture covering governance, risk management, and internal control and compliance throughout GC to help support stable and sustainable growth. The Board and executives decide risk management policy, objectives, and frameworks used as guidelines and continue to monitor progress at both the management and operation levels. Moreover, we review roles and responsibilities related to risk management, communicating the results to strengthen risk management knowledge for the entire organization.

In 2019, we organized a workshop to foster awareness for the Management, developed newsletters, conducted training sessions, and developed an e-learning platform at the staff level. We have a development plan that fosters the right mindset in all our employees and ingrains it in our work culture. The plan includes extending these values to our subsidiaries in the future.

SUSTAINABILITY AND RISK MANAGEMENT

GC always give precedence to sustainability issue by integrating such matter into our business started with defining our strategies until risk assessment. We appoint risk factors related with sustainability, for example, climate change and water management and continuous increasing environmental concerns (as detail demonstrated in the next section). Besides, we intend to add sustainability, eco-technology and reduction of GHG emission viewpoint into our future investments (as elaborated in investment risk). In 2019, we dedicated new function named Sustainability and Corporate Branding, and also revised sustainability committee to manage all related sustainability issue. These present our intention to manage risk together with sustainability to build confidence for our stakeholders.



RISK FACTORS

We have analyzed both internal and external business environments, along with relevant economic societal, political, technological, industrial, and competitor trends to define our corporate risk categorized into the three groups below.

CURRENT BUSINESS-RELATED RISK FACTORS

Corporate Risk Factors	Important Mitigation Measures
<p>Operational and Safety Risk</p> <p>We strive to maintain high operational standards. To this end, we place the utmost importance on managing our operation and safety risk to ensure that our production processes are both safe and reliable. Our Operational Excellence Management System (OEMS) and Process Safety Management (PSM) are applied continuously: The aim is world-class process safety management.</p>	<p>The following are the measures that GC continuously applied to maintain our operation reliable and safety.</p> <ul style="list-style-type: none">• Collaborate with PTT Group experts to assess OEMS performance and effectiveness. Also, improve reliability by enhancing technical standards and maintenance to maintain stable operations within the first-quartile level.• Cooperate with consultants to strengthen our Process Safety Management, raising it to an international standard during 2017-2022. There are focus on promoting a company-wide culture where employees pride themselves on applying safety to all aspects of work with discipline, with a good example set by executives and the Management downwards.• Assess operation of utility suppliers and together define risk and mitigations. We also continuously follow up such plan to ensure that our suppliers focus on their maintenance efficiently and reliable operate with safety. This directly consequence to our reliability, minimize risk of emergency shutdown and achieve GC's target.• With knowledge gained from consultant development experts and capable employees, nurture experts, develop company personnel, and share such knowledge with all business units and GC Group.• Apply the Business Continuity Management System (BCMS) and develop an Incident Management System (IMS) to manage emergency and crisis events which could interrupt our business to lessen impacts from these events and reduce the recovery period. Our Business Continuity Plan is rehearsed regularly.• GC Group has the necessary insurance to lessen impacts resulting from operational failures.

Corporate Risk Factors	Important Mitigation Measures
<p>Price Volatility Risk</p> <p>The economic slowdown from the ongoing U.S.-China trade war, OPEC production cuts, and new supply capacity have led to price volatility risk and deviate from our business plan: a mitigation plan is being prepared to handle this situation.</p>	<p>The following are the measures that GC has put forth to closely and continuously mitigate its price volatility risk.</p> <ul style="list-style-type: none"> • The risk of price spread, and oil inventory have been managed by applied derivatives and forward sales-and-purchase agreements under a policy and framework approved by the Risk Management Committee and closely controlled and monitored by the Value Chain Management Committee. • Closely monitor market situation, feedstock, and product prices to adjust sales and production plans for our value chain facing rapidly changing situations.
<p>Sales & Marketing Risk</p> <p>Our performance results also depend on our ability to maintain sales revenues—especially with volatile business conditions, demand-supply imbalances, trade wars, and geopolitics as factors contributing to market instability.</p>	<p>We always proceed sale and marketing mitigations as follows.</p> <ul style="list-style-type: none"> • Closely monitor market situation to accordingly adjust sales and production plan. • Diversify product portfolio and define sales portfolio including expanding to emerging markets such as the CLMV countries. • Enter the end-use market and acquire new customers interested in developing high-performance products distinguished by their technology and innovation to meet the needs of the end-use consumer. To this end, we have created a Customer Solution Center to build relationships with partners and customers on product development. • Develop and improve an end-to-end sales and marketing process in keeping with the changing of business context, consumer behavior, and sales channels.
<p>Joint-Venture Partnership Management Risk</p> <p>If we grow our business by finding partners with expertise and experience in the target business, we will manage business partners' expectations to achieve the joint-venture target objectives.</p>	<p>GC continuously applies the below mitigation to manage our Joint-Venture Partnership as below.</p> <ul style="list-style-type: none"> • Form a joint-venture management team to collaborate with our business partners at all levels to ensure that the joint-venture partnership is aligned with its own targets and our strategy. • Pursue synergistic opportunities and ways to expand the business with joint-venture partners to foster good working relationships by growing together. • Implement the GC Way of Conduct (WOC) and continuously monitor. In 2019, we did preliminary assessment to evaluate how our subsidiaries applied the GC WOC and use such assessment to improve the operation. We also communicate the GC WOC to all related parties to raise awareness and understanding.

FUTURE BUSINESS-RELATED RISK FACTORS

Successfully executing established strategies leads to achieving long-term goals, but this may be coupled with volatility and rapid changes in the business environment. Thus, we have managed risk factors related to our future business operations.

Corporate Risk Factors	Important Mitigation Measures
Innovation Risk We focus on innovation to develop new products with increased value to meet market demand, thus developing our capability to carry out research with commercially feasible results is another important factor for our future sustainable growth and maintain our competitiveness.	<p>The following are what GC apply to continuously manage the risk.</p> <ul style="list-style-type: none">• Pursue innovation opportunities through Corporate Venture Capital and Technology Scouting to relentlessly enhance technology, capability, and knowledge of our personnel.• Assess and manage investment risk associated with innovation, including monitoring the progress of invested projects regularly.• Recruit external experts to quickly strengthen innovation capability and related technology to serve targeted customers' expectations. <p>Also, we additionally mitigate such risk as below.</p> <ul style="list-style-type: none">• Develop market and cooperate with customers to expand business opportunities especially both domestic and international brand owners to support long-term sustainability growth for downstream business focusing on high-value products.• Seek technology to further expand into High Value Business (HVB). It also includes to seek opportunities for HVB investment matched with the End-Use market requirements.• Develop digital infrastructure to link all important information together to support and increase innovation performance.

Corporate Risk Factors	Important Mitigation Measures
<p>Investment Risk</p> <p>Investments that support our long-term growth give rise to risk requiring close monitoring. This includes selecting the right technologies to invest in and managing resources to achieve our long-term expansion goals.</p>	<p>Here are our measures to manage investment risks continuously.</p> <ul style="list-style-type: none"> • Implement a stage-gate process to govern investment decisions from the opportunity-seeking stage until investment approval known as Corporate Investment Process: CIM. For projects requiring high capital investment, the Risk Management Committee considers the adequacy of risk assessment performed and the mitigation measures chosen. • Systematically monitor to ensure investment project progress as planned. • Perform a lookback analysis to monitor completed projects and use the lessons learned to improve the investment process and increase the success of future investments. • Prepare investment capital and maintain liquidity as financial policy to support future investment. • Develop and include sustainability factors covering ecofriendly technology and greenhouse gas (GHG) emissions into investment criteria.
<p>Climate Change Risk</p> <p>Climate change remains a recurring issue on the international stage, resulting in risk including severe natural disasters and drought. Governments have therefore issued policies, regulations, and laws in response to COP21 with continued emphasis on reducing greenhouse gas emissions. Altering our current processes to accommodate these actions may inevitably increase production costs, while affecting competitiveness and business sustainability.</p>	<p>We continuously manage our GHG emission and water management as following mitigations.</p> <ul style="list-style-type: none"> • Establish a climate change team to monitor climate-related activities such as promoting more efficient energy usage, supporting the use of renewable energy, applying eco-design measures for product development, and closely monitoring laws and regulations related to climate change and GHG emissions to ensure our readiness to comply. Thus, we should be able to reduce greenhouse gas emissions as targeted which is aligned with governmental policy and the COP21 Paris Agreement. • Become involved in the Thailand Voluntary Emission Trading Scheme (Thailand V-ETS) to prepare for the buying and selling of permits for greenhouse gas (GHG) emission allowances. • Increase the portion of downstream and performance products that release less GHG emissions than the upstream business. <p>Moreover, the additional mitigations as below.</p> <ul style="list-style-type: none"> • Develop a policy and framework to support investment in renewable energy projects and investment to reduce GHG emissions as part of GHG emission mitigation. • Apply carbon pricing as part of our investment criteria to limit GHG emission in GC's future projects.

Corporate Risk Factors	Important Mitigation Measures
<p>People and Organization Risk</p> <p>Our strategic growth plans are always supported by developing our human resources. For effective operation and long-term growth of our business, both in Thailand and overseas, we need to continue developing our employees' knowledge and skills.</p>	<p>GC always give priority to manage our people as followed.</p> <ul style="list-style-type: none"> • Develop managers at all levels as defined in the people portfolio and continuously develop high-potential employees (Top talent) to support our long-term growth plan. • Prepare succession plans in time for retiring executives and company growth. • Continuously strengthen the organizational culture by driving GC SPIRIT through the 4 Core Behaviors. • Apply technology to enhance our learning program focusing on self-learners. • Improve performance management to support future sustainable growth. <p>(More detail in the section "People Management and Development Policy")</p>
<p>Policy & Regulatory Change Risk</p> <p>We strictly adhere to all laws, regulations, and policies imposed by the government. Changes in these laws and regulations can impact our operations or investment opportunities, thus we monitor these changes regularly and adjust our operations accordingly.</p>	<p>We prepare ourselves for managing the chain in policy and regulatory by following mitigations.</p> <ul style="list-style-type: none"> • A laws-and-regulations working team closely monitors important news and information related to proposed changes in regulations and, when enforced, communicates these to related functions to properly comply and apply these policies and regulations to assess the economic feasibility of our investments.



EMERGING RISK FACTORS

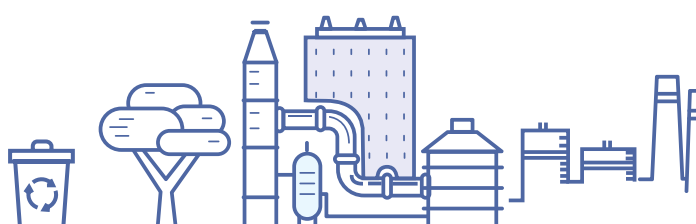
With volatility and unexpected changes in business conditions, we have monitored emerging risk to ensure that proactive mitigation measures are in place before they impact our business.

Corporate Risk Factors	Important Mitigation Measures
<p>Continuous Increasing Environmental Concerns</p> <p>Environmental concerns are becoming more serious both domestically and globally. Consumers with increased awareness of long-term environmental impacts have become more empowered. Their significant behavioral changes might impact the future of our business in several ways:</p> <ul style="list-style-type: none"> • The Thai government announced the plastic waste management plan 2018-2030 with a target of replacing single-use plastics with environmentally sustainable products or recyclable plastics by 2022. • Consumers value ecofriendly products and the trend to reduce usage of single-use plastics, with producers needing to change their products, leading to decreased plastics demand in the next 2-3 years. • Awareness of the importance of the circular economy: Our image and reputation of our products bearing on the environment. • Place importance and active on PM 2.5 pollution problem. • Image and reputation of company and our product in term of environmental impact. 	<p>GC has implemented the following mitigations preparing for handle with continuous increasing environmental concerns trend.</p> <ul style="list-style-type: none"> • Reduce business risk by diversifying our portfolio from single-use plastics to durable or semi-durable plastics. • Develop bioplastics and biodegradable plastics business certified by both national and international standards as an ecofriendly alternative solution for consumers. • Implement integrated circular economy concept by cooperating with related parties along the value chain to develop product served with consumer's expectations and raise up awareness to people for the use of petrochemical products as well as preserving the environment together through the projects such as the Upcycling the Oceans; the Thailand/Upcycling Plastic Waste Project; the ThinkCycle Bank Project and the Public Private Partnership (PPP Plastic). • Support cooperation with communities and agencies in sorting plastic waste and using it as raw material for plastic recycling prototype plants, to be operated with experienced business partners for future recycling business. <p>Besides, we intend to implement more measures as below.</p> <ul style="list-style-type: none"> • Promote biodegradable plastics to replace single-use plastics for non-recyclable contaminated products by inventing the GC Compostable label to illustrate GC's commitment to applying innovation to take care of the environment. We restrict the use of such label to our operators as a way of adding value to products and containers. • Associate with Our Khung BangKachao Project to develop end-to-end waste management system, setup learning resources and value added from the waste. • Promote circular economy concept and • Inspire new ideas to optimal resources by Circular Living Symposium 2019: Upcycling Our Planet.

Corporate Risk Factors	Important Mitigation Measures
	<ul style="list-style-type: none"> GC and our subsidiaries intend to support our product comply with Ministry of Energy policy about PM 2.5 pollution reduction actions. Presently, our refinery plant can produce diesel under EURO 5 standard and our subsidiary, Global Green Chemicals Company Limited, can produce Methyl Ester which is a part of diesel type B10 and B20. Support corporation with related parties to sort plastic waste correctly and recycle them as concept of Circular Economy
<p>Digital Technology Transformation: Business Impact of Technological Advances</p> <p>The rapid development of technology and digital technology plays a key role in changing market, product development as well as innovation. This means that every business must increasingly make adjustments to take advantage of new opportunities:</p> <ul style="list-style-type: none"> For petrochemicals, crude oil-to-chemicals (COTC) refers to transformative technology converting crude to higher-value petrochemicals on a scale that would disrupt our business. E-Mobility development of electronic vehicles and batteries might replace the internal combustion engine. Artificial intelligence (AI), robotics, data analytics, and smart factories will disrupt various businesses. Technology infrastructure development and digitalization present the challenge of how to develop our people's capability to cope with these technological advances. 	<p>We conduct the following measures to manage impact arising from technological advances.</p> <ul style="list-style-type: none"> Pursue innovation extension opportunities by open innovation and Corporate Venture Capital (CVC) as elaborated in innovation risk. Follow up and study technological solutions to improve our processes, enhance our competitiveness, and create more value from our products to maintain our competitiveness. Establish a digital technology transformation function to manage digitalization and maintain our competitiveness by focusing on three main perspectives: <ol style="list-style-type: none"> Business Perspective by using digital technology to maintain our competitive advantage and meet stakeholders' expectations Technology Perspective by developing IT and data architecture to more effectively manage cyber threats, and People Perspective by enhancing employees' capabilities aligned with the technological and digital technology transformation.

Corporate Risk Factors	Important Mitigation Measures
<p>Cyber Threats</p> <p>Increased dependence on technology leads to increased risk of cyber threats to our production processes and all our operating platforms that rely on Internet connections. Theft of important information or production process interruptions would affect our reliability, credibility, and reputation.</p>	<p>We seriously and continuously watch out cyber threats through key mitigations are as follows.</p> <ul style="list-style-type: none"> • Monitor and be alert for new cybersecurity threats at both plants and offices. Also, perform penetration tests and vulnerability assessments regularly to be proactive in planning preventive mitigation measures for possible attacks. • Carry out cybersecurity drills and disaster recovery tests regularly to manage and lessen the impacts should these events occur so as to ensure business continuity. • Implement an information security management system and asset security practices in accordance with cyber-related international standard. • Continuously foster cybersecurity awareness, for example, how to defend against cyber threats and IT laws related to employees. The company also regularly performs phishing tests so that employees may exercise caution when using IT communication platforms.
<p>Water Crisis</p> <p>Climate change is one of the factors could have an affect on water level changing in various area including Thailand. It is possible to turn into water crisis which affect to either drought or declining water quality and interrupt our production and business.</p>	<p>We implement following mitigations to handle water situation which might impact to our operation and business.</p> <ul style="list-style-type: none"> • Continuously monitor and analyze water level in Rayong and nearby area to assess situation and risk which possibly to occur. • Water management using control measures such as the 3Rs (Reduce, Reuse, Recycle); increasing water usage efficiency in our processes; increasing effectiveness of water desalination in our seawater reverse osmosis unit work with agencies in eastern Thailand to develop water resources.

We believe that these mitigation measures can help us minimize risk, increase opportunities for sustainable growth, and achieve our business goals stated in our direction and strategic plans.



INTERNAL CONTROL

PTT Global Chemical Public Company Limited (GC) runs an Internal Control System in accordance with the international standards of the Committee of Sponsoring Organizations of the Treadway Commission (COSO) to achieve internal control objectives relating to operations, reporting, and compliance with laws and regulations.

During Board of Directors Meeting 2/2020 held on February 17, 2020, the GC's system was evaluated based on an internal control assessment report prepared by the Management following the Securities and Exchange Commission, Thailand (SEC) guidelines. Together with the results of the Audit Committee's internal control review, the Board viewed that GC's internal control was adequate and effective for its businesses. No significant problems or material shortcomings were detected that could interfere with achieving internal control objectives. GC's Internal Control System was functioning properly in an adequate manner. The operation was efficiently managed with sufficient numbers of qualified and competent employees and processes. In addition, GC implemented a monitoring system to ensure the achievement of business objectives with effective, efficient operations, reliable reporting, and compliance with applicable laws and regulations as well as safeguarding GC Group's assets against misuse or unauthorized use by the Board, Management, or employees.

GC improved on internal control procedures and processes in 2019 to increase robustness and speed in identifying risks. GC's Internal Control System in accordance with COSO can be summarized in five categories:

1. CONTROL ENVIRONMENT

The Board and the Management strive to promote a corporate culture that focuses on integrity and ethics. They also supervise operations to ensure compliance with the organizational vision and mission and to ensure that GC's control environment is appropriate for implementing the Internal Control System, as detailed below.

- The Board and the Management establish the Corporate Governance Policy, Business Code of Conduct, Corporate Compliance Policy, Internal Control System Policy, and Anti-Corruption Guidelines setting out preferred practices for all directors, the Management, and employees. All employees are accountable for their internal control activities and for maintaining an effective internal control system. These policies are regularly communicated and promoted to all employees through training courses and other activities. These activities include monthly key meetings (Hook Talk) conducted by top management and used as a platform to communicate ethics and business code of conduct to employees, and to promote a good corporate governance culture. In 2019, GC emphasized communicating and promoting corporate governance and business code of conduct through a roadshow activity called "Hook Walk" on "How to perform duties in line with Governance and Compliance" to all departments as well as organizing a "GC Group Compliance Day" to communicate the importance of compliance to GC group employees. In addition, GC revised E-CG & Business Code of Conduct Handbook in electronic form for delivery to the Management and employees as guidelines including a written pledge to comply with the policy, principles, and business ethics. Also, an online Conflict of Interest application on intranet was developed to increase efficiency in data collection and storage, including security of information access.
- The Board is independent from the Management and is responsible for supervising overall operations as well as expressing views on the direction and strategy used as guidelines to formulate business and operating plans. Furthermore, the Board regularly monitors GC's performance and its subcommittees to ensure that GC achieve objectives and goals.
- GC's corporate structure is grouped into business units and functions that best support its business operations efficiently and with good governance. This structure comes with a system of checks and balances, with duties and responsibilities

delegated appropriately. Furthermore, all employees acknowledge their roles, authorities, responsibilities, and accountabilities.

- GC specifies qualifications for all positions: These form the basis for recruitment and personnel development aligned with corporate culture. Succession plans are in place for key management positions to ensure business continuity. Furthermore, performance-management and fair-reward systems are in place as incentives to motivate employee efficiency. In 2019, GC implemented agility testing—a tool for assessing the readiness of top talent to help plan career development. Moreover, “GC people website” was developed to gather information on human resources, employee activities, executive perspectives, recruitment, and relevant personnel information.
- GC regularly organize exhibitions to raise awareness of fraud risks and impacts from corruption, also providing related governance guidance to the Management and employees through activities and training programs such as GC Group CG Day, CG Role Model: Focus on Action and Ethical Leadership. In 2019 training programs were expanded to division managers of GC and GC group.

2. RISK ASSESSMENT

The Board and the Management recognize the importance of risk management in achieving short-term and long-term goals. The Risk Management Committee, appointed by the Board, along with the Enterprise Risk Management Committee, appointed by the CEO, are collectively responsible for overseeing risk management and ensuring that it is managed appropriately, effectively, and efficiently as specified under “Risk Management and Risk Factors”.

GC takes into consideration changes in internal and external factors along with the potential for fraud and corruption in assessing risks that can prevent GC from achieving objectives. Mitigation plans are drawn up to manage these risks. Risk-and-mitigation plans are reviewed and monitored monthly. All departments are responsible for managing risks to an acceptable

level. Furthermore, to meet the long-term goals, GC appoint taskforces to deal with specific risks that affect the business in the long run to ensure effective countermeasures.

- GC develops Key Risk Indicators (KRI) to monitor changes in risk factors so that these risks are managed efficiently and in a timely manner. GC also developed databases for risk management information to help every function access it for further analysis.
- In 2019, GC tested the robustness of “Cyber Incident Response” by simulating events (tabletop exercise) from cyberattacks with data leakage and hacking that could disrupt business operations and affect reputation. During this test, relevant operations and support functions were involved. This should assure all stakeholders that GC is well prepared to cope with such crises effectively.

3. CONTROL ACTIVITIES

GC develops efficient, effective control activities to mitigate risks to achieving goals and ensuring that risk remains acceptable. These include:

- Designing control activities aligned with internal control principles, including segregation of duties, policies, and good practices for conflict-of-interest transactions. In addition, the business is operated in a transparent, fair, and auditable manner. A transparent transaction-approval process provides the utmost benefit to the organization.
- Rules, regulations, policies, and procedures are in place with clear boundaries of authorization to limit the power and authority of the CEO, the President, the Management, and other employees. Furthermore, operations are reviewed regularly to ensure compliance with rules, regulations, policies, and procedures.
- GC implements the automated control of crucial processes: For example, SAP GRC Access Control is in place to ensure that SAP operating system access rights accord with good practices in segregation of duties. GC also use the Continuous Control Monitoring System (CCMS) for crucial processes to help detect and follow up exceptional transactions and to notify designated employees

to correct problematic transactions in a timely manner. In 2019, GC installed additional automated control systems such as blockchain for bank guarantees and Robotics Process Automation (RPA) for more efficient, effective procurement processes minimizing work process time and human errors, resulting in increased credibility and trust.

- GC has in place an Information Technology Security Policy in accordance with the ISO27001 – Information Security Management standards and the Control Objectives for Information and Related Technologies (COBIT), including reviewing, revising, and updating GC's policy covering important activities to ensure information security. Furthermore, Cyberthreat-prevention news and training are provided regularly to all employees. In 2019, GC increased the efficiency of an Information Technology Security by using two-factor authentication as two-step verification when accessing critical systems. In addition, to raise GC's information technology security standards, USB drive usage was cancelled, with the Cloud and intranet used to store or transfer data instead.
- Guidelines govern companies GC has invested in to ensure that these companies align with GC in terms of operating direction as well as complying with GC's policies, procedures, and strategic direction. Operations of these companies are monitored regularly and continuously.
- GC offers guidance called the GC Way of Conduct to govern and manage its subsidiaries, which is improved and continually communicated to affiliates in GC group. In 2019, GC provided training programs for executives of GC Group to raise understanding and awareness about the GC way of conduct and provided an assessment form to reinforce this guidance. The progress of this program was regularly reported to top management for acknowledgment.
- GC strengthens Governance, Risk Management, & Internal Control and Compliance (GRC) implementation by selecting employees to be accountable for driving, executing, and monitoring this program in its key business units. In 2019, GC provided GRC workshops for executives to raise GRC awareness as well as understanding. GRC personnel provides recommendations for improving corporate controls. GC also continually drove GRC in six subsidiaries through GRC committees by arranging quarterly meetings to govern, review, monitor, and assess GRC performance.

4. INFORMATION AND COMMUNICATION

GC values the quality of information and communication that supports the effectiveness of its Internal Control System, as detailed below.

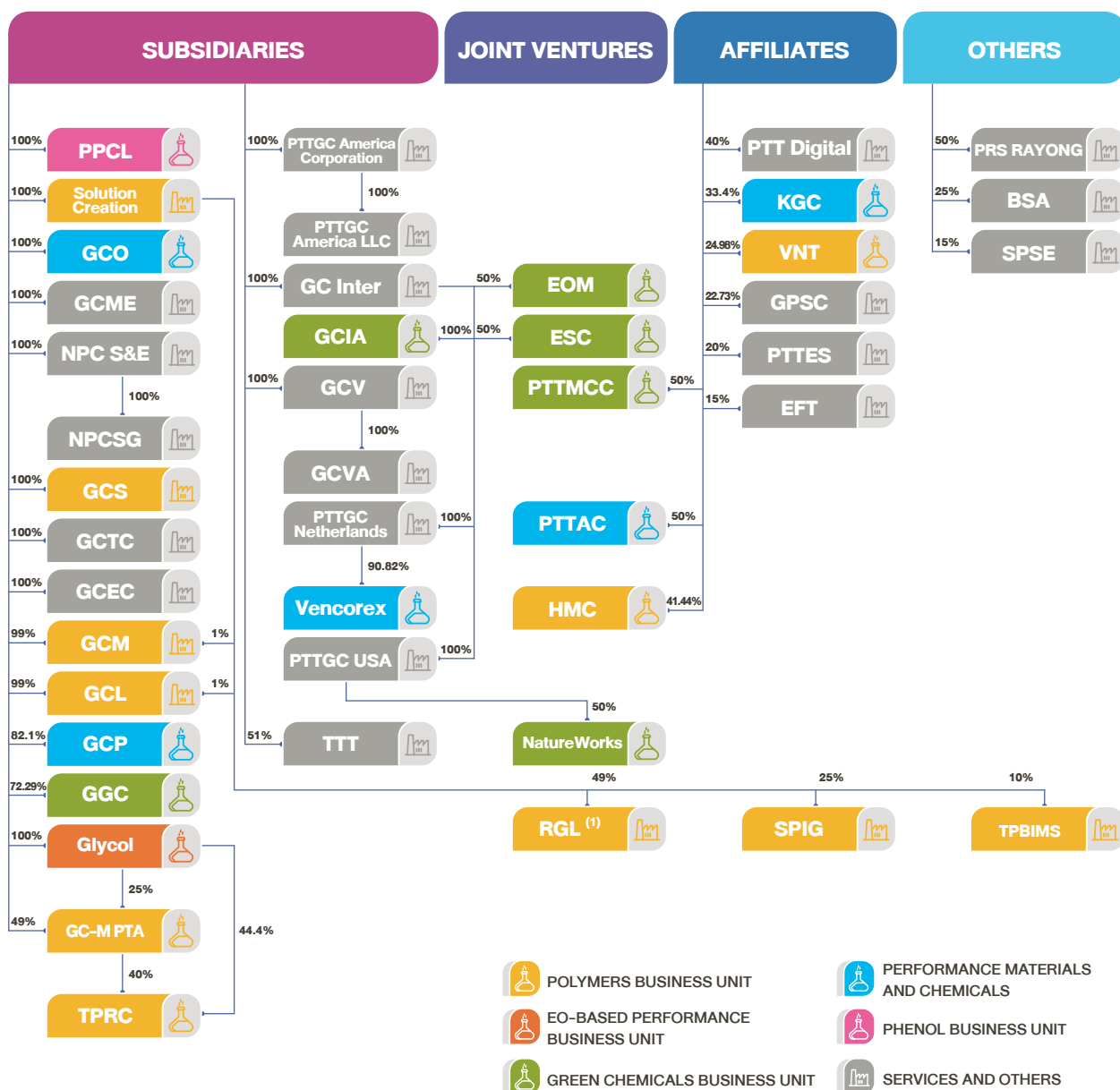
- GC have established information classification along with instructions for filing important and controlled documents, including information from both internal and external sources. This process is intended to ensure that important information about GC and its business operations is accurate, complete, adequate and timely.
 - GC has implemented SAP ECC 6.0 to process key business transactions, reducing duplication of small legacy systems, and enhancing the efficiency of management reporting.
 - GC has in place a database for information on key external factors to aid in preparing strategic plans, including systematically maintaining information on each business unit's plans aligned with GC strategies.
 - GC also developed an Incident Management System (IMS) Mobile Application to facilitate communicating information in the event of a crisis for more efficient information management.
 - In 2019, GC established the GC EYE team of analysts with expertise in business, the economy, and market outlook from various departments to strengthen the external-factors analysis and help GC anticipate developments that could affect business operations. GC EYE's news and analysis are communicated to executives and relevant parties through mobile application platform accessible anywhere and anytime.
- GC communicate relevant information to the Board, the Management, employees, and stakeholders to support efficient operations and internal controls.
 - Crucial information related to GC's performance is delivered to directors before Board meetings to allow sufficient time for them to study, review, and make decisions. When necessary, the Board may request additional information from specific departments or employees. Furthermore, to easily and swiftly dispatch information and meeting documents, GC implements "Digital Join", with information sent to directors' electronic devices protected by data encryption.

- Several internal communication channels are available: These include Town Hall activities for facilitating communication from top management to employees, the organization's intranet, and email. In addition, new employees receive important information through orientation sessions. Employees can also access useful information through a knowledge-based system and e-learning. GC develops "WE GC mobile phone application" enables all employees to access corporate news via mobile phone.
- GC use external communication channels to communicate with external stakeholders, such as company website, Facebook, and Twitter. In addition, designated departments are responsible for disclosing important information to all stakeholders regularly. A Customer Solutions Center is a communication channel for external stakeholders, founded as a one-stop center for interested parties to learn and gather information relating to GC products and services. Moreover, shareholders are invited to propose the agenda for the Annual General Meeting of Shareholders (AGM) and names of qualified candidates to be nominated for election as company directors to enhance good corporate governance regarding the rights and equitable treatment of shareholders.
- GC has established an open communication channel for whistleblowers. This allows employees and external individuals to be confident that any complaints will be handled with transparency, straightforwardness, confidentiality, and in a timely manner. In 2019, GC assessed employees' understanding of and confidence in whistleblowing with a survey to improve the whistleblower system, with survey results reported to the CG Board for acknowledgment.
- GC evaluates the adequacy of corporate internal controls system annually. In addition, GC implements Control Self-Assessment (CSA) for process owners to evaluate internal control mechanisms at the process level. The adequacy and appropriateness of assessment results are verified by the Internal Control System Division and GRC personnel who also provide recommendations for correcting any internal control deficiencies. Reporting and monitoring procedures are also in place to report deficiencies to the Management and track remediation progress to ensure that problems are addressed in a timely manner. In 2019 information-sharing sessions between internal audit, internal control, and GRC personnel were held to develop and improve internal control efficiency.
- Internal Audit, an independent unit reporting directly to the Audit Committee, examines and evaluates the effectiveness and operation of current internal control activities according to the audit plan approved by the Audit Committee. This audit plan is aligned with GC's strategy and its associated risks as well as providing suggestions and support for internal control. Deficiencies and recommendations are communicated by the management team to those responsible. The audit reports and findings are presented to the Audit Committee quarterly. Internal controls for financial reporting are reviewed by external auditors who report to the Audit Committee quarterly and yearly.
- GC has continually performed compliance monitoring and reporting for GC Group to ensure compliance with a compliance checklist used to monitor adherence to the corporate compliance policy.
- GC becomes also a certified member of the Private Sector Collective Action Coalition against Corruption (CAC) by performing annual self-assessments every year, with the results audited by the Audit Committee and signed by Chairman of the Audit Committee and Chairman of the Board of Directors every three years to prove that GC has indeed established anti-corruption policies, guidelines, and measures to prevent corruption as well as operating its business under GC's good corporate governance principles.

MONITORING ACTIVITIES

GC continually monitors and evaluates the adequacy of its internal controls. Development and improvement processes are also in place to ensure efficient, effective internal controls as shown below.

SHAREHOLDING STRUCTURE IN SUBSIDIARIES AND AFFILIATES



Remarks: Significant Change in the shareholding structure in subsidiaries and affiliates from January 1, 2019 to December 31, 2019

1. March 26, 2019: The company invested in RGL through Solution Creation, as a result holding 49% of the shares.

2. July 31, 2019: GC Inter sold all shares in PT Indo Thai Trading.

SUBSIDIARIES

GCO	GC Oxirane Company Limited
GCS	GC Styrenics Company Limited
Glycol	GC Glycol Company Limited
PPCL	PTT Phenol Company Limited
Solution Creation	Solution Creation Company Limited
GCL	GC Logistics Solutions Company Limited
GCM	GC Marketing Solutions Company Limited
GCP	GC Polyols Company Limited
GGC	Global Green Chemicals Public Company Limited
GC-M PTA	GC-M PTA Company Limited
TPRC	Thai PET Resin Company Limited
Vencorex	Vencorex Holding
GCEC	GC Estate Company Limited
GCME	GC Maintenance and Engineering Company Limited
GCTC	GC Treasury Center Company Limited
NPC S&E	NPC Safety and Environmental Service Company Limited
NPCSG	NPC S&E Security Guard Company Limited
TTT	Thai Tank Terminal Limited
GCIA	PTTGC Innovation America Corporation
GC Inter	PTTGC International Private Limited
GCV	GC Ventures Company Limited
GCVA	GC Ventures America Corporation
PTTGC America Corporation	PTTGC America Corporation
PTTGC America LLC	PTTGC America LLC
PTTGC Netherlands	PTTGC International (Netherlands) B.V.
PTTGC USA	PTTGC International (USA) Inc.

JOINT VENTURES

EOM	Emery Oleochemicals (M) Sdn. Bhd.
ESC	Emery Specialty Chemicals Sdn. Bhd.
HMC	HMC Polymers Company Limited
NatureWorks	NatureWorks LLC
PTTAC	PTT Asahi Chemical Company Limited
PTTMCC	PTT MCC Biochem Company Limited
RGL	Revolve Group Limited

AFFILIATES

EFT	Eastern Fluid Transport Company Limited
GPSC	Global Power Synergy Public Company Limited
KGC	Kuraray GC Advanced Materials Company Limited
PTT Digital	PTT Digital Solutions Company Limited
PTTES	PTT Energy Solutions Company Limited
SPIG	S. P. Petpack Inter Group Company Limited
VNT	Vinythai Public Company Limited

OTHERS

BSA	Business Services Alliance Company Limited
PRS RAYONG	Pracharath Rak Samakkee Rayong (Social Enterprise) Company Limited
SPSE	Sarn Palung Social Enterprise Company Limited
TPBIMS	TPBI & Myanmar Star Company Limited

REVENUE STRUCTURE

Business Unit	2017		2018		2019	
	Revenue (Million THB)	%	Revenue (Million THB)	%	Revenue (Million THB)	%
1. Refinery and Shared Facilities						
Total	187,424	42.7	227,034	43.8	175,036	42.4
2. Aromatics						
Total	65,195	14.7	92,601	17.8	54,653	13.2
3. Olefins						
Total	31,052	7.0	29,267	5.6	22,437	5.4
4. Polymers						
Total	80,919	18.4	89,353	17.2	99,760	24.2
5. EO-Based Performance						
Total	15,903	3.6	16,506	3.2	10,141	2.5
6. Green Chemicals						
Total	18,195	4.1	15,233	2.9	12,017	2.9
7. Performance Materials and Chemicals						
Total	39,198	9.0	46,751	9.1	36,769	8.9
8. Services and Others						
Total	2,035	0.5	1,910	0.4	1,997	0.5
Net Total after deduction from connected transaction	439,921	100	518,655	100	412,810	100



CONNECTED TRANSACTION

CONNECTED TRANSACTION BETWEEN RELATED COMPANIES

For the 2019 accounting period, PTTGC conducted significant business transactions with its subsidiaries and related companies with common shareholders and/or Directors. Connected transactions with other entities which may result in conflicts of interest are based on market or contractual prices (the prices agreed in previous contracts) - if there are no reference market prices. Details of the relationships with these companies are as follows:

(Unit: Million THB)

Company	Relationship As at 31 st December 2019	Connected Transaction	2017	2018	2019
1. PTT Public Company Limited (PTT)	<ul style="list-style-type: none"> Major shareholder holding 47.92% of the shares in PTTGC Common Directors: <ol style="list-style-type: none"> Mr. Don Wasantapruerk Mr. Supattanapong Punmeechaow Directors who are PTT Executives: <ol style="list-style-type: none"> Mr. Wittawat Svasti-xuto Mrs. Arawadee Photisaro Mr. Disathat Panyarachun Mr. Kongkrapan Intarajang Common Management: <ol style="list-style-type: none"> Mr. Kongkrapan Intarajang Miss Duangkamol Settanang Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	148,614	124,542	29,047
		Purchases of goods or receiving of services	244,807	310,191	237,553
		Other income	40	76	26
		Other expense	88	115	504
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	12,625	3,576	2,265
		Other accounts receivable – related parties	210	49	38
		Trade accounts payable – related parties	23,189	23,678	17,400
		Other accounts payable – related parties	36	43	90
2. Global Power Synergy Public Company Limited (GPSC)	<ul style="list-style-type: none"> Associate company (GC holds 22.73% of the shares) Major shareholder (PTT) holds 22.81% of the shares Common Director: Mr. Wittawat Svasti-xuto Executives who are Directors of GPSC: <ol style="list-style-type: none"> Mr. Kongkrapan Intarajang Mr. Boonchai Chunhawiksit Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	42	37	69
		Purchases of goods or services	8,290	8,966	9,405
		Interest income	-	-	163
		Other income	24	9	7
		Other expense	3	-	2
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	9	10	25
		Other accounts receivable – related parties	65	159	173
		Trade accounts payable – related parties	1,634	1,771	1,024
		Other accounts payable – related parties	11	13	6
		Payables to contractors – related parties	17	19	21

(Unit: Million THB)

Company	Relationship As at 31 st December 2019	Connected Transaction	2017	2018	2019
3. PTT Digital Solutions Company Limited (PTT DIGITAL)	<ul style="list-style-type: none"> Associate company (GC holds 40% of the shares) Major shareholder (PTT) holds 20% of the shares Executives who are Directors of PTT DIGITAL: <ol style="list-style-type: none"> Mr. Pirun Krimwongrut Mrs. Chatsuda Kanjanarat Services transaction 	Statements of Income Transactions			
		Purchases of goods or services	3	1	5
		Other income	57	52	55
		Other expense	451	455	451
		Statements of Financial Position Balances			
		Other accounts receivable – related parties	27	26	29
		Other accounts payable – related parties	115	84	104
		Payables to contractors – related parties	50	62	79
4. PTT Energy Solutions Company Limited (PTTES)	<ul style="list-style-type: none"> Associate company (GC holds 20% of the shares) Major shareholder (PTT) holds 40% of the shares Common Director: Mr. Wittawat Svasti-xuto Executive who is Director of PTES: Mrs. Jeeranee Pimthanothai Services transaction 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	3	7
		Purchases of goods or services	127	122	103
		Other income	3	-	-
		Other expense	3	8	2
		Statements of Financial Position Balances			
		Other accounts receivable – related parties	1	27	1
		Other accounts payable – related parties	15	52	1
5. Trans Thai-Malaysia (Thailand) Co., Ltd. (TTM)	<ul style="list-style-type: none"> Major shareholder (PTT) holds 50% of the shares Services transaction 	Statements of Income Transactions			
		Sales of goods or rendering of services	2	-	-
6. TOP Solvent Company Limited (TS)	<ul style="list-style-type: none"> Subsidiary of TOP Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	242	184	130
		Purchases of goods or services	127	274	206
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	11	10	6
		Trade accounts payable – related parties	5	21	10
		Other accounts payable – related parties	10	3	3

(Unit: Million THB)

Company	Relationship As at 31 st December 2019	Connected Transaction	2017	2018	2019
7. Dhipaya Insurance Public Company Limited (DHIPAYA)	<ul style="list-style-type: none"> Major shareholder (PTT) holds 13.33% of the shares Services transaction 	Statements of Income Transactions			
		Purchases of goods or services	761	618	653
		Other income	206	1	39
		Other expense	15	64	22
		Statements of Financial Position Balances			
		Other accounts receivable – related parties	595	503	477
		Trade accounts payable – related parties	-	7	1
		Other accounts payable – related parties	16	16	3
8. Thai Paraxylene Company Limited (TPX)	<ul style="list-style-type: none"> Subsidiary of TOP Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	-	55
		Statements of Financial Position Balances			
9. Thai Oil Public Company Limited (TOP)	<ul style="list-style-type: none"> Major shareholder (PTT) holds 47.53% of the shares Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	1,107	992	1,557
		Other income	3	6	4
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	68	8	100
		Other accounts receivable – related parties	-	39	-
		Other accounts payable – related parties	-	-	4
10. Business Services Alliance Company Limited (BSA)	<ul style="list-style-type: none"> GC holds 25% of the preference shares Major shareholder (PTT) holds 100% of the shares Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	-	1
		Purchases of goods or services	205	160	142
		Other income	-	-	4
		Other expense	101	108	126
		Statements of Financial Position Balances			
		Other accounts receivable – related parties	-	-	4
		Trade accounts payable – related parties	52	57	93
		Other accounts payable – related parties	103	60	63
		Payables to contractors – related parties	8	3	3

(Unit: Million THB)

Company	Relationship As at 31 st December 2019	Connected Transaction	2017	2018	2019
11. PTT Global Management Company Limited (PTTGM)	<ul style="list-style-type: none"> Major shareholder (PTT) holds 100% of the shares Services transaction 	Statements of Income Transactions			
		Other expense	11	-	-
12. PTT Oil and Retail Business Public Company Limited (PTTOR)	<ul style="list-style-type: none"> Major shareholder (PTT) holds 100% of the shares Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	69,948	123,025
		Purchases of goods or services	-	52	108
		Other income	-	143	12
		Other expense	-	-	2
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	-	8,108	8,705
		Other accounts receivable – related parties	-	86	77
		Trade accounts payable – related parties	-	-	6
		Other accounts payable – related parties	-	3	105
		Payables to contractors – related parties	-	21	-
13. PTTEP Siam Limited (PTTEPS)	<ul style="list-style-type: none"> Subsidiary of PTTEP Sales/Purchases transaction of products and services. 	Statements of Income Transactions			
		Sales of goods or rendering of services	46	1	2
14. PTTEP International Limited (PTTEPI)	<ul style="list-style-type: none"> Subsidiary of PTTEP Services transaction 	Statements of Income Transactions			
		Sales of goods or rendering of services	1	-	-
15. PTT Exploration and Production Public Company Limited (PTTEP)	<ul style="list-style-type: none"> Major shareholder (PTT) holds 65.29% of the shares Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	21	12	13
		Other expense	-	2	8
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	3	5	1
		Other accounts payable – related parties	-	2	-
16. PTT Tank Terminal Company Limited (PTT TANK)	<ul style="list-style-type: none"> Major shareholder (PTT) holds 100% of the shares Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	47	46	47
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	22	8	6
		Other accounts payable – related parties	-	-	1

(Unit: Million THB)

Company	Relationship As at 31 st December 2019	Connected Transaction	2017	2018	2019
17. PTT International Trading Pte. Ltd. (PTTT)	<ul style="list-style-type: none"> Major shareholder (PTT) holds 100% of the shares Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	21,352	24,330	9,889
		Purchases of goods or services	859	1,252	1,317
		Other income	3	21	2
		Other expense	6	7	13
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	2,446	1,724	2,374
		Other accounts receivable – related parties	24	209	93
		Trade accounts payable – related parties	203	251	221
		Other accounts payable – related parties	661	39	29
18. PTT LNG Company Limited (PTTLNG)	<ul style="list-style-type: none"> Major shareholder (PTT) holds 100% of the shares Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	27	9	4
		Statements of Financial Position Balances			
19. PTTEP Services Limited (PTTEP Services)	<ul style="list-style-type: none"> Subsidiary of PTTEP Services transaction 	Statements of Income Transactions			
		Other expense	1	1	1
20. Labix Company Limited (LABIX)	<ul style="list-style-type: none"> Subsidiary of TOP Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	20	9	10
		Statements of Financial Position Balances			
21. Sakchaisit Company Limited (SAKC)	<ul style="list-style-type: none"> Subsidiary of TOP Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	1,844	2,320	2,124
		Statements of Financial Position Balances			
22. Sport Services Alliance Company Limited (SSS)	<ul style="list-style-type: none"> Major shareholder (PTT) indirectly holds shares Executive who is Director of SSS: Mr. Pirun Krimwongrut Services transaction 	Statements of Income Transactions			
		Other expense	37	37	37
23. UBE Chemicals (Asia) Public Company Limited (UCHA)	<ul style="list-style-type: none"> Associate of IRPC Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	23	20	22
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	2	5	2

(Unit: Million THB)

Company	Relationship As at 31 st December 2019	Connected Transaction	2017	2018	2019
24. Energy Complex Company Limited (ENCO)	<ul style="list-style-type: none"> Major shareholder (PTT) holds 50% of the shares Services transaction 	Statements of Income Transactions			
		Sales of goods or rendering of services	44	47	46
		Other expense	196	205	213
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	13	13	9
		Other accounts receivable – related parties	44	47	1
25. IRPC Polyol Company Limited (IRPCP)	<ul style="list-style-type: none"> Subsidiary of IRPC Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	37	23	13
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	10	4	5
26. IRPC Public Company Limited (IRPC)	<ul style="list-style-type: none"> Major shareholder (PTT) holds 47.55% of the shares Sales/Purchases transaction of products and services 	Statements of Income Transactions			
		Sales of goods or rendering of services	20,162	26,560	19,892
		Purchases of goods or services	14,106	20,253	14,150
		Other income	16	11	1
		Other expense	7	5	9
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	1,969	2,022	1,816
		Other accounts receivable – related parties	6	35	3
		Trade accounts payable – related parties	1,311	1,583	1,224
		Other accounts payable – related parties	2	1	3
27. PTTEP International Limited (Yangon Branch)	<ul style="list-style-type: none"> Subsidiary of PTTEP Services transaction 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	2	-
		Statements of Financial Position Balances			
28. PTT International Trading DMCC (PTTT DMCC)	<ul style="list-style-type: none"> Subsidiary of PTTT Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	863	1,417	-
29. TOP Solvent (Vietnam) LLC. (TSV)	<ul style="list-style-type: none"> Subsidiary of TOP Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	215	142	54
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	23	1	1

(Unit: Million THB)

Company	Relationship As at 31 st December 2019	Connected Transaction	2017	2018	2019
30. Sarn Palung Social Enterprise Company Limited (SPSE)	<ul style="list-style-type: none"> Other related company (GC holds 15% of the shares) Major shareholder (PTT) holds 20% of the shares Services transaction 	Statements of Income Transactions			
		Other expense	-	-	3
31. Glow Energy Public Company Limited (GLOW)	<ul style="list-style-type: none"> Subsidiary of GPSC Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	-	261
		Purchases of goods or services	-	-	2,851
		Other expense	-	-	3
		Statements of Financial Position Balances			
		Trade accounts receivable – related parties	-	-	26
		Other accounts receivable – related parties	-	-	2
		Trade accounts payable – related parties	-	-	323
32. Glow SPP 2 Company Limited (GSPP2)	<ul style="list-style-type: none"> Subsidiary of GPSC Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	-	9
		Statements of Financial Position Balances			
33. Glow SPP 3 Company Limited (GSPP3)	<ul style="list-style-type: none"> Subsidiary of GPSC Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	-	6
		Statements of Financial Position Balances			
34. Glow SPP 11 Company Limited (GSPP11)	<ul style="list-style-type: none"> Subsidiary of GPSC Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	-	3
		Statements of Financial Position Balances			
35. Glow IPP Company Limited (GIPP)	<ul style="list-style-type: none"> Subsidiary of GPSC Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	-	2
		Statements of Financial Position Balances			
36. GHECO-One Company Limited (GHECO1)	<ul style="list-style-type: none"> Subsidiary of GPSC Sales/Purchases transaction of products 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	-	7
		Statements of Financial Position Balances			
37. PTTEP South Asia Limited (PTTEP SA)	<ul style="list-style-type: none"> Subsidiary of PTTEP Service transaction 	Statements of Income Transactions			
		Sales of goods or rendering of services	-	-	1

MEASURE AND PROCEDURE FOR APPROVAL OF CONNECTED TRANSACTION

The Company's Articles of Association stated that a Director can acquire or dispose of GC assets or perform any business transaction involving GC either by himself or herself or on behalf of others only with the approval from the Audit Committee and the Board of Director. However, any Director who personally gains from any acquisition or disposal of GC asset or any transaction of GC is not allowed to vote on that matter.

After receiving approval from the Audit Committee and the Board of Directors, GC can perform any business transactions or acquire or dispose of major assets in line with the announcement of the Stock Exchange of Thailand (SET) and the Securities and Exchange Commission, Thailand (SEC). This also applies to GC's subsidiaries in the SET announcement concerning connected transaction of listed companies as well as the buying and selling of registered company assets.

NECESSITY AND JUSTIFICATION OF CONNECTED TRANSACTION

The sales of products by GC to connected companies have been carried out mainly so that they may process its products into their own products for sale at prices corresponding to long-term off-take agreements or spot prices. Prices must prove mutually beneficial and based on market prices without any undue transfer of interests or extraordinary items to both parties. When providing services to connected companies, transactions must cover transportation or storage costs of products. The charges for services are both market-based and benefit-based without any undue transfer of interests or extraordinary items.

For the product and feedstock supply and/or services as well as the volume of products, feedstock or services given by connected companies must meet the needs and business operation of GC. Prices of products trading or services are as agreed by GC and connected companies without any undue transfer of interests or extraordinary items. In addition, GC is required to purchase feedstock from connected companies because the capacity and quality of such feedstock meet its needs. GC also saves on transportation expenses since the feedstock can be transferred safely by GC's pipeline systems from their plants in Map Ta Phut Industrial Estate, Rayong.

OPINION OF INDEPENDENT DIRECTORS

The Independent Directors agreed with the Board of Directors.

POLICY AND TREND ON FUTURE CONNECTED TRANSACTION

Future connected transactions between GC and connected companies will be conducted as part of the normal course of business with no special favors and no transfer of benefits. For the pricing policy between GC and connected companies, the price of products or feedstock purchased will be set in agreement and or linked to market prices. In addition, service charges paid to connected companies will also be at arm's length. The price of product sold or purchased between GC and connected companies will, as a rule, be linked to market prices.

Disclosure of the Company's connected transaction must be in compliance with the rules and regulations of the Securities and Exchange Commission, Thailand (SEC) and the Stock Exchange of Thailand (SET). The audit standards for connected parties will be as specified by the Federation of Accounting Professions under The Royal Patronage of His Majesty the King.

SHAREHOLDING STRUCTURE

List of Top 10 Major Shareholders according to registered book closing date on September 2, 2019

No.	Shareholders	Shares	%
1.	PTT Public Company Limited ⁽¹⁾	2,149,920,915	47.68%
2.	Thai NVDR Company Limited ⁽²⁾	359,474,834	7.97%
3.	HMC Polymers Company Limited ⁽³⁾	83,427,636	1.85%
4.	SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED	81,907,228	1.82%
5.	STATE STREET EUROPE LIMITED	81,592,700	1.81%
6.	THE BANK OF NEW YORK MELLON	69,165,346	1.53%
7.	Social Security Office	55,195,851	1.22%
8.	NORTRUST NOMINEES LIMITED-NT0 SEC LENDING THAILAND CL AC	50,585,514	1.12%
9.	Bangkok Synthetics Company Limited	43,420,625	0.96%
10.	GIC PRIVATE LIMITED	38,652,029	0.86%

Remarks:

(1) Majority shareholder of PTT Public Company Limited is Ministry of Finance.

(2) Shareholders of Thai NVDR Company Limited holding Non-Voting Depository Receipt: NVDR, are ineligible for voting at shareholders' meeting except when exercising their voting on delisting the shares from the Stock Exchange of Thailand.

(3) GC holds 41.44% of shares of HMC Polymers Company Limited.

As of December 30, 2019, the major shareholders with significant influence on the establishment of GC's policy and strategy are PTT Group, holding 47.92% of shares of GC.

As of December 30, 2019, there are 20 foreign shareholders of GC, holding a combined of 650,676,413 shares of GC or 14.43% of paid-up capital of GC.

GC has foreign shareholding limitation as specified in Article 8 of Article of Association that "GC's shares can be transferred without any restriction, except in the case where the said transfer would result in more than thirty-seven (37) percent of the Company's total paid-up shares being held by foreigners".

DIVIDEND PAYMENT POLICY

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED

The Board of Directors Meeting No. 1/2011, held on October 19, 2011, resolved that the dividend payment policy of the Company is to pay dividend at a rate of no less than 30% of net profit after tax and allocation to all reserve funds of the Company. Such dividend payment however is subject to the investment plan, other necessary and appropriate considerations in the future.

SUBSIDIARIES' DIVIDEND PAYMENT POLICY

The dividend payment policy for GC's subsidiaries shall be considered and proposed by the Board of Directors of each subsidiary for approval at the Annual General Meeting of each subsidiary. The dividend payment of subsidiaries shall be calculated based on the investment plans and other requirements and considerations, such as the adequacy of cash flow of each subsidiary after deducting reserve funds in accordance with the law.

**GREEN
JOURNEY
WITH
PRIDE**



ORGANIZATION STRUCTURE

GC BOARD OF DIRECTORS

As of December 31, 2019

Mr. Piyasvasti Amranand

Chairman and
Chairman of the Independent Director
Age 66

Appointed

April 9, 2018



Education/Training

- Doctor of Philosophy (Ph.D.) in Economics, London School of Economics and Political Science, U.K.
- Master of Science (Economics), London School of Economics and Political Science, University of London, U.K.
- Bachelor of Arts (Mathematics), (First-class Honors), University of Oxford, U.K.
- The Executive Program in Energy Literacy for a Sustainable Future Class 6, Thailand Energy Academy (TEA)

Director Training

- Director Accreditation Program (DAP) Class 35/2005, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company – The Stock Exchange of Thailand : 3

- Chairman and Chairman of the Independent Director, PTT Global Chemical Public Company Limited
- Independent Director and Chairman of the Audit Committee, Kasikornbank Public Company Limited
- Independent Director and Chairman of the Audit Committee, Pruksa Holding Public Company Limited

Board Member/Management in Non-Listed Company – The Stock Exchange of Thailand : 1

- Director, Kiroro Resort Holdings Company Limited

Position in Other Organization/Institutions : 2

- Chairman, Energy for Environment Foundation
- Council Member of the Heart Foundation of Thailand under the Royal Patronage

Work Experiences (5 Years Past Experiences)

1 Jul 2014 - 11 Jul 2018	Independent Director and Chairman, PTT Public Company Limited
2014 - 2016	Independent Director and Chairman of the Audit Committee, Pruksa Real Estate Public Company Limited

Shareholding : None

Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mr. Prasert Bunsumpun

Independent Director and
Chairman of the Risk
Management Committee
Age 67

Appointed

October 19, 2011/
April 8, 2014 (1st re-elected)/
April 5, 2017 (2nd re-elected)



Mr. Prasan Chuaphanich

Independent Director and
Chairman of
the Audit Committee

(Resigned with effective
from November 18, 2019)

Age 67

Appointed

April 5, 2016,
April 5, 2019 (re-elected)



Education/Training

- Honorary Doctoral of Arts (Innovation and Management) Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University
- Honorary Doctoral in Management, Mahasarakham University
- Honorary Doctoral in Management Science, Phetchaburi Rajabhat University
- Honorary Doctoral in Management, National Institute of Development Administration (NIDA)
- Honorary Doctoral in Engineering, Chulalongkorn University
- Master of Business Administration (M.B.A.), Utah State University, U.S.A.
- Bachelor of Engineering (Civil Engineering), Chulalongkorn University
- The Rule of Law for Democracy Class 7, College of the Constitutional Court
- Business Revolution and Innovation Network (BRAIN) Class 1, The Federation of Thai Industries (F.T.I.)
- The Executive Program in Energy Literacy for a Sustainable Future, Class 3, Thailand Energy Academy (TEA)
- Capital Market Academy Leadership Program, Class 3, Capital Market Academy
- Advanced Certificate Course in Politics and Governance in Democratic System for Executives, Class 6, King Prajadhipok's Institute
- Certificate in Advance Management Program (Class 155), Harvard Business School, U.S.A.
- Diploma, National Defence College, The Joint State-Private Sector Course, Class 10, The National Defence College of Thailand (NDC 4010)

Director Training

- Role of the Chairman Program (RCP) Class 28/2012 and Director Accreditation Program (DAP) Class 26/2004, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company -

The Stock Exchange of Thailand : 6

- Independent Director and Chairman of the Risk Management Committee, PTT Global Chemical Public Company Limited
- Independent Director and Chairman, Nok Airlines Public Company Limited
- Independent Director and Chairman, SVI Public Company Limited
- Chairman and Chairman of the Executive Board of Directors, Thoresen Thai Agencies Public Company Limited
- Independent Director/Chairman of the Nomination and Governance Committee/Member of the Leadership Development and Compensation Committee/Member of the Strategic and Organizational Review Committee, Intouch Holdings Public Company Limited
- Independent Director and Chairman, Thaicom Public Company Limited

Board Member/Management in Non-Listed Company -

The Stock Exchange of Thailand : 3

- Chairman and Non-Executive Chairman, Mermaid Maritime Public Company Limited
- Chairman, Yuanta Securities (Thailand) Company Limited
- Chairman, AIRA Property Public Company Limited

Position in Other Organization/Institutions : 7

- Distinguished Member of King Prajadhipok's Institute
- Member of the Eastern Economic Corridor Policy Committee (EEC)
- Chairman, Thailand Business Council for Sustainable Development (TBCSD)
- Chairman, Small and Micro Community Enterprise
- Distinguished Member of Chulalongkorn University Council
- Distinguished Member of the Suranaree University of Technology Council Office
- Council President, Dhurakij Punthit University

Work Experiences (5 Years Past Experiences)

- 2014 - 2019 Member of the National Legislative Assembly of Thailand
- 2011 - April 2018 Chairman, PTT Global Chemical Public Company Limited
- 2013 - 2017 Independent Director/Chairman of the Remuneration Committee and Member of the Enterprise Risk Management Committee, PTT Public Company Limited
- 2014 - 2015 Chairman of the Board of Executive Directors, Krung Thai Bank Public Company Limited
- 2011 - 2015 Independent Director, Krung Thai Bank Public Company Limited

Shareholding : Spouse 271,142 shares (0.006014%) as of December 31, 2019

Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Education/Training

- Honorary Doctoral in Accounting, Kasem Bundit University
- Bachelor of Accounting (Second-class Honor), Chulalongkorn University
- Diploma in Auditing Chulalongkorn Business School, Chulalongkorn University
- Certified Public Accountant (Thailand), Federation of Accounting Professions under the Royal Patronage of his Majesty the King
- Leading Professional Services Firms, Harvard Business School, Boston, U.S.A.
- Executive Management Program, Ivey School of Business, University of Western Ontario, Canada

Director Training

- Board Nomination and Compensation Program (BNCP) Class 7/2019/ National Director Conference "Steering Governance in a Changing World"/IOD International Trip 2017 - Attend Singapore IOD Flagship Conference "The Sustainability Imperative" and Visit Awards Winning Companies/Audit Committee Forum "The Audit Committee's Role in Compliance and Ethical Culture Oversight" and Collective Action Against Corruption Conference "Bright Spots : Lighting the way to a corruption free society/Board Matters and Trends (BMT) Class 2/2017 Financial Institution Governance Program (FGP) Class 6/2013 and Director Certification Program (DCP) Class 119/2009, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company -

The Stock Exchange of Thailand : 4

- Independent Director and Chairman of the Audit Committee, PTT Global Chemical Public Company Limited
- Independent Director and Chairman of the Audit Committee, The Siam Commercial Bank Public Company Limited
- Independent Director/Director to the Audit Committee and Chairman of the Nomination and Remuneration Committee, Thai Solar Energy Public Company Limited
- Independent Director/Member of Audit Committee and Chairman of Sustainable Development Committee, Advanced Info Service Public Company Limited

Board Member/Management in Non-Listed Company -

The Stock Exchange of Thailand : 1

- Director, Kerry Express (Thailand) Company Limited

Position in Other Organization/Institutions : 11

- Honorary Director in State Enterprise Policy Committee, State Enterprise Policy Office
- Chairman, Thai Institute of Directors Association (IOD)
- Commissioner and Audit Committee, The Securities and Exchange Commission
- Chairman in Advisory Committee in Auditing, The Securities and Exchange Commission
- Audit Committee Member, Mahidol University Council
- Commission Member (Accounting) and Chairman of the Audit Committee of the Office of Insurance Commission, Thailand
- Commission Member, OIC Advanced Insurance Institute
- Expert Member (Accounting) of the Committee on Dumping and Subsidy, Thailand
- Council in Private Sector Collective Action Coalition Against Corruption Council, The Private Sector Collective Action Coalition Against Corruption (CAC)
- Member of the Finance and Property Committee, King Mongkut's University of Technology Thonburi
- Commission Member, Public Sectors Audit and Evaluation Commission (PAEC)

Work Experiences (5 Years Past Experiences)

- 2016 - April 2018 Director to the Audit Committee, PTT Global Chemical Public Company Limited
- 2012 - 2017 Expert Member of the General Insurance Fund under the Ministry of Finance
- 2014 - 2017 President of the Federation of Accounting Professions under the Royal Patronage of His Majesty the King

Shareholding : None

Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Professor Somkit Lertpaithoon

Independent Director and
Chairman of the Corporate
Governance Committee
Age 60

Appointed

April 9, 2018



Mr. Don Wasantapruek

Independent Director and
Chairman of the Nomination and
Remuneration Committee
Age 61

Appointed

November 1, 2015,
April 5, 2016 (1st re-elected),
April 5, 2019 (2nd re-elected)



Education/Training

- Doctorate, (Droit Public Interne), The University Paris II, France
- Degree of Profound Studies, (Droit Public Interne), The University Paris II, France
- Bachelor of Laws, Thammasat University
- Barrister-at-Law, Institute of Legal Education Thai Bar Association
- Certification in Local Government, Institut International d'Administration Publique (IIAP), France
- The Executive Program in Energy Literacy for a Sustainable Future, Class 10, Thailand Energy Academy (TEA)

Board Member/Management in Listed Company -

The Stock Exchange of Thailand : 1

- Independent Director and Chairman of the Corporate Governance Committee, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company -

The Stock Exchange of Thailand : None

Position in Other Organization/Institutions : 5

- Member of the B.E. 2550 Constitution Drafting Council and Member and Secretary of the Steering Committee of the B.E. 2550 Constitution Drafting Council
- Honorary Board Member, King Prajadhipok's Institute
- Reform Commission of Thailand on Process of Judgement (Police)
- Member of the National Legislative Assembly (NLA)
- Professor of Faculty of Law, Thammasat University

Work Experiences (5 Years Past Experiences)

Feb 2017 - Apr 2018	Independent Director and Member of the Enterprise Risk Management Committee, PTT Public Company Limited
2017	Director, the Government Pharmaceutical Organization
2010 - 2017	Rector, Thammasat University

Shareholding : None

Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Education/Training

- Master of Engineering (Industrial Engineering), University of New South Wales, Sydney, Australia
- Bachelor of Engineering (Industrial Engineering), University of New South Wales, Sydney, Australia
- Seminar "Incorporation of State Investment Corporation" (July 13, 2015)
- The Executive Program in Energy Literacy for a Sustainable Future, Class 6/2015, Thailand Energy Academy (TEA)
- Thailand's 5th National Conference on Collective Action Against Corruption Tackling Corruption through Public - Private Collaboration (October 16th, 2014)

Director Training

- Briefing on International Anti-Corruption... International Cases and Practices/Seminar "Anti-Corruption : Leadership Role of the Board in Driven the Organization toward the Draft of the Development of Corporate Governance and Enterprise Management Act And Good Corporate Governance/Director Accreditation Program (DAP) Class 117/2015 and Role of the Nomination and Governance Committee (RNG) Class 7/2015, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company -

The Stock Exchange of Thailand : 2

- Independent Director and Chairman of the Nomination Committee, PTT Public Company Limited
- Independent Director and Chairman of the Nomination and Remuneration Committee, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company -

The Stock Exchange of Thailand : None

Position in Other Organization/Institutions : None

Work Experiences (5 Years Past Experiences)

2009 - Present	Self-employed
Apr 2018 - Nov 2019	Director to the Nomination and Remuneration Committee, PTT Global Chemical Public Company Limited
4 Feb 2014 - 23 Dec 2018	Member of the Corporate Governance Committee, PTT Public Company Limited
2015 - April 2018	Director to the Corporate Governance Committee, PTT Global Chemical Public Company Limited

Shareholding : None

Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mr. Pakorn Nilprapunt

Independent Director and
Director to the Audit Committee
Age 51

Appointed

April 9, 2018



Mr. Prapas Kong-ied

Independent Director and
Director to the Audit Committee
Age 57

Appointed

November 1, 2019



Education/Training

- Master of Laws (Trade Practices Law), The University of Sydney, Australia
- Public Sector Management and Organization Change, The University of Sydney, Australia
- Bachelor of Laws, Thammasat University
- High-Level Budget Management 1st Edition, Bureau of the Budget
- Program for Chief Executive Training Course, Class 2, The Royal Thai Police
- Train the Trainers Program in Information Communication and Technology Law for the Justice Executive, Class 1, Office of the Secretary of the Electronic Transaction Commission
- Chief Executive Training Program : Leadership with Vision and Morality (AMP 64), The Office of the Civil Service Commission (List of Qualified Candidates for Training)
- East Asian Public Sector Leadership Challenges, National Graduate Institute for Policy Study, Tokyo, Japan

Director Training

- Director Accreditation Program (DAP) Class 153/2018 Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Independent Director and Director to the Audit Committee, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : None

Position in Other Organization/Institutions : 2

- Secretary-General, Office of the Council of State, the Prime Minister's Office
- Director of the Strategic Reform Office on the Promotion of the National Reform, Strategy and Cohesion

Work Experiences (5 Years Past Experiences)

Jun 2018 - Jan 2019	Secretary-General, Office of the Public Sector Development Commission (OPDC)
2017 - 2019	Deputy Director, Prime Minister's Delivery Unit (PMDU)
2015 - 2018	Deputy Secretary-General, Office of the Council of State

Shareholding : None

Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Education/Training

- Barrister-at-Law, Institute of Legal Education of the Thai Bar
- International Tax Program Certificate and Master of Laws (ITP/LL.M.), Harvard Law School, Harvard University, Massachusetts, U.S.A.
- Bachelor of Laws (Second-class Honors), Ramkhamhaeng University
- The Executive Program in Energy Literacy for a Sustainable Future, Class 6, Thailand Energy Academy (TEA)
- Capital Market Academy Leadership Program, Class 21, Capital Market Academy
- Diploma, National Defence College, The National Defence Course Class 56, National Defence College of Thailand (NDC)
- Senior Executive Certificate in Anti-Corruption Strategic Management Class 9, Sanya Dhamasakti National Anti-Corruption Institute (SDI), The National Anti-Corruption Commission Institute
- National Academy Justice, Class 21, Judicial Training Institute
- Advanced Master of Management, Graduate School of Public Administration, National Institute of Development Administration
- Finance and Fiscal Management Program for Senior Executive (FME), Class 3, The Comptroller General's Department
- Senior Executive Program for Nation-Building, Class 3, The Nation-Building Institute

Director Training

- Anti-corruption : the Practical Guide (ACPG) Class 32/2016/ Risk Management Program for Corporate Leaders (RCL) Class 5/2016 Corporate Governance for Executives (CGE) Class 4/2015/ Director Certification Program (DCP) Class 172/2013/ Audit Committee Program (ACP) Class 44/2013/ Financial Institutions Governance Program (FGP) Class 6/2013/ Financial Statements for Directors (FSD) Class 21/2013/ Role of the Nomination and Governance Committee (RNG) Class 4/2013 and Role of the Compensation Committee (RCC) Class 16/2013, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 3

- Director and Chairman of Corporate Governance Committee, Dhipaya Insurance Public Company Limited
- Director and Member of the Corporate Social Responsibility Committee, Siam Commercial Bank Public Company Limited
- Independent Director and Director to the Audit Committee, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 1

- Chairman, National Credit Bureau Company Limited

Position in Other Organization/Institutions : 3

- Member of the National Reform Steering Assembly
- Director-General, The State Enterprise Policy Office, Ministry of Finance
- Director, Siam Commercial Foundation

Work Experiences (5 Years Past Experiences)

2017 - 2018	Managing Director, Public Debt Management Office
2015 - 2018	Director, Don Muang Tollway Public Company Limited
2012 - 2018	Director, Government Savings Bank
2015 - 2017	Deputy Permanent Secretary, Ministry of Finance
2015	Inspector General, Ministry of Finance
2013 - 2015	Director, KTB LAW Company Limited
2013 - 2015	Chairman, The Erawan Group Public Company Limited
2012 - 2015	Legal Advisory, Ministry of Finance

Shareholding : None

Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mr. Wittawat Svasti-xuto

Director and Director to
the Nomination and
Remuneration Committee
Age 58

Appointed

February 19, 2018

**Major General Nithi
Chungcharoen**

Independent Director
Director to the Nomination &
Remuneration Committee and
Director to the Corporate
Governance Committee
Age 48

Appointed

September 22, 2014 /
April 1, 2015 (1st re-elected)
April 9, 2018 (2nd re-elected)

**Education/Training**

- Master of Science (Industrial Engineering), The University of Rhode Island, U.S.A.
- Bachelor of Engineering (Chemical Engineering), Chulalongkorn University
- Capital Market Academy Leadership Program, Class 27/2018, Capital Market Academy
- The Executive Program in Energy Literacy for a Sustainable Future, Class 8, Thailand Energy Academy (TEA)
- Strategy and Innovation for Business in Asia (SIBA), Class 5/2016

Director Training

- Director Certification Program (DCP) Class 146/2011 and Financial Statements for Director (FSD) Class 12/2011, Thai Institute of Directors Association (IOD)

**Board Member/Management in Listed Company –
The Stock Exchange of Thailand : 3**

- Chief Technology and Engineering Officer, PTT Public Company Limited
- Director and Director to the Nomination and Remuneration Committee, PTT Global Chemical Public Company Limited
- Director, Member of the Nomination and Remuneration Committee and Member of the Risk Management Committee, Global Power Synergy Public Company Limited

**Board Member/Management in Non-Listed Company –
The Stock Exchange of Thailand : 1**

- Chairman, PTT Energy Solutions Company Limited

Position in Other Organization/Institutions : None**Work Experiences (5 Years Past Experiences)**

2017 - 2019	Chairman, PTT Digital Solutions Company Limited
2 Apr 17 - 31 Aug 18	Director, District Cooling System and Power Plant Company Limited
2017 - 2018	Senior Executive Vice President, Innovation and Digital, PTT Public Company Limited
2018	Director, Energy Complex Company Limited
2018	Director, Business Services Alliance Company Limited
1 Jan 17 - 31 Dec 17	Senior Executive Vice President, Sustainability Management and Project Engineering, PTT Public Company Limited
1 Oct 16 - 31 Dec 16	Senior Executive Vice President, Sustainability Management, PTT Public Company Limited
1 Jan 16 - 30 Sep 16	Executive Vice President, Downstream Business Group Alignment, PTT Public Company Limited
1 Aug 14 - Dec 15	Executive Vice President, Strategy Management, Downstream Business Unit, PTT Public Company Limited

Shareholding : 3,415 shares (0.000076%)
as of December 31, 2019

**Relation among Family with other Directors, Management,
Major Shareholders of the Company or Subsidiaries :** None

Education/Training

- Master of Engineering (Mechanical), Stevens Institute of Technology, New Jersey, U.S.A.
- Bachelor of Science, Chulachomklao Royal Military Academy
- Peace Mediation Course
- Command and General Staff College, Class 80
- Peace Keeping Operation Course

Director Training

- Board that Make a Difference (BMD) Class 9/2019/IOD Talk 2/2017 “Cyber Security: Risks, Liabilities, and Best Practices”/Driving Company Success with IT Governance (ITG) Class 5/2017/Role of the Nomination and Governance Committee Class 8/2016 and Director Certification Program (DCP) Class 200/2015, Thai Institute of Directors Association (IOD)

**Board Member/Management in Listed Company –
The Stock Exchange of Thailand : 1**

- Independent Director/Director to the Nomination & Remuneration Committee and Director to the Corporate Governance Committee, PTT Global Chemical Public Company Limited

**Board Member/Management in Non-Listed Company –
The Stock Exchange of Thailand : None****Position in Other Organization/Institutions : 2**

- Assistant General Director, 2nd Coordination Centre, Office of Internal Security Coordination, Royal Thai Army
- Expert, Royal Thai Army

Work Experiences (5 Years Past Experiences)

2016 - 2018	Deputy Defence Attaché, Canberra, Australia
2014 - 2015	Attached to Directorate of Intelligence
2013 - 2014	Deputy Chief of Staff, 11 th Army Circle

Shareholding : None

**Relation among Family with other Directors, Management,
Major Shareholders of the Company or Subsidiaries :** None

Mrs. Watanan Petersik

Independent Director and
Director to the Corporate
Governance Committee
Age 58

Appointed

September 22, 2014,
April 5, 2016 (1st re-elected),
April 5, 2019 (2nd re-elected)

**Mr. Disathat Panyarachun**

Director and
Director to the Corporate
Governance Committee
Age 55

Appointed

October 22, 2018

**Education/Training**

- AB Bryn Mawr College, Pennsylvania, U.S.A.

Director Training

- Director Accreditation Program (DAP) English Program Class 83/2010, Thai Institute of Directors Association (IOD)
- Bursatra Sdn. Bhd. : Mandatory Accreditation Programme (MAP) for Directors of Public Listed Companies (March 2010)
- Certificate : Role of Director, Singapore Institute of Directors Course

Board Member/Management in Listed Company –**The Stock Exchange of Thailand : 2**

- Independent Director and Director to the Corporate Governance Committee, PTT Global Chemical Public Company Limited
- Independent Director and Chairwoman of Nomination and Corporate Governance Committee, CIMB Thai Bank Public Company Limited

Board Member/Management in Non-Listed Company –**The Stock Exchange of Thailand : 1**

- Non-Executive Director, Jetanin Institute for Assisted Reproduction, Jetanin Company Limited

Position in Other Organization/Institutions : 5

- Standards Advisory Council, BCorp, U.S.A.
- Advisory Board, Nanyang Business School, Singapore
- Senior Moderator, Aspen Institute, U.S.A.
- Advisory Committee, Lien Centre for Social Innovation Singapore Management University
- Senior Advisor, TPG Capital Asia

Work Experiences (5 Years Past Experiences)

Jan 2010 - Jan 2019	Independent Director and Non-Executive Director, CIMB Group Sdn. Bhd.
Jan 2010 - Jan 2019	Independent Director and Non-Executive Director, CIMB Group Holdings Berhad, Malaysia
2008 - 2019	Director, Asia Capital Advisory Pte Ltd.
Jan 2016 - Nov 2017	Director, TPG Star SF Pte Ltd.
Jan 2016 - Nov 2017	Director, TPG Growth SF Pte Ltd.
Jan 2016 - Nov 2017	Director, TPG Growth III Asia Internet Holdings Pte Ltd.
Feb 2015 - Nov 2017	Director, TE Asia Healthcare Advisory Pte Ltd.
Sep 2014 - Nov 2017	Director, TE Asia Healthcare Partners Pte Ltd.
2010 - 2016	Member of Audit Committee, CIMB Thai Bank Public Company Limited

Shareholding : None

Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Education/Training

- Master of Political Science (M.P.A.), National University, San Diego, U.S.A.
- Bachelor of Social Science, Silpakorn University
- The Executive Program in Energy Literacy for a Sustainable Future, Class 14, Thailand Energy Academy (TEA)
- Leadership Development Program for Sustainability (LDP 3), PTT Leadership and Learning Institute
- Certification of Oil Futures Program, The Oxford Princeton, U.K.

Director Training

- Director Certification Program (DCP) Class 206/2015, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –**The Stock Exchange of Thailand : 2**

- Senior Executive Vice President, International Trading Business Unit, PTT Public Company Limited
- Director and Director to the Corporate Governance Committee, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –**The Stock Exchange of Thailand : 2**

- Chairman, PTT International Trading London Ltd.
- Chairman, PTT International Trading Pte Ltd.

Position in Other Organization/Institutions : None**Work Experiences (5 Years Past Experiences)**

1 Nov 2011 - 19 Oct 2018	Chairman, PTT International Trading DMCC
1 Feb 2016 - 30 Sep 2018	Executive Vice President, International Trading, PTT Public Company Limited
1 Aug 2015 - 31 Jan 2016	Vice President acting as Executive Vice President, International Trading, PTT Public Company Limited
2012 - 2015	Vice President, PTT Public Company Limited working on a Secondment as Managing Director, PTT International Trading Pte Ltd

Shareholding : Spouse 80 shares (0.000002%) as of December 31, 2019

Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mrs. Premrutai Vinaiphat

Director and
Director to the Risk
Management Committee
Age 57

Appointed

February 18, 2019

**Mrs. Arawadee Photisaro**

Director and
Director to the Risk
Management Committee
Age 58

Appointed

October 22, 2018

**Education/Training**

- Master of Science in Mining Engineering (Mineral Economics), McGill University, Montreal, Canada
- Bachelor of Science (Geology), Chiang Mai University
- The Executive Program in Energy Literacy for a Sustainable Future, Class 13, Thailand Energy Academy (TEA)
- The Program of Senior Executives on Justice Administration (Class 22), Judicial Training Institute
- Leadership 4.0 Program, The ICT Society for Social Development Association
- Diploma, National Defence College, The National Defence Course Class 57/2014, National Defence College of Thailand (NDC)
- World Fiscal Systems for Oil and Gas, U.K.
- Executive Development Program "Leadership with Vision and Virtue" (Class 71), Office of the Civil Service Commission
- Development of Management Competency and Leadership Program for Talent Network "Leadership & Change", Office of the Civil Service Commission, Japan
- Top Level Energy Administration (Class 2), Ministry of Energy
- International Petroleum Management Certificate Program, U.S.A.
- Law of the Sea, Malaysia
- Managing Managers in the Energy Industry, U.S.A.

Director Training

- Director Certification Program (DCP) Class 269/2019, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –**The Stock Exchange of Thailand : 1**

- Director and Director to the Risk Management Committee, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –**The Stock Exchange of Thailand : None****Position in Other Organization/Institutions : 1**

- Inspector General, Ministry of Energy

Work Experiences (5 Years Past Experiences)

2019	Director - General, Department of Mineral Fuels, Ministry of Energy
2018	Inspector General, Ministry of Energy
2018	Independent Director and Member of the Corporate Governance and Social Responsibility Committee, Ratchaburi Electricity Generating Holding Public Company Limited
2016 - 2018	Deputy Director-General, Department of Mineral Fuels, Ministry of Energy
2015 - 2016	Director of Petroleum Concession Management Bureau, Department of Mineral Fuels, Ministry of Energy

Shareholding : None**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None****Education/Training**

- Master of Business Administration (Management Information System), The University of Dallas, U.S.A.
- Bachelor of Accounting, Thammasat University
- The Executive Program in Energy Literacy for a Sustainable Future, Class 13, Thailand Energy Academy (TEA)
- Leadership Development Program for Sustainability (LDP 3) Class 3, PTT Leadership and Learning Institute
- Breakthrough Program for Senior Executives, International Leading Business School (IMD), Switzerland
- Mitsui-HBS Global Management Academy, Harvard Business School, U.S.A.

Director Training

- Director Certification Program (DCP) Class 253/2018, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –**The Stock Exchange of Thailand : 2**

- Senior Executive Vice President, Corporate Strategy, PTT Public Company Limited
- Director and Director to the Risk Management Committee, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –**The Stock Exchange of Thailand : 1**

- Chairman, Sakari Resources Limited

Position in Other Organization/Institutions : None**Work Experiences (5 Years Past Experiences)**

2017 - 2019	Director, PTT Digital Solutions Company Limited
2017 - 30 Sep 2018	Executive Vice President, PTT Public Company Limited working on a Secondment as Managing Director, PTT Digital Solutions Company Limited
2016 - 2017	Executive Vice President, Strategy & Portfolio Management and Director of ExpresSo Project, PTT Public Company Limited
2013 - 2016	Executive Vice President, Strategy & Portfolio Management, PTT Public Company Limited

Shareholding : 153 shares (0.000003%) as of December 31, 2019**Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None**

Mr. Supattanapong Punmeechaow

Director and
Director to the Risk
Management Committee
Age 60

Appointed

September 25, 2014/
April 5, 2016 (1st re-elected)/
April 5, 2019 (2nd re-elected)



Mr. Kongkrapan Intarajang

Director and
Secretary to the Board of Directors and
Director to the Risk Management Committee
Age 52

Appointed

October 1, 2019



Education/Training

- Master of Business Administration (M.B.A.), Chulalongkorn University
- Bachelor of Engineering (Chemical Engineering), Chulalongkorn University
- Business Revolution and Innovation Network : BRAIN, Class 2/2018, The Federation of Thai Industries (F.T.I.)
- Capital Market Academy Leadership Program, Class 23/2016, Capital Market Academy
- The Rule of Law and Democracy Course (Class 3/2015), College of the Constitutional Court
- Corporate Governance Program for Directors and Executives of State Enterprises and Public Organizations (Class 12/2014), King Prajadhipok's Institute-State Enterprise Policy Office and Office of the Public Sector Development Commission
- The Executive Program in Energy Literacy for a Sustainable Future Class 4, Thailand Energy Academy (TEA)
- Oxford Energy Seminar 2013, United Kingdom
- Diploma, National Defence College, The National Defence Course Class 50, National Defence College of Thailand (NDC)
- Diploma, National Defence College, The Joint State-Private Sector Course Class 20, National Defence College of Thailand (NDC)
- Advance Management Program, INSEAD University, France

Director Training

- Role of the Chairman Program (RCP) Class 30/2013 and Director Certification Program (DCP) Class 131/2010 Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company -

The Stock Exchange of Thailand : 3

- Director and Chairman of the Enterprise Risk Management Committee, PTT Public Company Limited
- Director and Director to the Risk Management Committee, PTT Global Chemical Public Company Limited
- Chairman, Global Green Chemicals Public Company Limited

Board Member/Management in Non-Listed Company -

The Stock Exchange of Thailand : None

Position in Other Organization/Institutions : 5

- Commission Member, Strategic Transformation Committee
- Commission Member (Business Administration), Office of the Public Sector Development Commission (OPDC)
- Commission Member in the Policy Committee for Integrated Provincial and Sub-Regional Administration, Office of the Public Sector Development Commission (OPDC)
- Director, Thai Institute of Directors Association (IOD)
- President, Chulalongkorn Engineering Alumni

Work Experiences (5 Years Past Experiences)

Oct 2014 - Sep 2019	Senior Executive Vice President, PTT Public Company Limited
Oct 2014 - Sep 2019	President & Chief Executive Officer, PTT Global Chemical Public Company Limited
Apr 2017 - Sep 2019	Chairman, Global Power Synergy Public Company Limited
2014 - 2019	Director, PTTGC International Private Limited
Feb 2015 - Sep 2019	Member of Kamnoetvidya Science Academy
May 2015 - Sep 2019	Honorary Member of Vidyasirimedhi Institute Council
Dec 2014 - Sep 2019	Vice President, Thailand Swimming Association
Nov 2014 - Sep 2019	Member, Council of Trustees, Petroleum Institute of Thailand
Nov 2014 - Sep 2019	Vice President, The Power of Learning Foundation
May 2015 - Mar 2018	Committee Member, Thai Listed Companies Association
2015 - 2018	Vice Chairman, The Federation of Thai Industries
Nov 2014 - Jul 2017	Vice Chairman, Vinythai Public Company Limited

Shareholding : 100,000 shares (0.002218%) as of December 31, 2019

Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Education/Training

- Doctor of Philosophy (Ph.D.) in Chemical Engineering, University of Houston, U.S.A.
- Bachelor of Engineering (Chemical Engineering) (Second-class Honors), Chulalongkorn University
- Leadership Development Program (LDP 3) Class 4, PTT Leadership and Learning Institute
- The Executive Program in Energy Literacy for a Sustainable Future, Class 14, Thailand Energy Academy (TEA)
- Diploma, National Defence College, The National Defence Course Class 60, National Defence College of Thailand (NDC)
- Breakthrough Program for Senior Executives, IMD Business School

Director Training

- Role of the Chairman Program (RCP) Class 21/2009 and Director Certification Program (DCP) Class 119/2009, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company -

The Stock Exchange of Thailand : 4

- Senior Executive Vice President reporting to Chief Operating Officer, Downstream Petroleum Business Group, PTT Public Company Limited
- Director and Secretary to the Board of Directors/Director to the Risk Management Committee and Chief Executive Officer, PTT Global Chemical Public Company Limited
- Director and Member of the Risk Management Committee, Global Power Synergy Public Company Limited
- Director, Global Green Chemicals Public Company Limited

Board Member/Management in Non-Listed Company -

The Stock Exchange of Thailand : 4

- Chairman, PTTGC America Corporation
- Chairman, PTTGC America LLC
- Director, PTTGC International Private Limited
- Director, PTTGC International (USA) Inc.

Position in Other Organization/Institutions : 7

- Member, The Petroleum Institute of Thailand (PTIT)
- Co-Chairman, France-Thailand Business Forum
- Committee Member of Sustainable Energy Foundation
- Committee Member of Kamnoetvidya Science Academy
- Honorary Member of Vidyasirimedhi Institute Council
- Member of the Thailand Energy Academy
- Vice President (Supporting), Thailand Swimming Association

Work Experiences (5 Years Past Experiences)

May 2017 - Jan 2020	Director, Thai Tank Terminal Limited
Apr 2017 - Sep 2019	Chief Operating Officer - Upstream Petrochemical Business, PTT Global Chemical Public Company Limited
Jul 2015 - Sep 2019	Director and President & CEO, PTTGC America Corporation
Apr 2015 - Sep 2019	Director, PTTGC Innovation America Corporation
Feb 2015 - Sep 2019	Director, PTTGC International (Netherlands) B.V.
Jan 2015 - Sep 2019	Director, Vencorex Holding
Nov 2008 - Sep 2019	Director, Emery Oleochemicals (M) Sdn. Bhd.
Nov 2008 - Sep 2019	Director, Emery Specialty Chemicals Sdn. Bhd.
Sep 2014 - Dec 2018	Director, NatureWorks LLC
Sep 2014 - Dec 2018	Director, PTTGC International (USA) Inc.
Oct 2014 - Mar 2017	Executive Vice President - International Business Operations, PTT Global Chemical Public Company Limited

Shareholding : None

Relation among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

GC EXECUTIVES



6. Miss Duangkamol Settanung
Executive Vice President,
Finance and Accounting

7. Mrs. Warawan Tippawanich
Executive Vice President,
Corporate Strategy

8. Mr. Saroj Putthammawong
Executive Vice President,
Marketing, Commercial and Supply

9. Mr. Narongsak Jivakanun
Executive Vice President,
International Business Operations

10. Mr. Pirun Krimwongrut
Acting Executive Vice President,
Organizational Effectiveness

11. Mr. Athavuth Vikitsreth
Executive Vice President,
External Affairs

12. Mr. Amorn Putiphrawan
Senior Vice President,
Internal Audit

13. Mr. Chaya Chandavasul
Senior Vice President,
Sustainability and Corporate Branding



2



3

1. Mr. Kongkrapan Intarajang

Chief Executive Officer

2. Mr. Patiparn Sukorndhaman

President

3. Mr. Varit Namwong

Chief Operating Officer –
Center of Excellence

4. Mr. Boonchai Chunhawiksit

Acting Senior Executive Vice President,
Upstream Petrochemical Business

5. Mr. Wiboon Chuchepchukamon

Acting Senior Executive Vice President, Downstream Petrochemical Business
and Acting Senior Vice President, Green Chemicals Business Unit



8



9



12



13



14



15

14. Mr. Thitipong Jurapornsiridee

Senior Vice President,
Corporate Finance and Strategy

15. Mrs. Pilasphan Udomjarumanee

Senior Vice President,
Corporate Secretary and Legal and Company Secretary

GC EXECUTIVES

16



18



20



21



22



23



24



25



27



28





17

16. Mr. Pukpong Wungrattanasopon

Acting Executive Vice President,
Group Performance Center – Olefins



19

17. Mr. Ratchada Sawasdirak

Senior Vice President,
Group Performance Center –
Refinery and Shared Facilities

18. Mr. Anutin Chuaypen

Senior Vice President,
Group Performance Center – Aromatics

19. Mr. Supasit Tongsupachok

Senior Vice President,
Group Performance Center – Utilities

20. Mr. Pornsak Mongkoltrirat

Acting Executive Vice President,
Polymers Business Unit

21. Mr. Kumpol Chaikitkosi

Senior Vice President,
EO-Based Performance Business Unit

22. Mr. Paisarn Sarapee

Senior Vice President,
Phenol Business Unit

23. Mrs. Chananchida Wiboonkanarak

Senior Vice President,
Downstream Strategy and Business Development



26

24. Mrs. Jeeranee Pimthanothai

Senior Vice President,
Technical, Engineering and Maintenance

25. Mr. Khomson Piyawattanaviroj

Senior Vice President, CAPEX Excellence

26. Mr. Wirat Boonbumrungchai

Senior Vice President, Quality, Safety,
Occupational Health and Environment

27. Mrs. Chatsuda Kanjanarat

Senior Vice President,
Transformation Excellence

28. Mrs. Wilawan Songjaroen

Senior Vice President, Procurement



29

29. Mr. Kevin Thomas Corby

Senior Vice President, Science and Innovation

GC EXECUTIVES

Mr. Kongkrapan Intarajang

Chief Executive Officer

Age 52

Appointed

October 1, 2019

Education/Training

- Doctor of Philosophy (Ph.D.) in Chemical Engineering, University of Houston, U.S.A.
- Bachelor of Engineering (Chemical Engineering), (Second-class Honors), Chulalongkorn University
- Leadership Development Program (LDP) 3 Class 4, PTT Leadership and Learning Institute
- The Executive Program in Energy Literacy for a Sustainable Future Class 14, Thailand Energy Academy (TEA)
- Diploma, National Defence College, The National Defence Course Class 60, National Defence College of Thailand (NDC)
- Breakthrough Program for Senior Executives, IMD Business School
- Role of the Chairman Program (RCP) Class 21/2009 and Director Certification Program (DCP) Class 119/2009, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 4

- Senior Executive Vice President Reporting to Chief Operating Officer, Downstream Petroleum Business Group, PTT Public Company Limited
- Director and Secretary to the Board of Directors/Director to the Risk Management Committee and Chief Executive Officer, PTT Global Chemical Public Company Limited
- Director and Member of the Risk Management Committee, Global Power Synergy Public Company Limited
- Director, Global Green Chemicals Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 4

- Chairman, PTTGC America Corporation
- Chairman, PTTGC America LLC
- Director, PTTGC International Private Limited
- Director, PTTGC International (USA) Inc.

Position in Other Organization/Institutions : 7

- Member, The Petroleum Institute of Thailand (PTIT)
- Co-Chairman, France-Thailand Business Forum
- Committee Member of Sustainable Energy Foundation
- Committee Member of Kamnoetvidya Science Academy
- Honorary Member of Vidyasirimedhi Institute Council
- Member of the Thailand Energy Academy
- Vice President (Supporting), Thailand Swimming Association

Work Experience (5 Years Past Experience)

May 2017 - Jan 2020	Director, Thai Tank Terminal Limited
Apr 2017 - Sep 2019	Chief Operating Officer - Upstream Petrochemical Business, PTT Global Chemical Public Company Limited
Jul 2015 - Sep 2019	Director and President & CEO, PTTGC America Corporation
Apr 2015 - Sep 2019	Director, PTTGC Innovation America Corporation
Feb 2015 - Sep 2019	Director, PTTGC International (Netherlands) B.V.
Jan 2015 - Sep 2019	Director, Vencorex Holding
Nov 2008 - Sep 2019	Director, Emery Oleochemicals (M) Sdn. Bhd.
Nov 2008 - Sep 2019	Director, Emery Specialty Chemicals (M) Sdn. Bhd.
Sep 2014 - Dec 2018	Director, NatureWorks LLC
Sep 2014 - Dec 2018	Director, PTTGC International (USA) Inc.
Oct 2014 - Mar 2017	Executive Vice President - International Business Operations, PTT Global Chemical Public Company Limited

Shareholding : None

Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mr. Patiparn Sukorndhaman

President

Age 58

Appointed

October 1, 2019

Education/Training

- Master of Business Administration (Finance), The American University, U.S.A.
- Bachelor of Arts in Political Science (Public Administration - Public Finance), (Second-class Honors), Chulalongkorn University
- Diploma, National Defence College, The National Defence Course Class 59, National Defence College of Thailand (NDC), 2016
- The Executive Program in Energy Literacy for a Sustainable Future Class 7, Thailand Energy Academy (TEA), 2015
- Leadership Development Program for Sustainability (LDP) 3, PTT Leadership and Learning Institute, 2014
- Breakthrough Program for Senior Executives, IMD Executive Development Services, Switzerland, 2014
- PTT Executive Leadership Program, General Electric, GE, U.S.A., 2012
- Certification Program for Senior Management 5 (Ex-PSM 5), Fiscal Policy Research Institute Foundation, 2009
- Director Certification Program (DCP) Class 73/2006, Thai Institute of Directors Association (IOD)
- Graduate Diploma in Public Law and Management (PLM 8), King Prajadhipok's Institute

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 2

- President, PTT Global Chemical Public Company Limited
- Director, Director to the Nomination and Remuneration Committee and Director to the Risk Management Committee, Global Green Chemicals Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 7

- Chairman, GC Marketing Solutions Company Limited
- Chairman, GC Polyols Company Limited
- Chairman, Solution Creation Company Limited
- Chairman, HMC Polymers Company Limited
- Chairman, GC-M PTA Company Limited
- Chairman, Thai PET Resin Company Limited
- Director, PTT Asahi Chemical Company Limited

Work Experience (5 Years Past Experience)

2 Jun 2017 - 12 Nov 2019	Chairman, GC Oxirane Company Limited
22 Jan 2016 - 30 Sep 2019	Chairman, GC Glycol Company Limited
1 Jan 2012 - 30 Sep 2019	Director, PTT Phenol Company Limited
1 Feb 2016 - 6 May 2019	Chairman, GC Styrenics Company Limited
1 Jan 2016 - 30 Sep 2019	Chief Operating Officer - Downstream Petrochemical Business, PTT Global Chemical Public Company Limited
2015 - Jul 2017	Director and Director to the Nomination and Remuneration Committee, Global Power Synergy Public Company Limited
Oct 2009 - 20 Jan 2016	Director, Thai Fatty Alcohols Company Limited
Sep 2012 - 2015	Director, PTT Chemical International Private Limited
19 Oct 2011 - 31 Dec 2015	Executive Vice President - Finance and Accounting, PTT Global Chemical Public Company Limited
2011 - 31 Jan 2015	Director, PTT ICT Solutions Company Limited
2009 - 2014	Director, Bio Creation Company Limited

Shareholding : None

Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mr. Varit Namwong

Chief Operating Officer –
Center of Excellence
Age 56

Appointed

October 1, 2016

Mr. Boonchai Chunhawiksit

Acting Senior Executive Vice President,
Upstream Petrochemical Business
Age 59

Appointed

October 1, 2019

Education/Training

- Master of Business Administration (International Program), Ramkhamhaeng University
- Bachelor of Business Administration, Assumption Business Administration College
- Diploma, National Defence College, The National Defence Course Class 61, National Defence College of Thailand (NDC), 2018
- The Executive Program in Energy Literacy for a Sustainable Future Class 10, Thailand Energy Academy (TEA), 2017
- Advanced Human Resource Executive Program, The Stephen M. Ross School of Business, University of Michigan, 2014
- Leadership Development Program for Sustainability (LDP) 3, PTT Leadership and Learning Institute, 2014
- Director Certification Program (DCP) Class 160/2012, and Director Accreditation Program (DAP) Class 91/2011, Thai Institute of Directors Association (IOD)
- Senior Executive Program (SEP), Sasin Graduate Institute of Business Administration of Chulalongkorn University

Board Member/Management in Listed Company –**The Stock Exchange of Thailand: 1**

- Chief Operating Officer - Center of Excellence, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –**The Stock Exchange of Thailand: 6**

- Chairman, GC Maintenance and Engineering Company Limited
- Chairman, NPC Safety and Environmental Service Company Limited
- Director, GC Marketing Solutions Company Limited
- Director, HMC Polymers Company Limited
- Director, PTTGC America Corporation
- Director, PTTGC America LLC

Work Experience (5 Years Past Experience)

21 Dec 2016 - 30 Sep 2019	Director, PTT Energy Solutions Company Limited
5 Apr 2012 - 31 Jan 2019	Director, Sport Services Alliance Limited
19 Oct 2011 - 30 Aug 2016	Executive Vice President - Organizational Effectiveness, PTT Global Chemical Public Company Limited
2014 - 2016	Director, Vencorex Holding
2011 - 2016	Director, Eastern Fluid Transport Company Limited
2011 - 2016	Director, PTT ICT Solutions Company Limited
2011 - 2016	Director, Solution Creation Company Limited
2016	Director, TOC Glycol Company Limited
2014	Director, Myriant Corporation
2011 - 2014	Director, Thai Styrenics Company Limited

Shareholding : 108,939 shares (0.002416%) as of December 31, 2019

Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Education/Training

- Master of Business Administration, Thammasat University
- Bachelor of Engineering (Electrical Engineering), King Mongkut's Institute of Technology (North Bangkok)
- Senior Executive Program (SEP), Sasin Graduate Institute of Business Administration of Chulalongkorn University
- Director Certification Program (DCP) Class 244/2017, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –**The Stock Exchange of Thailand : 2**

- Acting Senior Executive Vice President, Upstream Petrochemical Business, PTT Global Chemical Public Company Limited
- Director, Global Power Synergy Public Company Limited

Board Member/Management in Non-Listed Company –**The Stock Exchange of Thailand : 5**

- Chairman, GC Estate Company Limited
- Director, GC Glycol Company Limited
- Director, GC Maintenance and Engineering Company Limited
- Director, HMC Polymers Company Limited
- Director and Executive Committee, Thai Tank Terminal Limited

Work Experience (5 Years Past Experience)

1 Jan 2017 - 30 Sep 2019	Senior Vice President - Group Performance Center, Olefins, PTT Global Chemical Public Company Limited
1 Oct 2016 - 31 Dec 2016	Vice President - Group Performance Center, Olefins, PTT Global Chemical Public Company Limited
1 Oct 2015 - 30 Sep 2016	Vice President, Olefins Plant 2, PTT Global Chemical Public Company Limited
2015	Vice President, GPC Strategy & Business Development, PTT Global Chemical Public Company Limited

Shareholding : 40,000 shares (0.000887%) as of December 31, 2019

Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mr. Wiboon Chuchepchukamon

Acting Senior Executive Vice President,
Downstream Petrochemical Business/
Acting Senior Vice President,
Green Chemicals Business Unit
Age 57

Appointed

October 1, 2019

Miss Duangkamol Settanung

Executive Vice President,
Finance and Accounting
Age 60

Appointed

November 1, 2015

Education/Training

- Master of Management, Sasin Graduate Institute of Business Administration of Chulalongkorn University
- Master of Science (Petrochemical and Petrochemical), Petroleum and Petrochemical College, Chulalongkorn University
- Bachelor of Engineering (Electrical Engineering), Chulalongkorn University
- The Executive Program in Energy Literacy for a Sustainable Future Class 13, Thailand Energy Academy (TEA), 2019
- Director Certification Program (DCP) Class 219/ 2016, Thai Institute of Directors Association (IOD)
- Stanford – NUS Executive Program in International Management, the Republic of Singapore
- Harvard – Leadership Development, Shanghai, the People's Republic of China

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 2

- Acting Senior Executive Vice President, Downstream Petrochemical Business/Acting Senior Vice President, Green Chemicals Business Unit, PTT Global Chemical Public Company Limited
- Director, Vice Chairman of the Board of Directors and Member of the Nomination and Remuneration Committee, Vinythai Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 10

- Chairman, GC Glycol Company Limited
- Chairman, GC Oxirane Company Limited
- Director, PTT Phenol Company Limited
- Director, Solution Creation Company Limited
- Director, GC Marketing Solutions Company Limited
- Director, GC-M PTA Company Limited
- Director, HMC Polymers Company Limited
- Director, Kuraray GC Advanced Materials Company Limited
- Chairman, Revolve Group Limited
- Director, Thai PET Resin Company Limited

Working Experiences (5 Years Past Experience)

- 7 May 2019 - 10 Nov 2019 Chairman, GC Styrenics Company Limited
- 1 Jan 2018 - 31 Oct 2019 Chairman, GC Logistics Solutions Company Limited
- 1 Jan 2018 - 31 Oct 2019 Chairman, PL Global Transport Company Limited
- 1 Jan 2018 - 30 Sep 2019 Senior Vice President - Polymers Business Unit, PTT Global Chemical Public Company Limited
- 11 Jan 2018 - 6 May 2019 Director, GC Styrenics Company Limited
- 1 Jul 2017 - 31 Dec 2017 Senior Vice President - Downstream Petrochemical Business, PTT Global Chemical Public Company Limited
- 22 Jan 2016 - 15 Jul 2017 Director and Managing Director, TOC Glycol Company Limited
- 1 Jan 2016 - 30 Jun 2017 Senior Vice President - EO-Based Performance Business Unit, PTT Global Chemical Public Company Limited
- 15 Feb 2013 - 30 Sep 2015 Vice President, Production - Olefins 2, PTT Global Chemical Public Company Limited

Shareholding : Spouse 198 shares (0.000004) as of December 31, 2019

Relation among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Education/Training

- Master of Business Administration, Thammasat University
- Bachelor of Science (Statistics), (First-class Honors), Kasetsart University
- Capital Market Academy Leadership Program Class 26, Capital Market Academy
- Director Certification Program (DCP) Class 155/2012, Thai Institute of Directors Association (IOD)
- Leadership Development Program for Sustainability (LDP) 3, PTT Leadership and Learning Institute, 2014
- Certificate Program for GE : PTT Executive Program, GE, U.S.A., 2012
- Accounting Standard-Business Combination, 2019

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 3

- Senior Executive Vice President, PTT Public Company Limited
- Executive Vice President, Finance and Accounting, PTT Global Chemical Public Company Limited
- Director and Chairperson of the Business Advisory Committee, Vinythai Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 9

- Chairman, GC Treasury Center Company Limited
- Director, PTT Phenol Company Limited
- Director, GC Polyols Company Limited
- Director, PTTGC International Private Limited
- Director, PTTGC America Corporation
- Director, PTTGC America LLC
- Director, Emery Oleochemicals (M) Sdn. Bhd.
- Director, Emery Specialty Chemicals Sdn. Bhd.
- Director, PTTGC International (USA) Inc.

Work Experiences (5 Years Past Experiences)

- Jun 2017 - Nov 2019 Director, GC Oxirane Company Limited
- Oct 2011 - Nov 2015 Senior Executive Vice President - Corporate Accounting & Finance, IRPC Public Company Limited
- Feb 2015 - Nov 2015 Director, IRPC-PCC Company Limited
- Nov 2014 - Jun 2015 Director, PTT Polymer Marketing Company Limited
- Jun 2013 - Nov 2015 Director, IRPC Clean Power Company Limited
- Dec 2012 - Dec 2015 Director, UBE Chemicals (Asia) Public Company Limited
- Feb 2012 - Nov 2015 Director, IRPC Energy Company Limited
- Dec 2011 - Nov 2015 Director, IRPC A&L Company Limited
- Nov 2011 - Nov 2015 Director, Thai ABS Company Limited
- Nov 2011 - Nov 2015 Director, IRPC Oil Company Limited
- Nov 2011 - Nov 2015 Director, IRPC Polyol Company Limited

Shareholding : None

Relation among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Athavuth Vikitsreth

Executive Vice President,
External Affairs
Age 60

Appointed

October 1, 2013

Education/Training

- Bachelor of Business Administration (BBA), Abilene Christian University, Texas, U.S.A.
- The Programme of Senior Executives on Justice Administration Batch 22, Judicial Training Center, Court of Justice, 2017
- The Executive Program in Energy Literacy for a Sustainable Future Class 8, Thailand Energy Academy (TEA), 2016
- Capital Market Academy Leadership Program Class 20, Capital Market Academy, 2015
- Administrative Justice for Executives Class 4, The Administrative Court of Thailand, 2012
- Diploma, National Defence College, The Joint State-Private Sector Course Class 23, National Defence College of Thailand (NDC), 2010
- Corporate Governance for Directors and Senior Executive of State Enterprises and Public Organizations Class 2, Public Director Institute (PDI), 2009
- Advance Certificate Course in Politics and Governance in Democratic System for Executives Class 12, King Prajadhipok's Institute, 2008
- Monitoring the System of Internal Control and Risk Management (MIR) Class 5/2009
- Monitoring the Internal Audit Function (MIA) Class 5/2009
- Director Certification Program (DCP) Class 106/2008, Thai Institute of Directors Association (IOD)
- Audit Committee Program (ACP) Class 24/2008, Thai Institute of Directors Association (IOD)
- The Program of World Petrochemical Conference 2006 & Visit GE BCT (U.S.A.)

Board Member/Management in Listed Company –**The Stock Exchange of Thailand : 1**

- Executive Vice President, External Affairs, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –**The Stock Exchange of Thailand : None****Position in Other Organization/Institutions : 1**

- Director/Director to the Internal Audit Committee, Office of the National Broadcasting and Telecommunications Commission (NBTC)

Work Experience (5 Years Past Experience)

2018	Senior Executive Vice President - Special Affairs and Public Collaboration reporting to Chief Executive Officer and President, PTT Public Company Limited
2017 - 2018	Senior Executive Vice President - Government Relations reporting to Chief Executive Officer and President, PTT Public Company Limited
2016 - 2017	Advisor, Government Relations reporting to Chief Executive Officer and President, PTT Public Company Limited
2013 - 2016	Executive Vice President - External Affairs, PTT Global Chemical Public Company Limited

Shareholding : None

Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mrs. Warawan Tippawanich

Executive Vice President,
Corporate Strategy
Age 56

Appointed

October 1, 2019

Education/Training

- Master of Business Administration, Chulalongkorn University
- Bachelor of Science (Chemical Engineering), Chulalongkorn University
- Board Matters and Trends (BMT) Class 2/2017
- Company Secretary Program (CSP) Class 57/2014
- Board Reporting Program (BRP) Class 15/2014
- Company Reporting Program (CRP) Class 10/2014
- Director Certification Program (DCP) Class 190/2014, Thai Institute of Directors Association (IOD)
- Leadership Development Program (LDP) 2 and (LDP) 3 PTT Leadership and Learning Institute

Board Member/Management in Listed Company –**The Stock Exchange of Thailand : 1**

- Executive Vice President, Corporate Strategy, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –**The Stock Exchange of Thailand : 8**

- Director, GC-M PTA Company Limited
- Director, Thai PET Resin Company Limited
- Director, GC Polyols Company Limited
- Director, GC Ventures Company Limited
- Director, Solution Creation Company Limited
- Director, PTTGC America Corporation
- Director, PTTGC America LLC
- Director, GC Ventures America Corporation

Work Experience (5 Years Past Experience)

Jan 2015 - 11 Nov 2019	Director, GC Glycol Company Limited
Sep 2017 - 14 Sep 2019	Director, Sarn Palung Social Enterprise Company Limited
1 Jan 2015 - 30 Sep 2019	Senior Vice President - Corporate Affairs and Corporate Secretary, PTT Global Chemical Public Company Limited
Jan - Dec 2014	Vice President - Corporate Governance and Corporate Secretary, PTT Global Chemical Public Company Limited

Shareholding : None

Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mr. Narongsak Jivakanun
Executive Vice President,
International Business Operations
Age 51

Appointed

October 1, 2019

Mr. Pirun Krimwongrut
Acting Executive Vice President,
Organizational Effectiveness
Age 51

Appointed

October 1, 2019

Education/Training

- Master of Science (Chemical Engineering), Oregon State University, Oregon, U.S.A.
- Bachelor of Engineering (Chemical Engineering), Chulalongkorn University
- TLCA Leadership Development Program (LDP) Class 1, 2013, Thai Listed Companies Association (TLCA) and International Institute for Management Development (IMD)
- The Executive Program in Energy Literacy for a Sustainable Future Class 8, Thailand Energy Academy (TEA)
- Director Certification Program (DCP) Class 165/2012, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Executive Vice President, International Business Operations, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 13

- Chairman, GC Ventures Company Limited
- Chairman, GC Ventures America Corporation
- Director and Managing Director, PTTGC International Private Limited
- Director and Managing Director, PTTGC America Corporation
- Director, PTTGC America LLC
- Director, PTTGC Innovation America Corporation
- Director and Managing Director, PTTGC International (USA) Inc.
- Director, NatureWorks LLC
- Director, PTTGC International (Netherlands) B.V.
- Director, Vencorex Holding
- Director and Executive Committee, Emery Oleochemicals (M) Sdn. Bhd.
- Director and Executive Committee, Emery Specialty Chemicals Sdn. Bhd.
- Director, Soem Kit Textile Company Limited

Work Experience (5 Years Past Experience)

- | | |
|---------------------------|---|
| 21 Sep 2017 - 21 Nov 2019 | Director, Vice Chairman and Director to the Nomination and Remuneration Committee, Vinythai Public Company Limited |
| 2 Jun 2017 - 9 Nov 2019 | Director, GC Polyols Company Limited |
| 18 Feb 2016 - 14 Oct 2019 | Director and Director to the Risk Management Committee, Global Green Chemicals Public Company Limited |
| 23 Jan 2018 - 14 Oct 2019 | Chairman, GC Estate Company Limited |
| 11 Apr 2016 - 30 Sep 2019 | Director, PTT Phenol Company Limited |
| 1 Jan 2017 - 30 Sep 2019 | Executive Vice President - Corporate Strategy, PTT Global Chemical Public Company Limited |
| 3 Sep 2017 - 31 Jan 2018 | Chairman, PTT MCC Biochem Company Limited |
| 25 Nov 2016 - 26 Jul 2017 | Director, PTT Digital Solutions Company Limited |
| 13 Jan 2011 - 14 Jul 2017 | Director, Myriant Corporation |
| 1 Feb 2016 - 28 Feb 2017 | Director, PTT Chemical International Private Limited |
| 1 Feb 2016 - 28 Feb 2017 | Director, PTT Chemical International (Asia Pacific ROH) Company Limited |
| 1 Feb 2016 - 31 Dec 2016 | Senior Vice President - Corporate Strategy, PTT Global Chemical Public Company Limited |
| 2 Apr 2015 - 16 Nov 2016 | Director, Emery Oleochemicals (M) Sdn. Bhd. Director, Emery Specialty Chemicals Sdn. Bhd. |
| 10 Nov 2010 - 11 Apr 2016 | Director, Bio Spectrum Company Limited |
| 1 Oct 2014 - 31 Jan 2016 | Senior Vice President - International Strategy and Business Development Reporting to Executive Vice President - International Business Operations, PTT Global Chemical Public Company Limited |
| 1 Jan 2010 - 31 Jan 2016 | Chief Executive Officer, PTT Chemical International Private Limited |
| 1 Jan 2010 - 31 Jan 2016 | Chief Executive Officer, PTT Chemical International (Asia Pacific ROH) Company Limited |
| 15 Dec 2011 - 30 Jan 2015 | Director, PTTGC International (Netherlands) B.V. |
| 22 May 2012 - 26 Jan 2015 | Director, Vencorex Holding |
| 3 Mar 2011 - 23 Oct 2014 | Director, Bio Creation Company Limited |

Shareholding : None

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Education/Training

- Master of Engineering Science (Electrical Engineering), University of New South Wales, Australia
- Bachelor of Engineering (Electrical Engineering), (2nd Class Honors), Khon Kaen University
- Director Certification Program (DCP) Class 257/2018, Thai Institute of Directors Association (IOD)
- Leadership Development Program (LDP) 1, PTT Leadership and Learning Institute

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Acting Executive Vice President, Organizational Effectiveness, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 4

- Director, GC Styrenics Company Limited
- Director, GC Estate Company Limited
- Director, PTT Digital Solutions Company Limited
- Director, Sport Services Alliance Company Limited

Work Experience (5 Years Past Experience)

- | | |
|--------------------------|---|
| Mar 2018 - Dec 2019 | Director, Thai Tank Terminal Limited |
| Mar 2018 - Oct 2019 | Director, Eastern Fluid Transport Company Limited |
| 1 Apr 2018 - 30 Sep 2019 | Senior Vice President - Group Performance Center - Utilities, PTT Global Chemical Public Company Limited |
| 1 Sep 2017 - 31 Mar 2018 | Acting Senior Vice President - Group Performance Center - Utilities, PTT Global Chemical Public Company Limited |
| 2015 - 2017 | Vice President - GPC Strategy & Business Development, Upstream Petrochemical Business, PTT Global Chemical Public Company Limited |
| 2014 - 2015 | Vice President - Technical Standard and Policy, PTT Global Chemical Public Company Limited |

Shareholding : 27,033 shares (0.0006%) as of December 31, 2019

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Saroj Putthammawong

Executive Vice President,
Marketing, Commercial and Supply
Age 51

Appointed

October 1, 2019

Education/Training

- Master of Business Administration, Thammasat University
- Bachelor of Engineering (Chemical Engineering), Chulalongkorn University
- The Executive Program in Energy Literacy for a Sustainable Future Class 11/2018, Thailand Energy Academy (TEA)
- Director Certification Program (DCP) Class 220/2016, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Executive Vice President, Marketing, Commercial and Supply, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 5

- Director, GC Glycol Company Limited
- Director, GC Marketing Solutions Company Limited
- Director, GC Oxirane Company Limited
- Director, GC Treasury Center Company Limited
- Executive Committee Member, HMC Polymers Company Limited

Work Experience (5 Years Past Experience)

1 Oct 2015 - 30 Sep 2019	Senior Vice President - Marketing, Commercial and Supply, PTT Global Chemical Public Company Limited
2017 - 2019	Director, GC Logistics Solutions Company Limited
18 Nov 2015 - 8 Apr 2018	Director, Solution Creation Company Limited
21 Dec 2015 - 2 Mar 2018	Director, Thai Tank Terminal Limited
1 Jul - 30 Sep 2015	Vice President - Marketing Strategy, PTT Global Chemical Public Company Limited
1 Feb 2013 - 30 Jun 2015	Vice President - Supply Sourcing, PTT Global Chemical Public Company Limited

Shareholding : 4,900 shares (0.000109%) as of December 31, 2019

Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mr. Amorn Putiphrawan

Senior Vice President,
Internal Audit
Age 56

Appointed

January 1, 2018

Education/Training

- Master of Engineering (Chemical Engineering), Chulalongkorn University
- Bachelor of Science (Fuel Technology), Chulalongkorn University
- PTT Group Leadership Development Program
- Leadership Development Program (LDP) 2
- Leadership Development Program (LDP) 1

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Internal Audit, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : None

Work Experience (5 Years Past Experience)

1 Oct 2017 - 31 Dec 2017	Vice President reporting to Chief Executive Officer and President, PTT Global Chemical Public Company Limited
16 Jan 2014 - 30 Sep 2017	Vice President - Corporate Risk Management and Internal Control System, PTT Global Chemical Public Company Limited

Shareholding : None

Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mr. Chaya Chandavas

Senior Vice President,
Sustainability and Corporate Branding
Age 46

Appointed

October 1, 2019

Education/Training

- Doctor of Chemical Engineering, New Jersey Institute of Technology, U.S.A.
- Master of Chemical Engineering, New Jersey Institute of Technology, U.S.A.
- Bachelor of Science (Chemistry), (1st Class Honors), Mahidol University
- Director Certification Program (DCP) Class 152/2011, Thai Institute of Directors Association (IOD)
- Advanced Senior Executive Program, Sasin & Kellogg School of Management, 2008

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Sustainability and Corporate Branding, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 3

- Director, GC Ventures Company Limited
- Director, GC Ventures America Corporation
- Director, Sarn Palung Social Enterprise Company Limited

Work Experience (5 Years Past Experience)

23 May 2018 - 30 Oct 2019	Managing Director, GC Ventures Company Limited
27 Jan 2016 - 30 Sep 2019	Director, Solution Creation Company Limited
1 Nov 2015 - 30 Sep 2019	Senior Vice President - Science and Innovation, PTT Global Chemical Public Company Limited
2013 - 2019	Chairman, Auria BioChemicals Company Limited
2016 - 2019	Director, PTTGC Innovation America Corporation
2014 - 2015	Vice President - Innovation Strategy & Management, PTT Global Chemical Public Company Limited
2013 - 2014	Vice President - Strategy Initiatives International Business, PTT Chemical International (Asia Pacific ROH) Limited

Shareholding : None

Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

Mr. Thitipong Jurapornsiridee

Senior Vice President,
Corporate Finance and Strategy
Age 50

Appointed

July 1, 2019

Education/Training

- Master of Business Administration, Thammasat University
- Bachelor of Engineering (Electrical Engineering), Chulalongkorn University
- Director Certification Program (DCP) Class 267/2018, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Corporate Finance and Strategy, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 3

- Director, GC Oxirane Company Limited
- Director, PTT Asahi Chemical Company Limited
- Director, Vencorex Holding

Work Experience (5 Years Past Experience)

Oct 2011 - Jun 2019 Vice President - Corporate Finance & Investor Relations, PTT Global Chemical Public Company Limited

Jan 2011 - Sep 2019 Director, PTTGC Innovation America Corporation

Shareholding : None

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mrs. Pilasphan Udomjarumanee

Senior Vice President,
Corporate Secretary and Legal and
Company Secretary
Age 54

Appointed

October 1, 2019

Education/Training

- Master Degree of Business Administration (Finance), Royal Melbourne Institute of Technology, Melbourne, Australia
- Post Graduate Diploma Degree in Business Administration, Victoria University, Melbourne, Australia
- Bachelor of Arts (English), Silpakorn University
- Director Certification Program (DCP) Class 287/2019, Thai Institute of Directors Association (IOD)
- Leadership Development Program (LDP) 2 PLLI, INSEAD
- Supply Chain and Supply Sourcing, McKinsey
- Strategy Management Program - 2018, Fiscal Policy Research Institute Foundation, Ministry of Finance
- M&A Training for Senior Leadership - 2018, Institute for Merger, Acquisition & Alliance
- Leadership Development Program (LDP) 2 - 2015, Sasin Graduate Institute of Business Administration of Chulalongkorn University

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Corporate Secretary and Legal and Corporate Secretary, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : None

Work Experience (5 Years Past Experience)

1 Sep 2016 - 30 Sep 2019 Vice President - Strategy and Planning Department, PTT Global Chemical Public Company Limited

1 Sep 2014 - 31 Aug 2016 Vice President - Portfolio and Subsidiary Department, PTT Global Chemical Public Company Limited

Shareholding : 18,400 shares (0.000408%) as of December 31, 2019

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Pukpong Wungrattanasopon

Acting Executive Vice President,
Group Performance Center – Olefins
Age 49

Appointed

October 1, 2019

Education/Training

- Master of Science (Petrochemical Technology), The Petroleum and Petrochemical College, Chulalongkorn University
- Bachelor of Science (Chemical Technology), Chulalongkorn University
- Director Certification Program (DCP) Class 236/2017, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Acting Executive Vice President, Group Performance Center-Olefins, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 2

- Director, PTT Phenol Company Limited
- Director, Thai Tank Terminal Limited

Work Experience (5 Years Past Experience)

1 Aug 2016 - 30 Sep 2019 Senior Vice President - Group Performance Center, Aromatics, PTT Global Chemical Public Company Limited

19 Oct 2011 - 31 Jul 2016 Vice President, Technology, PTT Global Chemical Public Company Limited

Shareholding : None

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Ratchada Sawasdirak

Senior Vice President, Group Performance Center -
Refinery and Shared Facilities
Age 50

Appointed

October 1, 2019

Education/Training

- Master of Public Administration, Chulalongkorn University
- Bachelor of Engineering (Mechanical Engineering), Mahanakorn University of Technology
- Director Certification Program (DCP) Class 287/2019, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Group Performance Center - Refinery and Shared Facilities, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 1

- Director, Thai Tank Terminal Limited

Work Experience (5 Years Past Experience)

2008- Sep 2019 Vice President - Refinery,
PTT Global Chemical Public Company Limited

Shareholding : 30,000 shares (0.000665%) as of December 31, 2019

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Supasit Tongsupachok

Senior Vice President,
Group Performance Center - Utilities
Age 57

Appointed

October 1, 2019

Education/Training

- Master of Business Administration, Burapha University
- Bachelor of Engineering (Electronic Engineering), Rajmongkol Institute of Technology
- Executive Development Program, Class 11/2015, Fiscal Policy Research Institute Foundation
- Director Certification Program (DCP) Class 287/2019, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Group Performance Center - Utilities, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 6

- Director, GC Logistics Solutions Company Limited
- Director, GC Estate Company Limited
- Director, Thai Tank Terminal Limited
- Director, Eastern Fluid Transport Company Limited
- Director, PL Global Transport Company Limited
- Director, ISA Machining Service Company Limited

Work Experience (5 Years Past Experience)

23 Nov 2011-30 Sep 2019 Vice President – Aromatics Plant 1,
PTT Global Chemical Public Company Limited

Shareholding : 27,620 shares (0.000613%) as of December 31, 2019

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Anutin Chuaypen

Senior Vice President,
Group Performance Center - Aromatics
Age 53

Appointed

October 1, 2019

Education/Training

- Master of Science (Computer & Engineering Management), Assumption University
- Bachelor of Science (Chemical Engineering), Chulalongkorn University
- Leadership Development Program (LDP) 2
- Director Certification Program (DCP) Class 200/2015, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Group Performance Center - Aromatics, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 2

- Director, GC Styrenics Company Limited
- Director, NPC Safety and Environmental Service Company Limited

Work Experience (5 Years Past Experience)

27 Apr 2015 - 1 Jan 2020 Director, Thai Tank Terminal Limited

10 Jul 2014 - 30 Oct 2019 Director, GC Maintenance and Engineering Company Limited

1 Jan 2014 - 30 Sep 2019 Senior Vice President - Group Performance Center, Refinery and Shared Facilities, PTT Global Chemical Public Company Limited

16 Nov 2016 - 15 Mar 2018 Director, Eastern Fluid Transport Company Limited

Shareholding : 36,591 shares (0.000812%) as of December 31, 2019

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Pornsak Mongkoltrirat

Acting Executive Vice President,
Polymers Business Unit
Age 53

Appointed

October 1, 2019

Education/Training

- Master of Business Administration (Management), Kasetsart University
- Bachelor of Engineering (Mechanical Engineering), Kasetsart University
- Director Certification Program (DCP) Class 263/2017, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Acting Executive Vice President, Polymers Business Unit, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 8

- Chairman, GC Logistics Solutions Company Limited
- Chairman, GC Styrenics Company Limited
- Chairman, Envico Limited
- Director, GC Marketing Solutions Company Limited
- Director, GC Maintenance and Engineering Company Limited
- Executive Committee, HMC Polymers Company Limited
- Executive Board, PTT Asahi Chemical Company Limited
- Chairman, PL Global Transport Company Limited

Work Experience (5 Years Past Experience)

27 Dec 2018 - 12 Nov 2019	Director, GC-M PTA Company Limited
27 Dec 2018 - 12 Nov 2019	Director, Thai PET Resin Company Limited
16 Jul 2017 - 1 Oct 2019	Director and Managing Director, GC Glycol Company Limited
Jan 2018 - Sep 2019	Senior Vice President - EO-Based Performance Business Unit, PTT Global Chemical Public Company Limited
Jul 2017 - Dec 2017	Acting Senior Vice President - EO-Based Performance Business Unit, PTT Global Chemical Public Company Limited
Nov 2014 - Jun 2017	Acting Vice President - Strategy and Business Development, Polymer Business Unit, PTT Global Chemical Public Company Limited
Feb 2013 - Jun 2017	Vice President - LDPE Plant 1, Polymer Business Unit, PTT Global Chemical Public Company Limited

Shareholding : 6,258 shares (0.000139%) as of December 31, 2019

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Kumpol Chaikitkosi

Senior Vice President,
EO-Based Performance Business Unit
Age 59

Appointed

October 1, 2019

Education/Training

- Bachelor of Engineering (Chemical Engineering), Chulalongkorn University
- Program for Executive Development, IMD, Switzerland
- Executive Development Program, TLCA
- Director Certification Program (DCP) Class 219/2016, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, EO-Based Performance Business Unit, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 3

- Director and Managing Director, GC Glycol Company Limited
- Director, GC Oxirane Company Limited
- Director, GC Styrenics Company Limited

Work Experience (5 Years Past Experience)

1 Oct 2015 - 30 Sep 2019	Senior Vice President - Phenol Business Unit, PTT Global Chemical Public Company Limited
2015 - 2019	Director and Managing Director, PTT Phenol Company Limited
2006 - 2015	Executive Vice President - Operation, PTT Phenol Company Limited

Shareholding : None

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Paisarn Sarapee

Senior Vice President,
Phenol Business Unit
Age 55

Appointed

October 1, 2019

Education/Training

- Master of Business Administration, Graduate School of Commerce, Burapha University
- Bachelor of Science (Industrial Chemistry), Chiang Mai University
- Director Certification Program (DCP) Class 286/2019, Thai Institute of Directors Association (IOD)

- Head of Company Program, INSEAD University
- Senior Executive Program (SEP) 2019, Sasin Graduate Institute of Business Administration of Chulalongkorn University

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Phenol Business Unit, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 1

- Director and Managing Director, PTT Phenol Company Limited

Work Experience (5 Years Past Experience)

Jan 2015 - Sep 2019	Vice President - Phenol Operation Department, PTT Phenol Company Limited
Oct 2012 - Dec 2014	Vice President - Bisphenol A Plant Operation Department, PTT Phenol Company Limited

Shareholding : 47,334 shares (0.001050%) as of December 31, 2019

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mrs. Chananchida Wiboonkanarak

Senior Vice President, Downstream Strategy
and Business Development

Age 46

Appointed

April 1, 2018

Education/Training

- Master of Science (Chemical Engineering), Chulalongkorn University
- Bachelor of Science (Chemical Engineering), Chulalongkorn University
- Director Certification Program (DCP) Class 267/2018, Thai Institute of Directors Association (IOD)
- Leadership Development Program 2, 2015, Sasin Graduate Institute of Business Administration of Chulalongkorn University
- Leadership Development Program (LDP) 2, GE, U.S.A.
- PTT-HBS Leadership Development Program (LPD) 1, Harvard Business School Campus Shanghai, China

Board Member/Management in Listed Company –**The Stock Exchange of Thailand : 1**

- Senior Vice President, Downstream Strategy and Business Development, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –**The Stock Exchange of Thailand : 7**

- Director, PTT Phenol Company Limited
- Director, GC Glycol Company Limited
- Director, Solution Creation Company Limited
- Director, Kuraray GC Advanced Materials Company Limited
- Director and Chairman of Executive Committee, PTT MCG Biochem Company Limited
- Member of Executive Committee, HMC Polymers Company Limited
- Member of Executive Board, PTT Asahi Chemical Company Limited

Work Experience (5 Years Past Experience)

27 Dec 2018 - 22 Dec 2019	Director, GC-M PTA Company Limited
27 Dec 2018 - 22 Dec 2019	Director, Thai PET Resin Company Limited
26 Feb 2016 - 5 Nov 2018	Director, Thai Fatty Alcohols Company Limited
1 Oct 2017 - 31 Mar 2018	Acting Senior Vice President - Downstream Strategy and Business Development, PTT Global Chemical Public Company Limited
1 Apr 2014 - 30 Sep 2017	Vice President - Strategy and Business Development, High-Volume Specialties Business Unit, PTT Global Chemical Public Company Limited
1 Jan 2013 - 31 Mar 2014	Acting Vice President - Strategy and Business Development, High-Volume Specialties Business Unit, PTT Global Chemical Public Company Limited

Shareholding : None

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mrs. Jeeranee Pimthanothai

Senior Vice President,
Technical, Engineering and Maintenance

Age 55

Appointed

September 1, 2015

Education/Training

- Master of Engineering (Petrochemical Technology), Chulalongkorn University
- Bachelor of Science (Chemical Technology), Chulalongkorn University
- Director Certification Program (DCP) Class 249/2017 and Certificate of Corporate Governance: The Role of Manager in Supporting Directors, Thai Institute of Directors Association (IOD)
- Leadership Innovation and Strategy, GE Crotonville
- Leadership Development Program (LDP) 1
- NIDA-Wharton Executive Leadership Program, U.S.A.
- The Columbia Senior Executive Program, U.S.A.

Board Member/Management in Listed Company –**The Stock Exchange of Thailand : 1**

- Senior Vice President, Technical, Engineering and Maintenance, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –**The Stock Exchange of Thailand : 2**

- Director, GC Maintenance and Engineering Company Limited
- Director, PTT Energy Solutions Company Limited

Work Experience (5 Years Past Experience)

Nov 2019	Director, PTT Asahi Chemical Company Limited
Jan 2015 - Aug 2015	Vice President - Petrochemicals Subsidiary Planning & Management Department, PTT Public Company Limited
2014	Vice President - Refining Subsidiary Planning & Management Department and Acting in Vice President - Petrochemicals Subsidiary Planning & Management Department and Project Director of PTT Group Operational Excellence Management System Transformation Project, PTT Public Company Limited

Shareholding : 15,543 shares (0.000345%) as of December 31, 2019

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Khomson Piyawattanaviroj

Senior Vice President,
CAPEX Excellence

Age 57

Appointed

January 1, 2018

Education/Training

- Bachelor of Engineering (Mechanical Engineering), Chulalongkorn University

- Director Certification Program (DCP) Class 259/2018, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –**The Stock Exchange of Thailand : 1**

- Senior Vice President, CAPEX Excellence, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –**The Stock Exchange of Thailand : 1**

- Director, NPC Safety and Environmental Service Company Limited

Work Experience (5 Years Past Experience)

Jan 2017 - Dec 2017	Vice President - Center of Excellence, PTT Global Chemical Public Company Limited
Jul 2013 - Dec 2016	Project Director, PTT Phenol Company Limited

Shareholding : None

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Wirat Boonbumrungchai

Senior Vice President, Quality, Safety,
Occupational Health and Environment
Age 58

Appointed

January 1, 2017

Education/Training

- Master of Engineering (Mechanical Engineering), Chulalongkorn University
- Bachelor of Engineering (Mechanical Engineering), Chulalongkorn University
- Director Certification Program (DCP) Class 177/2013, Thai Institute of Directors Association (IOD)
- NIDA Executive Leadership Program WHARTON

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Quality, Safety, Occupational Health and Environment, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 1

- Director, NPC Safety and Environmental Service Company Limited

Work Experience (5 Years Past Experience)

2013 - 2016	Senior Vice President, PTT Global Chemical Public Company Limited, Secondment as Managing Director, PTT Maintenance and Engineering Company Limited
-------------	---

Shareholding : 30,237 shares (0.000671%) as of December 31, 2019

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mrs. Chatsuda Kanjanarat

Senior Vice President,
Transformation Excellence
Age 51

Appointed

July 1, 2017

Education/Training

- Bachelor of Engineering (Electrical-Electronics), (Second-class Honors), King Mongkut's Institute of Technology Ladkrabang
- Director Certification Program (DCP) Class 249/2017, Thai Institute of Directors Association (IOD)

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Transformation Excellence, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 1

- Director, PTT Digital Solutions Company Limited

Work Experience (5 Years Past Experience)

13 Jun 2016- 30 Jun 2017	Vice President - PTTGC Business Performance Improvement - Project MAX, PTT Global Chemical Public Company Limited
1 Jan 2014 - 12 Jun 2016	Vice President - Strategy and Planning, PTT Global Chemical Public Company Limited

Shareholding : None

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mrs. Wilawan Songjaroen

Senior Vice President,
Procurement
Age 56

Appointed

September 1, 2019

Education/Training

- Master of Engineering (Chemical Engineering), Chulalongkorn University
- Bachelor of Science (Chemistry), Silpakorn University
- International Management Program, Stanford - NUS, Singapore
- Stanford Executive Program (SEP), Stanford Graduate School of Business, Stanford University, U.S.A.
- Director Certification Program (DCP) Class 120/2009, Thai Institute of Directors Association (IOD) and Australian Institute of Company Directors
- Certificate in Procurement and Supply Operations, Purchasing & Supply Chain Management Association of Thailand/The Chartered Institute of Purchasing and Supply (CIPS), August-October 2007
- International Business Management Program, Graduate School of Business, Georgetown University, Washington DC, U.S.A.

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Procurement, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 2

- Director, GC Logistics Solutions Company Limited
- Director, PL Global Transport Company Limited

Work Experience (5 Years Past Experience)

Jan 2018 - Oct 2019	Director, GC Marketing Solutions Company Limited
1 Jan 2017 - 1 Sep 2019	Managing Director, GC Logistics Solutions Company Limited
20 Nov 2017 - 1 Sep 2019	Managing Director, PL Global Transport Company Limited
16 Oct 2015 - 2016	Vice President - Production Planning, Sales & Marketing, Polymers Business Unit, PTT Global Chemical Public Company Limited
1 Oct 2014 - 2016	Vice President - Marketing, High Volume Specialty Business Unit, PTT Global Chemical Public Company Limited
2011 - 30 Sep 2014	Vice President - Procurement, PTT Global Chemical Public Company Limited

Shareholding : None

Relations among Family with other Directors, Management,

Major Shareholders of the Company or Subsidiaries : None

Mr. Kevin Thomas Corby

Senior Vice President,
Science and Innovation
Age 64

Appointed

October 1, 2019

Education/Training

- Doctor of Philosophy in Chemistry, The Pennsylvania State University, U.S.A.
- Bachelor of Science (Chemistry), King's College, PA, U.S.A.
- Business Executive Program: University of Michigan, Ross School of Business, U.S.A.

Board Member/Management in Listed Company –

The Stock Exchange of Thailand : 1

- Senior Vice President, Science and Innovation, PTT Global Chemical Public Company Limited

Board Member/Management in Non-Listed Company –

The Stock Exchange of Thailand : 3

- Director, GC Ventures Company Limited
- Director, GC Ventures America Corporation
- Director, PTTGC Innovation America Corporation

Work Experience (5 Years Past Experience)

2008 - 2017 Global Technology Director, DuPont Protection Technologies, E.I. Dupont Co.

Shareholding : None

Relations among Family with other Directors, Management, Major Shareholders of the Company or Subsidiaries : None

EXECUTIVE VICE PRESIDENT/ SENIOR VICE PRESIDENT APPOINTED AS EXECUTIVES OF GC'S SUBSIDIARIES

1. Mr. Toasaporn Boonyapipat

Executive Vice President

Reporting to Chief Executive Officer,
Secondment as President & CEO, PTTGC America LLC

2. Mr. Siridech Kumvongdee

Executive Vice President

Reporting to Downstream Petrochemical Business,
Secondment as President, HMC Polymers Company Limited

3. Mr. Somnuk Suwanpradit

Senior Vice President

Reporting to Downstream Petrochemical Business,
Secondment as Managing Director, GC Oxirane Company Limited

4. Mr. Amnuai Phrom-Anant

Senior Vice President

Reporting to Downstream Petrochemical Business,
Secondment as Managing Director, GC Logistics Solutions Company Limited

5. Mr. Thitipol Artsanchorn

Senior Vice President

Reporting to Downstream Petrochemical Business,
Secondment as President, GC Marketing Solutions Company Limited

6. Miss Kornkamol Korpaisarn

Senior Vice President

Reporting to Downstream Petrochemical Business,
Secondment as Managing Director, GC Polyols Company Limited

7. Mr. Wittoon Suewatanakul

Senior Vice President

Reporting to Downstream Petrochemical Business,
Secondment as Managing Director,
Global Green Chemicals Public Company Limited

8. Mr. Narongchai Pisutpunya⁽¹⁾

Senior Vice President

Reporting to Downstream Petrochemical Business,
Secondment as President, GC-M PTA Company Limited and
Thai PET Resin Company Limited

9. Mr. Piroj Samutthanant⁽²⁾

Senior Vice President,

Reporting to Center of Excellence,
Secondment as Managing Director,
GC Maintenance and Engineering Company Limited

10. Mr. Kridsada Prasertsuko

Senior Vice President

Reporting to Center of Excellence,
Secondment as Managing Director,
NPC Safety and Environmental Service Company Limited

11. Mr. Theerapol Muenpakdee

Senior Vice President

Reporting to Upstream Petrochemical Business,
Secondment as Managing Director, Thai Tank Terminal Limited

12. Mr. Vitaya Pinmuangngarm

Senior Vice President

Reporting to Downstream Petrochemical Business,
Secondment as President, PTT Asahi Chemical Company Limited

13. Miss Somsri Phanichrungruang

Senior Vice President

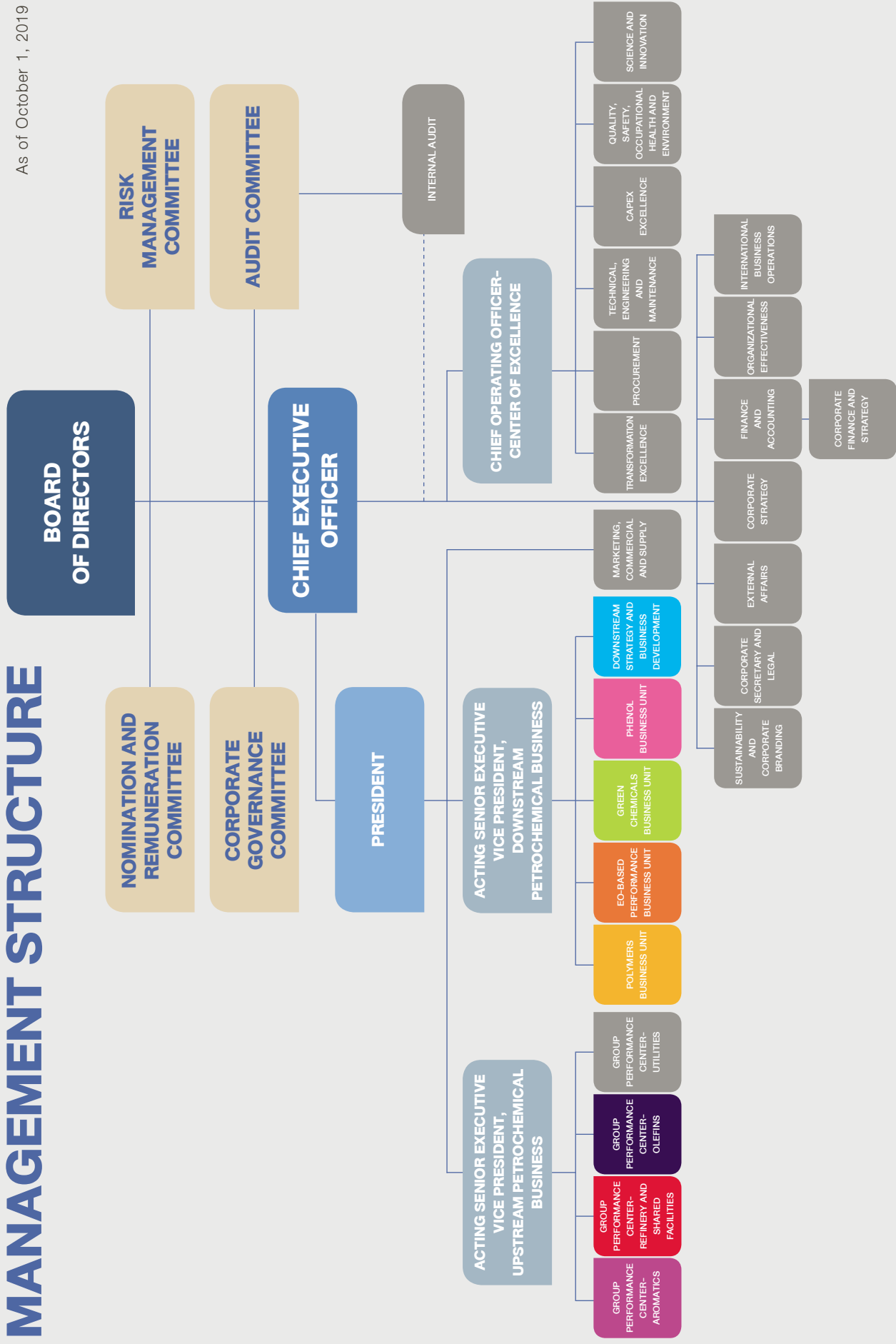
Reporting to Downstream Petrochemical Business,
Secondment as President, PTT MCC Biochem Company Limited

Remarks:

- (1) Mr. Narongchai Pisutpunya is appointed as President in replacement of Mr. Sommai Sirilertsombat effective from July 1, 2019.
- (2) Mr. Piroj Samutthanant is appointed as Managing Director in replacement of Mr. Pairush Soovan effective from January 1, 2020

MANAGEMENT STRUCTURE

As of October 1, 2019



MANAGEMENT STRUCTURE

THE BOARD OF DIRECTORS

The Board of Directors as of January 31, 2020 comprises the following members:

Name	Position	Date of Appointment
1. Mr. Piyasvasti Amranand	Chairman/Chairman of the Independent Directors	April 9, 2018
2. Mr. Prasert Bunsumpun	Independent Director/ Chairman of the Risk Management Committee	October 19, 2011
3. Mr. Apisak Tantivorawong ⁽¹⁾	Independent Director/Chairman of the Audit Committee	January 24, 2020
4. Professor Somkit Lertpaithoon	Independent Director/Chairman of the Corporate Governance Committee	April 9, 2018
5. Mr. Don Wasantapruek	Independent Director/Chairman of the Nomination & Remuneration Committee	November 1, 2015
6. Mr. Pakorn Nilprapunt	Independent Director/Director to the Audit Committee	April 9, 2018
7. Mr. Prapas Kong-ied ⁽²⁾	Independent Director/Director to the Audit Committee	November 1, 2019
8. Major General Nithi Chungcharoen	Independent Director/Director to the Corporate Governance Committee/Director to the Nomination & Remuneration Committee	September 22, 2014
9. Mrs. Watanan Petersik	Independent Director/Director to the Corporate Governance Committee	September 22, 2014
10.Mr. Wittawat Svasti-xuto	Director/Director to the Nomination & Remuneration Committee	February 19, 2018
11.Mr. Disathat Panyarachun	Director/Director to the Corporate Governance Committee	October 22, 2018
12. Mrs. Premrutai Vinaiphat ⁽³⁾	Director/Director to the Risk Management Committee	February 18, 2019
13.Mrs. Arawadee Photisaro	Director/Director to the Risk Management Committee	October 22, 2018
14.Mr. Supattanapong Punmeechaow	Director/Director to the Risk Management Committee	September 25, 2014
15.Mr. Kongkrapan Intarajang ⁽⁴⁾	Director/Director to the Risk Management Committee/ Chief Executive Officer	October 1, 2019

Remarks:

- (1) Mr. Apisak Tantivorawong, Independent Director, replaced Mr. Prasarn Chuaphanich, effective January 24, 2020.
- (2) Mr. Prapas Kong-ied, Independent Director, replaced Mr. Amnuay Preemonwong, effective November 1, 2019.
- (3) Mrs. Premrutai Vinaiphat, Director, replaced Mr. Praphon Wongtharua, effective February 18, 2019.
- (4) Mr. Kongkrapan Intarajang, Director, replaced General Chatchalerm Chalermsook, effective June 18, 2019.

Director who retired by rotation in 2019 are as follows:

Name	Position	Terms of Appointment
1. Mr. Anon Sirisaengtaksin	Director/Director to the Risk Management Committee	September 22, 2014 - April 5, 2019

Directors who resigned in 2019 are as follows:

Name	Position	Terms of Appointment
1. Mr. Praphon Wongtharua	Director/Director to the Risk Management Committee	August 24, 2015 - February 5, 2019
2. General Chatchalerm Chalermsook	Independent Director	April 5, 2019 - May 6, 2019
3. Mr. Amnuay Preemonwong	Independent Director/Chairman of the Nomination & Remuneration Committee/ Director to the Audit Committee	October 19, 2011 - October 31, 2019
4. Mr. Prasarn Chuaphanich	Independent Director/Chairman of the Audit Committee	April 5, 2016 - November 17, 2019

AUTHORIZED DIRECTORS

According to GC's Articles of Association and Certification of Incorporation from the Department of Business Development of the Ministry of Commerce, as of December 17, 2019, the authorized signatory Directors of GC were: "(1) Mr. Kongkrapan Intarajang, Chief Executive Officer, can sign and affix the Company's seal on behalf of GC; or (2) two of the following three Directors can jointly sign and affix the Company's seal on behalf of GC, namely Mr. Disathat Panyarachun, Mrs. Arawadee Photisaro, and Mr. Wittawat Svasti-xuto".

COMPOSITION OF THE BOARD OF DIRECTORS

GC's Articles of Association mandate that the Board of Directors be composed of no fewer than five but no more than 15 Directors. Each Director is to serve a three-year term. At least one-third and no fewer than three Directors on the entire Board must be Independent Directors. According to good corporate governance principles, more than half of the Board of Directors must be Independent Directors. Furthermore, GC's good corporate governance principles prescribe that at least half of the Board of Directors must be residents of the Kingdom of Thailand. These Directors must also have the legally required qualifications, not possess any attributes prohibited by law and not be over the age of 70.

The composition of the Board of Directors and its members' qualifications comply with its Articles of Association, good corporate governance principles and legal regulations. In addition, Company policy protects Directors from any form of gender discrimination. The Board of Directors comprises individuals from diverse fields of knowledge, expertise and professional experience which are beneficial to the Company's business operations. Furthermore, each Director may hold a directorship at no more than five companies listed with the Stock Exchange of Thailand (SET) and at no more than three state enterprises or juristic persons whose shares are held by state enterprises, according to a resolution passed by the cabinet. The Company's Board of Directors comprises a total of 15 Directors, which is a number appropriate for its business size and type. These Directors are divided into the following categories:

1. Fourteen Non-Executive Directors
2. One Executive Director, namely the Chief Executive Officer
3. Nine Independent Directors (more than half of the Board)
4. Three female Directors

AUTHORITY AND RESPONSIBILITIES OF THE BOARD OF DIRECTORS

The Board of Directors governs the Company's operations and ensures strict compliance with applicable laws, GC's objectives and Articles of Association and shareholder resolutions, as well as good corporate governance principles and best practices for Directors of listed companies set forth by SET. All Directors possess the knowledge and capability needed to perform their duties for the benefit of the Company and its shareholders. The Board's authority and responsibilities are summarized below:

1. Dedicate its time and attention to establish the Company's vision, mission, directions and strategies. Board members freely express their opinions and seek useful information to determine the direction of the Company.
2. Review and approve key strategies and policies as well as objectives, financial goals and corporate plans as well as supervise and monitor the management's implementation of the Company's strategic plans in compliance with the defined directions and strategies to ensure that the management is able to achieve the Company's vision, directions and strategies with efficiency, and readily adapt to the changing situation.
3. Establish Corporate Governance Policy and Business Code of Conduct, which appropriately outline principles and good practices for the Board, management and staff members, and instill responsibility awareness in all employees to promote an understanding of and strict compliance with these principles and guidelines, in addition to the Company's rules and regulations, to assure all stakeholders of fairness.
4. Exercise approval authority on various matters beyond the authority granted to the Chief Executive Officer and President in the Company provision namely budget, investment, project implementation of GC Group, key contract entry, directors' appointment to replace those who resigned during the year or to sub-committee, naming of authorized directors, and appointment of the dates for the annual general meeting of shareholders and interim dividend payment.
5. Ensure that the corporate accounting system, financial reporting and auditing are credible, supervise the assessment of internal control's adequacy and ensure that internal audits are performed efficiently and effectively.
6. Consider all relevant risk factors and devise comprehensive risk management guidelines, ensure that the Company's Executives are equipped with an efficient risk management system or process to mitigate risks, as well as to explore

business opportunities that may arise from these risks and ensure that adequate and effective internal control is in place.

7. Monitor and manage all conflicts of interest, as well as all connected transactions, that may arise, and value key transactions to maximize the benefit of shareholders and other stakeholders.
8. Provide appropriate channels of communication to each group of shareholders and ensure that the disclosure of information is accurate, clear, transparent, credible and of the highest standard.
9. Regularly conducts assessment and reviews of its own performance and that of the Chief Executive Officer and President.
10. Provide a suitable compensation system or mechanism for the Company's Executives, relative to the performance of the Company, to induce short-term and long-term motivation.
11. Act as leaders and role models in line with the Company's Corporate Governance Policy.
12. Assess corporate adherence to the Company's Corporate Governance Policy and Business Code of Conduct at least once a year.
13. Provide an appropriate, transparent and fair nomination system for all key managerial positions. Top executives, from Executive Vice Presidents to the Chief Executive Officer, are appointed by the Board's majority votes.
14. Report to the Company any conflict of interest that its members or their affiliates may have with the management of the Company or its subsidiaries.
15. Attend every Board meeting, as well as every shareholders' meeting. If, under any circumstance, attendance is impossible, the Chairman of the Board must be notified in writing.
16. Value corporate social and environmental responsibility and promote sustainable quality of life for Thai people, starting with improving the standard of living of communities around the Company's plants to foster an environment where its plants and these communities co-exist in a sustainable manner.
17. Provide support to all anti-fraud schemes for the purpose of progress and sustainable growth.

Moreover, the Board of Directors must obtain permission from the shareholders' meeting before acting on the following issues:

- Acquisition or disposition of an important asset or any connected transaction as prescribed by laws and the Capital Market Supervisory Board.
- Sale or transfer of the Company's entire enterprise or its essential components to other entities.
- Disposition or acquisition of an enterprise on behalf of the Company.

- Initiation, modification or termination of all or some key lease contracts of the Company, including the assignment of lease contracts to other individuals or entry into a partnership with another entity to share profits or losses.
- Making addenda or amendments to the Company's Memorandum or Articles of Association.
- Increasing or decreasing the registered capital.
- Issuance of debentures for sale to the public.
- Dissolution of the Company or merging it with another company.
- Announcing annual dividends.
- Other activities that require approval from the shareholders' meeting as mandated by law or the Company's Articles of Association.

APPOINTMENT TO AND TERMINATION FROM THE BOARD OF DIRECTORS

GC's Articles of Association provide the following guidelines for the appointment to and termination from the Board of Directors:

APPOINTMENT

- Shareholders at a shareholders' meeting shall vote to appoint Director(s) according to the following guidelines:
 1. Each shareholder shall have one vote per share held.
 2. In the event that the number of nominees for the election does not exceed the number of vacant positions, shareholders shall vote on these eligible nominees. Shareholders shall allocate all of their votes per (1) to one nominee without dividing their votes.
 3. In the event that the number of nominees exceeds the number of vacant positions, shareholders shall still allocate all of their votes per (1) to one nominee without dividing their votes. Nominees receiving the majority of the votes shall be appointed to the Board until there are no vacancies left. Additionally, in the event that the number of nominees with equal votes exceed the number of available positions, The Chairman of the meeting shall cast the deciding vote.
- The Board of Directors shall nominate one Director as Chairman of the Board of Directors. Decisions made during a Board meeting are based on majority votes. The Chairman shall vote only when a deciding vote is needed. In the event that a Director's position becomes vacant for any reason other than retirement by rotation, the Board may

appoint an individual who is qualified and does not possess any attributes prohibited by law as Director to attend the next Board meeting, unless the remaining term is less than two months. The new Director shall serve only the remaining term of his or her predecessor. This decision shall be made only with the agreement of at least three-quarters of the remaining Directors.

- In the event that vacancies cause the number of Directors to fall below the quorum, the remaining Directors shall have the only authority to call for a shareholders' meeting in which shareholders shall vote to appoint new Directors to fill these vacancies only. This process must be completed within one month from the date on which the number of Directors no longer constitutes the quorum. These newly appointed Directors shall serve only the remaining terms of their predecessors.

TERMINATION

- At each Annual General Meeting of Shareholders, one-third of the serving Directors shall retire by rotation. In the event that the number of serving Directors is not equality divisible by three, the number of Directors retiring shall be as close to one-third as possible. Directors to retire in the first and second years after Company registration shall be randomly selected; however, in later years, Directors serving the longest terms shall retire. Directors who retire by rotation may be re-elected to the Board.
- In addition to retirement by rotation, other causes for directorship termination include death, resignation or disqualification or prohibition by law. Additionally, Directors can be terminated by a shareholders' meeting resolution or a court order.
- Resigning Directors must submit their resignation notice to the Company. Resignation is effective from the day the Company receives such notice. In addition, Directors may submit their resignation notice through the registrar. At a shareholders' meeting, shareholders may pass a resolution to force the termination of a Director before his or her term ends with three-fourths of the attending and eligible shareholders' votes. Additionally, these majority votes must constitute at least half of the shares held by attending and eligible shareholders.

INDEPENDENT DIRECTORS

According to the Company's corporate governance principles, more than half of the Board of Directors must be Independent Directors. Each Independent Director may serve up to three consecutive terms or up to nine years. The term begins from the date of the 2014 Annual General Meeting of Shareholders onwards, regardless of their previous terms. These Independent Directors must be experienced and independent under the Capital Market Supervisory Board's requirements. Additionally, they must hold no more than 0.5% of the Company's shares (a stricter regulation than the Securities and Exchange Commission's limit of 1%). The definition of Independent Directors is disclosed in the Company's Corporate Governance Handbook and on the Company website.

Independent Directors must attend meetings regularly. They are allowed to freely express their opinions during these meetings. To do so, they are entitled to adequate access to company financial and business information. They are also tasked with protecting stakeholders' interests and preventing conflict of interest among the Company, its executives, Board of Directors and major shareholders.

Currently, the Company has a total of nine Independent Directors, constituting more than one-third of the Board and exceeding the legal requirement. In addition, this number is in line with the Company's corporate governance principles, which stipulate that more than half of Board members must be Independent Directors. Moreover, the Charter of Independent Directors clearly outlines their duties and ensures the tangibility of their performance. Under the Charter recently amended to suit current situation, duties and responsibilities of Independent Directors are as follows:

- Advise and provide recommendations to the Board of Directors on key issues that the Company should act upon or issues that could be beneficial to the Company, its shareholders and other relevant stakeholders.
- Ensure the Company's compliance with its Anti-Corruption Policy and measures.
- Value corporate social and environmental responsibility
- Seek consultation from external, independent consultants if necessary. The expenses incurred will be borne by the Company.
- Ensure that the Company operates according to the regulations and requirements of all Independent Directors related regulatory bodies for listed

companies, and review the definition of an Independent Director to make sure that it is appropriate and complete, according to legal requirements.

- Review the adequacy of their charter annually and propose recommended amendment, if any, to the Board of Directors for approval.
- Perform other duties as assigned by the Board of Directors, provided that these duties do not interfere with the independent nature required of Independent Directors.

AUDIT COMMITTEE

Name	Position	Date of Appointment
1. Mr. Prasan Chuaphanich ⁽¹⁾	Chairman of the Audit Committee (Independent Director)	April 25, 2016
2. Mr. Pakorn Nilprapunt	Director to the Audit Committee (Independent Director)	April 23, 2018
3. Mr. Prapas Kong-ied ⁽²⁾	Director to the Audit Committee (Independent Director)	November 1, 2019

Mr. Amorn Putiphrawan, Senior Vice President of Internal Audit, serves as Secretary to the Audit Committee.

Remarks:

- (1) Mr. Prasan Chuaphanich possesses his education background and work experiences in accounting and finance. He served as Chairman of the Audit Committee until November 18, 2019. Besides, Mr. Apisak Tantivorawong was appointed the Chairman of the Audit Committee on January 24, 2020.
- (2) Mr. Prapas Kong-ied was appointed Director to the Audit Committee, replacing Mr. Amnuay Preemonwong, on November 1, 2019.

The Audit Committee is composed of at least three Independent Directors. These Directors serve a three-year term unless their terms on the Board end, or they resign or are removed from positions. Directors to the Audit Committee who retire by rotation may be re-appointed by the Board. Each Director's qualifications, duties and responsibilities are in line with the criteria set forth by the Securities and Exchange Commission (SEC). Their scope of work is defined by the Capital Market Supervisory Board.

The Board of Directors has approved the Charter of the Audit Committee, which stipulates the composition, qualifications, terms of office and scopes of duties according to good corporate governance principles. Details of the charter are disclosed in the Company's Corporate Governance Handbook and on the Company website.

GC's Audit Committee comprises all Independent Directors. The Board believes that these respectable Directors possess sufficient knowledge, expertise and experience in finance and accounting. They have continuously undergone training to enhance their expertise for the benefit of ensuring the credibility of the Company's financial and auditing reports, including their adherence to accounting standards, applicable laws and other related standard practices. Furthermore, the Audit Committee ensures adequate and efficient internal control and risk management

SUB-COMMITTEES

In conformity to good corporate governance principles, the Board of Directors at Meeting No. 1/2011, held on October 19, 2011, established four Sub-Committees, namely the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee and the Risk Management Committee. Serving a three-year term, Directors appointed to these Sub-Committees are to perform their specific tasks with diligence and efficiency. All Sub-Committees report to the Board of Directors. The names and tasks of each Sub-Committee as of December 31, 2019, are listed below:

systems while overseeing internal processes regarding whistleblowers and complaint submissions. The Audit Committee nominates independent auditors and submits dismissal recommendations to the Board in the event that an independent auditor cannot or neglect to or wrongfully performs his or her duties. It probes the suitability and efficacy of the Company's internal audit system and oversees the functions of Internal Audit to ensure compliance with internal auditing standards. The Audit Committee oversees the Company's compliance with securities and exchange laws, regulations of the Stock Exchange of Thailand (SET) and other applicable laws. It also reviews connected transactions and conflicts of interest to ensure their compliance with applicable laws and the requirements of the Stock Exchange of Thailand (SET) and Securities and Exchange Commission (SEC), affording the Company sensibility, the utmost benefit and full disclosure.

In 2019, the Audit Committee held a total of nine meetings and one additional meeting with the External Auditor, performing its role within the scope of duties and responsibilities mandated by the Charter of the Audit Committee and as assigned to them by the Board of Directors. The Committee also reported its performance outcomes to the Board on a quarterly basis before further presenting a summary of the results to shareholders in the annual report.

NOMINATION AND REMUNERATION COMMITTEE

Name	Position	Date of Appointment
1. Mr. Don Wasantapruek ⁽¹⁾	Chairman of the Nomination and Remuneration Committee (Independent Director)	April 23, 2018
2. Mr. Wittawat Svasti-xuto	Director to the Nomination and Remuneration Committee	October 22, 2018
3. Major General Nithi Chungcharoen ⁽²⁾	Director to the Nomination and Remuneration Committee (Independent Director)	November 1, 2019

Mrs. Pilasphan Udomjarumanee, Senior Vice President, Corporate Secretary and Legal, serves as Secretary to the Nomination and Remuneration Committee, replacing Mrs. Warawan Tippawanich, on October 1, 2019.

Remarks:

- (1) Mr. Don Wasantapruek, Director to the Nomination and Remuneration Committee, was appointed Chairman on November 1, 2019.
- (2) Major General Nithi Chungcharoen was appointed Director to the Nomination and Remuneration Committee, replacing Mr. Amnuay Preemonwong, on November 1, 2019.

The Nomination and Remuneration Committee is composed of at least three Directors of the Board, more than half of whom are required to be Independent Directors. Its Chairman is also required to be an Independent Director. These Directors serve a three-year term unless their terms on the Board end, or they resign or are removed from positions.

The Nomination and Remuneration Committee nominates candidates for appointment to the Board or Sub-Committees, as well as nominating candidates to be appointed as the Chief Executive Officer (CEO) under a well-structured and transparent process. The Committee is also charged with establishing remuneration guidelines for the Directors and CEO. Nomination criteria include experiences, profession, skills, expertise diversity and niche qualifications needed for the Company's businesses under the Board Skill Matrix. These criteria strike a balance among all business fields and yield the utmost benefit to the Company. In addition, the

Committee considers candidates from the Director's Pool of credible organizations and present nominees to the Board and/or at the shareholders' meeting for appointment.

The Board of Directors has approved the Charter of the Nomination and Remuneration Committee, which identifies the composition, qualifications, terms of office and scopes of duties according to good corporate governance principles. Details of the charter are disclosed in the Company's Corporate Governance Handbook and on the Company website.

In 2019, the Nomination and Remuneration Committee held a total of five meetings, performing its roles within the scope of duties and responsibilities mandated by the Charter of the Nomination and Remuneration Committee and as assigned by the Board of Directors. The Committee also reported its performance to the Board before further presenting a performance summary to shareholders in the annual report.

CORPORATE GOVERNANCE COMMITTEE

Name	Position	Date of Appointment
1. Professor Somkit Lertpaithoon	Chairman of the Corporate Governance Committee (Independent Director)	April 23, 2018
2. Major General Nithi Chungcharoen	Director to the Corporate Governance Committee (Independent Director)	September 22, 2014
3. Mrs. Watanan Petersik	Director to the Corporate Governance Committee (Independent Director)	April 23, 2018
4. Mr. Disathat Panyarachun	Director to the Corporate Governance Committee	October 22, 2018

Mrs. Pilasphan Udomjarumanee, Senior Vice President, Corporate Secretary and Legal, serves as Secretary to the Corporate Governance Committee, replacing Mrs. Warawan Tippawanich, on October 1, 2019.

The Corporate Governance Committee is composed of at least three Directors of the Board, more than half of whom are required to be Independent Directors. Its Chairman is also required to be an Independent Director. These Directors serve a three-year term unless their terms on the Board end, or they resign or are removed from positions.

The responsibilities of the Committee include determination of guidelines and policies related to the business code of conduct and ethics, as well as anti-corruption measures and policies, in compliance with good corporate governance principles. These guidelines and policies are presented to the Board of Directors to be approved as company regulations. The Corporate Governance Committee also presents guidelines and policies on corporate social and

environmental responsibility to the Board. Moreover, the Committee supervises and provides guidance for the Company's sustainable development, as well as monitors its progress and assesses the effectiveness of its performance. All of this standardizes the Company's practices.

In 2019, the Corporate Governance Committee held a total of seven meetings, performing its roles within the scope of duties and responsibilities mandated by the Charter of the Corporate Governance Committee and as assigned by the Board of Directors. The Committee also reported its corporate governance monitoring results to the Board before further presenting a summary of the results to shareholders in the annual report.

RISK MANAGEMENT COMMITTEE

Name	Position	Date of Appointment
1. Mr. Prasert Bunsumpun	Chairman of the Risk Management Committee (Independent Director)	April 23, 2018
2. Mrs. Premrutai Vinaiphat ⁽¹⁾	Director to the Risk Management Committee	February 18, 2019
3. Mrs. Arawadee Photisaro	Director to the Risk Management Committee	October 22, 2018
4. Mr. Supattanapong Punmeechaow	Director to the Risk Management Committee	September 25, 2014
5. Mr. Kongkrapan Intarajang ⁽²⁾	Director to the Risk Management Committee	October 1, 2019

Mr. Chusak Wittayakajohnsad, Vice President of Corporate Risk Management and Internal Control System, serves as Secretary to the Risk Management Committee.

Remarks:

- (1) Mrs. Premrutai Vinaiphat was appointed Director to the Risk Management Committee, replacing Mr. Praphon Wongtharua, on February 18, 2019.
 (2) Mr. Kongkrapan Intarajang was appointed Director to the Risk Management Committee, replacing Mr. Anon Sirisaengtaksin, on October 1, 2019.

The Risk Management Committee is composed of at least three Directors of the Board, at least one of whom is required to be an Independent Director. These Directors serve a three-year term unless their terms on the Board end, or they resign or are removed from positions.

The Risk Management Committee's role is to establish policies related to the Company's risk appetite and risk tolerance, as well as risk management guidelines that serve as a framework within which the entire GC Group operates. With a particular focus on early-warning signs, the Committee oversees that risks are identified and ranked by impact and likelihood. In extension, the Committee establishes appropriate risk mitigation measures and monitors and assesses the effectiveness of the Company's risk management.

Furthermore, the Risk Management Committee offers its opinions and suggestions on possible risk issues of an investment project or a legally binding agenda item that is complex in nature or will impact the Company's reputation in a significant manner. It also ensures that the Company's business operations comply with relevant laws and standards.

In 2019, the Risk Management Committee held a total of six meetings, performing its roles within the scope of duties and responsibilities mandated by its Charter and as assigned by the Board of Directors. The Risk Management Committee also reported its performance to the Board on a quarterly basis before further presenting a performance summary to shareholders in the annual report.

DIRECTORS' MEETINGS

In 2019, meetings of the Board of Directors, Independent Directors, Non-Executive Directors and Sub-Committee Directors, including Directors' attendance are illustrated in the table below. These meetings had been scheduled

in advance. Directors who were unable to attend these meetings due to important, urgent matters submitted written notices to the Chairman of the Board of Directors, specifying their reasons. The Chairman informed the meeting of missing Director(s) before starting it.

Name	Meetings in 2019							2019 Annual General Meeting of Shareholders
	Board of Directors	Independent Directors	Non - Executive Directors	Audit Committee	Nomination and Remuneration Committee	Corporate Governance Committee	Risk Management Committee	
	(16 times)	(1 times)	(1 times)	(9 times)	(5 times)	(7 times)	(6 times)	
1. Mr. Piyasvasti Amranand	16/16	1/1	1/1	-	-	-	-	1/1
2. Mr. Prasert Bunsumpun	16/16	1/1	1/1	-	-	-	6/6	1/1
3. Professor Somkit Lertpaithoon	16/16	1/1	1/1	-	-	7/7	-	1/1
4. Mr. Don Wasantapruek	16/16	1/1	1/1	-	5/5	-	-	1/1
5. Mr. Pakorn Nilrapunt	16/16	1/1	1/1	9/9	-	-	-	1/1
6. Mr. Prapas Kong-ied	2/2	1/1	-	2/2	-	-	-	-
7. Mr. Wittawat Svasti-xuto	14/16	-	0/1	-	5/5	-	-	1/1
8. Major General Nithi Chungcharoen	15/16	1/1	1/1	-	1/1	5/7	-	1/1
9. Mrs. Watanan Petersik	12/16	1/1	1/1	-	-	7/7	-	1/1
10. Mr. Disathat Panyarachun	16/16	-	1/1	-	-	7/7	-	1/1
11. Mrs. Premrutai Vinaiphat	14/14	-	1/1	-	-	-	5/5	1/1
12. Mrs. Arawadee Photisaro	16/16	-	0/1	-	-	-	6/6	1/1
13. Mr. Supattanapong Punmeechaow	16/16	-	-	-	-	-	5/6	1/1
14. Mr. Kongkrapan Intarajang	3/3	-	-	-	-	-	1/1	-

DIRECTORS WHO RETIRED BY ROTATION IN 2019

1. Mr. Anon Sirisaengtaksin	3/3	-	-	-	-	-	1/1	1/1
-----------------------------	-----	---	---	---	---	---	-----	-----

DIRECTORS WHO RESIGNED IN 2019

1. Mr. Praphon Wongtharua	1/1	-	-	-	-	-	1/1	-
2. General Chatchalerm Chalermsook	1/1	-	-	-	-	-	-	-
3. Mr. Amnuay Preemonwong	12/14	-	1/1	7/7	3/4	-	-	1/1
4. Mr. Prasan Chuaphanich	14/14	-	1/1	8/8	-	-	-	1/1

GC EXECUTIVES

To ensure efficient organizational management and operations that adhere to the policies and directions established by the Board of Directors, the Chief Executive Officer (CEO), exercising the power vested in him by GC's Articles of Association, formed the Management Committee (MC) and the Group Management Committee (GMC). Both committees are composed of top management from Senior Vice President upwards, under the CEO's direct supervision. The CEO, as head of the Company's employees, commands the authority and duties to ensure that the Company operates according to the policies, plans and budgets approved by the Board.

The MC is responsible for devising and aligning operational directions and guidelines with the Board's established policies. It analyzes and offers suggestions on the Company's policies and operational guidelines in relation to marketing, commercial and supply, risk management, capital allocation and management, human resources management and development, quality, safety, occupational health and environmental management, and social responsibility as well as matters that may cause significant changes to its Business Units and Group Performance Centers. The MC also analyzes and offers suggestions on Board meeting agenda prior to presenting them to the Board at the meeting. In extension, the MC also oversees the Company's compliance with the law and regulations

of external regulatory authorities, as well as its own rules and regulations and the Company's related legal actions to ensure that the conduct of GC's business is in compliance with good corporate governance principles, and in conformity to international standards. The MC oversees implementation under the Board's resolutions, suggestions and opinions given at Board meetings. It also oversees diverse aspects of GC's progress as a whole and internationally.

Meanwhile, the GMC is tasked with analyzing and offering recommendations and suggestions on the alignment of Company policies with those of its Group Performance Centers in relation to the operational guidelines for Group Performance Centers' production management, marketing, commercial and supply, and risk management, including human resource management and development, quality, safety, occupational health and environmental management, and social responsibility. It also monitors the progress of Group Performance Centers on innovation and technology, as well as projects that contribute to the efficiency of their operations.

The MC holds at least three meetings monthly, while the GMC holds at least one monthly meeting. In 2019, the MC held a total of 34 meetings, and GMC held a total of 12 meetings. The Senior Vice President of Corporate Secretary and Legal serves as Secretary to both committees.



EXECUTIVES UNDER THE ORGANIZATIONAL STRUCTURE AS OF DECEMBER 31, 2019

Name	Position
1. Mr. Kongkrapan Intarajang	Chief Executive Officer
2. Mr. Patiparn Sukorndhaman	President
3. Mr. Varit Namwong	Chief Operating Officer - Center of Excellence
4. Mr. Boonchai Chunhawiksit	Acting Senior Executive Vice President - Upstream Petrochemical Business
5. Mr. Wiboon Chuchepchankamon	Acting Senior Executive Vice President - Downstream Petrochemical Business Acting Senior Vice President - Green Chemicals Business Unit
6. Mr. Athavuth Vikitsreth	Executive Vice President - External Affairs
7. Miss Duangkamol Settanung	Executive Vice President - Finance and Accounting
8. Mrs. Warawan Tippawanich	Executive Vice President - Corporate Strategy
9. Mr. Saroj Putthammawong	Executive Vice President - Marketing, Commercial and Supply
10. Mr. Narongsak Jivakanun	Executive Vice President - International Business Operations
11. Mr. Pornsak Mongkoltrirat	Acting Executive Vice President - Polymers Business Unit
12. Mr. Pirun Krimwongrut	Acting Executive Vice President - Organizational Effectiveness
13. Mr. Pukpong Wungrattanasopon	Acting Executive Vice President - Group Performance Center - Olefins
14. Mr. Kumpol Chaikitkosi	Senior Vice President - EO-Based Performance Business Unit
15. Mr. Wirat Boonbumrungchai	Senior Vice President - Quality, Safety, Occupational Health and Environment
16. Mr. Supasit Tongsupachok	Senior Vice President - Group Performance Center - Utilities
17. Mr. Khomson Piyawattanaviroj	Senior Vice President - CAPEX Excellence
18. Mrs. Wilawan Songjaroen	Senior Vice President - Procurement
19. Mr. Amorn Putiphrawan	Senior Vice President - Internal Audit
20. Mrs. Jeeranee Pimthanothai	Senior Vice President - Technical, Engineering and Maintenance
21. Mr. Paisarn Sarapee	Senior Vice President - Phenol Business Unit
22. Mr. Anutin Chuaypen	Senior Vice President - Group Performance Center - Aromatics
23. Mrs. Chatsuda Kanjanarat	Senior Vice President - Transformation Excellence
24. Mr. Ratchada Sawasdirak	Senior Vice President - Group Performance Center - Refinery and Shared Facilities
25. Mr. Thitipong Jurapornsiridee	Senior Vice President - Corporate Finance and Strategy
26. Mr. Chaya Chandavasu	Senior Vice President - Sustainability and Corporate Branding
27. Mrs. Chananchida Wiboonkanarak	Senior Vice President - Downstream Strategy and Business Development
28. Mr. Kevin Thomas Corby	Senior Vice President - Science and Innovation
29. Mrs. Pilasphan Udomjarumane	Senior Vice President - Corporate Secretary and Legal

Remarks:

Executives number 1-5 and 7 are executives under SEC's definition under the new Organization Structure, effective October 1, 2019.

CHANGES IN EXECUTIVES FROM JANUARY 1 TO DECEMBER 31, 2019

1. Mr. Thitipong Jurapornsiridee was appointed Senior Vice President - Corporate Finance and Strategy on June 1, 2019.
2. Mrs. Wilawan Songjaroen was transferred Senior Vice President - Procurement on September 1, 2019.
3. Mr. Supattanapong Punmeechaow reassumed his position at PTT Public Company Limited on September 30, 2019.
4. Mr. Kongkrapan Intarajang was appointed CEO on October 1, 2019.
5. Mr. Patiparn Sukorndhaman was appointed President on October 1, 2019.
6. Mr. Boonchai Chunhawiksit was appointed Acting Senior Executive Vice President - Upstream Petrochemical Business on October 1, 2019.
7. Mr. Wiboon Chuchepchankamon was appointed Acting Senior Executive Vice President - Downstream Petrochemical Business and Acting Senior Vice President - Green Chemicals Business Unit, both on October 1, 2019.
8. Mr. Pukpong Wungrattanasopon was appointed Acting Executive Vice President - Group Performance Center - Olefins on October 1, 2019.
9. Mr. Anutin Chuaypen was transferred Senior Vice President - Group Performance Center - Aromatics on October 1, 2019.
10. Mr. Ratchada Sawasdirak was appointed Senior Vice President - Group Performance Center - Refinery and Shared Facilities on October 1, 2019.
11. Mr. Supasit Tongsupachok was appointed Senior Vice President - Group Performance Center - Utilities on October 1, 2019.
12. Mr. Pornsak Mongkoltrirat was appointed Acting Executive Vice President - Polymers Business Unit on October 1, 2019.
13. Mr. Kumpol Chaikitkosi was transferred Senior Vice President - EO-Based Performance Business Unit and was seconded to GC Glycol Company Limited on October 1, 2019.
14. Mr. Paisarn Sarapee was appointed Senior Vice President - Phenol Business Unit and was seconded to PTT Phenol Company Limited on October 1, 2019.
15. Mr. Narongsak Jivakanun was transferred Executive Vice President - International Business Operations and was assigned to PTTGC America Corporation in the USA on October 1, 2019.
16. Mr. Toasaporn Boonyapipat was transferred Executive Vice President under the Chief Executive Officer and was seconded to PTTGC America LLC in the USA on October 1, 2019.
17. Mr. Saroj Putthammawong was appointed Executive Vice President - Marketing, Commercial and Supply on October 1, 2019.
18. Mr. Pirun Krimwongrut was appointed Acting Executive Vice President - Organizational Effectiveness on October 1, 2019.
19. Mrs. Warawan Tippawanich was appointed Executive Vice President - Corporate Strategy on October 1, 2019.
20. Mr. Chaya Chandavasv was transferred Senior Vice President - Sustainability and Corporate Branding on October 1, 2019.
21. Mrs. Pilasphan Udomjarumanee was appointed Senior Vice President - Corporate Secretary and Legal on October 1, 2019.
22. Mr. Kevin Thomas Corby was appointed Senior Vice President - Center of Excellence since September 16, 2019, was transferred Senior Vice President - Science and Innovation on October 1, 2019.
23. Mr. Siridech Kumvongdee was transferred Executive Vice President under Downstream Petrochemical Business (SEVP-D) and was seconded to HMC Polymers Company Limited on December 13, 2019.
24. Mr. Athavuth Vikitsreth retired on December 31, 2019.

COMPANY SECRETARY

Under the Securities and Exchange Act (No. 4) B.E. 2551 (2008), Sections 89/15 and 89/16, the Board of Directors at Meeting No. 10/2562 held on August 19, 2019 appointed Mrs. Pilasphan Udomjarumanee, Senior Vice President - Corporate Secretary and Legal, as Company Secretary replaced Mrs. Warawan Tippawanich. By law, the responsibilities of Company Secretary include the preparation and safekeeping of important company documents, including the register of directors, meeting notices, Board and shareholders' meeting minutes, annual report and conflicts of interest form filled by Directors and Executives. The Company Secretary is in charge of organizing Board and shareholders' meetings and submitting copies of reports on Directors and Executives interests to the Chairman of the Board of Directors and the Chairman of the Audit Committee. The Company Secretary also advises the Board and Executives on the rules and regulations they should familiarize themselves with, organizes training and orientation for current and new Directors, as well as providing them with information central to their performance as Directors. Moreover, the Company Secretary oversees compliance with laws, regulations and resolutions passed in Board and shareholders' meetings, as well as collaborates with relevant agencies on compliance. The Company Secretary has undergone training courses necessary for her to duly perform her roles.

REMUNERATIONS FOR THE BOARD OF DIRECTORS AND EXECUTIVES

REMUNERATIONS OF THE BOARD OF DIRECTORS

The Board of Directors has set up a fair and reasonable remuneration policy for its Directors in accordance with good corporate governance principles. The Nomination and Remuneration Committee determines suitable remuneration for Directors based on the Company's

financial standing and the practices of other SET listed companies in the same industry and of similar sizes, as well as each Director's responsibilities. Directors appointed to Sub-Committees are entitled to additional remuneration due to their additional responsibilities.

Directors' remuneration must be approved by the shareholders. At the 2019 Annual General Meeting of Shareholders, held on April 5, 2019, shareholders passed a resolution approving the 2019 remuneration of Directors and Directors to Sub-Committees and their bonus for the year 2018 as follows:

REMUNERATION FOR THE BOARD OF DIRECTORS AND SUB-COMMITTEES

Type of Remuneration	Remuneration Rate
1. Board of Directors	<p>Monthly Remuneration</p> <ul style="list-style-type: none"> Chairman Baht 62,500/Month Director Baht 50,000/Month/Director <p>Remuneration for Meeting Attendance</p> <ul style="list-style-type: none"> Chairman Baht 50,000/Meeting Director Baht 40,000/Meeting/Director
2. Sub-Committees	<p>Remuneration for Meeting Attendance</p> <ul style="list-style-type: none"> Chairman Baht 56,250/Meeting Director Baht 45,000/Meeting/Director
<ul style="list-style-type: none"> Audit Committee Nomination & Remuneration Committee Corporate Governance Committee Risk Management Committee 	
3. Others	No other remuneration

DIRECTORS' BONUS FOR 2018 PERFORMANCE

Effective from the date of the 2019 Annual General Meeting of Shareholders, unless the shareholders' meeting passes a new resolution, the Board of Directors as a group is to be awarded a bonus for the year when a dividend payment is made to the shareholders. The total sum of this bonus

equals 0.30% of the year's net profit and up to Baht 60 million. Each Director's bonus is calculated based on the time served in a corresponding year, and the Chairman's bonus is to be 25% higher than those of other Directors. In 2019, the Board of Directors collectively received a bonus of Baht 60 million.

DIRECTOR'S REMUNERATIONS IN 2019

Name	Monthly Remuneration for PTTGC Directors (Baht)	Remuneration for Meeting Attendance (Baht)	Remuneration for Sub-Committees Meeting Attendance (Baht)				2018 Bonus paid in 2019 (Baht)*	Total (Baht)
			Audit Committee	Nomination and Remuneration Committee	Corporate Governance Committee	Risk Management Committee		
1. Mr. Piyasvasti Amranand	742,166.67	810,000.00	-	-	-	-	3,572,951.15	5,125,117.82
2. Mr. Prasert Bunsumpun	600,000.00	640,000.00	-	-	-	331,250.00	4,299,514.71	5,870,764.71
3. Professor Somkit Lertpaithoon	600,000.00	640,000.00	-	-	437,500.00	-	2,906,254.25	4,583,754.25
4. Mr. Don Wasantapruek	600,000.00	640,000.00	-	271,250.00	-	-	3,972,969.30	5,484,219.30
5. Mr. Pakorn Nilrapunt	600,000.00	640,000.00	425,000.00	-	-	-	2,906,254.25	4,571,254.25
6. Mr. Prapas Kong-ied	100,000.00	80,000.00	45,000.00	-	-	-	-	225,000.00
7. Mr. Wittawat Svasti-xuto	600,000.00	570,000.00	-	260,000.00	-	-	3,439,611.77	4,869,611.77
8. Major General Nithi Chungcharoen	600,000.00	600,000.00	-	45,000.00	260,000.00	-	3,972,969.30	5,477,969.30
9. Mrs. Watanan Petersik	600,000.00	490,000.00	-	-	350,000.00	-	3,972,969.30	5,412,969.30
10. Mr. Disathat Panyarachun	600,000.00	640,000.00	-	-	350,000.00	-	772,824.16	2,362,824.16
11. Mrs. Premrutai Vinaiphat	519,642.86	550,000.00	-	-	-	225,000.00	-	1,294,642.86
12. Mrs. Arawadee Photisaro	600,000.00	640,000.00	-	-	-	265,000.00	772,824.16	2,277,824.16
13. Mr. Supattanapong Punmeechaow	600,000.00	640,000.00	-	-	-	220,000.00	3,972,969.30	5,432,969.30
14. Mr. Kongkrapan Intarajang**	150,000.00	120,000.00	-	-	-	45,000.00	-	315,000.00

Directors who resigned and retired by rotation in 2018-2019 and earned remuneration in 2019

1. Mr. Praphon Wongtharua***	58,928.57	60,000.00	-	-	-	40,000.00	3,972,969.30	4,131,897.87
2. General Chatchalerm Chalermsook***	43,010.75	40,000.00	-	-	-	-	-	83,010.75
3. Mr. Amnuay Preemonwong***	500,000.00	480,000.00	380,000.00	212,500.00	-	-	3,972,969.30	5,545,469.30
4. Mr. Prasan Chuaphanich***	528,333.33	560,000.00	531,250.00	-	-	-	3,972,969.30	5,592,552.63
5. Mr. Anon Sirisaengtaksin****	158,333.33	120,000.00	-	-	-	40,000.00	3,972,969.30	4,291,302.63
6. Mr. Sarun Rungkasiri*****	-	-	-	-	-	-	348,315.12	348,315.12
7. Mr. Auttapol Rerkpiboon *****	-	-	-	-	-	-	2,982,448.18	2,982,448.18
8. Mrs. Boobpha Amornkiatkajorn*****	-	-	-	-	-	-	2,982,448.18	2,982,448.18
9. Mr. Vasin Teeravechyan*****	-	-	-	-	-	-	1,077,599.89	1,077,599.89
10. Professor Surapon Nitikraipot*****	-	-	-	-	-	-	1,077,599.89	1,077,599.89
11. Mr. Somchai Kuvijitsuan*****	-	-	-	-	-	-	1,077,599.89	1,077,599.89
Grand Total	8,800,415.51	8,960,000.00	1,381,250.00	788,750.00	1,397,500.00	1,166,250.00	60,000,000.00	82,494,165.51

Remarks:

The Company provides a corporate vehicle for the Chairman throughout his term for corporate-related activities only.

* Bonus for 2018 performance paid in 2019 for time served in 2018 within a budget of Baht 60 million.

** Remuneration for directorship only; executive remuneration was not included.

*** Four Directors who resigned as Directors in 2019 were Mr. Praphon Wongtharua (effective February 6, 2019), General Chatchalerm Chalermsook (effective May 7, 2019), Mr. Amnuay Preemonwong (effective November 1, 2019), and Mr. Prasan Chuaphanich (effective November 18, 2019).

**** One Director who retired by rotation in 2019 was Mr. Anon Sirisaengtaksin. His term ended on April 5, 2019.

***** The three Directors who resigned in 2018 were Mr. Sarun Rungkasiri (effective February 1, 2018), Mr. Auttapol Rerkpiboon and Mrs. Boobpha Amornkiatkajorn (effective October 1, 2018).

***** The three Directors who retired by rotation in 2018 were Mr. Vasin Teeravechyan, Professor Surapon Nitikraipot and Mr. Somchai Kuvijitsuan. Their terms ended on April 9, 2018.

REMUNERATION OF THOSE RECEIVING FROM BEING AN INDEPENDENT DIRECTOR OF A PARENT COMPANY

GC's Independent Director who is an independent director of PTT Public Company Limited, the parent company, received the remuneration as follows:

No.	Name - Surname	PTT Public Company Limited (PTT)				
		Position	Remuneration for the Year 2019	Sub-Committee Meeting Allowance (Baht)	2018 Bonus Paid in 2019 (Baht)	Total (Baht)
		Chairman/ Director	Meeting Allowance (Including Monthly Allowance) (Baht)			
1	Mr. Don Wasantapruerk	Independent Director/ Chairman of the Nomination Committee	1,230,000	292,500	3,191,853.98	4,714,353.98

DIRECTORS' REMUNERATION FOR DIRECTORSHIPS AT MAJOR SUBSIDIARIES

The Company's Directors hold directorships at subsidiaries to ensure that their businesses are operated in compliance with GC Group's policies.

Name	Position	Total Remuneration
PTTGC International Private Limited (Wholly 100% Owned Subsidiary)		
Mr. Kongkrapan Intarajang	Director	12,000 SGD
Global Green Chemicals Public Company Limited (72.29% Shareholding)		
Mr. Supattanapong Punmeechaow	Chairman	450,000 Baht

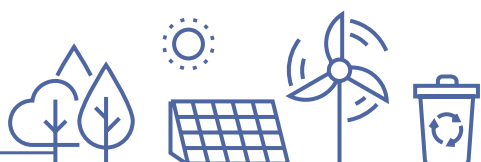


**SHARES HELD BY THE BOARD OF DIRECTORS, THEIR SPOUSES & THEIR MINORS
AS OF DECEMBER 31, 2019**

Name	Number of Shares		
	As of January 1, 2019	As of December 31, 2019	Increase / (Decrease) of Shares during the Year (Shares)
1. Mr. Piyasvasti Amranand	-None-	-None-	-No Change-
2. Mr. Prasert Bunsumpun	-None-	-None-	-No Change-
Spouse	271,142	271,142	-No Change-
3. Mr. Prasan Chuaphanich*	-None-	N/A	-No Change-
4. Professor Somkit Lertpaithoon	-None-	-None-	-No Change-
5. Mr. Don Wasantapruek	-None-	-None-	-No Change-
6. Mr. Pakorn Nilrapunt	-None-	-None-	-No Change-
7. Mr. Prapas Kong-ied	N/A	-None-	-
8. Mr. Wittawat Svasti-xuto	3,415	3,415	-No Change-
9. Major General Nithi Chungcharoen	-None-	-None-	-No Change-
10. Mrs. Watanan Petersik	-None-	-None-	-No Change-
11. Mr. Disathat Panyarachun	-None-	-None-	-No Change-
Spouse	80	80	-No Change-
12. Mrs. Premrutai Vinaiphath	N/A	-None-	-
13. Mrs. Arawadee Photisaro	153	153	-No Change-
14. Mr. Supattanapong Punmeechaow	60,000	100,000	40,000
15. Mr. Kongkrapan Intarajang	-None- Appointed Director on October 1, 2019	-None-	-No Change-

Remarks:

* (1) Mr. Prasan Chuaphanich resigned from his position as Director, effective November 18, 2019.



SHARES HELD BY EXECUTIVES UNDER SEC'S DEFINITION, THEIR SPOUSES & THEIR MINORS

Name	Number of Shares		
	As of January 1, 2019	As of December 31, 2019	Increase / (Decrease) of Shares during the Year (Shares)
1. Mr. Kongkrapan Intarajang	-None-	-None-	-No Change-
2. Mr. Patiparn Sukorndhaman	-None-	-None-	-No Change-
3. Mr. Varit Namwong	108,939	108,939	-No Change-
4. Mr. Boonchai Chunhawiksit	N/A	40,000	-
5. Mr. Wiboon Chuchepchunakamon	N/A	-None-	-
Spouse	N/A	198	-
6. Miss Duangkamol Settanung	-None-	-None-	-No Change-
7. Mr. Siridech Kumvongdee	91	91	-No Change-
Spouse	11,515	11,515	-No Change-
8. Mr. Narongsak Jivakanun	-None-	-None-	-No Change-
9. Mr. Toasaporn Boonyapipat	-None-	-None-	-No Change-
10. Mr. Athavuth Vikitsreth	-None-	-None-	-No Change-

Remarks:

- There has been a change of GC's organization structure, which could be divided into two periods. The first is from January-September 2019, and the second is from October-December 2019.
- Executives under SEC's definition number 1-3 and 6-10 are executives under the former Organization Structure, from January-September 2019.
- Executives under SEC's definition number 1-6 are executives under the new Organization Structure, from October-December 2019.

REMUNERATION OF THE EXECUTIVES

The Company evaluates the performance of its Executives annually against the pre-determined Key Performance Indicators (KPIs). These include financial performance, implementation of long-term strategic goals, personal performance, the Company's performance and practices of other listed companies in the same industry and of similar sizes. The evaluation also takes into account their responsibilities, management development and overall economic conditions.

The remuneration for the Chief Executive Officer is appropriately determined using transparent, fair and reasonable criteria. The position's duties and responsibilities are also taken into account in conjunction with personal performance. The Nomination and Remuneration Committee is charged with reviewing and proposing the remuneration of the Chief Executive Officer to the Board of Directors for approval. It should be noted that, at the highest level of the Company's management hierarchy, the Chief Executive Officer is awarded compensation and other benefits in addition to those received as a Director on the Board of Directors.

TOTAL REMUNERATION OF GC AND GC SUBSIDIARIES PAID TO THE EXECUTIVES UNDER SEC'S DEFINITION* SERVING IN 2019 (INCLUDING THOSE WHO RETIRED AND RESIGNED IN 2019)

Type of Remuneration	Number of Executives	Total (Million Baht)		
		GC	GC Subsidiaries	Total
Total Combined Salaries	10	75	8.73	83.73
Total Combined Special Bonuses	10	37	-	37
Provident Fund Contributions	10	10	-	10
Total				130.73

Remarks:

*The Company's organization structure was divided into two periods. The first is from January-September 2019 and the second is from October-December 2019.

EMPLOYEES

As of December 31, 2019, the Company hired a total of 6,925 employees, including those employed by its subsidiaries, according to business structure, which can be divided into the following functions:

1. Direct reports to the Chief Executive Officer and President	6 Employees
2. Internal Audit	28 Employees
3. International Business Operations and subsidiaries	672 Employees
4. Corporate Strategy	54 Employees
5. Finance and Accounting and subsidiaries	203 Employees
6. Organizational Effectiveness	259 Employees
7. Corporate Secretary and Legal	49 Employees
8. Sustainability and Corporate Branding	59 Employees
9. External Affairs	17 Employees
10. Direct reports to Senior Executive Vice President - Upstream Petrochemical Business and subsidiaries	144 Employees
11. Group Performance Center - Aromatics	332 Employees
12. Group Performance Center - Refinery and Shared Facilities and subsidiaries	313 Employees
13. Group Performance Center - Olefins	698 Employees
14. Group Performance Center - Utilities	258 Employees
15. Direct reports to Senior Executive Vice President - Downstream Petrochemical Business	126 Employees
16. Polymers Business Unit and subsidiaries	866 Employees
17. EO-Based Performance Business Unit and subsidiaries	167 Employees
18. Phenol Business Unit and subsidiaries	233 Employees
19. Green Chemicals Business Unit and subsidiaries	224 Employees
20. Downstream Strategy and Business Development and subsidiaries	182 Employees
21. Marketing, Commercial and Supply	102 Employees
22. Direct reports to Chief Operating Officer - Center of Excellence and subsidiaries	911 Employees
23. Technical, Engineering and Maintenance	479 Employees
24. CAPEX Excellence	183 Employees
25. Quality, Safety, Occupational Health and Environment	173 Employees
26. Transformation Excellence	37 Employees
27. Procurement	98 Employees
28. Science and Innovation	52 Employees

TOTAL REMUNERATION PAID TO EMPLOYEES IN 2019

Type of Remuneration	Total (Million Baht)
Salaries, Bonus, Wages and Other Welfares	14,714
Provident Fund Contributions	630
Long-Term Employee Benefits	1,418
Other Long-Term Employee Benefits	84

**LIST OF THE BOARD OF DIRECTORS IN SUBSIDIARIES/JOINT VENTURES/AFFILIATES
(AS OF JANUARY 1, 2020)**

No.	Name - Surname	GC	Subsidiaries					Joint Ventures		Affiliates		
			GGC	GC Inter	PTTGC America Corporation	PTTGC America LLC	PTTGC USA	GPSC	PTTES	PTT	PTTT LDN	PTTT
1.	Mr. Piyasvasti Amranand	▲										
2.	Mr. Prasert Bunsumpun	■										
3.	Mr. Prasan Chuaphanich*	■										
4.	Mr. Prapas Kong-ied	■										
5.	Professor Somkit Lertpaithoon	■										
6.	Mr. Pakorn Nilrapunt	■										
7.	Mrs. Watanan Petersik	■										
8.	Mr. Don Wasantapruek	■								■		
9.	Major General Nithi Chungcharoen	■										
10.	Mrs. Premrutai Vinaiphat	■										
11.	Mr. Wittawat Svasti-xuto	■						■	▲	●		
12.	Mrs. Arawadee Photisaro	■								●		
13.	Mr. Disathat Panyarachun	■								●	▲	■
14.	Mr. Supattanapong Punmeechaow	■	▲							■		
15.	Mr. Kongkrapan Intarajang	■ ●		■	▲	▲	■	■		●		

* Mr. Prasan Chuaphanich resigned from his position as director from November 18, 2019.

Remarks: ▲ = Chairman
■ = Director
● = Executive

Subsidiaries

GGC = Global Green Chemicals Public Company Limited
GC Inter = PTTGC International Private Limited
PTTGC America Corporation = PTTGC America Corporation
PTTGC America LLC = PTTGC America LLC
PTTGC USA = PTTGC International (USA) Inc.

Joint Ventures/Affiliates

PTT = PTT Public Company Limited
GPSC = Global Power Synergy Public Company Limited
PTTT LDN = PTT International Trading London Ltd
PTTT = PTT International Trading Pte Ltd
PTTES = PTT Energy Solutions Company Limited

LIST OF GC'S EXECUTIVES IN SUBSIDIARIES/JOINT VENTURES/AFFILIATES (AS OF DECEMBER 31, 2019)

No.	Name - Surname	GC	Subsidiaries															Joint Ventures/Affiliates																						
			GCO	Glycol	PPCL	Solution Creation	GCM	GCP	GGC	GC-M PTA	TRPC	Vencorex	GCEC	GCMC	GCTC	NPC S&E	TTT	GCI	GC Inter	GCV	GCVA	PTTGC America Corporation	PTTGC America LLC	PTTGC (Netherlands)	PTTGC USA	PTT	EOM	ESC	HMC	NatureWorks	PTTAC	RGL	GPSC	KGC	VNT					
1.	Mr. Kongkrapan Intarajang	■					■											■				■			●												■			
2.	Mr. Patiparn Sukornthaman	●			▲	▲	■	▲	▲																●				▲		■									
3.	Mr. Varit Namwong	●				■								▲								■			●				■											
4.	Mr. Boonchai Chunhawiksit	●		■								▲		■				■	●										■								■			
5.	Mr. Wiboon Chuhepchunkamon	●	▲	▲	■	■	■	■										■				■			●				■				▲			■		■		
6.	Miss Duangkamol Settanung	●					■								▲				■				■		●				■									■	■	
7.	Mr. Siridech Kumvongdee	●																											●											
8.	Mr. Narongsak Jivakanun	●														■		■	●	▲		■	■	■				■												
9.	Mr. Toasaporn Boonyapipat	●														■						■						■										■		
10.	Mr. Athavuth Vikitsreth	●																																						

Remarks: ▲ = Chairman
■ = Director
● = Executive

Subsidiaries
GCO = GC Oxirane Company Limited
Glycol = GC Glycol Company Limited
PPCL = PTT Phenol Company Limited
Solution Creation = Solution Creation Company Limited
GCM = GC Marketing Solutions Company Limited
GCP = GC Polyols Company Limited
GGC = Global Green Chemicals Public Company Limited
GC-M PTA = GC-M PTA Company Limited
TRPC = Thai PET Resin Company Limited
Vencorex = Vencorex Holding
GCEC = GC Estate Company Limited
GCMC = GC Maintenance and Engineering Company Limited
*Jointly controlled entities

Joint Ventures
EOM* = GC Treasury Center Company Limited
ESC* = NPC Safety and Environmental Service Company Limited
HMC* = Thai Tank Terminal Limited
NatureWorks* = PTTGC Innovation America Corporation
PTTAC* = PTTCG International Private Limited
RGL* = PTTCG International Company Limited
GPSC = GC Ventures Company Limited
KGC = GC Ventures America Corporation
VNT = PTTCG America Corporation = PTTCG America LLC
PTTGC America LLC = PTTCG America LLC
PTTGC (Netherlands) = PTTCG International (Netherlands) B.V.
PTTGC USA = PTTCG International (USA) Inc.

GCOTC
NPC S&E
TTT
GCI
GC Inter
GCV
PTTCG America Corporation = PTTCG America LLC
PTTCG (Netherlands) = PTTCG International (Netherlands) B.V.
PTTCG USA = PTTCG International (USA) Inc.

GCOTC = Emery Oleochemicals (M) Sdn. Bhd.
ESC* = Emery Specialty Chemicals Sdn. Bhd.
HMC* = HMC Polymers Company Limited
NatureWorks* = PTT Asahi Chemical Company Limited
RGL* = Revolve Group Limited
GPSC = Global Power Synergy Public Company Limited
KGC = Kuraray GC Advanced Materials Company Limited
VNT = Vinythai Public Company Limited
Affiliates
PTT = PTT Public Company Limited

**LIST OF DIRECTORS IN SUBSIDIARIES WHOLLY 100% OWNED BY THE COMPANY
(AS OF JANUARY 31, 2020)**

1. GC Glycol Company Limited		
List of Directors		Position
1.	Mr. Wiboon Chuchepchunkamon	Chairman
2.	Mr. Boonchai Chunhawiksit	Director
3.	Mr. Saroj Putthammawong	Director
4.	Mrs. Chananchida Wiboonkanarak	Director
5.	Mr. Kumpol Chaikitkosi	Director/ Managing Director

2. PTT Phenol Company Limited		
List of Directors		Position
1.	Mr. Bowon Vongsinudom	Chairman
2.	Mr. Wiboon Chuchepchunkamon	Director
3.	Miss Duangkamol Settanung	Director
4.	Mr. Pukpong Wungrattanasopon	Director
5.	Mrs. Chananchida Wiboonkanarak	Director
6.	Mr. Pramin Phantawesak	Director
7.	Mr. Paisarn Sarapee	Director/ Managing Director

3. GC Styrenics Company Limited		
List of Directors		Position
1.	Mr. Pornsak Mongkoltrirat	Chairman
2.	Mr. Pirun Krimwongrut	Director
3.	Mr. Kumpol Chaikitkosi	Director
4.	Mr. Anutin Chuaypen	Director
5.	Mr. Anupong Phitukpong	Director/ Managing Director

4. Solution Creation Company Limited		
List of Directors		Position
1.	Mr. Patiparn Sukorndhaman	Chairman
2.	Mr. Wiboon Chuchepchunkamon	Director
3.	Mrs. Warawan Tippawanich	Director
4.	Mrs. Chananchida Wiboonkanarak	Director
5.	Mr. Weerayuth Lorsathian	Director/ Managing Director

5. NPC Safety and Environmental Service Company Limited		
List of Directors		Position
1.	Mr. Varit Namwong	Chairman
2.	Mr. Wirat Boonbumrungchai	Director
3.	Mr. Khomson Piyawattanaviroj	Director
4.	Mr. Anutin Chuaypen	Director
5.	Mr. Kridsada Prasertsuko	Director/ Managing Director

6. PTTGC International Private Limited		
List of Directors		Position
1.	Mr. Anon Sirisaengtaksin	Chairman
2.	Mr. Kongkrapan Intarajang	Director
3.	Miss Duangkamol Settanung	Director
4.	Mr. Narongsak Jivakanun	Director/ Managing Director

7. PTTGC America Corporation		
List of Directors		Position
1.	Mr. Kongkrapan Intarajang	Chairman
2.	Mr. Varit Namwong	Director
3.	Miss Duangkamol Settanung	Director
4.	Mrs. Warawan Tippawanich	Director
5.	Mr. Toasaporn Boonyapipat	Director
6.	Mr. Narongsak Jivakanun	Director/ Managing Director

8. GC Marketing Solutions Company Limited

List of Directors	Position
1. Mr. Patiparn Sukorndhaman	Chairman
2. Mr. Varit Namwong	Director
3. Mr. Wiboon Chuchepchunkamon	Director
4. Mr. Pornsak Mongkoltrirat	Director
5. Mr. Saroj Putthammawong	Director
6. Mr. Thitipol Artsanchorn	Director/ President

9. GC Logistics Solutions Company Limited

List of Directors	Position
1. Mr. Pornsak Mongkoltrirat	Chairman
2. Mrs. Wilawan Songjaroen	Director
3. Mr. Thitipol Artsanchorn	Director
4. Mr. Supasit Tongsupachok	Director
5. Mr. Amnuai Phrom-Anant	Director/ Managing Director

10. GC Maintenance and Engineering Company Limited

List of Directors	Position
1. Mr. Varit Namwong	Chairman
2. Mr. Boonchai Chunhawiksit	Director
3. Mr. Pornsak Mongkoltrirat	Director
4. Mrs. Jeeranee Pimthanothai	Director
5. Mr. Piroj Samutthanant	Director/ Managing Director

11. GC Oxirane Company Limited

List of Directors	Position
1. Mr. Wiboon Chuchepchunkamon	Chairman
2. Mr. Saroj Putthammawong	Director
3. Mr. Thitipong Jurapornsiridee	Director
4. Mr. Kumpol Chaikitkosi	Director
5. Mr. Somnuk Suwanpradit	Director/ Managing Director

12. GC Treasury Center Company Limited

List of Directors	Position
1. Miss Duangkamol Settanung	Chairman
2. Mr. Saroj Putthammawong	Director
3. Mr. Chusak Wittayakajohnsad	Director
4. Mrs. Natchalee Phadungsith	Director/ Managing Director

13. GC Estate Company Limited

List of Directors	Position
1. Mr. Boonchai Chunhawiksit	Chairman
2. Mr. Pirun Krimwongrut	Director
3. Mr. Supasit Tongsupachok	Director
4. Mrs. Rattana Nakasiri	Director
5. Mrs. Wacharee Hanwongpaiboon	Director/ Managing Director

14. GC Ventures Company Limited

List of Directors	Position
1. Mr. Narongsak Jivakanun	Chairman
2. Mr. Chaya Chandavas	Director
3. Mrs. Warawan Tippawan	Director
4. Mr. Kevin Thomas Corby	Director

LIVE A
CIRCULAR
LIFESTYLE



**GOOD
CORPORATE
GOVERNANCE**

GOOD CORPORATE GOVERNANCE

CORPORATE GOVERNANCE POLICY

GC, under the supervision of the Board of Directors, is committed to maintaining its corporate governance standard in conformity with international standards since its establishment in 2011. To this end, Corporate Governance Policy has been established as part of the Business Operations Policy. The Corporate Governance Committee has been assigned to oversee matters and ensure that GC's corporate governance practices meet international standards and align with the Company's business strategies and directions as well as any other requirements, laws and guidelines. Additionally, the Corporate Governance Committee annually monitors and assesses the effectiveness of the Company's adherence to good corporate governance principles at each Sub-Committee meetings. Its assessment results are regularly reported to the Board of Directors and later disclosed to the shareholders in the annual report.

CORPORATE GOVERNANCE AND BUSINESS CODE OF CONDUCT

The Board of Directors approved the implementation of 'Corporate Governance and Business Code of Conduct Handbook' comprising of two parts: the first is good corporate governance structure and principles which align with corporate governance policy; and the second is business code of conduct consisting of principles and best practices for ethical business operations, such as observance of laws, rules and regulations, anti-corruption measures, responsibility towards stakeholders, human rights, consumer rights and fair treatment of workers. This handbook had been distributed to directors, executives and all employees. They were later to sign an acknowledgment of the handbook and were bound to uphold good corporate governance policy and the handbook as guidelines when carrying out their duties. In this year, the Board of Directors' Meeting No. 1/2019 held on January 21, 2019 considered approving the 2019 revision of Corporate Governance and Business Code of Conduct Handbook to ensure that its contents are in accordance with national and international standards.

At the same time, the Board of Directors and executives serve as role models to promote a culture of good corporate governance. They indeed provide mechanisms to oversee, monitor, assess and review employees' effective and complete adherence to the Business Code of Conduct. Additionally, the Business Code of Conduct is distributed to joint-ventures companies and business partners and is published at www.pttgcggroup.com on the topic of corporate governance in order that shareholders, investors, regulatory authorities, stakeholders and individuals are able to access the handbook conveniently.

CORPORATE COMPLIANCE

Acknowledging that compliance with laws or even more stringent standards promotes sustainable development, GC places importance on operating its businesses in full compliance with relevant regulatory and legal requirements at home and overseas. In 2019, the Company adopted the ISO 19600 (Compliance Management Systems-Guidelines: 2014 (E)) internal standard as its operational framework in order to ensure the organization culture of integrity and compliance. Its organizational culture is comprised of six stages: (1) Establish; (2) Develop; (3) Implement; (4) Evaluate; (5) Maintain; and (6) Improve. At the operational level, the first line of defense has prepared and disseminated information on the corporate compliance comprising of three processes, namely (1) Assessment - to identify major non-compliance risks; (2) Prevention - to define measures for compliance control and minimize non-compliance risk; and (3) Correction and Improvement - to appropriately manage matters that deviate from the standard and to regularly review and improve compliance control measures.

Furthermore, GC appointed the committee to strengthen the integration of Governance, Risk Management & Internal Control and Compliance through GRC Approach. This will lead to organizational integrated system of policies and practices and information sharing throughout the organization which improve the company's overall efficiency.



DELIVERY CEREMONY OF CORPORATE GOVERNANCE AND BUSINESS CODE OF CONDUCT HANDBOOK, 2019 REVISION, TO THE BOARD OF DIRECTORS AND GROUP MANAGEMENT COMMITTEE

For knowledge dissemination in the organization, GC implemented training program, namely Compliance Mandatory for Managers, in order that executives are able to operate its business with integrity and in accordance with principles of fiduciary duty and to ensure that its business operations are in line with any relevant regulations.

GC also organized training program to provide employees current and necessary information, such as (1) Confidential Information and Data Classification (2) Fraud Risk Management (3) Comply with Compliance and Code of Conduct (4) Complaint Management for Investigation Committee.

For compliance monitoring, GC applies compliance assessment checklist to GC and its subsidiaries, requesting them to identify non-conformance or non-compliance issues in order that GC can create appropriate compliance control measures.

In addition, Management Committee has managed and monitored compliance oversight process throughout the Company as well as reporting the progress to the Board of Directors for their acknowledgement and comments. This can ensure that GC's corporate compliance process is more efficient and in accordance with international standards.

DISSEMINATION OF GOOD CORPORATE GOVERNANCE PRINCIPLES

GC has communicated corporate governance principle, namely C R E A T E, comprising of six elements : Creation of long-term value for the organization; Responsibility of discharging its duties; Equitable treatment of all stakeholders; Accountability for decision along with availability of explanation to support the decision; Transparency in operations which

allows for an audit, including accurate, complete and timely information disclosure via appropriate channels; and Ethics in business conduct, to its employees for their acknowledgement since the first day of work. GC also continuously underlines and instills corporate governance principle into its employees through training programs and other activities. In 2019, to illustrate this, GC created E-Learning program on intranet in order that executives and employees can sign an acknowledgment of 2019 revision of CG handbook and take an assessment test, and organized onsite communication, namely Hook Walk, to communicate corporate governance practices and business code of conduct to its employees of each business unit, including those working in GC's factories. GC further organized an event, called GC Group CG Day 2019: Transparency, Zero Corruption, to raise awareness of executives and employees as well as encouraging them to be part of prevention and fight against any forms of corruption. In addition to above-mentioned activities, GC implemented the board performance assessment, employees' acknowledgment assessment on adherence to good corporate governance principle.



GC GROUP CG DAY 2019 : TRANSPARENCY AND ZERO CORRUPTION

Additionally, GC's corporate governance practices are assessed by regulatory authorities, such as the Securities and Exchange Commission (SEC), Stock Exchange of Thailand (SET), Thai Institute of Directors Association (IOD) and Thai Investors Association (TIA) in order to ensure the Company's adherence to Corporate Governance Code as well as maintaining its corporate practices to be in line with international standards. Furthermore, executives are responsible for communicating "Hook Talk" on topic areas of good corporate governance and compliance principles to its employees through internal meetings of each business unit. Hook Talk is aimed at noticing its employees to behave ethically and strictly perform their duties in accordance with good corporate governance principles, the Company's regulations, laws and any other rules.

COMPLIANCE WITH INTERNATIONAL STANDARDS OF GOOD CORPORATE GOVERNANCE

The Board of Directors has continuously placed importance on adherence to good corporate governance principles of international standards, including ASEAN CG Scorecard and Dow Jones Sustainability Indices (DJSI), and indeed encouraged the company to apply Good Corporate Governance principles, comprising of five core values, to its business operations. In this year, GC has complied with the said principles as per details given below.

1. SHAREHOLDER RIGHTS

Placing much emphasis on the protection of shareholder rights, the Board of Director has included shareholder rights protection principles in the handbook. The Board also oversees the company's business operation to be in compliance with the said principles.

1. THE PROVISION OF IMPORTANT AND PERTINENT INFORMATION TO SHAREHOLDERS

GC afforded shareholders clear, up-to-date information of importance and pertinence to its business operations. To this end, it disclosed information deemed necessary, though not legally required, on its website and via SET's portal.

2. THE 2019 ANNUAL GENERAL MEETING OF SHAREHOLDERS

GC held Annual General Meeting of Shareholders for the year 2019 (AGM) at 14.00 hours on Friday, April 5, 2019, at the Bangkok Convention Center on the 5th floor of Central Plaza Lardprao, 1695 Phahon Yothin Road, Chatuchak Sub-district, Chatuchak District, Bangkok. GC also treated and facilitated

convenience among its attending shareholders as per details given below.

Prior to the Meeting

- Minority shareholders, defined as any single shareholder or a group of shareholders holding at least 0.1% of all shares with eligible voting rights, were allowed to, via SET's portal and the Company's website, propose agenda items and nominate qualified candidates to be elected as Directors, with clear criteria and steps specified, from September 17 to December 31, 2018.
- Nominated candidates and proposed agenda items would be considered under the established criteria. The Nomination and Remuneration Committee would consider whether the proposed candidates possessed desired qualifications. Meanwhile, the Corporate Governance Committee would review and select proposed agenda items and then submit it to the Board of Directors for their final approval. The Board will later inform the shareholders of its decision and reasons to the AGM. For the year 2019, there were no shareholders proposing any agenda items or candidates nominated to be director to the Company.
- According to resolutions of the Board of Directors' meeting held on February 18, 2019, GC instantly notified SET after the meeting to disseminate the news to its shareholders that the 2019 AGM will be held on April 5, 2019, and the record date was set for March 6, 2019, to afford shareholders the rights to attend 2019 AGM and receive dividend payment. This information was also published on GC's website.
- GC published the invitation letter to attend AGM on GC's website in both Thai and English version, on March 1, 2019, more than 30 days prior to the meeting. This invitation letter was comprised of agenda items with the Board's opinions on each agenda as well as the attachments. In addition, GC sent the invitation letter containing barcode for registration form for AGM as well as QR Code for downloading digital version of Annual Report 2018 and Integrated Sustainability Report 2018.
- If a shareholder would like to assign a proxy to attend and vote at the AGM on their behalf or if they would be unable to attend the AGM in person, GC provided them with a proxy statement that allowed them to specify their "for", "against" or "abstain" vote for each agenda item. Independent Directors' names and biographies were also included for their consideration as their proxy. Details of the proxy assignment process and documents required to facilitate the procedure were enclosed with the invitation letter. All of these was available in Thai and English.

- The invitation letter was mailed to its shareholders on March 14, 2019, over 21 days ahead of the meeting. A map of the meeting venue and location and a phone number for inquiries were also included in the invitation letter.

On the Day of the Meeting

- GC held the 2019 Annual General Meeting of Shareholders (AGM) in a large conference hall that could accommodate a sizeable number of shareholders and allocated a specific time slot for shareholders to ask questions and express their opinions to ensure smooth and efficient meeting organization. GC also arranged an exhibition, with presenters, in front of the conference hall to educate attending shareholders regarding the various aspects of our business and performance and provided sufficient food and refreshments for participants.
- GC used barcode scanning in our registration process of AGM for convenience and efficiency. GC also assigned staff to verify shareholders' documents ahead of time. The said registration began more than two hours before the meeting started.
- All 15 Directors attended the 2019 AGM. Top management, auditors, legal advisors, lawyers, shareholders' right protection volunteer and shareholders volunteering to witness the vote counting were also present. In this year, GC received an exemption of Thai investors association's presence to evaluate the quality of the 2019 AGM as GC, being one of 68 listed companies, received AGM assessment score of 100 for the second consecutive year (2017-2018), after its AGM Quality Assessment had been revised in 2017.
- Before the meeting began, shareholders were explicitly informed of the voting and vote-counting procedure for each agenda item. "For", "against" or "abstain" voting ballots for each agenda item were provided to shareholders and proxies.
- At the meeting, the Chairman proceeded with all agenda items in order and afforded all shareholders equal rights to express their opinions. Sub-committee chairpersons, Chief Executive Officer and President, and any relevant top management were assigned to answer shareholders' questions. All expressed questions and opinions were fully recorded in the minutes of the AGM.

GC's 2019 AGM was ranked **"Outstanding"** with a perfect score of 100 for the eight consecutive year.

After the Meeting

- GC disclosed its resolutions of the 2019 AGM through the SET's portal once the meeting was finished. The disclosed resolutions included a complete set of the "for", "against", "abstain" and invalid ballots of each agenda item. The minutes of the AGM were prepared in Thai and English specifying the names of Directors and Executives attending the meeting, as well as other relevant attendees, key explanations, a list of questions and answers and a summary of opinions expressed. The minutes were submitted to SET and any other organizational authorities within 14 days after the meeting. They were also made available on www.pttgcgroup.com for shareholders' inspection.

GC's 2019 AGM was ranked "Outstanding" with a perfect score of 100 for the eight consecutive year (2012 to 2019). It also received 86% for its AGM assessment on Satisfaction of Shareholder and "Outstanding" on CG implementation.

2. EQUITABLE TREATMENT OF SHAREHOLDERS

The Board of Directors ensures equitable treatment of all shareholders, whether majority or minority, Thai or foreign. GC's equitable treatment of shareholders is summarized as follows:



ANNUAL GENERAL MEETING OF SHAREHOLDERS 2019

1. Valuing all shareholders, the Company adhered to the measures put in place to fairly and equitably safeguard the fundamental rights of every shareholder. These measures were aimed at bringing about investors' trust and confidence in the Company and ensuring continuous suitable returns.
2. Minority shareholders were afforded the opportunity to express their opinion, provide suggestions and submit complaints to the Board, Chairman of the Corporate Governance Committee (an Independent Director) and the Company Secretary via the GC website on Corporate Governance or email at cg@pttgcgroup.com. The Corporate Governance Committee would review the complaints submitted and take appropriate action. Institutional investors could request information or express their opinions via email at ir@pttgcgroup.com under the care of Investor Relations.
3. GC fostered good relations with its shareholders through an activity that would benefit society and the environment, namely Company Visit 2019, which took place in Rayong province. With a quota of 500 participants, GC afforded both majority and minority shareholders equal opportunities to participate in the activity. There were two groups of 250 participants each visiting GC Group's plants and taking part in a social outreach activity on November 11 and 12, 2019.

3. ROLE OF STAKEHOLDER

GC places importance on the rights of all stakeholders. Thus, principles in relation to the rights and impacts on stakeholders were compiled, and written good practice guidelines were formulated based on these principles and published on GC's website. Stakeholders were also provided with channels to express their opinions, suggestions and recommendations.

Stakeholder-related policies and guidelines, as well as actions in 2019, are summarized below:

SHAREHOLDERS

GC respects the fundamental rights of shareholders and treats every shareholder equitably for their utmost satisfaction. These rights include the right to participate

in the AGM, the rights to vote, to propose meeting agenda items and to nominate candidates for directors. To foster good relations with shareholders, GC organized Company Visit, heeded their suggestions and provided them with contact channels, via www.pttgcgroup.com, email addresses at ir@pttgcgroup.com and cg@pttgcgroup.com, as disclosed under Shareholder Rights and Equitable Treatment of Shareholders. In addition, the Company took part in the quarterly Opportunity Day, held in collaboration with SET to provide investors with access to information sources and an opportunity to learn more about listed companies.

Furthermore, GC continued for the fourth consecutive year with the Giving Back to Society campaign at the 2019 AGM, where it donated Baht 100 per shareholder who registered for the meeting (whether in person or through a proxy) instead of giving tokens to shareholders (refraining from distributing tokens is SEC's directive). The donated fund totaling Baht 553,000 was used to purchase medical equipment for Wang Chan Hospital in Rayong Province.

As for treatment of bondholders, the Company strictly complied with applicable laws and notifications of SEC, GC's policies, objectives and shareholders' meeting resolutions. Activities were also regularly conducted to foster good relations with bondholders, much like those organized for shareholders, such as national and international roadshows and Company Visit.

CUSTOMERS

To achieve customer satisfaction, GC continued to maintain and improve the quality of its products and



GC COMPANY VISIT 2019

services; ensured that the its management was fair, appropriate, transparent and accountable; provided good quality and reasonably priced products and services to its customers; maintained a good and sustainable relationship with its customers through a diverse range of activities, such as coordination meetings with customers to provide them with information on products and services as well as to learn more about their needs, which would enable GC to cater its products to their demand; conducted quality checks of its products regularly; and adopted a customer relationship management (CRM) system and a whistleblower form on the Company website to facilitate the submission of complaints about GC's products and services. Furthermore, several operation-enhancing standards were adopted as tools to manage and assess the efficiency of the operations. These standards included a standard product sales and purchase agreement, implementation of a tender software system, Internal Control Self-Assessment, operation monitoring policy for Marketing, Commercial and Supply, which had been implemented in conformity to the Corporate Governance and Business Code of Conduct Handbook and the Corporate Compliance Policy. These standards serve as guidelines to which all employees strictly adhere.

and Business Code of Conduct Handbook. An e-procurement system was implemented and developed for more transparent, more simplified and less costly procurement processes. The Approved Vendor List (AVL) was also enhanced and supplier audit and assessments were conducted annually. In addition, GC continued to conduct Supplier Relationship Management (SRM) activities, namely the Suppliers Conference, to meet its suppliers and exchange ideas with them, as well as to communicate its policies to them. GC encouraged its suppliers to join the Private Sector Collective Action against Corruption (CAC). It also continued partnering with suppliers to lower the costs of procurement and enhance suppliers' competitiveness.

BUSINESS COMPETITORS

To ensure that treatment of business competitors is compatible with international standards and within the scope of the laws on trade competition, GC established its Business Code of Conduct on Treatment of Business Competitors in conformity to those principles to ensure fair and transparent competition by neither seeking confidential information of business competitors through fraudulent or inappropriate means nor tarnishing their reputation with slanders.

CREDITORS

Treating its creditors fairly and responsibly, GC strictly adheres to best practices while complying with contractual terms and conditions, terms of guarantee, capital management and debt repayment terms, due dates and financial encumbrances. A Payment Tracking System (PTS) was set up to facilitate creditors to track and check the status of payment. The system provided information on the due date and payment in process. The Company in collaboration with financial institutes implemented an e-mail Advice from an Outsourced Payment System to inform its creditors in advance of the payment in process. An additional system was also provided to support the issuance of invoice, tax invoice, and receipt via e-system. GC did not conceal any information or facts that could cause damage to its creditors. If the Company foresaw that it might not be able to comply with any obligation of the contract, it would notify the creditor in advance to mutually agree on a corrective measure. The Company treated all creditors equally, whether financial institutions or bondholders, with the same standard contractual



GC SUPPLIER CONFERENCE 2019
AT THE OFFICE OF RAYONG PROVINCE

SUPPLIERS

Believing in a business model of mutual growth and sustainability, GC operates its businesses with fairness, transparency, accountability and lawfulness. It adheres to the Supplier Code of Conduct and Procurement Code of Conduct, which are in alignment with the Corporate Governance

terms and conditions. The major conditions of loan agreements are in the same standard and all the terms of these agreement are strictly complied with. Principal repayment and interest payment were made on time, and the use of a given loan agreed with the objectives stated in the agreement with the creditors, as well as compliance with the requirements on the rights and responsibilities of debenture issuers and conditions under the loan agreements. Furthermore, GC held Banker Feedback sessions to learn more about its financial institutions' opinions of its processes, which also enhanced their confidence in GC and its compliance with their regulations. Feedback from the sessions helped improve GC's work procedures concerning these banks.

PUBLIC SECTOR

Recognizing the significance of the public sector, which is one of its stakeholders, the Company established a policy on the treatment of the public sector in the countries where it invested in order to avoid adverse consequence of any action. This policy was included in the Corporate Governance and Business Code of Conduct Handbook. GC is committed to complying with laws and administrative rules and regulation in obtaining permits, benefits and concessions according to applicable laws, rules and regulations as well as established procedures, processes and practices. Contacts and communication with the public sector, including local authorities and state enterprises, must be transparent with complete and accurate information disclosed under governmental requirements. To this end, GC adopted

the Permits & Privilege Licenses online database in the planning and monitoring of the operations' progress, ensuring compliance with governmental rules, regulations and conditions. Moreover, to enhance good relations with relevant public agencies, GC held activities in an open and appropriate manner and under the law, such as anti-corruption activities, to improve understanding, enhance commitment in performing transparent work and against corruption, and support meeting venues for the exchange of knowledge and update on new laws, among others.

EMPLOYEES

Committed to employees' development as a way to bolster the organization, GC trained its employees and ensured their occupational health and safety. GC paid attention equally to employee opinions and suggestions regardless of their position in the corporate hierarchy. Its human resource management plan had been aligned with business needs, preparing the workforce to support the expansion and partnerships at home and overseas. Talent and Succession Management had been adopted as a framework for employee management and development which is in line with employees' potential, abilities and performance. Employees were suitably compensated since the remuneration policy took into account GC's short-term and long-term operating results. Details of GC's human resource management and performance are disclosed under the topic of "People Management and Development Policy".

In addition, GC implemented policy for employing people with disabilities, and created activities to enhance their quality of life, such as collaborative engagement with the social innovation foundation to promote jobs for disabled people in order that they can work as freelancers.

CIRCULAR LIVING SYMPOSIUMS 2019 : UPCYCLING OUR PLANET AT THE ATHENEE HOTEL, BANGKOK



SOCIETY, COMMUNITIES AND THE ENVIRONMENT

GC conducted its business responsibly with due regard for society, communities and the environment and took into account issues such as safety, quality of life and conservation of natural resources. As part of its Proactive Environmental Management (PEM), GC has revised Quality, Security, Occupational Health, Environment and Business Continuity policy to be in line with Climate Strategy practices of Dow Jones Sustainability Indices or DJSI. GC also promoted energy efficiency and placed importance on the quality of life in local communities and society by implementing CSR Program Portfolio at three



THE BOARD OF DIRECTORS AND EXECUTIVES DONATED MEDICAL EQUIPMENT TO WANG CHAN HOSPITAL IN RAYONG PROVINCE

levels: local, provincial and national. This program portfolio is aimed at improving the local communities at all three dimensions of sustainability (Economic, Social and Environment). Employee volunteer has been indeed an important driving force behind the said CSR Programs Portfolio. Details of each CSR program were communicated to the public to enhance GC's image on social responsibility. The Company has continued, from 2017, to cooperate with all sectors on resource usage efficiency via various implementations throughout the value chain, under the "Circular Living" concept which is in line with GC's "Better Chemistry for Better Living" mission, aiming to spearhead society in the new-trend use of plastics with responsibility. GC also adopted the world-class sustainability reporting framework known as Integrated Sustainability Report (ISR), which covers economic, social and environmental topics, as well as other issues that may significantly affect GC. Further details can be found in "Integrated Sustainability Report 2019".

4. DISCLOSURE OF INFORMATION AND TRANSPARENCY

GC is committed to transparent and timely disclosure of accurate and complete information, financial and non-financial, to stakeholders in conformity to applicable laws, rules and regulations via the SET Link and the Company's website at www.pttgcgroup.com. Its Investors Relations (IR) and Corporate Secretary (CS) were in charge of information disclosure and addressing inquiries.

1. DISCLOSURE OF MATERIAL INFORMATION IN THE ANNUAL REPORT AND IN FORM 56-1

- **FINANCIAL INFORMATION:** GC's financial statements are audited by a professional auditor for the accuracy of their material information and conformance to financial auditing standards.

Each set of financial statements has been approved by the Audit Committee and the Board of Directors before their disclosure to shareholders and the public. The Board of Directors' statement on the accountability of its financial reports is disclosed alongside the auditor's report in the annual report, which includes connected transactions, essential financial information, management's discussion and analysis, and significant financial ratios.

- **NON-FINANCIAL INFORMATION:** Non-financial information is disclosed, such as the operating structure of GC Group, which includes the majority shareholder's shareholding structure, the ratios of the number of shares held by institutional investors and of free-float shares, reports of the shares held and changes at the year-end as filed by Directors and Executives of the Company and related parties, reports on adherence to good corporate governance principles, and Integrated Sustainability Report.

2. ESSENTIAL INFORMATION IN THAI AND ENGLISH WERE DISCLOSED VIA THE FOLLOWING CHANNELS:

- The SET Link;
- GC's regularly updated website, www.pttgcgroup.com, where channels for contacting the Board and other divisions are also fully and clearly displayed;
- Information and news were disclosed to stakeholders via email, exhibitions, press release and other activities, such as newspapers and television.

INSIDER INFORMATION

An Insider Information Policy has been established and included in the Corporate Governance and Business Code of Conduct Handbook. It has also been published on the Company's website for shareholders' ready access. Directors, Executives and employees are constantly reminded of the policy and their compliance. Under the policy, they are prohibited from using material insider information, not yet published to the public, for personal gain or the benefit of others, including for trading GC's securities. The essence of the policy is summarized below:

1. Directors and Executives under SEC's definition must report to SEC changes in their holding of the Company's shares within three business days as required by SEC. Moreover, the Company sets up a policy requiring Directors and Executives to notify the Company Secretary of their intention to trade the Company's shares at least one business day before the transaction is made.

2. The Board of Directors monitors each individual's compliance with GC's Business Code of Conduct on insider information every month. The Company Secretary, who receives information via email from SEC on the changes to Directors and Executives' shareholding according to their shares trading or transfer, will report such changes to the Board. Information of changes in shareholding during the year and at the beginning and the end of each fiscal year is disclosed in the annual report.
3. GC notifies Directors and Executives in writing that they are prohibited from trading the Company's shares 30 days ahead of the disclosure of the quarterly and annual financial statements or that of other information that may affect the prices of the Company's shares. They are also prohibited from trading the Company's shares within 24 hours after the said disclosure.
4. All Executives and employees are required to comply with the Company's guidelines on Confidentiality of Information and safeguard its information, business partners' information and personal information of related parties. They are also required to adhere to the Company's measures on the safeguarding of confidential information or information that is not yet published to the public.
5. GC's Directors, Executives and employees are regularly kept up to date on regulations and policies regarding insider information to ensure their acknowledgement and compliance. The Company has clearly implemented disciplinary sanctions in case of violation of inside trading policy. No report on violation of insider information was, however, received this year.

INFORMATION TECHNOLOGY (IT) GOVERNANCE

GC oversaw the use of information technology to broaden its business opportunities and risk management development so as to achieve its objectives and goals. Its guidelines for IT monitoring have been defined as follows:

1. **Quality of Data and Information:** GC has implemented management information system to ensure that its data and information technology are correct, accurate, reliable and trustworthy. Its system has been divided into three level as follows:
 - **Governance level:** PTTGC Group's Digital and IT Steering Committee (DISC) was established to define IT direction, goals and strategies under GC Group's policies, business direction and strategy.

An Information Safety and Security Committee (ISMS Committee) was also formed to oversee the security of GC Group's essential data.

- **Management level:** Structure and approaches of management information system were implemented. ISO series were applied as an operational framework and to control users' implementation and to ensure the accuracy and availability of data. GC also used the internal and external audit systems for the review and audit of its processes to ensure that information and data are accurate, credible and reliable.
 - **Operation Level:** Information Technology Department has proceed as follows:
 - Establishing related systems, guidelines and other services for users and storing it in the intranet for users' further study. IT news was announced via email regularly.
 - Monitoring IT work progress. The results of the monitoring were used to improve the management and services provided as well as IT security. Reports on the progress were made to the DISC and ISMS Committee for further recommendations.
 - The risk of IT resources was annually assessed to ensure that they were sufficient to maintain and protect data and information. This would lead to accurate, correct, reliable, trustworthy and current data and information.
2. **Data and Information Security:** GC has developed a data and information security administration system with ISO 27001 serving as a practical scope for confidentiality, integrity, and availability of information as follows:
 - Mapping and rolling out a policy for steering and defining guidelines for the development of an information security administration system, including an information technology (IT) security policy and a computer room physical security policy.
 - Establishing procedures for alignment with and accommodation of policy development, including procedures for accessing key systems, computer room access control, and information asset risk management.
 - Developing assorted information systems for security and safeguarding against cyberthreats while accommodating the above-mentioned procedures, including systems to prevent computer virus spread (virus computer), cyber leaks of key data, and 2 Factor Authentication (2FA).

3. Availability of Data: GC implemented plans on the use of the Company's data and information to be in line with its corporate strategy, taking into account the needs of all business units in the implementation of the IT strategic plans.

4. Specifications of the Company's Hardware and Software: GC has proceeded as follows:

- IT devices must be replaced every three years. New models for replacement must have better capacities, equipped with security systems for intrusion prevention and data recovery.
- A system must be installed for 24-hour monitoring of the server. In case of computer malfunction, the system will send an alert SMS and email to IT supervisors to take promptly necessary corrective action.
- A security system must be installed to daily check the temperature and power sufficiency of the Data Center (DC) and Disaster & Recovery Site (DR Site). UPS Generator Power was installed for power reserve in case of power blackout.
- Vulnerability assessment and system hardening must be conducted annually, as well as installing and updating of anti-virus programs to the server and its clients. There must be daily, weekly and monthly data backups.
- Standard software to be used must pass the test, and an annual audit must be conducted on hardware and software management.

5. Information Availability in case of Emergency: GC has implemented a DR site for 24-hour backup of important data and information to ensure prompt

retrieval. Disaster recovery plans and recovery procedures were formulated to handle the situation in emergencies which might affect the main data system. The rehearsal of said recovery plan must also be held annually.

To implement an oversight process for digital and IT investment management, GC appointed a Digital & IT Investment Management Committee (DIM) to oversee and consider such investment under the DISC guidance. A process is in place to monitor budget disbursement and the status of the project to ensure progress in line with the schedule given to DIM, including project duration and anticipated benefit.

INVESTOR RELATIONS

Investor Relations Department serves as the center of communication, where essential information is made known to shareholders, institutional and minor investors, analysts and relevant regulatory authorities. It also oversees the quality of financial reporting processes and essential information that could affect the price of its securities, such as financial statements, performance results, earnings reports and quarterly and annual Management Discussion and Analysis (MD&A). These are all indicators of the Company's financial standing, performance and future trends. Investor Relations Department also manages the disclosure of information via the SET Community Portal to foreign and domestic investors. Furthermore, an Investor Relations Code of Conduct has been established to determine the roles and best practices that enable investor relations officers to treat all shareholders equitably.

In 2019, GC's Executives regularly met with shareholders, financial analysts, investors and employees through activities, such as analyst meeting, domestic and international road show and retail-investor events in order to present the Company's performance. Below is a summary of these events:

Investor Meetings	
Investor Meetings Abroad	5 times
Domestic Investor Meeting	13 times
Meetings with Financial Analysts	4 times
Meetings at the Company	18 times
Teleconferences	14 times
Information Disclosure	
Disclosure via SET Community Portal and Company Website	63 times
Activities	
Bondholders' Site Visit	1 time
Analysts/Fund Site Visit	3 times
Shareholders' Site Visit	2 times
Basic Training with Analysts	4 times

In addition, Investors or interested persons may contact the Company via the following channels for more information:

- 1) Mail : Investor Relations Department,
PTT Global Chemical Public
Company Limited
555/1 Energy Complex, Building A,
4th-18th Floors, Vibhavadi Rangsit Road,
Chatuchak, Bangkok 10900
- 2) Phone : 66 (0) 2265-8400
ext. 8172, 8665, 8364, 8637 and 8513
- 3) Email : ir@pttgcgroup.com
- 4) Fax : 66 (0) 2265-8500
- 5) Website : www.pttgcgroup.com.

In addition, the Company offers swift and convenient communication via email. The email address is displayed on the Company website under “Corporate Governance”. Shareholders, investors and the public may contact the Board of Directors or the Chairman of the Corporate Governance Committee directly. They may also contact the Company Secretary for company information at cg@pttgcgroup.com.

5. RESPONSIBILITIES OF THE BOARD OF DIRECTORS

The Board of Directors has established the following policy regarding its composition and the scope of its responsibilities and duties:

1. BUSINESS STRATEGIES, POLICIES AND DIRECTIONS

The Board establishes sustainable development policies, strategies and goals under the strategic framework of universal sustainable business practices to strike an economic, environmental and social balance; encourages innovation and the adoption of technology in the Company’s operations; reviews at least once a year the corporate vision and sets corporate goals under the current economic condition; approves financial and other Key Performance Indicators (KPIs) and goals and monitors their progress periodically; and supervises the performance of the management team through the President and CEO to ensure the achievement of the Company’s goals and plans.

2. CORPORATE GOVERNANCE AND BUSINESS CODE OF CONDUCT

The Board set the policies on Corporate Governance and Business Code of Conduct, and Corporate Compliance for GC Group. Directors, Executives and employees must abide by these policies to bring about efficient, standardized, ethical, transparent and accountable operations. The Board also ensures the rights of all stakeholders in justly receiving the benefits guaranteed to them by their fundamental rights to bolster confidence as well as fostering recognition among the public. The Board also treasures anti-corruption efforts. To this end, it tasks the Corporate Governance Committee with ensuring the Company’s strict compliance with such policies, as well as all applicable laws, objectives, articles of association and shareholder resolutions, overseeing equitable treatment of all shareholders and instilling an understanding of CG in the minds of our employees to facilitate compliance.

3. INTERNAL CONTROL AND INTERNAL AUDIT

To ensure that GC and GC Group adopt internal control systems of international standards and adequate risk management with appropriate risk appetites and tolerance, the Board of Directors tasked the Audit Committee and Internal Audit with regular reviews and monitoring of internal audit. They must also ensure that GC provides adequate, credible information internally and externally. In addition, they must regularly monitor and assess its compliance with applicable laws, rules and regulations, and foster confidence among executives, investors and stakeholders. Further information appears under “Internal Control”.

4. RISK MANAGEMENT

The Board oversaw GC’s management system for risks to its strategic objectives. It assigned the Risk Management Committee to devise risk management policies and frameworks; ensure the efficiency of its risk management; review risks of negative impacts on the Company’s objectives; consider substantial risks at project and organizational levels; and formulate execution plans and consistently monitor, assess and make adjustments to such plans to ensure that these risks are tolerable. Furthermore, the Risk Management Committee reported results of risk

management to the Board regularly and on an ad hoc basis, as disclosed under Risk Management and Risk Factors and Internal Control.

5. CONFLICTS OF INTEREST

The Board of Directors laid down a policy and guidelines for issues on or the possibility of a conflict of interest in the Corporate Governance and Business Code of Conduct Handbook, to which all Directors, Executives and employees must adhere to. They must also carefully follow the guidelines for connected transactions and refrain from violating the regulations of SEC and SET. Directors and Executives by SEC's definition must report to the Company their interests and those of their related parties. In addition, a connected transactions manual has been issued, and principles concerning connected transactions has been communicated to relevant units under GC and GC Group. In addition, information on these transactions was compiled in a database retrievable by relevant departments for further action so as to ensure operational compliance.

Furthermore, GC has put measures in place to prevent conflicts of interest. Directors, Executives and all employees are required to annually report potential conflicts of interest. If a conflict of interest has arisen, the person with vested interests must immediately report GC of such conflict, using the Conflict of Interest Form (for the Directors) or the form via the intranet (for executives and employees) to their immediate supervisors for acknowledgement and further action.

GC JOINED ANTI-CORRUPTION DAY 2019 AT BANGKOK INTERNATIONAL TRADE & EXHIBITION CENTRE (BITEC) UNDER THE CONCEPT 'JOINING FORCES AGAINST CORRUPTION'



ANTI-CORRUPTION

GC has maintained its commitment to transparent and accountable operations founded upon CG. Its control and monitoring mechanisms prevent and minimize the likelihood of internal fraud and corruption, direct or indirect.

GC expressed its dedication to the fight against corruption in the following manners:

IMPLEMENTATION UNDER ANTI-CORRUPTION MEASURES

GC has established an Anti-Bribery and Anti-Corruption Policy, providing in writing relevant guidelines. The policy has been publicized on the Company website. In addition, the Company was a recertified member of Thailand's Private Sector Collective Action Coalition against Corruption (CAC) in 2017, after its first certification in 2014. In 2019, GC was undergoing the recertification process to retain its membership for the third consecutive term. It conducted its annual review of all 71 items on its anti-corruption self-assessment form with supporting evidence, which was later assessed by an internal auditor. The result was reported to the Audit Committee for their acknowledgement. This process ensured that GC had comprehensive, suitable anti-corruption measures in place and that it operated its business under CAC-prescribed CG principles.



GC JOINED INTERNATIONAL ANTI-CORRUPTION DAY 2019 UNDER THE CONCEPT "ZERO TOLERANCE, THAIS WILL NOT TOLERATE CORRUPTION" AT IMPACT, MUANG THONG THANI, NONTABURI PROVINCE

NACC INTEGRITY AWARDS

GC firmly adheres to ethical and transparent business practices while supporting the government's efforts to promote awareness, social values, virtues and morality to prevent and suppress corruption, propel Thailand's transparency towards an internationally accepted standard and promote a Corporate Governance culture. GC has entered NACC Integrity Awards, in every year continuously held on December 9, 2019 organized by the Office of the National Anti-Corruption Commission (NACC) as well as participating several other activities to express the company commitment and efforts in the fight against corruption, including the International Anti-Corruption Day (Thailand), organized by the Royal Thai Government in conjunction with the Office of the NACC, the Office of the Public Sector Anti-Corruption Commission (PACC), the Anti-Corruption Organization of Thailand and Thailand's anti-corruption network, and the National Anti-Corruption Day (Thailand) 2019, organized by the Anti-Corruption Organization of Thailand, on September 6, 2019.

ANTI-CORRUPTION TRAINING

Since 2017, GC in collaboration with Corporate Governance and Human Resources Development Department conducted an ongoing training project entitled "CG Role Model: Focus on Action". Experts from

external organizations were invited to give lectures to supervisors on the Good Corporate Governance principles and business code of conduct and the likelihood of corruption to executive employee. The campaign has raised their awareness of ethical practices, fraud risk factors and fraud risk control. It has also bolstered the strength of the Company by enabling these employees to serve as role models and encouraging them to be vigilant of corruption in order to prevent it, as well as supporting employees to monitor protect and follow the implementation of anti-corruption measures.

NO GIFT POLICY

Giving or receiving a gift, treating someone or being treated to a meal, and giving or receiving any other form of benefit may lead to corruption. Therefore, GC issued a No-Gift Policy (no gift, no treat nor any other benefits) under its Anti-Corruption Policy. Strictly enforced across GC Group, the policy mandates that any person employed by GC Group must not ask for or receive any gift, meal or form of favor from a business partner of GC Group so as to prevent any influence on his or her decision or selective treatment or conflict of interest. This policy has been communicated to all external parties involved in its business operation for their acknowledgement so as to ensure GC's standard of business conduct with integrity, transparency, honesty and lawfulness.

WHISTLEBLOWER SYSTEM

GC recognizes the important roles of all stakeholders in its Corporate Governance. Whenever they witness any violation of the Business Code of Conduct, any form of fraud or any other improper case, they may submit a report, notification or complaint directly to either the Chairman of the Corporate Governance Committee, the head of Internal Audit, the Executives or the Company Secretary or via the GC-provided complaint channels or any other channels that they trust.

**Chairman of the Corporate Governance Committee/
Head of Internal Audit /
Executives or Company Secretary**

E-mail

Website

: PTT Global Chemical Public Company Limited
555/1 Energy Complex, Building A, 18th Floor
Vibhavadi Rangsit Road, Chatuchak
Bangkok 10900

: whistleblower@pttgcgroup.com

: www.pttgcgroup.com

WHISTLEBLOWER POLICY PROCEDURE

GC formulated and announced the following Whistleblower Policy Procedure:

- 1. Screening the complaint:** The responsible department screens the essential information

under the established policy. Even anonymous complaints will also be considered if they provide clear reasons and sufficient evidence. The result of screening is reported to the whistleblower.

- 2. Investigation:** For valid complaints, the head of Internal Audit will appoint an investigation committee under the Company's work regulations to conduct an investigation and fact-finding as well as to present mitigation measures for the resulting damage or impacts so as to ensure fairness to all parties.
- 3. Reporting:** Once the complaint has been dealt with, the whistleblower will be notified of the outcome (if contact information was provided). The Corporate Governance Committee and the Audit Committee will also be notified.

WHISTLEBLOWER AND WITNESS PROTECTION

Whistleblowers or witnesses who collaborate in the investigation will be provided with the following protection under the Whistleblower Policy:

1. A whistleblower, a stakeholder or any person who collaborates in good faith in the investigation will be protected and treated with non-retaliation.
2. Information of the whistleblower or of any persons involved will be classified as confidentiality according to GC's regulations on information classification and security of confidential documents.
3. The Company will provide suitable mitigation measures to the whistleblower or the affected party.

COMPLAINT STATISTICS

In 2019, the Company received a total of 164 complaints. They have been categorized as follows:

Voice of Customer	157 complaints
Voice from Community	3 complaints
Safety, Occupational Health and Environment	No complaint
Business Code of Conduct	4 complaints

PROGRESS OF IMPLEMENTATION UNDER ANTI-CORRUPTION MEASURES

GC prepared reports on the progress of the implementation under the anti-corruption measures throughout the year and presented them to the Corporate Governance Committee and the Audit Committee for their acknowledgement. A summary of the reports was disclosed to shareholders in the annual report.

BOARD OF DIRECTORS AND SUB-COMMITTEES

1. BOARD OF DIRECTORS

The Board of Directors is composed of experts from various fields with knowledge, skills and experiences which bring about advantages to GC. Members of the Board, known as Directors, are nominated and appointed under established criteria and shareholders' approval. The current Board of Directors consists of 15 members, nine of whom are Independent Directors. The proportion

of Independent Directors fits GC's size and business types, enabling the Board to perform its roles efficiently. Board duties and responsibilities are based on applicable laws, the Company's regulations and articles of association, shareholder resolutions and good corporate governance principles. The Board as a whole dedicates its time to perform its duties in GC's for utmost benefits of GC and the Board shareholders' best interests refrains from acting in any capacity that could constitute a conflict of interest with GC, thus instilling trust and confidence among shareholders and investors.

The structure of the Board of Directors appears under "Management Structure."

2. SUB-COMMITTEES

The Board of Directors appointed four Sub-Committees, namely the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee and the Risk Management Committee.

Directors serving on these sub-committees possess the expertise and knowledge required to oversee specific issues that each is tasked with according to the GC articles of association. The charter of each sub-committee prescribes its members' desired qualifications, terms in office and scope of duties and responsibilities. The names of sub-committee members, their duties and responsibilities, the number of their meetings and attendance in these meetings are detailed under "Management Structure".

Furthermore, these four sub-committees regularly report their performance to the Board of Directors at Board meetings and disclose their annual performances to shareholders in Form 56-1 and the annual report.

NOMINATION AND APPOINTMENT OF DIRECTORS, INDEPENDENT DIRECTORS AND CHIEF EXECUTIVE OFFICER

When a Director position becomes vacant or when a Director is due to retire by rotation, the Board of Directors, through the Nomination and Remuneration Committee, considers and nominates candidates with the knowledge, skills, expertise, experiences and specialization that would benefit and conform to the Company's business strategy under the Board Skill Matrix. Board diversity and independence together with potential Directors' conflicts of interest are also considered. Nomination is divided into the following categories:

DIRECTORS: GC encourages shareholders to nominate qualified individuals in addition to selecting candidates from the Directors' Pool of trusted organizations, such as the Thai Institute of Directors Association (IOD). This process ensures a wholesome composition of the Board and the best interests of the Company. A former Director may be re-nominated based on his or her performance during the past year, dedication and participation in activities and events.

INDEPENDENT DIRECTORS: GC strives to ensure its compliance with SEC's requirements regarding the suitable number of Independent Directors on the Board. As of January 31, 2020, the Board of Directors is comprised of 15 members, nine of whom are Independent Directors, which exceeds SEC's requirements. The definition and qualifications of an Independent Director appear in the Corporate Governance and Business Code of Conduct Handbook and on GC's website.

CHIEF EXECUTIVE OFFICER: If this position becomes vacant, the Nomination and Remuneration Committee will consider and nominate the member of the Board's Directors who possesses the skills, professional experiences and specialization that are in the greatest benefit of GC's business. In other words, the nominee must be knowledgeable and capable of managing a business and having relevant expertise and experience in the petrochemical, petroleum or energy sector. He or she must also demonstrate great leadership, have led an organization and be held in high esteem by relevant businesses and organizations. The possibility of a conflict of interest must also be taken into account. The nomination will be presented to the Board for consideration, approval and appointment.

ROLES OF THE CHAIRMAN AND THE CHIEF EXECUTIVE OFFICER

The Chairman of the Board of Directors and the Chief Executive Officer (CEO) are not the same person. Their duties and responsibilities are distinct and separate, as described below:

The Chairman of the Board of Directors is an Independent Director whose main role is to ensure that the Board of Directors efficiently performs its duties and in compliance with the Company's good corporate governance principles and the business code of conduct, being independent from the management. In addition, the Chairman works with CEO to determine meeting agenda but refrains from participate in day-to-day business management. The Chairman of the Board of directors will be the chairman of both Board and shareholders' meetings. He is prohibited from serving on any sub-committee as explicitly prescribed in the scope of responsibilities of the Board of Directors and sub-committees so the Chairman is able to freely exercise his judgement.

The Chief Executive Officer is the highest company executive whom the board of directors choose and appointed from one of the directors Under the GC's articles of association, to serves for managing the Company under Board-assigned policies and directions under the scope of authority set forth in GC's articles of association and company regulations. The CEO also serves as secretary to the Board of Directors. Furthermore, the GC articles of association mandate that the CEO receives compensation and benefits for his role as the highest executive officer in addition to what he or she earns as a director. The CEO's

roles, duties and responsibilities, as well as his or her compensation, are published on the Company website in Thai and English.

BOARD MEETING

The Board of Directors schedules the date and timing of Board meetings for the entire year in advance, and set each regular meeting's agenda clearly. The Board may also call special meetings if appropriate or as necessary. Directors receive a Board meeting invitation, draft minutes of the previous meeting and supporting information of the meeting agenda for the consideration of the meeting agenda at least seven days before the meeting. In 2019 there was a total of 14 Board meetings were scheduled in advance.

The Chairman of the Board of Directors presides over these Board meetings and gives Directors a chance to participate and express their opinions freely. At least two-thirds of all Directors on the Board must be present to constitute a quorum, which must be maintained until voting is completed. Each Director has one vote, and a resolution is passed based on majority votes. In case of a tie vote, the Chairman is to cast the decisive vote. The Board values the management of conflicts of related parties in prudent, impartial and transparent. All information regarding such conflicts is fully disclosed. If a Director has a personal interest on an agenda item, he or she is required to refrain from taking part in the decision-making process of that particular item.

After every meeting, the Company Secretary is responsible for completing the minutes of the meeting, which will be presented for the Board's certification as the first agenda item of the next meeting and for the Chairman's signature for minutes certification. The certified minutes and supporting documents on each agenda item will be systematically filed in electronical format, on a level of confidentiality categorized documents for easy retrieval and reference purposes.

Moreover, in compliance with good corporate governance principles. The Board of Directors, mandates that Non-Executive Directors meetings be held to suggest their opinions and guidelines of the Company's business management and operations. The Board also mandates that Independent Directors meetings to exchange ideas and review their roles and performance every year. In 2019, the Non-Executive Directors held one meeting and the Independent Directors held one meeting. The summaries of these meetings were presented to the Board for their acknowledgement. The details of Board meetings and Sub-Committee meetings are disclosed in "Directors' Meetings" under "Management Structure".

To easily and swiftly dispatch information and meeting documents, as well as to reduce the use of paper, the Company has implemented a Digital Join Application (D-Join) to forward information to Directors' iPads, which are equipped with the data security system.

DIRECTORS' PERFORMANCE ASSESSMENT

BOARD OF DIRECTORS

The Board of Directors set the Board performance assessment annually to help Directors review their performance and revisit problems and obstacles during the year. In 2019, the Company appointed an external consultant, EY Corporate Services Company Limited, to review and provide recommendation for the improvement of the Board. There are three types of performance assessment, namely group assessment, self-assessment and cross-assessment (assessing another Director) to ensure that they are suitable and align with Corporate Governance Code (CG Code) issued by SEC as well as to analyze and evaluate these performance assessment forms and provide recommendation and related suggestions to GC so that it can use them to improve and develop the Board's performance for greater efficiency. Furthermore, new Board KPIs were also established under the CG Code and the international criteria of the DJSI which are composed four aspects including the Company's performance results, the Board's group assessment results, Directors' meeting attendance and Directors' engagement during the Board meetings.

Board assessment details are as follows:

1. GROUP ASSESSMENT comprises six essential sections including 1) Board policy 2) Board performance 3) Board structure (composition and qualifications) 4) Board style 5) Board meeting 6) Board development. The assessed Directors were the Directors who held a position as director during the assessment period from January to September 2019 in a total of 14 directors (exclusive of one director, Mr. Kongkrapan Intarajang, appointed as Director on October 1, 2019).

THE AVERAGE GROUP ASSESSMENT SCORE OF THE BOARD IS 97.4%.

2. SELF-ASSESSMENT (ASSESSMENT OF INDIVIDUAL DIRECTORS) comprises three essential sections including 1) Directors' knowledge and expertise, self-development and teamwork 2) Board duties performed 3) dedication of time and meeting attendance.

THE AVERAGE SELF-ASSESSMENT SCORE OF THE BOARD IS 96.4%.

3. CROSS-ASSESSMENT (INDIVIDUAL ASSESSMENT OF OTHER DIRECTORS) comprises three main sections including 1) the Director's knowledge and expertise, self-development and teamwork, 2) Board duties performance and 3) dedication of time and meeting attendance.

THE AVERAGE CROSS-ASSESSMENT SCORE OF THE BOARD IS 97.9%.

SUB-COMMITTEES

The Company's sub-committees are the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee and the Risk Management Committee. They also generate the annual performance assessment, both at committee (group) and individual levels. In 2019, every Sub-Committee reviewed and improved the assessment questionnaires and criteria to be in line with good corporate governance practice.

1. AUDIT COMMITTEE: The assessment topics are audit committee charter, composition, meetings, training and resources, responsibilities, relationship with Senior Vice President - Internal Audit, auditors and management, reporting to the Board and shareholders and maintaining of performance quality. The results are summarized below:

- The average score of the Group Assessment is **93.2%**.
- The average score of the Individual Assessment is **90.7%**.

2. NOMINATION AND REMUNERATION COMMITTEE: The assessment topics are composition and qualifications, scope of duties, reporting and performance evaluation. The results are summarized below:

- The average score of the Group Assessment of the Board is **99.59%**.
- The average score of the Individual Assessment is **99.09%**.

3. CORPORATE GOVERNANCE COMMITTEE: The assessment topics are composition and qualifications, scope of duties, meetings, reporting and performance evaluation. The results are summarized below:

- The average score of the Group Assessment is **97.5%**.
- The average score of the Individual Assessment is **96.7%**.

4. RISK MANAGEMENT COMMITTEE: The assessment topics are composition and qualifications, scope of duties, meetings, reporting and performance evaluation. The results are summarized below:

- The average score of the Group Assessment is **99.4%**.
- The average score of the Individual Assessment is **98.8%**.

The results of these assessments and recommendations of the assessment will be presented to the Board of Directors to concretely improve the effectiveness of the Board. The summary of these results will be disclosed in the annual report. In addition, the Nomination and Remuneration Committee will take the Board's group assessment results into account for determining the Board's annual remuneration, in addition to GC's operating performance.

DEVELOPMENT OF DIRECTORS AND EXECUTIVES

The Board of Directors recognizes the role of leadership as a governing body of the Company. More than half of its members have studied or attended lectures on the Corporate Governance Code for Listed Company 2017 (CG Code) and have good understanding of CG Code and how it could create sustainable value for the Company's business.

To enhance Directors' knowledge and competence which will support the performance of the Board of Directors effectively, as well as to prepare executives for internal rotations and for the succession to the CEO and top management, the Board of Directors encourages their participation in pertinent training courses and provides the assessment of potential top management to develop the preparedness of executives' performance. The summary of the key developments is as follows

ORIENTATION FOR NEW DIRECTORS

Newly appointed Directors must attend the board orientation, which includes a presentation on GC's nature of business, business data and practices, as well as applicable rules and regulations, corporate governance principles and the business code of conduct, and useful information for the position. Additionally, the company prepares handbooks and other documents needed to perform their roles, namely the strategic plan, the Company's Articles of Association, Memorandum of Association, annual report, related rules and regulations, and the Corporate Governance and Business Code of Conduct Handbook.

TRAINING FOR DIRECTORS

GC always encourages its Directors to pursue further education and training opportunities to enhance their competence for the jobs, which includes:

- Participation in activities aimed to promote and elevate corporate governance, as well as visits to operating sites of GC Group and joint ventures in Thailand and overseas so as to enrich their

understanding of GC's businesses and optimize their knowledge and experiences for GC's benefit.

- Participation in relevant and beneficial training programs, as well as refresher programs, at Thai Institute of Directors Association (IOD).

In 2019, Directors participated in the following programs:

Director	Program / Institute
1. Mr. Praphon Wongtharua	<ul style="list-style-type: none"> • Advanced Audit Committee Program (AAPC), Class 32/2019, Thai Institute of Directors Association (IOD)
2. Major General Nithi Chungcharoen	<ul style="list-style-type: none"> • Boards That Make a Difference Program, Class 9/2019, Thai Institute of Directors Association (IOD)
3. Mrs. Premrutai Vinaiphath	<ul style="list-style-type: none"> • The Executive Program in Energy Literacy for Sustainable Future, Class 13, Thailand Energy Academy (TEA) • Director Certification Program (DCP), Class 269/2019, Thai Institute of Directors Association (IOD)
4. Mr. Prasert Bunsumpun	<ul style="list-style-type: none"> • Rule of Law for Democracy, Class 7, College of the Constitutional Court
5. Mr. Prasan Chuaphanich	<ul style="list-style-type: none"> • Board Nomination and Compensation Program (BNCP), Class 7/2019, Thai Institute of Directors Association (IOD)

- GC held a lecture for the Board of Directors on the topic of "Know Your Cyber Risk," for their acknowledgment and better understanding of the risk factors on technology which have become a key issue of the current situation and may impact to the Company's business so that they will be prepared to efficiently handle the situations, in line with the Director's Development plans under the CG code.

executives will be encouraged to serve as role models, while strictly and efficiently complying with the Corporate Governance and Business Code of Conduct.

- The company encouraged the Company Secretary to attend IOD's Director Certification Program (DCP), Class 287/2019, Thai Institute of Directors Association (IOD).

TRAINING FOR THE COMPANY SECRETARY

The Company encourages its Executives and the Company Secretary to pursue further education and training that will benefit their roles, the Company business and the Board, including:

- The company conducted training for executives serving as directors of GC and companies under GC on the topic of duties and responsibilities of a director under the laws and good corporate governance principles. The goal was to bolster their knowledge, skills and capabilities as directors of such subsidiaries.
- The company conducted a training program on the topic of Ethical Leadership in the digital era lectured by Professor Vicha Mahakun, President of Anti-Corruption Foundation, to enhance executives' performance in managing the organization with honesty, transparency, accountability with due regard for all stakeholders. In addition, the

TALENT MANAGEMENT AND SUCCESSION PLANNING

GC has established systematic succession plan in which all employees have been divided into groups based on their competency. A 360-degree assessment and Assessment Center were also applied to assess executives' experience, leadership and capability in organizational management in order to define efficient individual development plans and to prepare them for business expansion, change of organization structures, and replacement of retirees to ensure efficient business continuation. This can ensure seamless transition and achievement of strategic goals. Succession Plans has been implemented to fill vacant positions as a result of retirement, transfer, or as needed for the organization structure under the expansion plan, domestic and overseas. Those appointed as successors will be systematically developed to get ready to assume the new roles as scheduled.

GOVERNANCE OF GC GROUP

The Company conducts its business through its subsidiaries, joint ventures, affiliates and others as detailed under the topic of Shareholding Structure in Subsidiaries and Affiliates. The Board of Directors approved the implementation of governance guidelines for the operations and management of GC Group which are in line with GC Business Principle according the following details.

- Chief Executive Officer has the authority to establish policies, guidelines, conditions and methods needed to appoint an employee or another individual as a director of companies under GC which are part of the Company's human resource management regulations. Those appointed persons are entrusted with the responsibility to do his or her best for the utmost benefit of the organization where he or she serves as director.
- Ensuring that any major policies of companies under GC, such as Corporate Governance Policy, Corporate Compliance Policy, Finance, Accounting, Tax and Budget Policy, Quality, Security, Safety, Occupational Health, Environment and Business Continuity Policy, Human Resources Management Policy, Sustainability Management Policy, Risk Management Policy and Internal Control Policy as well as any another relevant policies, are in accordance with rules, regulations of Stock Exchange of Thailand and the Securities and Exchange Commission and any other relevant laws.
- Establishing GC Way of Conduct, in order for GC's executives and employees who are being seconded to companies under GC to uphold it as guidelines when undertaking management operations. Those seconded persons are to endorse a range of policies and precautionary internal control system in companies under GC, such as Corporate Governance Policy, Corporate Compliance Policy. GC also encourages companies under GC to operate its business at the same standard to improve its operational efficiency and achieve business goals.

COMPLIANCE ON OTHER PRINCIPLES OF CG CODE

The Board set a process to consider and review at least once a year the adoption and application of Corporate Governance Code for Listed Companies 2017 (CG Code) for its business context. Any principles not yet or could not be applied are to be recorded with corresponding justification as part of the Board's resolution. Implementations under each item of the CG Code will be evaluated to ensure appropriate outcomes or development plans.

In 2019, GC has at all times thoroughly observed its CG code as detailed below.

1. The Board of Directors reviewed its key performance indicators (Board KPIs) for determining the Board performance for the year 2020 which are in conformity to the CG Code and the DJSI international standard.
2. Board Skill Matrix has been updated to enhance Board development (improving Directors' knowledge and capabilities in areas that are needed or lacking) to align Directors' qualifications with the current nature of business and direction.
3. GC's conduct, under the current business context and condition, was assessed against criteria of the CG Code, to conclude that GC had complied with most of these criteria. In addition, the principles and guidelines of the CG Code, as well as the criteria of CAC and the DJSI international standard, had been reviewed and used in the 2019 revision of the Corporate Governance and Business Code of Conduct Handbook.
4. The Corporate Governance and Business Code of Conduct Handbook has been revised as well as Corporate Compliance Policy to be in line with best practices of regulatory and assessment authorities, both national and under international standards, such as CG Code, Private Sector Collective Action against Corruption (CAC), Dow Jones Sustainability Indices (DJSI).
5. An external consultant was appointed to provide guidelines and recommendations for the assessment of the Board of Directors' performance. Its assessment results will be disclosed in the annual report.

HEAD OF INTERNAL AUDIT AND CORPORATE COMPLIANCE

Audit Committee Charter recognizes that Audit Committee shall approve the appointment, transfer, termination and merits of the Head of Internal Audit Function. In addition, Audit Committee Meeting No. 8/2017 held on September 18, 2017 resolved to approve the appointment of Mr. Amorn Putiphawan as Senior Vice President, Internal Audit with effective from January 1, 2018 as he possesses knowledge, capability, experience and suitable qualification for the role of internal audit.

Furthermore, GC has established Corporate Compliance Division, under the supervision of Corporate Governance Department, to be responsible for monitoring and overseeing all business unit regarding legal compliance so that its personnel will comply with laws, rules and any other regulations correctly. GC has also assigned Mrs. Rattana Nakasiri, Vice President of Corporate Governance Department, to promote and facilitate good corporate governance practices as well as ensuring that executives and employees of GC Group are to perform their duties in accordance with laws, rules and any other regulations and of the country GC has operated.

PEOPLE MANAGEMENT AND DEVELOPMENT POLICY

Healthy organization and people are an important mechanism to augment our competitiveness and enhance effective contribution to operational excellence. While serving corporate domestic and international growth, enabling us to fulfill our aspiration “To be a Leading Global Chemical Company for Better Living”.

GC is determined to prepare organization and people readiness to meet future business needs and ensure expected result as planned. GC has developed HR strategy in corporated with GC Group’s people direction, strategic business directions and corporate goals for the utmost effective and efficient management in three major areas focusing on organization, people, and culture with the following actions:

1. ORGANIZATION

- Re-organized functional structure to support business directions that requires agility including sales & marketing and build our competitiveness to support international business and diverse business
- Embed a Management of Change process to ensure smooth organizational restructuring, minimize risks and impacts from organization restructuring, and to ensure smooth execution by executives and other employees in their new assignments
- Managed strategic manpower planning to support business growth and ensure optimal manpower to deliver business outcome
- Managed compensation & benefits to ensure our competitiveness with PTT Group and peers in same industry. Also, designed standardization of GC Group compensation and benefits structure to create group synergy



OPERATORS DAY 2019

2. PEOPLE

RECRUITMENT: To drive corporate strategies towards success, critical position including those in operator, engineer, and researcher is a key success factor to sustain business growth, highlighted this year stated below:

- Recruited for critical positions by launched an Operator Day, aimed at recruiting and selecting those in the operator discipline while preparing candidates’ databases to accommodate business expansion in major projects including Olefins Reconfiguration, GC Polyols and GC Oxirane projects
- Enhanced corporate branding especially for the new generation. GC’s strategic plans consisted of a special recruitment campaign called Synergos Project, blending the Gamification, which is a social trend with a short interview clips of each career path, namely researcher, process engineer, analyst, sales and project engineer. The purposes were to display employees’ in daily routines, corporate culture, work environment and pride of working with GC. After viewing the clip of each career path, candidates would be able to submit job application, resulting in GC’s ability to add to the databases of these groups. Moreover, we increase chance to recruit personnel and mid-career through social media such as LinkedIn

- Relentlessly fostered relations and opportunities for Rayong descendants by promoting activities designed to enhance job application skills, resume writing techniques and interview preparation skills, as seen in the Plook Fun Pun Dao camp

PERFORMANCE MANAGEMENT SYSTEM:

To motivate employees to sprint their capability in order to bring the best of achievement and organization achievement, GC integrated activities of performance management system end-to-end process and policy. The performance assessment process begins with the annual goal setting, followed by the mid-year review and the year-end assessment. During this process, it is mandatory for all function lines to undergo a Key Performance Indicator (KPI) alignment to make certain that each employee's goals contribute to the overall achievement of our corporate goals. Moreover, company policy requires that employees and their supervisors meet formally at least twice a year to discuss employees' performance to ensure fairness and transparency. Periodic performance check-ins are also enforced, allowing supervisors to monitor the progress of their supervisees and to offer assistance whenever needed. "The Words" video was produced to encourage superiors positive conversation through praises, valuing and morale boosting, to ensure employees' caliber building as well as reinforced performances. After the mid-year review, each function lines undergoes a performance alignment to ensure that performance assessment of the entire function lines is based on the same set of standards. Performance assessment results are part of the peer review criteria in recognition of their contribution and to distinguish top performers from the rest. These results also play a role in the annual salary adjustment in conformity with the Company's Remuneration and Performance Policy. Furthermore, to ensure that these assessments lead to true development, we have integrated our employee performance assessment system with our people development planning by combining a line of communication for our employees to express their own wishes regarding how they expect their career to progress over the course of the next three years. Their wishes are taken into account when we consider job rotations, people development and future recruitment.

EMPLOYEE RELATIONS: To boost up employees' better living with a happy and meaningful life, GC provides holistic of employees' health, wealth and mindfulness through the Well-being project, ongoing since 2018. Besides, GC launches long service year awards for enhancing moral for long service employees. A "GC Happy Retirement" project was staged for those due to retire this year to groom them for financial readiness and post-retirement health care and ceremony. Moreover, GC educated retirement preparation session for employee aged 55 to prepare their understanding and readiness of financial management and health care.

LEARNING AND DEVELOPMENT:

To accommodate business transformation into the digital age, which has rapidly played a role in employees' work and day-to-day living, GC advocated an employee development project to prepare them for efficient handling of change. GC has incorporated concept 70:20:10 (Experience: Exposure: Education) into the design of our development programs for all job families. We believe that this concept will drive changes in employees' attitude and vision. The concept was also employed in designing training courses for internal instructors in pursuit of international expertise. Below are the highlights of these programs:

- **Orientation and the Onboarding Camp:** Designed for newcomers from day one to their first service year at GC, cultivate a culture and build their engagement fostering bonds between new employees. New employees also engage in CSR activities to strengthen relationship between employees and communities



HEAD OF COMPANY DEVELOPMENT PROGRAM

- **Data Science and Engineering Program:** To develop data analytical skills for employees in all levels, this program increases employees' capability, particularly for data-oriented
- **STAR Interviewer Certified Trainer Program:** This internal instructor development course, developed by a leading international institute, develops line managers' ability to conduct effective interviews for the recruitment of new employees and selection of those to be promoted in an efficient and effective way
- **Supply Chain Transformation Program:** This program develops senior management's mastery of supply chain management methods, leading to the improvement and development of GC Group's supply chain management system
- **Leadership Development Program 2 (LDP 2) and Head of Company Development Program:** This program was led by instructors from world class educational institutes, foster management skills for leaders and international businesses for senior management in GC and subsidiaries company
- **PSM Enhance Capability and Culture Transformation Training Program and Maintenance & Reliability Value Extraction Enhancing Transformation Program:** Conducted based on guidelines of world class companies to boost the capabilities of personnel in Production and Maintenance on production safety and international standard maintenance. These programs were aimed at fostering a safety culture
- **Competency Readiness Program:** This program certifies personnel competency for handling Management of Change-People, particularly positions involving process safety and plant reliability

Also valuing employees' learning management, GC piloted a Learning Management System to promote employees' lifelong learning channels to ultimately elevate GC into a learning organization.

KNOWLEDGE MANAGEMENT (KM): We pay a great attention on organizational development and people development based on an excellent foundation of knowledge. It is our goal to become an effective petrochemical and refinery knowledge based organization and a learning organization. Therefore, knowledge management is a crucial tool that will drive

every unit to collect and exchange their knowledge and experience continuously and systematically. For example, knowledge sharing sessions, sharing of lessons learned to prevent future mistakes, applying knowledge to coach/mentor employees, on-the-job training and classroom training to build skills of employees to be trainers. GC captures knowledge of subject matter experts and those retire in next 3-5 years, to collect expertise and ensure smoothness of operation. Also, to continue improvement upon our best practices, existing knowledge can be further developed, together with exploring future knowledge with networks and stakeholders, leading to improve processes, products and services along with new business development. This year GC improved its knowledge-based system (KBS) by applying digital technology to the management of knowledge, creation of archives and Big Data, which promote individual and team learning in turn enabling all employees to compile, access and search knowledge anytime.

CAREER MANAGEMENT SYSTEM:

To encourage our employee to design their own future based on their career aspiration, GC designs a career management system covering the managerial track and the specialist track under success profiles which compiles of competency, exposure, organization knowledge and GC SPIRIT 4 Core Behaviors. There are two types of career growth, first, level advancement in the same band; for this purpose, GC allows employees to present their achievement in April and October, illustrating skills that align with the job expectations of the next level. Second is appointment, meaning promotion into managerial level. GC supports



SEEK DAY 2019

rotation stated in the career path system as to equip them with varieties skills and assignments before stepping up to the managerial level. These career management tools help employees clearly state their career wishes and design their own career plans for consultation with their superiors. At the same time, superiors would have more concrete guidelines for developing their subordinates' competency align with current and future business needs.

SUCCESSION PLANNING: To ensure executives readiness and strengthen capability for usual business and growth, we have succession plans in place for managerial positions, starting from division manager level up especially the executives who are going to retire in order to ensure seamless transitions. Our successors are evaluated by a third party, which not only ensures neutrality but also compares them to other executives worldwide. Based on the comparison, we have designed a development program for our talent with a focus on strengthening their vision and outlook as head of the company. Consequently, we were able to appoint new executives to replace all retirees executives in 2018 ensuring seamless transitions for job shadowing, as our designated succession plans. We will continue to regularly develop potential executives to make certain that we are always ready to fill any expected vacancies due to retirement and any key positions in our subsidiaries.

HR INTERNATIONAL MANAGEMENT: Our overseas growth has led to new challenging opportunities for our employees in the US, Europe and other Southeast Asian nations. GC therefore amended

its overseas secondment management process to ensure that suitable employees are selected and obtain readiness to work abroad. The process is also linked to the talent pool of the GC Group. Employees are trained for their secondment assignment based on the aforementioned 70: 20: 10 concept that align with employees' career paths. Furthermore, remunerations and living expense support for employees during their secondment period have been reviewed while remunerations, benefits and organization structure for secondment in new countries have been considered conform with Legal compliance, such as work permit and international tax laws, have been reviewed and assured our employees of legal complications risk.

3. CULTURE

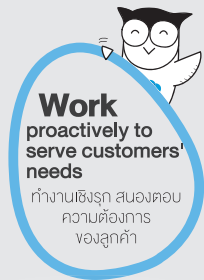
GC drives GC SPIRIT 4 Core Behaviors through communication, day-to-day activities and systems in order to gear all employees and process to one direction to uplifting company performance. Ultimately, all these lead to GC vision "To be a Leading Global Chemical Company for Better Living".

This year GC is continuously strengthened by all executives, as role model, leading and encouraging employees to embed culture in their practices through daily interactions. GC also emphasis GC SPIRIT 4 Core Behaviors through customers' needs and cross-functional collaboration, which promotes collaboration throughout the value chain. Further, GC has driven GC SPIRIT 4 Core Behaviors through digital transformation, blending GC SPIRIT 4 Core Behaviors and rapid transformation approach to strengthen and support business transformation and growth.

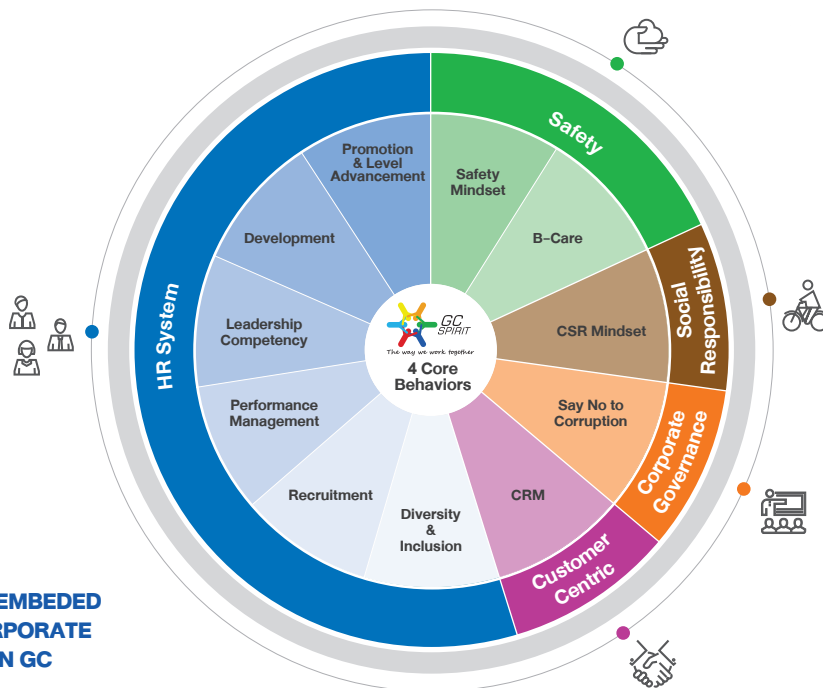


GC SPIRIT DAY 2019

GC SPIRIT 4 CORE BEHAVIORS



**GC SPIRIT EMBEDDED
IN ALL CORPORATE
SYSTEMS IN GC**



The company also engages our people with good work environment, happy workplace, better living, safety and occupational health. We also commit to improve our organization and enhance competency development in all dimensions as people are most valuable asset to promote the company growth and sustainability.

REPORT OF THE CORPORATE GOVERNANCE COMMITTEE

Dear shareholders,

In 2019, the Corporate Governance Committee comprised its chairman, namely Professor Somkit Lertpaitoon and its Committee members, namely Major General Nithi Chungcharoen, Mrs. Watanan Petersik and Mr. Disathat Panyarachun. The Committee performed its duties under Corporate Governance Committee Charter and executed tasks as assigned by the Board of Directors. The Committee held a total of seven meetings to proceed the following matters.

1. Ensuring Compliance with Requirements, Regulations, Legislation, Rules and Best Practices

- Ensuring the preparation of Annual General Meeting of Shareholders (AGM) to be in accordance with applicable laws and AGM Checklist, corporate governance principles and any other best practices. In this regard, GC received a perfect assessment score of 100 on the 2019 AGM checklist, with a rating of Excellence, for the eight consecutive year from the Thai Investors Association (TIA).
- Ensuring that minority shareholders were given more than three months in advance of the 2019 AGM to propose AGM agenda items and nominate director candidates, from September 16 to December 31, 2019 according to the established criteria.
- Regularly monitoring and advising on corporate compliance practices in GC Group as well as supervising whistleblowing procedures for handling any compliances received from reporting channels to be line with Whistleblower Policy through the Committee Meeting in every quarter. The Committee also approved corporate compliance plan for the year 2020 in order to prevent and mitigate any risks resulting from noncompliance with laws, rule and regulations (Predictive Compliance).

2. Promoting Compliance with Corporate Governance Policy and Business Code of Conduct

- Monitoring GC Group's corporate governance practices to ensure alignment with the requirements and regulations of domestic regulators and international standards, including corporate strategies and business directions. The Committee also approved the 2020 corporate governance plan to determine operation, monitoring, and measuring governance actions for GC Group.
- Monitoring and providing recommendations for the review of adherence to Corporate Governance Code for Listed Companies 2017 (CG Code) issued by The Securities and Exchange Commission for further submission to the Board of Directors. The Committee also disclosed its corporate governance practices in the Annual Registration Statement (Form 56-1) and the 2019 Annual Report and annually revised Corporate Governance and Business Code of Conduct Handbook to ensure its up-to-date and suitable policies and practices.
- Commenting and advising on anti-corruption measures and corruption risk assessment in GC's procedures for the preparation of recertification process of the Private Sector Collective Action Coalition Against Corruption (CAC) for the third time within February 2020. The Committee also approved clear anti-corruption plans for the year 2020 which is suitable for GC's business context and in line with any other regulations, such as CAC project and the Transparent Organization project under the Office of the National Anti-Corruption Commission.
- Reviewing reports on compliance with good corporate governance principles in the Annual Registration Statement (Form 56-1) and the 2019 Annual Report to ensure complete disclosure and compliance with good corporate governance guidelines. As a result, GC continued to receive the mark "Excellence" on Corporate Governance Report of Thai Listed Companies (CGR) of Thai Institute of Directors Association (IOD).

3. Supervising Sustainability Practices

- Monitoring and advising on the Company's sustainable development to be in line with international standards, such as Dow Jones Sustainability Indices (DJSI), UN Global Compact and Carbon Disclosure Project (CDP) as well as reviewing every component of the Company's sustainability framework to ensure that it aligned with the global circumstance and rapidly evolving challenges.
- Overseeing the Company's business responsibility towards stakeholders under good corporate governance principles by continually advising and following up on performance through presentations as well as determining an assessment of stakeholders' confidence in GC's business conduct under good corporate governance principles for the purpose of planning to meet the expectations of stakeholders.
- Promoting and valuing stewardship of communities and society of Rayong, GC's operating base, with all sectors through CSR projects (Rayong Programs) designed to resolve problems and meet the expectations of Rayong communities. The Committee also advised and monitored the CSR projects through presentations and site visits. In 2019, GC continued its project, namely the Giving Back to the Society, in which the Company refrained from giving souvenirs to shareholders attending the AGM for the fourth consecutive year. Instead, GC donated Baht 100 for every attending shareholders, totaling Baht 553,000, to purchase medical equipment for Wang Chan Hospital in Rayong province.
- Advocating and providing recommendations on conscientious consumption of resources through a wide array of actions throughout the value chain under the theme of "Circular Living", aiming primarily to lead society in responsibly consuming plastics.
- Approving plans and indicators of GC's sustainability work for the year 2020 activities which cover all three sustainability dimensions (economic, social, and environmental) to maintain its position as a global leader (the Top 10 World Members in Chemical Sector by DJSI).

4. Reporting Performance, Assessment and Development

- Pre-setting the dates for its meetings for the entire year, arranging at least one meeting per quarter. Ad-hoc meetings were allowed to take place if necessary. In these meetings, the Committee considered and acknowledged the Company's performance and report as well as providing any recommendations to the Board of Directors and the Management.
- Reviewing the Committee's charter to ensure its contents align with their roles and duties and any applicable rules and regulations.
- Reviewing the corporate governance Committee's assessment questionnaires (group and self-assessment) as well as endorsing the revision of the board of directors' assessment questionnaires (group assessment, cross-assessment, and self-assessment) by an external consultant to be in line with CG Code.
- Reporting performance and both group and self-assessment results of the Committee for the year 2019 to the Board of Directors for their acknowledgment.
- Continuously ensuring director development under good corporate governance principles by encouraging them to attend training courses of Thai Institutes of Directors Association. In 2019, GC invited an external lecturer to share knowledge with directors on crucial technological risks concerning GC's business.

The Corporate Governance Committee places great importance on ensuring GC's strict compliance with Corporate Governance Policy and Business Code of Conduct. The Committee is also committed to continually enhancing corporate governance practices on par with international standards. GC believes that good corporate governance help promote the business operations efficiently while supporting sustainability in order that the Company shall earn the confidence of its stakeholders as well as international recognition.

On behalf of the Corporate Governance Committee

(Signed) Somkit Lertpaithoon
(Professor Somkit Lertpaithoon)
Chairman of the Corporate Governance Committee

REPORT OF THE NOMINATION AND REMUNERATION COMMITTEE

Dear shareholders,

The Nomination and Remuneration Committee comprised its chairman, namely Mr. Don Wasantapruerk and its committee member, namely Mr. Wittawat Svasti-xuto. On November 1, 2019, the Board of Directors' Meeting resolved to appoint Major General Nithi Chungcharoen as its committee member in replacement of Mr. Amnuay Preemonwong and to appoint Mr. Don Wasantapruerk as Chairman of the Committee.

In 2019, the Nomination and Remuneration Committee performed its duties according to its charter and executed tasks as assigned by the Board of Directors. The Committee held a total of five meetings to proceed the following matters.

1. Nominating Directors and Executives

- Nominating candidates to replace directors who retired by rotation at the 2019 Annual General Meeting of Shareholders (AGM). Shareholders were given a period of time more than three months prior to the AGM to nominate candidates for vacant positions. Since there were no submissions of candidates from shareholders, the Committee resolved to nominate General Chatchalerm Chalermsook in replacement of a retiring director. The Committee also resolved to nominate Mr. Prasan Chuaphanich, Mrs. Watanan Petersik, Mr. Don Wasantapruerk and Mr. Supattanapong Punmeechaow to be re-elected as directors for another term. The qualifications of these candidates were aligned with the Company's strategy. In this regard, the 2019 AGM resolved to approve the appointment of those candidates as directors as instructed by the Committee.
- Nominating suitable candidates, namely Mrs. Premrutai Vinaiphath, Mr. Kongkrapan Intarajang and Mr. Prapas Kong-ied, to replace directors who resigned during 2019 to the Board of Directors for appointment.
- Nominating directors to fill vacant positions on the Sub-committees. The Committee considered the qualifications of each director against the composition of each Sub-committees according to regulations of Stock Exchange of Thailand and the Securities and Exchange Commission, the Company's Articles of Association and the charters of Sub-committees. Directors' knowledge, expertise (Skill Matrix) and specialized experience that could benefit their role on the Sub-committees were also taken into account to nominate the said qualified directors to the Board of Directors for the appointment as Sub-committee members.
- Nominating candidates to be Chief Executive Officer (CEO) and President under transparent procedures before proposing to the Board of Directors for their approval.

2. Remuneration

- Considering and proposing the 2019 remunerations for the Board of Directors and for the directors of each Sub-committee as well as the Board's bonus for the year 2018. The proposed remuneration was determined based on the Board's performance, economic conditions, the Company's earnings, remunerations of directors working at other companies of similar sizes in the same industry and the Board's responsibilities. In this regard, the 2019 AGM resolved to approve the 2019 Board's remuneration and bonus for the year 2018 as instructed by the Committee.

- Determining remuneration of CEO for the year 2019 based on his performance and assigning responsibilities before proposing to the Board of Directors.

3. Performance Assessment of the Board of Directors and Executives for the Year 2019

- Considering and requiring the revision of the Board of Directors' assessment questionnaires (group assessment, self-assessment and cross-assessment) for the year 2019 by an independent external consultant to ensure that its assessment questionnaires are thorough, up to date and in line with Corporate Governance Code for Listed Companies 2017 (CG Code), Dow Jones Sustainability Indices (DJSI) and ASEAN Corporate Governance Scorecard. Apart from the Company's performance, its assessment results were used to determine remuneration of the Board of Directors.
- Establishing the Board's key performance indicators (Board KPIs) to be in line with CG Code, DJSI (Roles and Responsibility of the Board) for determining the 2020 Board's performance. In this regard, the Board of Directors resolved to approve the Board KPIs with effective from 2020 onwards.
- Assessing the performance of CEO and President for the year 2019 before proposing to the Board of Directors.

4. Performance Improvement and Development

- Pre-setting the dates for its meetings for the entire year, arranging at least three meetings per year. Ad-hoc meetings were allowed to take place if necessary. In these meetings, the Committee considered and acknowledged the Company's performance and reports as well as providing any recommendations to the Board of Directors and the Management.
- Revising the Committee's assessment questionnaires (group assessment and self-assessment) for the year 2019 to ensure that its questionnaires are thorough, up to date and in line with CG Code and DJSI.
- Requiring the Committee's assessment for the year 2019 and reporting its assessment results to the Board of Directors before disclosing on the Company's Annual Report.
- Reviewing the Committee's charter to ensure that its contents are thorough and in line with any applicable regulations that may have changed.
- Reviewing the determination of directors' Skill Matrix, which includes specialized experience necessary for the Company's operations to be in accordance with CG Code, DJSI and best practices on Nomination Committee of Thai Institute of Directors Association (IOD).

The Nomination and Remuneration Committee strives to perform its duties to ensure that its business operations are transparent and in accordance with good corporate governance principles for the utmost benefit of the Company. This will create sustainable value to the Company in the long run.

On behalf of the Nomination and Remuneration Committee

(Signed) Don Wasantapruerk

(Mr. Don Wasantapruerk)

Chairman of the Nomination and Remuneration Committee

REPORT OF THE RISK MANAGEMENT COMMITTEE

Dear shareholders,

PTT Global Chemical Public Company Limited (the “Company”) has confidence that the risk management represents a crucial tool to cope with volatility of global economy, uncertainties and emerging risks that seem increasingly complicated and severe. The Company values development and efficiency improvement of risk management together with enhancement of risk management awareness amongst the employees to create risk management culture and driving it towards business objective and goal achievement, preventing and minimizing losses and effectively finding business opportunities. In 2019, GC obtained the first rank in risk and crisis management section from the Dow Jones Sustainability Indices (DJSI) which GC also achieved the first rank of top global chemical companies. This represents our intention and how well we maintain our risk management system on par with international standard.

In 2019, the Risk Management Committee efficiently and independently performed all its duties within the scope of its roles and responsibilities and in conformity with its charter. The Committee held a total of six meetings to consider and acknowledge agenda items under its responsibility while providing comments and advice, highlighted below:

- Revised and endorsed risk management policy, objective, and framework for flexibility and compatibility with the current business circumstances; and endorsed revision of risk appetite statements to apply with strategic options selection, setting of objectives. Such statements also use as control mechanism for GC’s enterprise risk management.
- Closely monitored situations of Petroleum, Petrochemical and FX as well as provided recommendations for managing prices, spreads and FX risk. The RMC also adjusts hedging framework to more flexible and applicable with the fluctuated situation.
- Provided opinions and recommendations on risk assessment and risk mitigation measures for the high capital investment projects in support of investment decision-making namely Energy Recovery Unit Project by Global Power Synergy Public Company Limited (GPSC) and invest in the newly-issued ordinary shares of GPSC.
- Continually monitored 2019 corporate risk management as well as key risk indicators, while providing opinions and recommendations on risk management for alignment with and suitability for GC’s businesses
- Reported its own performance to the Board of Directors by quarter.
- Considered and recommended on 2020 corporate risk factors to align with GC’s targets and strategic direction, under the uncertainty of global economic and industrial trends.

For 2020, the overall petroleum and petrochemical industry still retains the volatility seen in 2019, particularly for oil prices, product price and spreads including uncertainties arising from e.g. both domestic and foreign politics, potential flaring of the US-China trade war, epidemic, drought as well as government direction and consumers behavior change to be environmental conservation. These factors directly and indirectly impact demand for GC’s products, so the Committee will be closely monitored and will provide opinions and essential recommendations to manage such factors.

All in all, the Risk Management Committee has adequately and properly fulfilled its roles as prescribed in the charter. A corporate risk management system has been developed and improved to align with standards and rapidly changing nature of the industry. Besides, the Committee continually monitored and commented on all aspects of the Company's risk management, embracing all key short-term and long-term risk as well as given equal attention to emerging risks potentially affecting GC's future businesses. Therefore, the Committee is confident that GC has suitable and effective risk management with a healthy risk appetite that will enable it to achieve its goals and continually create sustainable value to its business in the long run.

On behalf of the Risk Management Committee

(Signed) Prasert Bunsumpun

(Mr. Prasert Bunsumpun)

Chairman of the Risk Management Committee

GET READY FOR
ECO-FRIENDLY
LIFESTYLE



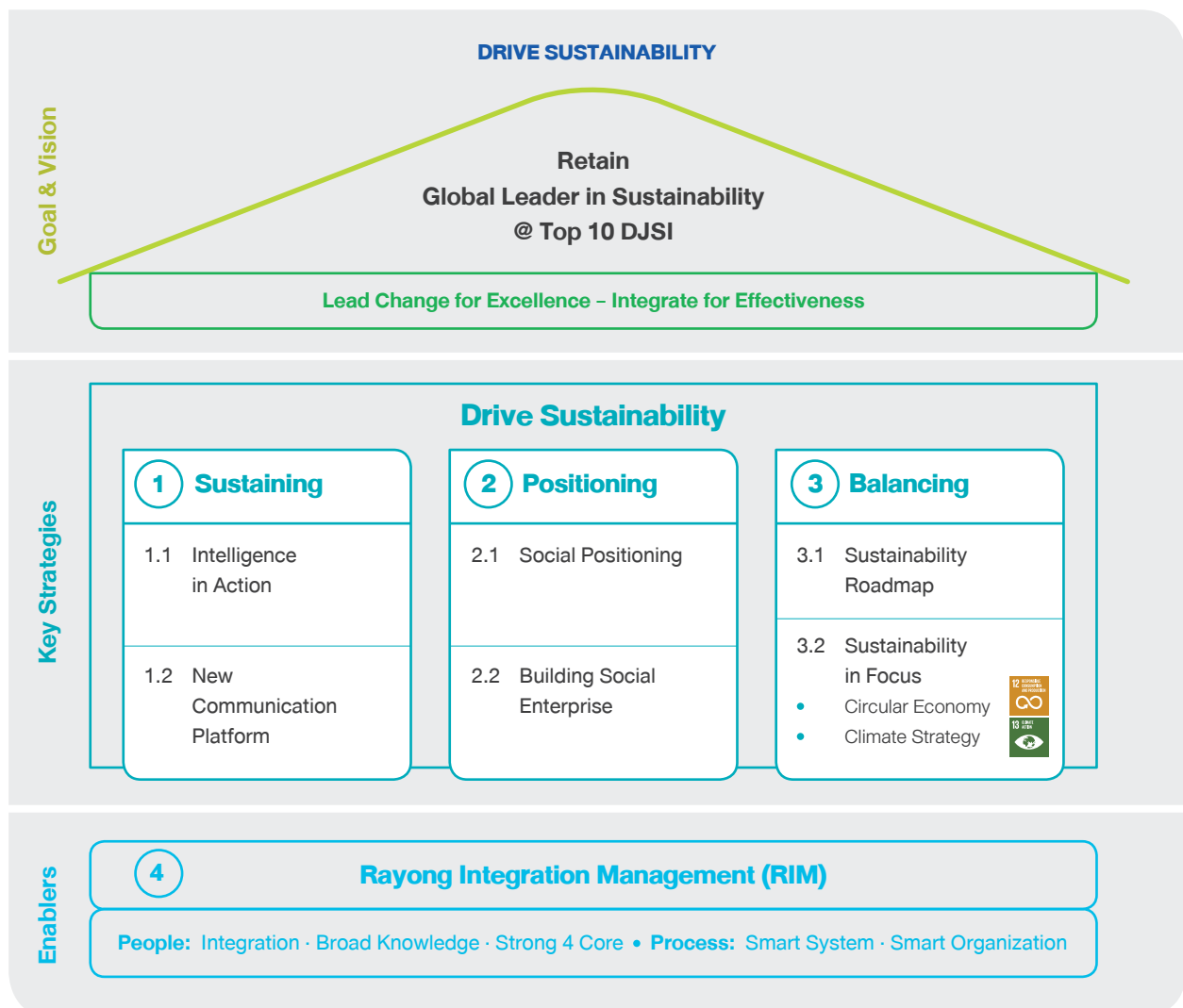
SUSTAINABLE DEVELOPMENT

SOCIAL RESPONSIBILITY AND SUSTAINABLE DEVELOPMENT

At GC, we have always pursued our businesses with sustainability as commitment to balancing the economy, social and the environment, known as the Drive Sustainability Strategy. Despite numerous challenges encountered in 2019, we were fully committed to adhering to our vision of being a leading global chemical company for better living. With this vision and commitment, we have become the world's number 1 role model for sustainable organizations ranked in Chemical Sector by the Dow Jones Sustainability Indices (DJSI), maintaining the Top 10 DJSI for the seventh consecutive year. Moreover, we are the only Thai business as a member of United Nations Global Compact at the LEAD level. In addition, we have won several awards on ESG (Environmental – Social –

Governance) by many local and international investors and institutions, including SET Sustainability awards of Honor from the Stock Exchange of Thailand (SET) for the third consecutive year, membership of the FTSE4Good (an investment index for outstanding performance on environmental, social and governance), and MSCI (Morgan Stanley Capital International), reflecting professional conduct on sustainability and a role model for the entire value chain, triggering expansion of sustainable development for the entire industry and the nation.

We pursue our sustainable development under four major strategies as follows.



STRATEGY 1: SUSTAINING

We have successfully become an industry leader in sustainable development; our first strategy is therefore to sustain this success. With a tremendous amount of data and a systematic database, integration with digital data analytics would multiply our competitive advantage and knowledge sharing, and in turn continuously improve the efficiency of data interface. We have already introduced digital data analytics to legal data and enhanced our communication by digitally interfacing with external digital media to better and promptly respond to more rapidly changing situations.

STRATEGY 2: POSITIONING

We are among the pioneers to introduce and promote the concept of Circular Economy in Thailand. We have initiated many projects promoting more of this concept with our partners. Our leading position has been widely accepted, evident in the Government invitation to help define the direction of Circular Economy for the country, a call by the Thai Industrial Standards Institute (TISI), Ministry of Industry, as a working team to help define standards of products under Circular Economy, and by the Ministry of Higher Education, Science, Research and Innovation as a leading private organization to help drive the BCG (Bioeconomy – Circular Economy – Green Economy) at the national level.

STRATEGY 3: BALANCING 2E1S (ECONOMIC, ENVIRONMENT, AND SOCIAL)

Under the global Sustainable Development Goals (SDGs), we have pursued our businesses with a fine balance in all dimensions, including the focus strategy following.

SDG GOAL 12: RESPONSIBLE CONSUMPTION & PRODUCTION



Our SDG Goal 12 is to promote among the industrial, business and consumer sectors recognition of efficient utilization of natural resources, the reduction of waste, reuse, and the after-use management of products such as the upcycling of plastic waste, which is an innovation to add value to plastic waste. From this strategy, we have been truly widely recognized as leader, invited to be partner with the governance and industries, and a role model for Circular Economy.

SDG GOAL 13: CLIMATE ACTION

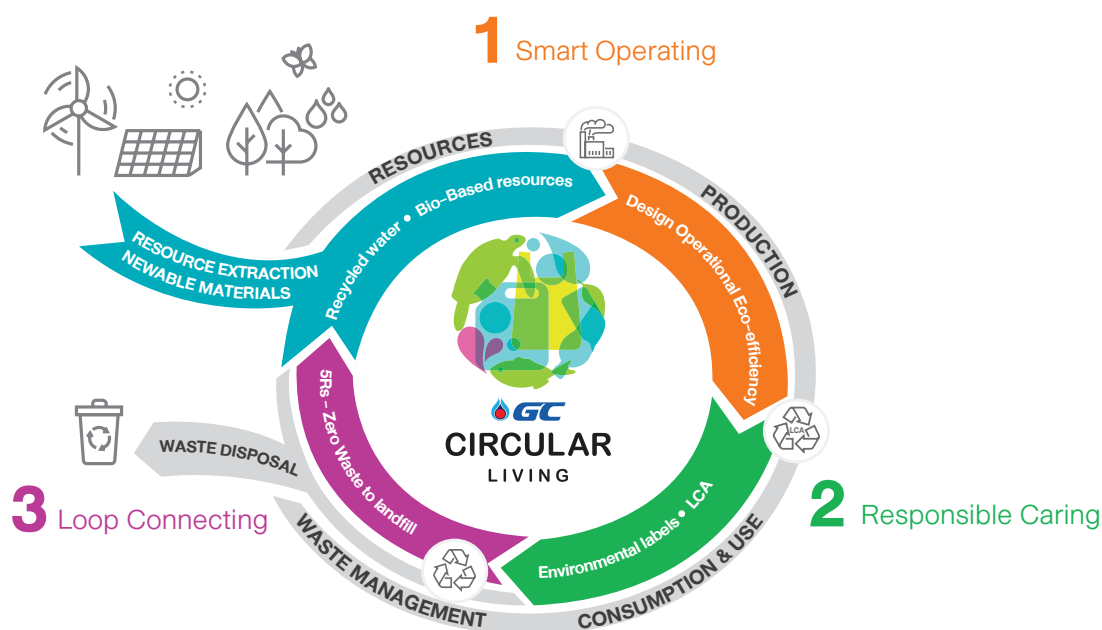


- Under the global's target to limit the global average temperature not to exceed 2 degrees Celsius by 2100.
- Under Thailand's ratification signed by the Thai Prime Minister at the Paris Agreement (COP 21) to reduce 20% of greenhouse gas (GHG) emissions by 2030.
- Our SDG Goal 13 is full of challenges, strategies directed to climate actions, and aligned with the Thai Prime Minister's ratification to reduce GHG emissions by 20% by 2030, with a base year (2012). This target focuses on both Scope 1 direct GHG emissions from our operations, and Scope 2 indirect GHG emissions from purchased energy which supply it to our operations. Our climate strategy target calls for reduction of GHG emissions per production by 52% (science based target), with a base year (2012), by 2050. This can be achieved by implementing controls of higher standards from the regulatory compliance level, increasing efficiency of energy consumption

through continuous improvement or more investment in environmental protection efficiency, installing solar rooftops for offices, warehouses and workshop facilities in Rayong, producing the low carbon product and having our carbon footprint of product certified. We successfully achieved all our targets under this climate strategy in 2019, evident in several outstanding awards, including the climate change management, A-List from Carbon Disclosure Project (CDP), Low Carbon and Sustainable Business Index (LCSi), excellence award from Thailand Greenhouse Gas Management Organization (Public Organization). These awards represent assurance of our commitment and active participation in national and international efforts to reduce negative effects of climate change.

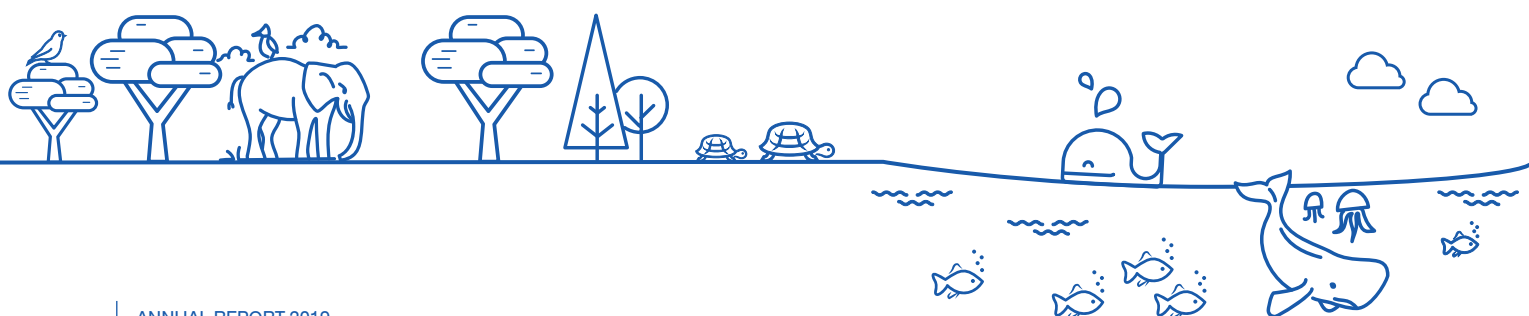
STRATEGY 4: RAYONG INTEGRATION MANAGEMENT

Recognizing the value of our strategic production facilities' location, the integration of our management in all aspects of the economy, environment, and social is focused on Rayong. We focus our work analysing and monitoring programs continuously both internal and external organizations. Our periodic surveys to assess community satisfaction have been routinely analyzed to define true needs of the communities and society to be incorporated with several business and development projects for the future. Our 2019 community satisfaction assessment yielded 90.10% satisfaction, constantly rising from the previous years, reflecting successes of our CSR projects and responses to community needs as well as improvement of the quality of life of society and communities in Rayong, in conjunction with the sustainable growth of our business.



**TO BE A ROLE MODEL
FOR CIRCULAR ECONOMY
THROUGHOUT THE VALUE CHAIN**

Further details of sustainability performance of GC can be found in Intergrated Sustainability Report 2019.



SAFETY, OCCUPATIONAL HEALTH, AND ENVIRONMENTAL MANAGEMENT

WITH ITS OPERATIONS ABIDING BY THE QUALITY, SECURITY, OCCUPATIONAL HEALTH, ENVIRONMENT, AND BUSINESS CONTINUITY POLICY (QSHEB POLICY) IN ACCORDANCE WITH INTERNATIONAL STANDARDS AND BASED ON GOOD CORPORATE GOVERNANCE PRINCIPLES AND STRICTLY ADHERING TO APPLICABLE STANDARDS, REGULATIONS AND LAWS ON SAFETY, OCCUPATIONAL HEALTH AND ENVIRONMENT, GC GROUP HAS WON PRAISE AND HONORS. THIS IS A TESTIMONY TO OUR COMMITMENT TO BUSINESS PRACTICES THAT STRIVES FOR EXCELLENCE.

QUALITY, SECURITY, SAFETY, OCCUPATIONAL HEALTH, ENVIRONMENT, AND BUSINESS CONTINUITY POLICY

GC is committed to conducting business to become a chemical industry leader and to be an innovative organization with corporate social responsibility (CSR) and to improving the effectiveness of quality, security, safety, occupational health, environment, and business continuity as follows:

1. Comply with quality, security, safety, occupational health, environment and business continuity laws and regulations, as well as applicable standards and requirements.
2. Implement total quality management (TQM) with quality, knowledge and productivity management tools to satisfy our customers and develop environmentally friendly innovations.
3. Manage risk management to prevent danger, work-related illnesses, accidental losses, injuries and property damage, while fostering the B-CAREs safety culture and exercising Process Safety Management (PSM) to ensure the safety of every person.
4. Be vigilant over security threats so as to protect lives, assets, data and business continuity.
5. Focus on good occupational health and working environment, including the promotion of good health and a happy in workplace.

6. Assess and prevent environmental impacts, ecosystems and sustain biodiversity by focusing on improvement, prevention and reduction at the sources, including the use of resources, energy, water and waste management following the principles of Circular Economy. GC aims to increase its efficiency to reduce greenhouse gas (GHG) emissions and the ability to adapt to climate change. It is determined to foster an environmental culture by disseminating information and encouraging its employees and stakeholders to be aware of and participate in the corporate environmental culture.

All executives are responsible for achieving GC's objectives and goals, serving as role models for development and the maintaining of quality, security, safety, occupational health, environment and business continuity (QSHEB) management systems by supplying sufficient resources so that all employees may be involved in the implementation of this policy as well as communication of the QSHEB results to relevant parties thoroughly.

The summary of the occupational health and environmental safety management in 2019 is as follows:

1. SAFETY MANAGEMENT

1.1) PERSONAL SAFETY

GC focuses on proactive occupational health and safety to reduce the risk of accidents from operations such as losses from workplace injuries. Therefore, it has established guidelines for managing safety in production processes and personal safety covering staffs, contractors and suppliers as well as developing a monitoring system to check and assess safety by the integration of various systems to become the GC Management System (GCMS) so that production operations standards may be maintained with safety and effectiveness, thus achieving GC's "Zero Accident" goal. In 2019, the Company has completed many safety projects as follows:

- **SAFETY CULTURE PROMOTION PROGRAM TO INCREASE SAFETY AWARENESS (B-CARES STRENGTHEN)**

The Company has promoted various safety activities under B-CARES to develop skills and raise awareness among employees and contractors to emphasize the safety culture. To this end, senior management has valued and paid attention by visiting production operation areas. This effort fosters and drives a culture of safety responsibility through the Management Safety, Energy and Reliability Walk activity which are the key to a sustainable safety culture. This activity is organized every Thursday and circulated to all areas of the GC Group to demonstrate the Felt Leadership of the management among employees and contractors.

- **LIFE SAVING RULES**

Since 2017, the Company has analyzed incident statistics, substandard actions and conditions, comparing with the global standards to enhance the improvement of safety culture to cover employees and contractors operating at sites. Life Saving Rules is composed of 4 clauses including: 1. Strictly complying with the instruction as indicated in the work permit; 2. Working in confined spaces must receive permission and there must be monitoring of confined spaces atmosphere before working; 3. Checking energy isolation before initiating work; and 4. In case of working at high ground, there must be Fall Arrestor standard. The rules have put into practice for further continuous improvement and preventing the risk of mortality. At present, the program is integrated

with various safety auditing systems, such as Management Line Walk, Field Risk Assessment, and Understand Risk Program. The assessment reports were summarized and presented to the management for further monitoring and systematic actions.

- **SAFETY AWARENESS PROJECT FOR SUPERVISORS (SAFETY IN LINE OF COMMAND)**

The Company has analyzed accidents statistic and found that most recordable accidents had happened to contractors. To follow the steps of work correctly, the Company has organized a Supervisory Skill Workshop to raise safety awareness to operators (supervisor level) who are responsible for controlling worksite safety.

- **CONTRACTOR SAFETY PARTNERSHIP PROJECT**

GC promotes a good safety culture and disseminates knowledge on the management and prevention of proactive accidents to contractors and partners.

- **HAND INJURY PREVENTION PROGRAM**

The Company promoted the sharing of experience among the company, companies under GC and contractors of business partners, resulting in the development of special tools and effective practices which effectively reduced hand-related accidents, the major accidents happened in GC Group.

- **UNDERSTAND RISK PROGRAM**

The company has prepared the risk assessment program to ensure its operation in every situation. Under the program, operators were asked to assess their knowledge so that they would be

Life Saving Rules



Hand Injury Protection Program

aware of on-site risk (Understand Risk). This would prevent an occurrence of accidents in every step of the operation from the beginning of a work permit, toolbox talk, before working and while working.

- **GC GROUP SEEK DAY 2019: YEAR TO MOVE FORWARD**

GC organized the GC Group SEEK Day 2019 (Safety, Environment, Energy and knowledge management day) to enhance the awareness of safety, occupational health, and the environment under the PSM and B-CAREs safety culture. The CEO and President have recognized and presented awards to outstanding employees who exemplified safe working and care for the environment, as well as exhibition contests from business units, able to exchange knowledge, foster pride for being a part of the success of safety, occupational health, and environmental performance.

In addition, factories in GC Group have won the Outstanding Safety, Occupational Health and Work Environment Award: Gold Level for the 21st consecutive year (1998 - 2019), representing the ongoing national outstanding safety performance.

With the extensive implementation of safety, occupational health, and environmental management, GC's 2019 safety performance has been ranked in the first quartile internationally with the Total Recordable Injury Rate (TRIR) of 0.05 person per 200,000 working hours. In addition, GC also adjusted its operation management and emphasized these projects to employees and contractors to adhere to safety principles. To achieve the goal to become a zero-accident organization, GC also encourages its employees and contractors to participate in all levels of safety projects.

1.2) PROCESS SAFETY

GC continuously strengthens the safety standard system in production processes to ensure that they are efficient and aligned with the 5-Year PSM Roadmap developed in 2017. The last three years' performance showed that GC had achieved its target of reducing accidents in production process. Examples of outstanding projects in 2019 were the Field Risk Assessment (FRA) project and the Smart PSE project. These projects is aimed at improving the Company's safety standard to achieve its goal of becoming a Zero Accident Organization. The details of these projects are as follows:



GC GROUP SEEK DAY 2019

- **FIELD RISK ASSESSMENT (FRA) PROJECT**

The Company has collaborated with DuPont experts to create an FRA project. This project were implemented to enhance the knowledge and capability of operation staffs to increase the observation ability and recognize the risks and potential impacts of deviations from the standards or specified work procedures as well as to increase the Barrier of Protection, reducing the accident risk in the production, regarding personnel, equipment or facility and technology. The goal of the FRA project is to reduce process accidents and workplace injuries from Process Safety Event. The Company collected all sharing issues to create guidelines for improving safety standards and safety engineering design.

- **THE SMART PROCESS SAFETY EVENT (PSE)**

GC developed digital systems to support the Integrity Operating Window (IOW) management for maximum efficiency and effectiveness. The systems can monitor Process Safety Near Miss (PSE Tier3b) to monitor and forecast the possibility of an accident, including the establishment of appropriate risk mitigation measures that prevent the Company from equipment damage or process disruption. In addition, the system could be applied to assess the devices' lifetime and inspection planning.

- **IMPLEMENTATION OF THE BOW-TIE DIAGRAM**

GC adopted Bow-Tie risk analysis to analyze the risks of danger or possible accidents and the impacts of such events that could lead to any Catastrophic Event or a Major Accident Event (MAE). Furthermore, Bow-Tie Diagram could also assess the effectiveness and adequacy of equipment as well as incident management

measures, which help communicate information to those responsible persons in all sectors, including those that may be affected so that they have an overall understanding of risk management. In case of an incident, the Bow-Tie Diagram also analyzes its causes and evaluates management practices that result in the lowest acceptable impacts (As the Low As Reasonably Practicable: ALARP).

1.3) FIRE-FIGHTING AND EMERGENCY CRISIS

- **EMERGENCY MUTUAL AID GROUP: EMAG**

GC is a founding member of Emergency Mutual Aid Group (EMAG), established as a center for industries in Map Ta Phut municipality, to cooperate and support others in emergencies. GC actively participated in drafting an Emergency Plan for Rayong province and an Emergency Action Plan for Map Ta Phut Industrial Estate Group. GC, in collaboration with a group of industrial plants in the Map Ta Phut area to help nearby communities set up and conduct emergency response drills at the Rayong provincial level. In addition, the Company has designated employees with expertise in emergency response and mitigation to support the Governor of Rayong, Rayong Province Disaster Prevention and Mitigation Office, Map Ta Phut Municipality, and group of industrial factories in Map Ta Phut to help support the community in creating their emergency plan and rehearse plans in case of accidents from the industries affecting the community.

- **SECURITY DRILLS FOR INTERNATIONAL SHIP AND PORT (NASMAX)**

GC has organized drills for international ship and port security plans (NASMAX) with government agencies, local administrative organization, ships and ports by identifying the ocean threats, determination of measures to prevent risks to ships or ports, and continual improvement of security measures of GC and ports to achieve maximum efficiency in line with the International Ship and Port Facility Security Code (ISPS Code).

- **BUSINESS CONTINUITY MANAGEMENT SYSTEM (BCM)**

The Company has implemented the Business Continuity Management System for its readiness, and ability to coordinate, respond to situations, and recover effectively after the incident so that business can continue operating smoothly, by establishing a structure to define responsible parties in various fields in a form of the Business Continuity Plan (BCP) as a business recovery standard for all GC Group's plants.

- **PROACTIVE FIRE-FIGHTING RELIABILITY AUDIT**

GC provided the inspection of a proactive fire-fighting equipment system to improve the readiness for use which meets the standard as well as providing a contingency plan for critical equipment or systems. GC also established guidelines for inspecting and testing the fire-fighting system, leveraging appropriate manuals.

- **INTEGRATION OF TECHNOLOGY INTO SAFETY MANAGEMENT**

The Company integrated technology and innovation into safety management to improve safety systems for prompt risk analysis as well as quick, accurate monitoring, thus reducing the risk of production accident and workplace injuries. These projects include Smart PSE, Safety Now, E-FRA and the Bow-Tie Diagram.

2. OCCUPATIONAL HEALTH MANAGEMENT

GC places importance on employee health and committed to continuously Developing its practices to be in line with international standards. It has therefore adopted and applied the Health Performance Index (HPI) from IPIECA - IOGP, a system for assessing the standard of occupational health management to the Company's operations, which is in line with the Sustainable Development Goals of the United Nations 3: Health and Well-being (UN SDG 3: Good, Health and Well Being).

The Company has developed computer software to improve the efficiency of occupational health management as follows:

- **HEALTH RISK ASSESSMENT SOFTWARE:** The software is created for health risk assessment and reviewed the prevention of work-related illness measures especially among process operators. In addition, the result assessment could be use to review of employees' health checkup programs as a way to proactively assure employees' good health. Data were also used to review our work areas' industrial hygiene measurements to ensure a safer work environment.
- **E-HEALTH BOOK**
Utilization of information technology for collecting employees' health information was made available electronically for ease of access and able to analyze for making the appropriate health promotion project for employees.
- **SAFETY DATA SHEETS (SDS)**
SDS is a chemical safety information system where employees can quickly and thoroughly search and easily access information for the safe use of chemicals.
- **MEDICAL CLINIC SERVICE**
The system collecting employees' medical data of those received medical treatment at a medical facility of the Company. It enables data analysis for future health care planning.

The Company continuously organizes health promotional activities for employees and contractors with the goal for employees and contractors remaining healthy and being more efficient at work. This is part

of organizational development for sustainable business excellence. Health promotional activities are as follows;

- **HEART CONSERVATION PROJECT**
This project assesses the risk of cardiovascular diseases of all employees by medical specialists so that they can provide cardiovascular diseases advise and follow up treatment for at-risk groups.
- **PLOGGING PROJECT**
This project encourages employees to exercise by running and collecting trash on the beach and in the communities. It enables employees and communities to develop good interaction with each other.
- **IMPROVEMENT OF ERGONOMICS**
This project improves the working postures of employees in line with the principles of ergonomics to reduce the risk of the Office Syndrome.
- **MEDICAL ASSISTANCE PROGRAM**
The Medical Assistance Program (MTA) is designed to help employees who suffer from treatment by specialized medical team. The team would analyze employees' data and provides appropriate and timely treatment.

In addition, GC has the monitoring measures for the seasonal influenza situation that is spread every year in Thailand. To this end, GC has carried out free vaccination against influenza for all employees, directly hired contractors, and their family members. This effort demonstrated GC's care for employees and their families.

3. ENVIRONMENTAL MANAGEMENT

GC is committed to becoming a leader in the international chemical business with environmental stewardship for sustainable development. GC also aims to become a leader in the management and development of environmentally friendly product design , and indeed operates its business in compliance with national and international environmental standards and requirements as well as the National Economic and Social Development Plan No. 12 (2017-2021), the 20-year National Strategic Plan for 2017-2036, and Sustainable Development Goals (SDGs) set by the United Nations as follows:

GC Plogging Project



3.1) ADHERENCE TO ENVIRONMENTAL STANDARDS AND REQUIREMENTS

GC values the prevention of environmental impacts by implementing control and protection from the design stage before project commencement. This includes a comprehensive environmental impact study with different dimensions of projects in the Environmental Impact Assessment report (EIA). GC strictly implements measures to prevent and reduce impacts as well as regularly reporting the results of the implementation of the measures to governmental authorities. The Company implemented the ISO 14001: 2015 Environmental Management System and adopted other international standards, guidelines, and good practices such as the Environmental, Health, and Safety Guidelines issued by the International Finance Corporation (IFC) of the World Bank group.

3.2) PROACTIVE ENVIRONMENTAL MANAGEMENT (PEM) AND SUSTAINABLE DEVELOPMENT INDICATORS

Since 2008 GC has adopted the philosophy of resource management along with sustainable business operation known as Eco-efficiency from the Manual of the United Nations Conference on Trade and Development (UNCTAD) as indicators of environmental performance. The intention is to improve the use of resources for maximum efficiency and reduce the environmental impacts caused by the activities and production processes under Circular Economy concept. Meanwhile, the Company developed an Environmental Performance Database under the framework of Global Reporting Initiative (GRI) Standards which is in line with UN SDG 12: Responsible Consumption and Production. GC together with all factories under GC Group is the first petrochemical and refinery organization in Thailand that conducted accounting, measurement, and reporting of Greenhouse gas (GHG) emissions and reduction in accordance with ISO 14064-1: 2006.

In addition, the Company has arranged proactive environmental management plans in both plants and its surrounding areas by applying Circular Economy concept as base guidelines to maximize the benefit of resource utilization, control environmental quality to better than standard and reduce impacts on the environment and communities. The example of operations are as follow:

- **AIR QUALITY CONTROL**
CONTROL AND REDUCTION OF VOLATILE ORGANIC COMPOUNDS (VOCs)

The Company controls and reduces volatile organic compounds (VOCs) at sources, beginning with the annual accounting of VOC sources. In case of TVOCs exceeding the control limit, which is more stringent than the governmental limit, the Company immediately fixes equipment to reduce potential impacts and implements a maintenance program of equipment to minimize VOCs arising to the atmosphere. GC has installed a Vapor Recovery Unit (VRU) and a Vapor Return Line to transport the vapors of hydrocarbons potentially which might be emitted into the atmosphere, and brought them back into the storage tank for proper use or proper management. In addition, the Company has installed bio-filter technology to control and treat VOCs in the process area and the wastewater treatment plant of the factory by decomposing vapor or Hydrocarbon compound of microorganism in order to limit odor in the community and environmentally friendly. To further control and reduce VOCs, GC and five petrochemical industrial estates and one port in the Map Ta Phut area have initiated a pilot project to manage benzene vapor release by using Code of Practice (COP) measures to help solve benzene release problems from industrial plants. This effort demonstrated care for the community, society, and environment.

Installation of New Bio-filter at Unit 5600



AIR POLLUTION MANAGEMENT

GC has promoted the reduction of air pollution, both internal and external, improving the production processes to produce cleaner fuels to meet the EURO 5 standard. GC also aims to limit the content of sulfur, a component of diesel fuel, to a maximum of 0.5 percent by weight by 2020 which is in accordance with the International Maritime Organization (IMO) and the fuel quality improvement measures required by the Department of Energy Business, Ministry of Energy.

- **NATURAL RESOURCES MANAGEMENT**
EFFECTIVE USE OF RESOURCES UNDER CIRCULAR ECONOMY CONCEPT

GC aims to manage resources efficiently for the utmost benefits. To encompass the product development stage and minimize potential waste by exchanging between GC's products, raw materials, and fuels derived from production process. This effort added value between plants. For example, the aromatic plant increases the value of its Off-Gas by transporting Ethane, Butane and Propane for use as feedstock for the Olefins plant instead of burning it. This resource utilization effort adds 107 million Baht per year. Furthermore, GC's refinery receives Heavy Residue produced from the Phenol plant as raw material for fuel oil.

IMPROVEMENT OF WASTE MANAGEMENT

GC is committed to minimizing environmental impacts. Since 2015 the waste management effort of the company has achieved zero industrial waste to landfill and continue proceeding until now. Moreover, the Green Turnaround Management project implemented preventive measures and reduced environmental impacts derived from the maintenance of machinery and equipment, including waste management, both in process areas and in administrative areas. For example, the Green Insulation is an effort to reuse insulators by improving the method to remove and store them so that they may remain in good condition and reusable. In 2019, it was found that this year more than 70 percent of the insulators recovered from turnarounds are reusable. In addition, the company has changed food containers to reduce the use of single-use containers by more than 200,000 Baht saved in 2019.

STAKEHOLDER COLLABORATION

GC encourages and emphasizes the community and youths to value recyclable waste with maximum usage efficiency, for example, the Waste Bank pilot project by community enterprises, which is a model of waste management for community and school project, provides the opportunity for communities and schools to learn and cultivate environmental conservation. Students learn proper basic waste segregation as well as supporting community enterprises to monetize recyclable waste for further distribution of income to communities and society.

- **WATER MANAGEMENT**
INTERNAL WATER MANAGEMENT

GC has a policy for sustainable water management under the 3Ws: efficient use of water throughout the production process (Water-Saving), seawater desalination to reduce the use of freshwater (Water Innovation), and assessment and reduction of impacts from water usage throughout the product lifecycle (Water Stewardship) for water usage efficiency. The Company implemented a project on efficient use of water and innovation in water management, such as the installation of reverse osmosis to recycle water for use and reduce wastewater disposal. In 2019, the Company could use the recycle water counted as 32 percent of the Water Circular Index. In addition, the Company continues monitoring and controlling the water quality required by law through COD online before disposing it outside the plants.

EXTERNAL WATER MANAGEMENT

GC cooperated with all sectors to integrate and promote the conservation of watershed areas, using the 2Ws approaches: water management through integration efforts (Water-Related) and sustainable watershed conservation (Water Conservation). For example, Khao Huai Mahat Forest Conservation Project aimed to restore the fertility of the watershed and promote biodiversity. The project further covered community education on the conservation of natural resources with reforestation and weir-building activity by the Company, community, and government using the winged-plastic sacks, a GC product.

SUSTAINABLE WATER MANAGEMENT

The policy of water management both inside and outside the Company under the 3Ws + 2Ws concept aimed to ensure the water sufficiency for all sectors. This aligns with UN SDG6: Clean Water and Sanitation. GC has evaluated the risk of water management (quantity and quality) of Map Ta Phut area by using a Water Risk Map through Aqueduct Water Risk Atlas and WBCSD Global Water Tool, developed by the Water Risk Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) to assess risk and plan for water usage efficiency. Furthermore, the Company is a member of the water task force (Water War Room) and a member of the Water and Environment Institute for Sustainability (WEIS) to closely monitor and report the water situation so that the water management project is propelled to ensure uninterrupted business operation on water supply. These ongoing efforts resulted in GC recognized as a Water Disclosure Leader. It reflected corporate excellence and transparency. GC was also certified for water use throughout the product lifecycle under a Federation of Thai Industries project.

3.3) LEADER IN SUSTAINABLE ENVIRONMENTAL MANAGEMENT

• CLIMATE STRATEGY

GC recognized its leadership role in dealing with climate change. With its energy management policies, the Energy Conservation and Efficiency Project was designed to support the government in attending the Conference of the Parties 21 on Convention on Climate Change (COP 21), which aimed to control the global average temperature rise to not exceed 2 degrees Celsius from the previous level of the Industrial Age. The Company also aimed to reduce GHG emissions based on the Science-Based Targets Initiative in which GC voluntarily reduced GHG emissions derived from each product by 52 percent within 2050 as

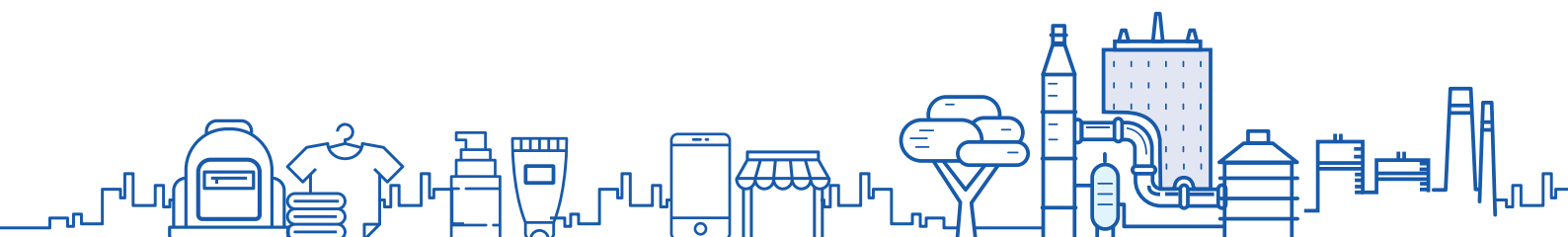
compared with base year 2012. In addition, GC planned to reduce GHG emissions by 20 percent within 2030. GC also implemented climate change management process, which is in line with GC's 5-year strategic plan and UN SDG13: Climate Action. With the Company's continuous effort under a policy regarding climate change management, GC has become Climate Disclosure Leader which reflects the fact that GC is excellent organization and continues to disclose the information transparently.

APPLYING TECHNOLOGY TO REDUCE GREENHOUSE GAS EMISSIONS

GC selected new High Selectivity Catalysts (HSC) to reduce raw material usage and CO₂ emissions that have negative impacts on the environment. GC also delivered CO₂, a byproduct from the production, to manufacturers for the production of purified CO₂. In addition, GC sold CO₂ to other manufacturers for the production of Sodium Carbonate in order to further reduce GHG emissions, which is considered a beneficial use.

• CIRCULAR ECONOMY

GC recognizes the importance of transitioning to the future of Circular Economy in Thailand. GC then established corporate strategy, under circular economy concept, to drive business, focusing on maximizing the benefits of resource utilization, re-using and recycling used resources within the organization and minimizing waste by implementing the 5Rs policy (Reduce, Reuse, Recycle, Refuse, Renewable) which aligns with the United Nations Sustainable Development Goal 12: Responsible Consumption and Production. Additionally, GC strives to become a leader in applying circular economy concept under BS 8001 Framework. In this regard, GC, alongside with Chulalongkorn University, implemented strategic plan and preliminary operational guidelines regarding circular economy so that GC would become circular economy leader.



- **PRODUCT STEWARDSHIP**

GC is committed to producing environmentally friendly and consumer healthy products with due regard to the impacts of products that may have arisen throughout the value chain by implementing product stewardship policy. For five years, this policy has been considered as guidelines when managing and operating its business as well as manufacturing products with due regard to environmental impacts and safety throughout the product life cycle. GC also applied the Life-Cycle Assessment (LCA) for all products to better serve future customer's demand for environmentally friendly products. In addition, all GC products have been certified with the Carbon Footprint of Products (CFP) since 2014 and Carbon Footprint Reduction (CFR) label from the Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) under the Ministry of Natural Resources and Environment.

- **SUSTAINABLE ENVIRONMENTAL MANAGEMENT AND EXPANSION TO ALL SECTORS**

With a commitment to conducting its business operation in an environmentally manner for sustainable development and driving its integrated sustainable environmental management throughout

all sectors of society, all GC plants were continuously certified "Eco Factory Certification" from the Federation of Thai Industries since 2015 in order to support and promote Eco Industrial Town. GC was also certified for Green Industry Level 5 which is the highest level from the Ministry of Industry since 2016, demonstrating its commitment to becoming a leader of Green Network. Companies under GC was also continued to be certified for Green Industry.

In 2019, GC was ranked at the top of the global chemicals sector for sustainability by Dow Jones Sustainability Indices (DJSI). It demonstrates that GC succeeded in operating its business while considering quality, safety, occupational health and environment throughout the value chain. It also shows that GC has been recognized as a leader of the chemical industry and innovation organization with due regard to the society and communities. This will lead to a leading provider of chemistry for better living. GC would further be regarded as a role model in raising sustainability awareness among related parties so that they can operate its business sustainably or apply sustainability practices to their business concretely.

GC becomes Industry 4.0 factories certified organization



GC becomes Green Industry Level 5 certified organization under Ministry of Industry

A BRIGHTER
FUTURE FOR
**OUR NEXT
GENERATION**



**FINANCIAL
EXCELLENCE**

AUDIT COMMITTEE REPORT

Dear Shareholders,

PTT Global Chemical Public Company Limited (GC), is a leading chemical business that focusses on fostering quality of life and is committed to achieving sustained growth in business while adhering to Good Corporate Governance and being responsive to all stakeholders. GC has appointed the Audit Committee and the Internal Audit Function to perform the audit duties and encourage the Company to have in place Good Corporate Governance and have sufficient risk management and internal control, comply with legal and regulatory requirements in doing business in line with good corporate practices of the Securities and Exchange Commission and the Stock Exchange of Thailand.

The Audit Committee of the PTT Global Chemical Public Company Limited (GC) is comprised of 3 independent directors who are eminent experts from various backgrounds such as Accounting and Finance, Business Management and Legal, per announcement of the Capital Market Supervisory Board B.E.2551 (2008).

The Audit Committee dispenses their duties in an independent, objectivity and objective manner as prescribed in the Audit Committee Charter and as directed by the GC Board of Directors. In 2019, the Audit Committee supported the operations of the Internal Audit Function by focusing on the development of the Internal Audit Works in building trust and creating long-term added-value to the organization by considering the requirements of the stakeholders holistically, of which the key areas are:

- Supporting the re-organization of the Internal Audit Functions, to achieve agility and readiness for internal and external organization changes that may impact GC.
- Approving the principles and use of the Way of Conduct as a guideline to govern, manage and align the Internal Audit operations of the subsidiaries.
- Advocate the introduction of Information Technology into Internal Audit works to drive the Internal Audit towards working with Robotic Process Automation (RPA) and moving forward with technology.
- Advocate the introduction of Data Analytics as an integral part of developing the Internal Audit works as well as the employment of external Internal Audit experts to share their knowledge and advanced practices in Internal Audit in order to continuously uplift the quality of Internal Audit works and aligned with international standards and best practices in Internal Audit.
- Advocate training and development, and skills enhancement of the internal auditors to achieve professional certification related to Internal Audit works to be well-versed and abreast of current and future changes.

In 2019, nine meetings of the Audit Committee were organized in which the management, the Internal Audit function and other business units participated. Special sessions were also held in private with the financial auditor without the management's presence. Minutes of the meetings recorded questions, observations, and recommendations which were presented to the management and the Board of Directors for acknowledgment and further actions as appropriate. Key achievements of the Audit Committee in 2019 can be summarized as follows:

1. Audit of Financial Reports

The Audit Committee reviewed the key financial highlights of the Quarterly Reports, 2019 Fiscal Financial Statements, the Consolidated Financial Reports, the Connected Transactions, and Transactions that may be Conflicts of Interests between business groups, that have been prepared in accordance with Thai Financial

Reporting Standards. The Financial Auditor and management both report that the Financial Reports including the disclosure of notes to the Financial Reports are all in accordance with the financial reporting standards. Thus, the Audit Committee approved the Financial Reports that the Financial Auditor has reviewed and gave unqualified opinions. Additionally, the Audit Committee further recommended that the Financial Auditor prepare themselves for the audit of financial reports in accordance with the new Thai Financial Reporting Standard (TFRS) Number 9 regarding Financial Instruments and Thai Financial Reporting Standard (TFRS) Number 16 regarding Leases that will be in effect as of 1 January 2020, onwards.

Furthermore, the Audit Committee also held a private meeting without the management's presence, to independently discuss the obtaining of information, the review of significant information, the preparation of the Financial Report, the disclosure of information as required by financial reporting standards and to be of useful to those who access the financial report. Discussion was also made on Key Audit Matters discovered from the audit of financial reports, Group Business Audit, Inventory Audit, Inter-personal or Inter-related Businesses Transactions, effects of the new Accounting standard that will be imposed, as well as the independency in performing of duties and the acknowledgment of information from Internal Audit activities, to all of which the financial auditor did not have any significant observations nor were there any suspicious actions.

2. Audit of Risk Management

The Audit Committee acknowledges the Corporate Risk Management Report from the Risk Management Committee as presented to the meeting of the Board of Directors that covered the Corporate Risk, Key Risk Indicator, Performance Risk Management, etc.. Additionally, the Audit Committee also reviewed the formulation of the Corporate Risk Appetite and Corporate Risk Tolerance of the Corporate Risk Management and provided recommendations for the advancement of the Corporate Risk Management works.

3. Audit of Internal Control System

The Audit Committee has reviewed the Internal Control Report that the Internal Audit Functions has reported that covers Operations, Information Technology as well as the assessment performed by using the Assessment Form of the Office of the Securities Exchange Committee and the Stock Exchange of Thailand that was completed by the management and found that the Internal Control was sufficient and adequate for the business operations of GC and is per Financial Auditor's comments as reported in their assessment and no issues nor significant discrepancies were found that could impact the Financial Report.

4. Audit of Corporate Governance

The Audit Committee has performed a review of Corporate Governance from the Whistleblower Report of the Company and subsidiaries and directed the disclosure of complete information per requirements of the Audit Committee. Additionally, the Audit Committee has reviewed the Corporate Self-Assessment Report on Anti-Corruption Measures for accuracy and adequacy, and the Chairman of the Audit Committee

has certified them with his signature and submitted to the Board of Directors for further submission to the CAC: Thailand's Private Sector Collective Action Coalition Against Corruption, as a part of the membership status re-certification that will be due in 2020. Furthermore, the Audit Committee also promoted and supported the subsidiary companies to join Thailand's Private Sector Collective Action Coalition Against Corruption. In 2019, four subsidiary companies announced their intention to join the CAC, and more shall follow in the years to come.

5. Governance of Internal Audit Works

The Audit Committee has supervised and overseen the works of the Internal Audit to assure that they are efficient and abreast of the current situation. The Audit Committee also approved of the strategy and targets, Annual Audit Plan, and Internal Audit Reports of the Internal Audit Function. Furthermore, they also provided constructive queries, observations, recommendations, as well as following-up on important corrective issues to enable Good Corporate Governance and increase the efficiency of the Internal Audit works. The Audit Committee supports the uplift of Internal Audit works towards becoming a Trusted Advisor and also the utilization of Data Analytics for use in auditing and application of the Continuous Control Monitoring and Auditing System (CCMS) in auditing as well to screen and continuously monitor irregular items and making corrections to improper transactions immediately as they are discovered. In 2019, the Internal Audit Function carried out additional IT General Control or ITGC audits as well as expanding the scope of the CCMS to cover the "Order to Cash" process.

6. Auditing Legal Compliance

The Audit Committee reviewed the business operations of the Company for compliance with laws and regulations on securities and Stock Exchange, requirements of the Stock Exchange of Thailand, as well as other laws related to the Company's business operations through various reports from the Internal Audit Function and insisting on the monitoring of new legislation coming into effect in the future – domestically and overseas in countries where the Company invests. Overall, the Audit Committee is of the opinion that no cases of legal non-compliance have been found that may affect the Company.

7. Appointment of Financial Auditor

The Audit Committee annually nominate candidates to be the Company's auditor to the Board of Directors, who then proposes these nominees to the B.E.2562 (2019) Annual General Meeting for appointment and the AGM unanimously approved of the selection of Deloitte Touche Tohmatsu Jaiyos Audit Co., Ltd., to be the B.E.2562 (2019) Auditor for the Company and subsidiaries – except for some subsidiaries in overseas locations.

In consideration of appointing financial auditors, candidates are scrutinized for their qualifications, including their knowledge, capabilities, business auditing experience, proposed auditing guidelines, independence per accounting ethics of the Federation of Accounting Professions and requirements of the Office of the Securities Exchange Committee and the Stock Exchange of Thailand, and appropriate auditing fees.

8. Consideration of Connected Transactions or Conflicts of Interest to comply with legal requirements and stipulations of the Stock Exchange

The Audit Committee reviewed and proposed their comments on the matter of connected transactions, with particular focus on issues of possible conflicts of interest to the Company, by adhering to reasonableness, transparency, and the sufficient information disclosure of optimum benefit to the Company. In 2019, no significant connected transactions were found, nor were there any transactions that deviate from contractual conditions that require disclosure per regulations of the Stock Exchange of Thailand. Furthermore, the Audit Committee did not receive any reports of anomalies from the disclosure of connected transactions from the Financial Auditor.

9. Other matters appointed by the Board of Directors:

The Audit Committee's Performance Assessment

The Audit Committee underwent the customary group and individual assessments of its performance in 2019, and assessment results were reported to the Board of Directors for their acknowledgment to support and enhance the Committee's future performance.

Performance Reports of the Audit Committee

The Audit Committee periodically completed four performance reports to the Board of Directors in 2019.

The Audit Committee has duly performed its duties as appointed by the Board of Directors and as per duties and responsibilities stipulated in the Audit Committee Charter. The Audit Committee has employed their knowledge, experience, and has adhered to the principles of righteousness, justice, prudence, vigilance, transparency and independence in carrying out their duties. The Audit Committee provided constructive queries, observations, and recommendations, all the while with due regard to all stakeholders and their optimal benefit.

The Audit Committee is thus of the opinion that the Company has an accurate and reliable accounting and financial reporting system and that the information disclosure is sufficient and conforms to the generally-accepted accounting best practices. The Company complies with all relevant laws, rules, and regulations in their business operations. It has good corporate governance, good risk management and adequate internal controls for business operations, has a good Internal Audit System, and continuous monitoring of various change variables, to enable the Company to be adequately prepared for any current or future risks.

The Audit Committee received excellent support and collaboration throughout 2019 from the Board of Directors, the management, the Financial Auditor, and all other relevant parties. The Audit Committee would like to thank and express its appreciation to all parties sincerely.

On Behalf of the Audit Committee

(Signed) Apisak Tantivorawang
(Mr. Apisak Tantivorawang)
Chairman of the Audit Committee

REPORT OF THE BOARD OF DIRECTORS' ACCOUNTABILITY TO FINANCIAL REPORT

The consolidated financial statements of PTT Global Chemical Public Company Limited and its subsidiaries were prepared in accordance with the Securities Exchange Commission under the Securities and Exchange Act B.E. 2535 and Department of Business Development, issued under the Accounting Act B.E. 2543 Section 11 paragraph 3 in accordance with the Federation of Accounting Professions' Thai Financial Reporting Standards.

The Company's Board of Directors is responsible for financial report of PTT Global Chemical Public Company Limited and its subsidiaries in providing reasonable assurance that the financial report present fairly financial position, financial performance and cash flows. The accounting data is sufficiently and accurately recorded to preserve the Company's assets and prevent fraud and irregularity. The financial report has been prepared accordingly to appropriate accounting policy and consistency practices, and in accordance with Thai Financial Reporting Standards. Significant information has been sufficiently disclosed in notes to financial statements, where the auditor expressed an opinion on the financial statements of PTT Global Chemical Public Company Limited and its subsidiaries in the auditor's report.

(Signed) Piyasvasti Amranand
(Mr. Piyasvasti Amranand)
Chairman

(Signed) Kongkrapan Intarajang
(Mr. Kongkrapan Intarajang)
Chief Executive Officer

REPORT OF THE INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

To the Shareholders and Board of Directors

PTT Global Chemical Public Company Limited

Opinion

We have audited the consolidated financial statements of PTT Global Chemical Public Company Limited and its subsidiaries (the “Group”) and the separate financial statements of PTT Global Chemical Public Company Limited (the “Company”) which comprise the consolidated and separate statements of financial position as at December 31, 2019, and the related consolidated and separate statements of profit or loss, comprehensive income, changes in shareholders' equity and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated and separate financial statements present fairly, in all material respects, the financial position of PTT Global Chemical Public Company Limited and its subsidiaries and of PTT Global Chemical Public Company Limited as at December 31, 2019, and financial performance and cash flows for the year then ended in accordance with Thai Financial Reporting Standards (“TFRSs”).

Basis for Opinion

We conducted our audit in accordance with Thai Standards on Auditing (“TSAs”). Our responsibilities under those standards are further described in the Auditor’s Responsibilities for the Audit of the Consolidated and Separate Financial Statements section of our report. We are independent of the Group in accordance with the Federation of Accounting Professions’ Code of Ethics for Professional Accountants together with the ethical requirements that are relevant to the audit of the consolidated and separate financial statements, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated and separate financial statements of the current period. These matters were addressed in the context of our audit of the consolidated and separate financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Key Audit Matter	Audit Responses
<p>The measurement of inventories valuation</p> <p>Inventories of the Group are significant balance to the consolidated and separate financial statements. The raw material and finished goods are commodities that contain intense price volatility. This volatility may lead to valuation of inventories at the end of reporting period as inventories are measured at the lower of cost or net realizable value.</p> <p>The accounting policy of inventories valuation of the Group and the detail of inventories are disclosed in notes to the financial statements no. 3.7 and 9, respectively.</p>	<p>Key audit procedures included:</p> <ul style="list-style-type: none"> • Gaining understanding and performing test of design and implementation as well as operating effectiveness of the relevant controls over inventories valuation measurement process. • Assessing the appropriateness of the methodology used to calculate the net realizable value of inventories at the reporting period, considering the reasonableness of the market price used by reference to commodity prices, and testing the accuracy of the calculation. • If the net realizable value is lower than the cost, considering to propose the adjustment of allowance for diminution in value of inventories in the consolidated and separate financial statements. • Assessing the adequate disclosure in relation to the estimation of allowance for diminution in value of inventories in notes to the financial statements.

Key Audit Matter	Audit Responses
<p>The existence of raw materials</p> <p>During the second quarter of 2018, a subsidiary found the quantity of raw materials recorded in the system higher than the actual quantity stored at the suppliers' facilities. In consequence, the Group recognized expenses from raw materials derogation amounting to Baht 2,004 million for the year ended December 31, 2018 (owners of the parent net of tax amounting to Baht 1,261 million). The existence of raw materials is considered to be a key audit matter as such raw materials are stored at the suppliers' facilities where the place are outside of the subsidiary's location.</p> <p>The details are disclosed in note to the financial statements no. 4.</p>	<p>Key audit procedures included:</p> <ul style="list-style-type: none"> • Gaining understanding and performing test of design and implementation of the relevant controls over raw material management process. • Enquiring with management on procurement of raw materials, issuing and storage of raw materials process. • Reading the factual investigation report regarding the procurement and distribution process of raw materials, the fraud investigation report, the internal control report for the process on procurement of raw materials and the related minutes of meeting of the board of directors. • Attending the physical raw material count observation, sending the raw material confirmation letter for raw materials at the storage facilities of the suppliers and reconciling confirmations with the accounting records.

Other Matter

The consolidated financial statements of PTT Global Chemical Public Company Limited and its subsidiaries and the separate financial statements of PTT Global Chemical Public Company Limited for the year ended December 31, 2018 (before the reclassifications), presented herein as comparative information, were audited by another auditor, whose report thereon dated February 18, 2019 expressed an unmodified opinion on those statements.

Other Information

Management is responsible for the other information. The other information comprises the information included in the annual report, but does not include the consolidated and separate financial statements and our auditor's report thereon.

Our opinion on the consolidated and separate financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the consolidated and separate financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the consolidated and separate financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of Management and Those Charged with Governance for the Consolidated and Separate Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated and separate financial statements in accordance with TFRSs, and for such internal control as management determines is necessary to enable the preparation of consolidated and separate financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated and separate financial statements, management is responsible for assessing the Group's and the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Group's financial reporting process.

Auditor's Responsibilities for the Audit of the Consolidated and Separate Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated and separate financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with TSAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated and separate financial statements.

As part of an audit in accordance with TSAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated and separate financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's and the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group and the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated and separate financial statements, including the disclosures, and whether the consolidated and separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated and separate financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.



(Mongkol Somphol)

Certified Public Accountant (Thailand)

Registration No. 8444

Deloitte Touche Tohmatsu Jaiyos Audit Co., Ltd.

Bangkok

February 17, 2020

FINANCIAL STATEMENTS

STATEMENTS OF FINANCIAL POSITION

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

AS AT DECEMBER 31, 2019

Unit : Baht

	Notes	Consolidated		Separate	
		financial statements		financial statements	
		2019	2018	2019	2018
ASSETS					
CURRENT ASSETS					
Cash and cash equivalents	6	18,840,303,824	36,744,040,127	12,397,417,335	27,141,980,258
Temporary investments	13	6,719,876,693	16,817,920,867	4,045,408,193	10,011,153,767
Trade receivables	7	34,156,903,430	41,990,677,039	28,118,814,466	34,832,891,357
Other receivables	8	3,149,134,830	3,624,987,347	2,314,454,135	2,776,875,934
Short-term loans to related parties	27	1,122,984,334	242,136,000	1,552,287,222	848,799,510
Current portion of long-term loans to related parties	27	1,558,404,698	-	1,558,404,698	-
Current portion of long-term loans to other parties		-	665,367,833	-	-
Inventories	9	36,252,319,422	39,365,633,468	26,380,866,034	29,105,102,076
Receivable from oil fuel fund		151,284,595	819,672,983	151,284,595	819,672,983
Value-added tax receivable		1,719,267,430	2,193,555,033	492,422,615	627,187,239
Derivatives	38	27,747,308	340,523,311	13,789,747	339,827,672
Other current assets		796,042,409	1,505,500,947	526,201,836	1,204,055,609
Total Current Assets		104,494,268,973	144,310,014,955	77,551,350,876	107,707,546,405
NON-CURRENT ASSETS					
Investments in subsidiaries	10	-	-	72,551,269,640	67,782,813,121
Investments in joint ventures	11	32,444,000,414	30,757,746,490	15,372,927,810	15,372,927,810
Investments in associates	12	29,829,463,974	15,450,398,109	26,812,494,981	9,792,804,660
Other long-term investments	13	2,910,779,525	7,146,165,871	2,340,894,476	6,806,191,293
Long-term loans to related parties	27	716,754,888	3,551,328,000	716,754,888	3,551,328,000
Investment properties	14	6,497,895,823	6,499,955,407	1,740,783,392	1,740,783,392
Property, plant and equipment	15	264,563,608,523	250,330,366,033	181,731,952,350	174,490,838,137
Land leasehold rights	16	190,505,835	234,181,354	184,162,171	234,181,354
Goodwill	17	931,328,672	931,328,672	-	-
Intangible assets	18	8,220,730,578	8,055,084,199	5,809,170,180	5,603,820,101
Deferred tax assets	19	1,073,520,214	1,171,330,392	-	-
Derivatives	38	-	122,469,564	-	122,469,564
Other non-current assets		641,532,387	694,978,299	278,035,974	408,721,068
Total Non-current Assets		348,020,120,833	324,945,332,390	307,538,445,862	285,906,878,500
TOTAL ASSETS		452,514,389,806	469,255,347,345	385,089,796,738	393,614,424,905

Notes to the financial statements form an integral part of these statements

STATEMENTS OF FINANCIAL POSITION (CONTINUED)

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

AS AT DECEMBER 31, 2019

Unit : Baht

		Consolidated		Separate	
		financial statements		financial statements	
	Notes	2019	2018	2019	2018
LIABILITIES AND SHAREHOLDERS' EQUITY					
CURRENT LIABILITIES					
Short-term borrowings from					
financial institutions	20	2,020,952,712	3,343,116,790	-	-
Trade payables	21	25,479,128,189	34,515,941,639	19,920,282,931	27,459,926,202
Other payables	22	14,092,519,798	15,867,926,247	8,443,466,497	11,712,990,634
Payables to contractors		2,717,169,778	9,127,020,070	2,778,691,141	5,191,027,808
Current portion of long-term borrowings					
from financial institutions	20	8,108,139,389	7,046,779,688	7,077,794,084	4,305,696,000
Current portion of long-term borrowings					
from other parties	20	40,599,692	927,744,204	-	-
Current portion of debentures	20	-	1,942,000,000	-	1,942,000,000
Short-term borrowings from related parties	20, 27	-	-	3,040,910,019	1,930,884,839
Income tax payable		125,041,110	665,994,033	-	473,886,450
Current provisions		97,106,390	65,762,666	-	-
Derivatives	38	319,631,248	310,771,095	68,847,127	2,871,113
Other current liabilities		32,849,201	45,197,792	-	-
Total Current Liabilities		53,033,137,507	73,858,254,224	41,329,991,799	53,019,283,046
NON-CURRENT LIABILITIES					
Long-term borrowings from					
financial institutions	20	26,517,395,423	30,915,455,205	2,995,267,683	10,113,474,702
Long-term borrowing from a related party	20, 27	-	-	14,991,042,331	16,105,004,749
Long-term borrowings from other parties	20	268,922,401	323,961,074	-	-
Debentures	20	70,131,423,772	52,408,085,202	55,221,250,537	36,379,430,264
Deferred tax liabilities	19	2,465,252,662	2,746,711,153	1,591,933,250	1,788,503,320
Provisions for employee benefits	23	5,558,472,038	4,283,089,819	4,014,311,572	3,015,279,364
Other non-current provisions		420,019,035	494,903,862	-	-
Derivatives	38	12,423,815	146,534,450	12,423,815	20,581,971
Other non-current liabilities		511,994,977	596,144,422	359,936,366	336,086,298
Total Non-current Liabilities		105,885,904,123	91,914,885,187	79,186,165,554	67,758,360,668
TOTAL LIABILITIES		158,919,041,630	165,773,139,411	120,516,157,353	120,777,643,714

Notes to the financial statements form an integral part of these statements

STATEMENTS OF FINANCIAL POSITION (CONTINUED)

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

AS AT DECEMBER 31, 2019

Unit : Baht

	Notes	Consolidated		Separate	
		financial statements		financial statements	
		2019	2018	2019	2018
LIABILITIES AND SHAREHOLDERS' EQUITY					
(CONTINUED)					
SHAREHOLDERS' EQUITY					
Share capital	24				
Authorized share capital					
4,508,849,117 ordinary shares of					
Baht 10 each		45,088,491,170	45,088,491,170	45,088,491,170	45,088,491,170
Issued and paid-up share capital					
4,508,849,117 ordinary shares of					
Baht 10 each		45,088,491,170	45,088,491,170	45,088,491,170	45,088,491,170
Treasury stock	26	(1,187,603,325)	-	(1,187,603,325)	-
Premium on ordinary shares	25	36,936,829,684	36,936,829,684	36,936,829,684	36,936,829,684
Premium on treasury stock	25	1,386,740,109	1,386,740,109	1,386,740,109	1,386,740,109
Difference arising from business combination					
under common control	25	1,690,706,891	1,690,706,891	77,453,518	77,453,518
Difference arising from the change in					
the ownership interest in an investment	12	(3,407,679,334)	-	-	-
Retained earnings					
Appropriated					
Legal reserve	25	4,512,930,269	4,512,930,269	4,512,930,269	4,512,930,269
Loan repayment reserve		807,802,564	807,802,564	807,802,564	807,802,564
Projects expansion reserve		12,446,994,126	12,446,994,126	12,446,994,126	12,446,994,126
Treasury stock reserve	25, 26	1,187,603,325	-	1,187,603,325	-
Unappropriated		187,854,749,537	192,959,190,549	163,299,727,947	171,114,157,807
Other components of shareholder's equity		(1,487,395,383)	216,077,207	16,669,998	465,381,944
Total attributions to owners of the parent		285,830,169,633	296,045,762,569	264,573,639,385	272,836,781,191
Non-controlling interests		7,765,178,543	7,436,445,365	-	-
TOTAL SHAREHOLDERS' EQUITY		293,595,348,176	303,482,207,934	264,573,639,385	272,836,781,191
TOTAL LIABILITIES AND					
SHAREHOLDERS' EQUITY		452,514,389,806	469,255,347,345	385,089,796,738	393,614,424,905

Notes to the financial statements form an integral part of these statements

STATEMENTS OF PROFIT OR LOSS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Baht

	Notes	Consolidated financial statements		Separate financial statements	
		2019	2018	2019	2018
Revenues from sale of goods and rendering of services		412,810,235,767	518,654,742,421	351,547,082,842	456,714,288,455
Cost of sale of goods and rendering of services		(390,619,277,638)	(466,025,790,273)	(339,068,290,381)	(418,114,455,761)
Gross profit		22,190,958,129	52,628,952,148	12,478,792,461	38,599,832,694
Investment income		1,000,821,422	1,577,303,108	5,195,501,283	6,284,765,652
Other income		1,317,855,026	1,117,147,616	1,916,888,618	2,049,607,521
Gain on bargain purchases	5	31,482,857	1,354,901,971	-	-
Selling and distribution expenses	29	(3,931,395,732)	(3,405,829,379)	(1,962,918,351)	(1,957,010,454)
Administrative expenses	30	(12,537,256,860)	(11,448,544,361)	(8,741,700,962)	(8,235,597,296)
Reversal of (expenses from) raw materials derogation	4	232,483,965	(2,003,572,583)	-	-
Loss on impairment of assets		-	-	(63,052,760)	(729,567,425)
Net derivative gain		1,498,820,135	122,019,087	1,499,404,054	65,021,626
Net gain (loss) on foreign exchange rate		1,755,535,325	13,073,207	1,523,281,288	(200,854,878)
Finance costs	33	(3,119,419,221)	(3,593,353,668)	(2,618,771,176)	(2,927,274,215)
Share of profit of investments in joint ventures	11	2,625,714,096	5,208,691,184	-	-
Share of profit of investments in associates	12	1,933,059,453	1,686,140,092	-	-
Profit before income tax expense		12,998,658,595	43,256,928,422	9,227,424,455	32,948,923,225
Income tax expense	34	(649,361,925)	(2,985,954,248)	(74,349,225)	(3,228,105,397)
PROFIT FOR THE YEAR		12,349,296,670	40,270,974,174	9,153,075,230	29,720,817,828
PROFIT ATTRIBUTABLE TO					
Owners of the parent		11,682,079,566	40,069,490,129	9,153,075,230	29,720,817,828
Non-controlling interests		667,217,104	201,484,045	-	-
		12,349,296,670	40,270,974,174	9,153,075,230	29,720,817,828
BASIC EARNINGS PER SHARE	36	2.59	8.89	2.03	6.59

Notes to the financial statements form an integral part of these statements

STATEMENTS OF COMPREHENSIVE INCOME

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Baht				
Notes	Consolidated financial statements		Separate financial statements	
	2019	2018	2019	2018
PROFIT FOR THE YEAR	12,349,296,670	40,270,974,174	9,153,075,230	29,720,817,828
OTHER COMPREHENSIVE INCOME (LOSS)				
Items that will be reclassified subsequently to profit or loss				
Exchange differences on translating financial statements	(675,835,696)	(138,916,708)	-	-
Gain (loss) on remeasurement investments held as available-for-sale	33,877,577	(90,402,521)	33,877,577	(90,402,521)
Gain (loss) on cash flow hedges	(262,701,249)	807,423,355	(482,589,523)	658,371,137
Share of other comprehensive loss of joint ventures	11 (446,306,794)	(399,462,671)	-	-
Share of other comprehensive income (loss) of associates	12 (383,170,024)	13,701,315	-	-
Items that will not be reclassified subsequently to profit or loss				
Gain (loss) on remeasurements of defined benefit plans	(54,831,636)	20,353,699	-	-
Share of other comprehensive income (loss) of joint ventures	11 (85,407,851)	25,893,879	-	-
Share of other comprehensive loss of associates	12 (1,911,962)	(8,585,329)	-	-
OTHER COMPREHENSIVE INCOME (LOSS)				
FOR THE YEAR, NET OF TAX	(1,876,287,635)	230,005,019	(448,711,946)	567,968,616
TOTAL COMPREHENSIVE INCOME				
FOR THE YEAR, NET OF TAX	10,473,009,035	40,500,979,193	8,704,363,284	30,288,786,444
TOTAL COMPREHENSIVE INCOME				
ATTRIBUTABLE TO				
Owners of the parent	9,840,397,339	40,337,826,087	8,704,363,284	30,288,786,444
Non-controlling interests	632,611,696	163,153,106	-	-
	10,473,009,035	40,500,979,193	8,704,363,284	30,288,786,444

Notes to the financial statements form an integral part of these statements

STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

								Retained earnings		
		Issued and paid-up share capital	Treasury stock	Premium on ordinary shares	Premium on treasury stock	Difference arising from business combination under common control	Difference arising from the change in the ownership interest in an investment	Legal reserve	Loans repayment reserve	Projects expansion reserve
	Notes									
BALANCE AS AT JANUARY 1, 2018		45,088,491,170	-	36,936,829,684	1,386,740,109	1,690,706,891	-	4,512,930,269	807,802,564	12,446,994,126
Dividends paid	37	-	-	-	-	-	-	-	-	-
Acquisition of businesses		-	-	-	-	-	-	-	-	-
Increase investment in a subsidiary		-	-	-	-	-	-	-	-	-
Profit for the year		-	-	-	-	-	-	-	-	-
Other comprehensive income (loss)		-	-	-	-	-	-	-	-	-
BALANCE AS AT DECEMBER 31, 2018		45,088,491,170	-	36,936,829,684	1,386,740,109	1,690,706,891	-	4,512,930,269	807,802,564	12,446,994,126
BALANCE AS AT JANUARY 1, 2019		45,088,491,170	-	36,936,829,684	1,386,740,109	1,690,706,891	-	4,512,930,269	807,802,564	12,446,994,126
Treasury stock	26	-	(1,187,603,325)	-	-	-	-	-	-	-
Dividends paid	37	-	-	-	-	-	-	-	-	-
Increase investment in a subsidiary		-	-	-	-	-	-	-	-	-
Difference arising from the change in the ownership interest in an investment	12	-	-	-	-	-	(3,407,679,334)	-	-	-
Interests in equity of associate		-	-	-	-	-	-	-	-	-
Profit for the year		-	-	-	-	-	-	-	-	-
Other comprehensive income (loss)		-	-	-	-	-	-	-	-	-
BALANCE AS AT DECEMBER 31, 2019		45,088,491,170	(1,187,603,325)	36,936,829,684	1,386,740,109	1,690,706,891	(3,407,679,334)	4,512,930,269	807,802,564	12,446,994,126

Notes to the financial statements form an integral part of these statements

Unit : Baht

Consolidated financial statements

		Other components of shareholders' equity								
Treasury stock reserve	Unappropriated	Exchange differences on translating financial statements	Gain (loss) on remeasurement investments held as available-for-sale	Gain (loss) on cash flow hedges	Share of other comprehensive income (loss) of joint ventures	Share of other comprehensive income (loss) of associates	Total other components of shareholders' equity	Total attributions to owners of the parent	Non- controlling interests	Total shareholders' equity
-	172,015,687,267	(383,885,257)	142,086,228	(789,930,586)	1,007,174,278	8,090,365	(16,464,972)	274,869,717,108	5,394,380,348	280,264,097,456
-	(19,161,780,626)	-	-	-	-	-	-	(19,161,780,626)	(577,303,184)	(19,739,083,810)
-	-	-	-	-	-	-	-	-	2,363,403,595	2,363,403,595
-	-	-	-	-	-	-	-	-	92,811,500	92,811,500
-	40,069,490,129	-	-	-	-	-	-	40,069,490,129	201,484,045	40,270,974,174
-	35,793,779	(96,351,209)	(90,402,521)	805,057,265	(399,462,671)	13,701,315	232,542,179	268,335,958	(38,330,939)	230,005,019
-	192,959,190,549	(480,236,466)	51,683,707	15,126,679	607,711,607	21,791,680	216,077,207	296,045,762,569	7,436,445,365	303,482,207,934
-	192,959,190,549	(480,236,466)	51,683,707	15,126,679	607,711,607	21,791,680	216,077,207	296,045,762,569	7,436,445,365	303,482,207,934
1,187,603,325	(1,187,603,325)	-	-	-	-	-	-	(1,187,603,325)	-	(1,187,603,325)
-	(15,779,901,765)	-	-	-	-	-	-	(15,779,901,765)	(556,380,393)	(16,336,282,158)
-	-	-	-	-	-	-	-	-	252,501,875	252,501,875
-	-	-	-	-	-	-	-	(3,407,679,334)	-	(3,407,679,334)
-	319,194,149	-	-	-	-	-	-	319,194,149	-	319,194,149
-	11,682,079,566	-	-	-	-	-	-	11,682,079,566	667,217,104	12,349,296,670
-	(138,209,637)	(644,186,753)	33,877,577	(263,686,596)	(446,306,794)	(383,170,024)	(1,703,472,590)	(1,841,682,227)	(34,605,408)	(1,876,287,635)
1,187,603,325	187,854,749,537	(1,124,423,219)	85,561,284	(248,559,917)	161,404,813	(361,378,344)	(1,487,395,383)	285,830,169,633	7,765,178,543	293,595,348,176

STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

						Difference arising from business combination under common control	Legal reserve
	Notes	Issued and paid-up share capital	Treasury stock	Premium on ordinary shares	Premium on treasury stock		
BALANCE AS AT JANUARY 1, 2018		45,088,491,170	-	36,936,829,684	1,386,740,109	77,453,518	4,512,930,269
Dividends paid	37	-	-	-	-	-	-
Profit for the year		-	-	-	-	-	-
Other comprehensive income (loss)		-	-	-	-	-	-
BALANCE AS AT DECEMBER 31, 2018		<u>45,088,491,170</u>	<u>-</u>	<u>36,936,829,684</u>	<u>1,386,740,109</u>	<u>77,453,518</u>	<u>4,512,930,269</u>
BALANCE AS AT JANUARY 1, 2019		45,088,491,170	-	36,936,829,684	1,386,740,109	77,453,518	4,512,930,269
Treasury stock	26	-	(1,187,603,325)	-	-	-	-
Dividends paid	37	-	-	-	-	-	-
Profit for the year		-	-	-	-	-	-
Other comprehensive income (loss)		-	-	-	-	-	-
BALANCE AS AT DECEMBER 31, 2019		<u>45,088,491,170</u>	<u>(1,187,603,325)</u>	<u>36,936,829,684</u>	<u>1,386,740,109</u>	<u>77,453,518</u>	<u>4,512,930,269</u>

Notes to the financial statements form an integral part of these statements

Unit : Baht

Separate financial statements

Retained earnings				Other components of shareholders' equity			
Loans repayment reserve	Projects expansion reserve	Treasury stock reserve	Unappropriated	Gain (loss) on remeasurement investments held as	Gain (loss) on cash flow hedges	Total other components of shareholders' equity	Total shareholders' equity
				available-for-sale			
807,802,564	12,446,994,126	-	160,555,120,605	142,086,228	(244,672,900)	(102,586,672)	261,709,775,373
-	-	-	(19,161,780,626)	-	-	-	(19,161,780,626)
-	-	-	29,720,817,828	-	-	-	29,720,817,828
-	-	-	-	(90,402,521)	658,371,137	567,968,616	567,968,616
807,802,564	12,446,994,126	-	171,114,157,807	51,683,707	413,698,237	465,381,944	272,836,781,191
807,802,564	12,446,994,126	-	171,114,157,807	51,683,707	413,698,237	465,381,944	272,836,781,191
-	-	1,187,603,325	(1,187,603,325)	-	-	-	(1,187,603,325)
-	-	-	(15,779,901,765)	-	-	-	(15,779,901,765)
-	-	-	9,153,075,230	-	-	-	9,153,075,230
-	-	-	-	33,877,577	(482,589,523)	(448,711,946)	(448,711,946)
807,802,564	12,446,994,126	1,187,603,325	163,299,727,947	85,561,284	(68,891,286)	16,669,998	264,573,639,385

STATEMENT OF CASH FLOWS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Baht

	Consolidated		Separate	
	financial statements		financial statements	
	2019	2018	2019	2018
CASH FLOWS FROM OPERATING ACTIVITIES				
Profit for the year	12,349,296,670	40,270,974,174	9,153,075,230	29,720,817,828
Adjustments for:				
Income tax expense	649,361,925	2,985,954,248	74,349,225	3,228,105,397
Depreciation and amortization	19,197,797,105	19,054,766,596	13,366,391,225	13,926,079,334
Investment income	(1,000,821,422)	(1,577,303,108)	(5,195,501,283)	(6,284,765,652)
Gain on settlement of borrowings	(211,556,237)	-	-	-
Loss from capital distribution of subsidiaries	-	-	69,799	-
Loss from sale of investment in an associate	13,115,757	-	-	-
Finance costs	3,119,419,221	3,593,353,668	2,618,771,176	2,927,274,215
Unrealised (gain) loss on derivatives	(54,827,103)	136,879,945	(19,990,128)	118,341,564
Gain on foreign exchange rates	(2,518,930,371)	(334,981,690)	(2,279,982,317)	(281,407,352)
Bad debt and doubtful debt expenses	172,882,726	11,218,974	159,994,458	-
(Reversal of) loss on obsolete inventories	(83,122,717)	34,558,967	(50,921,726)	5,046,175
Loss from written-off of assets	52,766,502	5,813,992	69,384,731	8,018,850
(Reversal of) loss on inventories devaluation	(1,060,886,068)	1,346,625,546	(1,089,977,606)	1,330,081,525
(Reversal of) expenses from raw materials derogation	(232,483,965)	2,003,572,583	-	-
Loss on impairment of assets	-	-	63,052,760	729,567,425
(Gain) loss on disposal of property, plant and equipment	40,554,053	22,408,748	(7,941,860)	3,553,332
Provision for employee benefits	1,501,638,645	383,910,976	1,156,107,086	272,715,440
Realised deferred pipeline and equipment income	(8,369,972)	(6,559,468)	(9,792,233)	(7,862,360)
Gain on bargain purchases	(31,482,857)	(1,354,901,971)	-	-
Share of profit of investments in joint ventures	(2,625,714,096)	(5,208,691,184)	-	-
Share of profit of investments in associates	(1,933,059,453)	(1,686,140,092)	-	-
Profit from operations before changes in operating assets and liabilities	27,335,578,343	59,681,460,904	18,007,088,537	45,695,565,721
Operating assets (increase) decrease				
Trade receivables	7,688,772,097	1,972,547,646	6,769,976,249	50,941,794
Other receivables	655,357,356	(2,194,830,878)	504,402,338	286,080,901
Inventories	4,206,895,474	(917,999,476)	3,795,750,644	(1,376,326,558)
Value-added tax receivable	456,218,332	(955,024,742)	134,764,625	(820,811,688)
Other current assets	1,216,416,609	(550,809,553)	1,346,221,634	(297,467,041)
Other non-current assets	(121,134,464)	55,416,788	(24,216,553)	(109,972,896)
Operating liabilities increase (decrease)				
Trade payables	(8,962,108,450)	1,860,866,374	(7,540,342,464)	1,011,331,784
Other payables	(405,767,945)	193,161,182	(2,731,219,413)	(108,196,027)
Current provisions	38,484,724	(29,593,048)	-	-
Other current liabilities	(10,756,357)	11,177,391	-	-
Cash paid for provisions for employee benefits	(233,434,021)	(150,305,564)	(157,074,878)	(89,105,922)
Other non-current provisions	(30,534,035)	54,072,970	-	-
Other non-current liabilities	(105,677,642)	(121,866,769)	(122,090,260)	2,226,848
Cash received from operations	31,728,310,021	58,908,273,225	19,983,260,459	44,244,266,916
Cash paid for income tax	(1,553,273,997)	(5,279,263,371)	(959,971,523)	(4,743,628,244)
Net cash flows provided by operating activities	30,175,036,024	53,629,009,854	19,023,288,936	39,500,638,672

Notes to the financial statements form an integral part of these statements

STATEMENT OF CASH FLOWS (CONTINUED)

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Baht

	Consolidated financial statements		Separate financial statements	
	2019	2018	2019	2018
CASH FLOWS FROM INVESTING ACTIVITIES				
Interest received	970,074,693	922,850,661	796,872,684	786,413,438
Dividends received	2,247,743,282	2,399,301,624	4,372,126,568	4,893,350,060
Acquisition of investment properties	-	(5,523,531,948)	-	-
Acquisition of property, plant and equipment	(39,827,749,088)	(27,760,616,724)	(22,275,592,652)	(15,731,041,673)
Proceeds from sale of property, plant and equipment	129,650,962	94,672,013	118,513,574	93,880,905
Acquisition of intangible assets	(989,177,952)	(1,016,175,888)	(720,528,657)	(777,243,580)
Acquisition of other non-current assets	(6,981,143)	-	-	-
(Increase) decrease of held-to-maturities debt securities	4,245,796,605	(2,288,774,783)	240,351,300	1,830,441,452
Decrease of available-for-sale securities	10,368,985,604	187,747,103	10,368,985,604	187,747,103
Acquisition of investments in subsidiaries, joint ventures and associates	(19,061,859,511)	(3,023,883,732)	(22,562,924,510)	(11,454,800,880)
Cash inflow from sale of investment in an associate	212,663,057	-	-	-
Cash inflow from capital distribution of subsidiaries	-	-	1,927,949	40,770,000
Cash paid for other non-marketable equity securities	(259,855,403)	(57,098,062)	(1,125,000)	-
Cash inflow from sales of other non-marketable equity securities	28,289,253	246,395,861	28,289,253	246,395,861
Proceeds from short-term loans to related parties	7,101,928,666	-	7,279,289,288	120,023,452
Increase in short-term loans to related parties	(8,000,000,000)	(234,817,500)	(8,000,000,000)	(485,469,576)
Proceeds from long-term loans to related parties	1,827,494,000	3,212,377,500	1,827,494,000	3,212,377,500
Increase in long-term loans to related parties	(766,981,093)	-	(766,981,093)	-
Net cash flows used in investing activities	(41,779,978,068)	(32,841,553,875)	(29,293,301,692)	(17,037,155,938)
CASH FLOWS FROM FINANCING ACTIVITIES				
Finance costs paid	(2,917,779,970)	(3,403,044,412)	(2,449,463,098)	(2,887,032,853)
Dividends paid	(16,336,282,158)	(19,739,083,810)	(15,779,901,765)	(19,161,780,626)
Repayment of finance lease liabilities	(175,771,913)	(152,762,836)	(121,544,992)	(122,484,066)
Proceeds from short-term borrowings from financial institutions	144,468,261	18,524,232,681	-	16,452,870,311
Proceeds from short-term borrowings from related parties	-	-	1,579,522,387	105,299,204
Proceeds from long-term borrowings from financial institutions	13,237,281,710	14,438,870,000	-	-
Proceeds from long-term borrowing from a related party	-	-	-	16,472,854,839
Proceeds from long-term borrowings from other parties	15,637,595	127,959,729	-	-
Repayment of short-term borrowings from financial institutions	(1,425,000,000)	(18,388,851,664)	-	(16,452,870,311)
Repayment of short-term borrowings from related parties	-	-	(469,497,207)	(732,420,891)
Repayment of long-term borrowings from financial institutions	(16,083,908,280)	(18,069,061,020)	(4,280,202,000)	(6,793,400,000)
Repayment of long-term borrowings from other parties	(42,186,998)	(746,806,619)	-	-
Proceeds from increase in investment in a subsidiary from non-controlling interests	252,501,875	92,811,500	-	-
Proceeds from debentures	20,000,000,000	16,371,246,158	20,000,000,000	-
Repayment of debentures	(1,942,000,000)	(16,452,870,311)	(1,942,000,000)	(16,452,870,311)
Cash paid for treasury stock	(1,187,603,325)	-	(1,187,603,325)	-
Net cash flows used in financing activities	(6,460,643,203)	(27,397,360,604)	(4,650,690,000)	(29,571,834,704)
Net decrease in cash and cash equivalents, before effect from foreign exchange rate	(18,065,585,247)	(6,609,904,625)	(14,920,702,756)	(7,108,351,970)
Effect from foreign exchange rate in cash and cash equivalents and effect from translation differences on financial statements	161,848,944	(75,447,225)	176,139,833	(185,189,619)
Net decrease in cash and cash equivalents	(17,903,736,303)	(6,685,351,850)	(14,744,562,923)	(7,293,541,589)
Cash and cash equivalents as at January 1,	36,744,040,127	43,429,391,977	27,141,980,258	34,435,521,847
Cash and cash equivalents as at December 31,	18,840,303,824	36,744,040,127	12,397,417,335	27,141,980,258

Notes to the financial statements form an integral part of these statements

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Notes	Contents
1.	The Company's operations and general information
2.	Basis for preparation and presentation of the financial statements
3.	Significant accounting policies
4.	Expenses from raw materials derogation
5.	Acquisition of businesses
6.	Cash and cash equivalents
7.	Trade receivables
8.	Other receivables
9.	Inventories
10.	Investments in subsidiaries
11.	Investments in joint ventures
12.	Investments in associates
13.	Other investments
14.	Investment properties
15.	Property, plant and equipment
16.	Land leasehold right
17.	Goodwill
18.	Intangible assets
19.	Deferred tax
20.	Interest-bearing liabilities
21.	Trade payables
22.	Other payables
23.	Provisions for employee benefits
24.	Share capital
25.	Additional paid-in capital and reserves
26.	Treasury stock
27.	Transactions with related parties
28.	Financial information by segment
29.	Selling and distribution expenses
30.	Administrative expenses
31.	Employee benefits expenses
32.	Expenses by nature
33.	Finance costs
34.	Income tax expense
35.	Promotional privileges
36.	Basic earnings per share
37.	Dividends paid
38.	Financial instruments
39.	Commitments with non-related parties
40.	Litigations
41.	Reclassifications
42.	Events after the reporting period
43.	Approval of the financial statements

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

1. THE COMPANY'S OPERATIONS AND GENERAL INFORMATION

PTT Global Chemical Public Company Limited (the “Company”) was registered on October 19, 2011 in accordance with the Public Company Limited Act, B.E. 2535. The Board of Governors of the SET approved the listing of the Company on the day that the Registrar accepted the registration on October 19, 2011.

The Company is a company in the PTT Public Company Limited (“PTT”) group of companies. PTT is incorporated in Thailand and is the major shareholder of the Company, holding 47.92% of the Company's issued and paid-up share capital.

The Company is incorporated in Thailand and has its registered offices as follows:

Head Office	: 555/1, Energy Complex, Building A, 14th - 18th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok, Thailand
Branch 1 (Rayong office Branch)	: 59, Radniyom Road, Tambon Noenphra, Amphoe Mueang Rayong, Rayong, Thailand
Branch 2 (Olefin 1 Branch)	: 14, I-1 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 3 (Olefin 2 Branch)	: 9, I-4 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 4 (Aromatics 1 Branch)	: 4, I-2 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 5 (Aromatics 2 Branch)	: 98/9, Rayong 3191 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 6 (Refining Branch)	: 8, I-8 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 7 (Jetty and Buffer Tank Farm Branch)	: 19, Rong Pui Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 8 (Aromatics reserve Branch)	: 11, I-4 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 9 (Lab Service Center Branch)	: 24/9, Pakorn Songkroo-Rat Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 10 (PTTGC 10 Branch)	: 555/1, Energy Complex, Building A, 1st , 3rd and 10th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok, Thailand
Branch 11 (Olefin 3 Branch)	: 8, Phadang Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 12 (Polyethylene Branch)	: 8, Map Ta Phut Industrial Estate, I-10 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 13 (Innoplus Solution Center Branch)	: 83/9-10, Moo 5, Tambon Tabma, Amphoe Mueang Rayong, Rayong, Thailand
Branch 14 (Maintenance office)	: 32, Rong Pui Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

The principal businesses of the Company are refining and provision of integrated petroleum products, production and distribution of aromatics products including aromatic derivatives and production and distribution of ethylene, propylene, polyethylene plastic pellets and biochemical products. By-products are mixed C4, cracker bottom and tail gas. Minor activities are production and distribution of electricity, water, steam and other utilities. In addition, the Company also operates production support facilities such as jetty and buffer tank farm services for liquid chemical, oil and gas.

2. BASIS FOR PREPARATION AND PRESENTATION OF THE FINANCIAL STATEMENTS

- 2.1 The Company and subsidiaries (The “Group”) maintains its accounting records in Thai Baht and prepares its statutory financial statements in the Thai language in conformity with Thai Financial Reporting Standards (TFRS) and accounting practices generally accepted in Thailand.
- 2.2 The Group’s financial statements have been prepared in accordance with the Thai Accounting Standard (TAS) No. 1 (Revised 2018) “Presentation of Financial Statements”, which was effective for financial periods beginning on or after January 1, 2019 onward, and the Regulation of The Stock Exchange of Thailand (SET) dated October 2, 2017, regarding the preparation and submission of financial statements and reports for the financial position and results of operations of the listed companies B.E. 2560 and the Notification of the Department of Business Development regarding “The Brief Particulars in the Financial Statements (No.2) B.E. 2559” dated October 11, 2016.
- 2.3 The financial statements have been prepared under the historical cost convention except as disclosed in the significant accounting policies.
- 2.4 An English version of the financial statements have been prepared from the financial statements that is in the Thai language under law. In the event of a conflict or a difference in interpretation between the two languages, the Thai language financial information shall prevail.
- 2.5 The consolidated financial statements included the accounts of the Company and its subsidiaries, after elimination of intercompany transactions, of which the percentage of shareholding as at December 31, 2019 and 2018, are as follows:

<u>Name of the entity</u>	<u>Type of business</u>	<u>Country of incorporation</u>	<u>Ownership interest (%)</u>	
			<u>2019</u>	<u>2018</u>
<i>Direct subsidiaries</i>				
Global Green Chemicals Plc.	Manufacturing and distributing biochemical products	Thailand	72.29	72.29
GC Glycol Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
GC Polyols Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	82.10	82.10
GC Marketing Solutions Co., Ltd.	Development, marketing and distributing polymers products, by-products and other polymers-related products	Thailand	100	100

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

<u>Name of the entity</u>	<u>Type of business</u>	<u>Country of incorporation</u>	<u>Ownership interest (%)</u>	
			<u>2019</u>	<u>2018</u>
GC Maintenance and Engineering Co., Ltd.	Factory maintenance and engineering services	Thailand	100	100
GC Logistics Solutions Co., Ltd.	Transportation, warehouse and bagging packing management of polyethylene plastic pellets	Thailand	100	100
GC Ventures Co., Ltd.	Invest in form of Corporate Venture Capital (CVC)	Thailand	100	100
GC Treasury Center Co., Ltd.	Financial service management for the group	Thailand	100	100
GC Styrenics Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
GC Oxirane Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
GC-M PTA Co., Ltd. (49% Direct interest and 25% Indirect interest) (Formerly Siam Mitsui PTA Co., Ltd.)	Manufacturing and distributing petrochemical products	Thailand	74	74
GC Estate Co., Ltd.	Real estate development for rent and to invest in petrochemical and related industries	Thailand	100	100
Solution Creation Co., Ltd.	Manufacturing and distributing petrochemical products and health and nutrition products	Thailand	100	100
Thai Tank Terminal Limited	Service for the storage and handling of liquid chemicals, oil and gas	Thailand	51	51
Bio Spectrum Co., Ltd. (Liquidation process finalized in January 2019)	Manufacturing and distributing biochemical products	Thailand	-	100
PTT Phenol Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
Auria BioChemicals Co., Ltd. (54% Direct interest and 46% Indirect interest) (Liquidation process finalized in April 2019)	Research and development of bio-based chemicals	Thailand	-	100

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

<u>Name of the entity</u>	<u>Type of business</u>	<u>Country of incorporation</u>	<u>Ownership interest (%)</u>	
			<u>2019</u>	<u>2018</u>
NPC Safety and Environmental Service Co., Ltd.	Safety and environmental services	Thailand	100	100
PTTGC America Corporation	Holding and operating international business	United States of America	100	100
PTTGC International Private Limited	Holding and operating international business	Singapore	100	100
<i>Indirect subsidiaries</i>				
GGC Biochemicals Co., Ltd.	Holding and operating in Thailand	Thailand	100	100
Thai Fatty Alcohols Co., Ltd.	Manufacturing and distributing biochemical products	Thailand	72.29	72.29
Thai Pet Resin Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	74	74
PL Global Transport Co., Ltd.	Transportation of polyethylene plastic pellets	Thailand	100	100
NPC S&E Security Guard Co., Ltd.	Safety services	Thailand	100	100
GC Logistics Solutions (Vietnam) Co., Ltd.	Transportation, warehouse and bagging packing management of polyethylene plastic pellets	Vietnam	100	-
GC Ventures America Corporation	Invest in form of Corporate Venture Capital (CVC) outside Thailand	United States of America	100	100
GCM Polymer Trading DMCC (Formerly Polymer Marketing DMCC)	Distributing polymer products and other polymers-related products	United Arab Emirates	100	100
GC Marketing Solutions Myanmar Co., Ltd. (Formerly Polymer Marketing Myanmar Co., Ltd.)	Distributing polymer products and other polymers-related products	Myanmar	100	100
GC Marketing Solutions Vietnam Co., Ltd. (Formerly Polymer Marketing Vietnam Co., Ltd.)	Distributing polymer products and other polymers-related products	Vietnam	100	100
PT GCM Marketing Solutions Indonesia	Distributing polymer products and other polymers-related products	Indonesia	67	-
PTTGC America LLC	Operating petrochemical business	United States of America	100	100

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

<u>Name of the entity</u>	<u>Type of business</u>	<u>Country of incorporation</u>	<u>Ownership interest (%)</u>	
			<u>2019</u>	<u>2018</u>
PTTGC Innovation America Corporation	Research and development of bio-based chemicals	United States of America	100	100
PTTGC International (Netherlands) B.V.	Holding and operating international business	Netherlands	100	100
PTTGC International (USA) Inc.	Holding and operating international business	United States of America	100	100
Vencorex Holding	Manufacturing and distributing chemical specialties	France	90.82	90.82

2.6 Thai Financial Reporting Standards affecting the presentation and disclosure in the current period financial statements

During the year, the Group has adopted the revised and new financial reporting standards and guidelines on accounting issued by the Federation of Accounting Professions which become effective for fiscal years beginning on or after January 1, 2019. These financial reporting standards were aimed at alignment with the corresponding International Financial Reporting Standards, with most of the changes directed towards revision of wording and terminology, and provision of interpretations and accounting guidance to users of standards. The adoption of these financial reporting standards does not have any significant impact on the Group's financial statements.

2.7 Thai Financial Reporting Standards announced in the Royal Gazette but not yet effective

The Federation of Accounting Professions has issued the Notification regarding the new and revised Thai Financial Reporting Standards that will be effective for the financial statements for the periods beginning on or after January 1, 2020 onwards. These financial reporting standards were aimed at alignment with the corresponding International Financial Reporting Standards, with most of the changes directed towards revision of wording and terminology, and provision of interpretations and accounting guidance to users of standards without material change in key concept except for the Thai Accounting Standards (TAS), Thai Financial Reporting Standards (TFRS) and Thai Financial Reporting Standard Interpretations (TFRIC):

The following TASs and TFRSs have revision or additional paragraph and accounting guidance:

Thai Accounting Standards ("TAS")

TAS 12	Income Taxes
TAS 19	Employee Benefits
TAS 23	Borrowing Costs
TAS 28	Investments in Associates and Joint Ventures

Thai Financial Reporting Standards ("TFRS")

TFRS 3	Business Combinations
TFRS 11	Joint Arrangements

The Group's management will adopt the relevant TFRS in the preparation of Group's financial statements when they become effective. The Group's management has assessed the impact of the TFRS and considered that the adoption of the TFRS does not have any significant impact on the financial statements of the Group in the period of initial application.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

The following new TFRSs have material change in key concept:

Group of Financial Instruments Standards

Thai Accounting Standards (“TAS”)

TAS 32 Financial Instruments: Presentation

Thai Financial Reporting Standards (“TFRS”)

TFRS 7 Financial Instruments: Disclosures

TFRS 9 Financial Instruments

Thai Financial Reporting Standard Interpretations (“TFRIC”)

TFRIC 16 Hedges of a Net Investment in a Foreign Operation

TFRIC 19 Extinguishing Financial Liabilities with Equity Instruments

These group of Standards make stipulations relating to the classification of financial instruments and their measurement at fair value or amortised cost; taking into account the type of instrument, the characteristics of the contractual cash flows and the Company’s business model, the calculation of impairment using the expected credit loss method, and the concept of hedge accounting. These include stipulations regarding the presentation and disclosure of financial instruments. These Standards will supersede the Standards and Interpretations relating to the financial instruments upon their effective date.

The Group’s management will adopt such TFRS in the preparation of the Group’s financial statements when they become effective. The Group’s management is in the process to assess the impact of the TFRS on the financial statements of the Group in the period of initial application. The Group’s management expected to apply the TFRS as an adjustment to the opening balance of retained earnings or other equity component as at January 1, 2020.

Thai Financial Reporting Standards No. 16 “Leases” (“TFRS 16”)

This TFRS provides a comprehensive model for the identification of lease arrangements and their treatment in the financial statements of both lessees and lessors.

This TFRS will supersede the following lease Standards and Interpretations upon its effective date, which are Thai Accounting Standard No. 17 “Leases” (“TAS 17”), Thai Accounting Standard Interpretation No. 15 “Operating Lease - Incentives”, Thai Accounting Standard Interpretation No. 27 “Evaluating the Substance of Transactions involving the Legal Form of a Lease” and Thai Financial Reporting Standard Interpretation No. 4 “Determining whether on Arrangement contains a Lease”.

For lessee accounting, there are significant changes to lease accounting in this TFRS by removing the distinction between operating and finance leases under TAS 17 and requiring a lessee to recognise a right-of-use asset and a lease liability at commencement for all leases, except for short-term leases and leases of low value assets. However, the lessor accounting treatment continues to require a lessor to classify a lease either as an operating lease or a finance lease, using the same concept as TAS 17.

The Group’s management will adopt such TFRS in the preparation of the Group’s financial statements when it becomes effective. The Group’s management is in the process to assess the impact of the TFRS on the financial statements of the Group in the period of initial application. The Group’s management expected to apply the TFRS using the cumulative effect recognised at the date of initial application as at January 1, 2020.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

3. SIGNIFICANT ACCOUNTING POLICIES

The accounting policies set out below have been applied consistently to all periods presented in these financial statements.

3.1 Basis of consolidation

The consolidated financial statements relate to the Company and its subsidiaries and the Group's interests in joint ventures and associates.

Business combinations

The Group applies the acquisition method for all business combinations when control is transferred to the Group, as describe in subsidiaries section, other than those with entities under common control.

The Group recognises goodwill at the acquisition date measured as the excess of (1) over (2) as:

(1) The aggregate of:

- the fair value of the consideration transferred;
- the recognised amount of any non-controlling interests in the acquiree; and
- if the business combination is achieved in stages, the fair value of the existing equity interest in the acquiree.

(2) The net fair value of the identifiable assets acquired and liabilities assumed.

If value of (1) is less than (2), difference is contributed to gain on bargain purchase and recognised immediately in profit or loss.

The consideration transferred is recognised at fair value at the acquisition date.

Transaction costs that the Group incurs in connection with a business combination, such as legal fees, and other professional and consulting fees are expensed as incurred.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period, or additional assets or liabilities are recognised, to reflect new information obtained about facts and circumstances that existed at the acquisition date that, if known, would have affected the amounts recognised at that date.

Acquisitions from entities under common control

Business combinations under common control are accounted for using a method similar to the pooling of interest method. Under that method the acquirer recognises assets and liabilities of the acquired businesses at their carrying amounts in the consolidated financial statements of the ultimate parent company at the moment of the transaction. The difference between the carrying amounts of the acquired net assets and the consideration transferred is recognised as surplus or discount from business combinations under common control in shareholder's equity. The surplus or discount will be transferred to retained earnings upon divestment of the businesses acquired.

The results from operations of the acquired businesses will be included in the consolidated financial statements of the acquirer from the beginning of the comparative period or the moment the businesses came under common control, whichever date is later, until control ceases.

Subsidiaries

Subsidiaries are entities controlled by the Group. The Group controls an entity when it has rights to variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

Non-controlling interests

At the acquisition date, the Group measures any non-controlling interest at its proportionate interest in the identifiable net assets of the acquiree.

Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Loss of control

When the Group loses control over a subsidiary, it derecognises the assets and liabilities of the subsidiary, and any related non-controlling interests and other components of equity. Any resulting gain or loss is recognised in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

Interests in equity-accounted investees

The Group's interests in equity-accounted investees comprise interests in joint ventures and associates.

A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than the rights to its assets and obligations for its liabilities. Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies.

Interests in joint ventures and associates are accounted for using the equity method. They are recognised initially at cost. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and other comprehensive income of equity-accounted investees, until the date on which joint control or significant influence ceases.

Transactions eliminated on consolidation

Intra-group balances and transactions and any unrealised income or expenses arising from intra-group transactions are eliminated in the preparing of the consolidated financial statements. Unrealised gains and losses arising from transactions with joint ventures and associates are eliminated against the investment to the extent of the Group's interest in the investee.

3.2 Foreign currencies

Foreign currency transactions

Transactions in foreign currencies are translated to the respective functional currency of Group entities at exchange rate at the dates of the transactions.

Monetary assets and liabilities denominated in foreign currencies at the reporting date are translated to the functional currency at the exchange rate at the reporting date.

Non-monetary assets and liabilities measured at cost in foreign currencies are translated to the functional currency at the exchange rate at the dates of the transactions.

Foreign currency differences arising on retranslation are generally recognised in profit or loss. However, foreign currency differences arising from the translation of qualifying cash flow hedges to the extent that the hedges are effective are recognised in other comprehensive income.

Foreign operations

The assets and liabilities of foreign operations, including goodwill and fair value adjustments arising on acquisition of foreign operations, are translated to Thai Baht at the exchange rates at the reporting date.

The revenues and expenses of foreign operations are translated to Thai Baht at the average rates during the year.

Foreign exchange differences are recognised in other comprehensive income and presented in the foreign currency translation reserve in equity until disposal of the investment, except to extent that the translation difference is allocated to non-controlling interest.

3.3 Derivatives

Derivatives are used to manage exposure to foreign exchange, interest rate arising from operating, financing and investing activities. Derivatives are not used for trading purposes. However, derivatives that do not qualify for hedging instruments are accounted for as trading instruments.

Derivatives are recognised initially at fair value; attributable transaction costs are recognised in profit or loss when incurred. Subsequent to initial recognition, they are remeasured at fair value. The gain or loss on remeasurement is recognised immediately in profit or loss.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

The fair value of interest rate swaps is based on broker quotes at the reporting date. Those quotes are tested for reasonableness by discounting estimated future cash flows based on the terms and maturity of each contract and using market interest rates for a similar instrument at the reporting date.

The fair value of forward exchange contracts is based on their listed market price as the reporting date, if available. If the listed market price is not available, then fair value is estimated by forward contract with the same nature and maturity date at the reporting date.

3.4 Hedge accounting

Cash flow hedges accounting of the non-financial assets or non-financial liabilities

When a derivative is designated as the hedging instrument in a hedge of the variability in cash flows of a non-financial asset or non-financial liability, the effective portion of gain or loss from subsequent measurement of fair value of the derivative is recognised in other comprehensive income and presented in the hedging reserve in equity. Any ineffective portion is recognised immediately in profit or loss.

When a hedge of a non-financial asset or non-financial liability occurs, the gain or loss recognised in other comprehensive income is included in the cost of the non-financial asset or non-financial liability.

Discontinuing hedge accounting

When the hedging instrument expires or is sold, terminated, or no longer qualifies for hedge accounting, the hedge accounting is discontinued prospectively. Any cumulative gain or loss on the hedging instrument existing in equity is retained in equity. When the hedge of the non-financial assets or non-financial liabilities item ultimately occurs, the gain or loss is adjusted according to cash flow hedges accounting.

When the non-financial assets or non-financial liabilities item is no longer expected to occur, the cumulative gain or loss that was reported in equity is recognised in profit or loss immediately.

3.5 Cash and cash equivalents

Cash and cash equivalents comprise cash balances, deposits and highly liquid current investments.

3.6 Trade and other receivables

Trade and other receivables are stated at their invoice value less allowance for doubtful accounts.

The allowance for doubtful accounts is assessed primarily on analysis of overdue aging and future expectations of customer payments. Bad debts are written off when incurred.

3.7 Inventories

Inventories are stated at the lower of cost or net realisable value.

Cost is calculated using the weighted average cost principle, and comprises all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition. In the case of manufactured inventories and work-in-progress, cost includes an appropriate share of production overheads based on normal operating capacity.

Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs to complete and to make the sale.

Provision is made for obsolete and slow-moving of finished goods, factory supplies and spare parts based on the items that are obsoleted and expected to be unsalable.

3.8 Investments

Investments in subsidiaries, joint ventures and associates

Investments in subsidiaries, joint ventures and associates in the separate financial statements of the Company are accounted for using the cost method. Investments in joint ventures and associates in the consolidated financial statements are accounted for using the equity method.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Investments in other debt securities and equity securities

Debt securities that the Group has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are stated at amortised cost, less any impairment losses. The difference between the acquisition cost and redemption value of such debt securities is amortised using the effective interest rate method over the period to maturity.

Debt securities and marketable equity securities, other than those securities held for trading or intended to be held to maturity, are classified as available-for-sale investments. Available-for-sale investments are, subsequent to initial recognition, stated at fair value, and changes therein, other than impairment losses and foreign currency differences on available-for-sale monetary items, are recognised directly in equity. Impairment losses and foreign exchange differences are recognised in profit or loss. When these investments are derecognised, the cumulative gain or loss previously recognised directly in equity is recognised in profit or loss. Where these investments are interest-bearing, interest calculated using the effective interest method is recognised in profit or loss.

Equity securities which are not marketable are stated at cost less any impairment losses.

The fair value of financial instruments classified as available-for-sale is determined as the quoted bid price at the reporting date.

Disposal of investments

On disposal of an investment, the difference between net disposal proceeds and the carrying amount together with the associated cumulative gain or loss that was reported in equity is recognised in profit or loss.

If the Group disposes of part of its holding of a particular investment, the deemed cost of the part sold is determined using the weighted average method applied to the carrying value of the total holding of the investment.

3.9 Investment properties

Property that is held for long-term rental yields or for capital appreciation or both, and that is not occupied by the companies in the consolidated Group, is classified as investment properties.

Investment properties of the Group are land and buildings held for long-term rental yields or for capital appreciation.

Investment properties are measured initially at its cost, including related transaction costs and borrowing costs. Borrowing costs incurred for the purpose of acquiring, constructing or producing a qualifying investment properties are capitalised as part of its cost.

After initial recognition, investment properties are carried at cost less accumulated depreciation and accumulated impairment losses.

Land is not depreciated. Depreciation on other investment properties which are buildings is calculated using the straight line method to allocate their cost to their residual values over their estimated useful live for 20 years.

Subsequent expenditure is capitalised to the asset's carrying amount only when it is probable that future economic benefits associated with the expenditure will flow to the Group and the cost of the item can be measured reliably. All other repairs and maintenance costs is expensed when incurred. When part of an investment property is replaced, the carrying amount of the replaced part is derecognised.

3.10 Property, plant and equipment

Recognition and measurement

Owned assets

Land are stated at cost less allowance for impairment.

Plant and equipment are measured at cost less accumulated depreciation and accumulated impairment losses.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the assets to a working condition for their intended use, the costs of dismantling and removing the items and restoring the site on which they are located, and capitalised borrowing costs. Cost also may include transfers from other comprehensive income of any gain or loss on qualifying cash flow hedges of foreign currency purchases of property, plant and equipment. Purchased software that is integral to the functionality of the related equipment is capitalised as part of that equipment.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Any gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment, and are recognised in profit or loss.

Leased assets

Leases in terms of which the Group substantially assumes all the risk and rewards of ownership are classified as finance leases. Property, plant and equipment acquired by way of finance leases are capitalised at the lower of their fair value and the present value of the minimum lease payments at the inception of the lease, less accumulated depreciation and impairment losses. Lease payments are apportioned between the finance charges and reduction of the lease liability so as to achieve a constant rate of interest on the remaining balance of the liability. Finance charges are charged directly to the profit or loss.

Subsequent costs

The cost of replacing a part of an item of property, plant and equipment is recognised in the carrying amount of the item if it is probable that the future economic benefits embodied within the part will flow to the Group, and its cost can be measured reliably. The carrying amount of the replaced part is derecognised. The costs of the day-to-day servicing of property, plant and equipment are recognised in profit or loss as incurred.

Depreciation

Depreciation on other assets is calculated based on the depreciable amount, which is the cost of an asset, or other amount substituted for cost, less its residual value.

Depreciation is charged to profit or loss on a straight-line basis over the estimated useful lives of each component of an item of assets. The estimated useful lives are as follows:

Land improvement	5-30	years
Plant, machinery, equipment and factory tools	5-40	years
Buildings and buildings improvement	5-30	years
Furniture, fixtures and office equipment	3-10	years
Vehicles	5-25	years

No depreciation is provided on assets under construction.

Depreciation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

3.11 Intangible assets

Goodwill

Goodwill that arises upon the acquisition of businesses is included in intangible assets. Subsequent to initial recognition, goodwill is measured at cost less accumulated impairment losses.

Goodwill in investment in joint ventures and associates is included in the carrying amount of the investment in joint ventures and associates, impairment loss on such an investment is deducted directly in investment in joint ventures and associates.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Other intangible assets

Other intangible assets that are acquired by the Group and have finite useful lives are measured at cost less accumulated amortisation and accumulated impairment losses.

Subsequent expenditure

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, are recognised in profit or loss as incurred.

Amortisation

Amortisation is based on the cost of the asset less its residual value.

Amortisation is recognised in profit or loss on a straight-line basis over the estimated useful lives of intangible assets, other than goodwill and trademark, from the date that they are available for use, since this most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. The estimated useful lives are as follows:

Production licence fees	10-30	years
Computer software	3-10	years
Customer contracts and the related customer relationships	5	years
Right to use - pipe rack	6-15	years
Right to use - others	3-16	years

Amortisation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

3.12 Impairment

The carrying amounts of the Group's assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, the assets' recoverable amounts are estimated. For goodwill and intangible assets that have indefinite useful lives or are not yet available for use, the recoverable amount is estimated each year at the same time.

An impairment loss is recognised if the carrying amount of an asset or its cash-generating unit exceeds its recoverable amount. The impairment loss is recognised in profit or loss.

When a decline in the fair value of an available-for-sale financial asset has been recognised directly in equity and there is objective evidence that the value of the asset is impaired, the cumulative loss that had been recognised directly in equity is recognised in profit or loss even though the financial asset has not been derecognised. The amount of the cumulative loss that is recognised in profit or loss is the difference between the acquisition cost and current fair value, less any impairment loss on that financial asset previously recognised in profit or loss.

Calculation of recoverable amount

The recoverable amount of held-to-maturity securities carried at amortised cost is calculated as the present value of the estimated future cash flows discounted at the original effective interest rate.

The recoverable amount of available-for-sale financial assets is calculated by reference to the fair value.

The recoverable amount of a non-financial asset is the greater of the asset's value in use and fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. For an asset that does not generate cash inflows largely independent of those from other assets, the recoverable amount is determined for the cash-generating unit to which the asset belongs.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Reversals of impairment

An impairment loss in respect of a financial asset is reversed if the subsequent increase in recoverable amount can be related objectively to an event occurring after the impairment loss was recognised in profit or loss.

An impairment loss in respect of goodwill is not reversed.

Impairment losses recognised in prior periods in respect of other non-financial assets are assessed at each reporting date for any indications that the loss has decreased or no longer exists. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

3.13 Interest-bearing liabilities

Interest-bearing liabilities are recognised initially at fair value less attributable transaction charges. Subsequent to initial recognition, interest-bearing liabilities are stated at amortised cost with any difference between cost and redemption value being recognised in profit or loss over the period of the borrowings on an effective interest basis.

3.14 Trade and other payables

Trade and other payables are stated at cost.

3.15 Employee benefits

Defined contribution plans

Obligations for contributions to defined contribution plans are expensed as the related service is provided.

Defined benefit plans

The Group's net obligation in respect of defined benefit plans is calculated separately for each plan by estimating the amount of future benefit that employees have earned in the current and prior periods, discounting that amount.

The calculation of defined benefit obligations is performed every 3 years by a qualified actuary using the projected unit credit method.

Remeasurements of the defined benefit liability, actuarial gain or loss are recognised immediately in Other comprehensive income. The Group determines the interest expense on the defined benefit liability for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period. Interest expense and other expenses related to defined benefit plans are recognised in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognised immediately in profit or loss. The Group recognises gains and losses on the settlement of a defined benefit plan when the settlement occurs.

Other long-term employee benefits

The Group's net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted to determine its present value. Remeasurements are recognised in profit or loss in the period in which they arise.

Termination benefits

Termination benefits are expensed at the earlier of when the Group can no longer withdraw the offer of those benefits and when the Group recognises costs for a restructuring. If benefits are not expected to be settled wholly within 12 months of the end of the reporting period, then they are discounted.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Short-term employee benefits

Short-term employee benefits are expensed as the related service is provided. A liability is recognised for the amount expected to be paid if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

3.16 Provisions

A provision is recognised if, as a result of a past event, the Group has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount on provisions is recognised as finance cost.

3.17 Repurchase of share capital (treasury stock)

When share capital recognised as equity is repurchased, the amount of consideration paid, including directly attributable costs, is classified as treasury stock and recognised as a deduction from equity. An equal amount is appropriated from retained earnings and taken to a reserve for treasury stock within equity. When treasury stock are sold, the amount received is recognised as an increase in equity by crediting the cost of the treasury stock sold, calculated using the weighted average method, to the treasury stock account and transferring the equivalent amount back from treasury stock reserve to retained earnings. Surpluses on the sale of treasury stock are taken directly to a separate category within equity, 'Premium on treasury stock'. Net deficits on sale or cancellation of treasury stock are debited to retained earnings after setting off against any remaining balance of premium on treasury stock.

3.18 Revenue

Revenue excludes value added taxes and is arrived at after deduction of trade discounts.

Revenues from sale of goods and rendering of services

Revenues from sale of goods is recognised when control of the goods has transferred to the customer, being at the point the goods are delivered to the customer. Revenues from rendering of services is recognised as a performance obligation satisfied at a point in time when services underlying the particular performance obligation is transferred to the customer or is recognised over time based on the stage of completion of the contract.

Investment income

Investment income consists of dividend income and interest income from investments and bank deposits. Dividend income is recognised in profit or loss on the date the Group's right to receive payments is established. Interest income is recognised on a time basis, based on the principle outstanding and the applicable interest rate.

Other income

Other income is recognised on an accrual basis.

3.19 Finance costs

Finance costs is recognised using the effective interest method and comprise interest expense on borrowings, unwinding of the discount on provisions and contingent consideration.

Borrowing costs that are not directly attributable to the acquisition, construction or production of a qualifying asset are recognised in profit or loss using the effective interest method.

3.20 Operating leases

Payments made under operating leases are recognised in profit or loss on a straight line basis over the term of the lease.

Contingent lease payments which the lease adjustment is confirmed are accounted for by revising the minimum lease payments over the remaining term of the lease.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

3.21 Income tax

Income tax expense for the year comprises current and deferred tax. Current and deferred tax are recognised in profit or loss except to the extent that they are relate to the items recognised in equity are recognised in other comprehensive income.

Current tax is the expected tax payable or receivable on the taxable income for the year, using tax rates enacted at the end of the reporting period, and any adjustment to tax payable or receivable in respect of previous years.

Deferred tax is recognised in respect of temporary differences between the carrying amounts and taxable value of assets and liabilities, using tax rates enacted or substantively enacted to the temporary differences when they reverse.

Deferred tax is not recognised for the following temporary differences:

- the initial recognition of goodwill and related transactions
- the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss
- differences relating to investments in subsidiaries to the extent that it is probable that they will not reverse in the foreseeable future.

The measurement of deferred tax reflects the tax consequences that would follow the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

In determining the amount of current and deferred tax, the Group takes into account the impact of uncertain tax positions and whether additional taxes and interest may be due. The Group believes that its accruals for tax liabilities are adequate for all open tax years based on its assessment of many factors, including interpretations of tax law and prior experience. This assessment relies on estimates and assumptions and may involve a series of judgements about future events. New information may become available that causes the Group to change its judgement regarding the adequacy of existing tax liabilities; such changes to tax liabilities will impact tax expense in the period that such a determination is made.

Deferred tax assets and liabilities on different tax entities are offset if there is a legally enforceable right to offset current tax assets and liabilities, and they relate to income taxes levied by the same tax authority.

A deferred tax asset is recognised to the extent that it is probable that deferred tax assets can be utilised as future tax benefit. Deferred tax assets are reviewed at each reporting date and reduced to the extent that it is no longer probable that the related tax benefit will be realised.

3.22 Basic earnings (loss) per share

Basic earnings (loss) per share ("EPS") is calculated by dividing net profit (loss) for the year attributable to owners of the parent by the weighted average number of ordinary shares outstanding during the year, adjusted for treasury shares.

3.23 Financial information by segment

Segment results that are reported to the Group's Management Committee (the chief operating decision maker) include items directly attributable to a segment as well as those that can be allocated on a reasonable basis.

3.24 Measurement of fair values

A number of the Group's accounting policies and disclosures require the measurement of fair values, for both financial assets and liabilities.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

When measuring the fair value of an asset or a liability, the Group uses observable market data as far as possible. Fair values are categorised into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or liability might be categorised in different levels of the fair value hierarchy, then the fair value measurement is categorised in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

Further information about the assumptions made in measuring fair values is included in note 14: Investment properties and note 38: Financial instruments.

3.25 Use of management's judgments

The preparation of financial statements in conformity with TFRS requires the Company's management to exercise judgments in order to determine the accounting policies, estimates and various assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Although these estimates are based on management's reasonable consideration of current events, actual results may differ from these estimates.

4. EXPENSES FROM RAW MATERIALS DEROGATION

As the raw materials used in the production process are the volatile commodity materials, Global Green Chemical Public Company Limited which is a subsidiary of the Group, has policy to manage inventory to be at an appropriate level in order to mitigate the impacts from raw material price volatility. During second quarter of 2018, the subsidiary found that the quantity of raw materials recorded in the system was higher than actual quantity stored at the suppliers' facilities. In addition, this also includes the case that the subsidiary delivered the raw materials to the supplier for refining, however, the supplier neither returned back the refining products according to the contract nor the raw materials to the subsidiary.

The subsidiary conducted an in-depth investigation and found the misconduct among certain suppliers and some employees in the relevant functions of the subsidiary, in which certain suppliers are related. The subsidiary had already taken legal actions against involved parties (both external and internal) as well as the disciplinary actions against every involved employees.

In consequence, the Group recognised expenses from raw materials derogation in the consolidated statements of income for the year ended December 31, 2018 amounting to Baht 2,004 million (owners of the parent net of tax amounting to Baht 1,261 million). However, the subsidiary is legally entitled to claim from those involved.

The subsidiary was informed by the third party who received the transfer of claim from the supplier of the subsidiary for the payment of raw materials, which the supplier of the subsidiary borrowed from the third party to purchase raw materials to sell to the subsidiary and the subsidiary had to pay for the raw materials to that third party under the transfer of right for the payment of raw materials. After reviewing the provided documents, the subsidiary informed to the third party that these documents were not in the system, nor there was no evidence regarding the delivery of raw materials as prescribed in the documents. Subsequently, on August 20, 2018, the third party filed a civil lawsuit against the supplier of the subsidiary and the subsidiary as joint defendants for violation of loan agreement and transfer of claim, with damage claimed amounting to Baht 308.75 million with interest rate at 15% per annum amounting to Baht 15.90 million, totalling Baht 324.65 million. The subsidiary appointed a lawyer and filed a statement of defense. Currently, this case is in the process of the plaintiffs and defendants witness hearing. However, the legal advisor of the subsidiary provided an opinion that the subsidiary is not liable for any damages as per the plaint as there was no evidence regarding the delivering of raw materials to the subsidiary. As a result, there is no obligation.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

On January 31, 2019, the subsidiary has entered into the settlement agreements with some suppliers in order to get compensate from those suppliers for the raw materials derogation which requires suppliers to deliver the pending quantity of raw materials under the period specified in the agreements. Consequently, the suppliers gradually delivered the pending raw materials to the subsidiary during the year 2019 amounting to Baht 16 million. In addition, such suppliers registered a mortgage on land to the subsidiary with fair value of Baht 217 million. Consequently, the subsidiary reviewed the provision for expenses from raw materials derogation and reversed such provision amounting to Baht 233 million in the consolidated and separate statements of profit or loss for the year ended December 31, 2019.

Besides, on February 27, 2019, a financial institution filed a civil lawsuit against the supplier of the subsidiary, director of supplier of the subsidiary and the subsidiary as joint defendants for violation of credit limit agreement, sale of promissory notes, transfer of money, guarantee and forced mortgage, with damage claimed amounting to Baht 55.95 million and interest amounting to Baht 3.49 million, totalling Baht 59.44 million. Therefore, the subsidiary filed a statement of defense. On October 28, 2019, the plaintiff submitted the motion for permission to withdraw the pliant against the subsidiary and the Court granted such permission and struck the case out of the case-list of the Court.

5. ACQUISITION OF BUSINESSES

On August 8, 2018, the Group entered into the Shares Purchase Agreement to acquire 74% share of Siam Mitsui PTA Company Limited, Purified Terephthalic Acid producer, and 74% share of Thai PET Resin Company Limited, Polyethylene Terephthalate resin producer, directly and indirectly, from SCG Chemicals Co., Ltd. and Mitsui Chemicals, Inc. Subsequently on December 27, 2018, the Group completed the share acquisition of subsidiaries for a preliminary cash consideration of approximately Baht 4,123 million. The final purchase price was settled with the seller for an additional payment of approximately Baht 1,249 million, which already paid in March 2019.

Management believes that the acquisition is harmonised with the business strategy of the Company that intends to expand the downstream investment and increase market potential in polymer business to satisfy customer's need.

The purchase under this condition is in accordance with TFRS 3 Business Combinations, requires the recognition of assets, liabilities and contingent liabilities acquired at the acquisition date at fair value. The Group is in process of hiring an independent appraiser to determine the fair value of assets and liabilities acquired during the measurement period, which must not exceed one year from the acquisition date to reflect new information obtained about facts and circumstances that existed as of the acquisition date. Accordingly, the fair value of assets acquired and liabilities assumed have been provisionally determined at the acquisition date (the value of property, plant and equipment determined by independent assets appraiser).

However, the fair value of assets acquired and liabilities have been already completed. Therefore, the fair value of assets acquired and liabilities have been adjusted and a gain on bargain purchase of Baht 31 million has been recognised in the consolidated income statement for the year ended December 31, 2019.

The following summarises the major classes of consideration transferred, and the recognised amounts of assets acquired and liabilities assumed at the acquisition date:

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Identifiable assets acquired and liabilities assumed as at December 31, 2018:

	Notes	Fair values (in million Baht)
Cash and cash equivalents		1,589
Trade receivables		2,481
Inventories		2,201
Property, plant and equipment	15	9,549
Intangible assets	18	8
Trade payables		(2,777)
Other payables		(183)
Long-term borrowings from financial institutions		(750)
Deferred tax	19	(584)
Other assets/(liabilities), net		(2,444)
Net identifiable assets acquired and liabilities assumed		9,090
Non-controlling interest acquired		(2,363)
Net assets acquired and liabilities assumed		6,727
Gain on bargain purchase		(1,355)
Total consideration		5,372
Cash acquired		(1,589)
Net consideration		3,783

Acquisition-related costs

The Group incurred acquisition-related costs of Baht 110 million related to external legal fees and due diligence costs. The legal fees and due diligence costs have been included in administrative expenses in the Group's consolidated statement of income in the period which transaction occurred.

6. CASH AND CASH EQUIVALENTS

6.1 Cash and cash equivalents as at December 31, 2019 and 2018 consist of:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Cash on hand	2	76	2	2
Cash and highly liquid current investments (Private funds)	62	533	62	533
Cash at banks - current accounts	822	1,679	5	4
Cash at banks - savings accounts	13,091	16,037	9,283	10,978
Cash at banks - foreign accounts	2,321	1,624	1,546	322
Highly liquid current investments	2,542	16,795	1,499	15,303
Total	18,840	36,744	12,397	27,142

As at December 31, 2019 and 2018, bank accounts of two subsidiaries totalling Baht 60 million and Baht 192 million, respectively, are pledged as collateral to secure credit facilities obtained from financial institutions. However, the pledged bank accounts can be withdrawn in accordance with the objective and conditions stipulated in the loan agreements for use as working capital required in the normal course of business (see Note 20).

6.2 Non-cash transactions:

Reconciliation of liabilities arising from financing activities

The table below details changes in the liabilities arising from financing activities, including both cash and non-cash changes.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

As at December 31, 2019

Unit : Million Baht

	Consolidated financial statements									Balance as at December 31, 2019
	Balance as at January 1, 2019	Net financing cash flows	Non-cash changes						Others	
			Interest expense	Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in finance lease liabilities	Amortisation of deferred interest from finance lease	Gain on exchange rate		
Accrued interest expense	706	(2,918)	3,637	(658)	93	-	-	(14)	-	846
Finance lease liabilities	320	(176)	-	-	-	250	7	-	-	401
Short-term borrowings from financial institutions	3,343	(1,281)	-	-	-	-	-	(41)	-	2,021
Long-term borrowings from financial institutions	37,962	(2,847)	-	-	39	-	-	(552)	24	34,626
Long-term borrowings from other parties	1,252	(27)	-	-	3	-	-	(71)	(847)	310
Debentures	54,350	18,058	-	-	47	-	-	(2,324)	-	70,131
Total	97,933	10,809	3,637	(658)	182	250	7	(3,002)	(823)	108,335

As at December 31, 2018

Unit : Million Baht

	Consolidated financial statements									Balance as at December 31, 2018
	Balance as at January 1, 2018	Net financing cash flows	Non-cash changes							
			Interest expense	Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in finance lease liabilities	Amortisation of deferred interest from finance lease	Effect from acquisition of subsidiaries	Gain on exchange rate	
Accrued interest expense	726	(3,403)	3,582	(295)	97	-	-	2	(3)	706
Finance lease liabilities	313	(153)	-	-	-	153	7	-	-	320
Short-term borrowings from financial institutions	263	135	-	-	-	-	-	2,955	(10)	3,343
Long-term borrowings from financial institutions	41,113	(3,630)	-	-	67	-	-	750	(338)	37,962
Long-term borrowings from other parties	1,810	(619)	-	-	89	-	-	-	(28)	1,252
Debentures	54,645	(82)	-	-	(129)	-	-	-	(84)	54,350
Total	98,870	(7,752)	3,582	(295)	124	153	7	3,707	(463)	97,933

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

As at December 31, 2019

Unit : Million Baht

	Separate financial statements								Balance as at December 31, 2019
	Balance as at January 1, 2019	Net financing cash flows	Non-cash changes						
			Interest expense	Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in finance lease liabilities	Amortisation of deferred interest from finance lease	Gain on exchange rate	
Accrued interest expense	715	(2,449)	2,851	(280)	26	-	-	-	863
Finance lease liabilities	226	(122)	-	-	-	180	5	-	289
Short-term borrowings from related parties	1,931	1,110	-	-	-	-	-	-	3,041
Long-term borrowings from financial institutions	14,419	(4,280)	-	-	5	-	-	(71)	10,073
Long-term borrowing from a related party	16,105	-	-	-	18	-	-	(1,132)	14,991
Debentures	38,321	18,058	-	-	(7)	-	-	(1,151)	55,221
Total	71,717	12,317	2,851	(280)	42	180	5	(2,354)	84,478

As at December 31, 2018

Unit : Million Baht

	Separate financial statements								Balance as at December 31, 2018
	Balance as at January 1, 2018	Net financing cash flows	Non-cash changes						
			Interest expense	Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in finance lease liabilities	Amortisation of deferred interest from finance lease	(Gain)/loss on exchange rate	
Accrued interest expense	698	(2,887)	3,018	(192)	78	-	-	-	715
Finance lease liabilities	221	(122)	-	-	-	123	4	-	226
Short-term borrowings from related parties	2,558	(627)	-	-	-	-	-	-	1,931
Long-term borrowings from financial institutions	21,259	(6,793)	-	-	5	-	-	(52)	14,419
Long-term borrowing from a related party	-	16,473	-	-	(68)	-	-	(300)	16,105
Debentures	54,645	(16,453)	-	-	83	-	-	46	38,321
Total	79,381	(10,409)	3,018	(192)	98	123	4	(306)	71,717

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

7. TRADE RECEIVABLES

Trade receivables as at December 31, 2019 and 2018 consist of:

	<i>Note</i>	Consolidated		Unit : Million Baht	
		financial statements		Separate	
		2019	2018	2019	2018
Related parties	27	16,721	17,601	22,433	25,708
Other parties		17,485	24,433	5,705	9,144
Total		34,206	42,034	28,138	34,852
<u>Less</u> Allowance for doubtful accounts		(49)	(43)	(19)	(19)
Total trade receivables		34,157	41,991	28,119	34,833

Trade receivables as at December 31, 2019 and 2018 are classified by aging as follows:

		Consolidated		Unit : Million Baht	
		financial statements		Separate	
		2019	2018	2019	2018
Related parties					
Within credit terms		16,705	17,579	22,428	25,271
Overdue					
- less than 3 months		16	21	5	437
- over 3 months but less than 6 months		-	1	-	-
- over 6 months but less than 12 months		-	-	-	-
- over than 12 months		-	-	-	-
Total trade receivables, related parties		16,721	17,601	22,433	25,708
Other parties					
Within credit terms		16,980	23,798	5,684	9,125
Overdue					
- less than 3 months		453	589	2	-
- over 3 months but less than 6 months		8	2	-	-
- over 6 months but less than 12 months		6	7	-	-
- over than 12 months		38	37	19	19
		17,485	24,433	5,705	9,144
<u>Less</u> Allowance for doubtful accounts		(49)	(43)	(19)	(19)
Total trade receivables, other parties		17,436	24,390	5,686	9,125
Total trade receivables		34,157	41,991	28,119	34,833

The normal credit term granted by the Group ranges from 14 days to 90 days.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

8. OTHER RECEIVABLES

Other receivables as at December 31, 2019 and 2018 consist of:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Prepaid expenses	1,358	1,503	747	947
Receivable from oil hedging contracts	417	436	417	436
Accrued income	216	488	305	560
Other receivables	579	693	578	697
Receivable from The Revenue Department	367	117	222	-
Others	212	388	46	137
Total	3,149	3,625	2,315	2,777

9. INVENTORIES

Inventories as at December 31, 2019 and 2018 consist of:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Finished goods	14,078	15,551	9,405	10,574
Work in progress	1,618	1,823	992	1,266
Raw materials	9,387	8,870	8,095	7,147
Factory supplies and spare parts	10,406	9,992	8,113	7,834
Goods in transit	1,221	4,750	49	3,701
Total	36,710	40,986	26,654	30,522
<u>Less</u> Allowance for decline in value	(303)	(1,366)	(240)	(1,330)
Allowance for obsolescence	(155)	(254)	(33)	(87)
Net	36,252	39,366	26,381	29,105
Inventories recognised as an expense in 'cost of sales of goods':				
- Cost	389,752	462,756	339,857	416,495
- (Reversal of) write-down to net realisable value	(1,061)	1,347	(1,090)	1,330
Net	388,691	464,103	338,767	417,825

As at December 31, 2019 and 2018, the Company's inventories included petroleum legal reserve of 302 million liters with approximated value of Baht 4,072 million and 341 million liters with approximated value of Baht 4,752 million, respectively.

10. INVESTMENTS IN SUBSIDIARIES

Movements of investments in subsidiaries for the years ended December 31, were as follows:

	<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>
<i>Subsidiaries</i>		
As at January 1,	67,783	56,859
Acquisition	4,833	11,694
Capital distribution	(2)	(41)
Allowance for impairment	(63)	(729)
As at December 31,	72,551	67,783

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Investments in subsidiaries as at December 31, 2019 and 2018, and dividend income for the years ended December 31, 2019 and 2018 were as follows:

	Separate financial statements										Unit : Million Baht
	Ownership Interest (%)		Paid-up capital		Cost		Impairment		At cost-net		Fair value of listed securities
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	
Subsidiaries											
Global Green Chemicals Plc.	72	72	10,237	10,237	7,400	7,400	-	-	7,400	7,400	9,324
GC Glycol Co., Ltd.	100	100	5,395	5,395	5,395	5,395	-	-	5,395	5,395	-
GC Polyols Co., Ltd.	82	82	2,692	1,281	2,210	1,052	-	-	2,210	1,052	-
GC Marketing Solutions Co., Ltd.	99	99	40	40	451	451	-	-	451	451	-
GC Maintenance and Engineering Co., Ltd.	100	100	137	137	155	155	-	-	155	155	-
GC Logistics Solutions Co., Ltd.	99	99	1,200	1,200	1,607	1,607	-	-	1,607	1,607	-
GC Ventures Co., Ltd.	100	100	465	144	465	144	-	-	465	144	-
GC Treasury Center Co., Ltd.	100	100	10	10	10	10	-	-	10	10	-
GC Styrenics Co., Ltd.	100	100	190	190	190	190	-	-	190	190	-
GC Oxirane Co., Ltd.	100	100	5,267	2,392	5,267	2,392	-	-	5,267	2,392	-
GC-M PTA Company Limited (Formerly Siam Mitsui PTA Co., Ltd.)	49	49	4,800	4,800	2,903	2,903	-	-	2,903	2,903	-
GC Estate Co., Ltd.	100	100	7,200	7,200	7,200	7,200	-	-	7,200	7,200	-
Solution Creation Co., Ltd.	100	100	524	183	524	183	-	-	524	183	-
Thai Tank Terminal Limited	51	51	900	900	459	459	-	-	459	459	-
Bio Spectrum Co., Ltd. (Liquidation process finalized in January 2019)	-	100	-	146	-	96	-	(95)	-	1	-
PTT Phenol Co., Ltd.	100	100	11,851	11,851	13,155	13,155	-	-	13,155	13,155	-
Auria Bio Chemicals Co., Ltd. (Liquidation process finalized in April 2019)	-	54	-	90	-	8	-	(7)	-	1	-
NPC Safety and Environmental Service Co., Ltd.	100	100	165	165	165	165	-	-	165	165	-
PTTGC America Corporation	100	100	-	-	4,407	4,361	-	-	4,407	4,361	-
PTTGC International Private Limited	100	100	30,877	30,785	30,877	30,785	(10,289)	(10,226)	20,588	20,559	-
Total investments in subsidiaries			82,840	78,111	82,840	78,111	(10,289)	(10,328)	72,551	67,783	9,324
											7,289
											2,666
											2,192

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Change in investments in subsidiaries

On March 14, 2019, Solution Creation Co., Ltd. has called for paid-up capital from the capital increase from the Company following the Extraordinary General Meeting of shareholders of the subsidiary held on January 11, 2019 to invest in Revolve Group Limited at Baht 340.90 million, of which received in March 2019.

On May 8, 2019, PTTGC International Private Limited has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the Company held on April 29, 2019 for the purpose of corporate and its subsidiary operation at SGD 3.92 million or equivalent to Baht 91.89 million, of which fully received in May 2019.

On August 28, 2019, PTTGC America Corporation has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the Company held on July 15, 2016 for the purpose of US Petrochemical Complex Project investment at USD 1.50 million or equivalent to Baht 46.24 million, of which fully received in September 2019.

During the year ended December 31, 2019, GC Ventures Co., Ltd. has called for paid-up capital from the capital increase by the Annual General Meeting of shareholders of the subsidiary held on March 25, 2019, for investment in Corporate Venture Capital (CVC) at Baht 320.76 million, of which fully received during the year ended December 31, 2019.

During the year ended December 31, 2019, GC Polyols Co., Ltd. has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the Company held on November 14, 2018 for conducting a Polyols & PU System Project at Baht 1,158.12 million, of which fully received during the year ended December 31, 2019.

During the year ended December 31, 2019, GC Oxirane Co., Ltd. has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the Company held on October 5, 2017 for conducting a Propylene Oxide Project at Baht 2,875.60 million, of which fully received during the year ended December 31, 2019.

On January 7, 2019, Bio Spectrum Co., Ltd. distributed capital to the Company amounting to Baht 1.40 million. On March 31, 2016, such subsidiary registered the dissolution with Department of Business Development, Ministry of Commerce and finalized the liquidation process on January 18, 2019.

On March 26, 2019, Auria BioChemicals Co., Ltd. distributed capital to the Company amounting to Baht 0.52 million. On April 25, 2018, such subsidiary registered the dissolution with Department of Business Development, Ministry of Commerce and finalized the liquidation process on April 4, 2019.

On January 11, 2018, Solution Creation Co., Ltd. has called for paid capital from the capital increase by the Extraordinary General Meeting of shareholders of the subsidiary held on September 4, 2017 to invest in TPBI & Myanmar Star Co., Ltd. at Baht 16.75 million, of which fully received in January 2018.

At the Board of Directors' Meeting of the Company held on December 18, 2017, the Board approved to establish GC Estate Co., Ltd. which is 100% shareholding by the Company, for developing estate for rent to invest in petrochemical and related industries. Subsequently on January 23, 2018, GC Estate Co., Ltd. registered the initial authorised share capital of Baht 1.01 million and called for paid-up capital of 10,100 shares at Baht 100 per share, totalling Baht 1.01 million, of which fully received in January 2018. Subsequently, at the Annual General Meeting of shareholders of the subsidiary held on March 21, 2018, the shareholders approved to increase the registered capital to Baht 1,300 million and called for paid-up capital of 12.99 million shares at Baht 100 per share, totalling Baht 1,298.99 million, of which fully received in March 2018. Subsequently, at the Extraordinary General Meeting of shareholders of the subsidiary held on June 20, 2018, the shareholders approved to increase the registered capital to Baht 7,200 million and called for paid-up capital of 59 million shares at Baht 100 per share, totalling Baht 5,900 million, of which fully received in June 2018.

On March 22, 2018, GC Treasury Center Co., Ltd. has called for paid capital from the capital increase by the Annual General Meeting of shareholders of the subsidiary held on March 21, 2018 at 75,000 shares, Baht 100 per share, totalling Baht 7.50 million, of which fully received in January 2018.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

At the Board of Directors' Meeting of the Company held on May 21, 2018, the Board approved to establish GC Ventures Co., Ltd. ("GCV") for investment in Corporate Venture Capital (CVC) which is 100% owned by the Company. On May 22, 2018, GCV registered the initial authorised share capital of Baht 5 million and called for paid-up capital of 0.05 million shares at Baht 100 per share, totalling Baht 5 million, of which fully received in May 2018. Subsequently, at the Annual General Meeting of shareholders of the subsidiary held on June 8, 2018, the shareholders approved to increase the registered capital to Baht 144 million and called for paid-up capital of 1.39 million shares at Baht 100 per share, totalling Baht 139 million, of which fully received in June 2018.

On August 31, 2018, PTTGC International Private Limited has called for paid capital from the capital increase by the Board of Directors' Meeting held on November 20, 2009 for the purpose of corporate and its subsidiary operation at SGD 1.12 million or equivalent to Baht 27.15 million, of which fully received in August 2018.

On November 8, 2018, GC Oxirane Co., Ltd. has called for paid capital from the capital increase by the Board of Directors' Meeting held on May 22, 2017 for conducting a Propylene Oxide Project at Baht 179.73 million, of which fully received in December 2018.

On August 8, 2018, the Company and a subsidiary entered into the Shares Purchase Agreement to acquire 74% share (49% direct interest and 25% indirect interest) of Siam Mitsui PTA Company Limited, Purified Terephthalic Acid producer, and 74% share (74% indirect interest) of Thai PET Resin Company Limited, Polyethylene Terephthalate resin producer, from SCG Chemicals Co., Ltd. and Mitsui Chemicals, Inc. Subsequently on December 27, 2018, the Group completed the share acquisition of subsidiaries for a preliminary cash consideration of approximately Baht 4,123 million. The final purchase price was settled with the seller for an additional payment of approximately Baht 1,249 million, which was paid in March 2019.

During the year ended December 31, 2018, PTTGC International Private Limited has called for paid-up capital from the capital increase by the Board of Directors' Meeting held on December 18, 2017 to invest in PTTGC Innovation America Corp. at USD 25 million or equivalent to Baht 790.71 million, to finance the loan prepayment in order to reduce the Group's finance cost and for subsidiary operation, of which fully received during the year ended December 31, 2018.

During the year ended December 31, 2018, GC Polyols Co., Ltd. has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the Company held on May 22, 2017 for conducting a Polyols & PU System Project at Baht 425.69 million, of which fully received during the year ended December 31, 2018.

On April 25, 2018, Auria BioChemicals Co., Ltd. which is a subsidiary of the Company registered the dissolution with Department of Business Development, Ministry of Commerce. Subsequently on December 19, 2018, Auria BioChemicals Co., Ltd. distributed capital to the Company amounting to Baht 40.77 million. As at December 31, 2018, the aforementioned subsidiary is in the liquidation process.

Impairment loss on investment in a subsidiary

During the year ended December 31, 2019, the Company recognised impairment loss on the investment in PTTGC International Private Limited totalling Baht 63.05 million in the separate financial statements as the recoverable amount of investment in PTTGC Innovation America Corp. was less than its carrying amount.

During the year ended December 31, 2018, the Company recognised impairment loss on the investment in PTTGC International Private Limited totalling Baht 729.56 million in the separate financial statements. Impairment loss Baht 727.65 million as the recoverable amount of investment in PTTGC Innovation America Corp. was less than its carrying amount. Impairment loss on investment resulted from the capital increase to finance the loan prepayment in order to reduce the Group's finance cost and impairment loss Baht 1.91 million as the recoverable amount of investment in PTT Chemical International (Asia Pacific ROH) Limited ("AP ROH") was less than its carrying amount due to the dissolution of AP ROH. On November 30, 2016, AP ROH registered the dissolution with Department of Business Development, Ministry of Commerce. AP ROH has finalized the liquidation process on November 30, 2018.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

11. INVESTMENTS IN JOINT VENTURES

Movements of investments in joint ventures for the years ended December 31, were as follows:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
Joint ventures				
As at January 1,	30,758	27,577	15,373	15,373
Acquisitions	794	-	-	-
Share of profit of investments in joint ventures	2,626	5,209	-	-
Share of other comprehensive loss of joint ventures	(532)	(374)	-	-
Effect from translation differences on foreign investment	165	-	-	-
Dividend income	(1,367)	(1,654)	-	-
As at December 31,	32,444	30,758	15,373	15,373

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Investments in joint ventures as at December 31, 2019 and 2018, and dividend income for the years ended December 31, 2019 and 2018 were as follows:

Consolidated financial statements														Unit : Million Baht
Ownership Interest (%)	Paid-up capital		Cost		Equity method		Impairment		Equity method - net		Dividend income			
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018		
Direct joint ventures														
50	50	13,819	13,819	996	996	10,878	9,569	-	-	10,878	9,569	-	-	
50	50	1,860	1,860	160	160	168	206	-	-	168	206	-	-	
41	41	3,790	3,790	14,217	14,217	12,337	12,885	-	-	12,337	12,885	828	1,242	
				15,373	15,373	23,383	22,660	-	-	23,383	22,660	828	1,242	
Indirect joint ventures														
50	50	420	420	210	210	585	736	-	-	585	736	223	91	
50	50	4,530	4,530	4,966	4,966	4,495	4,519	-	-	4,495	4,519	-	-	
50	50	818	818	407	407	-	-	-	-	-	-	-	-	
50	50	43,167	43,167	4,793	4,793	3,274	2,843	-	-	3,274	2,843	316	321	
GGC KTIS Bioindustrial Company Limited														
50	-	1,048	-	524	-	512	-	-	-	512	-	-	-	
49	-	3	-	270	-	195	-	-	-	195	-	-	-	
				11,170	10,376	9,061	8,098	-	-	9,061	8,098	539	412	
Total investments in joint ventures				26,543	25,749	32,444	30,758	-	-	32,444	30,758	1,367	1,654	

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

	Separate financial statements								Unit : Million Baht				
	Ownership Interest (%)		Paid-up capital		Cost		Impairment			At cost - net		Dividend income	
	2019	2018	2019	2018	2019	2018	2019	2018		2019	2018	2019	2018
Joint ventures													
PTT Asahi Chemical Co., Ltd.	50	50	13,819	13,819	996	996	-	-	996	996	-	-	
PTT MCC Biochem Co., Ltd.	50	50	1,860	1,860	160	160	-	-	160	160	-	-	
HMC Polymers Co., Ltd.	41	41	3,790	3,790	14,217	14,217	-	-	14,217	14,217	828	1,242	
Total investments in joint ventures													
					15,373	15,373	-	-	15,373	15,373	828	1,242	

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Joint ventures

The following table summarises the financial information of the joint ventures as included in their own financial statements, adjusted for fair value adjustments at acquisition and differences in accounting policies. The table also reconciles the summarised financial information to the carrying amount of the Group's interest in these companies.

	<u>PTT Asahi</u> <u>Chemical Co., Ltd.</u>	Unit : Million Baht <u>HMC Polymers</u> <u>Co., Ltd.</u>
For the year ended December 31, 2019		
Statement of profit or loss		
Revenue	13,141	27,033
Depreciation and amortisation	(866)	(1,579)
Loss for the year	2,617	1,627
Other comprehensive loss	-	(951)
Total comprehensive income for the year	<u>2,617</u>	<u>676</u>
As at December 31, 2019		
Statement of financial position		
Current assets	5,158	7,510
Non-current assets	21,186	25,481
Current liabilities	(1,428)	(5,365)
Non-current liabilities	(3,160)	(5,186)
Net assets	<u>21,756</u>	<u>22,440</u>
Proportion of the Group's ownership interest in joint ventures (%)	<u>50.00</u>	<u>41.44</u>
	10,878	9,299
Investment amount over net asset at acquisition date	-	3,038
Carrying amount of interest in investee	<u>10,878</u>	<u>12,337</u>
<i>Remark:</i>		
Cash and cash equivalents	854	1,344

The reconciliation of the summarised financial information to the carrying amount of the Group's interest in these companies.

	<u>PTT Asahi</u> <u>Chemical Co., Ltd.</u>	Unit : Million Baht <u>HMC Polymers</u> <u>Co., Ltd.</u>
Group's interest in net assets of investee as at January 1, 2019	9,569	12,885
Total comprehensive income attributable to the Group	1,309	280
Dividends received during the year	-	(828)
Carrying amount of interest in investee as at December 31, 2019	<u>10,878</u>	<u>12,337</u>

FOR THE YEAR ENDED DECEMBER 31, 2019

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Investments in associates as at December 31, 2019 and 2018, and dividend income for the years ended December 31, 2019 and 2018 were as follows:

Consolidated financial statements														Unit : Million Baht	
Ownership Interest (%)		Paid-up capital		Cost		Equity method		Impairment		Equity method - net		Dividend income			
2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018		
Direct associates															
23	23	28,197	14,983	22,753	5,934	22,599	8,756	-	-	22,599	8,756	443	426		
33	33	2,008	1,408	671	470	629	470	-	-	629	470	-	-		
20	20	150	150	30	30	42	48	-	-	42	48	-	-		
40	40	150	150	60	60	824	703	-	-	824	703	35	33		
25	25	7,111	7,111	3,297	3,297	5,642	5,130	-	-	5,642	5,130	385	266		
23	23	10	10	2	2	16	20	-	-	16	20	12	7		
				26,813	9,793	29,752	15,127	-	-	29,752	15,127	875	732		
Indirect associates															
-	49	-	255	-	124	-	220	-	-	-	220	-	-		
30	30	222	222	67	67	28	57	-	-	28	57	-	-		
25	25	200	200	50	50	49	46	-	-	49	46	-	-		
				117	241	77	323	-	-	77	323	-	-		
				26,930	10,034	29,829	15,450	-	-	29,829	15,450	875	732		
Total investments in associates															

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Million Baht

		Separate financial statements											
Ownership Interest (%)		Paid-up capital		Cost		Impairment		At cost - net		Fair value of listed securities		Dividend income	
2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Associates													
23	23	28,197	14,983	22,753	5,934	-	-	22,753	5,934	54,959	19,923	443	426
33	33	2,008	1,408	671	470	-	-	671	470	-	-	-	-
20	20	150	150	30	30	-	-	30	30	-	-	-	-
40	40	150	150	60	60	-	-	60	60	-	-	35	33
25	25	7,111	7,111	3,297	3,297	-	-	3,297	3,297	7,475	5,921	385	266
15	15	10	10	2	2	-	-	2	2	-	-	8	5
Total investments in associates				26,813	9,793	-	-	26,813	9,793	62,434	25,844	871	730

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Associates

The following table summarises the financial information of the associate as included in its own financial statements, adjusted for fair value adjustments at acquisition and differences in accounting policies. The table also reconciles the summarised financial information to the carrying amount of the Group's interest in the associate.

	Unit : Million Baht <u>Global Power</u> <u>Synergy Plc.</u>
For the year ended December 31, 2019	
Statement of income	
Revenue	65,789
Profit for the year	3,893
Other comprehensive loss	(1,452)
Total comprehensive income for the year	<u>2,411</u>
As at December 31, 2019	
Statement of financial position	
Current assets	38,760
Non-current assets	212,952
Current liabilities	(39,055)
Non-current liabilities	(103,949)
Net assets	<u>108,708</u>
Non-controlling interests	(9,283)
Total attributions to owners of the parent	<u>99,425</u>
Proportion of the Group's ownership interest in associate (%)	22.73
Carrying amount of interest in investee	<u>22,599</u>
<i>Remark:</i>	
Cash and cash equivalents	18,839

The reconciliation of the summarised financial information to the carrying amount of the Group's interest in this associate.

	Unit : Million Baht <u>Global Power</u> <u>Synergy Plc.</u>
Group's interest in net assets of investee as at January 1, 2019	8,756
Total comprehensive income attributable to the Group	556
Dividends received during the year	(443)
Acquisition	16,819
Difference arising from the change in the ownership interest in an investment ⁽¹⁾	(3,408)
Invests in equity of associate	319
Carrying amount of interest in investee as at December 31, 2019	<u>22,599</u>

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Immaterial associates

The summarised financial information for the Group's interest in immaterial associates based on the amounts reported in the Group's consolidated financial statements:

	Unit : Million Baht
	<u>Immaterial</u>
	<u>associates</u>
For the year ended December 31, 2019	
Carrying amount of interests in immaterial associates	7,230
Group's share of:	
- Profit for the year	1,049
- Other comprehensive loss	(69)
- Total comprehensive income for the year	980

Change in investment in associates

On August 28, 2019, the Extraordinary General Meeting No.1/2019 of Global Power Synergy Plc. ("GPSC") passed a resolution approving the registered capital increase of GPSC by issuing 1,321,428,571 ordinary shares, with a par value of Baht 10 per share amounting to Baht 13,214,285,710. From the original registered capital amounting to Baht 14,983,008,000 to a new registered capital amounting to Baht 28,197,293,710, and GPSC had received such share subscription amounting to Baht 13,214,285,670. On October 9, 2019, GPSC has already registered the change of registered capital and, on September 26, 2019, GPSC called for paid-up capital from the capital increase in the number proportionate to its shareholding GPSC of 300,344,470 shares at Baht 56 per share, totalling Baht 16,819.29 million, of which fully received in October 2019.

On November 18, 2019, Kuraray GC Advanced Materials Co., Ltd. ("KGC"), a direct associate of the Group, has called for paid-up capital from the capital increase of 2,004,000 shares at Baht 100 per share, totalling Baht 200.40 million, of which fully received in December 2019.

On August 14, 2018, Thai Eastern Top Seeds Oil Co., Ltd, an indirect associate of the Group, called for paid-up capital from the capital increase of 665,999 shares at Baht 29.89 per share, totalling Baht 19.91 million, of which fully received in September 2018.

At the Board of Directors' Meeting of the Company held on June 18, 2018, the Board approved to establish KGC as a joint venture company. The purpose of the joint venture company is planned to invest in production of specialty chemicals. The Company will hold 33.4% share while Kuraray Co., Ltd (KRR) and Sumitomo Corporation (SC) will hold indirect share via KRR and SC Affiliate Company by 53.3% and 13.3%, respectively. Subsequently on June 19, 2018, KGC registered the initial authorised share capital of Baht 10 million and called for paid-up capital of 33,400 shares at Baht 100 per share, totalling Baht 3.34 million. Subsequently, on August 28, 2018, KGC had called for paid - up capital from the capital increase of 4,667,650 shares at Baht 100 per share, totalling Baht 466.77 million, of which fully received in December 2018.

According to the Board of Directors' Meeting of the Company held on March 19, 2018, the Board of Directors approved the PTTGC International Private Limited ("GC Inter") as a subsidiary to sell shares of PT Indo Thai Trading Ltd. ("ITT") holding 49% of ITT's shares. On June 26, 2019, GC Inter entered into the Sale and Purchase Agreement with a company to sell shares of ITT. Subsequently, on July 31, 2019, GC Inter transferred the shares amounting to USD 7.02 million or equivalent to Baht 215.56 million (using the average exchange rates as of the transaction date).

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

⁽¹⁾ Difference arising from the change in the ownership interest in an investment

GPSC had completed Tender Offer for shares of Glow Energy Public Company Limited (“GLOW”) on May 22, 2019 and December 2, 2019. In 2019, GPSC has made payment for shares to minority shareholders of totalling Baht 40,806.27 million. GPSC therefore directly and indirectly held 99.83%, increased from 69.11%, of the total authorised and paid-up shares. GPSC recognised the negative movement from change in ownership interest of Baht 14,991.99 million in its shareholders’ equity as at December 31, 2019. The Company therefore recognised this transaction as the difference arising from the change in the ownership interest in an investment, according to its shareholding interest in GPSC of 22.73%, amounting to Baht 3,407.68 million in shareholders’ equity.

13. OTHER INVESTMENTS

Other investments as at December 31, 2019 and 2018 consisted of:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
Temporary investments				
Held-to-maturities debt securities	6,175	10,503	3,500	3,696
Available-for-sale debt securities	-	1,108	-	1,108
Available-for-sale debt securities (Private funds)	545	5,207	545	5,207
Total temporary investments	6,720	16,818	4,045	10,011
Other long-term investments				
Held-to-maturities debt securities	480	484	450	484
Available-for-sale debt securities	-	1,369	-	1,369
Available-for-sale debt securities (Private funds)	1,503	4,588	1,503	4,588
Available-for-sale equity securities	384	362	384	362
Other non-marketable equity securities:				
- Exeltium SAS (4% shareholding by the Group)	238	283	-	-
- Others	306	60	4	3
Total other long-term investments	2,911	7,146	2,341	6,806

During the third quarter of 2016, the Company established private funds and engaged local independent assets management companies for the purpose of cash balance management of the Company. Those private funds have invested in deposits at bank and debt securities which had high liquidity and credit quality. As at December 31, 2019 and 2018, the value of private funds outstanding totalled Baht 2,127 million and Baht 10,388 million, respectively.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

14. INVESTMENT PROPERTIES

Investment properties as at December 31, 2019 and 2018 consisted of:

		<u>Consolidated</u> <u>financial statements</u>			<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>
	<u>Note</u>	<u>Land</u>	<u>Buildings</u>	<u>Total</u>	<u>Land</u>
<i>Cost</i>					
As at January 1, 2018		5,482	41	5,523	-
Reclassification	41	977	-	977	1,741
As at December 31, 2018 and					
January 1, 2019		6,459	41	6,500	1,741
As at December 31, 2019		6,459	41	6,500	1,741
<i>Accumulated depreciation</i>					
As at January 1, 2018		-	-	-	-
Depreciation charge for the year		-	(1)	(1)	-
As at December 31, 2018 and					
January 1, 2019		-	(1)	(1)	-
Depreciation charge for the year		-	(1)	(1)	-
As at December 31, 2019		-	(2)	(2)	-
<i>Net book value</i>					
As at January 1, 2018		5,482	41	5,523	-
As at December 31, 2018 and					
January 1, 2019		6,459	40	6,499	1,741
As at December 31, 2019		6,459	39	6,498	1,741

The fair value of investment properties of the Group as at December 31, 2019 of Baht 8,435 million (2018: Baht 7,728 million) was determined at open market values on an existing use basis and income approach. The fair value measurement for investment properties has been categorised as Levels 2 and 3 fair value, respectively.

The fair value of investment properties of the Company as at December 31, 2019 of Baht 3,700 million (2018: Baht 3,700 million) was determined at open market values on an existing use basis. The fair value measurement for investment properties has been categorised as a Level 2 fair value.

Measurement of fair value

Fair value hierarchy

The fair value of investment properties was determined by independent external property valuers, having appropriate recognised professional qualifications and recent experience in the property being valued. The independent valuers provide the fair value of the Group's investment properties portfolio on an annual basis.

Valuation technique and significant unobservable inputs

The fair value of investment properties for land was determined by independent property valuers at open market values by scoring and weighted other different factors.

The fair value of investment properties for buildings was determined by the Group at income approach. The significant unobservable inputs comprise yield rate and finance costs.

Amounts recognised in the statements of profit or loss that are related to investment properties for the years ended December 31, are as follows:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Rental income	122	13	162	-

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES
FOR THE YEAR ENDED DECEMBER 31, 2019

15. PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment as at December 31, 2019 and 2018 consist of:

		Consolidated financial statements						Unit : Million Baht	
		<u>Notes</u>	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and office equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
Cost									
As at January 1, 2018			9,074	339,710	16,834	2,579	842	21,949	390,988
Additions			1,864	521	123	252	54	30,227	33,041
Acquired through business acquisitions		5	1,959	7,309	205	6	-	70	9,549
Transfers			358	10,468	518	140	-	(11,160)	324
Reclassifications		41	(977)	9,062	-	-	-	-	8,085
Disposals			-	(2,062)	(2)	(177)	(15)	(69)	(2,325)
Effect of change in foreign exchange rates			(15)	(481)	(64)	(2)	-	(51)	(613)
As at December 31, 2018 and January 1, 2019			12,263	364,527	17,614	2,798	881	40,966	439,049
Additions			76	2,073	37	300	251	30,837	33,574
Transfers			41	10,458	406	91	1	(11,057)	(60)
Disposals			-	(3,918)	(8)	(204)	(168)	(18)	(4,316)
Effect of change in exchange rates			(111)	(980)	(130)	(11)	-	(458)	(1,690)
As at December 31, 2019			12,269	372,160	17,919	2,974	965	60,270	466,557

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

		<u>Consolidated financial statements</u>						Unit : Million Baht
	<u>Note</u>	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and office equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<i>Accumulated depreciation and allowance for impairment</i>								
		(1,288)	(158,903)	(7,070)	(1,882)	(592)	(1,564)	(171,299)
	As at January 1, 2018	(86)	(15,925)	(717)	(296)	(66)	-	(17,090)
	Depreciation charge for the year	-	(7)	-	-	-	-	(7)
	Transfers	-	(2,776)	-	-	-	-	(2,776)
	Reclassification	-	1,287	(13)	171	13	-	1,458
	Disposals	-	739	14	-	-	-	753
	Reversal of impairment losses	-	206	22	1	-	9	242
	Effect of change in foreign exchange rates	4						
As at December 31, 2018 and January 1, 2019								
		(1,370)	(175,379)	(7,764)	(2,006)	(645)	(1,555)	(188,719)
	Depreciation charge for the year	(99)	(16,937)	(727)	(327)	(98)	-	(18,188)
	Transfers	-	(25)	-	-	(2)	-	(27)
	Disposals	-	3,875	4	191	168	-	4,238
	Reversal of impairment losses	3	-	-	-	-	-	3
	Effect of change in foreign exchange rates	38	508	53	9	-	91	699
As at December 31, 2019								
		(1,428)	(187,958)	(8,434)	(2,133)	(577)	(1,464)	(201,994)

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

	<u>Consolidated financial statements</u>						Unit : Million Baht
	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and office equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<i>Net book value</i>							
As at January 1, 2018							
Owned assets	7,786	180,807	9,764	539	110	20,385	219,391
Assets under finance leases	-	-	-	158	140	-	298
	<u>7,786</u>	<u>180,807</u>	<u>9,764</u>	<u>697</u>	<u>250</u>	<u>20,385</u>	<u>219,689</u>
As at December 31, 2018 and January 1, 2019							
Owned assets	10,893	189,148	9,850	618	109	39,411	250,029
Assets under finance leases	-	-	-	174	127	-	301
	<u>10,893</u>	<u>189,148</u>	<u>9,850</u>	<u>792</u>	<u>236</u>	<u>39,411</u>	<u>250,330</u>
As at December 31, 2019							
Owned assets	10,841	184,202	9,485	587	266	58,806	264,187
Assets under finance leases	-	-	-	254	122	-	376
	<u>10,841</u>	<u>184,202</u>	<u>9,485</u>	<u>841</u>	<u>388</u>	<u>58,806</u>	<u>264,563</u>

The gross amount of the Group's fully depreciated buildings and equipment that was still in use as at December 31, 2019 amounted to Baht 20,213 million (2018: Baht 17,947 million).

Security

As at December 31, 2019, the Group's assets with a net book value of Baht 15,837 million (2018: Baht 17,069 million) were registered to secure Bank loan (see note 20).

Property, plant and equipment under construction

As at December 31, 2019, capitalised borrowing costs relating to the acquisition of the land and the construction of the new factory amounted to Baht 735 million (2018: Baht 504 million), with a capitalisation rate of 3.59% to 5.00% (2018: 3.38% to 5.00%).

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Million Baht									
<u>Separate financial statements</u>									
	<u>Note</u>	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and office equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>	
<i>Cost</i>									
As at January 1, 2018		6,279	265,675	9,309	1,637	539	12,649	296,088	
Additions		291	523	28	168	21	17,420	18,451	
Transfers		69	8,947	370	106	-	(9,502)	(10)	
Reclassifications	41	(1,741)	6,896	-	-	-	-	5,155	
Disposals		-	(929)	(3)	(169)	(3)	(64)	(1,168)	
As at December 31, 2018 and January 1, 2019		4,898	281,112	9,704	1,742	557	20,503	318,516	
Additions		20	1,703	33	225	227	17,907	20,115	
Transfers		34	6,481	64	50	-	(6,659)	(30)	
Disposals		-	(2,696)	(3)	(124)	(146)	(15)	(2,984)	
As at December 31, 2019		4,952	286,600	9,798	1,893	638	31,736	335,617	
<i>Accumulated depreciation</i>									
As at January 1, 2018		(537)	(123,780)	(3,928)	(1,196)	(379)	(270)	(130,090)	
Depreciation charge for the year		(59)	(12,002)	(398)	(199)	(38)	-	(12,696)	
Reclassification	41	-	(2,316)	-	-	-	-	(2,316)	
Disposals		-	907	3	163	3	-	1,076	
As at December 31, 2018 and January 1, 2019		(596)	(137,191)	(4,323)	(1,232)	(414)	(270)	(144,026)	
Depreciation charge for the year		(55)	(12,048)	(406)	(218)	(68)	-	(12,795)	
Disposals		-	2,665	2	124	145	-	2,936	
As at December 31, 2019		(651)	(146,574)	(4,727)	(1,326)	(337)	(270)	(153,885)	

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Million Baht

Separate financial statements

	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and office equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<i>Net book value</i>							
As at January 1, 2018							
Owned assets	5,742	141,895	5,381	318	67	12,379	165,782
Assets under finance leases	-	-	-	123	93	-	216
	<u>5,742</u>	<u>141,895</u>	<u>5,381</u>	<u>441</u>	<u>160</u>	<u>12,379</u>	<u>165,998</u>
As at December 31, 2018 and January 1, 2019							
Owned assets	4,302	143,921	5,381	371	63	20,233	174,271
Assets under finance leases	-	-	-	139	80	-	219
	<u>4,302</u>	<u>143,921</u>	<u>5,381</u>	<u>510</u>	<u>143</u>	<u>20,233</u>	<u>174,490</u>
As at December 31, 2019							
Owned assets	4,301	140,026	5,071	368	225	31,466	181,457
Assets under finance leases	-	-	-	199	76	-	275
	<u>4,301</u>	<u>140,026</u>	<u>5,071</u>	<u>567</u>	<u>301</u>	<u>31,466</u>	<u>181,732</u>

The gross amount of the Company's fully depreciated buildings and equipment that was still in use as at December 31, 2019 amounted to Baht 12,612 million (2018: Baht 11,079 million).

Property, plant and equipment under construction

As at December 31, 2019, capitalised borrowing costs relating to the acquisition of the land and the construction of the new factory amounted to Baht 329 million (2018: Baht 192 million), with a capitalisation rate of 5.00% (2018: 5.00%).

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

16. LAND LEASEHOLD RIGHT

Land leasehold right as at December 31, 2019 and 2018 consist of:

	<u>Consolidated</u> <u>financial statements</u>	Unit : Million Baht <u>Separate</u> <u>financial statements</u>
<i>Cost</i>		
As at January 1, 2018	1,131	1,130
As at December 31, 2018 and January 1, 2019	1,131	1,130
Additions	7	-
As at December 31, 2019	1,138	1,130
<i>Accumulated amortisation</i>		
As at January 1, 2018	(807)	(806)
Amortisation charge for the year	(90)	(90)
As at December 31, 2018 and January 1, 2019	(897)	(896)
Amortisation charge for the year	(50)	(50)
As at December 31, 2019	(947)	(946)
<i>Net book value</i>		
As at January 1, 2018	324	324
As at December 31, 2018 and January 1, 2019	234	234
As at December 31, 2019	191	184

17. GOODWILL

Goodwill as at December 31, 2019 and 2018 consist of:

	Unit : Million Baht <u>Consolidated</u> <u>financial statements</u>
<i>Cost</i>	
As at January 1, 2018	1,648
As at December 31, 2018 and January 1, 2019	1,648
As at December 31, 2019	1,648
<i>Allowance for impairment</i>	
As at January 1, 2018	(717)
As at December 31, 2018 and January 1, 2019	(717)
As at December 31, 2019	(717)
<i>Net book value</i>	
As at January 1, 2018	931
As at December 31, 2018 and January 1, 2019	931
As at December 31, 2019	931

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES
FOR THE YEAR ENDED DECEMBER 31, 2019

18. INTANGIBLE ASSETS

Intangible assets as at December 31, 2019 and 2018 consist of:

<u>Consolidated financial statements</u>							Unit : Million Baht	
	<u><i>Note</i></u>	<u>Production licence fees</u>	<u>Computer software</u>	<u>Customer contracts and the related customer relationships</u>	<u>Right to use pipe rack</u>	<u>Right to use others</u>	<u>Intangible assets under development</u>	<u>Total</u>
<i>Cost</i>								
As at January 1, 2018		5,980	4,210	149	508	2,743	1,337	14,927
Additions		23	58	-	15	6	921	1,023
Acquired through business acquisitions	5	-	5	-	-	3	-	8
Transfers		1,162	348	-	7	5	(1,520)	2
Disposals		-	(7)	-	-	(191)	-	(198)
Effect of change in foreign exchange rates		-	(5)	(1)	-	(63)	(2)	(71)
As at December 31, 2018 and January 1, 2019		7,165	4,609	148	530	2,503	736	15,691
Additions		274	19	-	-	5	733	1,031
Transfers		268	389	-	17	41	(703)	12
Disposals		-	(7)	-	-	-	(86)	(93)
Effect of change in foreign exchange rates		-	(13)	(11)	-	(169)	(3)	(196)
As at December 31, 2019		7,707	4,997	137	547	2,380	677	16,445

Unit : Million Baht

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Million Baht

Consolidated financial statements

	Production licence fees	Computer Software	Customer contracts and the related customer relationships	Right to use pipe rack	Right to use others	Intangible assets under development	Total
<i>Accumulated amortisation and allowance for impairment</i>							
As at January 1, 2018	(2,355)	(2,372)	(130)	(358)	(1,922)	(22)	(7,159)
Amortisation charge for the year	(243)	(308)	(12)	(29)	(127)	-	(719)
Disposals	-	7	-	-	105	-	112
Reversal of impairment losses	-	-	-	-	86	-	86
Effect of change in foreign exchange rates	-	5	2	-	37	-	44
As at December 31, 2018	(2,598)	(2,668)	(140)	(387)	(1,821)	(22)	(7,636)
and January 1, 2019	(268)	(342)	(7)	(31)	(117)	-	(765)
Amortisation charge for the year	-	4	-	-	22	-	26
Transfers	-	5	-	-	-	-	5
Disposal	-	12	10	-	124	-	146
Effect of change in foreign exchange rates	-	-	-	-	-	-	-
As at December 31, 2019	(2,866)	(2,989)	(137)	(418)	(1,792)	(22)	(8,224)
<i>Net book value</i>							
As at January 1, 2018	3,625	1,838	19	150	821	1,315	7,768
As at December 31, 2018 and January 1, 2019	4,567	1,941	8	143	682	714	8,055
As at December 31, 2019	4,841	2,008	-	129	588	655	8,221

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Million Baht

	<u>Separate financial statements</u>					<u>Intangible assets under development</u>	<u>Total</u>
	<u>Production licence fees</u>	<u>Computer software</u>	<u>Right to use pipe rack</u>	<u>Right to use others</u>			
Cost							
As at January 1, 2018	4,120	3,288	415	-		1,146	8,969
Additions	10	22	15	-		730	777
Transfers	1,162	305	4	-		(1,471)	-
Disposals	-	(6)	-	-		-	(6)
As at December 31, 2018 and January 1, 2019	5,292	3,609	434	-		405	9,740
Additions	233	4	-	-		545	782
Transfers	267	219	20	-		(506)	-
Disposals	-	-	-	-		(62)	(62)
As at December 31, 2019	5,792	3,832	454	-		382	10,460
Accumulated amortisation							
As at January 1, 2018	(1,644)	(1,734)	(278)	-		(22)	(3,678)
Amortisation charge for the year	(189)	(248)	(27)	-		-	(464)
Disposals	-	6	-	-		-	6
As at December 31, 2018 and January 1, 2019	(1,833)	(1,976)	(305)	-		(22)	(4,136)
Amortisation charge for the year	(214)	(273)	(28)	-		-	(515)
Disposals	-	-	-	-		-	-
As at December 31, 2019	(2,047)	(2,249)	(333)	-		(22)	(4,651)
Net book value							
As at January 1, 2018	2,476	1,554	137	-		1,124	5,291
As at December 31, 2018 and January 1, 2019	3,459	1,633	129	-		383	5,604
As at December 31, 2019	3,745	1,583	121	-		360	5,809

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

19. DEFERRED TAX

Movements in total deferred tax assets and liabilities during the years were as follows:

Unit : Million Baht

	<u>Consolidated financial statements</u> (Charged) / credited to:					
	<u>As at January 1, 2019</u>	<u>Profit or loss</u>	<u>Other comprehensive income (loss)</u>	<u>Exchange differences</u>	<u>Acquisition of businesses</u>	<u>As at December 31, 2019</u>
<i>Deferred tax assets</i>						
Inventories	12	(8)	-	-	-	4
Employee benefits expenses	725	262	3	-	-	990
Tax loss carry forward	848	(143)	-	-	(1)	704
Others	647	77	59	-	(3)	780
Total	2,232	188	62	-	(4)	2,478
<i>Deferred tax liabilities</i>						
Property, plant and equipment	(3,469)	(231)	-	(11)	15	(3,696)
Finance lease assets	(6)	-	-	-	-	(6)
Others	(333)	172	(8)	-	1	(168)
Total	(3,808)	(59)	(8)	(11)	16	(3,870)
Net	(1,576)	129	54	(11)	12	(1,392)

Unit : Million Baht

	<u>Consolidated financial statements</u> (Charged) / credited to:					
	<u>As at January 1, 2018</u>	<u>Profit or loss</u>	<u>Other comprehensive income (loss)</u>	<u>Exchange differences</u>	<u>Acquisition of businesses</u>	<u>As at December 31, 2018</u>
<i>Deferred tax assets</i>						
Inventories	10	1	-	-	1	12
Employee benefits expenses	688	18	-	-	19	725
Capital distribution from subsidiaries	22	(22)	-	-	-	-
Loss carry forward	41	650	-	(1)	158	848
Others	610	18	-	-	19	647
Total	1,371	665	-	(1)	197	2,232
<i>Deferred tax liabilities</i>						
Property, plant and equipment	(2,847)	146	-	9	(777)	(3,469)
Finance lease assets	(7)	1	-	-	-	(6)
Others	(48)	(268)	(13)	-	(4)	(333)
Total	(2,902)	(121)	(13)	9	(781)	(3,808)
Net	(1,531)	544	(13)	8	(584)	(1,576)

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Million Baht			
	As at January 1, 2019	Separate financial statements (Charged) / credited to:	
		Profit or loss	Other comprehensive income (loss)
As at December 31, 2019			
Deferred tax assets			
Inventories	11	(8)	-
Employee benefits expenses	584	207	-
Others	356	64	15
Total	951	263	15
Deferred tax liabilities			
Inventories	(244)	209	-
Property, plant and equipment	(2,432)	(287)	-
Finance lease assets	(5)	1	-
Others	(59)	4	(8)
Total	(2,740)	(73)	(8)
Net	(1,789)	190	7

Unit : Million Baht			
	As at January 1, 2018	Separate financial statements (Charged) / credited to:	
		Profit or loss	Other comprehensive income (loss)
As at December 31, 2018			
Deferred tax assets			
Inventories	10	1	-
Employee benefits expenses	573	11	-
Capital distribution from subsidiaries	22	(22)	-
Others	352	4	-
Total	957	(6)	-
Deferred tax liabilities			
Inventories	(1)	(243)	-
Property, plant and equipment	(2,530)	98	-
Finance lease assets	(5)	-	-
Others	(32)	(14)	(13)
Total	(2,568)	(159)	(13)
Net	(1,611)	(165)	(13)

In the fourth quarter of 2019 and 2018, the Group recognised deferred tax assets of previously unrecognised tax losses because management considered it probable that future taxable profits would be available against which such losses can be used.

20. INTEREST-BEARING LIABILITIES

Interest bearing liabilities are defined as borrowings, debentures and finance lease liabilities. The balances as at December 31, 2019 and 2018 were as follows:

Unit : Million Baht				
Note	Consolidated financial statements		Separate financial statements	
	2019	2018	2019	2018
Current				
Short-term borrowings from financial institutions				
Secured	427	388	-	-
Unsecured	1,594	2,955	-	-
Short-term borrowings from related parties				
Unsecured	27	-	3,041	1,931
Short-term borrowings	2,021	3,343	3,041	1,931

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

	<i>Note</i>	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
		<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Current (Continue)					
Current portion of long-term borrowings from financial institutions					
Secured		265	883	-	-
Unsecured		7,843	6,164	7,078	4,306
Current portion of long-term borrowings from other parties					
Secured		-	894	-	-
Unsecured		41	34	-	-
Current portion of debentures					
Unsecured		-	1,942	-	1,942
Current portion of long-term borrowings and debentures		8,149	9,917	7,078	6,248
Current portion of finance lease liabilities	22	187	138	141	93
Total current		10,357	13,398	10,260	8,272
Non-current					
Long-term borrowings from financial institutions					
Secured		16,908	13,648	-	-
Unsecured		9,610	17,267	2,995	10,113
Long-term borrowing from a related party					
Unsecured	27	-	-	14,991	16,105
Long-term borrowings from other parties					
Secured		-	-	-	-
Unsecured		269	324	-	-
Debentures					
Unsecured		70,131	52,408	55,221	36,379
Long-term borrowings and debentures		96,918	83,647	73,207	62,597
Finance lease liabilities		215	181	148	133
Total non-current		97,133	83,828	73,355	62,730
Total		107,490	97,226	83,615	71,002

As at December 31, 2019, the Group had unutilised credit facilities totalling Baht 12,285 million (2018: Baht 19,072 million).

The periods to maturity of interest-bearing liabilities, excluding finance lease liabilities, as at December 31, 2019 and 2018 were as follows:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Within one year	10,170	13,260	10,119	8,179
After one year but within five years	75,970	74,624	64,717	62,597
After five years	20,948	9,023	8,490	-
Total	107,088	96,907	83,326	70,776

Long-term borrowings as at December 31, 2019 and 2018 were secured on the following assets:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Cash and cash equivalents	60	192	-	-
Property, plant and equipment	15,837	17,962	-	-

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Debentures and Borrowings from financial institutions of the Group were as follows:

Debentures

On August 22, 2019, the Company issued a 5-year tenor, name-registered, unsubordinated and unsecured debentures with debentureholders' representative. Debenture issuer has rights to redeem the debentures prior to maturity after one year of issuance. The debentures have an issued 10 million units and the issue price per unit is Baht 1,000, totalling Baht 10,000 million. The use of proceeds are for debt settlement and/or for business expansion and/or for working capital. The coupon rate is 2.90% per annum with interest payable on semi-annual basis and maturity in August 2024.

On September 5, 2019, the Company issued name-registered, unsubordinated and unsecured debentures without a debentureholders' representative for institutional investors. The debentures have an issued 10 million units and the issue price per unit is Baht 1,000, totalling Baht 10,000 million separate into 3 tranches, A 5-year tenor, Baht 1,500 million, carrying a 2.20% coupon rate per annum with interest payable on semi-annual basis and maturity in September 2024; A 7-year tenor, Baht 7,000 million, carrying a 2.43% coupon rate per annum with interest payable on semi-annual basis and maturity in September 2026; A 10-year tenor, Baht 1,500 million, carrying a 2.75% coupon rate per annum with interest payable on semi-annual basis and maturity in September 2029. The use of proceeds is for business expansion.

As at December 31, 2019, the Group had unsubordinated and unsecured debentures in US dollar and Thai Baht in the amount of Baht 70,131 million (2018: Baht 54,350 million). These debentures have maturity periods between 4 years to 10 years, bear different interest rates and repayment schedules as specified in each agreement.

Details of the Group's debentures as at December 31, 2019 were as follows:

	Currency	Facilities (in million)	Face value per share	Years	Interest rates (% p.a.)	Repayment Terms
The Company						
Unsubordinated debenture at 99.108% of the face value unsecured with a debentureholders' representative	USD	504.11	1,000	10	4.25	Interest is payable on a semi-annual basis and maturity in September 2022.
Unsubordinated debenture unsecured with a debentureholders' representative	Baht	10,000	1,000	7	4.50	Interest is payable on a semi-annual basis and maturity in August 2021.
Unsubordinated debenture unsecured with a debentureholders' representative and debenture issuer has right to redeem the debentures prior to maturity after one year of issuance	Baht	10,000	1,000	4	3.05	Interest is payable on a semi-annual basis and maturity in August 2021.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

	Currency	Facilities (in million)	Face value per share	Years	Interest rates (% p.a.)	Repayment Terms
The Company (Continue)						
Unsubordinated debenture unsecured with a debentureholders' representative and debenture issuer has right to redeem the debentures prior to maturity after one year of issuance	Baht	10,000	1,000	5	2.90	Interest is payable on a semi-annual basis and maturity in August 2024.
Unsubordinated debenture unsecured without a debentureholders' representative	Baht	1,500	1,000	5	2.20	Interest is payable on a semi-annual basis and maturity in September 2024.
Unsubordinated debenture unsecured without a debentureholders' representative	Baht	7,000	1,000	7	2.43	Interest is payable on a semi-annual basis and maturity in September 2026.
Unsubordinated debenture unsecured without a debentureholders' representative	Baht	1,500	1,000	10	2.75	Interest is payable on a semi-annual basis and maturity in September 2029.
Subsidiaries						
Unsubordinated debenture at 100.00% of the face value unsecured with a debentureholders' representative	USD	495.89	1,000	4.2	4.25	Interest is payable on a semi-annual basis and maturity in September 2022.

Borrowings from financial institutions

As at December 31, 2019, the Group and the Company had long-term and revolving long-term credit facility agreements with several financial institutions totalling Baht 34,626 million and Baht 10,073 million, respectively (2018: Baht 37,962 million and Baht 14,419 million, respectively) bear different interest rates as specified in each agreement. The Group is required to comply with certain covenants pertaining to maintain of certain financial ratios, percentage of share held by the major shareholder and other conditions as specified in each agreement.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Details of the Group's borrowings as at December 31, 2019 were as follows:

Currency	Facilities (in million)	Interest Rates (% p.a.)	Repayment Terms
The Company			
Baht	3,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 10 instalments commencing from July 2015.
Baht	7,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 15 instalments commencing from September 2013.
USD	100	LIBOR 6M plus margin	Principal is repayable on a semi-annual basis, in 10 instalments commencing from March 2016.
Baht	3,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 14 instalments commencing from March 2014.
Baht	6,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 10 instalments commencing from March 2016.
Baht	5,000	THBFIX 6M plus margin	Principal is repayable in 2 instalments in December 2020 and June 2023.
Subsidiaries			
EUR	180	EURIBOR 3M plus margin	Principal is repayable on an annual basis, in 6 instalments commencing from 2021.
Baht	1,000	Fixed rate	Principal is repayable on a quarterly basis, in 16 instalments commencing from September 2016.
Baht	700	BIBOR 3M plus margin	Principal is repayable on a quarterly basis, in 16 instalments, commencing from March 2016.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 14 instalments commencing from April 2016.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 14 instalments commencing from May 2016.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 12 instalments commencing from May 2017.
Baht	8,653.87	Highest interest rate for 6 month-fixed deposit (4 Banks averaged) plus margin	Principal is repayable on a semi-annual basis, in 17 instalments commencing from September 2018.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Currency	Facilities (in million)	Interest Rates (% p.a.)	Repayment Terms
Subsidiaries (Continue)			
Baht	500	Fixed rate	Principal is repayable on a quarterly basis, in 13 instalments commencing from January 2021.
Baht	500	Fixed rate	Principal is repayable on a quarterly basis, in 10 instalments commencing from June 2019.
Baht	575	BIBOR 3M plus margin	Principal is repayable on a quarterly basis, in 13 instalments commencing from September 2019.
Baht	14,357	THBFIX 3M plus margin	Principal is repayable on a semi-annual basis, in 24 instalments commencing from February 2021.
Baht	6,004	THBFIX 3M plus margin	Principal is repayable on a semi-annual basis, in 20 instalments commencing from February 2021.

As at December 31, 2019, the subsidiaries' interest-bearing liabilities were guaranteed by the Company totalling Baht 19,777 million (2018: Baht 22,217 million) (See note 39).

21. TRADE PAYABLES

Trade payables as at December 31, 2019 and 2018 consisted of:

	<i>Note</i>	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
		<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Related parties	27	20,727	28,167	19,470	26,147
Other parties		4,752	6,349	450	1,313
Total		25,479	34,516	19,920	27,460

22. OTHER PAYABLES

Other payables as at December 31, 2019 and 2018 consisted of:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Accrued operating expenses	3,689	3,303	1,708	2,120
Accrued interest expenses	846	706	863	715
Other payables	5,265	5,193	5,138	4,331
Deposits and advances received	3,313	1,979	62	198
Retention payables	-	49	-	24
Current portion of finance lease liabilities	187	138	141	93
Withholding tax payable	460	451	327	259
Accrued other tax expenses	271	4,005	183	3,967
Others	62	44	21	6
Total	14,093	15,868	8,443	11,713

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

23. PROVISIONS FOR EMPLOYEE BENEFITS

Provisions for employee benefits as at December 31, 2019 and 2018 consisted of:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
Post-employment benefits	4,860	3,585	3,553	2,545
Other long-term employee benefits	698	698	461	470
Total	5,558	4,283	4,014	3,015

Movement in the present value of the defined employee benefit obligations were as follows:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
As at January 1,	4,283	4,011	3,015	2,832
Include in profit or loss:				
Current service costs	368	294	235	192
Interest on obligation	130	102	101	80
Past service costs	993	-	820	-
Actuarial (gain) loss	11	(12)	-	-
	<u>1,502</u>	<u>384</u>	<u>1,156</u>	<u>272</u>
Included in other comprehensive income				
Actuarial (gain) loss	57	(20)	-	-
Exchange differences on translating financial statement	(54)	(32)	-	-
	<u>3</u>	<u>(52)</u>	<u>-</u>	<u>-</u>
Others				
Benefits paid by the plan	(234)	(150)	(157)	(89)
Defined benefit obligations from acquisition of business	-	90	-	-
Recorded as cost of assets under construction	4	-	-	-
	<u>(230)</u>	<u>(60)</u>	<u>(157)</u>	<u>(89)</u>
As at December 31,	5,558	4,283	4,014	3,015

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Actuarial (gains) losses recognised in other comprehensive income arising from:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Demographic assumptions	-	-	-	-
Financial assumptions	58	(19)	-	-
Experience adjustment	(1)	(1)	-	-
Total	57	(20)	-	-

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
For the years ended December 31,				
Recognised in profit or loss:				
Post-employment benefits	1,418	326	1,111	226
Other long-term employee benefits	84	58	45	46
Total	1,502	384	1,156	272

Recognised in other comprehensive income:

Actuarial (gains) losses recognised during the year	57	(20)	-	-
Cumulative actuarial (gains) losses recognised	(903)	1,043	-	824

The expense is recognised in the following line items in the statement of profit or loss:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Cost of sales	912	244	732	167
Selling and distribution and administrative expenses	590	140	424	105
Total	1,502	384	1,156	272

Actuarial assumptions

The following were the principal actuarial assumptions as at December 31, 2019 and 2018 (expressed as weighted-averages):

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit: %</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Discount rate	1.0-4.0	1.8-3.5	2.9	2.9
Future salary growth	3.0-7.0	1.5-8.0	7.0	7.0
Employee turnover	0-50	0-50	0-3	0-3
Retirement age	55-65 years	55-65 years	60 years	60 years

Assumptions regarding future mortality have been based on published statistics and mortality tables.

As at December 31, 2019, the weighted-average duration of the defined benefit obligation was 18 years (2018: 18 years).

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Sensitivity analysis

Reasonably possible changes at the reporting date to one of the relevant actuarial assumptions, holding other assumptions constant, would have affected the defined benefit obligation by the amounts shown below:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	Increase	Decrease	Increase	Decrease
As at December 31, 2019				
Discount rate (1% movement)	(577)	667	(422)	498
Future salary growth (1% movement)	602	(498)	423	(367)
As at December 31, 2018				
Discount rate (1% movement)	(425)	503	(308)	363
Future salary growth (1% movement)	433	(358)	299	(259)

Although the analysis does not take account of the full distribution of cash flows expected under the plan, it does provide an approximation of the sensitivity of the assumptions shown.

The Labor Protection Act (No. 7) B.E. 2562 has been announced in the Royal Gazette on April 5, 2019, which will be effective after 30 days from the date announced in Royal Gazette. This Labor Protection Act stipulates additional legal severance pay rates for employees who have worked for an uninterrupted period of twenty years or more. Such employees are entitled to receive compensation of not less than 400 days at the employees' latest wage rate. This change is considered an amendment to post-employment benefits plan. The Group has already reflected the effect of such change by recognising past service cost as an expense in the consolidated and separate statements of profit or loss for the year ended December 31, 2019.

24. SHARE CAPITAL

	Par value per share (Baht)	Unit : Million Shares / Million Baht			
		2019		2018	
		Number	Amount	Number	Amount
Authorised					
As at January 1, ordinary shares	10	4,508.8	45,088.5	4,508.8	45,088.5
As at December 31, ordinary shares	10	4,508.8	45,088.5	4,508.8	45,088.5
Issued and paid-up					
As at January 1, ordinary shares	10	4,508.8	45,088.5	4,508.8	45,088.5
As at December 31, ordinary shares	10	4,508.8	45,088.5	4,508.8	45,088.5

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

25. ADDITIONAL PAID-IN CAPITAL AND RESERVES

Share premium

Section 51 of the Public Companies Act B.E. 2535 requires companies to set aside share subscription monies received in excess of the par value of the shares issued to a reserve account ("share premium"). Share premium is not available for dividend distribution.

Premium on treasury stock

The premium on treasury stock represents the accumulated premium on sale of treasury stock, net of any deficits on sale or cancellation of treasury stock. The premium on treasury stock is not available for dividend distribution.

Difference arising from business combination under common control

Difference on common control transactions arising within equity represents the difference of the book values of certain entities or businesses under common control under their cost as of the date of their acquisition. The reserve is non-distributable and will be retained until the respective businesses are sold or otherwise disposed of.

Legal reserve

Section 116 of the Public Companies Act B.E. 2535 requires that a company shall allocate not less than 5% of its annual net profit, less any accumulated losses brought forward (if any), to a reserve account ("legal reserve"), until this account reaches an amount not less than 10% of the registered authorised capital. The legal reserve is not available for dividend distribution.

Treasury stock reserve

The treasury stock reserve represents the amount appropriated from retained earnings equal to the cost of the Company's own shares held by the Company. The treasury stock reserve is not available for dividend distribution.

Other components of equity

Exchange differences on translating financial statements

The exchange differences on translating financial statements account within equity comprises all foreign currency differences arising from the translation of the financial statements of foreign operations, as well as from the translation of liabilities that hedge the Company's net investment in a foreign operation.

Remeasurement of investments held as available-for-sale

Gain or loss on remeasurement of investments held as available-for-sale account within equity comprises the cumulative net change in the fair value of available-for-sale investments until the investments are derecognised or impaired.

Cash flow hedges

The cash flow hedges account within equity comprises the cumulative net change in the fair value of cash flow hedges related to hedged transactions that have not yet occurred for effective portion.

Movements in reserves

Movements in reserves are shown in the statements of changes in equity.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

26. TREASURY STOCK

At the Board of Directors' Meeting held on May 27, 2019, the Board approved a share repurchase program for financial management purpose not exceeding 50 million shares, or approximately 1.1 percent of the total issued shares, with the maximum amount of Baht 3,000 million. The Company may purchase the shares through the Stock Exchange of Thailand within 6 months, during the period from June 11, 2019 to December 9, 2019. Treasury stock has to be resold after 6 months but no later than 3 years from the completion date of share repurchases.

On December 9, 2019, the Company has repurchased the shares under the program totalling 22.30 million shares, equivalent to 0.49% of issued share and paid-up capital, at a total cost of Baht 1,187.60 million with an equivalent amount had been appropriated from retained earnings to treasury stock reserve.

27. TRANSACTIONS WITH RELATED PARTIES

A related party is as follows:

- An individual or an entity which has the ability, directly or indirectly, to control or joint control or exercise significant influence over the Group in making financial and operating decisions or;
- An individual or an entity which is subject to common control or common significant influence with the Group or;
- The Group has the ability, directly or indirectly, to control or joint control or exercise significant influence over an individual or an entity in making financial and operating decisions.

Relationships with significant related parties were as follows:

Name of entities	Country of incorporation/ nationality	Nature of relationships
PTT Plc.	Thailand	Parent, some common directors and management and the Company's director as a management
Global Green Chemicals Plc.	Thailand	Subsidiary, 72.29% shareholding, some common directors and the Company's management as a director
GC Glycol Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC Polyols Co., Ltd.	Thailand	Subsidiary, 82.10% shareholding and the Company's management as a director
GC Maintenance and Engineering Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC Marketing Solutions Co., Ltd.	Thailand	Subsidiary, 100% shareholding by the Group, and the Company's management as a director
GC Logistics Solutions Co., Ltd.	Thailand	Subsidiary, 100% shareholding by the Group
GC Ventures Co., Ltd.	Thailand	Subsidiary, 100% shareholding
GC Treasury Center Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Name of entities	Country of incorporation/ nationality	Nature of relationships
GC Styrenics Co., Ltd.	Thailand	Subsidiary, 100% shareholding
GC Estate Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC Oxirane Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
Solution Creation Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
Thai Tank Terminal Limited	Thailand	Subsidiary, 51% shareholding, some common directors and the Company's management as a director
Bio Spectrum Co., Ltd. (Liquidation process finalized in January 2019)	Thailand	Subsidiary, 100% shareholding
PTT Phenol Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC-M PTA Company Limited (Formerly Siam Mitsui PTA Co., Ltd.)	Thailand	Subsidiary, 49% shareholding by the Company and 25% shareholding by subsidiary and the Company's management as a director
NPC Safety and Environmental Service Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
Auria BioChemicals Co., Ltd. (Liquidation process finalized in April 2019)	Thailand	Subsidiary, 100% shareholding by the Group
PTTGC America Corporation	United States of America	Subsidiary, 100% shareholding, some common directors and the Company's management as a director
PTTGC International Private Limited	Singapore	Subsidiary, 100% shareholding, some common directors and the Company's management as a director
GGC Biochemicals Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by subsidiary
Thai PET Resin Co., Ltd.	Thailand	Indirect subsidiary, 84.40% shareholding by subsidiaries and the Company's management as a director
Thai Fatty Alcohols Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by subsidiary
PL Global Transport Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by the Group

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Name of entities	Country of incorporation/ nationality	Nature of relationships
NPC S&E Security Guard Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by the Group
Vencorex (Thailand) Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by indirect subsidiary
GCM Polymer Trading DMCC (Formerly Polymer Marketing DMCC)	United Arab Emirates	Indirect subsidiary, 100% shareholding by the Group
GC Logistics Solutions (Vietnam) Co., Ltd.	Vietnam	Indirect subsidiary, 100% shareholding by the Group
GC Marketing Solutions Myanmar Co., Ltd. (Formerly Polymer Marketing Myanmar Co., Ltd.)	Myanmar	Indirect subsidiary, 100% shareholding by the Group
GC Marketing Solutions Vietnam Co., Ltd. (Formerly Polymer Marketing Vietnam Co., Ltd.)	Vietnam	Indirect subsidiary, 100% shareholding by the Group
GC Ventures America Corporation	United States of America	Indirect subsidiary, 100% shareholding by the Group
PTTGC America LLC	United States of America	Indirect subsidiary, 100% shareholding by the Group, some common directors and the Company's management as a director
PTTGC Innovation America Corporation	United States of America	Indirect subsidiary, 100% shareholding by the Group
PTTGC International (Netherlands) B.V.	Netherlands	Indirect subsidiary, 100% shareholding by the Group
PTTGC International (USA) Inc.	United States of America	Indirect subsidiary, 100% shareholding by the Group, some common directors and the Company's management as a director
PT GCM Marketing Solutions Indonesia	Indonesia	Indirect subsidiary, 67% shareholding by the Group
Vencorex France S.A.S.	France	Indirect subsidiary, 100% shareholding by indirect subsidiary
Vencorex Holding	France	Indirect subsidiary, 90.82% shareholding by subsidiary
PTT Asahi Chemical Co., Ltd.	Thailand	Joint venture, 50% shareholding and the Company's management as a director
PTT MCC Biochem Co., Ltd.	Thailand	Joint venture, 50% shareholding
HMC Polymers Co., Ltd.	Thailand	Joint venture, 41.44% shareholding and the Company's management as a director

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Name of entities	Country of incorporation/ nationality	Nature of relationships
GGC KTIS Bioindustrial Company Limited	Thailand	Indirect joint venture, 50% shareholding by subsidiary
Thai Ethoxylate Co., Ltd.	Thailand	Indirect joint venture, 50% shareholding by subsidiary
NatureWorks Asia Pacific Co., Ltd.	Thailand	Indirect joint venture, 50% shareholding by the Group
Emery Oleochemicals (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group and the Company's management as a director
Emery Oleochemicals Marketing (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group
Emery Specialty Chemicals Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group and the Company's management as a director
Emeryleo Specialties (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group
NatureWorks LLC	United States of America	Indirect joint venture, 50% shareholding by the Group
Matrix Polymers Australia Pty Ltd.	Australia	Indirect joint venture, 49% shareholding by the Group
Matrix Polymers Ltd.	England	Indirect joint venture, 49% shareholding by the Group
Matrix Polymers New Zealand Pty Ltd.	New Zealand	Indirect joint venture, 49% shareholding by the Group
Revolve Group Limited	England	Indirect joint venture, 49% shareholding by the Group
Revolve Matrix Polymers Malaysia Sdn. Bhd.	Malaysia	Indirect joint venture, 49% shareholding by the Group
Global Power Synergy Plc.	Thailand	Associate, 22.73% shareholding, shareholding by parent company, some common directors and the Company's management as a director
Kuraray GC Advanced Materials Company Limited	Thailand	Associate, 33.40% shareholding and the Company's management as a director
PTT Energy Solutions Co., Ltd.	Thailand	Associate, 20% shareholding, shareholding by parent company, some common directors
PTT Digital Solutions Co., Ltd.	Thailand	Associate, 40% shareholding and shareholding by parent company

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Name of entities	Country of incorporation/ nationality	Nature of relationships
Vinythai Plc.	Thailand	Associate, 24.98% shareholding and the Company's management as a director
Eastern Fluid Transport Co., Ltd.	Thailand	Associate, 15% shareholding by the Company and 15% shareholding by subsidiary
GHECO-One Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow Energy Public Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow SPP 2 Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow SPP 3 Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow SPP 11 Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow IPP Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Thai Eastern Topseeds Oil Co., Ltd.	Thailand	Indirect associate, 30% shareholding by subsidiary
Combined Heat and Power Producing Co., Ltd.	Thailand	Indirect associate, 22.73% shareholding by the Group
Advanced Biochemical (Thailand) Co., Ltd.	Thailand	Indirect associate, 24.98% shareholding by the Group
S.P. Petpack Inter Group Co., Ltd.	Thailand	Indirect associate, 25% shareholding by the Group
PT Indo Thai Trading	Indonesia	Indirect associate, 49% shareholding by the Group until July 2019
Thai Petroleum Pipeline Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Dhipaya Insurance Plc.	Thailand	Related party, shareholding by parent company
Thai Paraxylene Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Thai Oil Plc.	Thailand	Related party, shareholding by parent company
TOP Solvent Co., Ltd.	Thailand	Related party, indirect shareholding by parent company

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Name of entities	Country of incorporation/ nationality	Nature of relationships
TOP Solvent (Vietnam) LLC.	Vietnam	Related party, indirect shareholding by parent company
Business Services Alliance Co., Ltd.	Thailand	Related party, shareholding by parent company, the Company and two Company's associates, each of 25% shareholding of preferred stock
PTT Natural Gas Distribution Co., Ltd.	Thailand	Related party, shareholding by parent company
PTT Retail Services Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
PTT Retail Management Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
PTT Oil and Retail Business Plc.	Thailand	Related party, shareholding by parent company
PTTEP Siam Limited	Thailand	Related party, indirect shareholding by parent company
PTTEP International Limited	Thailand	Related party, indirect shareholding by parent company
PTT Exploration and Production Plc.	Thailand	Related party, shareholding by parent company
PTT Tank Terminal Limited	Thailand	Related party, shareholding by parent company
PTT Energy Resources Co., Ltd.	Thailand	Related party, shareholding by parent company
PTT LNG Co., Ltd.	Thailand	Related party, shareholding by parent company
Rak Phasak Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
LABIX Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Sak Chaisidhi Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Sport Services Alliance Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Community Partnership Association	Thailand	The Company's management as a director
Sarn Palung Social Enterprise Company Limited	Thailand	Related party, 15% shareholding and shareholding by parent company

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Name of entities	Country of incorporation/ nationality	Nature of relationships
Amata Natural Gas Distribution Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Energy Complex Co., Ltd.	Thailand	Related party, shareholding by parent company
UBE Chemicals (Asia) Plc.	Thailand	Related party, indirect shareholding by parent company
IRPC Plc.	Thailand	Related party, shareholding by parent company
IRPC Polyol Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Carigali-PTTEPI Operating Company Sdn. Bhd.	Malaysia	Related party, indirect shareholding by parent company
PTTEP South Asia Limited	Cayman Islands	Related party, indirect shareholding by parent company
PTT International Trading DMCC	United Arab Emirates	Related party, indirect shareholding by parent company
PTT International Trading London Ltd.	England	Related party, shareholding by parent company and some common directors
PTT International Trading Pte. Ltd.	Singapore	Related party, shareholding by parent company
TPBI & Myanmar Star Co., Ltd.	Myanmar	Related party, shareholding by subsidiary

The pricing policies for particular types of transactions are explained further below:

Transactions	Pricing policies
Sale of goods	Contract price / Regional market price / World market price
Rendering of services	Contract price
Purchase of goods / raw materials / services	Contract price / Market price
Interest on loan	Average cost of fund / Contractually agreed rate
Key management personnel compensation (Meeting allowance and bonus)	The rate approved by the Board of Directors and shareholders

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Significant transactions for the years ended December 31, 2019 and 2018 with related parties were as follows:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
Parent				
Sales of goods or rendering of services	29,047	124,542	28,886	121,869
Purchases of goods or receiving of services	237,553	310,191	236,347	307,987
Other income	26	76	5	26
Other expense	193	115	129	85
Purchase of assets	-	6,944	-	-
Subsidiaries				
Sales of goods or rendering of services	-	-	99,395	107,775
Purchases of goods or receiving of services	-	-	3,661	3,364
Interest income	-	-	15	16
Dividend income	-	-	2,666	2,912
Other income	-	-	1,144	1,263
Interest expense	-	-	762	427
Other expense	-	-	1,971	2,146
Expense capitalised to fixed assets	-	-	3,164	1,015
Joint ventures				
Sales of goods or rendering of services	7,874	9,199	4,469	4,839
Purchases of goods or receiving of services	3,745	4,042	204	297
Interest income	145	242	143	240
Dividend income	-	-	828	1,242
Other income	96	70	80	63
Other expense	1	2	1	2
Associates				
Sales of goods or rendering of services	5,831	9,684	4,531	5,720
Purchases of goods or receiving of services	12,916	9,635	7,220	4,783
Interest income	163	-	163	-
Dividend income	4	2	871	730
Other income	242	69	150	68
Other expense	459	462	353	342
Expense capitalised to fixed assets	304	122	224	50
Other related parties				
Sales of goods or rendering of services	156,928	127,249	150,458	122,271
Purchases of goods or receiving of services	16,577	22,608	15,312	21,074
Other income	59	182	22	175
Other expense	435	431	335	320
Expense capitalised to fixed assets	40	75	24	67
Key management personnel				
Key management personnel compensation				
Short-term benefits	374	369	193	192
Post-employment benefits and other long-term employee benefits	14	5	12	4
Total key management personnel compensation	388	374	205	196

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Balances as at December 31, 2019 and 2018 with related parties were as follows:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<i>Trade receivables - related parties</i>				
Parent	2,265	3,576	2,251	3,554
Subsidiaries	-	-	6,942	9,520
Joint ventures	838	1,192	374	556
Associates	378	716	318	404
Other related parties	13,240	12,117	12,548	11,674
Total	16,721	17,601	22,433	25,708

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<i>Other receivables - related parties</i>				
Parent	38	49	36	42
Subsidiaries	-	-	425	441
Joint ventures	56	52	33	43
Associates	211	284	35	125
Other related parties	655	920	550	780
Total	960	1,305	1,079	1,431

Loans to related parties

	<u>Interest rate</u> <u>(% per annum)</u>		<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<i>Short-term loans</i>						
Subsidiaries	1.80 - 3.93	1.89 - 3.52	-	-	429	607
Joint venture	LIBOR plus margin	LIBOR plus margin	-	242	-	242
Associate	Fixed rate	-	1,123	-	1,123	-
Total			1,123	242	1,552	849

Long-term loans

Joint ventures	LIBOR plus margin	LIBOR plus margin	2,275	3,551	2,275	3,551
Total			2,275	3,551	2,275	3,551

Summary of loans to related parties

Short-term loans	1,123	242	1,552	849
Long-term loans	2,275	3,551	2,275	3,551
Total	3,398	3,793	3,827	4,400

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Movements during the years ended December 31, 2019 and 2018 of loans to related parties were as follows:

Loans to related parties

	Consolidated		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<i>Short-term loans</i>				
Subsidiaries				
As at January 1,	-	-	607	476
Increase	-	-	-	251
Decrease	-	-	(178)	(120)
As at December 31,	-	-	429	607
Joint venture				
As at January 1,	242	-	242	-
Increase	-	235	-	235
Decrease	(225)	-	(225)	-
Effect of change in exchange rates	(17)	7	(17)	7
As at December 31,	-	242	-	242
Associate				
As at January 1,	-	-	-	-
Increase	8,000	-	8,000	-
Decrease	(6,877)	-	(6,877)	-
As at December 31,	1,123	-	1,123	-
Total				
As at January 1,	242	-	849	476
Increase	8,000	235	8,000	486
Decrease	(7,102)	-	(7,280)	(120)
Effect of change in exchange rates	(17)	7	(17)	7
As at December 31,	1,123	242	1,552	849
<i>Long-term loans</i>				
Joint ventures				
As at January 1,	3,551	6,665	3,551	6,665
Increase	767	-	767	-
Decrease	(1,827)	(3,212)	(1,827)	(3,212)
Effect of change in exchange rates	(216)	98	(216)	98
As at December 31,	2,275	3,551	2,275	3,551

	Consolidated		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Investments in subsidiaries (Note 10)	-	-	72,551	67,783
Investments in joint ventures (Note 11)	32,444	30,758	15,373	15,373
Investments in associates (Note 12)	29,829	15,450	26,813	9,793

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

		Unit : Million Baht	
		<u>Consolidated</u>	<u>Separate</u>
		<u>financial statements</u>	<u>financial statements</u>
		<u>2019</u>	<u>2018</u>
		<u>2019</u>	<u>2018</u>
<i>Trade payables - related parties</i>			
Parent		17,400	23,678
Subsidiaries		-	-
Joint ventures		386	562
Associates		1,386	1,817
Other related parties		1,555	2,110
Total		20,727	28,167
<i>Other payables - related parties</i>			
Parent		90	43
Subsidiaries		-	-
Joint ventures		16	7
Associates		112	150
Other related parties		215	143
Total		433	343
<i>Payables to contractors - related parties</i>			
Subsidiaries		-	-
Associates		101	81
Other related parties		3	24
Total		104	105
<i>Borrowings from related parties</i>			
		Unit : Million Baht	
		<u>Consolidated</u>	<u>Separate</u>
		<u>financial statements</u>	<u>financial statements</u>
		<u>2019</u>	<u>2018</u>
		<u>2019</u>	<u>2018</u>
<i>Short-term borrowings</i>			
Subsidiaries	1.10	-	-
Total		-	-
<i>Long-term borrowing</i>			
Subsidiary	4.68	-	-
Total		-	-
<i>Summary of borrowings from related parties</i>			
Short-term borrowings		-	-
Long-term borrowing		-	-
Total		-	-

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Movements during the years ended December 31, 2019 and 2018 of borrowings from related parties were as follows:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
Short-term borrowings				
Subsidiaries				
As at January 1,	-	-	1,931	2,558
Increase	-	-	1,580	105
Decrease	-	-	(470)	(732)
As at December 31,	-	-	3,041	1,931
Long-term borrowing				
Subsidiary				
As at January 1,	-	-	16,105	-
Increase	-	-	-	16,473
Effect of change in exchange rate	-	-	(1,132)	(300)
	-	-	14,973	16,173
Amortise (less) deferred financing cost	-	-	18	(68)
As at December 31,	-	-	14,991	16,105

Significant agreements with related parties

The Group has significant agreements with related parties as at December 31, 2019 as follows:

Olefins Sales and Purchase Agreements

The Company has 4 Ethylene sales and purchase agreements with a parent company and 2 related parties. Selling prices are determined based on Ethylene price in the world market. These agreements are for the periods from 7 years to 21 years, commencing from the effective date specified in each agreement. One agreement that is expired in July 2020 is automatically renewed except for advance cancellation not less than 1 year through written notice by each party. Other three agreements will expire in December 2021, May 2022 and December 2027.

The Company has 3 Propylene sales and purchase agreements with 3 related parties. Selling prices are determined based on Polypropylene plastic pellets and Propylene prices in the world market. Two agreements are for the periods from 5 years to 11 years, commencing from the effective date specified in each agreement and expiring in December 2021 and December 2026 and another agreement is for the period 15 years, start from the plant commercial operation date.

By-Product Sales and Purchase Agreements

The Company has a Hydrogen sales and purchase agreement with 2 related parties. Selling price in the agreement is determined based on Natural Gas price for the industry. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in March 2024 and another agreement is for the period of 15 years, start from the plant commercial operation date or one hundred and eighty (180) days from the first date of counter party's plant start receiving product from the company, whichever occurs earlier.

The Company has a Tail Gas sales and purchase agreement with a related party. Selling price in the agreement is determined based on Natural Gas price for the industry. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in August 2021.

The Company has a Butene sales and purchase agreement with a related party. Selling price in the agreement is determined based on Butene Price in the world market. The agreement is for the period of 1 year, commencing from the date as specified in the agreement and expiring in December 2019.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Utilities and Other Services Agreements

The Company has 3 Power Supply agreements with 3 related parties. Selling prices in these agreements are determined based on reference price from the Provincial Electricity Authority. These agreements are for the periods of 6 years 8 months and 15 years, commencing from the date as specified in each agreement and expiring in September 2022, June 2027 and September 2028.

The Company has 6 Utilities agreements covering electricity, steam and demineralised water with a related party. These agreements are for the periods from 12 years to 19 years 9 months, commencing from the date as specified in each agreement and expiring in December 2028.

The Company and certain related parties have many Utilities agreements for the industries covering electricity, steam, and water for industrial use with a related party. These agreements are for the periods from 15 years to 20 years, commencing from the date as specified in each agreement and expiring from December 2021 to June 2033 and two agreements are for the period 15 years, start from the plant commercial operation date. All agreements can be renewed for the period of 5 years with the terms and conditions agreed by both parties.

The Company has Tank Farm Storage and Service Agreement with a related party covering tank storage, utilities for product warehouse and transportation of Methanol. This agreement is for the period of 15 years, commencing from the effective date as specified in each agreement and expiring in March 2034, with the service charge as stipulated in the agreement.

Feedstock and Fuel Gas Sales and Purchase Agreements

The Company has 3 LPG sales and purchase agreements with a parent company. The selling price is determined based on the Polypropylene plastic pellets price. These agreements are for the periods from 8 years 7 months to 15 years, commencing from the date as specified in the agreement. Two agreements will expire in December 2020 and one agreement will expire in May 2021.

The Company has a Natural Gas sales and purchase agreement with a parent company. The selling price is determined based on gas price as specified in the agreement. The agreement is for the period of 20 years, commencing from the date as specified in the agreement. Subsequently, the agreement is renewed for the period of 2 years 3 months and expiring in March 2021.

The Company has 2 Natural Gas sales and purchase agreements with a parent company. Selling prices are determined based on gas price as specified in the agreement and Thailand Producer Price Index as classification of products by activity (CPA). These agreements are for the periods of 10 years, commencing from the date as specified in each agreement and expiring in May 2023 and December 2029.

The Company and 2 related parties have various Natural Gas sales and purchase agreements with a parent company. Selling price in an agreement is determined based on fuel oil prices and Thailand Producer Price Index (PPI). These agreements are for the periods from 10 years to 15 years, commencing from the date as specified in each agreement and expiring from June 2020 to December 2029.

The Company has a Natural Gas Liquid sales and purchase agreement with a parent company. The selling price is determined based on the standard price of Naphtha in the region. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in May 2021. The agreement is renewable for the period of 5 years with the agreement of both parties.

The Company has 2 Ethane, Propane and LPG sales and purchase agreements with a parent company. Selling price in an agreement is determined based on the high density Polyethylene plastic pellets and Polypropylene plastic pellets price and selling price in another agreement is determined based on the high density Polyethylene plastic pellets price. These agreements have been extended and consequently will expire in December 2020.

The Company has 2 Ethane sales and purchase agreement with a parent company. The selling price is determined based on prices prevailing in the high density Polyethylene price in the world market. These agreements are for the periods from 1 year 11 months to 15 years, commencing from the date as specified in the agreements and expiring in December 2020 and January 2025.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

The Company has an Ethane Rich Gas sales and purchase agreement with a related party. The selling price is determined based on prevailing prices of Polyethylene and Polypropylene in the region. This agreement is for the period of 10 years and will expire in January 2021.

From August 1, 2012, the Company has entered into the adjustment of the pricing formula in the sales and purchase agreements of petrochemical natural gas feedstock with a parent company.

Petroleum Product Offtake Agreement

The Company has a Petroleum Product sales and purchase agreement with a parent company and a related party. For domestic sales, the product price reflects prices prevailing in Thailand for products of a similar quality that are sold in or imported to Thailand. For export sales, the product price reflects the prevailing international spot price for that product. This agreement is for the period of 18 years, commencing from the date as specified in the agreement and expiring in February 2024. The agreement is automatically renewed except for advance cancellation through written notice by each party.

Expansion Phase Product Offtake Agreement

The Company has an expansion phase product offtake agreement with a parent company and a related party, which a parent company and a related party agree to purchase 100% of the volume of refined petroleum products produce by reforming and upgrading complexes. As specified in the Product Offtake Agreement, at least 50% of such volume will be sold at a competitive domestic market price and the remaining sold at a competitive export market price or other mutually agreed price. The agreement is for the period of 18 years, commencing from the date as specified in the agreement and expiring in February 2024. The agreement is automatically renewed except for advance cancellation through written notice by each party.

Long-term Crude Oil and Other Raw materials Supply Agreements

The Company entered into 2 supply agreements for crude oil and other raw materials with a parent company, the reference price being based on market price of crude oil and other raw materials. One agreement is for the periods of 18 years, will expire in February 2024 and another agreement is for the periods of 20 years, was automatically renewed and will expire in December 2020. These agreements are automatically renewed except for advance cancellation through written notice by each party.

Crack Spread Swap Agreements

The Company has entered into many crack spread swap agreements with a related party to hedge the Company's oil refinery margin. Under the agreements the floating amount of the basket refinery margin, (calculated crack spread based on the Singapore price of refined petroleum products, which are Naphtha, Gasoline, Gasoil, Kerosene and Fuel Oil, against the price of Dubai crude oil), is swapped for a fixed amount of the basket refinery margin for a fixed quantity per month. Under the agreements, the Company shall receive or make payment for the crack spread difference according to terms and conditions stipulated in the agreements.

Product Spread Swap Agreements

The Company has entered into many petrochemical product margin spread swap agreements with a related party to hedge the Company's petrochemical margin. Under the agreements the floating amount of the petrochemical margin, (calculated margin spread based on the key markets petrochemical products, Paraxylene, Benzene and other products against the Naphtha price), is swapped for a fixed amount of the petrochemical margin for a fixed quantity per month. Under the agreements, the Company shall receive or make payment of the product spread difference according to terms and conditions stipulated in the agreements.

Crude Oil Price Hedging Agreements

The Company has entered into many crude oil price hedging agreements to mitigate price risk with a related party. As at December 31, 2019 and 2018, the Company has no oil volume under the agreements.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Sales and Purchase Aromatics Product Agreements

The Company, a parent company, related parties and various other companies have entered into many raw material and product sales and purchase agreements. The sales and purchase prices of raw material and product are based on the prices specified in the agreements. These agreements are for the periods from 1 year to 11 years 9 months, commencing from the effective date as specified in each agreement. The agreements will expire from March 2020 to December 2026. Other agreements are automatically renewed except for a cancellation through written notice by each party.

Polyethylene plastic pellets Sales and Purchase Agreements

The Company and a related party have 2 Polyethylene plastic pellets sales and purchase agreements with another related party. The Company and a related party agrees to sell all Polyethylene plastic pellets to the other related party for distributing to the customers in the market. The Polyethylene pricing structure is linked to the Polyethylene product price that the related party sells to end customers, adjusted by the marketing expenses specified in the agreements. These agreements are for the period of 15 years, commencing from the effective date as specified in each agreement. One agreement will expire in December 2021 and another will expire in June 2023.

Lending and Borrowing Agreements

The Company has unsecured short-term lending agreements for the period of 3 years through Liquidity Management System (“LMS”) with 7 related parties with the credit facility of Baht 3,000 million, Baht 1,000 million, Baht 800 million, Baht 350 million, Baht 300 million and Baht 80 million. These loans bear interest based on market rate referenced to BIBOR O/N plus interest rate spread.

The Company has an unsecured short-term lending agreement for the period of 1 year with a related party with the credit facility of Baht 8,000 million. This loans bear interest at the fixed rate.

The Company has an unsecured long-term lending agreement for the period of 3.5 years with a related party with the credit facility of USD 238.36 million. This loan bears interest based on market rate referenced to LIBOR plus interest rate spread.

The Company has a secured long-term lending agreement for the period of 5 years with a related party with the credit facility of USD 7.9 million. This loan bears interest based on market rate referenced to LIBOR plus interest rate spread.

The Company has an unsecured long-term lending agreement for the period of 2 years with a related party with the credit facility of USD 17 million. This loan bears interest based on market rate referenced to LIBOR plus interest rate spread.

The Company has unsecured short-term borrowing agreements for the period of 3 years through LMS with 7 related parties with the credit facility of Baht 4,000 million, Baht 2,500 million, Baht 400 million, Baht 200 million, Baht 60 million and Baht 50 million. These loans bear interest based on market rate referenced to BIBOR O/N minus interest rate spread.

The Company has an unsecured long-term borrowing agreement for the period of 4.2 years with a related party with the credit facility of USD 495.89 million. This loan bear interest at the fixed rate.

Service Agreements

The Company has Shared Service agreements with 24 related parties for the provision of general services. All of these agreements are effective from the date as specified in the agreements and the service charges will be agreed in the fourth quarter of each year.

The Company has a Technical Services agreement with a related party. Under which the Company agreed to obtain certain technical advisory services. The agreement is for the period of 3 years 4 months and will expire in December 2019.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

The Company has Management and Engineering agreement, Design, Supply, Construction and Installation agreement, Inspection of Construction, Equipment and Machinery agreement and Management and Maintenance Work agreement with a related party. These agreements are for the periods from 1 year 3 months to 5 years, commencing from the date as specified in the agreements and expiring in June 2023.

The Company has 3 Services agreements to have the right to lay the pipelines for delivery of raw material and product on pipeline structure with a parent company. These agreements are for the period of 15 years from the agreement date and will expire in May 2023, July 2024 and June 2025.

The Company has a Security Service agreement with a related party. Under which the related party agrees to provide security service to asset, employees and visitors in the location of the Company. The agreement is for the period of 2 years and will expire in December 2020.

The Company has a Safety Inspection Service agreement and an Emergency Control Center agreement with a related party. These agreements are for the period from 2 years to 3 years and will expire in December 2020 with service rate as stipulated in the agreement.

The Company has Warehouse Management agreements with a related party. The agreements are for the periods from 1 year to 21 years 3 months and expiring from December 2020 to December 2030.

The Company has a Logistics Services agreement with a related party. The agreement is for the period of 3 years 1 month and will expire in December 2020.

The Company has entered into 2 Information and Communication Technology Service agreements with a related party. Under which the related party agrees to provide Information Technology system maintenance and support services, system structure and data centre management, system supporting and advisory, including system design and development as the Company's requirements. These agreements are for the periods from 1 year to 15 years, commencing from the date as specified in the agreements and expiring in December 2020 and December 2027.

The Company has Share Service agreement for Engineering, Procurement and Construction (EPC) Phase with 2 related parties. The agreement is effective from the date as specified in the agreement for the period of 3 years. This agreement will expire at least 6 months before the completion of EPC Phase and can be terminated by providing not less than 3 months advance written notice to the counter party.

Rental Agreements

The Company has Office Rental and Service agreement with a related party. The agreement is for the period of 3 years and will expire in September 2021 with rental and service rate and conditions as stipulated in the agreement.

The Company has entered into Land Lease agreement with a parent company to operate jetty and buffer tank farm services. The agreement is for the period of 23 years 6 months, commencing from the date signed in the agreement by both parties, and will expire in December 2037 with land lease rate and condition as specified in the agreement.

The Company has various Land Lease agreements with related parties. These agreements are for the periods from 14 years to 20 years, commencing from the date as specified in the agreements, and expiring from February 2029 to December 2038 with land lease rate and condition as specified in the agreements.

A subsidiary has Land Lease and Office Rental agreements with 4 related parties. These agreements are for the periods from 3 years to 30 years, commencing from the date as specified in the agreements and the renewal of the contract will be subject to negotiation with the counter party.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

28. FINANCIAL INFORMATION BY SEGMENT

The Group has significant business segments which offer different products and services, and are managed separately. For each of the business segments, the chief operating decision maker (CODM) reviews internal management reports on at least a quarterly basis. The operations in each of the Group's reportable segments have 7 reportable segments as follows;

Segment 1	Refinery
Segment 2	Aromatics
Segment 3	Olefins and Derivatives
Segment 4	Green Chemicals
Segment 5	Performance Materials and Chemicals
Segment 6	Service and Others
Segment 7	Investments in Other Joint Ventures and Associates

Performance information of each reportable segment is measured based on segment profit before finance cost, income tax, depreciation and amortisation which as included in the internal management reports that are reviewed by the Group's CODM. Management believes that using profit before finance cost, income tax, depreciation and amortisation to measure performance is the most relevant in evaluating the results of certain segments relative to other entities that operate within these industries.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Information about reporting segments for the year ended December 31, 2019

	Refinery	Aromatics	Olefins and Derivatives	Green Chemicals	Performance Materials and Chemicals	Service and Others	Investments in Other Joint Ventures and Associates	Elimination	Unit : Million Baht Total
External revenues	175,036	54,653	132,338	12,017	36,769	1,997	-	-	412,810
Inter-segment revenues	17,417	54,549	10,418	1,037	-	6,455	-	(89,876)	-
Total revenues	192,453	109,202	142,756	13,054	36,769	8,452	-	(89,876)	412,810
Cost of sales and rendering of services	(187,844)	(107,204)	(117,865)	(11,795)	(31,026)	(6,289)	-	89,529	(372,494)
Selling and administrative expenses	(913)	(1,728)	(8,314)	(936)	(2,424)	(2,132)	-	1,376	(15,071)
Profit before finance costs, income tax, depreciation and amortisation	4,208	1,042	17,085	604	3,533	1,340	-	(10)	27,802
Interest income	115	69	362	54	63	375	-	(48)	990
Finance costs	(388)	(171)	(450)	(79)	(445)	(1,681)	-	95	(3,119)
Depreciation and amortisation	(2,784)	(3,259)	(9,692)	(519)	(2,727)	(744)	-	212	(19,513)
Reversal of expenses from raw materials derogation	-	-	-	232	-	-	-	-	232
Gain on bargain purchase	-	-	31	-	-	-	-	-	31
Dividend income	-	-	-	-	-	3,538	-	(3,527)	11
Share of profit (loss) of investments in joint ventures	-	-	(73)	60	-	-	2,639	-	2,626
Share of profit (loss) of investments in associates	-	-	(5)	(29)	-	-	1,972	(5)	1,933
Others	(173)	(84)	18	(3)	194	2,051	-	3	2,006
Profit (loss) before income tax	978	(2,403)	7,276	320	618	4,879	4,611	(3,280)	12,999
Profit (loss) for reportable segment	1,008	(2,381)	7,022	162	395	4,126	4,611	(3,261)	11,682
Owners of the parent									

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Information about reporting segments for the year ended December 31, 2018

	<u>Refinery</u>	<u>Aromatics</u>	<u>Olefins and Derivatives</u>	<u>Green Chemicals</u>	<u>Performance Materials and Chemicals</u>	<u>Service and Others</u>	<u>Investments in Other Joint Ventures and Associates</u>	<u>Elimination</u>	<u>Unit : Million Baht Total</u>
External revenues	227,034	92,601	135,126	15,233	46,751	1,910	-	-	518,655
Inter-segment revenues	23,877	53,968	13,134	984	135	3,984	-	(96,082)	-
Total revenues	250,911	146,569	148,260	16,217	46,886	5,894	-	(96,082)	518,655
Cost of sales and rendering of services	(242,617)	(138,697)	(106,392)	(14,618)	(37,677)	(3,969)	-	96,013	(447,957)
Selling and administrative expenses	(786)	(1,656)	(7,173)	(835)	(2,362)	(2,184)	-	1,352	(13,644)
Profit before finance costs, income tax, depreciation and amortisation	7,960	5,750	35,137	859	6,998	1,303	-	256	58,263
Interest income	178	159	462	54	59	322	-	(58)	1,176
Finance costs	(382)	(126)	(642)	(233)	(465)	(1,824)	-	79	(3,593)
Depreciation and amortisation	(3,592)	(3,343)	(8,538)	(529)	(2,925)	(552)	-	199	(19,280)
Expenses from raw materials derogation	-	-	-	(2,004)	-	-	-	-	(2,004)
Gain on bargain purchase	-	-	1,355	-	-	-	-	-	1,355
Dividend income	-	-	-	25	-	4,214	-	(4,202)	37
Share of profit of investments in joint ventures	-	-	-	118	-	-	5,091	-	5,209
Share of profit of investments in associates	-	-	4	(8)	-	-	1,672	18	1,686
Others	12	120	369	22	200	(318)	-	3	408
Profit (loss) before income tax	4,176	2,560	28,147	(1,696)	3,867	3,145	6,763	(3,705)	43,257
Profit (loss) for reportable segment	4,031	2,269	25,118	(1,056)	4,173	2,467	6,763	(3,696)	40,069
Owners of the parent									

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

	<u>Refinery</u>	<u>Aromatics</u>	<u>Olefins and Derivatives</u>	<u>Green Chemicals</u>	<u>Performance Materials and Chemicals</u>	<u>Service and Others</u>	<u>Investments in Other Joint Ventures and Associates</u>	<u>Elimination</u>	<u>Unit : Million Baht Total</u>
As at December 31, 2019									
Segment assets	64,704	69,264	162,080	13,289	60,473	94,124	60,904	(72,324)	452,514
Investment in joint ventures and associates	-	-	244	1,125	-	-	60,904	-	62,273
Change in non-current assets (excluding deferred tax assets and derivatives)	1,293	(494)	6,057	(36)	6,142	(1,966)	15,534	(3,235)	23,295
As at December 31, 2018									
Segment assets	72,671	74,561	179,071	14,226	60,628	90,078	45,370	(67,350)	469,255
Investment in joint ventures and associates	-	-	46	792	-	-	45,370	-	46,208
Change in non-current assets (excluding deferred tax assets and derivatives)	(2,362)	(848)	19,245	(135)	7,806	23,135	4,590	(21,696)	29,735

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Geographical segments

In presenting information on the basis of geographical segments, segment revenue from sale of goods and rendering of services for the years ended December 31, 2019 and 2018 are based on the geographical location of customers. Segment non-current assets (exclude derivatives and deferred tax) as at December 31, 2019 and 2018 are based on the geographical location of the assets.

Geographical information

	Unit: Million Baht	
	Revenues	
	2019	2018
Thailand	260,869	316,080
The People's Republic of China	42,994	70,588
Singapore	20,021	34,337
Vietnam	17,278	27,524
Malaysia	13,517	7,292
Indonesia	6,052	7,079
India	5,108	7,150
Japan	4,481	4,589
United States of America	2,786	3,509
Other countries	39,704	40,507
Total	412,810	518,655

	Unit: Million Baht	
	Non-current assets (excluding deferred tax assets and derivatives)	
	2019	2018
Thailand	324,881	302,864
United States of America	10,242	8,353
France	6,900	7,681
Malaysia	4,505	4,526
Other countries	419	228
Total	346,947	323,652

Major customers

The Group's revenue from sale of goods and rendering of services for the years ended December 31, 2019 and 2018 mainly comprise revenue from one customer of Refinery, Aromatics and Olefins and derivatives segment representing Baht 29,047 million (2018: Baht 124,542 million) and revenue from another customer of Refinery and Green Chemicals segment representing Baht 123,025 million (2018: Baht 69,948 million).

29. SELLING AND DISTRIBUTION EXPENSES

Selling and distribution expenses for the years ended December 31, 2019 and 2018 consisted of:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
Distribution expense	3,534	2,981	1,908	1,882
Promotional expense	97	98	13	19
Marketing expense	109	120	42	56
Personnel expense	191	207	-	-
Total	3,931	3,406	1,963	1,957

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

30. ADMINISTRATIVE EXPENSES

Administrative expenses for the years ended December 31, 2019 and 2018 consisted of:

	Consolidated		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Personnel expense	6,257	5,265	4,401	3,686
Professional and consultancy fee	1,264	1,624	1,100	1,569
Depreciation and amortisation	1,211	1,137	772	690
Loss on disposal of fixed assets	50	23	-	4
Donation	186	155	180	150
Secondment fee	94	65	53	97
Others	3,475	3,180	2,236	2,040
Total	<u>12,537</u>	<u>11,449</u>	<u>8,742</u>	<u>8,236</u>

31. EMPLOYEE BENEFITS EXPENSES

Employee benefits expenses for the years ended December 31, 2019 and 2018 consisted of:

		Consolidated		Unit : Million Baht	
	<u>Note</u>	<u>financial statements</u>		<u>Separate</u>	
		<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Salaries, bonus, wages and other welfares		14,714	13,650	8,695	8,556
Contribution to provident funds		630	561	506	472
Defined benefit plans	23	1,418	326	1,111	226
Other long-term employee benefits	23	84	58	45	46
Total		<u>16,846</u>	<u>14,595</u>	<u>10,357</u>	<u>9,300</u>

Defined contribution plans

The defined contribution plans comprise provident funds established by the Group for its employees. Membership to the funds is on a voluntary basis. Contributions are made monthly by the employees at the minimum rate as required by law not exceeding 15% of their basic salaries and the Group contributes at the minimum rate as required by law not exceeding 15% of the employees' basic salaries. The provident funds are registered with the Ministry of Finance as juristic entities and are managed by a licensed Fund Manager.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

32. EXPENSES BY NATURE

The statements of income include an analysis of expenses by function. Expenses by nature disclosed in accordance with the requirements of various TFRS were as follows:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
<i>Included in cost of sales of goods</i>				
Changes in finished goods and work in progress	1,677	(810)	1,443	210
Raw materials used	324,740	389,710	254,546	331,200
Personnel expense	10,397	9,123	5,956	5,614
Depreciation of property, plant and equipment	17,352	16,311	12,258	12,217
Amortisation of intangible assets	393	368	280	253
<i>Included in selling and distribution and administrative expenses</i>				
Personnel expense	6,448	5,472	4,401	3,686
Depreciation of property, plant and equipment	839	787	537	479
Amortisation of intangible assets	372	350	235	211
Minimum lease payments recognised as an operating lease expense	667	640	317	328

33. FINANCE COSTS

Finance costs for the years ended December 31, 2019 and 2018 consisted of:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
<i>Interest expense</i>				
Subsidiaries	-	-	762	427
Debentures	2,300	2,227	1,646	1,880
Bank loans and overdrafts	1,208	1,154	354	493
Borrowings from other parties	15	168	-	-
Total interest expense	3,523	3,549	2,762	2,800
Other finance costs	331	548	186	319
<u>Less</u> Capitalised as cost of assets under construction	(735)	(504)	(329)	(192)
Net	3,119	3,593	2,619	2,927

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

34. INCOME TAX EXPENSE

Income tax expense for the years ended December 31, 2019 and 2018 consisted of:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
Current tax expense				
Current year	800	3,509	281	3,038
(Over) under provided in prior years	(22)	21	(17)	25
	<u>778</u>	<u>3,530</u>	<u>264</u>	<u>3,063</u>
Deferred tax expense				
Movements in temporary differences	(129)	(544)	(190)	165
Total	649	2,986	74	3,228

Reconciliation of effective tax rate

	Consolidated financial statements		Unit : Million Baht	
	2019	2018		
	Rate (%)		Rate (%)	
Profit before income tax expense		12,999		43,257
Income tax using the Thai corporation tax rate	20.0	2,600	20.0	8,651
Effect of different tax rates in foreign Jurisdictions		1		32
Income not subject to tax		(2,207)		(5,995)
Non-deductible tax expenses		278		232
(Over) under provided in prior years		(22)		21
Others		(1)		45
Total	5.0	649	6.9	2,986

	Separate financial statements		Unit : Million Baht	
	2019	2018		
	Rate (%)		Rate (%)	
Profit before income tax expense		9,227		32,949
Income tax using the Thai corporation tax rate	20.0	1,845	20.0	6,590
Income not subject to tax		(1,969)		(3,521)
Non-deductible tax expenses		215		134
(Over) under provided in prior years		(17)		25
Total	0.8	74	9.8	3,228

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

35. PROMOTIONAL PRIVILEGES

By virtue of the provisions of the Industrial Investment Promotion Act of B.E. 2520, the Company has been granted privileges by the Board of Investment relating to production of upstream, intermediate and downstream petrochemical, utilities and production support facilities, jetty for transportation and storage of liquid product and transportation by marine vessels, production of petroleum product, research and development of polymer products and chemical formula, lab testing services and refinery. The privileges granted include:

- (a) exemption from payment of import duty on machinery approved by the Board;
- (b) exemption from payment of income tax not over 100 percent of investment excluded land and working capital of certain operations for a period of eight years from the date on which the income is first derived from such operations
- (c) a 50% reduction in the normal income tax rate on the net profit derived from certain operations for a period of five years, commencing from the expiry date in (b) above.

As promoted companies, the Company must comply with certain terms and conditions prescribed in the promotional certificates.

Summary of revenues from promoted and non-promoted businesses in separate financial statement for the years ended December 31, 2019 and 2018 were as follows:

						Unit : Million Baht
<u>Separate financial statements</u>						
2019			2018			
Promoted businesses	Non-promoted businesses	Total	Promoted businesses	Non-promoted businesses	Total	
Export sales	2,027	28,176	30,203	2,927	52,985	55,912
Domestic sales	22,397	298,356	320,753	22,614	377,607	400,221
Services income	-	591	591	1	580	581
Total revenue	24,424	327,123	351,547	25,542	431,172	456,714

Certain subsidiaries in the Group have been granted promotional privileges as same as the Company.

36. BASIC EARNINGS PER SHARE

The calculation of basic earnings per share for the years ended December 31, 2019 and 2018 were based on the profit for the years attributable to ordinary shareholders of the Company and the weighted average number of ordinary shares outstanding during the years as follows:

				Unit : Million Baht / Million shares
<u>Consolidated financial statements</u>		<u>Separate financial statements</u>		
2019	2018	2019	2018	
Profit attributable to ordinary shareholders of the parent company (basic)	11,682.08	40,069.49	9,153.08	29,720.82
Number of ordinary shares as at January 1,	4,508.85	4,508.85	4,508.85	4,508.85
Effect of treasury stock	(2.59)	-	(2.59)	-
Weighted average number of ordinary shares (basic)	4,506.26	4,508.85	4,506.26	4,508.85
Earnings per share (basic) (in Baht)	2.59	8.89	2.03	6.59

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

37. DIVIDENDS PAID

At the Annual General Meeting of the shareholders of the Company held on April 5, 2019, the shareholders approved the appropriation of annual dividend from 2018 performance at Baht 4.25 per share, amounting to Baht 19,163 million. The Company had paid interim dividend of the first half year of 2018 at Baht 1.75 per share, amounting to Baht 7,890 million on September 18, 2018. The remaining dividend was paid for the second half year of 2018 at Baht 2.50 per share, amounting to Baht 11,272 million. Such dividend was paid to the shareholders in April 2019.

At the Board of Directors' Meeting of the Company held on August 19, 2019, the Board approved the appropriation of interim dividends from the earnings from January 1, 2019 to June 30, 2019 at Baht 1 per share. The dividend amounting to Baht 4,508 million was paid to the rightful shareholders in September 2019.

At the Annual General Meeting of the shareholders of the Company held on April 9, 2018, the shareholders approved the appropriation of annual dividend from 2017 performance at Baht 4.25 per share, amounting to Baht 19,087 million. The Company had paid interim dividend of the first half year of 2017 at Baht 1.75 per share, amounting to Baht 7,815 million on September 18, 2017. The remaining dividend was paid for the second half year of 2017 at Baht 2.50 per share, amounting to Baht 11,272 million. Such dividend was paid to the shareholders in April 2018.

At the Board of Directors' Meeting of the Company held on August 20, 2018, the Board approved the appropriation of interim dividends from the earnings from January 1, 2018 to June 30, 2018 at Baht 1.75 per share. The dividend amounting to Baht 7,890 million was paid to the rightful shareholders in September 2018.

38. FINANCIAL INSTRUMENTS

Financial risk management policies

The Group is exposed to normal business risks from changes in market interest rates and currency exchange rates and from non-performance of contractual obligations by counterparties. The Group does not hold or issue derivative financial instruments for speculative or trading purposes.

Risk management is integral to the whole business of the Group. The management continually monitors the Group's risk management process to ensure that an appropriate balance between risk and control is achieved.

Capital management

The Company's Board of Directors' policy is to maintain a strong capital base so as to maintain investor, creditor, partners and other stakeholders. In addition, the Board monitors the return on capital and the level of dividends to ensure business sustainability.

Interest rate risk

Interest rate risk is the risk that future movements in market interest rates will affect the results of the Group's operations and its cash flows because the Group's finances loans which have both floating and fixed interest rates for their operations. The Group has managed this risk to ensure the appropriateness to the business operation.

The effective interest rates of interest-bearing liabilities at December 31, 2019 and 2018 and the periods in which those liabilities mature or re-price were disclosed in note 20 to the financial statements.

Foreign currency risk

The Group is exposed to foreign currency risk relating to purchases, sales, and construction payment, including borrowings which are denominated in foreign currencies. The Group primarily utilises forward exchange contracts to hedge such financial assets and liabilities denominated in foreign currencies. The forward exchange contracts entered into at the reporting date also relate to anticipated purchases and sales, denominated in foreign currencies, for the subsequent period.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

As at December 31, 2019 and 2018, the Group was exposed to foreign currency risk in respect of financial assets and liabilities denominated in the following currencies:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
USD				
Financial assets	16,536	39,624	12,680	32,913
Financial liabilities	(21,295)	(24,515)	(34,681)	(37,282)
Gross statement of financial position exposure	(4,759)	15,109	(22,001)	(4,369)
Currency forward contracts	4,199	14,780	3,122	5,225

The Group performs foreign currency risk management on assets and liabilities held in USD. The Group has net liabilities under USD currency. The Group manages net USD liabilities by naturally hedged USD portion of net profit to minimise the impact from fluctuations in foreign currency to the Group's performance.

In addition to forward exchange contracts, the Group uses derivatives financial instruments, principally currency swaps and interest rate swap, to manage exposure to fluctuations in interest rates and in exchange rates. As at December 31, 2019, the Group entered into interest rate swap contracts, totalling Baht 0.48 million (2018: Baht 4.00 million) to repay certain interest bearing liabilities in foreign currencies.

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
EUR				
Financial assets	46	170	-	18
Financial liabilities	(85)	(240)	(41)	(59)
Gross statement of financial position exposure	(39)	(70)	(41)	(41)
Currency forward contracts	6	18	-	-

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
Others				
Financial assets	29	393	1	1
Financial liabilities	(60)	(158)	(43)	(68)
Gross statement of financial position exposure	(31)	235	(42)	(67)
Currency forward contracts	377	748	-	-

Credit risk

Credit risk is risk of failure from a customer or a counterparty to settle its obligations to the Group as and when they fall due.

Management has a policy in place and the exposure to credit risk is monitored on an ongoing basis. Credit evaluations are performed on all customers requiring credit over a certain amount. At the reporting date, there were no significant concentrations of credit risk. The maximum exposure to credit risk is represented by the carrying amount of each financial asset in the statement of financial position. However, the majority of the customers are on the long-term contracted commitment and parts of them are the Company's shareholders which the company has consistently collected from them. For the customers who do not have the long-term contracted commitments, the Group monitors the risk on an ongoing basis and would do the business only with the credible customers by limiting the credit lines and requesting the guarantee on some cases. For the export, the credit of counterparty will be considered. The Group will demand a payment on a case to case basis and also has commercial credit insurance. Management does not anticipate material losses from its debt collection.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Liquidity risk

The Group monitors its liquidity risk and maintains a level of cash and cash equivalents deemed adequate by management to finance the Group's operations and to mitigate the effects of fluctuations in cash flows.

Carrying amount and fair values

The carrying value of financial assets and liabilities in the consolidated and separate statements of financial position as at December 31, 2019 and 2018 are approximated to fair values except the following items:

Unit : Million Baht							
<u>Consolidated financial statements</u>							
<u>Carrying value</u>				<u>Fair value</u>			
<u>Current</u>	<u>Non-current</u>	<u>Total</u>	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>	<u>Total</u>	
As at December 31, 2019							
<i>Financial assets</i>							
Debt securities							
available-for-sale	545	1,503	2,048	-	2,048	-	2,048
Equity securities							
available-for-sale	-	384	384	384	-	-	384
Financial derivatives	28	-	28	-	28	-	28
Commodity derivatives	194	-	194	-	194	-	194
<i>Financial liabilities</i>							
Debentures	-	70,131	70,131	-	72,477	-	72,477
Financial derivatives	320	12	332	-	332	-	332
Commodity derivatives	466	-	466	-	466	-	466
As at December 31, 2018							
<i>Financial assets</i>							
Debt securities							
available-for-sale	6,315	5,957	12,272	-	12,272	-	12,272
Equity securities							
available-for-sale	-	362	362	362	-	-	362
Financial derivatives	341	122	463	-	463	-	463
Commodity derivatives	67	-	67	-	67	-	67
<i>Financial liabilities</i>							
Debentures	1,942	52,408	54,350	-	55,290	-	55,290
Financial derivatives	311	147	458	-	458	-	458
Commodity derivatives	308	-	308	-	308	-	308

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Million Baht

	<u>Separate financial statements</u>						
	<u>Carrying value</u>			<u>Fair value</u>			
	<u>Current</u>	<u>Non-current</u>	<u>Total</u>	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>	<u>Total</u>
As at December 31, 2019							
Financial assets							
Debt securities							
available-for-sale	545	1,503	2,048	-	2,048	-	2,048
Equity securities							
available-for-sale	-	384	384	384	-	-	384
Financial derivatives	14	-	14	-	14	-	14
Commodity derivatives	194	-	194	-	194	-	194
Financial liabilities							
Long-term borrowing							
from a related party	-	14,991	14,991	-	15,808	-	15,808
Debentures	-	55,221	55,221	-	56,761	-	56,761
Financial derivatives	69	12	81	-	81	-	81
Commodity derivatives	466	-	466	-	466	-	466
As at December 31, 2018							
Financial assets							
Debt securities							
available-for-sale	6,315	5,957	12,272	-	12,272	-	12,272
Equity securities							
available-for-sale	-	362	362	362	-	-	362
Financial derivatives	340	122	462	-	462	-	462
Commodity derivatives	67	-	67	-	67	-	67
Financial liabilities							
Long-term borrowings							
from a related party	-	16,105	16,105	-	16,530	-	16,530
Debentures	1,942	36,379	38,321	-	39,082	-	39,082
Financial derivatives	3	21	24	-	24	-	24
Commodity derivatives	308	-	308	-	308	-	308

Measurement of fair values

Level 1 of fair values for equity securities available-for-sale investments are based on quoted bid price as at the end of reporting period by references from the Stock Exchange of Thailand.

Level 2 of fair values for debt securities available-for-sale investments are based on the yield rate quoted by the Thai Bond Market Association or other markets and for simple over-the-counter derivative instruments are based on broker quotes. Those quotes are tested for reasonableness by discounting expected future cash flows using market interest rate for a similar instrument at the measurement date. Fair values reflect the credit risk of the instrument and include adjustments to take account of the credit risk of the Group and counterparty when appropriate. For fixed-rate long-term borrowings are based on discounted future cash flows for the remaining periods using market interest rate for a similar instrument at the measurement date. For debentures are based on the last bid price on the Thai Bond Market Association at the measurement date.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

39. COMMITMENTS WITH NON-RELATED PARTIES

As at December 31, 2019 and 2018, the Company and its subsidiaries had commitments with non-related parties as follows:

	Consolidated		Unit : Million Baht	
	financial statements		Separate	
	2019	2018	2019	2018
Capital commitments				
<i>contracted but not provided for</i>				
Land	5	2	2	2
Plant, machinery and equipment	13,475	31,460	9,084	19,006
Buildings	107	38	98	36
Others	627	617	228	199
Total	14,214	32,117	9,412	19,243
Non-cancellable operating lease				
<i>commitments</i>				
Within one year	602	195	286	121
After one year but within five years	1,467	888	795	649
After five years	2,459	2,402	1,957	2,097
Total	4,528	3,485	3,038	2,867
Other commitments				
Letters of credits	333	383	-	-
Bank guarantees	3,336	2,043	1,467	266
Guarantees for credit facilities and bank guarantees	2,613	2,784	22,661	25,002
Other agreements	8,699	9,524	7,214	9,047
Total	14,981	14,734	31,342	34,315

As at December 31, 2019 and 2018, the Company and a subsidiary had capital commitments as follows:

- The Company had commitments relating to Olefins Reconfiguration Project totalling Baht 6,074 million (2018: Baht 16,125 million). The project has been planned for commercial operation within 2020.
- A subsidiary had commitments relating to Propylene Oxide (PO) Project totalling Baht 2,940 million (2018: Baht 9,013 million). The project has been planned for commercial operation within 2020.

Utilities and Other Services Agreements with minimum purchase quantity

The Group has 17 utilities and other services agreements which have minimum purchase quantity with other parties. These agreements are for the periods from 10 years to 30 years, commencing from the date as specified in each agreement and expiring in March 2022 to September 2035. The minimum purchase quantity, the selling price of products and the renewal of the contract will be subject as specified in the agreements.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

40. LITIGATIONS

a) Purchase and sales of raw materials agreement legal case

On December 3, 2009, a company filed for arbitration against PTT Plc. (“PTT”) and the Company as a producer to perform according to purchase and sales of raw materials agreement, of which the said company has been committed by PTT, or to compensate for damages of approximately Baht 13,805 million. On March 8, 2010, the dispute was struck out of the case-list by the arbitration ruling that the Company was not a party to the contract.

On August 27, 2010, the said company filed a civil suit to the Civil Court against PTT and the Company as a producer to perform according to purchase and sales of raw materials agreement, of which the said company has been committed by PTT, or to compensate for damages of approximately Baht 9,380 million. In this regards, the Company filed an objection against the indictment with the Civil Court on the basis that the Company was not a party to the contract.

On May 21, 2013, the Civil Court considered that the arbitration process between such company and PTT has not yet finalized; therefore, the Court has temporarily struck the case out of the case-list until the final decision has been reached under arbitration process. Then, both parties or either party can resubmit the case to the Civil Court for the further trial.

Subsequently, on March 25, 2016, the arbitration has reached a conclusion for PTT to compensate the damages in some amount. On June 30, 2019, PTT submitted a motion for setting aside the arbitral award to the Civil Court. Thereafter, on September 19, 2019, the Civil Court rendered the judgement for enforcement of the arbitral award, however, PTT will appeal to the Supreme Court under applicable law. The Company believes that the outcome of the consideration will not result in any liability to the Company, because the arbitral award and the judgement shall not be enforced on the Company due to the fact that the Company was not the party in the case, therefore, has not provided any provision against any loss that may result from this matter in the financial statements.

b) Oil spill incident legal case

During the third quarter of 2014, the number of people in Rayong filed several lawsuits with the Civil Court and the Rayong Provincial Court against the Company to claim the extra compensation from oil spill incident and to perform the rehabilitation of the sea and natural environmental recovery. Some cases have been dismissed and some cases have been passed a judgement by the Civil Court on August 25, 2016 by ordered the Company to compensate for damages including interest and rehabilitation of approximately Baht 11.26 million. The Company has appealed on February 17, 2017. Subsequently, on May 11, 2018, the Company made a compromise agreement with majority plaintiffs at the Civil Court. On December 20, 2018, the Court of Appeal has passed the judgement according to the compromise contracts which the Company has already paid compensation in full amount. For the remaining plaintiffs, the Court of Appeal ordered the Company to pay compensation with its interest according to the judgement of the Court of First Instance and reduced the amount of interest. The Company has paid the compensation to all plaintiffs completely and no petition is submitted to Supreme Court by any plaintiffs. This case has become final.

For the case at Rayong Provincial Court, on September 28, 2018, the Court has made the judgement ordering the Company to pay damage cost with its interest of approximately Bath 38 million by deducting the remedy payment paid to the plaintiffs of Baht 24 million. The Company deposited the remaining damage cost with its interest to the Rayong Provincial Court on February 25, 2019. Some plaintiffs filed an appeal with the Rayong Provincial Court and the Company has filed an answer to the appeal with the Rayong Provincial Court on October 2, 2019. Subsequently, on January 22, 2020 the Rayong Provincial Court sent an appointment to hear the judgment of the Court of Appeal Region 2 on March 19, 2020.

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

c) Transfer of right for the payment of raw materials legal case of the subsidiary

- c.1) The subsidiary was informed by the third party who received the transfer of claim from the supplier of the subsidiary for the payment of raw materials, which the supplier of the subsidiary borrowed from the third party to purchase raw materials to sell to the subsidiary and the subsidiary had to pay for the raw materials to that third party under the transfer of right for the payment of raw materials. After reviewing the provided documents, the subsidiary informed to the third party that these documents were not in the system, nor there was no evidence regarding the delivery of raw materials as prescribed in the documents. Subsequently, on August 20, 2018, the third party filed a civil lawsuit against the supplier of the subsidiary and the subsidiary as joint defendants for violation of loan agreement and transfer of claim, with damage claimed amounting to Baht 308.75 million with interest rate at 15% per annum amounting to Baht 15.90 million, totalling Baht 324.65 million. The subsidiary appointed a lawyer and filed a statement of defense. Currently, this case is in the process of the plaintiffs and defendants witness hearing. However, the legal advisor of the subsidiary provided an opinion that the subsidiary is not liable for any damages as per the plaint as there was no evidence regarding the delivering of raw materials to the subsidiary. As a result, there is no obligation.
- c.2) On February 27, 2019, a financial institution filed a civil lawsuit against the supplier of the subsidiary, director of supplier of the subsidiary and the subsidiary as joint defendants for violation of credit limit agreement, sale of promissory notes, transfer of money, guarantee and forced mortgage, with damage claimed amounting to Baht 55.95 million and interest amounting to Baht 3.49 million, totalling Baht 59.44 million. Therefore, the subsidiary filed a statement of defense. On October 28, 2019, the plaintiff submitted the motion for permission to withdraw the pliant against the subsidiary and the Court granted such permission and struck the case out of the case-list of the Court.

41. RECLASSIFICATIONS

Certain reclassifications have been made to the consolidated and separate financial statements for the year ended December 31, 2018, to conform to the classifications used in the consolidated and separate financial statements for the year ended December 31, 2019 as follows:

Account name	Previous presentation	Current presentation	Unit : Million Baht	
			Consolidated financial statements	Separate financial statements
Land	Property, plant and equipment	Investment properties	977	1,741
Other assets	Other non-current assets	Property, plant and equipment	6,286	4,580

NOTES TO THE FINANCIAL STATEMENTS

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

FOR THE YEAR ENDED DECEMBER 31, 2019

42. EVENTS AFTER THE REPORTING PERIOD

- 42.1 The Company has established a Joint Venture company called ENVICCO Limited (ENVICCO) on February 3, 2020 to operate High-quality recycled plastic plant which the Company holds 70% of total shares in Joint Venture company together with another 30% held by ALPLA. The establishment of ENVICCO is in accordance with the resolution of Board of Directors' meeting No. 8/2019 on July 22, 2019 approving the Company to enter into the Joint Venture Agreement (JVA) to invest in Recycle plastic plant project. The Joint Venture company has the objectives to manufacture and distribute rPET and rHDPE recycled plastic resins with overall production capacity of 45,000 Ton per year comprised of rPET capacity of 30,000 Ton per year and rHDPE capacity of 15,000 Ton per year. The project will be located at Asia Industrial Estate in Rayong province and has expected commercial operation date within the fourth quarter of 2021.
- 42.2 At the Board of Directors' meeting held on February 17, 2020, the Board approved to submit for approval at the Annual General Meeting of the Shareholders, a full year 2019 dividend payment at the rate of Baht 2.00 per share, of which Baht 1.00 per share was paid as an interim dividend in September 2019 as disclosed in note 37. Thus, the remaining dividend will be paid at the rate of Baht 1.00 per share to the shareholders entitled to receive dividends. This dividend is subject to the approval of the Shareholders at the Annual General Meeting to be held on April 9, 2020.

43. APPROVAL OF THE FINANCIAL STATEMENTS

These financial statements have been approved for issue by the Board of Directors on February 17, 2020.

AUDIT FEE AND NON-AUDIT FEE

1. AUDIT FEE

GC and its subsidiaries paid the audit fee to:

- Deloitte Touche Tohmatsu Jaiyos Audit Co., Ltd., which is the auditor of GC and its subsidiaries for the fiscal year of 2019 amounting to THB 10,265,000. Of this amount, GC paid THB 3,000,000 and its subsidiaries paid THB 7,265,000.
- The audit company that the auditor worked for, including persons or entities that are related to the auditors and the audit company for the fiscal year of 2019 amounting to SGD 25,000, USD 27,000, EUR 226,000, and VND 482,000,000.

2. NON-AUDIT FEE

GC and its subsidiaries paid the non-audit fee for performing agreed-upon procedures in connection with the requirements of the Board of Investment (BOI), consulting and document certifying for participation in the Thailand's Private Sector Collective Action Coalition Against Corruption Program (CAC), filing tax returns, tax consulting services and other audits by agreed-upon procedures to:

- Deloitte Touche Tohmatsu Jaiyos Audit Co., Ltd., which is the auditor of GC and its subsidiaries for the fiscal year of 2019 for incomplete services in the fiscal year of 2019 that will be paid for a total of THB 2,940,000.
- The audit company that the auditor worked for, including persons or entities that are related to the auditors and the audit company for the fiscal year of 2019 amounting to THB 2,090,420 and USD 83,250 plus incomplete services in the fiscal year of 2019 that will be paid for a total of THB 1,166,790, and USD 23,750.

APPENDIX

COMPANY INFORMATION AND OTHER IMPORTANT INFORMATION

NAME	: PTT Global Chemical Public Company Limited
INITIAL	: PTTGC
WEBSITE	: www.pttgcgroup.com
REGISTERED NUMBER	: 0107554000267
NUMBER AND VALUE	: As at December 31, 2019, the Company's registered share capital was of Baht 45,088,491,170 comprising of 4,508,849,117 common shares at a par value of Baht 10 per share. Paid-up capital was Baht 45,088,491,170.
ESTABLISHMENT	: October 19, 2011
FIRST DAY TRADE ON THE SET	: October 21, 2011
BUSINESS STRUCTURE AND VALUE CHAIN	<ul style="list-style-type: none"> : Group Performance Center - Refinery & Shared Facilities : Group Performance Center - Aromatics : Group Performance Center - Olefins : Polymers Business Unit : EO-Based Performance Business Unit : Green Chemicals Business Unit : Phenol Business Unit : Performance Materials and Chemicals : Services & Others
NUMBER OF EMPLOYEES	: 6,925 as of December 31, 2019

CONTACT

INVESTOR RELATION DEPARTMENT

Tel: 66 (0) 2265-8400 EXT. 8665, 8637, 8513, 8364
Email: ir@pttgcgroup.com

CORPORATE GOVERNANCE DEPARTMENT

Tel: 66 (0) 2265-8645, 66 (0) 2140-8759
Email: cg@pttgcgroup.com

HEAD OFFICE

555/1 Energy Complex, Building A, 14th-18th Floor
Vibhavadi Rangsit Road, Chatuchak Sub-District,
Chatuchak District, Bangkok 10900
Tel: 66 (0) 2265-8400, Fax: 66 (0) 2265-8500

BRANCH 1: RAYONG OFFICE

59 Ratniyom Road, Noen-Phra Sub-District,
Muang Rayong District, Rayong Province 21150
Tel: 66 (0) 3899-4000, Fax: 66 (0) 3899-4111

BRANCH 2: OLEFINS I-1

14 I-1 Road, Map Ta Phut Industrial Estate,
Map Ta Phut Sub-District, Muang Rayong District,
Rayong Province 21150
Tel: 66 (0) 3899-4000, Fax: 66 (0) 3899-4111

BRANCH 3: OLEFINS I-4

9 I-4 Road, Map Ta Phut Industrial Estate,
Map Ta Phut Sub-District, Muang Rayong District,
Rayong Province 21150
Tel: 66 (0) 3899-4000, Fax: 66 (0) 3899-4111

BRANCH 4: AROMATICS I

4 I-2 Road, Map Ta Phut Industrial Estate,
Map Ta Phut Sub-District, Muang Rayong District,
Rayong Province 21150
Tel: 66 (0) 3897-1000, Fax: 66 (0) 3899-4111

BRANCH 5: AROMATICS II

98/9 Rayong Highway Road 3191, RIL Industrial Estate,
Map Ta Phut Sub-District, Muang Rayong District,
Rayong Province 21150
Tel: 66 (0) 3897-1000, Fax: 66 (0) 3899-4111

BRANCH 6: REFINERY

8 I-8 Road, Map Ta Phut Industrial Estate,
Map Ta Phut Sub-District, Muang Rayong District,
Rayong Province 21150
Tel: 66 (0) 3897-1000, Fax: 66 (0) 3899-4111

BRANCH 7: JETTY AND BUFFER TANK FARM

19 Rong-Pui Road, Map Ta Phut Industrial Estate,
Map Ta Phut Sub-District, Muang Rayong District,
Rayong Province 21150
Tel: 66 (0) 3899-4000, Fax: 66 (0) 3899-4111

CONTACT

BRANCH 8: AROMATICS TANK FARM

11 I-4 Road, Map Ta Phut Industrial Estate,
Map Ta Phut Sub-District, Muang Rayong District,
Rayong Province 21150
Tel: 66 (0) 3897-1000, Fax: 66 (0) 3899-4111

BRANCH 9: LABORATORY SERVICE CENTER

24/9 Pakorn Songkrorat Road, Map Ta Phut Sub-District,
Muang Rayong District, Rayong Province 21150
Tel: 66 (0) 3899-4000, Fax: 66 (0) 3899-4111

BRANCH 10: PTTGC 10

555/1 Energy Complex, Building A, 1st, 3rd, 10th Floor
Vibhavadi Rangsit Road, Chatuchak Sub-District,
Chatuchak District, Bangkok 10900
Tel: 66 (0) 2 265-8400, Fax: 66 (0) 2 265-8500

BRANCH 11: OLEFINS III

8 Padaeng Road, Map Ta Phut Sub-District,
Muang Rayong District, Rayong Province 21150
Tel: 66 (0) 3899-4000, Fax: 66 (0) 3897-6205

BRANCH 12: POLYETHYLENE

8 I-10 Road, Map Ta Phut Industrial Estate,
Map Ta Phut Sub-District, Muang Rayong District,
Rayong Province 21150
Tel: 66 (0) 3899-4000, Fax: 66 (0) 3897-6977

BRANCH 13: INNOPLUS SOLUTION CENTER

83/9-10 Moo 5, Tub-ma Sub-District,
Muang Rayong District, Rayong Province 21000
Tel: 66 (0) 3899-4526, Fax: 66 (0) 3899-4452

BRANCH 14: GC 14

32 Rong Pui Road, Map Ta Phut Sub-District,
Muang Rayong District, Rayong Province 21150
Tel: 66 (0) 3897-5000, Fax: 66 (0) 3899-4111

REFERENCES

SECURITIES REGISTRAR

Thailand Securities Depository Company Limited
93, 14th Floor, Rachadapisek Road, Dindaeng Sub-District,
Dindaeng District, Bangkok 10400
Tel: 66 (0) 2009-9999, Fax: 66 (0) 2009-9991
Website: www.set.or.th/tsd

US\$ BOND REGISTRAR

Citibank, N.A.
39th Floor, Citibank Tower,
Citibank Plaza, 3 Garden Road, Central, Hong Kong
Tel: +852 2868 7961, Fax: +852 2323 0279

REGISTRAR AND DEBENTURE HOLDERS REPRESENTATIVE

Bank of Ayudhya Public Company Limited*
1222 Rama III Road, Bang Phongphang Sub-District,
Yan Nawa District, Bangkok 10120
Tel: 66 (0) 2296-2030, 4808, 5557 Fax: 66 (0) 2683-1298
Website: www.krungsri.com

AUDITOR

1. Mr. Suphamit Techamontrikul, CPA No. 3356 or
2. Mr. Chavala Tienpasertkij, CPA No. 4301 or
3. Mr. Suwatchai Meakhaamnouychai, CPA No. 6638 or
4. Mr. Mongkol Somphol, CPA No. 8444

Deloitte Touche Tohmatsu Jaiyos Audit Company Limited

AIA Sathorn Tower, 23rd-27th Floor,
11/1 South Sathorn Road, Yannawa Sub-District,
Sathorn District, Bangkok 10120
Tel: 66 (0) 2034-0000, Fax: 66 (0) 2034-0100
Website: www.deloitte.com

REGISTRAR SERVICES

The Siam Commercial Bank Public Company Limited**
Financial Transactions and Securities Operations
G Tower, The Grand Rama 9, 15th Floor, North Wing,
9 Rama IX Road, Huai Khwang Sub-District,
Huai Khwang District, Bangkok 10310
Tel: 66 (0) 2128-2323 (2325, 2326, 2327, 2328, 2329)
Fax: 66 (0) 2128-4625

GLOBAL TRANSACTION SERVICES DIVISION CORPORATE TRUST

14th Floor, Zone A, 9 Ratchadapisek Road,
Chatuchak Sub-District, Chatuchak District Bangkok 10900
Tel: 66 (0) 2544-2923, Fax: 66 (0) 2544-7475
Website: www.scb.co.th

LEGAL ADVISOR

Baker & McKenzie Limited

5th and 21st-25th Floor, Abdulrahim Place,
990 Rama IV Road, Silom Sub-District,
Bangrak District, Bangkok 10500
Tel: 66 (0) 2636-2000 Fax: 66 (0) 2636-2111
Website: www.bakermckenzie.com

Domnern Somgiat & Boonma Law Office Limited

719 Si Phya Road, Bangrak Sub-District,
Bangrak District Bangkok 10500
Tel: 66 (0) 2639-1955, Fax: 66 (0) 2639-1956-8
Website: www.dsb.co.th

Remarks:

* Bank of Ayudhya Public Company Limited acts as the debenture holders' representative for the Company's debentures, namely PTTGC196A (The maturity date of this debenture is June 19, 2019) PTTGC218A, PTTGC218B, PTTGC248A, PTTGC249A, PTTGC269A and PTTGC299A.

Bank of Ayudhya Public Company Limited acts as the registrar and paying agent for the Company's debentures, namely PTTGC218A, PTTGC218B, PTTGC248A, PTTGC249A, PTTGC269A and PTTGC299A.

** The Siam Commercial Bank Public Company Limited acts as the registrar and paying agent for the Company's debenture, namely PTTGC196A (The maturity date of this debenture is June 19, 2019).

OTHER IMPORTANT INFORMATION

(1) In 2019, GC issued and offered debt instruments No. 1/2562, worth Baht 10,000 million, to the public as detailed below:

Objective	Estimated Budget (Baht)	Estimated Budget Duration	Detail
1. To repay loans or debts resulting from debt instrument issuance	4,298,000,000	Within 2019	<p>The debenture issuer will use the money derived from the issuance and offering of debentures to repay the following items.</p> <ol style="list-style-type: none"> Long-term loans from Krung Thai Bank Public Company Limited, representing the managing group for the distribution of these debentures. <ul style="list-style-type: none"> Total loans: Baht 3,653,400,000 Interest rate: 3.35-4.60% To be repaid in installments within 2019 Loans from other financial institutions unrelated to the manager of debenture distribution, worth Baht 644,600,000.
2. Other purposes, including business working capital	5,702,000,000	Within 2019	<p>The debenture issuer will use the money derived from the issuance and offering of debentures in its general business or business growth, or both.</p>

(2) The above-mentioned debt instruments are subject to the enforcement and interpretation of Thai laws.

TECHNICAL TERMS AND ABBREVIATIONS

TECHNICAL TERMS & ABBREVIATIONS	
Acrylonitrile (AN)	AN, an intermediate product, is used for many applications such as acrylic fiber, automotive parts, and electric appliance parts.
Aromatics	A group of cyclic hydrocarbons containing one or more benzene rings of six carbon atoms characterized by single and double bonds, such as benzene, toluene, and xylene.
Bio-based Polybutylene Succinate (Bio-PBS)	Bio-PBS, a natural material made from bio-succinic acid and 1, 4-butanediol, used in applications such as paper coating, compound injection, and packaging.
Bisphenol A (BPA)	BPA, an intermediate product produced from acetone and phenol, is used to produce polycarbonate or epoxy resins.
Butadiene	Butadiene, derived from the extraction of mixed-C4, is used in making synthetic rubber.
Butene-1	Butene-1, a byproduct of the cracking of petroleum (kerosene or gasoil) and naphtha distillation, or extraction of mixed-C4, is used as polymer feedstock.
Carotenoid	Carotenoid, a natural substance found in plants, vegetables, fruits, and microbes, consists of the carotene group and xantho group. Carotene, such as beta carotene and lycopene, is fats-soluble, whereas xantho is less fats-soluble.
EO-Based Performance Product	EO-based refers to ethylene oxide derivatives such as ethylene oxide, ethylene glycol, ethanolamine products, and ethoxylate.
Ethanolamine (EA)	EA, obtained from the reaction between ethylene oxide and ammonia, is used in hair conditioner, fabric softener, cosmetics, and pharmaceuticals.
Ethoxylate	Ethoxylate, produced from ethylene oxide, is used as a surfactant in soap and detergent.
Ethylene	Ethylene, obtained from ethane, LPG, or naphtha, is feedstock for polyethylene, vinyl chloride monomer, styrene monomer, and ethylene oxide.
Ethylene Glycol (EG)	EG is synthesized from ethylene oxide reacting with water, producing mono ethylene glycol, diethylene glycol, triethylene glycol, and polyethylene glycol.
Ethylene Oxide (EO)	EO, obtained from the reaction between ethylene and oxygen, is a chemical intermediate of ethylene glycol, ethanolamine, and ethoxylate, and others.
Fatty Alcohol	Fatty alcohol, produced from methyl ester and hydrogen through hydrogenation, is used in personal care products.
Glycerin	Glycerin, a byproduct of methyl ester production, is used in pharmaceuticals, food, and personal care products.
Hexamethylene Diisocyanate (HDI)	HDI, obtained from the reaction between hexamethylenediamine and phosgene, is used in polyurethane production.

TECHNICAL TERMS & ABBREVIATIONS

High Density Polyethylene (HDPE)	Produced from ethylene monomers, HDPE is a very dense and crystallized thermoplastic used for containers, including plastic bags, bottles, fuel containers, tanks, and cartons.
Hydrocracking	Hydrocracking is a process of breaking up hydrocarbon molecules by breaking up carbon-carbon bonds with the use of hydrogen and catalysts.
Linear Low Density Polyethylene (LLDPE)	LLDPE, a branched thermoplastic with 65-80% crystallization and a byproduct produced from chemical reaction between ethylene and butene -1, is found in film and containers.
Low Density Polyethylene (LDPE)	LDPE is a branched type of thermoplastic with 65-75% crystallization. Obtained from chemical reaction of ethylene monomer coalescing, it is found in film and containers.
Methyl Amines	Methylamine, derived from methanol and ammonia, is found in shampoo, hair conditioner, fabric softener, cosmetics, and pharmaceuticals.
Methyl Ester	Methyl ester is derived from the reaction between crude plant/vegetable oil or animal fats and alcohols under transesterification, and it is known as biodiesel.
Methyl Methacrylate (MMA)	MMA is an intermediate product for polymethyl methacrylate (PMMA) used for LCD screen light guide panels, automotive parts, and billboards.
Mixed C4	Mixed C4, the byproducts produced from naphtha crackers for olefins production, can be isolated into butadiene, butane-1, and isobutene, and others.
Mixed Xylenes	Aromatics derived from naphtha undergoing a chemical reaction aided by catalysts. They consist of paraxylene, orthoxylene, and metaxylene, all capable of serving as reactants for higher-value aromatics and as industry solvents.
Mono Ethylene Glycol (MEG)	MEG, derived from the oxidation of ethylene produced by the reaction of ethylene oxide and water, can serve as an automobile antifreeze agent or a reactant with pure terephthalic acid to produce polyester, clear drinking-water bottles, film, and fiber.
Naphtha	Naphtha is a general term for low-boiling hydrocarbon fractions that is a product of crude oil refining or a condensate splitter. It serves as petrochemical feedstock and as a solvent.
Olefins	Olefins are unsaturated hydrocarbons with at least one carbon-carbon bond. The main olefins include ethylene, propylene, and butadiene.
Oleochemicals	Oleochemicals are natural chemicals derived from plant fats and animal fats, such as fatty alcohols, methyl ester, and glycerin.
O-Xylene or Orthoxylene (OX)	This aromatic compound with two methyl groups in the 1- and 2-positions of the benzene ring is used to produce phthalic anhydride, feedstock for plasticizers
O-Xylene or Orthoxylene (OX)	This aromatic compound with two methyl groups in the 1- and 2-positions of the benzene ring is used to produce phthalic anhydride, feedstock for plasticizers

TECHNICAL TERMS & ABBREVIATIONS

Polymers	Chemicals with molecular weights of 5,000 or more, derived when certain individual monomers come together and link up. Examples are polyethylene, rubber, and cellulose.
Polypropylene	Polypropylene, a thermoplastic polymer derived from the reaction between propylene and catalysts, is used in containers, textiles, and injected plastics.
Polyethylene Terephthalate (PET)	PET is made by combining mono ethylene glycol and pure terephthalic acid. PET and mono ethylene glycol serve as feedstock for synthetic fiber, water bottles, audiotapes, adhesive tapes, film, food packaging, and others.
Polyurethane (PU)	PU, a thermoplastic resulting from glycol and diisocyanate condensation, can be stiff, soft, or flexible, depending on the additives used. When blended with rubber, it provides shoe soles, heat insulators, windshield wipers, and others.
Polyvinyl Chloride (PVC)	PVC is a thermoplastic polymer produced from vinyl chloride monomers (VCM), and consists of unplasticized and plasticized PVC. It is used in water pipes, electric wire conduits, artificial leather, among others.
Propylene	Propylene is an unsaturated hydrocarbon derived from propane, LPG, or naphtha. This feedstock of polypropylene is of three grades: refinery, chemical, and polymer, depending on the proportions of propylene and propane.
Purified Terephthalic Acid (PTA)	PTA is a hydrocarbon compound resulting from paraxylene and is feedstock for polyester production.
P-xylene or Paraxylene (PX)	PX, feedstock for PTA, is an aromatic hydrocarbon with two methyl groups in the 1- and 4-positions of the benzene ring.
Pyrolysis Gasoline	Pyrolysis gasoline, a byproduct of naphtha distillation, can be blended with gasoline or used as feedstock for aromatics.
Rotomolding Compound	Rotomolding Compound, a byproduct produced from low-density Polyethylene (LLDPE), is plastic powders which are processed through rotational moulding machine at suitable temperature. It is used to manufacture some products such as water tanks, chemical storage tanks, playground, kayaks and other common products.
Toluene	Toluene, an aromatic hydrocarbon with one methyl group connected to the benzene ring, is feedstock for higher-valued aromatics, including benzene and xylene. It is used as a solvent in paints, adhesives, lacquer, thinner, and others.
Toluene Diisocyanate	This chemical derived from the reaction between toluene diamine and phosgene is used for polyurethane production.
Vinyl Chloride Monomer (VCM)	VCM is a hydrocarbon compound used as feedstock for PVC production. It is a colorless, sweet-smelling gas.



1,500 hardcopies (both Thai and English versions) of PTT Global Chemical Public Company Limited's Annual Report 2019 were certified with the carbon footprint label with the total emission amount of 4.06 kg CO₂e/report.

GC achieved zero greenhouse gas emission from carbon offsetting project compensation, resulting in Thailand

Greenhouse Gas Management Organization (Public Organization) (TGO) Carbon neutral certification.

This is part of GC's efforts to demonstrate our responsibility to the society and the environment.



Please scan QR Code
to view Annual Report 2019



PTT Global Chemical Public Company Limited

555/1 Energy Complex, Building A, 14th-18th Floor,
Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900 Thailand.
Tel : 66 (0) 2265-8400 Fax : 66 (0) 2265-8500

www.pttggroup.com