



MANAGEMENT DISCUSSION & ANALYSIS 4Q2022 & YE2022

Management's Discussion and Analysis (MD&A) and operating result for the fourth quarter of 2022 and year ended December 31, 2022

Executive Summary

Unit : Million Baht	4Q2021	3Q2022	4Q2022	%Inc. (Dec.)		2021	2022	% Inc. (Dec.)
				YoY	QoQ			
Sales Revenue	688,837	884,610	797,174	15.7%	(9.9%)	2,258,818	3,367,203	49.1%
EBITDA	101,271	92,277	73,542	(27.4%)	(20.3%)	427,956	491,288	14.8%
Net Profit	27,544	8,884	17,872	(35.1%)	>100%	108,363	91,175	(15.9%)
Earnings per share (Baht/share)	0.97	0.31	0.63	(35.1%)	>100%	3.79	3.20	(15.6%)
Average Dubai Price (US\$/barrel)	78.3	96.9	84.8	8.3%	(12.5%)	69.2	96.3	39.2%

For the fourth quarter of 2022 (4Q2022), Earnings before Interest, Tax, Depreciation and Amortization (EBITDA) of PTT and its subsidiaries was reported at Baht 73,542 million, decreased by Baht 27,729 million or 27.4 % from the fourth quarter of 2021 (4Q2021) at Baht 101,271 million. This was mainly from Petrochemical and Refining business mainly from increasing in PTT Group's stock loss approximately Baht 25,000 million. Furthermore, Refining business's performance decreased due to lower sales volume despite increasing in Market Gross Refining Margin (GRM) from the rising in spread of diesel and aviation fuel to crude oil. Moreover, Petrochemical business's performance also decreased from lower sales volume together with lower in most of petrochemical spreads. International Trading business's performance decreased as a result of lower product spreads of domestic condensate and refined products. In addition, Gas business's performance decreased from lower gross profit of Gas Separation Plant business (GSP) due to higher gas cost following the increase of gulf gas price as well as lower overall average selling price and sales volume. Loss from NGV business's performance increased along with higher gas cost owing to higher pool gas price and the incremental cost from the Energy Pool Price (EPP) policy. Moreover, Oil and Retail business's performance also decreased primarily from drop in overall average gross margin per liter mainly from diesel and gasoline following the increased cost from products import during the main domestic oil refinery turnaround period. However, Exploration and Production business's performance rose from the increase in both of average sales volume and average selling price. Net income of PTT and its subsidiaries in 4Q2022 was Baht 17,872 million, decreased by Baht 9,672 million or 35.1% from the 4Q2021 at Baht 27,544 million in line with the decreased EBITDA as well as the increased depreciation and amortization expenses despite an increase in gain on foreign exchange rate. In 4Q2022, there were loss recognition of non-recurring items (PTT's portion) after tax approximately by Baht 7,700 million mainly from PTT Exploration and Production Public Company Limited (PTTEP)'s impairment loss on Mozambique Area 1 Project approximately by Baht 4,300 million, and the provision for the class action settlement from Montara incident approximately by Baht 3,000 million. Meanwhile, in 4Q2021 there were loss recognition approximately of Baht 6,900 million mainly from impairment loss on Mozambique Area 1 Project approximately by Baht 3,600 million, and impairment loss on NGV business approximately by Baht 3,500 million.

For the 4Q2022, EBITDA of PTT and its subsidiaries was reported at Baht 73,542 million, decreased by Baht 18,735 million or 20.3% from the third quarter of 2022 (3Q2022) at Baht 92,277 million. This was mainly from the decrease in the performance of International Trading business from lower margin per unit of crude oil and refined products following

the downward trend of global oil price and recognition of inventory loss from Mark to Market. **New Business and Infrastructure's** performance dropped due to the decrease in gross profit of PTT Global Management Company Limited (PTTGM) owing to lower revenue from pharmaceutical business and Global Power Synergy Public Company Limited (GPSC) from lower Small Power Producer (SPP) power plants' gross profit because of higher fuel costs. **Petrochemical and Refining business's** performance also decreased. Petrochemical business's performance decreased from lower petrochemical spreads, together with lower sales volume. Moreover, the performance of Refining business dropped due to lower sales volume despite increasing in Market GRM mainly from higher spread of diesel and aviation fuel to crude oil, as well as lower crude premium. However, PTT Group's stock loss decreased approximately Baht 7,500 million. Moreover, **Gas business's** performance increased primarily from Supply and Marketing business (S&M) and NGV business due to the decreased in natural gas cost following the decrease of pool gas price. **Net income of PTT and its subsidiaries in 4Q2022 was Baht 17,872 million, increased by Baht 8,988 million or over 100.0% from the 3Q2022 at Baht 8,884 million.** Although there were lower EBITDA and higher loss on derivatives, gain on foreign exchange increased significantly in this quarter. Moreover, in 4Q2022, there were loss recognition of non-recurring items (PTT's portion) after tax approximately by Baht 7,700 million as aforementioned. Meanwhile, in 3Q2022 there were loss recognition approximately of Baht 2,000 million mainly from impairment loss on assets held for sales from PTTEP's Brazil Investments in Oil and Gas Exploration and Production Limitada (PTTEP BL) approximately by Baht 2,300 million.

For the year 2022, EBITDA of PTT and its subsidiaries was reported at Baht 491,288 million, increased by Baht 63,332 million or 14.8% from 2021 at Baht 427,956 million. This was mainly from the increase of **Exploration and Production business's** performance from higher average selling price and average sales volume. In addition, performance of **Coal business** increased due to higher average selling price. However, **Gas business's** performance decreased from higher gas cost owing to higher pool gas price. **Petrochemical and Refining business's** performance decreased mainly from petrochemical business due to lower most of petrochemical product spreads. Meanwhile, Refining business's performance improved as Market GRM increased due to the increase in overall product spreads, while PTT Group's stock gain decreased following the decrease in crude oil price in the second half of 2022. **Net income of PTT and its subsidiaries in 2022 was Baht 91,175 million, decreased by Baht 17,188 million or 15.9% from 2021 at Baht 108,363 million.** Although EBITDA was improved, in 2022, there were higher loss on derivatives, finance costs, depreciation and amortization expenses, as well as the loss from non-recurring items (PTT's portion after tax) amounting to Baht 10,200 million mainly from PTTEP's impairment loss on Mozambique Area 1 Project approximately by Baht 4,300 million, the provision for the class action settlement from Montara incident approximately by Baht 3,000 million, impairment loss on assets held for sales from PTTEP BL approximately by Baht 2,300 million, as well as PTT's contribution to oil fund during energy crisis of Baht 3,000 million offset with discounted benefit from production shortfall approximately Baht 3,400 million. Meanwhile, in 2021, there was the loss amounting to Baht 6,900 million mainly from impairment loss on Mozambique Area 1 Project approximately by Baht 3,600 million, and impairment loss on NGV business approximately by Baht 3,500 million.

As of 31 December 2022, PTT and its subsidiaries had the total assets amounting to Baht 3,415,632 million, increased by Baht 344,248 million or 11.2% from 31 December 2021 which had total asset amounting to Baht 3,071,384 million mainly from increasing in current assets especially inventories and trade accounts receivables due to higher average selling price following market price. Property, Plant, and Equipment (PPE) increased mainly from PTTEP's exploration and evaluation assets of G1/61 Project and G2/61 Project and Thai Oil Public Company Limited (TOP)'s additional construction in progress of Clean Fuel Project (CFP). Moreover, other non-current assets increased mainly from right-of-use assets of G1/61 Project and G2/61 Project as well as goodwill and intangible assets from the acquisition of PTTGM's pharmaceutical business. Whereas, the total liabilities were reported at Baht 1,881,939 million, increased by Baht 283,495 million or 17.7% from 31 December 2021 as the increased in short-term and long-term loans mainly from PTT Global Chemical Public Company Limited (GC), PTT, and TOP. Moreover, the total shareholders' equity as of 31 December 2022 was Baht 1,533,693 million, increased by Baht 60,753 million or 4.1% from the increase in PTT and its subsidiaries' net income of 2022 offset with dividend payment from the operating results of the second half of 2021 and the first half of 2022.

Economic Overview in the Fourth Quarter of 2022

The world economy in 4Q2022 expanded at a slower pace from 3Q2022, following a slowdown in major economies, namely the U.S., Euro Area, and China, as a result of the continuing monetary policy tightening of major central banks to tame the remaining above-target inflation rate, including the Federal Reserves (The Fed) at its December 2022 meeting raised its federal funds rate for the seventh time in 2022 to the highest level in 15 years, at a range of 4.25% to 4.50%, European energy crisis due to the prolonged Russia-Ukraine conflict, and frequent lockdowns under Zero-COVID policy and the worsening property market crisis in China. In this regard, the International Monetary Fund (IMF) in January 2023 revised up its global growth forecast for 2022 to 3.4% from its previous forecast of 3.2% in October 2022.

Global oil demand in 4Q2022, according to S&P Global report of January 2023, was averaged at 100.4 million barrels per day (MMBD), decreasing from 3Q2022 at 101.7 MMBD following economic growth slowdown, and higher new COVID-19 cases in China, where the Zero-COVID policy was active. When comparing to 4Q2021 at 100.3 MMBD, global oil demand slightly increased following the economic growth, though frequent lockdown in China to control spreading of COVID-19 pressured the oil demand.

Unit: US\$/barrel	4Q2021	3Q2022	4Q2022	% Inc. (Dec.)		2021	2022	% Inc. (Dec.)
				YoY	QoQ			
Average Dubai Crude Oil Price	78.3	96.9	84.8	8.3%	(12.5%)	69.2	96.3	39.2%
Gasoline Crack Spread	15.4	13.2	9.4	(39.0%)	(28.8%)	11.0	18.8	70.9%
Diesel Crack Spread	11.4	35.2	39.3	>100.0%	11.6%	6.7	39.3	>100.0%
FO Crack Spread (180 – 3.5%S)	(6.9)	(22.3)	(22.5)	<(100.0%)	(0.9%)	(4.9)	(14.1)	<(100.0%)
GRM-Singapore Crack	6.1	7.1	6.3	3.3%	(11.3%)	3.4	10.7	>100.0%

Dubai crude oil price in 4Q2022 was averaged at US\$ 84.8 per barrel, decreasing from 3Q2022 at US\$ 96.9 per barrel due to subdued demand from concerns about economic recession. In the meantime, continuously increasing supply from non-OPEC led to oversupply condition, even with effort from OPEC+ to lower production quota to balance with the demand. However, higher Dubai crude oil price when comparing to 4Q2021 at US\$ 78.3 per barrel was from geopolitical risks between Russia and Ukraine causing oil price to stay at high level.

Petroleum product prices at Singapore spot market

- **Gasoline crack spread** in 4Q2022 was averaged at US\$9.4 per barrel, decreasing from 3Q2022 at US\$ 13.2 per barrel and 4Q2021 at US\$ 15.4 per barrel. This was mainly due to more supply from improved refinery's utilization rate, more export supply from China due to higher allowance of refining product export while domestic demand was still not recovered from its Zero-COVID policy, and higher-than-expected inventory buildup in the U.S. pressured the crack spread.
- **Diesel crack spread** in 4Q2022 was averaged at US\$ 39.3 per barrel, increasing from 3Q2022 at US\$ 35.2 per barrel and 4Q2021 at US\$11.4 per barrel. This was due to market concerns of crude oil supply disruption

from Russia, after the EU sanctioned Russian petroleum products to be effective in February 2023 and continuously strained diesel inventory supported the crack spread.

- **High-Sulfur Fuel Oil 3.5% crack spread (HSFO)** in 4Q2022 was averaged at US\$ -22.5 per barrel, decreasing from 3Q2022 at US\$ -22.3 per barrel and 4Q2021 at US\$ -6.9 per barrel. The bearish factors were the higher Russian and Middle East exports to Asia, and higher supply amid strong refinery's utilization rate.

Singapore Gross Refining margin (GRM) in 4Q2022 was averaged at US\$6.3 per barrel, decreasing from 3Q2022 at US\$ 7.1 per barrel amid market concerns on demand growth slowdown, while there was higher refinery runs and higher Chinese products exports. However, higher Singapore GRM comparing to 4Q2021 at US\$ 6.1 per barrel was from geopolitical concerns amid tension situation between Russia and Ukraine, and low inventory reserves of each product.

Unit: US\$/Ton	4Q2021	3Q2022	4Q2022	% Inc. (Dec.)		2021	2022	% Inc. (Dec.)
				YoY	QoQ			
HDPE: CFR SEA	1,252	1,104	1,033	(17.5%)	(6.4%)	1,181	1,203	1.9%
PP: CFR SEA - Film	1,335	1,088	995	(25.5%)	(8.5%)	1,321	1,206	(8.7%)
BZ: FOB Korea	945	978	824	(12.8%)	(15.7%)	914	1,028	12.5%
BZ - Naphtha	200	264	151	(24.5%)	(42.8%)	268	243	(9.3%)
PX: CFR Taiwan	893	1,088	979	9.6%	(10.0%)	859	1,103	28.4%
PX - Naphtha	148	374	306	>100.0%	(18.2%)	213	318	49.3%
Naphtha (MOPJ)	745	714	673	(9.7%)	(5.7%)	646	785	21.5%

Petrochemical prices of Olefins and Aromatics in 4Q2022 decreased from 3Q2022, which was pressured from weak finished products demand, and a decrease in crude oil and naphtha prices.

- **Olefins: High density polyethylene (HDPE) and polypropylene (PP) prices** fell from 3Q2022, due to weak finished products demand amid gloomy global economic outlook, continued lockdowns in some areas in China at the beginning of 4Q2022, credit tightening of commercial banks, and lower-than-expected demand during a traditional peak season at the end of the year. In addition, the weak demand from Europe and India had prompted more suppliers to redirect sales shipments to Asia continuously. However, Olefins prices were partially supported by a surge of demand for PP non-woven masks and medical devices amid rising COVID-19 cases in China as well as postponing new petrochemical plants start-up in Asia to the beginning of 2023.
- **Aromatics: Benzene (BZ) price, Paraxylene (PX) price, PX spread over naphtha, and BZ spread over naphtha** decreased from 3Q2022, following the decline in crude oil and naphtha prices, including a

market's excess supply, together with a slowdown in downstream market both inside and outside region regarding squeezed margins and sluggish final demand.

Comparing with 4Q2021, most of petrochemical prices of Olefins and Aromatics in 4Q2022 decreased, following the decline in crude oil and naphtha prices, amid market concerns over the risk of global recession. Meanwhile, PX price and PX spread over naphtha increased, supported by an increase in demand for gasoline blending, which significantly generates higher margins.

Thai economy in 4Q2022 continued to improve from 3Q2022, as tourism sector recovered significantly amid high season demand and further relaxation of travel restrictions in many countries, including Hong Kong, Taiwan, and Japan have fully reopened its borders, while China has gradually eased travel measures by reducing its duration of quarantine on arrival, etc. Additionally, private consumption and private investment continued to expand following the resumption of economic activities after the COVID-19 was downgraded to an endemic disease. Meanwhile, merchandise exports grew at a slower rate amid lower trading partner's economic growth and government spending became more selected due to less room for fiscal policy support. The Fiscal Policy Office (FPO) in January 2023 revised down its Thai economic forecast for 2022 to 3.0% from its previous forecast of 3.4% in October 2022.



Non-recurring Items in 2022 until Present

Summary of non-recurring items in 2022 until present are as follows:

January 2022

- PTT: On 1 January, to support Thai people on energy prices, PTT has extended the cap of NGV retail price from 1 January to 15 March 2022. For the taxi in Bangkok Metropolitan Area the retail price has capped at 13.62 Baht/kg and the NGV retail price for general cars has capped at 15.59 Baht/kg as well as extended the cap of retail prices for taxi to the end of 15 March 2023 including adjusting the NGV retail price for general car users to 17.59 Baht/kg. Also, PTT has extended the period of LPG's discount for low-income household who sell food or operate food stalls through the State Welfare Card by Baht 100 per person per month until 31 March 2023.
- PTT & GPSC: On 11 January, Board of Directors of Arun Plus Company Limited (Arun Plus), the wholly owned subsidiary of PTT, approved the establishment of Nuovo Plus Company Limited (Nuovo Plus), a joint venture company with GPSC with the registered capital of Baht 4,200 million and an initial paid-up capital of Baht 1,050 million. Arun Plus and GPSC hold 51% and 49% of the shares in Nuovo Plus, respectively. The objectives of the company establishment are to study the possibility of the investments in the battery value chain in order to support the electric vehicle industry in accordance with Thailand's automotive industry policy to promote electric vehicles, energy storage system (for the storage of electricity from renewable sources), as well as the investment in the related businesses. On 28 February 2022, Board of Directors of Nuovo Plus approved the acquisitions of battery related assets from PTT Group companies with the total amount of not exceed Baht 2,900 million. The battery related assets consist of:
 1. The assets, expenses, contracts, and other agreements related to the battery plant with the initial capacity of 30 MWh per year in Map Ta Phut Industrial Estate, Rayong province from GPSC
 2. 100% of the ordinary shares of GPSC-SG Holding Company, Singapore (the subsidiary of GPSC) that holds 11.1 percent in Anhui Axxiva New Energy Technology Co., Ltd, China, which operates a battery plant with the capacity of 1 GWh per year, and also any relevant contracts and other agreements from GPSC
 3. The battery development under VISESS project of PTT and Alpha Com Company Limited (Alpha Com) (PTT's wholly owned subsidiary)

February 2022

- PTT: On 3 February, Arun Plus completed the establishment of Horizon Plus Company Limited (Horizon Plus) according to the Arun Plus's Board of Directors that approved the establishment of a joint venture company with Lin Yin International Investments Company Limited (Lin Yin) (the wholly owned affiliate of Hon Hai Precision Industry Company Limited (Foxconn)) to operate the electric vehicle manufacturing business. Horizon Plus had the registered capital

not in excess of Baht 3,220 million, which Arun Plus and Lin Yin hold 60% and 40% stakes respectively. Horizon Plus expects to start its commercial operation within the first quarter of 2024.

- **GPSC:** On 7 February, GPSC has entered into the Sales Agreement for the divestment of all shares in Ichinoseki Solar Power 1 GK or ISP1, which GPSC holds 100 % stake in ISP1, to CES Iwate Taiyoko Hatsudensho GK for the total value of approximately JPY 3,860 million, or approximately Baht 1,119 million. Such transaction is part of asset management in alignment with GPSC's strategy to expand its total capacity from green portfolio in target countries.
- **PTT & TOP:** On 17 February, PTT's and TOP's Board of Directors approved the shareholding restructure of PTT Group's power business by the sale the ordinary shares of GPSC from TOP with a par value of Baht 10 per share to PTT and/or Siam Management Holding Co., Ltd. (SMH), the wholly owned subsidiary of PTT, in the aggregate amount of 304,098,630 shares, representing approximately 10.78% of the total issued and paid-up shares of GPSC, totaling approximately Baht 22,351 million, which is the price before deduction of GPSC's dividends after December 31, 2021 and before the share transfer date (if any). TOP will derive the proceeds to repay the loan to PTT and commercial banks for financial assistance in the form of bridging loan to finance the TOP's investment in PT Chandra Asri Petrochemical Tbk. Consequently, after the Restructuring Transaction, PTT and SMH will own 55.23% and TOP will own 10.00% of GPSC's total paid-up capital. SMH and PTT have completed the purchase of GPSC's ordinary shares from TOP on 7 June 2022.
- **TOP:** On 17 February, the Board of Directors has approved an increase in TOP's registered capital in the amount of Baht 2,751,200,000 from Baht 20,400,278,730 to Baht 23,151,478,730 through the issuance up to 275,120,000 of newly issued ordinary shares with a par value of Baht 10 per share. Such increase in the TOP's registered capital is for the fund raising as part of TOP's long-term financial restructuring, the offering structure of TOP shall be as follows:
 - (1) TOP will issue up to 239,235,000 new ordinary shares with a par value of Baht 10 per share for public offering, including issuance and offering to existing shareholders in proportion to their shareholding.
 - (2) Over-Allotment, where the underwriter of TOP may consider to allocate the shares of TOP in the amount up to 35,885,000 shares, with the par value of Baht 10 in case there are subscribers subscribing for the newly issued shares of TOP in excess of the amount to be offered in (1). PTT will be the shares lender to deliver to the subscribers. The period to return shares to PTT was ended on 21 October 2022. After TOP has already increased in registered capital, the shares held by PTT is totaling 1,005,920,239 shares or equivalent to 45% of TOP's total outstanding ordinary shares.

Consequently, 19 August 2022 is the record date for the shareholders who are entitled to allocation rights of newly issued ordinary shares.

March 2022

- **PTTEP:** On 1 March, PTTEP MENA Limited, a subsidiary of PTTEP, has completed the conditions precedent in Farm-in/Farm-out Agreement to acquire 25% stake in the Concession Area C onshore the Emirate of Sharjah from Eni Sharjah B.V. , it is an onshore gas and condensate concession block, situated in the central part of Sharjah Emirate.
- **PTTEP:** On 14 March, PTTEP International Limited (PTTEPI), a wholly-owned subsidiary of PTTEP and a partner in the Yadana Project in Myanmar, will be the operator of Yadana Project after the withdrawal announcement of TotalEnergies EP Myanmar (TotalEnergies) as the operator and the partner from Yadana Project on 21 January 2022. The change was approved by the Project's partners and has been effective from 20 July 2022 onwards. Following the withdrawal of TotalEnergies, the consortium of Yadana project consists of Unocal Myanmar Offshore Company Limited (a wholly-owned subsidiary of Chevron) 41.1016% participating interest, PTTEPI (as the Operator) 37.0842% participating interest, and Myanmar Oil and Gas Enterprise (MOGE) 21.8142% participating interest. Yadana Project is a significant natural gas field with an average gas sales volume of 770 MMSCFD, which supply gas to generate electricity, accounting for 11% of Thailand's natural gas consumption and 50% of total gas supply to Myanmar people. Decision to becoming the operator of Yadana Project is to ascertain gas supply continuity to support energy consumption and long-term energy security.
- **PTTEP:** On 23 March, PTTEP HK Offshore Limited (PTTEP HKO), a wholly-owned subsidiary of PTTEP Group, and SapuraOMV Upstream (Sarawak) Inc. are awarded the exploration Block SB412, which is located offshore of Sabah, Malaysia. The consortium has signed a Production Sharing Contract (PSC) with Petroliam Nasional Berhad (PETRONAS), with the participation interests for PTTEP HKO at 60% (the operator) and SapuraOMV at 40%.
- **PTTEP:** On 31 March, PTTEP has dissolved an inactive subsidiary, namely PTTEP Sadang Limited, effective on 31 March 2022 in order to minimize administrative costs. This has no impact to PTTEP's operations.

April 2022

- **PTT:** On 1 April, the Energy Regulatory Commission (ERC) announced criteria for calculating Energy Pool Price (EPP), which is the weighted average prices of energy used to generate power, including PTT's pool gas, New Shipper's liquefied natural gas (LNG), diesel, fuel oil, LPG and other fuels as specified by the ERC in order to average the cost of natural gas prices in the Pool Gas to calculate EPP price. EGAT which is the clearing house is responsible for gathering data from relevant sectors to calculate the EPP gas price and submit EPP to PTT for determining gas cost for PTT's all customers. The purposes of the change are to reduce power producer's burden of higher gas cost. EPP is effective from 1 April 2022 and implemented on 1 May 2022 onwards.
- **PTTEP:** On 1 April, PTTEP has dissolved an inactive subsidiary, namely Partex Services Portugal – Serviços para a Indústria Petrolífera, S.A. (PSP), effective on 1 April 2022 in order to

improve operational efficiency and minimize administrative costs. This has no impact to PTTEP's operations.

- PTT: On 7 April, Innobic (Asia) Company Limited (Innobic) (a wholly owned subsidiary of PTT), has completed the cooperative investment with Aztq HK Limited, the affiliate of Aztq Investment Group to acquire all stakes in Alvogen Emerging Markets Holdings Limited, a major shareholder of Lotus Pharmaceutical Company Limited (Lotus) and also holds 100% stake in Alvogen Malta (Out-Licensing) Holding Limited who owns 100% of the company so called Adalvo Limited (Adalvo), B2B pharmaceutical company with the massive global network. Consequently, Innobic will then has an indirect shareholding in Lotus of approximately 37% of the total issued capital and 60% of the total issued capital in Adalvo. The objective for the investment is to align with PTT's New S-curve strategy in expanding into new business especially in Life Science area. Lotus is a fully integrated pharmaceutical company that focuses on research and development, manufacturing, and distribution of Generic drugs that cover therapeutic areas especially oncology and central nervous system.
- PTT: On 8 April, the annual general meeting of shareholders approved the dividend payment from 2021 performance which will be paid at Baht 2.00 per share to the shareholders of totaling 28,562,996,250 shares in an approximated amount of Baht 28,563 million. The dividend payments are divided into the interim dividend payment from the first half of 2021 performance which PTT already paid to shareholders at Baht 1.20 per share on 15 October 2021. PTT also paid the dividend from the second half of 2021 performance at Baht 0.80 per share which already paid on 29 April 2022.
- PTT: On 8 April, PTT has issued unsubordinated and unsecured debentures No. 1/2022 for the total amount of Baht 20,000 million with the tenor of 3-12 years and the interest rate of 1.79% - 3.47% per annum to the institutional investors and/or high net worth investors (excluding individuals). The debentures are issued under Baht 130,000 million Medium - Term Note Program (MTN Program) which was approved by the Securities and Exchange Commission of Thailand.
- PTT & PTTEP: On 20 April, PTT, as buyer, and PTTEP Energy Development Company Limited (PTTEP ED) (a wholly owned subsidiary of PTTEP), operator of G1/61 and G2/61 Project, together with Department of Mineral Fuels as sellers, have completely entered into Gas Sale Agreement, Condensate Sale Agreement, and Crude Sale Agreement. PTTEP ED will become an operator under a Production Sharing Contract of both projects from 24 April 2022 onwards. PTTEP ED has also reached an agreement with MP G2 (Thailand) Limited, a subsidiary of Mubadala Petroleum (Thailand) Holdings Limited (Mubadala), for PTTEP ED to be a sole investment operator of G1/61 and shall recognize all revenues and costs from the petroleum produced with effective date from 1 December 2021.

- **OR:** On 27 April, OR's Board of Directors has resolved to approve PTT (Cambodia) Limited (PTTCL) (OR's wholly-owned subsidiary) to establish 2 subsidiaries registered in Cambodia, with an investment value not exceeding US\$ 1 million. The objective of this investment is to enhance capability to compete and provide stability for OR's long-term business operations in Cambodia, where PTTCL hold 49% stake of the registered capital. The company registration has been completed in the third quarter of 2022.
- **PTTEP:** On 29 April, PTTEP International Limited (PTTEPI) and PTTEP Offshore Investment Company Limited (PTTEPO), subsidiaries of PTTEP, have notified their decisions to withdraw from Yetagun Project and gas transportation company, Taninthayi Pipeline Company LLC (TPC), which have been effective on 31 May 2022 after receiving the official regulatory approval from Myanmar government.

May 2022

- **GPSC:** On 5 May, Nava Nakorn Electricity Generating Company Limited (GPSC holds 30% stake together with the joint investors comprised of Ratchaburi Electricity Generating Company Limited and Nava Nakorn Public Company Limited, which holds share proportion of 40% and 30% respectively) will invest in an expansion for an addition of 30 megawatts of electricity generation capacity and 5.3 tons per hour of steam generation capacity, with the project cost of approximately Baht 1,724 million. The construction of expansion project will be in December 2022 and the commercial operation will commence in June 2024. After the operation, Nava Nakorn Electricity Generating Company Limited will have the total electricity generation capacity of approximately 215 megawatts and the net steam generation capacity of approximately 45.3 tons per hour.
- **PTT & PTTEP:** On 17 May, PTT's Board of Directors Meeting approved the shareholding restructure of PTT Global LNG Company Limited (PTTGL) by assigning SMH to purchase all shares of PTTGL from PTT and PTTEP Business Center Company Limited (PTTEP BC), which equally hold 50% stake in PTTGL, at the amount approximately US\$ 255 million. The transaction was completed in June 2022, after the restructuring transaction, SMH will hold 100% of PTTGL's shares. The shareholding restructure will enable PTTGL to flexibly accelerating growth in the LNG value chain business and becoming a global LNG player in accordance with PTT group's strategic plan.
- **PTT:** On 20 May, PTT's Board of Directors and Board of Directors of Interpharma Public Company Limited (IP) (Thai listed company on MAI ticker: IP) have approved the investment in IP's newly issued shares via private placement by Innobio LL Holding Co., Ltd. (INBL) to acquire IP's stakes at 20% of the total registered and paid-up capital. The total investment value is approximately Baht 1,043 million. The transaction has been completed in the third quarter of 2022. The collaboration aims for the further development of R&D and for the escalation in businesses across the country, covering a full range of healthcare products including

innovative medicine, eye healthcare, nutraceuticals & supplement, Thai herbal medicines, as well as health food and drink.

- **PTT:** On 20 May, PTT's Board of Directors passed a resolution for PTT to relieve electricity generating cost of EGAT in order to alleviate electricity burden for Thai people during the energy crisis in Thailand through the discharge of the interest from the delay of natural gas payment to EGAT according to the postponement of the natural gas payment for the period of May 2022. The due date will be extended from June to October 2022. The interest amount is approximately Baht 340 million. EGAT has already paid for gas payment for the period as aforementioned.
- **OR:** On 20 May, Modulus Venture Company Limited (Modulus), a wholly-owned subsidiary of OR, has signed a share subscription agreement and a shareholder agreement to invest through purchasing newly issued preferred stock of Polar Bear Mission Company Limited (Freshket), on 19 May 2022 with a total investment amount not exceeding US\$ 14.5 million. Freshket is a food supply chain service provider that procures, imports, and distributes quality raw materials for restaurants, hotels and consumers.
- **PTT:** On 25 May, Alpha Com has established P-Dictor Company Limited (P-Dictor) with the registered capital of approximately Baht 54.5 million with the objective to operate the predictive maintenance and machine monitoring artificial intelligence (AI) for industrial solution which help predicting the possibility of any mechanical failures on the critical machineries and equipments of the plants. Therefore, the production and maintenance could be properly planned and the risk of damage on operational production and product distribution would be reduced. The service will be provided to the industrial plants both within PTT group and external customers.
- **PTT:** On 27 May, PTT has issued the unsubordinated and unsecured debenture No. 2/2022 for the total amount of Baht 20,000 million with the tenor of 7 years and interest rate of 3.25% per annum to general public, foundation, and non-profit organization. The debenture is issued under Baht 170,000 million Medium-Term Note Program (MTN Program) in 2020 which was approved by the Securities and Exchange Commission of Thailand.

June 2022

- **PTTEP:** On 1 June, the Algeria Hassi Bir Rekaiz Project has successfully commenced the production with the oil production target at 13,000 barrels per day. The Project will add the total production volume and support the long-term growth for PTTEP. The project is located onshore, in the eastern part of the People's Democratic Republic of Algeria, covering an area of 1,916 square kilometers. The Project's consortium consists of PTTEP at 49% and SONATRACH (Algeria's National Oil and Gas company) at 51%.
- **OR:** On 6 June, Phnom Penh Aviation Fuel Service Co., Ltd. (PPAFS) is a joint venture between PTTOR International Holdings (Singapore) (SG HoldCo), a subsidiary of OR, China National Aviation Fuel International Holdings Limited (CNAF) from the People's Republic of China, and

Total Energies Marketing (Cambodia) Co., Ltd. (TOTAL) which hold 33.33% equally. PPAFS has signed a Concession Agreement dated 3 June 2022, together with Cambodia Airport Investment Company Limited (CAIC), a company awarded a concession to develop a new international airport in Phnom Penh from the Cambodian government, which granted PPAFS a concession right to become an operator of an aviation refueling service system at the New International Airport in Phnom Penh. The source of investment will be from loans and capital from shareholders, where OR will invest in the amount of not exceeding US\$ 18.20 million.

- **OR:** On 8 June, Modulus, a wholly-owned subsidiary of OR, had signed the related contracts with Boonrawd Trading Co., Ltd. (Boonrawd) to establish a new joint venture which will be equally hold at 50% of all common shares. Modulus will invest in the amount of no more than Baht 210 million. The objective of this joint venture is to manufacture and distribute ready-to-drink products. The registration has been completed in the third quarter of 2022.
- **OR:** On 17 June 2022, OR's Board of Directors approved Modulus, a subsidiary of OR, to invest by purchasing newly issued common shares of K-NEX Corporation Company Limited (KNEX), with a total investment amount not exceeding Baht 1,105 million. After such investment, Modulus will hold 40% and the KNEX's former shareholders will hold 60% of all common shares issued by KNEX. KNEX sells and distributes industrial washing and drying machines and operates a self-service laundromat chain under the brand of Otteri Wash & Dry. In this regard, Modulus has signed a share subscription agreement and a shareholder agreement on 16 June 2022.

July 2022

- **GC:** On 4 July, GC's Board of Directors has the resolution approved GC to accept the entire business transfer of GC Glycol Co., Ltd. (Glycol) and GC Styrenics Co., Ltd. (GCS). The acquisition was effective legally on 1 July 2022 and GC will further proceed with the dissolution of Glycol and GCS. The group business restructuring will better support GC's long-term strategy including the business expansion internationally, sales and development of High Value Products, enhancing the GC's governance efficiency of group of companies both domestically and internationally, and also support GC's Sustainability strategy.
- **PTT:** On 11 July, PTT's Board of Directors passed a resolution for PTT's gas business to specifically support the Oil Fuel Fund for the amount of Baht 1,000 million per month for 3 months within the year of 2022 in the total amount of Baht 3,000 million. PTT aims to support the oil fuel fund to stabilize the energy prices in Thailand during the period of fluctuating global energy prices.
- **PTTEP:** On 15 July, PTTEP has dissolved an inactive subsidiary, namely PTTEP FLNG Holding Co., Ltd. (PTTEP FH) in order to improve operational efficiency and minimize administrative costs. This transaction has no impact to PTTEP's operations.

- **PTT:** On 21 July, PTT's Board of Directors approved the establishment of Innobic Nutrition Co., Ltd. (INNT) which is 100% owned by Innobic LL holding Co., Ltd. (INBL), with the registered capital of Baht 100 million. The objective of the company establishment is to conduct Nutrition business including the Nutraceutical, which offer dietary supplements for general wellness that focuses on the suitable nutrition for each individual group by age, gender, or their nutritional needs as well as for specific prevention and the Medical Nutrition, which provide the nutritional needs for patients that will be developed for both general and specific patients. INNT is completed its registration in September 2022.
- **PTT:** On 22 July, PTT Global LNG Co., Ltd. (PTTGL) has signed the sale and purchase agreement of LNG with Corpus Christi Liquefaction LLC (CCL), which is a wholly-owned subsidiary of Cheniere Energy Inc (the energy company in US) in the amount of 1 million tons per year for a period of 20 years, starting its first delivery in 2026 onwards. The signing of this long-term LNG purchase agreement was in accordance with the Board's resolution of National Energy Policy (NEPC) which approved PTT to procure for the additional 1 million tons per annum of LNG, from current long-term LNG contracts of 5.2 million tons per annum, in order to increase country's energy security.

August 2022

- **PTTEP:** On 1 August, PTTEP International Limited (PTTEPI), Yangon Branch, a wholly-owned subsidiary of PTTEP, informed that there was a leakage at the Zawtika's onshore pipeline. As a result, PTTEP temporarily suspended gas delivery from the Zawtika Project to Thailand. However, PTTEPI repaired the leakage of pipeline which completed and resumed the normalcy of gas delivery to Thailand on 14 August.
- **PTT:** On 2 August, PTT International Holdings Limited (PTTIH) (a wholly owned subsidiary of PTT) has entered into a Share Purchase Agreement of its entire investment, being 100% of the total issued shares, in PTT Mining Limited (PTTML) with PT Astrindo Nusantara Infrastruktur Tbk (Astrindo), a listed company in Indonesia Stock Exchange, or its affiliate, on 1 August 2022 with a purchase price of approximately US\$ 486 million. The transaction has been completed on 15 February 2023. This transaction will divest all of PTT's investment in the coal business which is aligned with PTT's strategy towards sustainability and clean energy.
- **PTTEP:** On 4 August, Malaysia-Thailand Joint Authority, an authority established under the Agreement between the Government of Malaysia and the Government of the Kingdom of Thailand, has concluded the annexation of Production Sharing Contract (PSC) of the Malaysia-Thailand Joint Development Area (MTJDA) with PTTEPI, a wholly-owned subsidiary of PTTEP, and PETRONAS Carigali (JDA) Limited (PC JDA), a subsidiary of PETRONAS Carigali Sdn Bhd. The annexation, which has been duly approved by the government of Thailand and Malaysia, attains the rights to an additional area for exploration and production (Open Area) and a 10-

year production period extension until 2039, as well as securing an additional gas volume of at least 30 MMSCFD until 2025 to satisfy Thailand's gas demand.

- **OR:** On 8 August, OR's Management Committee (ORMC) resolved to approve Modulus Venture Co., Ltd. (Modulus), a wholly-owned subsidiary of OR, to invest by purchasing existing and newly issued common shares of Dusit Foods Co., Ltd. (DF), a subsidiary of Dusit Thani Public Co., Ltd. (DUSIT), with a total investment amount not exceeding Baht 299.6 million. After such investment, Modulus will hold 25%, and DUSIT will hold 75% of all common shares issued by DF. DF is a company that invests in food business throughout the supply chain focusing on high-growth food businesses and linking food businesses within the group, including the Dusit Thani College and Dusit Hotels & Resorts of the DUSIT group.
- **PTT:** On 17 August, the Energy Regulatory Commission (ERC) has approved the criteria of natural gas tariff for natural gas transportation licensee through pipeline which consist of two components; the Demand Charge (Td) for the period of 2022-2026 and Commodity Charge (Tc) for year 2022 according to new natural gas pricing structure from the resolution of National Energy Policy Council (NEPC)'s meeting on 4 August 2021. The revised gas pipeline tariff rates are effective since August 2022.
- **GPSC:** On 23 August, GPSC's Board of directors has approved the establishment of two new subsidiaries; Eurus Plus Co., Ltd. (EurusPlus) and Boree Plus Co., Ltd. (BoreePlus) which is 100% owned, with the registered capital of Baht 3.5 million for each company. The objective of the company establishment is to study the possibility and support the investment plan for renewable energy.
- **PTT:** On 29 August, the Extraordinary General Meeting of Shareholders of PTT Energy Solutions Co., Ltd. (PTTES) approved the dissolution of PTTES. PTTES is the subsidiary in which PTT holds 40% together with TOP, GC, and IRPC which hold equally at 20%. The registration of dissolution has already been completed in December 2022. The dissolution of PTTES is aligned with PTT group's business restructuring policy and does not affect PTT group's business operations.
- **PTTEP:** On 31 August, PTTEP Netherlands Holding Coöperatie U.A. (PTTEP NH) and PTTEP Brazil Investment B.V. (PTTEP BI), subsidiaries of PTTEP, have entered into a Sale and Purchase Agreement (SPA) to sell PTTEP Brazil Investments in Oil and Gas Exploration and Production Limitada (PTTEP BL), which are registered in the Federative Republic of Brazil (Brazil), altogether with all obligations to Ubuntu Engenharia e Serviços Ltda. PTTEP BL is holding 25% interest in the Barreirinhas AP1 Project and 20% interest in the Brazil BM-ES-23 Project. Completion of the sale is subject to the conditions prescribed in the SPA. The Barreirinhas AP1 Project and the Brazil BM-ES-23 Project are in exploration phase and are

located offshore of Brazil. This divestment marks the withdrawal of all PTTEP's investment in Brazil as part of portfolio rationalization which aligned with the company's strategy.

September 2022

- PTT: On 15 September, PTT's Board of Directors has approved a resolution of interim dividend payment for the first six-month performance of year 2022 to PTT's shareholders at the rate of Baht 1.30 per share, totaling approximately Baht 37,132 million, or 58% of the consolidated net income. The Record Date to entitle rightful shareholders who may receive the interim dividend was on 29 September 2022. The payment of the interim dividend was made on 12 October 2022.
- GPSC: On 26 September, Global Renewable Synergy Co., Ltd. (GRSC), a wholly-owned subsidiary of GPSC, has completed the conditions precedent of the Share Purchase Agreement, and holds 25% of the total shareholder in CI Changfang Limited and CI Xidao Limited which are the investment of offshore wind power project in Taiwan with the total investment of approximately US\$ 500 million.
- GPSC: On 27 September, Board of Directors approved the dissolution of two subsidiaries of GPSC, namely GPSC International Holdings Limited (GPSCIH), a wholly owned subsidiary of GPSC, which was established in Hong Kong as a holding company to support overseas investment, and Glow Energy Myanmar Co., Ltd. (GE Myanmar), a subsidiary of GPSC in which the Company collectively holds 99.83% through Glow Co., Ltd. GE Myanmar is a holding company which was established in the Republic of the Union of Myanmar. The dissolution of GPSCIH and GE Myanmar aims to minimize administrative costs which has no impact to the company's strategic plan to support investment expansion abroad.
- GC: On 30 September, the Board of Directors of GC Marketing Solutions Co., Ltd. (GCM), a wholly own subsidiary of the Company, approved to purchase additional 33% of the ordinary share of PT GCM Marketing Solutions Indonesia from PT. Cipta Aneka Air. After the transaction is completed, GCM will hold 100% in PT GCM Marketing Solutions Indonesia, increased from 67%.

October 2022

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

November 2022

- **PTTEP:** on 26 October, PTTEP MENA has signed Farm-in/Farm-out Agreement to acquire 25% stake in the Sharjah Onshore Area A Project from Eni Sharjah B.V. (“ENI”). The acquisition has been completed in 2022. Sharjah Onshore Area A Project is an onshore gas project in the exploration phase, situated in the central part of Sharjah Emirate, covering area approximately 437 square kilometers. The transaction aligns with PTTEP’s strategy, focusing on prolific area in the Middle East.
- **PTTEP:** On 21 November, Referring to the class action lawsuit against PTTEP Australasia (Ashmore Cartier) Pty Ltd (PTTEP AAA), in the Federal Court of Australia brought by a group of Indonesian seaweed farmers, claiming damages to their seaweed crops caused by the 2009 Montara incident in the Australian waters. PTTEP has been informed that PTTEP AAA participated in mediation in the class action, as ordered by the Federal Court of Australia. Such mediation requirement was in line with the normal legal process under Australian Law for class actions. During such mediation, PTTEP AAA reached an in-principle agreement with the group of Indonesian seaweed farmers, that PTTEP AAA will pay 192.5 Million Australian Dollars (equivalent to approx. 129 Million US Dollars) in full and final settlement of the class action (including PTTEP AAA’s appeal). The in-principle settlement was made on a no admission of liability basis.
- **PTTEP:** On 22 November, PTTEP has established a subsidiary to support future investments. Xplor Ventures Company Limited has been established with registered capital of 5,000,000 Thai Baht, with 100% shareholding by EP-Tech Ventures Holding Company Limited, a subsidiary of PTTEP. The establishment of this company is to support the investment in new technology, enhance competitiveness and identify new technology development opportunities as well as increase the efficiency of the technologies used in exploration and production business, which aligns with PTTEP’s strategy.
- **GPSC:** On 30 November, GPSC has signed the Joint Venture Agreement to develop a portfolio of wind projects with Copenhagen Infrastructure Partners Group (“CIP”) via CI NMF I Cooperatief U.A. (“CI NMF I”), with the purpose of jointly exploring opportunities in wind energy and to establish a joint venture to jointly develop wind projects with a focus on Thailand. GPSC will hold a 51% stake in the aforementioned joint venture and individual projects. Additionally, GPSC and CIP via CI NMF I have established WindPower Development Company Limited (“WPD”) on 30 January 2023 with an initial registered capital of THB 1 million. GPSC and CI NMF I hold 51 percent and 49 percent of the shares in WPD, respectively. The objectives of this company is to jointly explore opportunities in wind energy and develop wind projects with a focus on Thailand according to the Joint Venture Agreement with Copenhagen Infrastructure Partners (“CIP”), which the company has already signed Joint Venture Agreement as aforementioned.

December 2022

- **GC:** On 9 December, an Extraordinary General Meeting of Shareholders of Thai Tank Terminal Company Limited (“TTT”), a subsidiary of the Company, had the resolution to approve the increase of the registered share capital and propose to sell new shares to Gulf Energy Development Public Company Limited (“Gulf”) in the proportion of 28.57% of the ordinary shares of TTT. GC has signed the Share Subscription and Shareholders Agreement with Vopak Holding International B.V. (“Vopak”), Gulf, and TTT. The new shareholding structure of TTT is GC holding 36.43% (from 51.00% previously), Vopak holding 35.00% (from 49.00% previously) and Gulf holding 28.57%. GC’s proportion of shareholding in TTT has been reduced from 51.00% to 36.43% and resulted to the change in investment of TTT from subsidiary company to joint venture company. The joint shareholding by Gulf as a business partner will support TTT’s business operation as well as enhance the ability of TTT to further expand growth in its port terminal and tank farm businesses. Gulf has a long experience in developing largescale infrastructure projects in Thailand which will further add more value to TTT’s business.
- **GPSC:** On 13 December, GPSC’s Board of directors approved the establishment of five subsidiaries. The objective of the company’s establishment is to submit the application for electricity generation according to the Energy Regulatory Commission (“ERC”) announced the notification for the purchase of electricity generated from renewable energy sources under the Feed-in Tariff (FiT) scheme 2022 – 2030 for power plants with no fuel costs B.E. 2565 (2022) on 30 September 2022, and to support the Company investment plan for renewable energy.
- **PTT:** On 14 December, PTT’s Board of Directors approved the shareholding restructuring of AI and Robotics business by assigning SMH to purchase all shares of ReAcc Co., Ltd. (“ReAcc”) from Alpha Com Co., Ltd. (“Alpha Com”) (SMH, ReAcc, and Alpha Com are indirect wholly-owned subsidiary of PTT). In addition, there was an approval for the shareholding restructuring of Mekha Tech by assigning ReAcc to purchase all shares of Mekha Tech from Alpha Com. The objective of the shareholding restructuring is to strengthen operational agility of AI & Robotic business to support new business opportunities as per PTT group’s strategy. Moreover, Board of Directors Meeting approved the change in registered capital and company name which Mekha Tech completed the registration in 2022 and ReAcc is expected to complete the registration within the first quarter of 2023, detail as follows:
 - Previous name : Mekha Technology Co., Ltd. (“Mekha Tech”)
 - New name : MEKHA V Co., Ltd. (“Mekha V”)
 - Registered capital : Baht 266 million (initial registered capital is Baht 30 million)
 - Previous name : ReAcc Co., Ltd. (“ReAcc”)
 - New name : NEW VER SAL Co., Ltd. (“New Ver Sal”)
 - Registered capital : Baht 302 million (initial registered capital is Baht 29 million)

- **PTT:** On 15 December, PTT's Board of Directors has approved the five-year (Year 2023 – 2027) investment plan of PTT and its wholly owned subsidiaries in an aggregate amount of Baht 100,227 million. PTT has invested in the core businesses to ensure national energy security which are accounted for 55% of PTT's total five-year investment plan. Additionally, PTT has prepared provisional capital expenditure for the next 5 years amounting to Baht 302,168 million mainly for the investment expansion into new businesses to align with PTT's vision "Powering life with future energy and beyond" with the focus on clean energy businesses toward a low-carbon society i.e. investment in Electric Vehicle value chain business covering from upstream to downstream, Logistic and Infrastructure businesses focusing on connecting all transportation networks throughout the country, Life Science (Pharmaceutical, Nutrition, and Medical device & Diagnostics) to drive Life Science business in Thailand and the ASEAN, as well as the investment in Renewable energy to achieve PTT group's renewable energy target of 12,000 megawatts within year 2030. Furthermore, there is investment in gas business which is the transition fuel with the focus on the expansion of pipeline network and the investment in LNG value chain both in Thailand and overseas.
- **PTT & GPSC:** On 15 December, Nuovo Plus (a subsidiary which PTT holds 51% of shares and GPSC holds 49% of shares) enter into a joint venture agreement and to establish NV Gotion Company Limited ("NV Gotion"), a joint venture company with Gotion Singapore Pte. Ltd. ("Gotion"), the leading Chinese company specializing in power battery for electric vehicles and energy storage systems, with the registered capital of not exceeding Baht 600 million, in which Nuovo Plus and Gotion hold 51% and 49% of the shares, respectively. The objectives of the joint venture company are to operate the business of importing, assembling, and distributing battery modules and battery packs for energy storage systems and electric vehicles by combining technology and expertise of those two companies to increase competitiveness in the battery business and also to integrate the supply chain of renewable energy and electric vehicles for Thailand which are in line with PTT Group's investment strategy in Future Energy. The establishment of the joint venture company is expected to complete by the first quarter of 2023 with the initial capacity of 1,000 megawatt-hours per year and is expected to start of operation by the fourth quarter of 2023 and scale up to 2,000 megawatts-hours per year by 2025.
- **GC:** On 16 December, an Extraordinary General Meeting of Shareholders of AGC Vinythai Public Company Limited ("AVT") had the resolution to approve the allocation of new ordinary shares to the Company by way of private placement, totaling to approximately THB 2,144 million. Subsequent to the transaction, the Company's shareholding in AVT will increase from 27.32% to 32.72%. The payment of such share subscription has been completed in December 2022.

- **PTTEP:** On 19 December, PTTEP (Angola) Corporation (PANG), a subsidiary of PTTEP, has entered into a Sale and Purchase Agreement (SPA) to sell its entire 2.5% participation interest in Block 17/06 Project in Angola to SOMOIL BLOCO 17/06 (SU), S.A., a wholly owned subsidiary of Sociedade Petrolifera Angolana, S.A (SOMOIL). Completion of the sale is expected by mid-2023 subject to the conditions prescribed in the SPA. This divestment marks the withdrawal of all PTTEP's investment in Angola which aligned with the Company's strategy.
- **PTTEP:** On 23 and 30 December, PTTEP has dissolved an inactive subsidiary, namely Participations and Explorations Corporation (PEC) and PTTEP South Sageri Limited (PTTEP SS) respectively in order to improve operational efficiency and minimize administrative costs. This has no impact to PTTEP's operations.

January 2023

- **PTTEP:** On 10 January, PTTEP has established a subsidiary to operate Artificial Intelligence and technology businesses which are Bedrock Analytics Company Limited which has been established with registered capital of 5,000,000 Thai Baht, with 100% shareholding by AI and Robotics Ventures Company Limited, a subsidiary of PTTEP. Bedrock will use the Geospatial Location Intelligence Platform and AI Technology to provide advanced location insights. Moreover, Bind Systems Company Limited has been established with registered capital of 5,000,000 Thai Baht, with 100% shareholding by AI and Robotics Ventures Company Limited, a subsidiary of PTTEP. The company will use Web 3.0 technology to provide security, privacy, and seamless access to Digital Identity and Personal / Enterprise data. The establishment of this company is to enhance competitiveness and identify new technology development opportunities, which aligns with PTTEP's strategy.
- **PTTEP:** On 17 January, PTTEP has established a subsidiary to develop and commercialize Artificial Intelligence technology which is S2 Robotics Company Limited has been established with registered capital of 1,000,000 Thai Baht, with 100% shareholding by Rovula (Thailand) Company Limited, a subsidiary of PTTEP. S2 Robotics will use AI and Robotics (Nautilus) to provide the subsea horizontal repair service while reducing risks and repair time. The establishment of this company is to enhance competitiveness and identify new technology development opportunities, which aligns with PTTEP's strategy.

February 2023

- **GC:** On 2 February, GC's Board of Directors has the resolution to approve the acquisition of the entire business of PTT Phenol Co.,Ltd. (Phenol) and GC Oxirane Co.,Ltd. (GCO) is part of the business restructuring plan which is effective under the law on February 1, 2023 and the Company will further proceed with the dissolution of Phenol and GCO.

Financial Results of PTT Group by Business

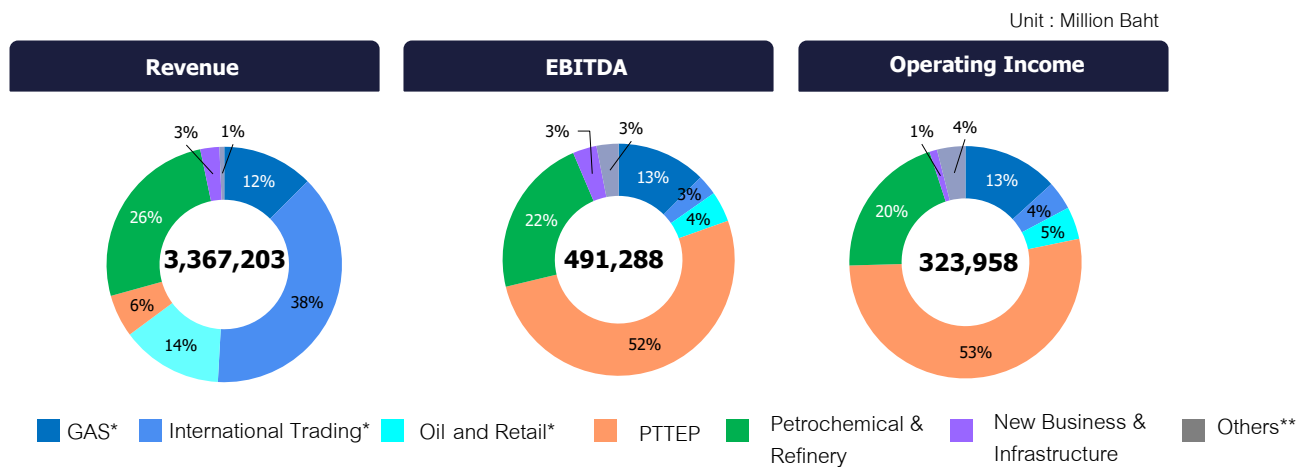
Financial performance of 4Q2022 compared with 4Q2021 and 3Q2022 as well as 2022 compared with 2021

are summarized as follows:

Unit : Million Baht	4Q2021	3Q2022	4Q2022	% Inc. (Dec.)		2021	2022	% Inc. (Dec.)
				YoY	QoQ			
Sales revenue	688,837	884,610	797,174	15.7%	(9.9%)	2,258,818	3,367,203	49.1%
: Exploration & Production	63,189	88,503	91,610	45.0%	3.5%	219,068	331,350	51.3%
: Gas	132,464	199,251	165,812	25.2%	(16.8%)	464,038	708,852	52.8%
: Coal	5,774	9,190	8,075	39.9%	(12.1%)	16,983	33,599	97.8%
: Oil & Retail	158,265	195,156	206,655	30.6%	5.9%	513,895	791,745	54.1%
: International trading	378,076	623,448	441,837	16.9%	(29.1%)	1,146,564	2,172,566	89.5%
: Petrochemical & Refining	310,044	382,621	300,459	(3.1%)	(21.5%)	1,037,276	1,473,678	42.1%
: New Business & Infrastructure	24,263	42,915	42,975	77.1%	0.1%	81,262	148,424	82.6%
: Others	889	1,008	1,089	22.5%	8.0%	3,558	4,063	14.2%
EBITDA	101,271	92,277	73,542	(27.4%)	(20.3%)	427,956	491,288	14.8%
: Exploration & Production	47,419	67,615	69,237	46.0%	2.4%	164,365	253,973	54.5%
: Gas	19,200	6,926	11,869	(38.2%)	71.4%	86,497	61,207	(29.2%)
: Coal	2,943	4,997	4,210	43.1%	(15.7%)	7,158	18,347	>100.0%
: Oil & Retail	4,513	2,787	1,337	(70.4%)	(52.0%)	20,807	20,962	0.7%
: International trading								
- Excluding effect of FX and derivatives	(54)	1,348	(9,465)	<(100.0)%	<(100.0)%	10,740	13,897	29.4%
- Including effect of FX and derivatives	1,449	4,097	(366)	<(100.0)%	<(100.0)%	5,436	8,735	60.7%
: Petrochemical & Refining	23,573	(556)	(4,600)	<(100.0)%	<(100.0)%	120,733	109,719	(9.1%)
: New Business & Infrastructure	4,423	6,609	2,447	(44.7%)	(63.0%)	20,918	16,392	(21.6%)
: Others	(1,125)	(680)	(1,407)	(25.1%)	<(100.0)%	(3,349)	(3,263)	2.6%
Depreciation and amortization expenses	33,851	45,191	44,681	32.0%	(1.1%)	146,790	167,330	14.0%
Operating income (loss)	67,420	47,086	28,861	(57.2%)	(38.7%)	281,166	323,958	15.2%
: Exploration & Production	33,439	44,703	45,630	36.5%	2.1%	94,303	171,031	81.4%
: Gas	14,411	2,267	7,178	(50.2%)	>100.0%	67,768	42,905	(36.7%)
: Coal	2,257	4,252	4,203	86.2%	(1.2%)	5,404	16,509	>100.0%
: Oil & Retail	2,939	1,167	(321)	<(100.0)%	<(100.0)%	14,899	14,614	(1.9%)
: International trading								
- Excluding effect of FX and derivatives	(108)	938	(9,753)	<(100.0)%	<(100.0)%	10,536	12,943	22.8%
- Including effect of FX and derivatives	1,395	3,687	(654)	<(100.0)%	<(100.0)%	5,232	7,781	48.7%
: Petrochemical & Refining	13,662	(11,541)	(15,600)	<(100.0)%	(35.2%)	81,788	66,181	(19.1%)
: New Business & Infrastructure	1,682	2,863	(868)	<(100.0)%	<(100.0)%	10,182	3,440	(66.2%)
: Others	(1,241)	(794)	(1,522)	(22.6%)	(91.7%)	(3,801)	(3,719)	2.2%
Share of net income from investments in joint ventures and associates	1,937	156	1,246	(35.7%)	>100.0%	9,010	5,849	(35.1%)
Loss on impairment of assets	9,250	3,646	8,475	(8.4%)	>100.0%	13,286	12,609	(5.1%)
Gain (loss) on derivatives	(172)	13,072	(4,502)	<(100.0)%	<(100.0)%	(31,958)	(74,914)	<(100.0)%
Gain (loss) on foreign exchange	5,139	(19,850)	32,711	>100.0%	>100.0%	(6,469)	5,552	>100.0%
EBIT	65,019	37,236	48,715	(25.1%)	30.8%	247,821	249,653	0.7%
Finance costs	7,153	10,141	10,355	44.8%	2.1%	28,163	37,091	31.7%
Income taxes	19,648	16,385	17,352	(11.7%)	5.9%	67,590	90,462	33.8%
Net income	27,544	8,884	17,872	(35.1%)	>100.0%	108,363	91,175	(15.9%)
Earnings per share (Baht/share)	0.97	0.31	0.63	(35.1%)	>100.0%	3.79	3.20	(15.6%)

Segmentation Performance of PTT Group

The details of revenue, EBITDA and operating income by segmentation of 2022 are as follows;



The overall performance of Exploration and Production business increased following the increase in operating income as aforementioned. Despite, there was loss from foreign exchange forward contracts increased by Baht 3,017 million. Moreover, in 4Q2022, there were loss recognition of non-recurring items approximately Baht 9,400 million. While, in 4Q2021 there were loss approximately Baht 6,100 million (see appendix).

Fourth quarter of 2022 compared with Third quarter of 2022

In 4Q2022, sales revenue of PTTEP was Baht 91,610 million, increasing by Baht 3,107 million or 3.5% from 3Q2022 as the average sales volume increased by 4.6% from 478,323 BOED in 3Q2022 to 500,456 BOED in 4Q2022 primarily from first crude oil sales of Algeria Hassi Bir Rekaiz Project in October 2022, together with Bongkot Project, Zawtika Project and Arthit Project due to higher gas sales volume, offset with Oman Block 61 Project due to lower gas sales volume and Malaysia Project from lower crude oil sales volume. However, the average selling price decreased by 1.7% from US\$ 53.7 per BOE in 3Q2022 to US\$ 52.8 per BOE in 4Q2022.

EBITDA in 4Q2022 was Baht 69,237 million, increasing by Baht 1,622 million or 2.4% from 3Q2022 mainly due to an increase in sales revenue as aforementioned. In addition, exploration expenses decreased primarily from write-off of assets of PTTEP Australasia Project in the previous quarter. As a result, the operating income in 4Q2022 was Baht 45,630 million, increasing by Baht 927 million or 2.1% from 3Q2022.

The overall performance of Exploration and Production business decreased due to in 4Q2022 there were loss recognition of non-recurring items approximately Baht 9,300 million. While, in 3Q2022, there were loss approximately Baht 3,500 million. (see appendix) Moreover, there was higher loss from oil price hedging instruments amounting to Baht 3,196 million due to an upward trend of forward oil price, despite of an increase in operating income as aforementioned.

2022 compared with 2021

In 2022, sales revenue of PTTEP was Baht 331,350 million, increasing by Baht 112,282 million or 51.3% from 2021 as the average selling price increased by 22.8% from US\$ 43.5 per BOE in 2021 to US\$ 53.4 per BOE in 2022. In addition, the average sales volume increased by 12.5% from 416,141 BOED in 2021 to 468,130 BOED in 2022 primarily from first production of G1/61 Project since the end of April 2022, full year production of Oman Block 61 Project, as well as Arthit Project due to higher gas nomination from buyer.

EBITDA in 2022 was Baht 253,973 million, increasing by Baht 89,608 million or 54.5% from 2021 mainly due to an increase in sales revenue as aforementioned. However, operating expenses increased primarily from first production of G1/61 and G2/61 Projects, together with Malaysia Project due to higher sales volume and maintenance activities. While, depreciation, depletion and amortization increased primarily from first production of G1/61 and Malaysia Projects which had higher sales volume, offset with the decrease in sales volume of Bongkot Project. In addition, petroleum royalties

increased primarily from higher revenue from sales in Thailand and Malaysia. As a result, the operating income in 2022 was Baht 171,031 million, increasing by Baht 76,728 million or 81.4% from 2021.

The overall performance of Exploration and Production business increased following the increase in operating income as aforementioned, despite income taxes increased by Baht 30,767 million mainly from projects in Thailand and Oman following higher earnings before tax, as well as in 2022 there were loss recognition of non-recurring items approximately Baht 13,000 million. While, in 2021 there were gain approximately Baht 100 million (see appendix).

Gas Business Group

The details of all product sales volume from GSPs are as follows:

Unit: Ton	4Q2021	3Q2022	4Q2022	% Inc.(Dec.)		2021	2022	% Inc.(Dec.)
				YoY	QoQ			
LPG	767,362	834,689	834,351	8.7%	-	3,113,277	3,301,907	6.1%
Ethane	512,947	427,589	451,074	(12.1%)	5.5%	2,181,272	1,752,287	(19.7%)
Propane	201,818	354,517	183,537	(9.1%)	(48.2%)	953,395	1,139,217	19.5%
NGL	143,620	110,890	123,585	(14.0%)	11.4%	617,011	504,133	(18.3%)
Pentane	11,440	11,500	11,188	(2.2%)	(2.7%)	43,057	48,803	13.3%
Total	1,637,187	1,739,185	1,603,735	(2.0%)	(7.8%)	6,908,012	6,746,347	(2.3%)

The details of reference product prices of GSPs are as follows:

Unit: US\$ per Ton	4Q2021	3Q2022	4Q2022	% Inc.(Dec.)		2021	2022	% Inc.(Dec.)
				YoY	QoQ			
LPG ^{1/}	807	677	612	(24.2%)	(9.6%)	639	736	15.2%
LDPE ^{2/}	1,592	1,300	1,110	(30.3%)	(14.6%)	1,516	1,428	(5.8%)
LLDPE ^{2/}	1,285	1,100	999	(22.3%)	(9.2%)	1,200	1,208	0.7%
HDPE ^{2/}	1,252	1,104	1,033	(17.5%)	(6.4%)	1,181	1,203	1.9%
Propane ^{1/}	822	682	617	(24.9%)	(9.5%)	648	737	13.7%

Note: ^{1/} Global Gas Price (Contract Price Saudi Aramco) as a reference for selling prices of petrochemical customers, LPG calculated from the proportion of Propane and Butane by 50:50

^{2/} South East Asia - Spot Price

Fourth quarter of 2022 compared with Fourth quarter of 2021

In 4Q2022, gas business reported sales revenue of Baht 165,812 million, increasing by Baht 33,348 million or 25.2% from 4Q2021. This resulted mainly from the increase in sales revenue of S&M business following the increase in average selling price in line with pool gas price. In addition, the average selling price for industrial customers increased from higher average fuel oil referenced prices as well as the implementation of new procedure which using the selling price to Small Power Producer (SPP) in the previous month as referenced price instead if the fuel oil referenced selling price below those SPP price since August 2022. However, the average sales volume (calculated at heating value of 1,000

BTU per cubic feet) decreased by 253 MMSCFD or 6.1% from 4,158 MMSCFD in 4Q2021 to 3,905 MMSCFD in 4Q2022 mainly from lower supply of gulf gas during the transition of operator for G1/61 concession resulted in adjustment of fuel management plan of power plant customers by operating with diesel instead of natural gas. Nevertheless, demand of electricity sector increased following economic recovery from the relief of COVID-19. In addition, sales volume to GSP decreased following turndown of GSP's production to in line with lower supply of gulf gas.

Sales revenue of GSP business rose due to higher sales volume of LPG and the increasing of LPG household's price. While GSP average selling price decreased in all products following the petrochemical referenced prices. In addition, GSP's overall sales volume (including NGL derived from Dew Point Control units) decreased from 1,637,187 tons in 4Q2021 to 1,603,735 tons in 4Q2022 or 2.0% following the lower in GSP's production to in line with lower supply of gulf gas and the lower demand of petrochemical customer due to concern on the economic recession.

However, in 4Q2022 sales revenue of Transmission pipeline business (TM) also decreased mainly from lower gas pipeline tariff rates which the Energy Regulatory Commission (ERC) has approved the criteria of natural gas tariff for natural gas transportation licensee through pipeline for two components; the Demand Charge (Td) in the 5-year period of 2022-2026 and Commodity Charge (Tc) for year 2022 according to new natural gas pricing structure. The revised gas pipeline tariff rates were effective from August 2022 onwards.

In 4Q2022, EBITDA of gas business was reported at Baht 11,869 million, decreasing by Baht 7,331 million or 38.2%. The operating income was reported at Baht 7,178 million, decreasing by Baht 7,233 million or 50.2%. This was mainly from lower gross profit of GSP business following higher gas cost in line with gulf gas price. Moreover, NGV's loss increased from the higher gas cost following pool gas price as well as the incremental cost according to EPP policy. Additionally, NGV retail price has capped for the taxi in Bangkok Metropolitan Area (NGV for the same breath project) at 13.62 Baht/kg. from 1 November 2021 to 15 March 2023, and the NGV retail price for other vehicles have capped at 15.59 Baht/kg. from 16 November 2021 to 15 September 2022 and the price increased by 1 Baht/kg. to 16.59 Baht/kg. from 16 September 2022 to 15 December 2022 and 17.59 Bath/kg since 16 December 2022 onwards to easing Thai people's burden on energy price. Besides, gross margin of S&M increased from higher sales revenue as aforementioned despite higher gas cost following the increase of pool gas price including the incremental cost according to EPP policy. However, in 4Q2022 there was recognition of shortfall discount approximately Baht 300 million while in 4Q2021 there was the return of Take or Pay benefit from Myanmar gas fields offset with shortfall discount approximately Baht 1,000 million.

Fourth quarter of 2022 compared with Third quarter of 2022

In 4Q2022, gas business reported sales revenue of Baht 165,812 million, decreasing by Baht 33,439 million or 16.8% from 3Q2022. This resulted mainly from sales revenue of S&M business decreased following the lower average selling price as a result of lower pool gas price. In addition, the average sales volume (calculated at heating value of 1,000

BTU per cubic feet) decreased by 200 MMSCFD or 4.9% from 4,105 MMSCFD in 3Q2022 to 3,905 MMSCFD in 4Q2022 mainly from the adjustment of fuel management plan of power plant customers by operating with diesel instead of natural gas together with lower demand of household sector during winter.

Sales revenue of GSP business decreased from lower sales volume (including NGL derived from Dew Point Control units) decreased from 1,739,185 tons in 3Q2022 to 1,603,735 tons in 4Q2022 or 7.8% mainly from Propane following lower demand of petrochemical customers due to the turndown of production to in line with market situation together with the decrease in selling price of all products following the petrochemical referenced prices.

In addition, sales revenue of TM business decreased mainly from revised gas pipeline tariff as aforementioned.

In 4Q2022, EBITDA of gas business was reported at Baht 11,869 million, increasing by Baht 4,943 million or 71.4%. The operating income was reported at Baht 7,178 million, increasing by Baht 4,911 million or more than 100.0%. This was mainly from the higher gross profit of S&M business primarily from industrial customers which had lower gas cost following lower pool gas price. In addition, in 4Q2022 there was recognition of shortfall discount approximately by Baht 300 million decreased from 3Q2022 which recognition approximately by Baht 1,100 million. Moreover, NGV's loss decreased from lower gas cost in line with pool gas price. While there was the capped of NGV retail price. In addition, gross profit of GSP business dropped from lower average selling price of all products in accordance with the referenced product prices together with the decrease in overall sales volume as well as higher feed cost following gulf gas price.

2022 compared with 2021

In 2022, gas business reported sales revenue of Baht 708,852 million, increasing by Baht 244,814 million or 52.8%. This resulted mainly from S&M business, the sales revenue of S&M business increased due to the higher average selling price following pool gas price. In addition, the average selling price for industrial customers increased from the higher average fuel oil referenced prices as well as the implementation of new procedure since August 2022 as aforementioned. However, average sales volume (calculated at heating value of 1,000 BTU per cubic feet) decreased by 247 MMSCFD or 5.6% from 4,437 MMSCFD in 2021 to 4,190 MMSCFD in 2022 mainly from lower supply of gulf gas and maintenance shutdown of some production fields resulted in the adjustment of fuel management plan by calling the higher electricity generation from hydropower plants following the higher water level in 2022. Moreover, some power plants have operated with diesel instead of natural gas as aforementioned. In addition, sales volume to GSP decreased following the turndown of GSP's production to in line with lower output of gulf gas.

Sales revenue of GSP business rose due to the higher average selling price of almost products in accordance with the higher petrochemical referenced prices despite lower GSP's sales volume (including NGL derived from Dew Point Control units) from 6,908,012 tons in 2021 to 6,746,347 tons in 2022 or decreased by 2.3%, mainly from Ethane due to

major planned maintenance shutdown of Ethane Separation Plant (ESP) and the turndown of GSP's production to in line with lower supply of gulf gas together with lower demand of petrochemical customer following the economic situation.

In addition, sales revenue of TM business decreased mainly from revised gas pipeline tariff since August 2022 onwards as aforementioned.

In 2022, EBITDA of gas business was reported at Baht 61,207 million, decreasing by Baht 25,290 million or 29.2%. The operating income was reported at Baht 42,905 million, decreasing by Baht 24,863 million or 36.7%. This was mainly from industrial customers as the gas cost increased following the pool gas price and the incremental costs according to EPP policy. The gas cost increased in the higher extent compared to the increase in average selling price, resulting in the decrease in gross margin of S&M. However, in 2022 there was the shortfall discount and compensation approximately by Baht 3,400 million. In 2021, there was the return of Take or Pay from Myanmar gas supply offset with shortfall approximately by Baht 1,000 million. Performance of NGV business also decreased from higher gas cost together with the capped NGV retail price as aforementioned. However, gross profit of GSP business rose from higher average selling price of all products in accordance with the referenced prices despite the decrease in sales volume and higher gas cost in line with higher gulf gas price as aforementioned.

Coal Business

	4Q2021	3Q2022	4Q2022	%Inc. (Dec.)		2021	2022	%Inc. (Dec.)
				YoY	QoQ			
Newcastle index price (US\$ per ton)	183.9	420.7	379.5	>100.0%	(9.8%)	137.3	360.2	>100.0%
Average selling price (US\$ per ton)	95.3	152.5	167.9	76.2%	10.1%	83.0	156.4	88.4%
Cash cost (US\$ per ton)	50.2	81.0	92.0	83.3%	13.6%	49.2	74.7	51.8%
Sales volume (million tons)	1.8	1.6	1.4	(22.2%)	(12.5%)	6.1	6.1	-

Fourth quarter of 2022 compared with Fourth quarter of 2021

In 4Q2022, sales revenue of Coal business was Baht 8,075 million, increasing by Baht 2,301 million or 39.9% compared with 4Q2021 mainly due to the increase in average selling price by US\$ 72.6 per ton or 76.2% from US\$ 95.3 per ton in 4Q2021 to US\$ 167.9 per ton in 4Q2022 following the increase in Newcastle referenced price which increase more than 100.0% as many countries reduce and stop the import of Russian coal, thus, more demand for coal from Australia. However, sales volume decreased by 0.4 million tons or 22.2% from 1.8 million tons in 4Q2021 to 1.4 million tons in 4Q2022, follow the production plan.

EBITDA in 4Q2022 was Baht 4,210 million, increasing by Baht 1,267 million or 43.1% from 4Q2021 mainly from higher gross profit due to higher average selling price as aforementioned despite higher mining cost following higher prices of coal and gasoil. Furthermore, in 4Q2022, the Indonesian government has raised the royalty rate since September

2022 as well as a farther Over Burden distance, causing the increase in fuel consumption. The operating income was Baht 4,203 million in 4Q2022, increasing by Baht 1,946 million or 86.2% mainly from the increase in EBITDA. Consequently, the overall performance of Coal business improved.

Fourth quarter of 2022 compared with Third quarter of 2022

In 4Q2022, sales revenue of Coal business was Baht 8,075 million, decreasing by Baht 1,115 million or 12.1% compared with 3Q2022 mainly due to the decrease in sales volume by 0.2 million tons or 12.5% from 1.6 million tons in 3Q2022 to 1.4 million tons in 4Q2022, mainly due to the decrease in production according to the production plan. Even though, average selling price increased by US\$ 15.4 per ton or 10.1% from US\$ 152.5 per ton in 3Q2022 to US\$ 167.9 per ton in 4Q2022 from more export sales which has a higher selling price than domestic sales despite the decrease in Newcastle referenced price as the demand from Europe started to stabilize due to stocking of the natural gas during October to November to cope with winter demand including demand in China was limited from the implementation of Zero-COVID policy.

EBITDA in 4Q2022 was Baht 4,210 million, decreasing by Baht 787 million or 15.7% mainly from lower sales volume as aforementioned, together with higher mining cost following higher royalty rate, and the farther Over Burden distance as aforementioned. Operating income was Baht 4,203 million in 4Q2022, decreasing by Baht 49 million or 1.2% in accordance with the decrease in EBITDA. As a result, Coal business's overall performance was dropped.

2022 compared with 2021

In 2022, sales revenue of Coal business was Baht 33,599 million, increasing by Baht 16,616 million or 97.8% compared with 2021 mainly due to the increase in average selling price by US\$ 73.4 per ton or 88.4% from US\$ 83.0 per ton in 2021 to US\$ 156.4 per ton in 2022 following the increase in Newcastle referenced price which increase more than 100.0% while sales volume was close to 2021 following the production plan.

EBITDA in 2022 was Baht 18,347 million, increasing by Baht 11,189 million or more than 100.0% from 2021 mainly due to the increase in gross profit following higher average selling price despite higher mining cost following higher coal and fuel prices, higher royalty rate, and the farther Over Burden distance as aforementioned. Operating income in 2022 was Baht 16,509 million, increasing by Baht 11,105 million or more than 100.0% in accordance with the increase in EBITDA, resulting in an increase in overall performance.

2. Downstream Petroleum Business Group

Oil and Retail Business Group

	4Q2021	3Q2022	4Q2022	%Inc. (Dec.)		2021	2022	%Inc. (Dec.)
				YoY	QoQ			
Average Sales Volume* (Unit: Million Liter)	6,476	6,284	6,979	7.8%	11.1%	23,145	26,846	16.0%
Average Selling Prices (Unit: US\$ per barrel)								
Gasoline	93.8	110.1	94.2	0.4%	(14.4%)	80.3	115.2	43.5%
Aviation	88.6	129.3	118.3	33.5%	(8.5%)	75.1	126.6	68.6%
Diesel	89.8	132.1	124.2	38.3%	(6.0%)	76.0	130.6	71.8%

*The average sales volume of domestic oil segment only

Fourth quarter of 2022 compared with Fourth quarter of 2021

In 4Q2022, sales revenue of Oil and Retail business group was Baht 206,655 million, increasing by Baht 48,390 million or 30.6% from 4Q2021 due to higher average selling price compared to 4Q2021 which was in line with the rising of global oil price. Additionally, sales volume increased by 503 million liters or 7.8% from 6,476 million liters or equivalent to 442,757 barrels per day in 4Q2021 to 6,979 million liters or equivalent to 477,147 barrels per day in 4Q2022, mainly from the increase of sales volume of aviation following more travel from better COVID-19 situation. While diesel's sales volume increased a few from power plant sector which switched to use diesel instead of natural gas. Non-oil business' revenue increased mostly from higher sales volume as expanding food and beverage business's and convenient store's network.

In 4Q2022, EBITDA was Baht 1,337 million, decreasing from 4Q2021 by Baht 3,176 million or 70.4% due to lower Oil business group's gross margin, as a result of lower overall average gross margin per liter, mainly from diesel and gasoline following the increased cost from importing the products during domestic main oil refinery turnaround period. While Non-oil business group's gross margin increased in line with higher sales and services revenue. As a result, the overall performance of Oil and retail business declined compared to 4Q2021 following lower EBITDA. The operating loss in 4Q2022 was Baht 321 million, while the operating income in 4Q2021 was Baht 2,939 million.

Fourth quarter of 2022 compared with Third quarter of 2022

In 4Q2022, sales revenue of Oil and Retail business group was Baht 206,655 million, increasing by Baht 11,499 million or 5.9% from 3Q2022 due to overall sales volume increased by 695 million liters or 11.1% from 6,284 million liters or equivalent to 429,630 barrels per day in 3Q2022 to 6,979 million liters or equivalent to 477,147 barrels per day in 4Q2022, mainly from diesel and aviation. Diesel's sales volume increased from power plant sector which switched to use diesel instead of natural gas, and increased from marine vessel customers. Aviation's sales volume increased from more travel following high season, better COVID-19 situation, and country reopening. Non-oil business' revenue increased from higher Café amazon's products' prices.

In 4Q2022, EBITDA was Baht 1,337 million, decreasing by Baht 1,450 million or 52.0% from 3Q2022 from the lower of Oil business' overall average gross margin per liter decreased which was mainly from importing diesel during domestic main oil refinery turnaround period, in order to support higher demand in year-end period. Non-oil business' gross margin increased in line with higher food and beverage business's and other retail business's sales and services revenue. As a result, the overall performance of Oil and Retail business declined compared to 3Q2022 following lower EBITDA. The operating loss in 4Q2022 was Baht 321 million, while the operating income in 3Q2022 was Baht 1,167 million.

2022 compared with 2021

In 2022, sales revenue of Oil and Retail business group was Baht 791,745 million, increasing by Baht 277,850 million or 54.1% from 2021 mostly due to higher average selling price following higher global oil price. In addition, the overall sales volume increased by 3,701 million liters or 16.0% from 23,145 million liters or equivalent to 398,851 barrels per day in 2021 to 26,846 million liters or equivalent to 462,629 barrels per day in 2022, mainly from diesel, aviation, and fuel oil, as the recovery of travel sector and service sector. Additionally, sales volume of fuel oil and diesel increased from power plant sector which switched to use diesel instead of natural gas, and increased from international marine vessel customers. Non-oil business' revenue increased from the increasing sales volume which resulted from expanding food and beverage stores network.

EBITDA in 2022 was Baht 20,962 million, slightly increased from 2021 by Baht 155 million or 0.7% from increasing Non-oil business's gross margin according to higher sales and services revenue of food and beverage business as well as other retail business. While EBITDA of Oil business decreased from lower gross margin following lower overall average gross margin per liter mainly from gasoline and diesel which increase in cost from importing the products in 4Q2022 during domestic main oil refinery turnaround period. The operating income in 2022 was Baht 14,614 million, decreasing by Baht 285 million or 1.9% in line with lower EBITDA of Oil business. As a result, the overall performance of Oil and Retail business has declined slightly from previous year.

International Trading Business Group

Unit : Million Liter	4Q2021	3Q2022	4Q2022	%Inc. (Dec.)		2021	2022	%Inc.(Dec.)
				YoY	QoQ			
Average sales volume	25,082	40,064	22,257	(11.3%)	(44.4%)	79,134	127,082	60.6%

Fourth quarter of 2022 compared with Fourth quarter of 2021

In 4Q2022, sales revenue of International Trading business was Baht 441,837 million, increased by Baht 63,761 million or 16.9% from 4Q2021 due to the increase in product selling prices following the rise in global oil price while sales volume decreased by 2,825 million liters or 11.3% from 25,082 million liters or equivalent to 1,714,829 barrels per day in

4Q2021 to 22,257 million liters or equivalent to 1,521,687 barrels per day in 4Q2022 mainly from lower volume of crude imports for domestic refineries following the planned maintenance shutdown.

EBITDA, adjusted by the impact from foreign exchange rate and derivatives, in 4Q2022 was loss Baht 366 million, decreased by Baht 1,815 million or more than 100.0% mainly from the decrease in spreads of domestic condensate and out-out refined products following the decreased in global oil and referenced prices as well as the decrease in sales volume as aforementioned. The operating loss, adjusted by the impact from foreign exchange rate and derivatives in 4Q2022 was Baht 654 million, increased by Baht 2,049 million or over 100.0%.

Fourth quarter of 2022 compared with Third quarter of 2022

Sales revenue of International Trading business in 4Q2022 was Baht 441,837 million, decreased by Baht 181,611 million or 29.1% from 3Q2022 due to the decrease in sales volume by 17,807 million liters or 44.4% from 40,064 million liters or equivalent to 2,739,133 barrels per day in 3Q2022 to 22,257 million liters or equivalent to 1,521,687 barrels per day in 4Q2022 mainly from lower volume of crude imports for domestic refineries following the planned maintenance shutdown. Moreover, the volume of LNG imports decreased resulted from the lower demands during winter. In addition, product selling prices decreased in line with global oil price.

EBITDA, adjusted by the impact from foreign exchange rate and derivatives, in 4Q2022 was loss Baht 366 million, decreased by Baht 4,463 million or over 100.0% primarily from the lower margin per unit of out-out refined products and crude trading following the downward trend of global oil price together with loss on mark-to-market inventory in 4Q2022. Moreover, spreads of domestic condensate decreased following oil referenced price as well as the decrease in sales volume as aforementioned. The operating loss, adjusted by the impact from foreign exchange rate and derivatives, in 4Q2022 was Baht 654 million, increased by Baht 4,341 million or more than 100.0%

2022 compared with 2021

Sales revenue of International Trading business in 2022 was Baht 2,172,566 million, increased by Baht 1,026,002 million or 89.5% from 2021 due to higher sales volume by 47,948 million liters or 60.6% from 79,134 million liters or equivalent to 1,363,694 barrels per day in 2021 to 127,082 million liters or equivalent to 2,189,968 barrels per day in 2022. This was mainly from the higher volume of LNG imports to fulfill lower supply of gulf gas and LPG imports as a result of higher customer demand as well as higher volume of crude imports for domestic refineries following the higher demand and the higher volume of crude and refined product out-out tradings as a result of the economic activities recovery from the reopening of the countries in many regions around the world. In addition, product selling price increased following the rise in global oil prices.

EBITDA, adjusted by the impact from foreign exchange rate and derivatives, in 2022 was Baht 8,735 million, increased by Baht 3,299 million or 60.7% primarily from the higher margin per unit of international crude and refined product following product spread as well as the increase in sales volume as aforementioned. The operating income, adjusted by the impact from foreign exchange rate and derivatives in 2022 was Baht 7,781 million, increased by Baht 2,549 million or 48.7%.

Petrochemical and Refinery Business Group

Unit: US\$ per barrel	4Q2021	3Q2022	4Q2022	%Inc. (Dec.)		2021	2022	%Inc. (Dec.)
				YoY	QoQ			
Market GRM	5.5	6.8	7.9	43.6%	16.2%	2.9	10.7	>100.0%
Inventory gain (loss) excl. NRV	1.8	(7.9)	(8.7)	<(100.0%)	(10.1%)	3.3	0.0	(100.0%)
Hedging gain (loss)	(1.4)	0.5	(0.8)	42.9%	<(100.0%)	(1.1)	(5.8)	<(100.0%)
Accounting GRM	5.9	(0.6)	(1.6)	<(100.0%)	<(100.0%)	5.1	4.9	(3.9%)
Refinery Utilization rate (%)	101.5%	97.7%	76.1%	(25.4%)	(21.6%)	95.2%	94.1%	(1.1%)

*From 3 Refineries: TOP, GC and IRPC

Unit : US\$ per Ton	4Q2021	3Q2022	4Q2022	%Inc. (Dec.)		2021	2022	%Inc. (Dec.)
				YoY	QoQ			
Olefins								
Naphtha (MOPJ)	745	714	673	(9.7%)	(5.7%)	646	785	21.5%
HDPE	1,252	1,104	1,033	(17.5%)	(6.4%)	1,181	1,203	1.9%
LDPE	1,592	1,300	1,110	(30.3%)	(14.6%)	1,516	1,428	(5.8%)
LLDPE	1,285	1,100	999	(22.3%)	(9.2%)	1,200	1,208	0.7%
PP	1,335	1,088	995	(25.5%)	(8.5%)	1,321	1,206	(8.7%)
Aromatics								
Condensate	683	820	732	7.2%	(10.7%)	596	830	39.3%
PX (TW)	893	1,088	979	9.6%	(10.0%)	859	1,103	28.4%
PX (TW) – Condensate	210	268	247	17.6%	(7.8%)	263	273	3.8%
BZ	945	978	824	(12.8%)	(15.7%)	914	1,028	12.5%
BZ – Condensate	262	158	92	(64.9%)	(41.8%)	318	198	(37.7%)

Fourth quarter of 2022 compared with Fourth quarter of 2021

In 4Q2022, sales revenue of petrochemical and refining business was Baht 300,459 million, decreasing by Baht 9,585 million or 3.1% primarily due to Petrochemical business from both Aromatics business and Olefins business due to the decrease in sales volume as a result of production adjustment aligning with market conditions and GC IRPC and TOP's refineries major turnaround in 4Q2022 as well as lower selling price of PE and BZ following global market price as a result of economic slowdown and COVID-19 control measures in China.

Moreover, refinery business decreased mainly from the decrease in sales volume mainly due to PTT Group refineries' utilization rates decreased from 101.5% in 4Q2021 to 76.1% in 4Q2022 mainly from major turnaround as aforementioned in spite of the increase in average selling price following the increase in petroleum product prices.

EBITDA of Petrochemical and Refining business in 4Q2022 was loss of Baht 4,600 million decreasing by Baht 28,173 million or more than 100.0% from gain of Baht 23,573 million in 4Q2021. There was operating loss of Baht 15,600 million in 4Q2022, loss increasing by Baht 29,262 million or more than 100.0% when compared to operating income of Baht 13,662 million in 4Q2021 details as follows:

- **Refinery performance** decreased due to the higher stock loss (There was stock loss of US\$ 8.7 per bbl in 4Q2022 versus gain of US\$ 1.8 per bbl in 4Q2021) Conversely, Market GRM increased from US\$ 5.5 per bbl in 4Q2021 to US\$ 7.9 per bbl in 4Q2022 mainly from the increase in Gasoline and Aviation's product spreads despite the decrease in sales volume as aforementioned.
- **Petrochemical performance** also decreased mainly from both Olefins business and Aromatics business due to the decrease in sales volume as aforementioned and the decrease in almost of petrochemical product spread.

The overall performance of Petrochemical and Refining business in 4Q2022 decreased compared to 4Q2021 due to an increase in operating loss as aforementioned and loss on derivatives mainly from financial hedging instruments despite the increase in gain on exchange rates.

Fourth quarter of 2022 compared with Third quarter of 2022

In 4Q2022, sales revenue of Petrochemical and Refining business was Baht 300,459 million, decreasing by Baht 82,162 million or 21.5% primarily due to Refinery business mainly from the decrease in sales volume due to PTT Group refineries' utilization rates decreased from 97.7% in 3Q2022 to 76.1% in 4Q2022 mainly due to major turnaround of refinery plant as aforementioned as well as the decrease in average selling price following the decrease in global refined product price.

In addition, the sales revenue of Petrochemical business also decreased mainly from Aromatics business due to the decrease in sales volume as a result of production adjustment aligning with market conditions and refineries major turnaround in 4Q2022 as well as lower almost all petrochemical selling prices following global market price.

EBITDA of Petrochemical and Refining business in 4Q2022 were loss of Baht 4,600 million decreasing by Baht 4,044 million or decreasing more than 100.0% from loss of Baht 556 million in 3Q2022. There was operating loss of Baht

15,600 million in 4Q2022, decreasing by Baht 4,059 million or 35.2% when compared to operating loss of Baht 11,541 million in 3Q2022 details as follows:

- **Petrochemical performance** decreased mainly from both Olefins business and Aromatics business due to the decrease in petrochemical product spread and the decrease in sales volume as aforementioned.
- **Refinery performance** also decreased, according to the decrease in sales volume as aforementioned. Conversely, Market GRM increased from US\$ 6.8 per bbl in 3Q2022 to US\$ 7.9 per bbl in 4Q2022 mainly from the increase in Gasoil and Aviation's product spreads from tightened supply and the decrease in crude premium due to lower demand following economic slowdown. In addition, the overall stock loss decreased.

The overall performance of Petrochemical and Refining business in 4Q2022 was increased compared to 3Q2022 due to the significant increase in gain on exchange rates despite the increase in operating loss as aforementioned and the increase in loss on derivatives from both financial and oil price hedging instruments.

2022 compared with 2021

In 2022, sales revenue of Petrochemical and Refining business was Baht 1,473,678 million, increasing by Baht 436,402 million or 42.1% primarily due to Refinery business mainly from the increase in average selling price following crude oil price, overall sales volume also increased following economic recovery.

The sales revenue of petrochemical business also increased from Olefins and Aromatics businesses despite the decrease in sales volume due to planned maintenance shutdown aligning with market conditions and refinery major turnaround in 4Q2022.

EBITDA of Petrochemical and Refining business in 2022 was Baht 109,719 million decreasing by Baht 11,014 million or 9.1% from Baht 120,733 million in 2021. There was operating income of Baht 66,181 million in 2022, decreasing by Baht 15,607 million or 19.1% when compared to Baht 81,788 million in 2021 details as follows:

- **Petrochemical performance** decreased mainly from both Olefins business and Aromatics business due to the decrease in most of product spread and the decrease in sales volume as aforementioned.
- However, **Refinery performance** increased due to the higher Market GRM from US\$ 2.9 per bbl in 2021 to US\$ 10.7 per bbl in 2022 mainly from the increase in most of petroleum product spreads as well as the increase of sales volume. However, there is lower stock gain in this year.

The overall performance of Petrochemical and Refining business in 2022 decreased compared with 2021 due to the decrease in operating performance as aforementioned. In addition, there was a recognition of higher loss on derivatives mainly from oil price hedging instruments despite the decrease of loss on exchange rates.

3. New Business and Infrastructure Group

	4Q2021	3Q2022	4Q2022	%Inc. (Dec.)		2021	2022	%Inc. (Dec.)
				YoY	QoQ			
Power sales volume (GWh)	5,295	5,494	5,695	7.6%	3.7%	20,148	21,531	6.9%
Steam sales volume (Thousand tons)	3,741	3,831	3,222	(13.9%)	(15.9%)	15,090	14,509	(3.9%)

Fourth quarter of 2022 compared with Fourth quarter of 2021

In 4Q2022, sales revenue of New Business and Infrastructure group was Baht 42,975 million, increased by Baht 18,712 million or 77.1% mainly from GPSC which Energy Payment (EP) revenue from IPP power plants (IPP) increased due to higher electricity dispatch instructed by EGAT. Furthermore, the revenue of SPP power plants also increased due to higher average electricity and steam selling prices as well as higher dispatch volume to EGAT, despite a decline in electricity and steam sales volume to industrial customers following the customers' plants maintenance. In addition, PTTGM started to recognize revenue from pharmaceutical business of Lotus Pharmaceuticals, Inc. since April 2022.

EBITDA, in 4Q2022, was Baht 2,447 million, decreased by Baht 1,976 million or 44.7% mainly from lower gross profit of GPSC following a decrease in gross profit of SPP power plants due to significantly higher natural gas and coal costs. This resulted in lower profit margin of electricity sell to industrial customers. Although, gross profit of IPP power plants improved from using diesel as the alternative fuel instead of natural gas. In addition, PTTGM recognized higher gross profit from pharmaceutical business. As a result, the operating loss in 4Q2022 was Baht 868 million, loss increased by Baht 2,550 million or over 100.0% from gain of Baht 1,682 million in 4Q2021. In this regard, the overall performance of New Business and Infrastructure group decreased mainly from GPSC's overall performance due to the decrease in EBITDA as aforementioned.

Fourth quarter of 2022 compared with Third quarter of 2022

In 4Q2022, sales revenue of New Business and Infrastructure group was Baht 42,975 million, increased by Baht 60 million or 0.1% mainly from GPSC following higher EP revenue of IPP power plant as a result of higher electricity dispatch instructed by EGAT. Despite, lower PTTGM's sales revenue in pharmaceutical business as there was a large order in 3Q2022 after launched a new generic drug in the U.S. market, which is the Lenalidomide used to treat a certain type of cancers.

EBITDA in 4Q2022 was Baht 2,447 million, decreased by Baht 4,162 million or 63.0% mainly from the decrease in PTTGM's gross profit following the decrease in revenue from pharmaceutical business as aforementioned. In addition, GPSC's gross profit also decreased following lower gross profit of SPP power plants. This was due to the increase in natural gas and coal costs combined with lower electricity and steam sales volume to industrial customers following the customers' plants maintenance during the quarter. As a result, the operating loss in 4Q2022 was Baht 868 million, loss increased by Baht

3,731 million or over 100.0% from 3Q2022. The overall performance of New Business and Infrastructure group decreased in accordance with lower EBITDA as aforementioned. In addition, GPSC also recognized lower share of profit from Xayaburi Power Plant due to lower water level according to seasonality resulting in lower electricity production.

2022 compared with 2021

In 2022, sales revenue of New Business and Infrastructure group was Baht 148,424 million, increased by Baht 67,162 million or 82.6%. This was mainly from GPSC which has higher revenue of SPP power plants due to the increase in average electricity and steam selling prices, together with higher EP revenue of IPP power plants due to higher dispatch sales volume to EGAT. In addition, PTTGM started to recognize revenue from pharmaceutical business of Lotus Pharmaceuticals, Inc. since April 2022.

EBITDA, in 2022, was Baht 16,392 million, decreased by Baht 4,526 million or 21.6% mainly from lower gross profit of GPSC following lower gross profit of SPP power plants. This was due to the significant increase in natural gas and coal costs, resulting in a decrease of profit margin on electricity sales to industrial customers, while Ft has yet to adequately catch up with the rising fuel cost. Nevertheless, IPP power plants' gross profit improved from using diesel as alternative fuel instead of natural gas. In this regard, in 2022, operating income was Baht 3,440 million, decreased by Baht 6,742 million or 66.2% in accordance with lower EBITDA. As a result, the overall performance of New Business and Infrastructure group decreased mainly from lower performance of GPSC, despite recognized higher share of profit from Xayaburi Power Plant due to higher water level compared to 2021.

Overall Performance of PTT and its Subsidiaries

Fourth quarter of 2022 compared with Fourth quarter of 2021

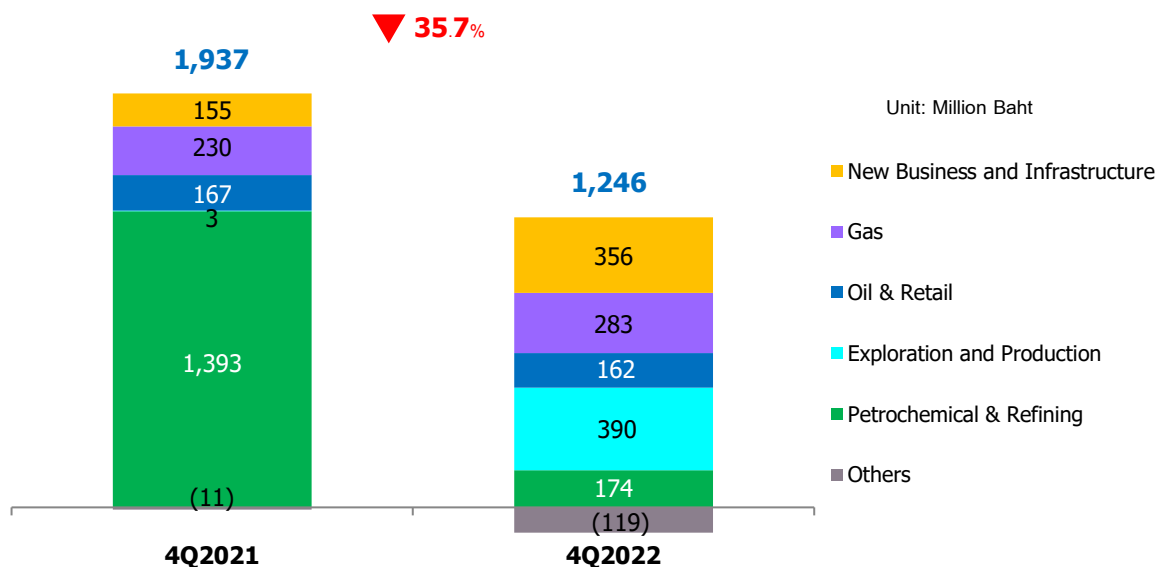
In 4Q2022, sales revenue of PTT and its subsidiaries was reported at Baht 797,174 million increased from 4Q2021 by Baht 108,337 million or 15.7% from most of businesses. Sales revenue of International Trading business increased due to higher average selling price despite sales volume decreases. Sales revenue of Oil and Retail business and Exploration and Production business increased as a result of higher average selling price following the rise in global crude oil price and product prices as well as higher overall sales volume according to the recovery of economic activities from the easing of COVID-19 restrictions. In addition, sales revenue of Gas business increased mainly from Supply and Marketing business following the higher pool gas price, although sales volume dropped compared to the same period last year mainly from the adjustment of fuel management plan of power plant customers which switched to use diesel instead of natural gas as well as lower supply of gulf gas during the transition of operator for G1/61 concession resulting to lower sales volume to Gas Separation Plant business. Furthermore, Sales revenue of New Business and Infrastructure

also increased from higher electricity and steam selling prices in accordance with higher natural gas and coal prices together with revenue recognition of pharmaceutical business from Lotus which was acquired since April 2022. However, Sales revenue of Petrochemical and Refining business decreased mainly from lower sales volume resulted from production cuts and planned maintenance shutdown of refineries and petrochemical plants in 4Q2022.

EBITDA in 4Q2022 was Baht 73,542 million, decreased by Baht 27,729 million or 27.4 % mainly from Petrochemical and Refining business mainly from increasing in PTT Group's stock loss approximately Baht 25,000 million. Refining business's performance decreased due to lower sales volume. However, market GRM rose from US\$ 5.5 per bbl in 4Q2021 to US\$ 7.9 per bbl in 4Q2022 from the rising in spread between diesel and aviation fuel to crude oil. Moreover, Petrochemical business's performance also decreased from lower sales volume together with lower in most of product spreads. International Trading business's performance decreased as a result of lower product spreads of domestic condensate and international refined products. In addition, Gas business's performance decreased from lower gross profit of GSP due to higher gas cost following the increase of gulf gas price as well as lower overall average selling price and sales volume. Loss from NGV business's performance increased along with higher gas cost owing to higher pool gas price and the incremental cost from the EPP policy. Moreover, Oil and Retail business's performance also decreased primarily from drop in overall average gross margin per liter mainly from diesel and gasoline following the increased cost from products import during the main domestic oil refinery turnaround period. However, Exploration and Production business's performance rose from the increase in both of average sales volume and average selling price.

The depreciation and amortization expenses of 4Q2022 were Baht 44,681 million, increased by Baht 10,830 million or 32.0% mainly from PTTEP due to Bongkot Project and first production of G1/61 Project as well as GC as a result of acquisition of Allnex in December 2021.

Share of profit from investments in joint ventures and associates



In 4Q2022, the share of profit from investments in joint ventures and associates was Baht 1,246 million, decreased by Baht 691 million or 35.7% from 4Q2021. This was primarily from lower performance of joint ventures in Petrochemical and Refining businesses mainly from PTT Asahi Chemical Company Limited (PTTAC) and HMC Polymers Company Limited (HMC) due to lower product to feed.

In 4Q2022, loss on derivatives was Baht 4,502 million, loss increased by Baht 4,330 million or more than 100.0% mainly from financial derivatives of GC and PTTEP.

In 4Q2022, gain on foreign exchange rate was Baht 32,711 million, gain increased by Baht 27,572 million or more than 100.0% mainly from increasing in unrealized gain on US currency loans as a result of more Thai Baht appreciation compared to the same period last year. (Thai Baht appreciation in 4Q2022 closed of Baht 3.34 per US Dollar, Thai Baht appreciation in 4Q2021 closed of Baht 0.50 per US Dollar).

Finance costs was Baht 10,355 million in 4Q2022 increased by Baht 3,202 million or 44.8% mainly from increasing in loans of GC, PTT, and PTTEP.

In 4Q2022, there were loss recognition of non-recurring items (PTT's portion) after tax approximately by Baht 7,700 million. Meanwhile, in 4Q2021 there were loss recognition approximately of Baht 6,900 million (see appendix).

The corporate income taxes in 4Q2022 was Baht 17,352 million, decreased by Baht 2,296 million or 11.7% mainly from lower performance of GC, IRPC, and OR. However, corporate income taxes of PTTEP increased from higher performance.

As aforementioned, this was resulted in PTT Group's net profit in 4Q2022 amounting to Baht 17,872 million, decreased by Baht 9,672 million or 35.1% from the net profit amounting to Baht 27,544 million in 4Q2021.

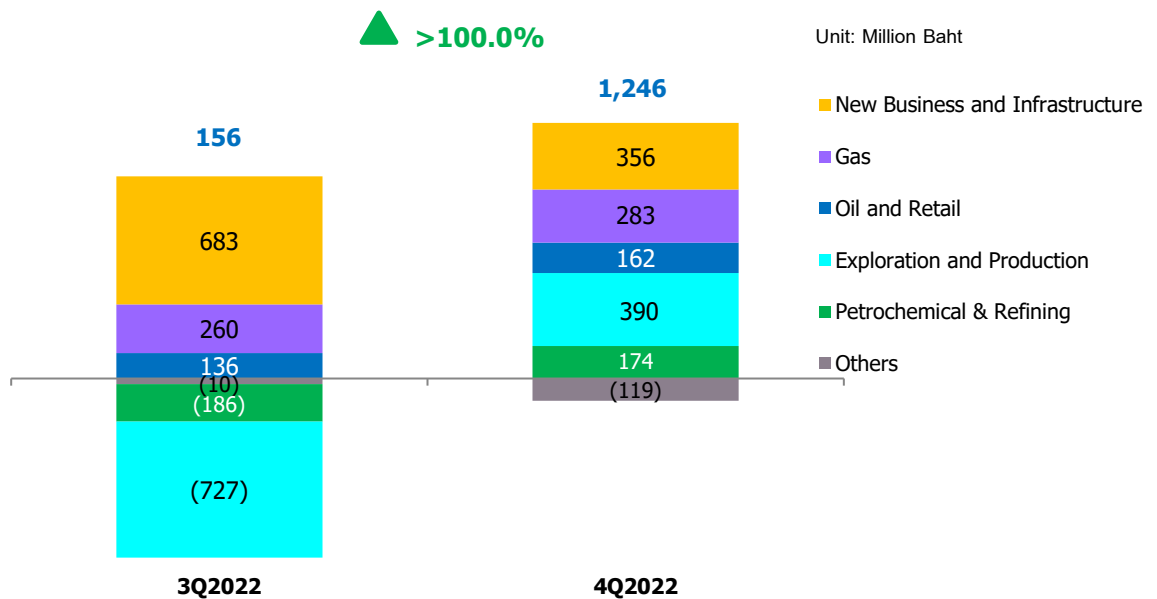
Fourth quarter of 2022 compared with Third quarter of 2022

In 4Q2022, PTT and its subsidiaries' sales revenue was reported at Baht 797,174 million, decreased from 3Q2022 by Baht 87,436 million or 9.9%. Sales revenue of International Trading and Petrochemical and Refining businesses decreased due to lower sales volume and lower average selling price according to the decrease in global product prices. Moreover, Gas business's revenue decreased due to lower pool gas and referenced prices together with lower sales volume compared to the previous quarter mainly from the adjustment of fuel management plan of power plant customers by operating with oil instead of natural gas as well as lower household's electricity demand during winter. However, sales revenue of Oil and Retail business increased from higher overall sales volume of diesel and aviation fuel, due to higher sales volume to power plants sector which was in need of diesel as substituted fuel of natural gas, increased in cargo ship sector, as well as better COVID-19 situation and the country reopening.

EBITDA, in 4Q2022, was Baht 73,542 million, decreased by Baht 18,735 million or 20.3% mainly from the decrease in the performance of International Trading business from lower margin per unit of international crude and refined products trading along following the downward trend of global oil price and recognition of loss from Mark-to market. New Business and Infrastructure's performance dropped following the decrease in gross profit of PTTGM due to lower revenue from pharmaceutical business and GPSC from lower SPP power plants' gross profit because of higher fuel costs. Petrochemical and Refining business's performance also decreased. Petrochemical business's performance decreased from lower product spreads, together with lower sales volume. Moreover, the performance of Refining business dropped due to lower sales volume, despite Market GRM increased from US\$ 6.8 per bbl in 3Q2022 to US\$ 7.9 per bbl in 4Q2022 mainly from higher spread between diesel and aviation fuel to crude oil as well as lower crude premium. In addition, PTT Group's stock loss decreased approximately Baht 7,500 million. Moreover, Gas business's performance increased primarily from S&M and NGV due to the decreased in natural gas cost following the decrease of pool gas price.

The depreciation and amortization expenses in 4Q2022 were Baht 44,681 million, which was close to 3Q2022.

Share of profit from investments in joint ventures and associates



In 4Q2022, the share of profit from investments in joint ventures and associates was Baht 1,246 million, increased by Baht 1,090 million or over 100.0% mainly from the performance of joint ventures in Exploration and Production business due to APICO LLC's wells written off in Thailand in 3Q2022.

In 4Q2022, there was loss on derivatives amounting to Baht 4,502 million, loss increased by Baht 17,574 million or over 100.0% mainly from loss on finance derivatives from PTTEP and GC, together with lower gain on commodity price hedging instruments from TOP and PTTEP due to upward trend of forward oil price.

In 4Q2022, gain on foreign exchange was Baht 32,711 million, gain increased by Baht 52,561 million or over 100.0% mainly from unrealized gain on US currency loans and realized gain on accounts payable as a result of Baht appreciation in this quarter compared to Baht depreciation in previous quarter (Thai Baht appreciation in 4Q2022 closed of Baht 3.34 per US Dollar, while Thai Baht depreciation in 3Q2022 closed of Baht 2.61 per US Dollar).

Finance costs was Baht 10,355 million in 4Q2022 which was close to 3Q2022.

In 4Q2022, there were loss recognition of non-recurring items (PTT's portion) after tax approximately by Baht 7,700 million. Meanwhile, in 3Q2022 there were loss recognition approximately of Baht 2,000 million (see appendix).

The corporate income taxes in 4Q2022 was Baht 17,352 million, increased by Baht 967 million or 5.9% result primarily from higher performance of PTT.

As previously mentioned, this was resulted in PTT and its subsidiaries' net profit in this quarter amounting to Baht 17,872 million, increased by Baht 8,988 million or over 100.0% from net profit of Baht 8,884 million in 3Q2022.

2022 compared 2021

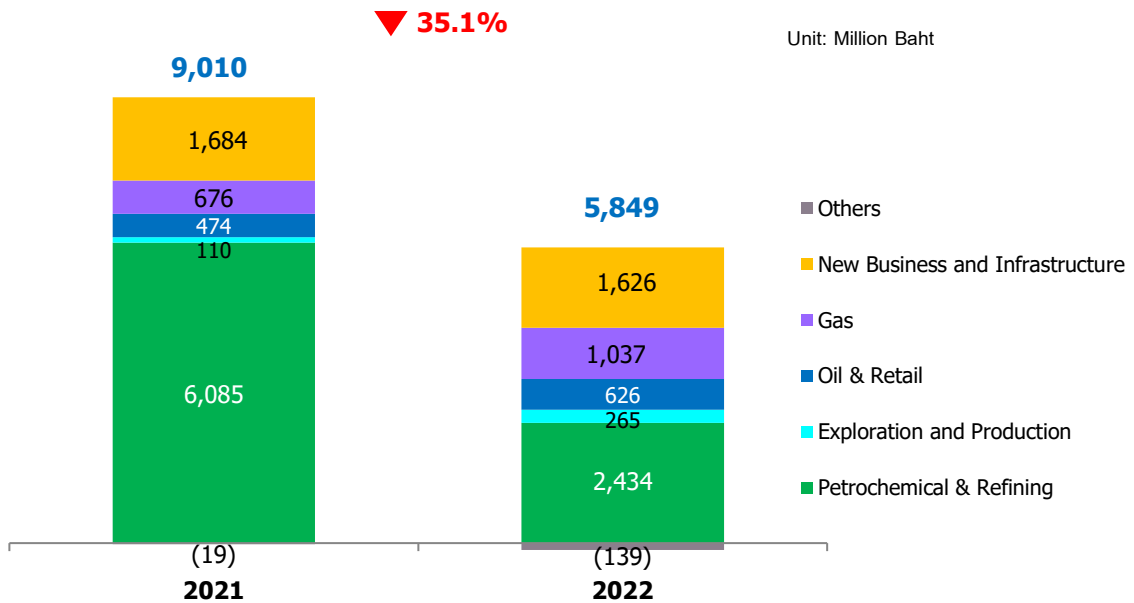
In 2022, sales revenue of PTT and its subsidiaries was reported at Baht 3,367,203 million increased from 2021 by Baht 1,108,385 million or 49.1% from all businesses. Sales revenue of International Trading business, Petrochemical and Refining business, Oil and retail business and Exploration and Production business increased due to higher average selling price and overall sales volume according to the economic activities recovery as aforementioned. Sales revenue of Gas business increased due to higher average selling price following pool gas price and referenced prices, while sales volume decreased mainly from lower supply of gulf gas during the transition of operator for G1/61 concession as aforementioned.

EBITDA in 2022 was Baht 491,288 million, increased by Baht 63,332 million or 14.8%. This was mainly from the increase in Exploration and Production business performance from higher average selling price and average sales volume. In addition, performance of coal business increased following higher average selling price. However, Gas business's performance decreased from higher gas cost owing to higher pool gas price. Petrochemical and Refining business' performance decreased mainly from petrochemical due to lower most of petrochemical product spreads. Meanwhile, Refining business's performance improved as Market GRM increased from US\$ 2.9 per bbl in 2021 to US\$ 10.7 per bbl in 2022 due to the increase in overall product spreads, while PTT Group's stock gain decreased approximately Baht 42,000 million following the decrease in crude oil price in 2H2022.

The depreciation and amortization expenses of 2022 were Baht 167,330 million, increased by Baht 20,540 million or 14.0% mainly from PTTEP as a result of first production of G1/61 and Malaysia Projects which had higher sales

volume, GC as a result of acquisition of Allnex in December 2021 and PTTGM primarily from investment in pharmaceutical business in April 2022.

Share of profit from investments in joint ventures and associates



In 2022, the share of profit from investments in joint ventures and associates was Baht 5,849 million, decreased by Baht 3,161 million or 35.1%. This was primarily from lower performance of joint venture in Petrochemical and Refining business as aforementioned.

In 2022, loss on derivatives increased by Baht 42,956 million, from loss on derivatives of Baht 31,958 million in 2021 to loss on derivatives of Baht 74,914 million in 2022 mainly from loss on oil and commodities price hedging transactions from P&R business due to actual oil price and products spread were higher than hedged price.

Gain on foreign exchange rate increased by Baht 12,021 million from loss Baht 6,469 million in 2021 to gain Baht 5,552 million in 2022 mainly from decrease in unrealized loss on US currency loans as Baht lower depreciation compared to the same period last year. (Thai Baht depreciation in 2022 closed of Baht 1.14 per US Dollar, while Thai Baht depreciation in 2021 closed of Baht 3.38 per US Dollar).

Finance costs was Baht 37,091 million in 2022 increased by Baht 8,928 million from 2021 mainly from the increase of loan of GC PTTEP and PTT.

In 2022, there were loss recognition of non-recurring items (PTT's portion) after tax approximately Baht 10,200 million. Meanwhile, in 2021 there were the loss recognition approximately by Baht 6,900 million (see appendix).

The corporate income taxes in 2022 was Baht 90,462 million, increased by Baht 22,872 million or 33.8% mainly from PTTEP and TOP following higher performance, while corporate income taxes of GC and PTT decreased in line with lower performance.

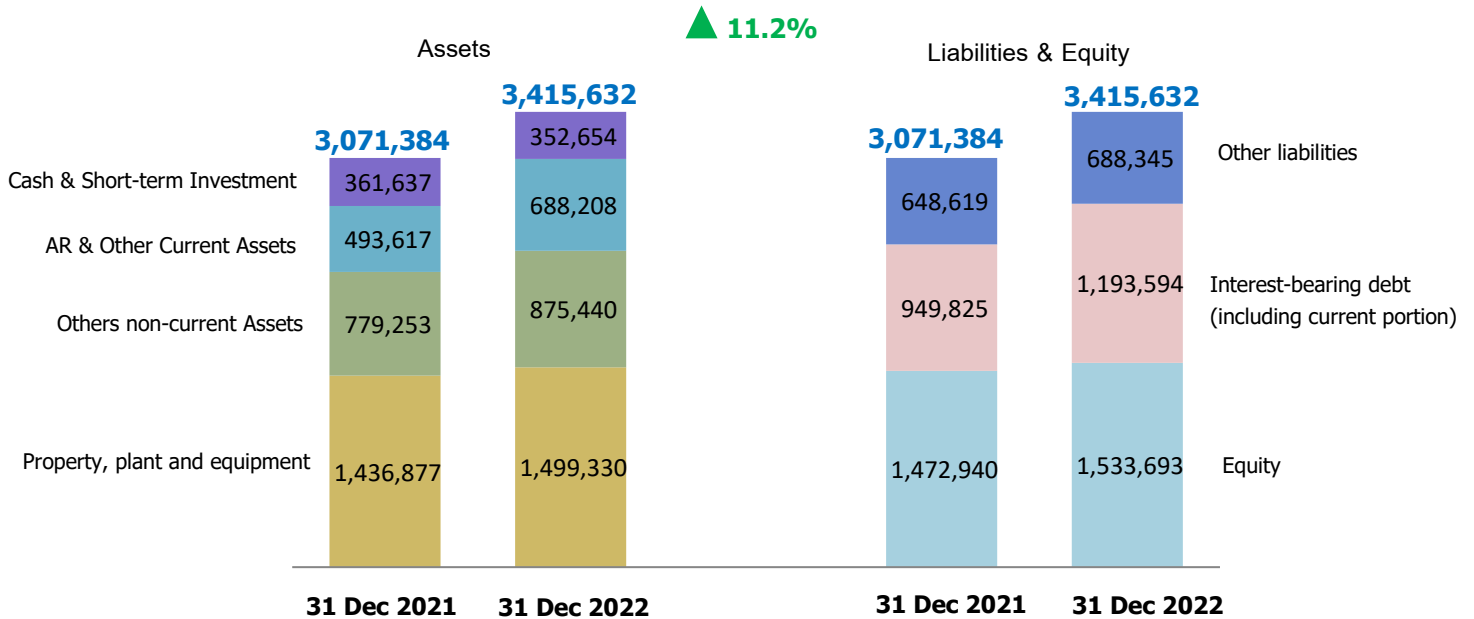
As aforementioned, this was resulted in PTT Group's net profit in 2022 amounting to Baht 91,175 million, decreased by Baht 17,188 million or 15.9% from the net profit amounting to Baht 108,363 million in 2021.



The Analysis of PTT Group Consolidated Financial Position

As of December 31, 2022 compared with December 31, 2021

Unit: Million Baht



Assets

As of 31 December 2022, total assets of PTT Group were Baht 3,415,632 million, increasing by Baht 344,248 million or 11.2% compared with 31 December 2021 mainly from following:

- : Cash and cash equivalents and short-term investments decreased by Baht 8,983 million mainly from PTT Group's investing activities
- : AR & Other Current Assets increased by 194,591 million or 39.4 % mainly from the following:
 - Inventories increased by Baht 51,525 million due to overall higher price and inventory level from TOP, PTT, IRPC, GC and GPSC.
 - Trade accounts receivables increased by Baht 22,812 million mainly from overall higher average selling price following market price of PTT, OR and GPSC.
- : Other non-current assets increased by Baht 96,187 million or 12.3% mainly from
 - Long-term investments increased by Baht 43,865 million from the increased investment in associates mainly from GPSC's investment in CI Changfang and CI Xidao, the purchasing additional shares in Vinythai (VNT) of GC as well as the increase in long-term investments in financial assets in Contemporary Amperex Technology Co., Ltd. (CATL) of PTTGM.
 - Right-of-use assets increased by Baht 43,664 million mainly from G1/61 Project and G2/61 Project of PTTEP

: Property, plant, and equipment (PPE) increased by Baht 62,453 million or 4.4% mainly from PTTEP's exploration and evaluation assets of G1/61 Project and G2/61 Project and TOP's additional construction in progress of Clean Fuel Project (CFP).

Liabilities

As of 31 December 2022, PTT Group had total liabilities of Baht 1,881,939 million, increasing by Baht 283,495 million or 17.7% from 31 December 2021, mainly from the following:

: Other liabilities increased by Baht 39,726 million or 6.1% mainly from the increase in trade accounts payables due to the increase in purchasing volume and prices mainly from PTT as well as the increase in commodity derivatives primarily from PTTT and the increase in provision for decommissioning costs of G1/61 Project and G2/61 Project of PTTEP.

: Interest-bearing debt increased by Baht 243,769 million or 25.7% due to the increase in long-term loans and bond by Baht 124,308 million mainly from GC, PTT, TOP, and GPSC as well as the increase in short-term loans by Baht 79,798 million mainly from TOP, IRPC, and GC.

Equity

As of 31 December 2022, PTT Group had total shareholders' equity of Baht 1,533,693 million, increasing by Baht 60,753 million or 4.1% from 31 December 2021 as PTT Group reported 2022 net income amounting to Baht 91,175 million offset with dividend payment from the operating results of the second half of 2021 amounting to 0.80 Baht per share and the first half of 2022 amounting to 1.30 Baht per share which total amount is approximately Baht 60,000 million. Additionally, non-controlling interests increased by Baht 14,859 million mainly from higher net income of subsidiaries.

Liquidity

For the year-ended 31 December 2022, PTT Group had net increase in cash and cash equivalents amounting to Baht 27,324 million. There was cash and cash equivalents at the beginning of the period of Baht 312,730 million. As a result, cash and cash equivalents at the end of the period was Baht 340,054 million. Details of cash flow by activities are as follows:

	Unit: Million Baht
	PTT Group
Net cash provided by operating activities	191,700
Net cash used in investing activities	(186,690)
Net cash provided by financing activities	50,668
Effects of exchange rates on cash and cash equivalents	697
Exchange differences on translation	(20,287)
Cash and cash equivalents classified as held for sale	(8,764)
Net increase in cash and cash equivalents during the period	27,324
Cash and cash equivalents at the beginning of the period	312,730
Cash and cash equivalents at the end of the period	340,054

Net cash provided by operating activities of Baht 191,700 million was derived from Baht 212,562 million of profit before income taxes, adjusted to net cash provided by (used in) operating activities. The increase in net cash flow from operating activities mainly resulted from Baht 167,330 million of depreciation and amortization expenses, Baht 37,091 million of finance costs, Baht 12,304 million of loss on impairment of assets, Baht 11,649 million of loss on foreign exchange rate, Baht 10,243 million of loss on derivatives, Baht 7,920 million of unrealized loss on fair value of commodity contracts. The decrease in net cash flow from operating activities mainly resulted from Baht 5,849 million of share of profit from investments in joint ventures and associates, and the change in net operating assets resulting in the decrease in cash flow of Baht 178,970 million while income taxes paid of Baht 85,482 million.

Net cash used in investing activities was Baht 186,690 million mainly resulted from the following:

: The cash outflow of investments in property, plant and equipment, investment property, intangible assets, and exploration and evaluation assets amounting to Baht 171,813 million, mainly due to additional investment in exploration and production assets in G1/61 Project, G2/61 Project, Zawtika Project, Bongkot Project, and S1 Project of PTTEP, additional investment of TOP in CFP and expand the capacity of electricity and steam of TOP SPP Co., Ltd. (TOP SPP), GC's Olefins I4/2 Modification project, the 7th Gas Separation Plant, Bang Pakong– South Bangkok power plant transmission pipeline project, the 5th transmission pipeline project of PTT, GSP Logistics Management, and LNG receiving terminal at Nong Fab of PTT LNG Co., Ltd. (PTTLNG).

: The cash outflow of business acquisition and long-term investments amounting to Baht 60,905 million, mainly from CATL of PTTGM, GPSC's investment in CI Changfang and CI Xidao, as well as the purchasing additional shares in VNT of GC.

: The cash inflow from short-term investment in financial assets totaling Baht 37,031 million, mainly from maturity of fixed deposits of OR and GC.

Net cash provided by financing activities was Baht 50,668 million, mainly from the following:

: The net cash inflow of short-term and long-term loans amounting to Baht 171,139 million mainly from GC, PTT, TOP, and IRPC.

: Dividend payment amounting to Baht 85,923 million mainly from PTT, PTTEP, and GC.

: Finance costs paid amounting to Baht 36,198 million mainly from GC, TOP, PTT, and PTTEP.

Financial ratios and earnings per share of PTT Group

Financial Ratio	Unit	2021	2022
<u>Liquidity Ratios</u>			
Current ratio	Times	1.73	1.76
Quick ratio	Times	1.13	0.96
Accounts receivable turnover	Times	14.43	16.01
Average Collection period	Days	25.30	22.79
Inventory turnover	Times	14.24	14.79
Average inventory period	Days	25.63	24.69
Accounts payable turnover	Times	11.69	13.08
Average Payment period	Days	31.23	27.90
Cash Cycle	Days	19.70	19.58
<u>Profitability Ratios</u>			
Gross profit margin	%	16.67	13.68
Net profit margin	%	6.73	3.63
Return on equity	%	11.47	8.85
<u>Activity Ratios</u>			
Return on asset	%	5.42	3.76
Return on fixed assets	%	11.14	8.32
Total asset turnover	Times	0.80	1.04
<u>Solvency Ratios</u>			
Debt to equity	Times	0.64	0.78
Interest coverage	Times	15.20	13.25
<u>Earnings per share</u>			
Earnings per share	Baht/share	3.79	3.20

Note:

Current ratio	=	Current assets divided by Current liabilities
Quick ratio	=	(Cash and cash equivalent + Current investments + Accounts receivable) divided by Current Liabilities
Accounts receivable turnover	=	Sales and service income divided by Average accounts receivable
Average Collection period	=	365 divided by Accounts receivable turnover
Inventory turnover	=	Cost of sales and services divide by Average inventory
Average inventory period	=	365 divided by Inventory turnover
Accounts payable turnover	=	Cost of sales and services divided by Average accounts payable
Average Payment period	=	365 divided by Accounts payable turnover
Cash Cycle	=	Average Collection period + Average inventory period - Average Payment period
Gross profit margin	=	Gross profit divided by Sales and service income
Net profit margin	=	Net profit divided by Sales and service income
Return on equity	=	Net profit divided by Average shareholders' equity
Return on asset	=	Net profit divided by Average total assets
Return on fixed assets	=	Net profit divided by Average total fixed assets
Total asset turnover	=	Sales and service income divided by Average total assets
Debt to equity	=	Interest bearing debt divided by Total shareholder's equity
Interest coverage	=	EBITDA divided by Finance costs*
Earnings per share	=	Net income attributable to ordinary shareholders divided by the weighted average number of ordinary shares which are held by third parties during the periods

*The calculation formula has been changed (old formula: Net cash flow from operating activities + Taxes paid from operating activities divided by Finance costs paid)

Economic Outlook in 2023

The world economy in 2023 is expected to grow at a slower rate from 2022, amid the steep challenge shaped by the tighter and longer monetary policy tightening from major economies, including the US and Euro Area, aimed at cooling down high inflation rate to return to the target range, an unresolved conflict between Russia and Ukraine could lead to a new round of sanctions and countermeasures, which exacerbating the food and energy crisis in further. However, Chinese economy is expected to recover after the lifting of Zero-COVID policy, amid the uncertainty of the spread of COVID-19 that could intensify the outbreak and lead to the implementation of strict control measures again. The IMF in January 2023 projected global growth forecast for 2023 to be 2.9%.

According to the S&P Global's report of January 2023, global oil demand in 2023 is expected to expand by 1.9 MMBD from the year 2022 to reach 101.7 MMBD following global economic growth, and China demand recovery after lifting of Zero-COVID policy and reopening. In addition, OPEC+ decided to keep production control policy to balance the market, which was evaluated to be highly well-supplied. While the concerns on tight supply from Russia is now subsided. In 2023, Dubai crude oil price is expected to average at US\$81 - 86 per barrel, and Singapore GRM is expected to average at US\$8.0 – 9.0 per barrel.

Petrochemical prices of Olefins and Aromatics in 2023 are expected to soften from 2022, due to the persistent weak demand, amid a clear sign of global economic slowdown and new supply in Asia, coupled with the decrease in crude oil and naphtha prices.

- **Olefins:** prices in 2023 is expected to decrease from 2022, with average price of \$1,120 – 1,170 per ton for HDPE and \$1,050 – 1,200 per ton for PP, due to persistently weak finished products demands and new Asia capacities, which are scheduled to come in line with the plan and also those which are postponed from 4Q2022. However, the further China's easing of Zero-COVID policy is faster than expected, the pickup demand after Chinese New Year due to low inventory level, and the production cuts owing to lower profitability are expected to support Olefins prices.
- **Aromatics:** prices in 2023 is expected to be lower comparing with 2022. BZ and PX prices are projected to be around US\$940 - 990 per ton and US\$1,040-1,090 per ton, respectively, due to an expected slowdown in finished product demands, including automotive, electrical appliance, and clothing, following an expected global economic slowdown, together with an upcoming of new capacities in China will pressure the market further. However, an expected increase in PX demand for gasoline blending, following the growth in tourism sector, will support the market.

Thai economy in 2023 is expected to continue expanding from 2022, as tourism sector is projected to significantly recover, thanks to pent-up demand for travel and further easing of travel restrictions in many countries, especially China that announced to open its border without quarantine requirements for inbound travelers starting from 8 January 2023. Private consumption and private investment are likely to continue to expand on the back of the resumption of economic activities, especially in tourism-related services. In addition, public spending is expected to improve due to Mega projects

investments both on-going and new projects, but economic stimulus may weaken amid fiscal budget constraints which forced the government to be more cautious in spending. Meanwhile, merchandise export is projected to lose momentum amid the risks of global economic slowdown. Thai economic recovery could face further short-term downside risks, including global economic slowdown, the rise of geopolitical tensions, the emergence of new COVID-19 variants, and internal political uncertainties. The FPO in January 2023 projected its Thai economic forecast for 2023 to be 3.8%.



Major Project Plan

Gas Business Group: The progress of major projects

Pipelines Transmission Projects

- The 5th Transmission Pipeline (Rayong - Sai Noi – North/South Bangkok power plants)
 - Total Project Progress as of December 2022: 95.26% (Including 3 phases construction)
 - COD: within 2023

Gas Separation Plant Unit 7 (GSP#7)

PTT is constructing the Gas Separation Plant Unit 7 (GSP#7) in Map Ta Phut Industrial Estate, Rayong Province to replace gas separation plant Unit 1 (GSP#1) and to increase the efficiency of the gas separation plant's production process. The GSP #7 is designed to have a maximum capacity of 460 MMSCFD. It is scheduled to COD in the first quarter of 2024.

LNG Project:

Currently, PTT have long term LNG contracts with Qatargas, Shell, BP, and Petronas at 5.2 MTA and has a capability to procure LNG in order to fulfill the country demand growth in the future.

In addition, PTT procures additional 1 MTA of long-term LNG contract from PTT Global LNG Co., Ltd. (PTTGL) to further enhance national energy security and the first gas delivery will be in 2026.

- **LNG Receiving Terminal #2:**

Total Project progress as of December 2022: 100.0%

 - Total capacity of 7.5 MTA be approved by the Cabinet meeting on 11 April 2017
 - The capacity of 2.5 MTA is already COD since July 2022 and fully COD with capacity 7.5 MTA since 24 November 2022.
 - As of 31 December 2022, PTT Group's LNG terminal capacity is total at 19 MTA.
- **Other LNG Receiving Terminal Project (LNG Receiving Terminal 3):**
 - On 24 September 2019, the Cabinet approved the private entity selection, negotiations and the draft of the contract between Public Private Partnership (PPP) and the Industrial Estate Authority of Thailand (IEAT) on the development of Map Ta Phut seaport phase III (Section 1) as proposed by the Eastern Economic Corridor Office. Gulf MTP LNG Terminal Co., Ltd., a new joint venture company between PTT Tank Terminal Co., Ltd. (PTT Tank) and Gulf Energy Development Public Co., Ltd. (GULF) with shareholding of 30%, and 70%, respectively, is to proceed land reclamation with the investment cost of approximately Baht 12,900 million which is expected to be completed by 2024, as well as having the right to construct LNG terminal 3 phase 1 with the capacity not less than 5

MTA. The LNG terminal 3 phase 1 has an investment cost approximately Baht 28,000 million which is expected to be completed by the year 2027.

Summary Planned Shutdown for Gas Separation Plants in 2022

Plant	1Q2022	2Q2022	3Q2022	4Q2022
GSP #1			SD (6-19 Aug :14 days)	
GSP #2		TD (10 May-1 Jun : 23 days)		
GSP #3		TD (10 May-1 Jun : 23 days)	SD (21-26 Aug :6 days)	
GSP #4			Major SD (1-20 Sep : 20 days)	
GSP #5			TD (1-30 Sep : 30 days)	TD (1-15 Oct : 15 days) Minor SD (5-19 Dec : 15 days)
GSP#6			SD (9-12 Jul :4 days)	
ESP		Major SD (10 May-1 Jun : 23 days)		

Summary Planned Shutdown for Gas Separation Plants in 2023

Plant	1Q2022	2Q2022	3Q2022	4Q2022
GSP #1			SD (20 – 27 Jul.: 8 days)	
GSP #2			TD (1 – 30 Sep : 30 days)	TD (1 – 4 Oct :4 days) Major SD (1 – 18 Nov :18 days)
GSP #3			Major SD (1 – 18 Sep :18 days)	TD (1 Nov – 4 Dec :34 days)
ESP			TD 50% (1 – 30 Sep : 30 days)	TD 50% (1 – 4 Oct : 4 days) TD 50% (1 Nov – 4 Dec :34 days)

*TD: Turndown

**SD: Shutdown

Summary of PTT Sustainability Performances in 2022

PTT has committed to managing sustainability to enhance national competitiveness, leverage society's and people's quality of life, develop and implement innovation and technology for all areas, and drive people, society, community and environment toward the future transition under PTT aspiration "Powering Life with Future Energy and Beyond" with its mission to balance all stakeholders.

Climate change is currently being prioritized and raised as an important issue by all domestic and international sectors. PTT has incorporated climate change risks and opportunities as essential components in shaping the direction of its strategy, as well as its long-term goals for 2030, which are business growth, new growth, and clean growth. PTT is prepared to transform its business into future energy and beyond business. In 2022, there has been progress in expanding investment into future energy and beyond, including Decarbonization Initiatives. This will not only benefit for the environment by reducing greenhouse gas emissions to meet short-term, middle-term, and long-term targets on net zero emission by 2050, but it will also be a driving force in the national economy, encouraging employment and quality of life for citizens and society, and enhancing the knowledge and skills of employees from new businesses. The following details are the implementations in translating plans into practices throughout the value chain.

● Performance progress toward 2030 long-term goal

Long-term goals	Performance Guidelines	Key achievements in 2022
<p>Business growth:</p> <ul style="list-style-type: none"> • LNG business: 9 million tons per year • Conventional power business: 8 GW. • Renewable Energy business: 12 GW. 	<ul style="list-style-type: none"> ● Increase the volume of LNG trade in the portfolio from 1.5 million tons in 2021 to 9 million tons in 2030, through the LNG Value Chain investment and the LNG Portfolio creation by long-term contracts and spot LNG. ● Increase power generation capacity from 4.5 GW in 2021 to 8 MW in 2030 by focusing on gas-or-LNG-based power plants. ● Increase renewable power generation capacity from 2.6 GW in 2021 to 12 MW in 2030 through domestic and international investment. 	<ul style="list-style-type: none"> ● LNG portfolio supply increases to 4.5 million tons. ● Power generation capacity expands to 5.2 GW.

Long-term goals	Performance Guidelines	Key achievements in 2022
		<ul style="list-style-type: none"> Renewable power generation capacity expands to 2.8 GW.
<p>New growth:</p> <p>Future energy and beyond business shall contribute net income proportion for more than 30% within 2030.</p>	<p>Increase the net income contribution from the future energy and beyond to be more than 30% within 2030, by increasing business investment in EV Value Chain, Energy Storage, Life Science, Lifestyle, High Value Business, Logistics and Infrastructure and AI and Robotics.</p>	<p>Business development and investment in future energy and beyond businesses remains on track.</p>
<p>Clean growth:</p> <p>Reduce GHG emissions by 15% compared to emissions in 2020.</p>	<p>Reduce PTT Group's greenhouse gas emissions by 15% from 2020 by 2030.</p>	<p>In 2022, PTT has continuously improved its production processes to increase energy efficiency and plans to invest in Sodium Bicarbonate, a project that uses carbon dioxide as a raw material for production with the potential to reduce greenhouse gas emissions along with creating value added to business. In addition, PTT has begun to survey reforestation areas together with the government in each region of Thailand.</p>

- Announcements towards Carbon Neutrality by 2040 and Net Zero greenhouse gas emissions by 2050, In line with government measures to drive Thailand towards a low-carbon society and achieve carbon neutrality by 2050 and achieve net zero greenhouse gas emissions by 2065, PTT has launched the "3P Implementation Guidelines" which linked to its 2030 long-term goals as the framework for the group's collective actions. PTT has the following key projects/ initiatives and operations:



Performance Guidelines	Key projects and initiatives
<p>Pursuit of Lower Emissions (Accelerate production processes adjustment) in line with <u>Clean Growth</u> to reduce GHG in the process as much as possible</p>	<ul style="list-style-type: none"> ● Established the PTT Group's Zero Greenhouse Gas Emissions Working Group (PTT Group Net Zero Task Force: G-NET) and its sub-working groups to drive the implementation of decarbonization projects to achieve concrete results. ● Implement energy efficiency projects in all areas of operation, such as in the production process of natural gas separation plants. ● Gas Separation Plant Unit 7, a replacement for the Gas Separation Plant Unit 1 to increase operational efficiency and energy consumption, is under construction. It is expected to be completed in 2024. ● Carbon dioxide capture and storage project (CCS): 1) Off-shore: CCS at the production field, with the pilot project at the Arthit and Langlabah gas field. 2) Near-shore: PTT group jointly study the 'PTT Group CCS Hub Model' which is a CO₂ exploration and capture project within the PTT Group. ● Carbon dioxide capture and utilization project (CCU): PTT and its affiliates have jointly studied the utilization of carbon dioxide as a precursor to production and utilization in various fields. ● Renewable energy projects on site: Start installing solar panels to replace electricity from transmission lines and converting electric vehicles instead of internal combustion engine vehicles. ● Hydrogen Fuel Energy Project: PTT Innovation Institute has developed a strategic plan to build a hydrogen business portfolio, which is studying investment opportunities with domestic and international partners. Besides, PTT Group is exploring the opportunity to apply and use Hydrogen in production process.
<p>Portfolio Transformation (Accelerate the transition to green business) Create growth from the future energy business '<u>New Growth</u>' by increasing the <u>green portfolio</u> and managing the Hydrocarbon portfolio.</p>	<ul style="list-style-type: none"> ● Re-focus investment direction: End all investments in the coal business and invest in a comprehensive electricity vehicle ecosystem through the operation of companies in which PTT holds 100% shares, including new businesses beyond energy following the New Growth Target ● Apply Internal Carbon Price: Use internal carbon price to PTT's investment consideration as the tool to increase the chances in making decisions in projects contributing to reduce GHG emissions.













Performance Guidelines	Key projects and initiatives
<p>Partnership with Nature and Society</p> <p>(Accelerate planting of an additional 1 million Rai of forest)</p> <p>Increase the amount of carbon dioxide absorbed and stored in natural ways through planting and maintaining forests and increasing green areas.</p>	<ul style="list-style-type: none"> Cooperation with the government to increase green areas to increase greenhouse gas absorption through natural ways: Together with the government and local communities, PTT plans to reforest 1 million Rai of land and mangrove forests, and PTT Group companies reforest another 1 million Rai by 2030. We have begun to explore the area and started reforesting together with the government in each region. The 1994-2017 Reforestation Project, in which PTT is responsible for the continuous planting and maintenance of forest areas, received a certificate of low emission support scheme (LESS) from the Thailand Greenhouse Gas Management Organization (Public Organization) (TGO), which is a joint cooperation between 4 agencies, namely the Royal Forest Department, the Department of National Parks, the Department of Marine and Coastal Resources, and PTT have been assessed to be capable of absorbing more than 32.5 million tons of greenhouse gas equivalent during 1944-2017.

By fully and continuously driving the organization towards sustainability, in 2022, PTT remained a member of the Dow Jones Sustainability Indices (DJSI) for the 11th consecutive year in the World Index and Emerging Market Index, as well as being selected on the Thailand Sustainability Investment (THSI) list, receiving the Sustainability Awards of Honor for the 2nd consecutive year on the Stock Exchange of Thailand, reflecting Thailand's largest listed companies with sustainable business performances.








In addition, PTT has reviewed the "Sustainability Strategy Direction" which is included in the "Sustainability Management Master Plan to Show Responsibility to Society and the Environment PTT 2021-2025 (Revised 2022)", focusing on managing key sustainability issues in 3 dimensions: Environmental (E): Sustainable Production and Consumption, Social (S): People's Well-being, and Governance (G): Corporate Governance and Performance Excellence, with clearly defined goals and plans. The following key performances and activities in 2022 are:



 Environmental: Sustainable Production and Consumption	Sustainable Development Goals (SDGs) Contribution
 <p>Develop towards low carbon society and environmentally friendly business operations</p> <ul style="list-style-type: none"> 51.16 million tons of carbon dioxide equivalent ¹ <p>PTT's absolute greenhouse gas emissions directly and indirectly (Scope 1 and Scope 2) in 2022 are in line with the target (Target: Control PTT Group's GHG Scope 1, 2 domestic and international emissions not to exceed 52.5 million tons of CO2 equivalent). Progress is being made in projects/initiatives as detailed in Pursuit of Lower Emissions.</p>	
 <p>Drive resource utilization based on the principle of Circular Economy (CE)</p> <ul style="list-style-type: none"> Water recycle technology for water withdrawal reduction: Expand the installation of Greywater Recycle System (Gen#2) at PTT Head Office to use water resources cost-effectively in accordance with CE principles. PTT Group's joint pilot project on waste recycling includes plastic from packaging, furniture furnishings made from wasted plastic composite (WPC), Amazon cup collecting, Used lubricant to alternative fuel oil project. 	
 Social: People's Well-Being	SDGs Contribution
 <p>Promote safe working environment and respecting human rights principles</p> <ul style="list-style-type: none"> Lost Time Accident (LTA) of employees and contractors is equal to 0 (Target: Zero LTA of employees and contractors) Complaints on PTT's human rights issues are equal to 0 (Zero Human Rights Incidents) (Target: Zero Complaints on Human Rights Issues) 	
 <p>Co-create values and elevate society and community's quality of living</p> <ul style="list-style-type: none"> Equipment procurement and construction of 45 greenhouses according to the plan have been completed. Over 267 community products have been developed. Continue to support advanced science and technology education through KVIS & VISTEC. 	

¹ Performance data for 2022 is in the process of verifying information from 3rd parties.

<ul style="list-style-type: none"> • More than 30,000 people affected by natural disasters in 34 areas have been assisted. 	
 <p>Enhance employees' readiness to facilitate future business growth</p> <ul style="list-style-type: none"> • Human Capital Index (HCI) is at 82 % which is above target (target: 77%). The index assesses across 3 dimensions; competence, engagement, and rotation 	
 <p>Governance: Corporate Governance and Performance Excellent</p>	
 <p>Operate with good governance and integrity</p> <ul style="list-style-type: none"> • No non-compliance with the law was found to have a significant impact on the target. • Integrity and Transparency Assessment (ITA) scores at level A • Good Corporate Governance Policies, Anti-Corruption Policy and Good Corporate Governance Manual, Ethical Standards and Code of Conduct (CG Handbook) have been reviewed, improved, and implemented. • The process and system for receiving complaints and reporting fraud complaints have been improved to ensure a management process, follow up and report with standards and build confidence have been put in place for stakeholders on PTT's transparent, fair and accountable management. • The Way of Conduct guidelines for new company have been developed to ensure that they are adequate, appropriate, standardized and in accordance with the context of the newly formed company. • The internal control of PTT and its affiliates is conducted by assessing the risk and effectiveness of control activities, as well as developing control activities to reduce risk to an acceptable level. • The protection of personal data policies and practices, as well as provide training and education have been supported to educate personnel on how to treat personal data and be able to perform their duties correctly in accordance with PDPA laws. 	



Appendix

Exploration and Production Business consists of PTT Exploration and Production Public Co., Ltd. (PTTEP)

Natural Gas Business consists of PTT natural gas business unit, PTT Natural Gas Distribution Co., Ltd. (PTTNGD) and PTT LNG Co., Ltd (PTTLNG)

Coal Business consists of PTT Energy Resources Co., Ltd. (PTTER), PTT Global Management Co., Ltd. (PTTGM)

Oil and Retail Business consists of PTT Oil and Retail Business Public Co., Ltd. (OR)

International Trading Business consists of PTT international business unit and PTT International Trading Pte. Ltd. (PTTT), PTT International Trading London Limited (PTTT LDN) and PTT International Trading USA Incorporated (PTTT USA)

Petrochemical and Refinery Business consists of PTT Global Chemical Public Co., Ltd. (GC), Thai Oil Public Co., Ltd. (TOP), IRPC Public Co., Ltd. (IRPC), and PTT Tank Terminal Co., Ltd. (PTT TANK)

New Business and Infrastructure Business consists of PTT New Business and Infrastructure business unit, Global Power Synergy Public Co., Ltd. (GPSC), PTT Energy Solution Co., Ltd. (PTTES), Energy Complex Co., Ltd. (EnCo) and PTT Digital Solutions Co., Ltd. (PTT DIGITAL)

Other Business consists of Business Services Alliance Co., Ltd. (BSA), PTT Green Energy Pte. Ltd. (PTTGE), and PTT Treasury Center Co., Ltd. (PTT TCC)

*Note: *PTTGM owns shares in many companies which operate in various businesses such as Coal Business, Natural Gas Business, and New Business and Infrastructure Business. However, currently PTTGM's performance is mainly contributed from the Coal Business.*

Appendix

The majority of non-recurring items after tax (PTT's portion) of 4Q2022 compared with 4Q2021 and 3Q2022 as well as 2022 compared to 2021 are summarized as follows:

Unit : Million Baht

Business	Item	4Q2021	3Q2022	4Q2022	2021	2022
Exploration and Production business	Impairment loss on Mozambique Area One Project	~(3,600)		~ (4,300)	~(3,600)	~ (4,300)
	Impairment loss on Yetagun Project	~(400)			~(400)	
	Recognition partial write-off of the assets in the exploration project in Brazil				~(2,900)	
	Gain from a bargain purchase of Oman Block 61 Project				~ 7,000	
	Impairment loss on assets held for sales from PTTEP BL		~ (2,300)			~ (2,300)
	The provision for the Class Action settlement from Montara incident			~ (3,000)		~ (3,000)
	Loss after reclassifying net assets of Block 17/06 Project (Angola)			~ (350)		~ (350)
	Income from adjustment of contingent liabilities of Oman Block 61 project			~ 1,600		~ 1,600
Gas business	Impairment loss on NGV business	~(3,500)			~(3,500)	
	Write-off on obsolete materials and supplies of PTT				~(800)	
	The return of Take or Pay benefit from Myanmar gas fields	~(2,700)			~(2,700)	
	Gain on divestment of gas pipeline business in Egypt of PTTER	~1,400			~1,400	
	PTT's benefit from lawsuit	~1,000			~1,000	
	Benefit from discount from production shortfall	~1,700	~1,100	~300	~1,700	~3,400
	Contribution to oil fund during energy crisis		(1,000)	(2,000)		(3,000)
Petrochemical and Refining business	Impairment loss on U.S. Petrochemical of GC	~(1,000)			~(1,000)	
	Loss from restructuring of Emery Group of GC	~(1,000)			~(1,000)	
	GC's tax on divestment of GPSC				~(2,300)	
	TOP's tax on divestment of GPSC					~(2,100)
New Business and Infrastructure	Gain on Ichinoseki Solar Power 1 GK divestment of GPSC					~350
Coal business	PTTGM's loss on impairment on coal mine project in Madagascar					~400