



Supplementary of Form 56-1 One Report for Year **2022**



Details of Businesses Invest
through PTT Group



Details of Connected Transaction



Supplement Information for 56-1 One Report 2022

Nature of Business/ Procurement/Distribution of Businesses invested through PTT Group

Details of businesses invested by PTT through PTT Group as listed below provide additional information to Item 1.2.2 Nature of Business/ Procurement/ Distribution of Businesses in the 56-1 One Report 2022.

1. Upstream Businesses invested through PTT Group

1.1 Gas Related Business

PTT has operated businesses related to natural gas through its affiliates. For example, Liquefied Natural Gas (LNG) business operates LNG receiving and distribution station services, LNG storage, and LNG regasification to support LNG import, investment expansion and the operations of integrated LNG business. Its portfolio has even included the development and construction of gas transmission pipelines systems and natural gas transportation. To support PTT Group's status as the fully-integrated natural gas business operator, PTT has invested in the following companies:

- 1.1.1 [PTT Natural Gas Distribution Company Limited \(PTTNGD\)](#)
- 1.1.2 [Trans Thai-Malaysia \(Thailand\) Limited \(TTM\(T\)\) and Trans Thai-Malaysia \(Malaysia\) Sdn.Bhd. \(TTM\(M\)\)](#)
- 1.1.3 [PTT LNG Company Limited \(PTTLNG\)](#)
- 1.1.4 [Map Ta Phut Air Products Company Limited \(MAP\)](#)

1.2 Petroleum Exploration and Production Business

PTT has conducted petroleum exploration and production business through [PTT Exploration and Production Public Company Limited \(PTTEP\)](#), which is PTT Group's flagship company in the petroleum exploration and production. PTTEP has operated its business both domestic and international as well as invested in related businesses to explore petroleum sources of crude oil and natural gas to ensure Thailand's energy security and supplied petroleum products from domestic and regional projects, mostly natural gas, primarily to the domestic market. As of 31 December 2022, PTTEP had petroleum exploration and production projects in domestic and overseas for over 50 projects in 15 countries including Thailand.

1.3 Investment in Other Upstream Business

PTT has operated energy businesses both domestic and overseas to find new sources of energy and alternative energy to ensure security for the country and extend its own existing businesses by leveraging the knowledge, expertise, and experiences of its human resources as well as collaborations within its group. PTT has invested in the following companies:

- 1.3.1 [PTT Energy Resources Company Limited \(PTTER\)](#)
- 1.3.2 [PTT Global Management Company Limited \(PTTGM\)](#)
- 1.3.3 [PTT Green Energy Company Limited \(PTTGE\)](#)
- 1.3.4 [PTT Global LNG Company Limited \(PTTGL\)](#)

2. Downstream Businesses invested through PTT Group

2.1 International Trading Business

PTT invested in international trading business to undertake full-fledged international trading transactions through 3 companies as follows:

- 2.1.1 [PTT International Trading Pte Ltd. \(PTTT\)](#)
- 2.1.2 [PTT International Trading London Ltd. \(PTTT LDN\)](#)
- 2.1.3 [PTT International Trading USA Inc. \(PTTT USA\)](#)

2.2 Petrochemical and Refining, Oil and Retail Businesses

PTT has invested in integrated refining business with interests in three of Thailand's six refineries. Through the investments, it has had the total refining capacity of 770,000 barrels per day (BPD) that accounted for 62% of the country's total capacity (as of 31 December 2022). Moreover, PTT has operated integrated petrochemical business from upstream to downstream, from production to sale of fuels, upstream midstream and downstream petrochemicals both olefins and aromatics lines which enables us to add significant value to our. Receiving terminal and storage services are also parts of the integrated business. PTT is responsible for procuring crude oil and buying fuels and petrochemical products from PTT Group for distribution in domestic and overseas markets. The operating results of oil, petrochemical and refinery businesses are mainly subject to economic situation and the spreads between crude oil/feedstock and petroleum/petrochemical products in global market, which are related to demand and supply together with year-end inventories. For PTT Group, PTT Global Chemical Public Company Limited (GC) is the petrochemical flagship. Thai Oil Public Company Limited (TOP) is the refinery flagship. IRPC Public Company Limited (IRPC) is the integrated petrochemical and refinery flagship. PTT Oil and Retail Business Public Company Limited (OR) is the oil and retail business flagship that has covered oil and non-oil businesses both in domestic and overseas markets. The oil business includes the distribution of petroleum products and other products in retail and commercial markets. The non-oil business includes coffee business, food and beverages, convenience stores, and space management. Additionally, PTT Tank Terminal Company Limited (PTT TANK) has offered petroleum and petrochemical product receiving, storing, and loading/unloading services to companies in PTT Group. PTT exercises direct and indirect governance of its affiliates through representatives that serve as directors and secondments.

PTT has invested in Petrochemical & Refining, Oil and Retailing Businesses through 5 companies as follows:

- 2.2.1 [PTT Global Chemical Public Company Limited \(GC\)](#)
- 2.2.2 [Thai Oil Public Company Limited \(TOP\)](#)
- 2.2.3 [IRPC Public Company Limited \(IRPC\)](#)
- 2.2.4 [PTT Oil and Retail Business Public Company Limited \(OR\)](#)
- 2.2.5 [PTT Tank Terminal Company Limited \(PTT TANK\)](#)

3. New Business and Infrastructure Operated through PTT Group

The following companies are in PTT Group and under the supervision of the New Business and Infrastructure Group:

- 3.1 [Global Power Synergy Public Company Limited \(GPSC\)](#)
- 3.2 [District Cooling System and Power Plant Company Limited \(DCAP\)](#)
- 3.3 [Energy Complex Company Limited \(EnCo\)](#)
- 3.4 [PTT Energy Solutions Company Limited \(PTTES\)](#)
- 3.5 [PTT Digital Solution Company Limited \(PTT DIGITAL\)](#)

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

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

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

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

Energy Storage & System related business, NUOVO PLUS Company Limited was established to study the possibility of the investments in battery value chain business to accommodate the electric vehicle industry in line with the country's automotive industry policy, including energy storage system to enhance the electricity storage capacity from renewable energy and investment in related businesses.

Life Science business, Innobic (Asia) Company Limited, leading in Life Science business engages in pharmaceutical, nutrition, medical equipment, medical diagnosis businesses, etc. The investment in this business will enhance PTT's capability in life science and create added value for the country. For example, Innobic Asia has purchased common stock of Lotus Pharmaceutical Company Limited (LOTUS), a listed company in Taiwan Stock Exchange whose core business is research and development (R&D), manufacturing, and distribution of the generic drugs that cover various therapeutic areas especially oncology, central nervous system, etc.

AI, Robotics, and Digitalization business, Alpha Com Company Limited serves as an investment vehicle in new businesses for PTT and PTT Group, whereby new business concepts and models can be tested prior to actual investments. PTT Raise Company Limited (PTT Raise) supplies and installs robotic and automation system for industrial customers. PTT and TGES Optec Company Limited (OPTEC) operates one-stop total improving efficiency technology solutions/services that deploys technology to enhance efficiency of industrial equipment and machineries. ReAcc Company Limited (ReAcc), which is in the process of changing its name to New Ver Sal Company Limited (New Ver Sal) (expected to be completed within the first quarter of 2023), and undergoing a restructuring to hold shares in Mekha V Company Limited (Mekha V) to be a flagship for supporting AI & Robotics investments, which the company restructuring was completed in November 2022. Moreover, T-ECOSYS Company Limited (T-ECOSYS) operates Industrial Digital Platforms (IDPs) for driving industrial transformation in Thai industrial sector through connecting service providers with industrial users who want to access the service of robotics technology, automation systems, and digital technology which is the basic ecosystem to support the growth of the industry, and

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

4. Other Business Group

[PTT Treasury Center Company Limited \(PTT TCC\)](#) offers financial services to PTT and PTT Group. PTT TCC provides both short-term and long-term financing in foreign currencies as well as THB for PTT and PTT Group. Moreover, PTT TCC also provide services in debt management, liquidity management and financial management for the best interest of PTT's Group.

**Details of Businesses invested through
PTT Group
2022**

1. Upstream Businesses invested through PTT Group

1.1 Gas-related businesses

PTT has operated gas-related businesses via PTT Group in order to support the group's role as the fully integrated natural gas business operator. Details are as follows:

1.1.1 PTT Natural Gas Distribution Company Limited (PTT NGD)

PTT Natural Gas Distribution Company Limited (PTT NGD) was founded on 24 June 1996 to operate the development and constructions of gas distribution pipeline systems for natural gas transport and distribution. Its current shareholders are (1) PTT Public Company Limited; (2) Gulf Energy Development Public Company Limited; and (3) Gulf LNG Company Limited. PTT NGD has developed and constructed distribution pipeline systems for natural gas transmission and distribution to customers in industrial zones around Bangkok, its perimeter, and Rayong. As of 31 December 2022, PTT NGD had the registered and paid-up capital of THB 500 million. Its current shareholders are PTT Plc, with 58%, Gulf Energy Development Plc, with 42% of its registered and paid-up shares.

PTT NGD invests in constructing distribution pipeline systems, using Steel and High-Density Polyethylene (HDPE) pipe branching off from PTT's transmission pipelines to customers located in industrial zones around Bangkok Metropolis, its perimeter, and Rayong. Additionally, PTT assists PTT NGD in procuring land as well as the rights to use land to construct the natural gas pipeline distribution network. PTT NGD also extends its business and investment to address customers' needs by providing energy services, cogeneration business, and alternative-energy businesses along with other business activities, for instance providing additional services regarding pipeline transmission systems.

1) Procurement

PTT procured all natural gas for PTT NGD through sale and purchase agreements that are valid for five to ten years. Natural gas price structure includes the price of natural gas under the regulation of ERC, pipeline tariff, and the return for the gas supply, marketing and distribution of natural gas as well as the price structure under Energy Pool Price.

2) Distribution

As of 31 December 2022, PTT NGD's distribution pipeline system delivered natural gas to 13 industrial zones namely the Bangpoo Industrial Estate, the industrial zone in Bangpoo Mai, the Bang Plee Industrial Estate, the Lat Kra Bang Industrial Estate, the industrial zone in Rangsit, the Rojana Industrial Park, the Nava Nakorn Industrial Estate, the Theparak Industrial Town, the Bang Pa-In Industrial Estate, the Bangkokadi Industrial Park, the Eastern Seaboard Industrial Park (Rayong), the WHA Eastern Seaboard Industrial Estate 1, and the Bangpoo Industrial Estate (North). The gas sale / purchase agreements with customers are valid for 5 to 7 years with gas price set at a rate that could compete against alternative fuels namely fuel oil or cooking gas. In 2022, PTT NGD recorded the natural-gas sales volume of 56.47 MMSCFD – a decreased of 0.86% from 2021 with a total of 253 customers. Its natural-gas sales and number of customers between 2020 and 2022 are as follows:

Sales	2020	2021	2022
Volume (MMSCFD)	50.48	56.96	56.47
Number of customers	255	253	253

In addition, PTT NGD expanded its channel for sales of natural gas by co-venturing with 80% holding in Amata Natural Gas Distribution Company Limited (AMATA NGD) to construct a natural gas pipeline distribution network for customers in Amata City Chonburi Industrial Estate and the Amata City Rayong Industrial Estate.

3) Management

PTT NGD's board of directors as of December 31, 2022, consisted of 12 directors, 5 of whom were appointed by PTT, including the Chairman. In addition, PTT has assigned its executives to take the position of the PTT NGD's management, including the Managing Director.

4) Finance

The operating results of PTT NGD between 2020 and 2022 are as follows:

Unit : THB million

Separate financial statements	2020	2021	2022*
Revenue from sales and services	4,785	7,583	11,163
Total revenue	4,872	8,028	11,240
Total expenses (including taxes)	5,067	6,967	11,140
Net profit (loss)	(195)	1,061	100

Unit : THB million

Separate financial statements	2020	2021	2022*
Total assets	3,075	3,345	3,105
Total liabilities	1,119	1,277	1,300
Shareholders' equity	1,956	2,068	1,805

* Data of 2022 are unaudited.

1.1.2 Trans Thai – Malaysia (Thailand) Company Limited (TTM(T)) and Trans Thai-Malaysia (Malaysia) Sdn. Bhd. (TTM(M))

PTT and Petronas, Malaysia's National oil company, jointly established Trans Thai-Malaysia (Thailand) Company Limited (TTM(T)) in Thailand on 4 February 2000 and Trans Thai-Malaysia (Malaysia) Sdn. Bhd. (TTM(M)) in Malaysia on 21 March 2000. TTM(T) services have transported natural gas via transmission pipelines from the Malaysia-Thailand Joint Development Area (JDA) for utilization within Thailand and also to Thai – Malaysia border as well as providing gas separation services in Songkhla and transporting Liquefied Petroleum Gas via pipelines from Songkhla to Thai – Malaysia border. TTM(M), meanwhile, has transported natural gas and Liquefied Petroleum Gas via pipelines from Thai – Malaysia border to Malaysia for utilization within the country. As of 31 December 2022, TTM(T) had issued and paid-up capital of THB 6,343.6 million and TTM(M) issued and paid-up capital of MYR 52.8 million and held the redeemable preference shares amounting to MYR 15 million, in which PTT and Petronas own a 50% of the paid-up capital in both companies.

1) Services

TTM (T) has provided the transmission service of natural gas and Liquefied Petroleum Gas, and gas separation services to only PTT and Petronas. Both are the shareholders of TTM(T). TTM(M), meanwhile, has provided transmission service of natural gas and Liquefied Petroleum Gas to Petronas and its wholly-owned subsidiary, Petronas Energy & Gas Trading Sdn. Bhd. (PEGT). The services are provided under a mutual service agreements. The companies have been providing natural gas transmission services (onshore and offshore) since January 2006 with natural gas being processed through carbon dioxide separation units. Gas separation services and Liquefied Petroleum Gas transmission services started since 14 April 2006. Additionally, TTM(T) expanded a commercial gas delivery for PTT to Chana Power Plant with a capacity of 131 MMSCFD since the third quarter of 2008 and subsequently increased by 7 MMSCFD, starting from June 2011, to deliver to NGV mother station in Thailand's southern region. The

installation of pipeline from the MTJDA-A18 gas field, which is connected to PTT's third gas pipeline, began in December 2006. Having delivery capacity of 300 MMSCFD, it then started its gas transmission in late 2008. Consequently, the commercial service from MTJDA-B17, which is connected to PTT's third gas pipeline, started on 1 June 2010 with increased capital by 300 MMSCFD.

Moreover, the gas transmission pipeline from the MTJDA-B17 field was expected to connect with Petronas's pipeline at the edge of the JDA for further delivery to Kerteh, Malaysia, and started commercial from 1 May 2008. Such expansion not only generates additional revenue but it also helps PTT procure sufficient gas supply to meet its customers' needs. This move has also stabilized and strengthened Thailand's energy security.

As of 31 December 2022, service details were as follows:

• Natural-gas production (Feed Gas) (Block A18)	869	MMSCFD
• Natural-gas production (Feed Gas) (Block B17)	275	MMSCFD
• Gas Delivery (Sales Gas)	345	MMSCFD
• LPG Delivery	160,308	metric tons per year
• NGL Delivery	51,223	metric tons per year

2) Management

The boards of directors of TTM(T) and TTM(M), as of 31 December 2022, comprised 6 members each; 3 appointed from PTT and another 3 appointed from Petronas. Currently, the directors appointed by Petronas serve as the chairman of the board for both companies with a 3-year term, and then alternating this position with PTT's appointee.

3) Finance

The operating results of TTM(T) between 2020 and 2022 are as follows:

Unit : THB million

Financial statements	2020	2021	2022*
Revenue from sales and services	2,874	3,054	3,407
Total revenue	3,122	3,281	3,612
Total expenses (including taxes)	2,731	2,104	2,001
Net profit (loss)	391	1,177	1,612

Unit : THB million

Financial statements	2020	2021	2022*
Total assets	13,221	13,613	12,738
Total liabilities	7,119	6,227	4,919
Shareholders' equity	6,102	7,386	7,819

* 2022 data are unaudited.

The operating results of TTM(M) between 2020 and 2022 are as follows:

Unit : Ringgit million

Financial statements	2020	2021	2022*
Revenue from sales and services	72	68	66
Total revenue	84	79	83
Total expenses (including taxes)	55	49	51
Net profit (loss)	29	30	32

Financial statements	2020	2021	2022*
Total assets	720	610	549
Total liabilities	477	373	275
Shareholders' equity	243	237	274

* 2022 data are unaudited.

1.1.3 PTT LNG Company Limited (PTTLNG)

PTT established PTT LNG Company Limited (PTTLNG) on 30 August 2004 to operate a Liquefied Natural Gas receiving terminal and provide Liquefied Natural Gas storage and regasification services. As of 31 December 2022, PTTLNG had the registered capital of THB 27,748 million and the paid-up capital of THB 27,748 million.

1) Nature of Business

Its Liquefied Natural Gas Receiving Terminal 1 (LNG Map Ta Phut Terminal 1: LMPT1) Project is consisted of LNG receiving terminal, LNG storage tanks, and LNG regasification unit with the capacity of 11.5 million tons per annum. Of the total capacity, five million tons per annum achieved in Phase 1 and ramp up to 10 million tons per annum in Phase 2 and an additional expansion of phase 2 of 1.5 million tons per annum. Moreover, it has a fleet of trucks to transport up to 182,500 tons of LNG a year.

LNG Receiving Terminal 2 (LNG Map Ta Phut Terminal 2: LMPT2) is consisted of LNG receiving terminal, two LNG storage tanks with capacity to store 250,000 cubic meters of LNG a year, and an LNG regasification unit with the capacity of 7.5 million tons per annum.

2) Progress

LNG Receiving Terminal 2 (LMPT2) has production capacity of 2.5 million tons per annum under Early Gas Send Out (EGSO) plan since 25 May 2022. Its commissioning of LNG Tank 2 has been completed. The capacity of regasification is up to 7.5 million tons per annum since 24 November 2022.

3) Services

PTT LNG provides services and management of LNG receiving terminals and collect terminal tariffs service, where LNG is supplied and imported by clients.

- Demand Charge : Ld Rate for Years 2018 to 2022 is THB 18.3506 per MMBTU at both LMPT1 and LMPT2;
- Commodity Charge : Lc Rate was THB 0.5423 per MMBTU from 1 January 2022 to 28 February 2022 and THB 0.4807 per million BTUs from 1 March 2022 to 31 December 2022 at both LMPT1 and LMPT2
- Current customers: PTT, EGAT, BGRIMM, and PTTGL

4) Management

The board of directors of PTT LNG consists of 6 directors, 5 of whom from PTT and another was a representative from the Ministry of Finance, nominated by PTT as an expert.

5) Finance

The operating results of PTTLNG between 2020 and 2022 are as follows:

Unit : THB million

Financial statements	2020	2021	2022*
Revenue from sales and services	9,581	9,691	9,949
Total revenue	9,599	9,705	9,988
Total expenses (including taxes)	2,882	2,743	4,212
Net profit (loss)	6,717	6,962	5,776

Unit : THB million

Financial statements	2020	2021	2022*
Total assets	56,981	69,394	79,693
Total liabilities	13,344	18,155	22,421
Shareholders' equity	43,637	51,239	57,272

1.1.4 Map Ta Phut Air Products Company Limited (MAP)

PTT Board of Directors, at its meeting on 16 November 2018, issued a resolution for PTT to establish MAP with PTT holding 51% and Bangkok Industrial Gas Company Limited (BIG) holding 49% of MAP's shares. In response to the resolution, PTT registered MAP on 15 January 2019 to operate a business that utilizes excess cold energy from Liquefied Natural Gas to reduce operating cost in Air Separation Unit (ASU) Project for the production and distribution of industrial gases namely nitrogen, oxygen, liquid nitrogen, liquid oxygen, and liquid argon. The construction of ASU plant was completed on 1 September 2021. Its commercial operation date was 1 October 2021.

1) Nature of Business

- Joint venture with BIG in ASU Project as a Production JVC to produce industrial gases with about 0.67 million tons of excess cold energy from Liquefied Natural Gas per year.
- ASU Project utilizes excess cold energy from Liquefied Natural Gas. It has constructed cold air-duct system that links to PTT LNG Receiving Terminal in order to transport Liquefied Natural Gas to its facilities that will take cold energy out from Liquefied Natural Gas. After that, the ASU will send natural gas via ducts back to PTT LNG Receiving Terminal, which will forward it to natural gas users. PTTLNG has invested in the project's air-duct system.
- The parent company of BIG, Air Products and Chemicals, Inc. (APC), provides manufacturing technologies to ASU facilities.
- ASU Project is located on 9.5 rai of land in the Map Ta Phut Industrial Port in Rayong, which is operated by the Industrial Estate Authority of Thailand (I-EA-T). Its location sits about one kilometer away from PTT LNG Receiving Terminal.

2) Distribution

MAP distributes industrial gas products to BIG, PTT Group, and other users in various industries with a sales price formula that follows the cost-plus pricing principle. The retail marketing will be managed by BIG for distributing the gases to end users in different economic sectors, such as the frozen industry, electronics industry, welding industry, and hospitals, which will be delivered through pipelines and transport trucks.

3) Management

MAP board of directors is consisted of 4 members. Of them, 2 are PTT's executives and 2 others are BIG's executives.

4) Finance

The operating results of MAP between 2020 and 2022 are as follows:

Unit : THB million

Financial statements	2020	2021	2022*
Revenue from sales and services	-	195	746
Total revenue	13	200	748
Total expenses (including taxes)	13	170	569
Net profit (loss)	-	30	179

Note: MAP's commercial operation date was 1 October 2021.

Unit : THB million

Financial statements	2020	2021	2022*
Total assets	960	1,604	1,669
Total liabilities	741	1,230	1,116
Shareholders' equity	219	374	553

* 2022 data are unaudited

1.2 Petroleum Exploration and Production

PTT has operated petroleum exploration and production business through its subsidiary PTTEP, which was established on 20 June 1985 with the initial registered capital of THB 400,000 as the E&P Flagship Company of PTT. On 10 June 1993, PTTEP was listed on Thai stock market. As of 31 December 2022, PTTEP had the registered capital of THB 3,969,985,400 with PTT holding 63.79 % of PTTEP's registered and paid-up capital.

To operate its petroleum exploration and production businesses in Thailand and overseas, PTTEP must comply with conditions and laws of relevant countries, which could be in forms of (1) Production Sharing Contracts (PSC) (2) Concessions, or (3) Services Agreements. In Thailand, PTTEP also has to adhere to Petroleum Act B.E. 2514 (and amendments), as well as other applicable laws.

PTTEP Group has mainly operated in Southeast Asia namely Thailand, Myanmar, Malaysia, Vietnam, and Indonesia. Moreover, PTTEP has also invested in other regions including Oman, the United Arab Emirates, Algeria, Mozambique, Angola, Kazakhstan, Australia, Canada, and Mexico. As of 31 December 2022, PTTEP conducted more than 50 petroleum exploration and production projects in 15 countries including Thailand with proved reserves of 1,350 million barrel of oil equivalent consisting of crude oil, condensate and Liquefied Petroleum Gas which were at 357 million barrel and the volume of natural gas which was at 5,973 billion cubic feet. Moreover, the Probable Reserves had the volume of 773 million barrel of oil equivalent. The total proven reserves of PTTEP and its subsidiaries at the year-end of 31 December 2020 - 2022 were as follows:

Unit : million barrel of oil equivalent

Proved reserves	2020	2021	2022
Indigenous Thailand	534	605	712
International	540	745	730
Total	1,074	1,350	1,442

Moreover, PTTEP has invested in new businesses outside petroleum exploration and production field in pursuit of long-term growth. These investments focus on the development of its current technologies and R&D capabilities that support its current business. PTTEP has urgently expanded its artificial intelligence (AI) and robotics businesses, its renewable energy business, and new energy business. For example, it has invested in AI & Robotics Ventures Company Limited (ARV) to develop a platform of AI and robotic innovations to be a tech leader in AI and robotics field and it also intends to provide forums where young talents are able to apply their concepts and technologies for the commercial market in a systematic manner and make positive changes to the world.

PTTEP has also entered into joint ventures in others business outside petroleum exploration and production field. For instance, it has co-invested in gas pipeline projects in Myanmar namely the Zawtika Project, the Yadana Project, and the Yetagun Project. PTTEP has also formed joint ventures with PTT Group. For example, PTT and PTTEP jointly invested in Energy Complex Company Limited to operate office-space rental business. They each hold 50.00% of Energy Complex's shares.

The operating results of PTTEP mainly depend on global crude oil prices, the success of its petroleum exploration and production projects, continued enhancement of operational performance and cost management, and investment opportunities. In summary, its operating results are as follows:

1) Production

As of 31 December 2022, the total production capacity of PTTEP and its subsidiaries was 585,244 barrels of oil equivalent per day (BOED). The total annual production for 2020 - 2022 is summarized as follows:

Unit : BOED

Production volume	2020	2021	2022
All projects	422,278	494,877	585,244

2) Distribution

PTTEP and its subsidiaries have produced four types of products namely crude oil, natural gas, Liquefied Natural Gas, and condensate with most products sold to PTT (68.00 % of PTTEP's 2022 sales). Regarding natural gas sales and purchases, PTT and PTTEP have signed long-term contracts that are valid for 25 to 30 years. There is also minimum purchase requirement in each year. For crude oil and condensate, the prices under sale / purchase agreements between PTT and PTTEP are made in reference to the global crude oil prices, which have similar qualification in order to reflect the value of its product at the rate as close as possible to market price. PTT has also signed sale and purchase agreement for crude oil and condensate with PTTEP.

As of 31 December 2022, the total sales volume of all four types of products by PTTEP and its subsidiaries was approximately 468,130 BOED, an increase of 12.00% when compared to 416,141 BOED in 2021. This was mainly from PTTEP becoming the operator of G1/61 (Erawan) Project and producing natural gas under the project. Another key factor was its Arthit Project's production capacity and sales volume increase. Sales of PTTEP and its subsidiaries by product type between 2020 and 2022 are as follows:

Products	2020	2021	2022
Crude oil (thousand barrel per day)	79	71	72
Natural gas (MMSCFD)	1,469	1,829	2,079
Liquefied Petroleum Gas (metric tons per day)	182	186	177
Condensate (thousand barrel per day)	35	45	53
All products (BOED)	354,052	416,141	468,130
Average selling prices (USD per barrel of oil equivalent)	39	43	53

3) Management

PTT governs PTTEP through its executives nominated as members of the board of directors with authority to define and supervise policies and business activities under good governance. PTTEP's board of directors as of December 31, 2022, consisted of 15 directors, 2 of whom were nominated by PTT.

4) Finance

The operating results of PTTEP between 2020 and 2022 are as follows:

Unit : THB million

Financial statements *	2020	2021	2022
Revenue from sales and services	160,401	219,068	331,350
Total revenue	167,418	234,631	339,902
Total expenses (including taxes)	146,061	196,256	269,668
Net profit (loss)	22,664	38,864	70,901

Unit : THB million

Financial statements *	2020	2021	2022
Total assets	675,637	783,536	869,864
Total liabilities	321,226	368,186	402,744
Shareholders' equity	354,411	415,350	467,120

* From 1 January 2011, PTTEP has chosen USD as functional currency. Any figure in THB in financial statements therefore is converted from USD.

5) Project progress and projects under development

PTTEP's primary operational bases are mostly in Southeast Asia namely Thailand, Myanmar, Malaysia, Vietnam, and Indonesia. In 2022, the average sales volume from projects in Thailand was about 295,362 BOED, which accounted for 63% of total sales volume. Average sales volume from other countries in this region was approximately 98,715 BOED, which accounted for 21% of total sales volume.

Key progress are as follows: Projects in the Gulf of Thailand such as Bongkot Project, Arthit Project, and Contract 4 Project which were delivered higher production in accordance with higher nomination from the buyer after COVID-19 outbreak eased and the situation started to return to normal in 2022. Moreover, PTTEP became the operator of G1/61 (Erawan) Project and started natural-gas production under the project as plan. For Myanmar Project, PTTEP became the operator of Yadana Project after its previous operator withdraw. Moreover, PTTEP has already withdrawn in Yetagun Project. For Malaysia Project, PTTEP recognized natural

gas sales for a full year from Malaysia Block H Project for the first time and other exploration and production projects in Malaysia also progressed in line with plans. For other regions, Algeria Hassi Bir Rekaiz Project started the production of crude oil in the second quarter of 2022 with the production capacity of 13,000 BOED. Moreover, PTTEP successfully dug an exploration well in Abu Dhabi Offshore Block 2, the United Arab Emirates (UAE). Results will be evaluated for the project's further development. In addition, PTTEP acquired 25% interest in Sharjah Onshore Area A Project, the United Arab Emirates (UAE) from Eni Sharjah B.V. The acquisition will be completed after fulfilling all conditions which was completed in 2022. The transaction aligns with PTTEP's strategy, focusing on prolific area in the Middle East.

For more information, visit PTTEP website: pttep.com/en/Investorrelations/Regulatorfilings/Annualfiling.aspx

1.3 Investment in Other Upstream Business

1.3.1 PTT Energy Resources Company Limited (PTTER)

PTTER, a wholly owned subsidiary of PTT, was established in October 2007. PTTER has operated service management for PTT's coal business. As of 31 December 2022, PTTER had the registered capital of THB 36,045 million (3,604,500,000 common shares that have the par value of THB 10 each). Its paid-up capital was THB 33,703 million.

1) Business Operations

PTTER sold all its 25.00% stake in East Mediterranean Gas S.A.E. (EMG) to Snam S.p.A. (Snam) (a listed company in Italy) or its wholly owned subsidiary, at the price of USD 50 million. The sale was completed on 2 December 2021.

2) Management

As of December 31, 2022, there were 3 directors on the PTTER board of directors, 2 of whom were from PTT and the remaining person was an external independent director.

3) Finance

The operating results of PTTER between 2020 and 2022 are as follows:

Unit : THB million

Financial statements	2020*	2021	2022
Revenue from sales and services	-	-	-
Other revenues	114	1,460	189
Total expenses (including taxes)	(409)	136	70
Net profit (loss)	523	1,324	119

Unit : THB million

Financial statements	2020*	2021	2022
Total assets	1,564	3,134	3,324
Total liabilities	50	67	34
Shareholders' equity	1,514	3,067	3,290

* In 2020, reversal of doubtful debts of THB 513 million was recorded due to the restructuring of coal business investments.

1.3.2 PTT Global Management Company Limited (PTTGM)

PTTGM was established as a holding company to facilitate PTT's investments in both domestic and overseas. PTT has held all registered and paid-up shares of PTTGM. As of 31 December 2022, PTTGM had the registered capital of THB 119,022 million and the paid-up capital of THB 111,468 million.

1) Business Operations

In 2022, PTTGM operated two main businesses which are coal business and new business group according to New S-Curve strategy. Investments in coal businesses are as follows:

PTT Mining Limited (PTTML), wholly owned subsidiary of PTTGM (direct and indirect), is registered in Hong Kong, China.

The investment are as follows:

- Holding of 95.82% stake in Sakari Resources Limited (SAR), a Singapore-based company, operating coal mining in the Republic of Indonesia including Sebuku mine and Jembayan mine, and trading of coal in the Republic of Singapore through Tiger Energy Trading Pte Ltd. (TET).
- Holding 80.00% stake thru subsidiary company in Madagascar Consolidated Mining SA (MCM), a joint investment entity with the nominating entity of the Madagascan government, operating exploration and development of coal in the Sakoa Coal Field in the Republic of Madagascar. The project, located in the southwest of Madagascar, has a potential on coal production for export and fuel use as an energy source for power generation and industrial use, particularly in the Republic of India and western European countries. Currently, MCM has successfully obtained an operating license from the Madagascan government but is currently delaying its mining operation due to the falling price of coal.
- Holding of 35.00% stake thru a subsidiary company in Fee (Bru) Pte Ltd., a joint venture company which used to have an exploration license to explore coal potential in Brunei.
- PTT has withdrawn its investments in coal businesses align with strategy. PTT International Holdings Limited (PTTIH) sold its investments in PTML, which was its wholly owned subsidiary, to PT Astrindo Nusantara Infrastruktur Tbk (Astrindo) (a listed company in Indonesia) or Astrindo's subsidiary at approximately USD 471 million. PTTIH and Astrindo signed share purchase agreement on 1 August 2022. The transaction under the agreement was 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.
- For coal business's performance in 2022, sales volume of SAR was 6 million tons and net income was USD 254 million.

In addition, to accommodate PTT's and PTT Group's investment strategy in New S-Curve business, PTTGM has established several subsidiaries in response to PTT's objectives for agility to operate the new businesses. Its New S-Curve investments cover EV value chain business and Life Science business (includeing pharmaceutical, nutrition, medical device and diagnosis businesses), as well as AI, Robotics and Digitalization business. However, as most of these businesses are in the early stage which have not yet generated a significant revenue for PTTGM. Nevertheless, in 2022, life science business has started to recognize Lotus Pharmaceuticals's performance after acquire stakes in April 2022. As a result, PTT group becomes a major shareholder of Lotus Pharmaceutical Company Limited.

2) Management

As of December 31, 2022, there were 3 directors on PTTGM's board of directors, 2 of whom were from PTT and another was a representative of the Ministry of Finance.

3) Finance

The overall operating results of PTTGM between 2020 and 2022 are as follows:

Unit : THB million

Financial statements	2020	2021	2022
Revenue from sales and services	11,057	16,984	49,229
Other revenues	470	814	2,408
Total expenses (including taxes)	18,606	14,285	40,918
Net profit (loss)	(7,079)	3,513	10,719

Unit : THB million

Financial statements	2020	2021	2022
Total assets	39,519	62,227	171,530
Total liabilities	19,706	27,504	58,113
Shareholders' equity	19,813	34,723	113,417

1.3.3 PTT Green Energy Company Limited (PTTGE)

PTT Green Energy Company Limited (PTTGE) was registered as a wholly owned subsidiary of PTT on 14 September 2007, with an initial capital of THB 833 million. Currently, PTTGE has the register capital of THB 12,403 million. Its primary objective was to invest in palm plantation and crude palm oil production. However, the assets under PTTGE is not appropriate for palm plantations at the international acceptable level. The performance failed to meet the business targets and expenses to maintain the assets were high compare to business standard which was not cost-effective to continue the operations. As a result, in 2014, the PTT Board of Directors decided at Board Meeting No. 5/2557 to liquidate the projects under PTTGE.

1) Business Progress

PTTGE fully completed the liquidation of its subsidiaries PTT Green Energy (Hong Kong) Limited, Kalimantan Thailand Palm Pte. Ltd., and Sabran Brothers Pte. Ltd., on 6 April 2018, 4 July 2018, and 14 November 2019, respectively. Currently, PTTGE has just 2 active entities: PTT Green Energy Pte. Ltd. (a Singaporean registered company) and PTT Green Energy (Thailand) Company Limited (a Thai registered company).

2) Management

As of December 31, 2022, PTTGE had 4 directors on its board of directors, all of them were executives from PTT.

3) Finance

The operating results of PTTGE between 2020 and 2022 are as follows:

Unit : USD million

Financial statements	2020	2021	2022*
Total revenue	-	2	-
Total expenses (including taxes)	1	1	1
Net profit (loss)	(1)	1	(1)

Financial statements	2020	2021	2022*
Total assets	18	18	17
Total liabilities	1	-	-
Shareholders' equity	17	18	17

* 2022 data are unaudited.

1.3.4 PTT Global LNG Company Limited (PTTGL)

PTTGL was formed on 23 June 2017, 50:50 joint venture between PTT and PTTEP. Currently, PTTGL's registered capital is THB 10,421 million (10,421,446 common shares, par value of THB 1,000 per share). Its paid-up capital is THB 10,421 million.

PTT Group has restructured PTTGL shareholding structure by assigning PTT's wholly-owned subsidiary Siam Management Holding Company Limited (SMH) to purchase all shares in PTTGL from PTT and PTTEP Business Center Company Limited (PTTEP BC). After the restructuring, SMH becomes the sole shareholder of PTTGL paving way for agile integrated LNG business operations and facilitating PTT Group's LNG portfolio management strategy. The restructuring was completed on 1 June 2022.

1) Business Operations

Presently, PTTGL has invested in LNG Value Chain businesses overseas. PTTGL has set up PTTGL Investment Limited (PTTGLI) in Hong Kong, China, with the registered capital of USD 25,000 and has held all of its shares. PTTGLI has acquired 10% of the shares in PETRONAS LNG 9 Sdn Bhd (PL9SB), which has operated an LNG liquefaction plant or Liquefaction Train 9 Project and facilities around PETRONAS LNG Complex in Malaysia's Sarawak. Its annual production capacity totals 3.6 million tons. Its LNG has been distributed to customers across Asia. This investment marks PTTGL's first step into LNG Value Chain sector in line with PTT's strategy to focus on transition fuel and forge partnerships with strong players for greater business opportunities. On 30 June 2022, PTTGL signed the Terminal Use Agreement (TUA) with PTT LNG to reserve a capacity to provide LNG receiving/distributing services, to increase its competitiveness as PTT Group's procurer and wholesaler of natural gas for commercial market, and to enhance its marketing abilities in preparations for its role as an LNG shipper that serves customers outside PTT Group. Moreover, PTTGL signed an LNG procurement agreement with Cheniere Energy to support Thailand's energy security. Under this agreement, The gas delivery is scheduled between 2026 and 2045.

2) Management

PTTGL board of directors, as of 31 December 2022, had 4 members. All of them were PTT executives.

3) Finance

The operations results of PTTGL between 2020 and 2022 are as follows:

Financial statements	2020	2021	2022*
Total revenue	5	2	2
Total expenses (including taxes)	3	5	7
Net profit (loss)	(2)	(3)	(5)

Financial statements	2020	2021	2022*
Total assets	379	339	280
Total liabilities	120	84	15
Shareholders' equity	259	255	265

*2022 data are unaudited

2. Downstream Businesses Invested through PTT Group

2.1 International Trading

2.1.1 PTT International Trading Pte. Ltd. (PTTT)

PTTT registered in Singapore on 1 December 2000. This wholly-owned subsidiary of PTT has the registered and paid-up capital of SGD 6.1 million. It has the objective to undertake full-fledged international trading transactions through commodity storage, blending, administration, chartering service and price risk management for crude oil, condensate, liquefied natural gas, petroleum products, petrochemicals, products related to energy, and other commodities to generate revenue, create added value, represent a platform for transaction expansion in the Eastern Hemisphere, and contribute to Thailand's energy security.

PTT MEA Ltd. (PTT MEA) is a subsidiary of PTTT, located in Abu Dhabi of the United Arab Emirates. PTT MEA was established on 21 February 2021 to operate forward trade invest in the ICE Futures Abu Dhabi (IFAD) market and extend trading networks in the Middle East. Also, PTTT has a representative office in Shanghai, China, to coordinate market data in China and the nearby region.

1) Trading and Services

PTTT engages in full-fledged international trading ranges from storage, blending, administration through the sales and purchase of commodities together with chartering service and price risk management through derivatives. PTTT also focuses on Asia market and intercontinental market associated with other subsidiaries of the International Trading Business unit and PTT Group.

2) Management

PTTT's board of directors as of December 31, 2022, consisted of 6 directors, 5 of whom were appointed by PTT and the other appointed by the Ministry of Finance.

3) Finance

The operating results of PTTT and its subsidiary between 2020 and 2022 are as follows:

Unit : USD million

Financial statements	2020	2021	2022
Revenue from sales and services	8,553	15,316	24,660
Total revenue	8,565	15,320	24,665
Total expenses (including taxes)	8,524	15,302	24,584
Net profit (loss)	41	18	81

Unit : USD million

Financial statements	2020	2021	2022
Total assets	1,084	1,614	2,495
Total liabilities	936	1,451	2,252
Shareholders' equity	148	163	243

2.1.2 PTT International Trading London Ltd. (PTTT LDN)

PTTT LDN was established on 24 October 2016 in London, England, with the registered capital of USD 26.5 million and the paid up capital of USD 10.5 million. PTT holds all of PTTT LDN's shares. The objective of the company is to operate international trading, focus on expanding the trading network in the Western corridor together with the aspiration to pursue opportunities and create value added of new transactions from West to East. Its transactions embrace trading of crude oil and petroleum products together with chartering service and price risk management. PTTT LDN's other key role is to pursue trading and price movement data in the West, which gives PTT worldwide product data around the clock; its location in the best of the world's derivatives market in the UK also contributes to even more efficient trading and price risk management.

1) Trading and Services

PTTT LDN has conducted trading activities outside Thailand. Its businesses involve the purchases and sales of commodities, the provision of chartering service, and price-risk management services via derivatives. Treating Europe and Africa as its major markets, PTTT LDN has also conducted intercontinental trading activities with other subsidiaries in the International Trading Business unit and PTT Group.

2) Management

PTTT LDN's board of directors as of December 31, 2022, consisted of 6 directors, 5 of whom were appointed by PTT and the other appointed by the Ministry of Finance.

3) Finance

The operating results of PTTT LDN between 2020 and 2022 are as follows:

Unit : USD million

Financial statements	2020	2021	2022
Revenue from sales and services	1,141	2,046	3,080
Total revenue	1,159	2,053	3,082
Total expenses (including taxes)	1,145	2,044	3,040
Net profit (loss)	14	9	42

Unit : USD million

Financial statements	2020	2021	2022
Total assets	149	357	392
Total liabilities	111	311	305
Shareholders' equity	38	46	87

2.1.3 PTT International Trading USA Inc. (PTTT USA)

PTTT USA registered as a company on April 2, 2020, in Houston, USA, which a wholly owned subsidiary of PTT. PTTT USA has a registered capital of USD15 million; paid up USD 5 million. The company's objective is to engage in international trading, focus on expanding trading network embracing the Americas (North America, Central America, and Latin America), including pursuing opportunities to create value added and enlarge trading transactions in the Americas and intercontinental. PTTT USA also procures feedstock for PTT Group's refineries and/or petrochemical plants, which reduce dependence on the Middle East, where politics is highly risky. Its transactions consist of trading in crude oil, petroleum products, petrochemicals, chartering service, and price risk management.

Moreover, PTTT USA's key role is to pursue data on product trading and price movement in the Americas and the world's foremost derivative market in the US, contributing to PTT's efficiency of trading and hedging, thanks to around-the-clock product data availability.

1) Trading and Services

PTTT USA engages in full-fledged international trading by purchasing and selling commodities and providing chartering and hedging services through derivatives. PTTT USA focuses on the primary markets in North America and South America, including intercontinental trading associated with other subsidiaries under PTT's International Trading Business unit and PTT Group.

2) Management

PTTT USA's board of directors as of December 31, 2022, consisted of 4 directors, 3 of whom are PTT executives and the other appointed by the Ministry of Finance.

3) Finance

PTTT USA's operating results in 2020 - 2022 are as follows:

Unit: USD million

Financial statements	2020	2021	2022
Revenue from sales and services	-	234	1,654
Total revenue	-	234	1,654
Total expenses (including taxes)	-	232	1,635
Net profit (loss)	-	2	19

Unit: USD million

Financial statements	2020	2021	2022
Total assets	5	8	53
Total liabilities	-	1	27
Shareholders' equity	5	7	26

2.2 Petrochemical, Refining, Oil and Retail business

2.2.1 PTT Global Chemical Public Company Limited (GC)

PTT Global Chemical Public Company Limited (GC) is involved in integrated petrochemicals and refining with total production capacity of 14.23 million tons per year for petrochemical and chemical products and total refining capacity of about 280,000 barrels per day (BPD) for crude oil and condensate. GC is PTT Group's petrochemical flagship. PTT held 45.18% of shares in GC as of 31 December 2022.

GC has 5 core business groups, as follows:

- 1) Upstream petrochemical products
- 2) Intermediate petrochemical products
- 3) Polymers & Chemicals
- 4) Bioplastics & Circularity
- 5) Special chemical products

In addition to the aforementioned 5 major business groups, GC offers various services namely product marketing & distribution service, logistics services, port services, utilities, technical support, engineering services, plant-maintenance services, as well as conducts many other businesses. As of 31 December 2022, GC's capacities were as follows:

Business Group	<u>Installed Capacity</u> (tons per year except when stated otherwise)
1) Upstream petrochemical products	
Refinery ⁽¹⁾	280,000
Aromatics plants	2,419,000
Olefins plants	3,738,000
2) Intermediate petrochemical products ⁽²⁾	
Ethylene Oxide.....	423,000
Phenol.....	954,000
Other intermediate petrochemical products...	1,408,000
3) Polymers & Chemicals ⁽²⁾	
Polymer.....	2,842,000
Chemicals.....	198,000
4) Bioplastics & Circularity ⁽²⁾	
	824,000
5) Special chemical products ⁽²⁾	
	1,424,000

Notes:

(1) Raw materials entering the crude distillation unit (CDU) are measured in barrels per day, including 145,000 barrels per day for crude distillation and 135,000 barrels per day for condensate distillation.

(2) As for intermediate petrochemical products, polymer products & chemicals, bioplastics & circularity, and special chemical products, capacities are calculated from companies in which GC holds at least 25% stake.

Production capacity and utilization rates of GC refinery, olefins plants and aromatics plants in recent years are as follows:

	Production capacity	2020 ^{/1}	2021 ^{/2}	2022 ^{/3}
		Utilization rate (%)	Utilization rate (%)	Utilization rate (%)
Refinery	280 thousand barrels per day	97	95	89
Olefins plant	3,738 thousand tons per year	97	91	80
Aromatics plant	2,419 thousand tons per year	96	99	88

^{/1} In 2020, there were planned maintenance shutdown of main production; Olefins Plants 2/1 and 2/2 from January to March for 74 days and the Oleflex Production Unit for 37 days between March and April.

^{/2} In 2021, oleflex production unit has planned maintenance shutdown for 37 days between October and November.

^{/3} In 2022, refinery production unit has planned maintenance shutdown for 48 days between October and November.

1) Procurement

Raw materials used in the production of petroleum and aromatics products are: 1) Imported crude oil, and 2) condensate obtained from both domestic and international sources. PTT is responsible for procuring crude oil and other raw materials under a feedstock supply agreement with price structure based on the market prices. GC has also procured condensate via PTT under long-term agreements. Raw materials used in the production of olefins products are ethane, propane, LPG, NGL, and light naphtha. Most of the raw materials are acquired from domestical sources with PTT responsible for procuring natural gas from its gas separation plants under a long-term supply agreement.

In addition, GC has used aromatics and olefins products from its operations for the production of intermediate and downstream petrochemicals for upgrading its businesses and adding value to its products.

Regarding bioplastics, GC has procured raw materials mainly from local suppliers to support Thailand’s agricultural sector and related industries. For the production of its special chemical products, GC has procured key raw materials from suppliers under both short-term and long-term sales and purchases agreements.

2) Distribution

Regarding upstream petrochemical products, PTT Oil and Retail Business Public Company Limited (OR) has purchased petroleum products from GC under a product offtake agreement at market prices. GC’s aromatics is not only used for its production of intermediate petrochemical products but is also sold under short-term and long-terms agreements to domestic customers. GC’s olefins is mainly used for its production of downstream petrochemicals, and it also sold to other companies in PTT Group as well as other domestic customers.

Regarding intermediate petrochemical products, GC has sold them mainly to dosmetic customers. Distribution has been done with a focus on major customers and agents, which help distribute the products to small customers. After domestic demand is fulfilled, the remaining volume of products are exported.

Regarding Polymer and plastic pellet products, GC enters into an agreement with a domestic agents and international traders for the distribution of polyethylene plastic pellets under the trademark “InnoPlus” and polystyrene plastic pellets under the trademark “Diarex”. GC has conducted both domestic and international integrated marketing and distribution activities for these products via its subsidiaries and joint ventures.

Bioplastic products, GC sold them to specific customers who are major manufacturers in foreign countries while environmental chemical products are distributed to almost all domestic customers.

Special chemical products, GC mainly distributes directly to customers and dealers, and operate through subsidiaries and joint ventures.

3) Management

GC board of directors, as of 31 December 2022, had 14 members. Of them, 3 were PTT executives. PTT has assigned its executives to serve in GC management, including in the posts of chief executive officer and president. (As of 1 February 2023, GC had 15 members. Of them, 4 were PTT executives.)

4) Finance

GC's comparative performance results between 2020 and 2022 are as follows:

Unit: THB million

Consolidated financial statements	2020	2021	2022
Revenue from sales and services	329,291	468,953	683,954
Total revenue	335,716	492,126	668,873
Total expenses (including taxes)	335,064	446,576	677,625
Net profit (loss) *	652	45,550	(8,752)
Net profit (loss) of the major shareholder	200	44,982	(7,636)

Unit: THB million

Consolidated financial statements	2020	2021	2022
Total assets	489,383	754,115	719,965
Total liabilities	200,389	426,512	421,138
Shareholders' equity	288,994	327,603	298,827

*Profit (loss) of the major shareholder after deducting the portion of non-controlling interests. The profit (loss) of the non-controlling interests totaled THB 452 million in 2020, THB 568 million in 2021, and THB (1,116) million in 2022.

5) Projects

5.1) PVC business expansion project: establishment of AGC Vinythai Public Company Limited (AVT)

GC supported the merging of Vinythai Public Company Limited (VNT) and Thai Asahi Chemicals Company Limited (AGC-TH). Through the merging, AGC Vinythai Public Company Limited (AVT) was established to facilitate business restructuring as GC sought to expand its presence in downstream sector and get closer to end users by developing integrated polyvinyl chloride (PVC) business. After the establishment of AVT was completed on 1 July 2022, GC was allocated 27.32% of its shares. On 15 December 2022, GC also bought AVT's new common stock. Its shareholding percentage in AVT is thus now 32.72%.

5.2) High-quality recycled plastics project

GC has invested through a joint venture, Envicco Company Limited, in this project with the objective to produce and sell recycled plastic products in rPET and rHDPE categories. With a total capacity of 45,000 tons per year, this joint venture is capable of producing up to 30,000 tons of rPET and up to 15,000 tons of rHDPE annually. Its commercial operation date was 15 October 2022.

5.3) Advanced-engineering plastics project

GC has set up a joint venture, Kuraray GC Advanced Materials Company Limited, for the production and distribution of advanced-engineering plastics such as High Heat Resistant Polyamide-9T (PA9T), with the production capacity of 13,000 tons per year, and Hydrogenated Styrenic Block Copolymer (HSBC), with the capacity of 16,000 tons per year. Its plant is expected to start commercial operation in the first quarter of 2023.

5.4) Olefins 2 modification project

GC has obtained the approval to implement the olefins 2 modification project, with the use of propane as an additional feedstock. Commercial operation is expected to start in the second quarter of 2023.

5.5) Other projects

HMC Polymers Company Limited, whose plants produces polypropylene (PP) pellets, has implemented a project to raise its production capacity and diversify its production to cover a wider range of PP grades through its PP Line 4. Designed to enhance the company's competitiveness, this project started its production on 29th December 2022. Its annual production capacity is expected to be 250,000 tons a year.

For additional details, visit the company's website: pttgcgroup.com/en/investor-relations/document/annual-filings

2.2.2 Thai Oil Public Company Limited (TOP)

TOP is Thailand's largest business operator in refinery and petroleum distribution. Its refinery also ranks among the most efficient in Asia-Pacific. The company's main business is petroleum oil refining. Presently, its production capacity is 275,000 barrels per day, or 22.1% of the country's overall refinery nameplate capacity. Domestic distribution accounts for 85% of the total capacity. The company has also expanded its investment into aromatics-production business with the current annual production capacity of 838,000 tons. Moreover, it has engaged in the businesses of surface-active agent (LAB), olefins, electricity generation, alternative energy, and solvent. As of 31 December 2022, PTT holds 45.03% of shares in the company.

The following is TOP's production capacity and utilization rate of its refinery and aromatics plant for the periods indicated:

	Production capacity	2020 ¹	2021	2022 ²
		Utilization rate (%)	Utilization rate (%)	Utilization rate (%)
Refinery	275,000 barrels per day	101	100	107
Aromatics plant	838,000 tons per year	71	87	71

¹ In 2020, a major maintenance shutdown was carried out at LAB production unit from mid-July to late August 2020.

² In 2022, there was a major maintenance shutdown at Thai Lube Base Public Company Limited's production unit from early October to mid-November 2022.

1) Procurement

TOP's production uses crude oil obtained from both domestic and international sources. Most of the imported crude oil is shipped from the Middle East, transported by sea freight. Domestic crude oil, meanwhile, is transported by rail and ships. The selection of crude oil is based on prices and expected returns. PTT is responsible for procuring crude oil under a crude supply agreement with a price structure that is based on market prices.

2) Distribution

In 2022, TOP distributed 85% of its products in the domestic market and exported the remaining 15%. OR, the main distributor of PTT Group's refined products, is responsible for purchasing TOP's oil products under a product offtake agreement at market prices.

2020	2021	2022
Proportion of domestic/international sale (%)	Proportion of domestic/international sale (%)	Proportion of domestic/international sale (%)
87/13	80/20	85/15

3) Management

As of 31 December 2022, TOP board of directors had 14 members. Of them, 5 were PTT executives. PTT assigned its executives to serve in TOP management, including in the posts of its chief executive officer and president.

4) Finance

TOP's performance results between 2020 and 2022 are as follows:

Unit: THB million

Consolidated financial statements	2020	2021	2022
Revenue from sales and services	242,840	335,827	505,703
Total revenue *	259,104	348,308	547,273
Total expenses **	261,986	335,305	514,167
Net profit (loss) ***	(2,882)	13,003	33,106
Net profit (loss) of the major shareholder	(3,301)	12,578	32,668

Unit: THB million

Consolidated financial statements	2020	2021	2022
Total assets	306,188	362,144	444,581
Total liabilities	186,069	239,050	285,924
Shareholders' equity	120,119	123,094	158,657

* Includes share of profit from investments in joint ventures and associates: THB 2,492 million in 2020, THB 1,675 million in 2021, and THB (513) million in 2022.

** Includes income tax items (income tax credit) of THB (647) million in 2020, THB 2,034 million in 2021, and THB 8,918 million in 2022, as well as the financial costs of THB 4,292 million in 2020, THB 3,595 million in 2021, and THB 3,860 million in 2022.

*** Profits belonging to major shareholders after deducting that of minority shareholders; the profit (loss) shares of non-controlling interests amounted to THB (419) million in 2020, THB 425 million in 2021, and THB 438 million in 2022.

5) Projects

5.1) Clean Fuel Project (CFP)

CFP aims at increasing refinery competitiveness by raising daily refinery capacity from 275,000 barrels to 400,000 barrels. Designed to achieve economies of scale, CFP promises to lower production cost and enhance flexibility in receiving crude oil. Through the project, refinery can increase its heavy crude processing by 40-50 % and add value to products by turning fuel oil into aviation fuel and diesel, which have a higher value. Also, the refinery will be able to produce gasoline and diesel oil that meet Euro-5 standard for improved environment and better quality of life. The CFP project, which requires an investment of about USD 4,825 million, began in 2018. As of 31 December 2022, its progress rate was 89.6%. Under the project are not just ongoing constructions but also preparations for crude-oil procurement, product sales, and review of the feasibility of receiving different types of crude oil beyond the original design, in case of crude-oil price fluctuations. Also prepared are public utilities, infrastructures and workforce. Commercial operation is expected to gradually start in 2024.

5.2) Olefins business co-investment project

TOP has invested in PT Chandra Asri Petrochemical Tbk (CAP), which is Indonesia’s largest producer of integrated chemical products, with years of experience and expertise in the petrochemical sector. TOP investment is made through a new subsidiary set up in the Republic of Indonesia, “PT TOP Investment Indonesia (TII)”. On 29 July 2021, TII entered into agreements with the original major shareholders to acquire 15% of CAP’s shares, at the total price of no more than USD 914 million, or about THB 30,222 million. TII, moreover, has planned to acquire 0.38% more of CAP’s shares if CAP approves the investment in the development and construction of CAP2 petrochemical plant (“investment approval”) within five years since the share-subscription transaction based on right offering was completed under conditions that the purchase of additional shares shall cost no more than USD 270 million or about THB 8,928 million. However, if investment approval is not granted within five years, the purchase of additional shares shall cost no more than USD 3.9 million or about THB 129 million with both parties agreeing to specify investment methods in such event later but under conditions that the methods must receive approval from both CAP shareholders and relevant authorities in Indonesia. The additional share purchase is designed to ensure that TII shall hold 15.38% of CAP’s shares. This project is consistent with TOP’s long-term strategy of diversifying investments towards the growing petrochemical market. Business expansion into the petrochemical sector is executed through extension of its existing hydrocarbon business’s downstream supply chain.

For additional details, visit the company’s website: investor.thaioilgroup.com/form_561_one_report.html

2.2.3 IRPC Public Company Limited (IRPC)

IRPC Public Company Limited (IRPC) is involved in an integrated petrochemical business. Its refinery has the production capacity of 215,000 barrels per day, accounting for 17.31% of the country’s total refinery capacity. As of 31 December 2022, PTT held 45.05 % of the company’s shares.

IRPC’s refinery is capable of producing various petroleum products, including naphtha and liquefied petroleum gas (LPG). The company is able to produce 320,000 tons of lubricant oils per year and 600,000 tons of asphalt per year. Also, IRPC is a producer of petrochemical products such as olefins and aromatics, with the production capacity of 1,221,000 and 367,000 tons per year, respectively. These upstream petrochemical products are feedstocks in the production of different plastic pellets, including HDPE and PP, with the production capacity of 915,000 tons per year, as well as styrenics (ABS, SAN, PS, and EPS), with the production capacity of 352,000 tons per year. These products are sold to operators in plastics industry to use as raw materials in the production of numerous plastic wares, and purchase orders are from both domestic and overseas customers. Moreover, IRPC has facilities to support its operation, including deep-sea port, oil storage and power plant, which gives the company an edge in management and the economy of scale such as cost of transporting raw materials.

The following is IRPC’s production capacity and utilization rate of its refinery, olefins plant, and aromatics and styrenics plant for the periods indicated:

	Production capacity	2020 ¹	2021 ²	2022 ³
		Utilization rate (%)	Utilization rate (%)	Utilization rate (%)
Refinery	215,000 barrels per day	89	89	81
Olefins plant	1,611,000 tons per year	93	95	86
Aromatics and styrenics plants	1,194,000 tons per year	98	99	86

¹ In 2020, a main production unit - RDCC plant – was shut down for scheduled maintenance for 27 days.

² In 2021, a main production unit - RDCC plant – was shut down for scheduled maintenance for 45 days.

³ In 2022, a main production unit – ADU1 & 2 plant – was shut down for scheduled maintenance for 37 days.

1) Procurement

The company's major raw material, crude oil, accounts for 81% of its feedstock. Most of the crude oil used in the production process is imported from Middle East by sea freight. The company has a policy of acquiring the feedstocks from sources that generate maximum returns. PTT is responsible for procuring most of the crude oil under the crude oil supply agreement, with the price structure based on the market prices.

2) Distribution

In 2022, IRPC sold 59% of its products in the domestic market and exported 41% as calculated from the net petroleum-product sales revenue.

Petrochemical products: In 2022, IRPC sold 64% of its products in the domestic market and exported the remaining 36% as calculated from the net petrochemical-product sales revenue. Domestic distribution was executed through distributors and direct sales. For exports, sales were done via trade representatives based overseas.

3) Management

IRPC board of directors had 15 members as of 31 December 2022. Of them, 4 were PTT executives. PTT has assigned its executives to serve IRPC management, including in the posts of its chief executive officer and president.

4) Finance

The operating results of IRPC between 2020 and 2022 are as follows:

Unit: THB million

Consolidated financial statements	2020	2021	2022
Revenue from sales and services	174,463	255,115	324,800
Total revenue	175,802	255,393	326,622
Total expenses (including taxes) *	181,932	240,860	330,986
Net profit (loss) **	(6,130)	14,533	(4,364)
Net profit (loss) of the major shareholder	(6,152)	14,505	(4,360)

Unit: THB million

Consolidated financial statements	2020	2021	2022
Total assets	173,491	190,492	198,187
Total liabilities	97,825	102,780	118,509
Shareholders' equity	75,666	87,712	79,678

* Includes income taxes: THB 1,554 million in 2020, THB 2,351 million in 2021, and THB 1,142 million in 2022.

** Net profit (loss) of the major shareholder after deducting those of minority shareholders; the profit (loss) shares of non-controlling interests amounted to THB 22 million in 2020, THB 28 million in 2021, and THB (4) million in 2022.

5) Projects

5.1) Ultra Clean Fuel (UCF) project

The objective of the UCF Project is to increase refinery plant's efficiency and upgrade diesel quality to Euro-5 standard, given that Ministry of Energy has issued the policy to require the distribution of Euro-5 diesel in Thailand from 1 January 2024 onward. Under the Euro-5 standard, the permitted sulfur level will decline to 10 parts per million (PPM) from 50 PPM (under Euro-4 standard). The project will increase the company's competitiveness in light of the growing demand for low sulfur diesel in domestic market as well as ASEAN Economic Community (AEC). The UCF project promises to strengthen the company that has diesel its main product. Being environmentally friendly, this project also resonates with the company's Eco Factory policy. At present, the UCF project is in the stage of constructing its plant. Its commercial operation is expected to start in the first quarter of 2024. Upon the completion of the project, IRPC will have the capacity to convert all its high-sulfur diesel into low-sulfur diesel based on Euro-5 standards.

For more details, visit the company's website: irpc.co.th/annualreport_post/annual-report/

2.2.4 PTT Oil and Retail Business Public Company Limited (OR)

OR, a flagship company in PTT Group, has operated its businesses based on "Empowering All toward Inclusive Growth" concept. Its four missions are to strengthen integrated energy businesses with Seamless Mobility; to create alternatives for All Lifestyles; to successfully expand businesses in Global Market; and to solve social and environmental problems with OR Innovation. The goal is to achieve Triple Bottom Line growth, which accords importance to not just business performance but also Society, People and the Planet.

OR has three core businesses: Mobility Business, Lifestyle Business, and Global Business.

1) Nature of Business by business group

1.1 Mobility group

OR has operated an integrated energy business for seamless mobility, consistent with the future trend of energy use. Its scope of business has already expanded beyond oil ecosystem to energy solution ecosystem. OR has conducted petroleum-products marketing through retail and commercial market sectors. Regarding the retail market, OR has sold petroleum products and lubricants mainly to motorists and other retail customers through its service stations under the brand PTT Station. In the commercial market, OR has sold petroleum products and other products to commercial customers, including industrial factories, airlines and gas filling plants. Also, OR has sold lubricants and operated FIT Auto service centers. OR, moreover, has set up EV charging stations both inside and outside stations under a plan to ensure there will be such facilities for all of Thailand's major routes in the future.

1.2 Lifestyle group

OR has engaged in businesses that present alternatives and respond to all lifestyles, expanding beyond F&B ecosystem to one-stop solution ecosystem. These include: (1) Food and beverage, such as coffee business under the brand Café Amazon that sells coffee, other beverages, bakeries and snacks, as well as fried chicken business under the brand Texas Chicken, of which OR is the only licensee in Thailand. Also, the company has diversified its products by investing in high-potential SMEs, such as "Ohkajhu" healthy-food restaurant chain, "Pacamara" specialty coffee, "Kamu Tea" tea shop chain, and "Kouen Premium Buffet" and "Ono Sushi" Japanese-food restaurant chains. The company has jointly established Drink Enterprise Company Limited to step into ready-to-drink beverage sector. Moreover, it has invested in Dusit Foods Company Limited to strengthen its Lifestyle Business, diversify its food-business portfolio, and promote opportunities for mutual growth in both domestic and international markets; (2) Other businesses, including convenience stores that sell foods, drinks and various basic necessities under the brand "Jiffy", which owns by

OR, and “7-Eleven, which OR has signed an exclusive collaboration agreement with CP ALL. Moreover, OR offers the service of space management by providing rental space and other services to various Thai and foreign brands. In addition, OR has invested in Otteri Wash & Dry laundromat brand in its bid to respond to new-generation consumers’ behaviors.

1.3 Global group

OR has expanded its business for success and well known in the global market. The overseas expansion is executed through the existing Mobility business involving petroleum products, such as diesel, gasoline, aviation fuel, fuel oil, lubricants and other petroleum products. Also, the overseas expansion is executed through the Lifestyle business involving coffee shops under the brand “Café Amazon” and “Jiffy” convenience store. At present, OR has operated businesses in foreign countries, including the Philippines, Cambodia, Laos, China, Myanmar and Vietnam.

2) Procurement

Procurement of petroleum products is mainly executed through procurement or offtaking contracts with refineries owned by the PTT Group or Third party refineries. Certain petroleum products including gasoline are procured from importers, in addition to the purchases from Thailand-based refineries, for a variety of sources. The purchased petroleum products are transported through transmission pipelines, or by ship, trucks and rail to OR’s storage network.

Liquefied petroleum gas is procured mainly by PTT, with OR purchasing directly from PTT’s gas separation plants. Condensate and methanol are procured for a particular group of customers. Ethanol, biodiesel (B100), and fuel additives are purchased from selected distributors as raw materials for gasohol / diesel production for further distribution to customers.

Base oils for lubricants are procured from Thai Lube Base Public Company Limited, IRPC and other domestic and overseas distributors. Additives for lubricants are acquired from domestic and overseas distributors.

Coffee beans for Café Amazon shops are procured from local producers in Thailand, including farmers, the Royal Project Foundation, Sarn Palung Social Enterprise Company Limited, community enterprises and cooperatives. Such procurement aims to encourage local communities and farmers to grow coffee. For Café Amazon business based overseas, coffee beans are procured from local sources in respective countries that are also major coffee producers. In other foreign countries, roasted coffee beans are sent from Thailand. Other related raw materials for Café Amazon, such as condensed milk, evaporated milk, powdered drink mixes, cups and drinking straws, are procured from local producers with potential and leading producers in their respective industries.

For other food and beverage shops under the brand “Texas Chicken”, raw materials are mainly procured from wholesalers but some types of supplies are sourced from several small vendors.

Regarding 7-Eleven convenience stores, CP ALL is responsible for procuring goods, as it owns all goods available at 7-Eleven outlets located within the OR network. For Jiffy convenience stores, OR generally does not sign long-term agreements with suppliers because it has other sourcing alternatives for most products.

3) Distribution

Distribution channels cover all regions of Thailand and areas in the Philippines, Cambodia, Laos, Japan, Oman, Singapore, Myanmar, Malaysia and China. These include oil stations, Liquefied Petroleum Gas stations, cooking gas shops, FIT Auto service centers, Café Amazon outlets, other food and beverage shops, and convenience stores.

4) Projects

Mobility business: Its major plan is to expand network of oil stations under “PTT Station” brand by choosing high-potential locations for the new stations. Also, there is a plan to improve existing service stations as well as oil products’ quality, in order to raise competitiveness and customer confidence. Moreover, OR has pursued an expansion plan for commercial market based on storage terminals and distribution centers. In addition, OR has embraced clean energy with an investment plan to expand EV station network both inside and outside PTT service stations and other sites, and also to promote various types of clean energy and solutions for efficient energy consumption.

Lifestyle business: A major plan calls for a continued expansion of the network of retail outlets to meet the growing demand in the market. There is a plan to open new Café Amazon and Texas Chicken outlets, as well as expanding the existing network of convenience stores, other shops, and the space management business. The company also seeks opportunities for joint ventures (JV) or mergers and acquisitions (M&A) to meet the rapidly changing customer needs. In addition to the food and beverage business, OR has also set its sight on other growing sectors, including tourism and health & wellness.

Global business: The company has a plan to expand the network of oil stations and retail shops overseas. Also, it seeks to expand its business-growth foundation by presenting new products, services, and business models. Included are efforts to explore business opportunities and to co-invest alongside strong partners in new markets that have good potential.

OR Innovation business: The company has entered into joint investments with potential partners. For example, it co-founded ORBIT for the purposes of developing technology and innovations, and upgrading digital business. Moreover, it has set up ORZON Ventures Fund in collaboration with 500TukTuks for investments in early-stage startups. It has invested in digital platforms in order to pursuit of Inclusive Growth Platforms for OR’s Mobility and Lifestyle businesses such as Food and Beverage, Tourism, Health and Wellness. For instance, its investment in Freshket delivers food-supply-chain services in support of SMEs’ enhanced capabilities and opportunities. It has also invested in Traveloka platform to serve tourism and lifestyles services. Moreover, there is GoWabi-platform investment to connect health and beauty services.

5) Management

OR board of directors had 15 members as of 31 December 2022. Of them, 3 were PTT executives. PTT has assigned its executives to serve in OR management.

6) Finance

The performance results of OR between 2020 and 2022 are as follows:

Unit: THB million

Consolidated financial statements	2020	2021	2022
Revenue from sales and services	428,804	511,799	789,785
Total revenue	434,129	516,422	795,020
Total expenses (including taxes)	425,338	504,952	784,647
Net profit (loss)	8,791	11,470	10,373
Net profit (loss) of the major shareholder	8,791	11,474	10,370

Unit: THB million

Consolidated financial statements	2020	2021	2022
Total assets	144,979	207,659	225,504
Total liabilities	107,063	107,787	121,743
Shareholders' equity	37,916	99,872	103,761

For additional details, visit the company's website: investor.pttor.com/en/document/annual-reports

2.2.5 PTT Tank Terminal Company Limited (PTT TANK)

PTT TANK was established on 6 March 2009. This wholly owned subsidiary of PTT has the registered and paid-up capital of THB 3,887.50 million (at THB 100 per share). Its objective is to operate the business of providing services of storing and transporting liquid chemical products, oil and gas for PTT and its affiliates. As of 31 December 2022, PTT owned 100% of the company's shares.

On 30 June 2009, PTT TANK was handed over 2 contracts that PTT signed with the Industrial Estate Authority of Thailand (I-EA-T) namely an agreement on permission for the use of a 57.8-rai land plot for construction of a liquid storage warehouse at the Map Ta Phut Industrial Estate 1 extension zone, and an agreement on joint development of the Map Ta Phut Industrial Port.

PTT TANK offers the terminal service and the service of receiving, storing and distributing products for PTT Group and its affiliates. Commercial services began on 21 April 2011, with 2 terminals for the maximum cargo size of 60,000 DWT. Maximum cargo volume is 2,000,000 tons per year. The throughput rate is about 800,000 tons per year (with 40 % utilization rate) and there are 10 storage tanks for liquid products available. Services now cover sulfuric acid, propylene, methyl methacrylate, acrylonitrile, ammonia, Liquefied Petroleum Gas, solvent and nitrogen.

1) Management

PTT TANK board of directors has 4 members as of 31 December 2022. Of them, 3 are PTT executives. PTT has assigned its representatives to serve in PTT TANK management, including in the post of its president.

2) Finance

PTT TANK's performance results between 2020 and 2022 are as follows:

Unit: THB million

Financial statements	2020	2021	2022
Revenue from sales and services	920	934	967
Total revenue	984	1,010	1,220
Total expenses (including taxes)	707	739	805
Net profit (loss)	277	271	415

Unit: THB million

Financial statements	2020	2021	2022
Total assets	5,187	6,793	7,106
Total liabilities	385	423	409
Shareholders' equity	4,802	6,370	6,697

3) Projects

3.1 Map Ta Phut Industrial Port Phase 3 (Part 1)

On 1 October 2019, PTT TANK and Gulf Energy Development (GULF) established a new joint venture company under the name of Gulf MTP LNG Terminal Company Limited (GMTP) with the initial registered capital of THB 3,500 million. PTT TANK and GULF respectively hold 30% and 70% of shares in GMTP. The company's objective is to conduct business related to the Liquefied Natural Gas value chain and logistics to support other future investments consistent with PTT Group's strategy. On 1 October 2019, GMTP entered into a Public Private Partnership (PPP) contract with Industrial Estate Authority of Thailand (I-EA-T) for the development of Map Ta Phut Seaport Phase III (Section 1) with joint investments including: 1) Design and construction of the infrastructure with an investment of THB 12,900 million, and 2) Design, construction and operation of Liquefied Natural Gas superstructure on a reclaimed area covering about 200 rai and having the capacity to handle at least 5 million tons of Liquefied Natural Gas cargoes per year (for the first section of gas port), and an extension that can deal with up to 10.8 million tons per year. This part requires an investment of about THB 28,000 million. The project's total investment is THB 40,900 million. The commercial operation is expected to start in 2027.

3.2 Laem Chabang port phase III, Terminal F

Laem Chabang port phase III, Terminal F is a project that the Port Authority of Thailand (PAT) allows the private sector to take part in the development of Terminal F1 and Terminal F2, under a Public Private Partnership (PPP) agreement with a 35-year concession.

PTT TANK established a new joint venture with Gulf Energy Development Public Company Limited (GULF) and CHEC OVERSEA INFRASTRUCTURE HOLDING PTE. LTD (CHEC OVERSEA) under the name of GPC International Terminal Company Limited (GPC) with the registered capital of THB 4,000 million. PTT Tank, CHEC OVERSEA, and GULF will hold 30%, 30%, and 40% of this joint investment's shares respectively. The investment objectives are to operate a seaport and to provide services covering mooring, docking, loading, unloading of goods for container vessels as well as to conduct warehouse business with the capacity to handle containers of at least 4,000,000 TEU/year (TEU is equivalent to 20 Foot Unit of container) to meet the expected demand increase for Laem Chabang Port's services and to enable logistics businesses that use state-of-the-art technology. Not only that this joint venture is in line with PTT's strategy and vision on Logistics & Infrastructure business, but it also supports infrastructure growth in Thailand. On 25 November 2021, GPC entered into a 35-year Public-Private Partnership (PPP) contract with the Port Authority of Thailand ("PAT") for the above project with the investment cost of THB 30,871 million. Terminal F1 is expected to start construction in 2023 and commercial operation in 2025, and Terminal F2 will then start its construction in 2027 with an expected commercial operation in 2029.

3. New Business and Infrastructure Group

3.1 Global Power Synergy Public Company Limited (GPSC)

GPSC was registered from the consolidation of related partnership entities at the Department of Business Development, Ministry of Commerce, on 10 January 2013. The company was later transformed into a public company limited and listed on the Stock Exchange of Thailand (SET) with the first trading date on 18 May 2015. The objective is to support future business growth under a prime mission to pursue power businesses expansion both in Thailand and abroad, and become a power flagship for PTT Group as a synergy force. Additionally, GPSC focuses on the investment in renewable energy power plants and integrated energy storage systems, both domestically and internationally. As of 31 December 2022, GPSC's registered capital stood at THB 28,197.29 million, all of which is paid-up capital.

In June 2022, PTT increased its shareholding percentage in GPSC which PTT and its subsidiary, Siam Management Holding Company Limited (SMH), purchased 10.78% of GPSC's total paid-up capital from TOP. As a result, GPSC shareholding structure changed from 42.54% by PTT, 10.00% by GC, 20.78% by TOP, 1.91% by SMH, and 24.77% by minor shareholders to 47.27% by PTT, 10.00% by GC, 10.00% by TOP, 7.96% by SMH, and 24.77% by minor shareholders.

As of the year-end 2022, GPSC's total equity capacities were 7,227 MW of power generation, 3,064 tons per hour (T/h) of steam, 7,026 cubic metres per hour (Cu.m/h) of industrial water, 15,400 refrigerated tons of chilled water, and 65 megawatts-hour (MWh) per year of energy storage unit.

1) Procurement

GPSC's power and steam production uses natural gas as its main feed. PTT is the sole supplier of gas to GPSC under the long-term gas sale and purchase agreements that are valid from 15 to 25 years.

2) Distribution

GPSC has two main target groups, categorized based on product-usage characteristics.

- 1) Distribution to the Electricity Generating Authority of Thailand (EGAT), the Provincial Electricity Authority (PEA), and the Metropolitan Electricity Authority (MEA): GPSC and its subsidiaries have signed contracted with these customers. With EGAT, GPSC has also had standby-reserve purchase agreements paving way for it to have power reserves, thus strengthening the security of its power production system and power plants.
- 2) Direct Distribution to industrial customers: GPSC sells power to industrial customers via its role as public-utilities producer. Its products cover power, steam, chilled water and industrial water. Most of GPSC's customers are in petrochemical industry. Also, GPSC sells nitrogen to PTT Group's companies as parts of integrated services.

3) Management

As of 31 December 2022, GPSC's Board of Directors comprised 13 directors, including 6 from PTT executives. Under the shareholding structure, PTT also appointed a number of executives to hold executive positions in GPSC, including the President and Chief Executive Officer.

4) Finance

The financial profile of GPSC for 2020 - 2022 is as follows:

Unit: THB million

Consolidated financial statements	2020	2021**	2022
Sales and services revenue*	68,757	74,137	123,083
Total revenue	69,579	74,874	123,685
Total expenses (including taxes)	61,089	67,034	122,228
Net profit (loss)	8,490	7,840	1,457
Net profit (loss) of the major shareholder	7,508	7,319	891

Unit: THB million

Consolidated financial statements	2020	2021**	2022
Total assets	256,656	270,796	288,810
Total liabilities	144,789	153,048	173,710
Shareholders' equity	111,867	117,748	115,100

* Excluding income from financial lease

** The statement of financial position of 2021 was recategorized

5) Projects progress and projects under construction

In 2022, GPSC completed the construction of several projects to pave way for their commercial operation, as well as finished business restructuring as follows:

- SPP Replacement Glow Energy Phase 2: the construction was completed on 15 January 2023 with the power capacity of approximately 200 MW and stream capacity of approximately 300 tons per hour.
- The Transfer of assets related to battery business including assets, expenses, contracts and other agreements related to the battery plant with initial production capacity of 30 MWh per year in Map Ta Phut Industrial Estate, Rayong province from GPSC in Mueang district, Rayong province and 100.00% of the ordinary shares of GPSC-SG Holding Company, Singapore that holds 10.31% in Anhui Axxiva New Energy Technology Company Limited, China to NUOVO PLUS (a joint venture company which GPSC and ARUN PLUS hold 49.00% and 51.00% of share respectively). The transaction has completed on 29 April 2022.
- Divestment of shares in Ichinoseki Solar Power 1 GK to CES Iwate Taiyoko Hatsudensho GK: The transaction was carried out on 18 March 2022.

The under-investment or under construction projects are as follows:

- Energy Recovery Unit (ERU) Project: ERU is a part of TOP's Clean Fuel Project (CFP) which has capacity to generate 250 MW of power and 175 tons per hour of steam. ERU will retrieve oil residue, which is a byproduct of CFP's distillation units, to use as main fuel in generating power and steam which are sold directly to CFP. The project is scheduled of start its commercial operation in 2025.
- Avaada Solar Power Platform Project: Global Renewable Synergy Company Limited (GRSC) (a subsidiary of GPSC) holds 42.93% stake in Avaada Energy Private Limited, which operate a large-scale of renewable energy projects in India. Avaada's current committed capacity is approximately 4,634 MW (GPSC's equity portion is approximately 1,990 MW), of which about 3,842 MW are from operating plants and approximately 792 MW from under-construction plants, which will gradually begin commercial operations between 2023 and 2024. In addition, Avaada aims to expand the renewable energy business up to 11,000 MW by 2025.

- Offshore Wind Power Plant Project in Taiwan (Changfang and Xidao: CFXD): Global Renewable Synergy Taiwan (GRSC TW) has secured 25.00% stake in CI Changfang Limited and CI Xidao Limited, which engage in the offshore wind power plants Taiwan. The project has total production capacity of 595 MW, in which GPSC's equity portion is 149 MW. The first wind turbine has started dispatch electricity in November 2022 and the project is expected to go entirely commercial by the first quarter of 2024.
- Project to raise Nava Nakorn Electricity Generating Company Limited's capacity to produce about 30 MW of power and about 5.3 tons of steam per hour: GPSC holds 30.00% of the company's shares. Constructions for the project were scheduled to start in December 2022. Its commercial operations are expected to be in June 2024.

For more details, visit the company's website: gpscgroup.com/en/investor-relations/downloads/one-reports

3.2 District Cooling System and Power Plant Company Limited (DCAP)

DCAP is a joint venture of PTT, the Electricity Generating Authority of Thailand (EGAT), and the Metropolitan Electricity Authority (MEA) which hold 35.00%, 35.00%, and 30.00% of shares respectively. The company was established on 2 April 2003 with the registered capital of THB 1,670 million. The objective of the company is to engage in the production and sale of power and chilled water for the Airports of Thailand Plc. (AOT) and other customers in Suvarnabhumi Airport. Details are as follows:

The District Cooling System and Power Plant project for Suvarnabhumi Airport was designed to supplement value to natural gas by using natural gas to generate electricity. The surplus heat generating steam which using for generate additional electricity; the surplus steam then produces chilled water for air-conditioning systems. This scheme represents highly cost-effective energy consumption and lowering air pollution.

DCAP's utilities units are as follows:

- A combined-cycle cogeneration power plant with a total capacity of about 95 MW
- A Steam Absorption Chiller (SAC) unit with a total chilled-water capacity of about 13,100 Refrigerant Ton (RT)
- An electric chiller with a total chilled-water capacity of about 11,600 RT
- An electric chiller for the Satellite Airport Terminal-1 (SAT-1) with a capacity of about 12,500 RT, which is operate commercially in April 2021.

Installation of 8-inch gas transmission pipeline branching off PTT's transmission pipeline system at King Kaeo – Lat Krabang Road into the airport, 2 kilometers. This pipeline segment can transport up to 25 MMSCFD.

1) Procurement

DCAP fuels its power and chilled water production with natural gas supplied by PTT under a gas supply agreement containing a minimum of about 7 MMSCFD for 25 years.

2) Distribution

DCAP's product distribution consists of:

- Electricity sold to AOT Plc. (AOT) under a power purchase agreement (PPA) of 50 MW. The surplus electricity sold to the EGAT under a non-firm PPA of up to 65 MW.
- Chilled water for air-conditioning and steam systems of the following customers:

- AOT’s passenger terminals, Airport Operation Building (AOB), Airport Information Management System (AIMS) building under a purchase agreement for 21,500 RT
- Satellite Terminal 1 (SAT-1) under a purchase agreement for 9,000 RT
- Catering building of Thai Airways International Plc. under a purchase agreement for 6,600 RT of chilled water and 8.6 tons/hour of steam
- Suvarnabhumi Airport Hotel Company Limited under a purchase agreement for 1,500 RT of chilled water and about 2 tons/hour of steam
- Electric train station at the Suvarnabhumi Airport under a purchase agreement for 700 RT

3) Management

As of 31 December 2022, DCAP’s board of directors consisted of 7 members. 2 of whom were PTT executives.

4) Finance

DCAP’s operating results from 2020 to 2022 are as follows:

Unit: THB million

Financial statements	2020	2021	2022*
Total revenue	2,655	3,116	4,410
Total expenses	2,477	2,747	4,285
Net profit (loss)	178	368	125

Unit: THB million

Financial statements	2020	2021	2022*
Total assets	3,839	3,904	3,293
Total liabilities	1,179	1,275	1,267
Shareholders’ equity	2,660	2,629	2,026

* 2022 Financial statements are unaudited

3.3 Energy Complex Company Limited (EnCo)

PTT and PTTEP have jointly established EnCo on 11 August 2004 with the registered capital of THB 1,800 million, in which PTT and PTTEP equally hold 50.00% of share. As PTT Group’s subsidiaries expanded their businesses and investments, they needed more office space. The Ministry of Energy, meanwhile, intended to relocate its various units to one same building. EnCo, therefore, has established and taken up the mission of constructing and managing Energy Complex Project with aim to install it as the country’s energy center, a model of green mixed-used complex and eco-friendly. Energy Complex has complied with LEED Platinum standards, thus being an environmentally friendly facility and Thailand’s first exemplary energy-saving building.

1) Services

1.1 Property Management Business: EnCo developed a land plot on Vibhavadi-Rangsit road for the development of Energy Complex with aim to lease space to PTT Group’s subsidiaries and the Ministry of Energy. The first tenant’s space rental started in October 2009. Presently, its occupancy rate is 100.00%. In 2015, EnCo started providing facility-management services. Today, it has provided the services to PTT Group’s subsidiaries and external customers on 23 locations. In 2018, EnCo started a residential project in the Eastern Economic Corridor of Innovation (EECi) in Wang Chan district, Rayong province called THE EnCony Residential Hotel project which consists of 8 buildings included serviced-apartment buildings and hotel buildings to serve people who work in EECi and nearby areas. In 2022, EnCo also began developing EnCo Terminal (EnTer) under the concept of “The Future Station”

which located near Don Mueang International Airport. EnCo's property management business has generated revenue from the rental of office spaces, apartments, serviced apartments, hotels, conventions, and commercial areas as well as other related activities. Customers include both PTT Group's subsidiaries and external customers.

1.2 Facility Management Business: EnCo has provided integrated services of facility management and administration to PTT Group's subsidiaries as well as external customers. Also provides total service solutions and various new optional services, which are designed to complement facilities and create new business opportunities.

1.3 Property Development Business: EnCo has operated a property development business. However, at this stage, the property development covers only EnCo's properties. EnCo also provides the construction services, renovation and interior-design services, improvement of building systems, and project management/development services. The services comprise of the design process, construction process, system-wide testing, and energy and environmental-management services.

2) Management

As of 31 December 2022, EnCo's board of directors comprised 8 members. 4 of whom were PTT's executives. PTT also appointed its executives as the managing director.

3) Finance

EnCo's operating results between 2020 and 2022 are as follows:

Unit: THB million

Financial statements	2020	2021	2022*
Revenue from sales and services	1,985	1,999	2,289
Total expenses (including taxes)	1,307	1,373	1,674
Net profit (loss)	678	626	616

Unit: THB million

Financial statements	2020	2021	2022*
Total assets	5,802	7,388	8,723
Total liabilities	2,074	3,174	4,033
Shareholders' equity	3,728	4,215	4,689

* 2022 Financial statements are unaudited

3.4 PTT Energy Solutions Company Limited (PTTES)

PTT and subsidiaries established PTT Energy Solutions Company Limited (PTTES) on 10 June 2011, with a registered capital of THB 150 million to provide consultancy services on technical engineering and operation to PTT Group and external customers. PTTES is 40.00% held by PTT and the remaining 20.00% held by TOP, GC, and IRPC equally.

1) Services

PTTES provides technical engineering services to support the operation efficiency of PTT Group and external customers. The services include energy management, project development, risk management, production-process safety, and equipment reliability improvement as well as technical and development of PTT Group for high capiber and global competitiveness.

2) Management

As of 31 December 2022, PTTEs's board of directors comprised 5 members. 2 of whom were PTT's executives. PTT also appointed its executive as the managing director.

3) Finance

The operating results of PTTEs between 2020 and 2022 are as follows:

Unit: THB million

Financial statements	2020	2021	2022*
Revenue from sales and services	438	350	307
Total revenue	440	355	310
Total expenses (including taxes)	435	395	369
Net profit (loss)	5	(40)	(59)

Unit: THB million

Financial statements	2020	2021	2022*
Total assets	513	293	117
Total liabilities	289	109	11
Shareholders' equity	224	184	106

* 2022 Financial statements are unaudited

PTTEs has operated at a loss on a continued basis because the energy industry has been moving towards low-carbon society. A strong emphasis on greenhouse-gas emission reduction and clean energy is a key reason that make PTTEs failed to meet its business targets. On 29 August 2022, the extraordinary meeting of PTTEs shareholders No. 1/2565 passed a resolution to terminate PTTEs operations. PTTEs was registered for dissolution with the Department of Business Development on 29 December 2022. PTTEs is currently in the process of liquidation.

3.5 PTT Digital Solutions Company Limited (PTT DIGITAL)

PTT and subsidiaries established PTT DIGITAL on 7 July 2006 with the registered capital of THB 150 million. The objectives of the company are to foster collaborations and enhance value added to PTT Group's operations through integrated management and investments in information and communications technologies. PTT Digital's shareholders consist of 4 entities which are PTT, PTTEP, TOP that held equally at 20.00%, and GC that held the remaining 40.00%.

1) Services

PTT DIGITAL provides integrated digital services to customers both inside and outside PTT Group. Its services cover consultancy, design, development, implementation, maintenance as well as after-sales support in response to business needs. Having capabilities and technological expertise in various fields, PTT Digital presents a team of experienced specialists and attentive services to promote professionalism, systematic services, and technological integration while maintaining cybersecurity. Moreover, the company has won international certifications such as ISO/IEC 27001:2005 (regarding data center) and Level 3 of CMMI (Capability Maturity Model Integration), a standard involving work process development.

2) Management

As of 31 December 2022, PTT DIGITAL's board of directors comprised 7 members. 3 were of whom were PTT's executives. PTT also appointed its executive as managing members and managing director.

3) Finance

The operating results of PTT DIGITAL between 2020 and 2022 are as follows:

Unit: THB million

Financial statements	2020	2021	2022*
Revenue from sales and services	5,103	5,408	6,613
Total revenue	5,110	5,415	6,627
Total expenses (taxes included)	4,587	4,907	6,068
Net profit (loss)	523	508	559

Unit: THB million

Financial statements	2020	2021	2022*
Total assets	4,980	5,646	6,656
Total liabilities	2,444	2,703	3,281
Shareholders' equity	2,536	2,943	3,375

* 2022 financial statements are unaudited.

4. Other business groups

PTT Treasury Center Company Limited (PTT TCC)

PTT established PTT TCC on 11 May 2018, with a registered capital of THB 20 million. The company, wholly owned by PTT, serves as the treasury center for PTT and its subsidiaries. PTT TCC was authorized to operate as a treasury center on 31 July 2018.

1) Services

The company operates as the treasury center for PTT and its subsidiaries, with the duty of procuring money in foreign currencies and Thai baht, both in long and short terms, for lending to PTT and/or its subsidiaries. The company also has the duty of managing debts, liquidity and money in the best interests of PTT and its subsidiaries.

2) Management

PTT TCC board of directors has 4 members, as of 31 December 2022. Of them, 3 were PTT executives and 1 was a representative from the Ministry of Finance. PTT has assigned its executives to serve in PTT TCC's management, including in the post of president.

3) Finance

The operating results of PTT TCC between 2020 and 2022 are as follows:

Unit: THB million

Financial statements	2020	2021	2022*
Interest income	3,058	3,684	4,913
Total revenue	3,073	3,708	4,938
Total expenses	2,903	3,507	4,618
Net profit (loss)	170	201	320

Financial statements	2020	2021	2022*
Total assets	99,189	185,785	136,746
Total liabilities	99,011	185,377	136,009
Shareholders' equity	178	408	737

* The 2022 financial statements have not been certified by the auditor (Unaudited).

Connected Transactions

9.2 Connected Transactions

The following connected transactions is an expansion of the Annual Registration Statement/Annual Report 2022 (Form 56-1 One Report) under 9.2 Connected Transactions

9.2.2 Connected Transactions between PTT and Entities with the Same Major Shareholder

9.2.2.1 Transactions of product(s) /service(s) sold by PTT to entities with the same major shareholder and potential conflict of interest

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Electricity Generating Authority of Thailand	110,538	63,632	65,117	The Finance Ministry, which is PTT major shareholder, has controlling power over Electricity Generating Authority of Thailand.	—
State Railway of Thailand	2,491	1,519	1,687	The Finance Ministry, which is PTT major shareholder, has controlling power over State Railway of Thailand.	—
Bangkok Mass Transit Authority	1,755	1,395	1,306	The Finance Ministry, which is PTT major shareholder, has controlling power over Bangkok Mass Transit Authority.	—
Port Authority of Thailand	979	852	626	The Finance Ministry, which is PTT major shareholder, has controlling power over Port Authority of Thailand.	—
Provincial Electricity Authority	331	223	270	The Finance Ministry, which is PTT major shareholder, has controlling power over Provincial Electricity Authority.	- PTT director (Mr. Danucha Pichayanan) is also a director of the Provincial Electricity Authority.
Transport Co., Ltd.	320	169	319	The Finance Ministry, which is PTT major shareholder, has controlling power over Transport Co., Ltd.	—
Dairy Farming Promotion Organization Of Thailand	113	81	54	The Finance Ministry, which is PTT major shareholder, has controlling power over Dairy Farming Promotion Organization Of Thailand.	—
Liquor Distillery Organization, the Excise Department	46	32	20	The Finance Ministry, which is PTT major shareholder, has controlling power over Liquor Distillery Organization, the Excise Department.	—

9.2.2.1 Transactions of product(s) /service(s) sold by PTT to entities with the same major shareholder and potential conflict of interest (continued)

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Metropolitan Electricity Authority	40	32	32	The Finance Ministry, which is PTT major shareholder, has controlling power over Metropolitan Electricity Authority.	—
Government Pharmaceutical Organization	23	24	19	The Finance Ministry, which is PTT major shareholder, has controlling power over Government Pharmaceutical Organization.	—
Tobacco Authority of Thailand	11	9	8	The Finance Ministry, which is PTT major shareholder, has controlling power over Tobacco Authority of Thailand.	—
Rubber Authority of Thailand	8	7	7	The Finance Ministry, which is PTT major shareholder, has controlling power over Rubber Authority of Thailand.	—
Civil Aviation Training Center	5	4	8	The Finance Ministry, which is PTT major shareholder, has controlling power over Civil Aviation Training Center.	—
Airports of Thailand Plc.	3	1	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Airports of Thailand Plc.	—
Thailand Institute of Scientific and Technological Research	1	-	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Thailand Institute of Scientific and Technological Research.	—
Thailand Post Co., Ltd.	-	-	2	The Finance Ministry, which is PTT major shareholder, has controlling power over Thailand Post Co., Ltd.	—
Thai Airways International Plc.	-	-	2	The Finance Ministry, which is PTT major shareholder, holds more than 10 % of Thai Airways International Plc.'s shares.	- PTT executive (Mr. Chansin Treenuchagron) is a director and plan administrator of Thai Airways International Plc.
Total	116,664	67,980	69,477		

9.2.2.2 Transactions of product(s) /service(s) purchased, including any expense paid, by PTT from entities with the same major shareholder and potential conflict of interest

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Provincial Electricity Authority	911	931	1,196	The Finance Ministry, which is PTT major shareholder, has controlling power over Provincial Electricity Authority.	- PTT director (Mr. Danucha Pichayanan) is also a director of the Provincial Electricity Authority.
Metropolitan Electricity Authority	306	262	369	The Finance Ministry, which is PTT major shareholder, has controlling power over Metropolitan Electricity Authority.	—
State Railway of Thailand	38	3	26	The Finance Ministry, which is PTT major shareholder, has controlling power over State Railway of Thailand.	—
Export-Import Bank of Thailand	35	-	29	The Finance Ministry, which is PTT major shareholder, has controlling power over Export-Import Bank of Thailand.	—
Government Savings Bank	24	-	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Government Savings Bank.	—
Industrial Estate Authority of Thailand	22	4	3	The Finance Ministry, which is PTT major shareholder, has controlling power over Industrial Estate Authority of Thailand.	—
Airports of Thailand Plc.	21	5	44	The Finance Ministry, which is PTT major shareholder, has controlling power over Airports of Thailand Plc.	—
Thai Airways International Plc.	17	-	-	The Finance Ministry, which is PTT major shareholder, holds more than 10.00 % of Thai Airways International Plc's shares.	- PTT executive (Mr. Chansin Treenuchagron) is a director and plan administrator of Thai Airways International Plc.
MCOT Plc.	9	-	-	The Finance Ministry, which is PTT major shareholder, holds more than 10.00 % of MCOT Plc.'s shares.	—
Aeronautical Radio of Thailand Co., Ltd.	7	-	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Aeronautical Radio of Thailand Co., Ltd.	—

9.2.2.2 Transactions of product(s) /service(s) purchased, including any expense paid, by PTT from entities with the same major shareholder and potential conflict of interest (continued)

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Electricity Generating Authority of Thailand	5	319	44	The Finance Ministry, which is PTT major shareholder, has controlling power over Electricity Generating Authority of Thailand.	—
Thailand Post Co., Ltd.	5	6	6	The Finance Ministry, which is PTT major shareholder, has controlling power over Thailand Post Co., Ltd.	—
Provincial Waterworks Authority	5	5	12	The Finance Ministry, which is PTT major shareholder, has controlling power over Provincial Waterworks Authority.	—
Port Authority of Thailand	4	-	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Port Authority of Thailand.	—
Metropolitan Waterworks Authority	2	2	5	The Finance Ministry, which is PTT major shareholder, has controlling power over Metropolitan Waterworks Authority.	—
Thailand Institute of Scientific and Technological Research	2	-	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Thailand Institute of Scientific and Technological Research.	—
Expressway Authority of Thailand	2	-	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Expressway Authority of Thailand.	—
National Telecom Plc.	-	-	27	The Finance Ministry, which is PTT major shareholder, has controlling power over National Telecom Plc.	—
TMBThanachart Bank	-	-	1	The Finance Ministry, which is PTT major shareholder, holds more than 10.00 % of TMBThanachart Bank's shares.	—
Total	1,415	1,537	1,762		

9.2.2.3 Interest income from entities with the same major shareholder and potential conflict of interest

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
TMBThanachart Bank	45	24	2	The Finance Ministry, which is PTT major shareholder, holds more than 10.00 % of TMBThanachart Bank's shares.	—
Government Housing Bank	22	-	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Government Housing Bank.	—
Total	67	24	2		

9.2.2.4 Trade Accounts Receivable, Other Receivables, and Advance Payments involving entities with the same major shareholder and potential conflict of interest

9.2.2.4.1 Trade Accounts Receivable

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Electricity Generating Authority of Thailand	16,010	6,289	4,632	The Finance Ministry, which is PTT major shareholder, has controlling power over Electricity Generating Authority of Thailand.	—
State Railway of Thailand	239	154	192	The Finance Ministry, which is PTT major shareholder, has controlling power over State Railway of Thailand.	—
Bangkok Mass Transit Authority	207	179	171	The Finance Ministry, which is PTT major shareholder, has controlling power over Bangkok Mass Transit Authority.	—
Port Authority of Thailand	104	74	51	The Finance Ministry, which is PTT major shareholder, has controlling power over Port Authority of Thailand.	—
Transport Co., Ltd.	37	30	38	The Finance Ministry, which is PTT major shareholder, has controlling power over Transport Co., Ltd.	—
Provincial Electricity Authority	31	19	22	The Finance Ministry, which is PTT major shareholder, has controlling power over Provincial Electricity Authority.	- PTT director (Mr. Danucha Pichayanan) is also a director of the Provincial Electricity Authority.

9.2.2.4 Trade Accounts Receivable, Other Receivables, and Advance Payments involving entities with the same major shareholder and potential conflict of interest (continued)

9.2.2.4.1 Trade Accounts Receivable (continued)

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Dairy Farming Promotion Organization Of Thailand	7	12	6	The Finance Ministry, which is PTT major shareholder, has controlling power over Dairy Farming Promotion Organization Of Thailand.	—
Government Pharmaceutical Organization	2	2	3	The Finance Ministry, which is PTT major shareholder, has controlling power over Government Pharmaceutical Organization.	—
Liquor Distillery Organization, the Excise Department	2	3	3	The Finance Ministry, which is PTT major shareholder, has controlling power over Liquor Distillery Organization, the Excise Department.	—
Thai Airways International Plc.	2	2	2	The Finance Ministry, which is PTT major shareholder, holds more than 10.00 % of Thai Airways International Plc.'s shares.	- PTT executive (Mr. Chansin Treenuchagron) is a director and plan administrator of Thai Airways International Plc.
Metropolitan Electricity Authority	1	3	3	The Finance Ministry, which is PTT major shareholder, has controlling power over Metropolitan Electricity Authority.	—
Airports of Thailand Plc.	1	-	-	The Finance Ministry, which is PTT major shareholder, holds more than 10.00 % of Airports of Thailand Plc.'s shares.	—
Civil Aviation Training Center	1	-	1	The Finance Ministry, which is PTT major shareholder, has controlling power over Civil Aviation Training Center.	—
Thailand Post Co., Ltd.	-	-	1	The Finance Ministry, which is PTT major shareholder, has controlling power over Thailand Post Co., Ltd.	—
Total	16,644	6,767	5,125		

9.2.2.4 Trade Accounts Receivable, Other Receivables, and Advance Payments involving entities with the same major shareholder and potential conflict of interest (continued)

9.2.2.4.2 Other Receivables

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
TMBThanachart Bank	133	-	-	The Finance Ministry, which is PTT major shareholder, holds more than 10.00 % of TMBThanachart Bank's shares.	—
Electricity Generating Authority of Thailand	1	-	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Electricity Generating Authority of Thailand.	—
Total	134	-	-		

9.2.2.4.3 Advance Payments

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Export-Import Bank of Thailand	3	-	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Export-Import Bank of Thailand.	—
Total	3	-	-		

9.2.2.5 Trade Accounts Payable and Other Accounts Payable involving entities with the same major shareholder and potential conflict of interest

9.2.2.5.1 Trade Accounts Payable

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Industrial Estate Authority of Thailand	16	27	18	The Finance Ministry, which is PTT major shareholder, has controlling power over Industrial Estate Authority of Thailand.	—
Total	16	27	18		

9.2.2.5 Trade Accounts Payable and Other Accounts Payable involving entities with the same major shareholder and potential conflict of interest (continued)

9.2.2.5.2 Other Accounts Payable

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
TMBThanachart Bank	133	-	-	The Finance Ministry, which is PTT major shareholder, holds more than 10.00 % of TMBThanachart Bank's shares.	---
State Railway of Thailand	131	44	44	The Finance Ministry, which is PTT major shareholder, has controlling power over State Railway of Thailand.	---
Industrial Estate Authority of Thailand	7	6	1	The Finance Ministry, which is PTT major shareholder, has controlling power over Industrial Estate Authority of Thailand.	---
MCOT Plc.	5	5	10	The Finance Ministry, which is PTT major shareholder, has controlling power over MCOT Plc.	---
National Telecom Plc.	-	-	1	The Finance Ministry, which is PTT major shareholder, has controlling power over National Telecom Plc.	---
Aeronautical Radio of Thailand Co., Ltd.	3	18	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Aeronautical Radio of Thailand Co., Ltd.	---
Thailand Institute of Scientific and Technological Research	2	-	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Thailand Institute of Scientific and Technological Research.	---
Electricity Generating Authority of Thailand	1	313	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Electricity Generating Authority of Thailand.	---
Thai Airways International Plc.	1	-	-	The Finance Ministry, which is PTT major shareholder, holds more than 10.00 % of Thai Airways International Plc.'s shares.	- PTT executive (Mr. Chansin Treenuchagron) is a director and plan administrator of Thai Airways International Plc.

9.2.2.5 Trade Accounts Payable and Other Accounts Payable involving entities with the same major shareholder and potential conflict of interest (continued)

9.2.2.5.2 Other Accounts Payable (continued)

Entities with the same major shareholder	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Provincial Electricity Authority	-	1	-	The Finance Ministry, which is PTT major shareholder, has controlling power over Provincial Electricity Authority.	- PTT director (Mr. Danucha Pichayanan) is also a director of the Provincial Electricity Authority.
Total	283	387	56		

9.2.3.1 Transactions of product(s) /service(s) sold by PTT to subsidiaries, joint operations, joint ventures, associates and other related companies

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
Thai Oil Plc.	382,479	114,454	67,590	PTT Group holds 48.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Ms. Pannalin Mahawongtikul, Mr. Terdkiat Prommool, Mr. Suchat Ramarch, and Dr. Buranin Rattanasombat) are directors of Thai Oil Plc. - PTT executive (Mr. Noppadol Pinsupa) is a director, the secretary, and acting CEO and president of Thai Oil Plc.
PTT Global Chemical Plc.	376,062	271,569	175,175	PTT Group holds 48.18 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director (M.L. Chayotid Kridakon) is a director of PTT Global Chemical Plc. - PTT executives (Mr. Chadil Chavanalikhikorn and Mr. Cherdchai Boonchoochauy) are directors of PTT Global Chemical Plc. - PTT executive (Dr. Kongkrapan Intarajang) is a director, secretary, CEO and president of PTT Global Chemical Plc.

9.2.3.1 Transactions of product(s) /service(s) sold by PTT to subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
IRPC Plc.	240,239	164,665	100,329	PTT Group holds 48.05 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Ms. Peangpanor Boonklum, Mr. Chansak Chuenchom and Mr. Prasong Intaranongpai) are directors of IRPC Plc. - PTT executive (Mr. Kris Imsang) is a director, the secretary, CEO and president of IRPC Plc.
PTT International Trading Pte. Ltd.	58,665	24,052	22,597	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Ms. Jaroonsri Wankertphon) is a director of PTT International Trading Pte. Ltd.
PTT Oil and Retail Business Plc.	39,156	28,583	29,552	PTT Group holds 75.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director / executive (Mr. Auttapol Rerkpiboon) is the chairman of PTT Oil and Retail Business Plc. - PTT executives (Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool) are directors of PTT Oil and Retail Business Plc.
PTT MEA Ltd.	36,092	2,415	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT International Trading USA Inc.	31,807	7,025	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT International Trading London Ltd.	27,636	12,948	-	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.1 Transactions of product(s) /service(s) sold by PTT to subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Global Power Synergy Plc.	19,489	12,372	11,400	PTT Group holds 75.23 % of this subsidiary's shares.	- PTT executives (Mr. Wuttikorn Stithit, Mr. Noppadol Pinsupa, Ms. Pannalin Mahawongtikul, M.L. Peekthong Thongyai, and Dr. Kongkrapan Intarajang) are directors of Global Power Synergy Plc. - PTT executive (Mr. Worawat Pitayasiri) is a director, the secretary, CEO and president of Global Power Synergy Plc.
Glow Energy Plc.	19,312	9,288	8,444	PTT Group holds 99.83 % of this subsidiary's shares.	- PTT executive (Mr. Worawat Pitayasiri) is a director of Glow Energy Plc.
PTT Natural Gas Distribution Co., Ltd.	10,195	5,625	4,432	PTT Group holds 58.00 % of this subsidiary's shares.	- PTT executive (Mr. Wuttikorn Stithit) is the chairman of PTT Natural Gas Distribution Co., Ltd.
Top SPP Co., Ltd.	8,033	4,636	4,158	PTT Group holds 99.99 % of this subsidiary's shares.	—
Glow SPP2 Co., Ltd.	7,914	5,480	4,139	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Worawat Pitayasiri) is a director of Glow SPP2 Co., Ltd.
IRPC Clean Power Co., Ltd.	7,034	3,950	3,762	PTT Group holds 100.00 % of this subsidiary's shares.	—
Glow SPP 11 Co., Ltd.	6,113	3,469	3,170	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Worawat Pitayasiri) is a director of Glow SPP 11 Co., Ltd.
Amata Natural Gas Distribution Co., Ltd.	5,208	3,062	2,329	PTT Group holds 80.00 % of this subsidiary's shares.	—
PTT LNG Co., Ltd.	1,300	274	257	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.1 Transactions of product(s) /service(s) sold by PTT to subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Glow IPP Co., Ltd.	908	1,753	913	PTT Group holds 95.00 % of this subsidiary's shares.	- PTT executive (Mr. Worawat Pitayasiri) is a director of Glow IPP Co., Ltd.
Labix Co., Ltd.	873	656	494	PTT Group holds 75.00 % of this subsidiary's shares.	---
GC-M PTA Co., Ltd.	683	435	217	PTT Group holds 74.00 % of this subsidiary's shares.	---
GC Oxirane Co., Ltd.	394	270	65	PTT Group holds 100 % of this subsidiary's shares.	---
Thai Lube Base Plc.	377	301	213	PTT Group holds 99.99 % of this subsidiary's shares.	---
Thai PET Resin Co., Ltd.	227	115	89	PTT Group holds 84.40 % of this subsidiary's shares.	---
Sak Chaisidhi Co., Ltd.	96	71	53	PTT Group holds 80.52 % of this subsidiary's shares.	---
PTT Phenol Co., Ltd.	47	37	27	PTT Group holds 100.00 % of this subsidiary's shares.	---
Allnex (Thailand) Co., Ltd.	24	-	-	PTT Group holds 94.96 % of this subsidiary's shares.	---
GC Glycol Co., Ltd.	13	18	11	PTT Group holds 100.00 % of this subsidiary's shares.	---
GC Polyols Co., Ltd.	12	8	4	PTT Group holds 82.10 % of this subsidiary's shares.	---
PTT Exploration and Production Plc.	5	4	7	PTT Group holds 65.29 % of this subsidiary's shares.	- PTT director / executive (Mr. Auttapol Rerkpiboon) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Wuttikom Suthit) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Montri Rawanchaikul) is a director and CEO of PTT Exploration and Production Plc.

9.2.3.1 Transactions of product(s) /service(s) sold by PTT to subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTTEP Energy Development Co., Ltd.	2	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Global Green Chemicals Plc.	-	145	-	PTT Group holds 72.29 % of this subsidiary's shares.	- PTT executive (Dr. Kongkrapan Intarajang) is the chairman of Global Green Chemicals Plc.
Thai Oil Power Co., Ltd.	-	-	2,419	The company has been completely dissolved 17 September 2021.	—
Joint Ventures					
HMC Polymers Co., Ltd.	7,992	6,768	4,414	PTT Group holds 41.44 % of this joint venture's shares.	—
PTT Asahi Chemical Co., Ltd.	5,337	4,847	3,336	PTT Group holds 50.00 % of this joint venture's shares.	—
Nava Nakorn Electricity Generating Co., Ltd.	4,236	2,513	1,788	PTT Group holds 30.00 % of this joint venture's shares.	—
District Cooling System and Power Plant Co., Ltd.	3,279	1,777	1,623	PTT Group holds 35.00 % of this joint venture's shares.	—
OGP Energy Solutions Co., Ltd.	123	62	34	PTT Group holds 40.00 % of this joint venture's shares.	—
PTT MMC Biochem Co., Ltd.	39	40	29	PTT Group holds 50.00 % of this joint venture's shares.	—
Associates					
Bangpa-In Cogeneration Co., Ltd.	5,720	3,222	2,948	PTT Group holds 25.00 % of this associate's shares.	—
AGC Vinythai Plc.	271	-	-	PTT Group holds 32.72 % of this associate's shares.	—
Vinythai Plc.	176	270	237	As of 31 December 2022, it was merged into AGC Vinythai Plc.	—

9.2.3.1 Transactions of product(s) /service(s) sold by PTT to subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Other related company					
Ratchaburi Power Plc.	4,671	6,784	6,028	PTT Group holds 15.00 % of this related company's shares.	- PTT executive (Mr. Worawat Pitayasiri) is a director of Ratchaburi Power Plc.
Total	1,312,239	703,963	462,283		

9.2.3.2 Transactions of product(s) /service(s) purchased by PTT from subsidiaries, joint operations, joint ventures, associates and other related companies

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
PTT International Trading Pte. Ltd.	262,536	77,740	28,594	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Ms. Jaroonsri Wankertphon) is a director of PTT International Trading.
PTT Exploration and Production Plc.	125,870	99,569	81,264	PTT Group holds 65.29 % of this subsidiary's shares.	- PTT director / executive (Mr. Auttapol Rerkpiboon) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Wuttikorn Stithit) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Montri Rawanchaikul) is a director and CEO of PTT Exploration and Production Plc.
PTTEP Energy Development Co., Ltd.	30,257	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.2 Transactions of product(s) /service(s) purchased by PTT from subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTTEP Siam Co., Ltd.	24,895	16,807	11,465	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTTEP International Co., Ltd.	22,590	15,573	14,536	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Oil and Retail Business Plc.	18,789	16,305	18,140	PTT Group holds 75.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director / executive (Mr. Auttapol Rerkpiboon) is the chairman of PTT Oil and Retail Business Plc. - PTT executives (Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool) are directors of PTT Oil and Retail Business Plc.
PTT Global Chemical Plc.	12,894	19,591	17,415	PTT Group holds 48.18 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director (M.L. Chayotid Kridakon) is a director of PTT Global Chemical Plc. - PTT executives (Mr. Chadil Chavanalikhikorn and Mr. Cherdchai Boonchoochauy) are directors of PTT Global Chemical Plc. - PTT executive (Dr. Kongkrapan Intarajang) is a director, the secretary, CEO and president of PTT Global Chemical Plc.
PTT International Trading London Ltd.	11,722	19,682	7,482	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTTEP SP Limited	9,649	7,538	5,840	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT LNG Co., Ltd.	9,554	9,403	9,517	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTTEP Oman E&P Corporation	7,534	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.2 Transactions of product(s) /service(s) purchased by PTT from subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTT MEA Ltd.	5,871	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTTEP MENA Limited	5,285	2,847	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
IRPC Plc.	1,439	177	592	PTT Group holds 48.05 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Ms. Peangpanor Boonklum, Mr. Chansak Chuenchom and Mr. Prasong Intaranongpai) are directors of IRPC Plc. - PTT executive (Mr. Kris Imsang) is a director, the secretary, CEO and president of IRPC Plc.
Thai Oil Plc.	1,233	65	57	PTT Group holds 48.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Ms. Pannalin Mahawongtikul, Mr. Terdkiat Prommool, Mr. Suchat Ramarch, and Dr. Buranin Rattanasombat) are directors of Thai Oil Plc. - PTT executive (Mr. Noppadol Pinsupa) is a director, the secretary, and acting CEO and president of Thai Oil Plc.
Glow Energy Plc.	684	576	-	PTT Group holds 99.83 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Worawat Pitayasiri) is a director of Glow Energy Plc.

9.2.3.2 Transactions of product(s) /service(s) purchased by PTT from subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Business Service Alliance Co., Ltd.	252	198	197	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Suchat Ramarch) is the chairman of Business Service Alliance Co., Ltd. - PTT executives (Mr. Chadil Chavanalikhikorn and Mrs. Nivadee Jaroensitipun) are directors of Business Service Alliance Co., Ltd.
PTT Tank Terminal Co., Ltd.	176	119	156	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (M.L. Peekthong Thongyai) is a director of PTT Tank Terminal Co., Ltd.
PTT Global LNG Co., Ltd.	67	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Digital Solution Co., Ltd.	36	38	34	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Terdkiat Prommool) is the chairman of PTT Digital Solution Co., Ltd.
GC Maintenance and Engineering Co., Ltd.	25	13	10	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Natural Gas Distribution Co., Ltd.	16	9	19	PTT Group holds 58.00 % of this subsidiary's shares.	- PTT executive (Mr. Wuttikorn Stithit) is the chairman of PTT Natural Gas Distribution Co., Ltd.
Thai Paraxylene Co., Ltd.	6	-	-	PTT Group holds 99.99 % of this subsidiary's shares.	—
GC Glycol Co., Ltd.	3	3	2	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Energy Solutions Co., Ltd.	2	3	-	The registration of dissolution was on 29 December 2022, this subsidiary is now in the process of liquidation.	—
NPC Safety and Environmental Service Co., Ltd.	1	2	1	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.2 Transactions of product(s) /service(s) purchased by PTT from subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Business Professional Solutions Recruitment Co., Ltd.	1	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Chadil Chavanalikkorn) is the chairman of Business Professional Solutions Recruitment Co., Ltd. - PTT executive (Mrs. Nivadee Jaroensitipun) is a director of Business Professional Solutions Recruitment Co., Ltd.
PTT Retail Management Co., Ltd.	1	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Suchat Ramarch) is the chairman of PTT Retail Management Co., Ltd.
GC Logistics Solutions Co., Ltd.	1	1	3	PTT Group holds 100.00 % of this subsidiary's shares.	—
Alpha Com Co., Ltd.	-	5	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Cherdchai Boonchoochauy) is the chairman of Alpha Com Co., Ltd.
TOPNEXT Internatoinal Co., Ltd. (previously known as TOP Solvent Co., Ltd.)	-	5	4	PTT Group holds 99.99 % of this subsidiary's shares.	—
Joint Operations					
Moattama Gas Transportation Company	21,174	14,185	13,918	PTT Group holds 37.08 % of shares in this joint operation.	—
Andaman Transportation Limited	14,037	9,213	9,250	PTT Group holds 80.00 % of shares in this joint operation.	—
Orange Energy Co., Ltd.	5,057	3,872	2,874	PTT Group holds 53.95 % of shares in this joint operation.	—
B 8/32 Partners Co., Ltd.	5,056	3,872	2,874	PTT Group holds 25.00 % of shares in this joint operation.	—
Taninthayi Pipeline Company LLC	428	402	1,571	PTT Group holds 19.32 % of shares in this joint operation.	—

9.2.3.2 Transactions of product(s) /service(s) purchased by PTT from subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Joint Ventures					
Trans Thai-Malaysia (Thailand) Co., Ltd.	1,598	1,443	1,402	PTT Group holds 50.00 % of this joint venture's shares.	—
Map Ta Phut Air Products Co., Ltd.	30	23	-	PTT Group holds 51.00 % of this joint venture's shares.	—
Associate					
Thai Petroleum Pipeline Co., Ltd.	-	6	5	PTT Group holds 49.21 % of this associate's shares.	—
Other Related Company					
Dhipaya Insurance Plc.	-	83	288	As of 31 December 2022, PTT Group has not held any share of Dhipaya Insurance Plc.	—
Total	598,769	319,370	227,510		

9.2.3.3 Interest income from subsidiaries, joint operations, joint ventures, associates, and other related companies

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
PTT Treasury Center Co., Ltd.	1,829	1,272	1,195	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mrs. Chanamas Sasnanand) is the chairman of PTT Treasury Center Co., Ltd.
PTT Oil and Retail Business Plc.	18	-	-	PTT Group holds 75.00 % of this subsidiary's shares.	- PTT director / executive (Mr. Auttapol Rerkpiboon) is the chairman of PTT Oil and Retail Business Plc. - PTT executives (Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool) are directors of PTT Oil and Retail Business Plc.
IRPC Plc.	2	-	3	PTT Group holds 48.05 % of this subsidiary's shares.	- PTT executives (Ms. Peangpanor Boonklum, Mr. Chansak Chuenchom and Mr. Prasong Intaranongpai) are directors of IRPC Plc. - PTT executive (Mr. Kris Imsang) is a director, the secretary, CEO and president of IRPC Plc.

9.2.3.3 Interest income from subsidiaries, joint operations, joint ventures, associates, and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Arun Plus Co., Ltd.	2	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director (Professor Dr. Thosaporn Sirisumphand) is the chairman of Arun Plus Co., Ltd. - PTT directors (Mr. Danucha Pichayanan and M.L. Chayotid Kridakon) are directors of Arun Plus Co., Ltd. - PTT executive (Mr. Cherdchai Boonchoochauy) is a director of Arun Plus Co., Ltd.
PTT Global Chemical Plc.	1	-	2	PTT Group holds 48.18 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director (M.L. Chayotid Kridakon) is a director of PTT Global Chemical Plc. - PTT executives (Mr. Chadil Chavanalikhikorn and Mr. Cherdchai Boonchoochauy) are directors of PTT Global Chemical Plc. - PTT executive (Dr. Kongkrapan Intarajang) is a director and the secretary, CEO and president of PTT Global Chemical Plc.

9.2.3.3 Interest income from subsidiaries, joint operations, joint ventures, associates, and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Global Power Synergy Plc.	-	-	14	PTT Group holds 75.23 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Mr. Wuttikorn Stithit, Mr. Noppadol Pinsupa, Miss Pannalin Mahawongtikul, M.L. Peekthong Thongyai, and Dr. Kongkrapan Intarajang) are directors of Global Power Synergy Plc. - PTT executive (Mr. Worawat Pitayasiri) is a director, the secretary, CEO and president of Global Power Synergy Plc.
Energy Complex Co., Ltd.	-	6	15	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Chansak Chuenchom) is the chairman of Energy Complex Co., Ltd. - PTT executive (Ms. Peangpanor Boonklum) is a director of Energy Complex Co., Ltd.
PTT LNG Co., Ltd.	-	-	20	PTT Group holds 100.00 % of this subsidiary's shares.	—
Total	1,852	1,278	1,249		

9.2.3.4 Interest expenses paid to subsidiaries, joint operations, joint ventures, associates and other related companies

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
PTT Treasury Center Co., Ltd.	2,269	2,016	1,476	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mrs. Chanamas Sasnanand) is the chairman of PTT Treasury Center Co., Ltd.
Arun Plus Co., Ltd.	21	5	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT director (Professor Dr. Thosaporn Sirisumphand) is the chairman of Arun Plus Co., Ltd. - PTT directors (Mr. Danucha Pichayanan and M.L. Chayotid Kridakon) are directors of Arun Plus Co., Ltd. - PTT executive (Mr. Cherdchai Boonchoochauly) is a director of Arun Plus Co., Ltd.
Siam Management Holding Co., Ltd.	10	2	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Innobic (Asia) Co., Ltd.	10	2	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Dr. Buranin Rattanasombat) is the chairman of Innobic (Asia) Co., Ltd. - PTT executive (Mrs. Chanamas Sasnanand) is a director of Innobic (Asia) Co., Ltd.
PTT LNG Co., Ltd.	5	3	7	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Tank Terminal Co., Ltd.	5	6	5	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (M.L. Peekthong Thongyai) is a director of PTT Tank Terminal Co., Ltd.

9.2.3.4 Interest expenses paid to subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTT Digital Solutions Co., Ltd.	3	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Terdkiat Prommool) is the chairman of PTT Digital Solutions Co., Ltd.
EV ME Plus Co., Ltd.	2	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
T-ECOSYS Co., Ltd.	1	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mrs. Chanamas Sasnanand) is the chairman of T-ECOSYS Co., Ltd.
Alpha Com Co., Ltd.	1	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Cherdchai Boonchoochauy) is the chairman of Alpha Com Co., Ltd.
Innobic LL Holding Co., Ltd.	1	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Global Management Co., Ltd.	-	3	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Cherdchai Boonchoochauy) is the chairman of Global Management Co., Ltd.
PTT Energy Resources Co., Ltd.	-	-	1	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Cherdchai Boonchoochauy) is the chairman of PTT Energy Resources Co., Ltd.
Joint Venture					
Trans Thai-Malaysia (Thailand) Co., Ltd.	38	43	48	PTT Group holds 50.00 % of this joint venture's shares.	—
Total	2,366	2,080	1,537		

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies

9.2.3.5.1 Trade Accounts Receivable

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
Thai Oil Plc.	39,282	12,845	4,186	PTT Group holds 48.00 per cent of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Ms. Pannalin Mahawongtikul, Mr. Terdkiat Prommool, Mr. Suchat Ramarch, and Dr. Buranin Rattanasombat) are directors of Thai Oil Plc. - PTT executive (Mr. Noppadol Pinsupa) is a director, the secretary, and acting CEO and president of Thai Oil Plc.
PTT Global Chemical Plc.	21,030	19,531	12,262	PTT Group holds 48.18 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director (M.L. Chayotid Kridakon) is a director of PTT Global Chemical Plc. - PTT executives (Mr. Chadil Chavanalikhorn and Mr. Cherdchai Boonchoochauy) are directors of PTT Global Chemical Plc. - PTT executive (Dr. Kongkrapan Intarajang) is a director, the secretary, CEO and president of PTT Global Chemical Plc.

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

9.2.3.5.1 Trade Accounts Receivable (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
IRPC Plc.	14,908	10,201	13,569	PTT Group holds 48.05 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Ms. Peangpanor Boonklum, Mr. Chansak Chuenchom and Mr. Prasong Intaranongpai) are directors of IRPC Plc. - PTT executive (Mr. Kris Imsang) is a director, the secretary, CEO and president of IRPC Plc.
PTT International Trading Pte. Ltd.	3,888	2,807	3,011	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Ms. Jaroonsri Wankertphon) is a director of PTT International Trading Pte. Ltd.
PTT Oil and Retail Business Plc.	2,452	3,114	1,721	PTT Group holds 75.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director / executive (Mr. Auttapol Rerkpiboon) is the chairman of PTT Oil and Retail Business Plc. - PTT executives (Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool) are directors of PTT Oil and Retail Business Plc.

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

9.2.3.5.1 Trade Accounts Receivable (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Global Power Synergy Plc.	1,724	1,373	1,352	PTT Group holds 75.23 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Mr. Wuttikorn Stithit, Mr. Noppadol Pinsupa, Miss Pannalin Mahawongtikul, M.L. Peekthong Thongyai, and Dr. Kongkrapan Intarajang) are directors of Global Power Synergy Plc. - PTT executive (Mr. Worawat Pitayasiri) is a director, the secretary, CEO and president of Global Power Synergy Plc.
PTT Natural Gas Distribution Co., Ltd.	1,538	1,358	744	PTT Group holds 58.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Wuttikorn Stithit) is the chairman of PTT Natural Gas Distribution Co., Ltd.
Glow Energy Plc.	1,260	961	602	PTT Group holds 99.83 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Worawat Pitayasiri) is a director of Glow Energy Plc.
Amata Natural Gas Distribution Co., Ltd.	791	699	399	PTT Group holds 80.00 % of this subsidiary's shares.	—
Glow SPP 2 Co., Ltd.	754	687	429	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Worawat Pitayasiri) is a director of Glow SPP 2 Co., Ltd.
Top SPP Co., Ltd.	613	546	337	PTT Group holds 99.99 % of this subsidiary's shares.	—
IRPC Clean Power Co., Ltd.	523	475	286	PTT Group holds 100.00 % of this subsidiary's shares.	—
Glow SPP 11 Co., Ltd.	474	323	238	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Worawat Pitayasiri) is a director of Glow SPP 11 Co., Ltd.

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

9.2.3.5.1 Trade Accounts Receivable (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Glow IPP Co., Ltd.	142	163	163	PTT Group holds 95.00 % of this subsidiary's shares.	- PTT executive (Mr. Worawat Pitayasiri) is a director of Glow IPP Co., Ltd.
PTT MEA Ltd.	136	1,376	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
GC-M PTA Co., Ltd.	70	54	21	PTT Group holds 74.00 % of this subsidiary's shares.	—
Labix Co., Ltd.	65	73	47	PTT Group holds 75.00 % of this subsidiary's shares.	—
PTT LNG Co., Ltd.	40	31	18	PTT Group holds 100.00 % of this subsidiary's shares.	—
Thai Lube Base Plc.	26	29	19	PTT Group holds 99.99 % of this subsidiary's shares.	—
Thai PET Resin Co., Ltd.	22	16	8	PTT Group holds 84.40 % of this subsidiary's shares.	—
GC Oxirane Co., Ltd.	5	48	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Sak Chaisidhi Co., Ltd.	5	6	3	PTT Group holds 80.52 % of this subsidiary's shares.	—
PTT Phenol Co., Ltd.	4	4	3	PTT Group holds 100.00 % of this subsidiary's shares.	—
Allnex (Thailand) Co., Ltd.	2	2	-	PTT Group holds 94.96 % of this subsidiary's shares.	—
PTT International Trading London Ltd.	1	770	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
GC Glycol Co., Ltd.	-	1	1	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

9.2.3.5.1 Trade Accounts Receivable (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTT Exploration and Production Plc.	-	1	1	PTT Group holds 65.29 % of this subsidiary's shares.	- PTT director / executive (Mr. Auttapol Rerkpiboon) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Wuttikorn Sittitit) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Montri Rawanchaikul) is a director and CEO of PTT Exploration and Production Plc.
Thai Oil Power Co., Ltd.	-	-	190	The company has been completely dissolved 17 September 2021.	—
Joint Ventures					
PTT Asahi Chemical Co., Ltd.	383	397	411	PTT Group holds 50.00 % of this joint venture's shares.	—
Nava Nakorn Electricity Generating Co., Ltd.	308	280	159	PTT Group holds 30.00 % of this joint venture's shares.	—
District Cooling System and Power Plant Co., Ltd.	257	218	134	PTT Group holds 35.00 % of this joint venture's shares.	—
HMC Polymers Co., Ltd.	132	765	443	PTT Group holds 41.44 % of this joint venture's shares.	—
OGP Energy Solutions Co., Ltd.	7	6	4	PTT Group holds 40.00 % of this joint venture's shares.	—
PTT MMC Biochem Co., Ltd.	5	3	-	PTT Group holds 50.00 % of this joint venture's shares.	—

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies (continued)

9.2.3.5.1 Trade Accounts Receivable (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Associates					
Bangpa-In Cogeneration Co., Ltd.	412	367	230	PTT Group holds 25.00 % of this associate's shares.	---
AGC Vinythai Plc.	46	-	-	PTT Group holds 32.72 % of this associate's shares.	---
Vinythai Plc.	-	44	19	As of 31 December 2022, it was merged into AGC Vinythai Plc.	---
Other Related Company					
Ratchaburi Power Co., Ltd.	719	1,259	954	PTT Group holds 15.00% of this related company's shares.	- PTT executive (Mr. Worawat Pitayasiri) is a director of Ratchaburi Power Co., Ltd.
Total Trade Receivables	92,024	60,833	41,964		

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.5.2 Other Receivables

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
IRPC Plc.	285	108	14	PTT Group holds 48.05 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Ms. Peangpanor Boonklum, Mr. Chansak Chuenchom and Mr. Prasong Intaranongpai) are directors of IRPC Plc. - PTT executive (Mr. Kris Imsang) is a director, the secretary, CEO and president of IRPC Plc.
PTT Treasury Center Co., Ltd.	265	255	283	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mrs. Chanamas Sasnanand) is the chairman of PTT Treasury Center Co., Ltd.
PTT Oil and Retail Business Plc.	239	736	616	PTT Group holds 75.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director / executive (Mr. Auttapol Rerkpiboon) is the chairman of PTT Oil and Retail Business Plc. - PTT executives (Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool) are directors of PTT Oil and Retail Business Plc.
PTT International Trading London Ltd.	182	360	4	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.5.2 Other Receivables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Thai Oil Plc.	181	61	14	PTT Group holds 48.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Ms. Pannalin Mahawongtikul, Mr. Terdkiat Prommool, Mr. Suchat Ramarch, and Dr. Buranin Rattanasombat) are directors of Thai Oil Plc. - PTT executive (Mr. Noppadol Pinsupa) is a director, the secretary, and acting CEO and president of Thai Oil Plc.
Top SPP Co., Ltd.	135	-	-	PTT Group holds 99.99 % of this subsidiary's shares.	—
PTT International Trading Pte. Ltd.	123	139	11	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Ms. Jaroonsri Wankertphon) is a director of PTT International Trading Pte. Ltd.
PTT LNG Co., Ltd.	90	20	20	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Global Chemical Plc.	81	9	23	PTT Group holds 48.18 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director (M.L. Chayotid Kridakon) is a director of PTT Global Chemical Plc. - PTT executives (Mr. Chadil Chavanalidikorn and Mr. Cherdchai Boonchoochauy) are directors of PTT Global Chemical Plc. - PTT executive (Dr. Kongkrapan Intarajang) is a director, the secretary, CEO and president of PTT Global Chemical Plc.

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies
(continued)

9.2.3.5.2 Other Receivables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTT Digital Solutions Co., Ltd.	63	51	48	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Terdkiat Prommool) is the chairman of PTT Digital Solutions Co., Ltd.
PTT Exploration and Production Plc.	35	25	46	PTT Group holds 65.29 % of this subsidiary's shares.	- PTT director / executive (Mr. Auttapol Rerkpiboon) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Wuttikom Suthit) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Montri Rawanchaikul) is a director and CEO of PTT Exploration and Production Plc.
Arun Plus Co., Ltd.	32	5	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT director (Professor Dr. Thosaporn Sirisumphand) is the chairman of Arun Plus Co., Ltd. - PTT directors (Mr. Danucha Pichayanan and M.L. Chayotid Kridakon) are directors of Arun Plus Co., Ltd. - PTT executive (Mr. Cherdchai Boonchoochauly) is a director of Arun Plus Co., Ltd.

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies
(continued)

9.2.3.5.2 Other Receivables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Global Power Synergy Plc.	22	32	31	PTT Group holds 75.23 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Mr. Wuttikorn Stithit, Mr. Noppadol Pinsupa, Miss Pannalin Mahawongtikul, M.L. Peekthong Thongyai, and Dr. Kongkrapan Intarajang) are directors of Global Power Synergy Plc. - PTT executive (Mr. Worawat Pitayasiri) is a director, the secretary, CEO and president of Global Power Synergy Plc.
PTT Tank Terminal Co., Ltd.	22	16	15	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (M.L. Peekthong Thongyai) is a director of PTT Tank Terminal Co., Ltd.
Energy Complex Co., Ltd.	21	18	18	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Chansak Chuenchom) is the chairman of Energy Complex Co., Ltd. - PTT executive (Ms. Peangpanor Boonklum) is a director of Energy Complex Co., Ltd.
Business Service Alliance Co., Ltd.	16	10	11	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Suchat Ramarch) is the chairman of Business Service Alliance Co., Ltd. - PTT executives (Mr. Chadil Chavanalikhikorn and Mrs. Nivadee Jaroensitipun) are directors of Business Service Alliance Co., Ltd.

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.5.2 Other Receivables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTT Global LNG Co., Ltd.	15	9	10	PTT Group holds 100.00 % of this subsidiary's shares.	—
Nuovo Plus Co., Ltd.	12	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Dr. Buranin Rattanasombat) is the chairman of Nuovo Plus Co., Ltd. - PTT executive (Mr. Worawat Pitayasiri) is a director of Nuovo Plus Co., Ltd.
PTT Energy Solutions Co., Ltd.	9	10	7	The registration of dissolution was on 29 December 2022, this subsidiary is now in the process of liquidation.	—
PTT Natural Gas Distribution Co., Ltd.	7	9	6	PTT Group holds 58.00 % of this subsidiary's shares.	- PTT executive (Mr. Wuttikorn Stithit) is the chairman of PTT Natural Gas Distribution Co., Ltd.
Global Renewable Power Co., Ltd.	7	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Ms. Peangpanor Boonklum) is the chairman of Global Renewable Power Co., Ltd. - PTT executive (Mr. Worawat Pitayasiri) is a director of Global Renewable Power Co., Ltd.
PTT International Trading USA Inc.	6	6	-	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies
(continued)

9.2.3.5.2 Other Receivables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Innobic (Asia) Co., Ltd.	6	3	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Dr. Buranin Rattanasombat) is the chairman of Innobic (Asia) Co., Ltd. - PTT executive (Mrs. Chanamas Sasnanand) is a director of Innobic (Asia) Co., Ltd.
PTT MEA Ltd.	2	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Glow SPP 2 Co., Ltd.	2	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Worawat Pitayasiri) is a director of Glow SPP 2 Co., Ltd.
Glow Energy Plc.	2	-	-	PTT Group holds 99.83 % of this subsidiary's shares.	- PTT executive (Mr. Worawat Pitayasiri) is a director of Glow Energy Plc.
Global Multimodal Logistics Co., Ltd.	2	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Chansak Chuenchom) is a director of Global Multimodal Logistics Co., Ltd.
PTT Energy Resources Co., Ltd.	1	3	2	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Cherdchai Boonchoochauy) is the chairman of PTT Energy Resources Co., Ltd.

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.5.2 Other Receivables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTTOR Singapore Pte. Ltd.	1	2	2	PTT Group holds 100.00 % of this subsidiary's shares.	—
Business Professional Solutions Recruitment Co., Ltd.	1	1	1	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Chadil Chavanalikhorn) is the chairman of Business Professional Solutions Co., Ltd. - PTT executive (Mrs. Nivadee Jaroensitipun) is a director of Business Professional Solutions Co., Ltd.
GC Polyols Co., Ltd.	1	1	1	PTT Group holds 82.10 % of this subsidiary's shares.	—
Sport Services Alliance Co., Ltd.	1	1	1	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mrs. Nivadee Jaroensitipun) is a director of Sport Services Alliance Co., Ltd.
Tiger Energy Trading Pte. Ltd.	1	1	1	PTT Group holds 100.00 % of this subsidiary's shares.	—
EV ME Plus Co., Ltd.	1	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Combined Heat and Power Producing Co., Ltd.	1	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Global Management Co., Ltd.	1	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Cherdchai Boonchoocha) is the chairman of Global Management Co., Ltd.

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies
(continued)

9.2.3.5.2 Other Receivables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Sakari Resources Ltd.	1	1	-	PTT Group holds 95.82 % of this subsidiary's shares.	- PTT executive (Mr. Cherdchai Boonchoocha) is the chairman of Sakari Resources Ltd.
P-Dictor Co., Ltd.	1	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
T-ECOSYS Co., Ltd.	1	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mrs. Chanamas Sasnanand) is the chairman of T-ECOSYS Co., Ltd.
Global Renewable Power Operating Co., Ltd.	1	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Amata Natural Gas Distribution Co., Ltd.	1	-	-	PTT Group holds 80.00 % of this subsidiary's shares.	—
PTT Philippines Trading Corporation	-	2	1	PTT Group holds 100.00 % of this subsidiary's shares.	—
Global Green Chemicals Plc.	-	1	3	PTT Group holds 72.29 % of this subsidiary's shares.	- PTT executive (Dr. Kongkrapan Intarajang) is the chairman of Global Green Chemicals Plc.
Mekha V Co., Ltd. (previously known as Mekha Technology Co., Ltd.)	-	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.5.2 Other Receivables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
GC Oxirane Co., Ltd.	-	-	26	PTT Group holds 100 % of this subsidiary's shares.	—
PTT Retail Management Co., Ltd.	-	-	2	PTT Group holds 100 % of this subsidiary's shares.	- PTT executive (Mr. Suchat Ramarch) is the chairman of PTT Retail Management Co., Ltd.
GC Marketing Solutions Co., Ltd.	-	-	1	PTT Group holds 100 % of this subsidiary's shares.	—
PTTEP Siam Co., Ltd.	-	-	1	PTT Group holds 100 % of this subsidiary's shares.	—
GC Logistics Solutions Co., Ltd.	-	-	1	PTT Group holds 100 % of this subsidiary's shares.	—
GC-M PTA Co., Ltd.	-	-	1	PTT Group holds 74.00 % of this subsidiary's shares.	—
PT Bahari Cakrawala Sebuku	-	-	1	PTT Group holds 100 % of this subsidiary's shares.	—
PTTOR China (Shanghai) Co., Ltd.	-	-	1	PTT Group holds 100 % of this subsidiary's shares.	—
PTT Philippines Corporation	-	-	1	PTT Group holds 100 % of this subsidiary's shares.	—
Joint Ventures					
Nava Nakorn Electricity Generating Co., Ltd.	199	-	-	PTT Group holds 30.00 % of this joint venture's shares.	—
District Cooling System and Power Plant Co., Ltd.	37	2	3	PTT Group holds 35.00 % of this joint venture's shares.	—
Map Ta Phut Air Products Co., Ltd.	13	14	13	PTT Group holds 51.00 % of this joint venture's shares.	—

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.5.2 Other Receivables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Joint Ventures (Continued)					
Trans Thai-Malaysia (Thailand) Co., Ltd.	7	4	6	PTT Group holds 50.00 % of this joint venture's shares.	—
PTT MMC Biochem Co., Ltd.	3	3	1	PTT Group holds 50.00 % of this joint venture's shares.	—
Trans Thai - Malaysia (Malaysia) Sdn. Bhd.	1	18	39	PTT Group holds 50.00 % of this joint venture's shares.	—
PTT Raise Co., Ltd.	1	2	-	PTT Group holds 50.00 % of this joint venture's shares.	—
PTT and TGES Optec Co., Ltd.	1	-	-	PTT Group holds 51.00 % of this joint venture's shares.	—
OGP Energy Solutions Co., Ltd.	-	-	8	PTT Group holds 40.00 % of this joint venture's shares.	—
HMC Polymers Co., Ltd.	-	5	-	PTT Group holds 41.44 % of this joint venture's shares.	—
VEOLIA Sustainable Solutions (Thailand) Co., Ltd. (previously known as Suez Environmental Services Co., Ltd.)	-	4	6	PTT Group holds 40.00 % of this joint venture's shares.	—

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.5.2 Other Receivables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Associates					
Thai Petroleum Pipeline Co., Ltd.	1	(1)	1	PTT Group holds 49.21 % of this associate's shares.	—
Eastern Fluid Transport Co., Ltd.	-	6	6	PTT Group holds 30.00 % of this associate's shares.	—
Total Other Receivables – Net	2,139	1,958	1,307		

9.2.3.5.3 Short-Term Prepaid Expenses

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
PTT Digital Solutions Co., Ltd.	32	10	13	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Terdkiat Prommool) is the chairman of PTT Digital Solutions Co., Ltd.
Other Related Company					
Dhipaya Insurance Plc.	-	-	325	As of 31 December 2022, PTT Group has not held any share of Dhipaya Insurance Plc.	—
Total	32	10	338		

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies
(continued)

9.2.3.5.4 Short-Term Financial Loan

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
PTT Treasury Center Co., Ltd.	2,044	4,279	4,987	PTT Group holds 100 % of this subsidiary's shares.	- PTT executive (Mrs. Chanamas Sasnanand) is the chairman of PTT Treasury Center Co., Ltd.
Energy Complex Co., Ltd.	-	-	150	PTT Group holds 100 % of this subsidiary's shares.	- PTT executive (Mr. Chansak Chuenchom) is the chairman of Energy Complex Co., Ltd. - PTT executive (Ms. Peangpanor Boonklum) is a director of Energy Complex Co., Ltd.
Total Short-Term Financial Loan	2,044	4,279	5,137		

9.2.3.5 Trade Accounts Receivable, Other Receivables, Advance Payments, and Financial Loans involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.5.5 Long-Term Financial Loans

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTT Treasury Center Co., Ltd.	56,067	119,596	44,346	PTT Group holds 100 % of this subsidiary's shares.	- PTT executive (Mrs. Chanamas Sasnanand) is the chairman of PTT Treasury Center Co., Ltd.
Energy Complex Co., Ltd.	-	-	317	PTT Group holds 100 % of this subsidiary's shares.	- PTT executive (Mr. Chansak Chuenchom) is the chairman of Energy Complex Co., Ltd. - PTT executive (Ms. Peangpanor Boonklum) is a director of Energy Complex Co., Ltd.
Total Long-Term Financial Loans	56,067	119,596	44,663		

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

9.2.3.6.1 Trade Accounts Payable

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
PTT International Trading Pte. Ltd.	15,618	5,356	1,745	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Ms. Jaroonsri Wankertphon) is a director of PTT International Trading Pte. Ltd.
PTT Exploration and Production Plc.	12,960	10,269	8,333	PTT Group holds 65.29 % of this subsidiary's shares.	- PTT director / executive (Mr. Auttapol Rerkpiboon) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Wuttikorn Sthitit) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Montri Rawanchaikul) is a director and CEO of PTT Exploration and Production Plc.
PTTEP International Co., Ltd.	3,876	2,597	1,916	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Oil and Retail Business Plc.	3,841	3,240	2,906	PTT Group holds 75.00 % of this subsidiary's shares.	- PTT director / executive (Mr. Auttapol Rerkpiboon) is the chairman of PTT Oil and Retail Business Plc. - PTT executives (Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool) are directors of PTT Oil and Retail Business Plc.
PTTEP Energy Development Co., Ltd.	3,356	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies
(continued)

9.2.3.6.1 Trade Accounts Payable (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTTEP Siam Co., Ltd.	1,682	1,416	989	PTT Group holds 100 % of this subsidiary's shares.	—
IRPC Plc.	1,442	19	509	PTT Group holds 48.05 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Ms. Peangpanor Boonklum, Mr. Chansak Chuenchom and Mr. Prasong Intaranongpai) are directors of IRPC Plc. - PTT executive (Mr. Kris Imsang) is a director, the secretary, CEO and president of IRPC Plc.
PTT Global Chemical Plc.	1,386	2,430	2,166	PTT Group holds 48.18 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director (M.L. Chayotid Kridakon) is a director of PTT Global Chemical Plc. - PTT executives (Mr. Chadil Chavanalikhikorn and Mr. Cherdchai Boonchoochauly) are directors of PTT Global Chemical Plc. - PTT executive (Dr. Kongkrapan Intarajang) is a director, the secretary, CEO and president of PTT Global Chemical Plc.

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies
(continued)

9.2.3.6.1 Trade Accounts Payable (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Thai Oil Plc.	1,256	-	-	PTT Group holds 48.00 % of this subsidiary's shares.	- PTT executives (Ms. Pannalin Mahawongtikul, Mr. Terdkiat Prommool, Mr. Suchat Ramarch, and Dr. Buranin Rattanasombat) are directors of Thai Oil Plc. - PTT executive (Mr. Noppadol Pinsupa) is a director, the secretary, and acting CEO and president of Thai Oil Plc.
PTT LNG Co., Ltd.	873	837	867	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTTEP SP Limited	862	652	625	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Global LNG Co., Ltd.	24	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Tank Terminal Co., Ltd.	8	6	11	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (M.L. Peekthong Thongyai) is a director of PTT Tank Terminal Co., Ltd.
Thai Paraxylene Co., Ltd.	6	-	-	PTT Group holds 99.99 % of this subsidiary's shares.	—
PTT Natural Gas Distribution Co., Ltd.	1	-	1	PTT Group holds 58.00 % of this subsidiary's shares.	- PTT executive (Mr. Wuttikorn Stithit) is the chairman of PTT Natural Gas Distribution Co., Ltd.
GC Logistics Solutions Co., Ltd.	-	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT International Trading London Ltd.	-	2,789	274	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTTEP MENA Limited	-	703	-	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies
(continued)

9.2.3.6.1 Trade Accounts Payable (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Joint Operations					
Moattama Gas Transportation Company	3,380	2,801	1,876	PTT Group holds 37.08 % of shares in this joint operation.	—
Andaman Transportation Limited	2,736	1,713	1,190	PTT Group holds 80.00 % of shares in this joint operation.	—
Orange Energy Co., Ltd.	564	249	296	PTT Group holds 53.95 % of shares in this joint operation.	—
B 8/32 Partners Co., Ltd.	564	249	296	PTT Group holds 25.00 % of shares in this joint operation.	—
Taninthayi Pipeline Company LLC	-	239	160	PTT Group holds 19.32 % of shares in this joint operation.	—
Joint Venture					
Trans Thai-Malaysia (Thailand) Co., Ltd.	281	274	237	PTT Group holds 50.00 % of this joint venture's shares.	—
Total	54,716	35,840	24,397		

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.6.2 Other Payables

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
PTT Oil and Retail Business Plc.	1,581	2,117	4,537	PTT Group holds 75.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director / executive (Mr. Auttapol Rerkpiboon) is the chairman of PTT Oil and Retail Business Plc. - PTT executives (Dr. Buranin Rattanasombat and Mr. Terdkiat Prommool) are directors of PTT Oil and Retail Business Plc.
PTT Digital Solutions Co., Ltd.	1,017	832	695	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Terdkiat Prommool) is the chairman of PTT Digital Solutions Co., Ltd.
PTT Treasury Center Co., Ltd.	877	848	763	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mrs. Chanamas Sasnanand) is the chairman of PTT Treasury Center Co., Ltd.
Business Service Alliance Co., Ltd.	280	286	173	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Suchat Ramarch) is the chairman of Business Service Alliance Co., Ltd. - PTT executives (Mr. Chadil Chavanalikhikorn and Mrs. Nivadee Jaroensitipun) are directors of Business Service Alliance Co., Ltd.
Energy Complex Co., Ltd.	137	146	161	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Chansak Chuenchom) is the chairman of Energy Complex Co., Ltd. - PTT executive (Ms. Peangpanor Boonklum) is a director of Energy Complex Co., Ltd.

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.6.2 Other Payables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Thai Oil Plc.	122	3	1	PTT Group holds 48.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executives (Ms. Pannalin Mahawongtikul, Mr. Terdkiat Prommool, Mr.Suchat Ramarch, and Dr. Buranin Rattanasombat) are directors of Thai Oil Plc. - PTT executive (Mr. Noppadol Pinsupa) is a director, the secretary, and acting CEO and president of Thai Oil Plc.
PTT International Trading USA Inc.	119	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT International Trading Pte. Ltd.	54	4	524	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Ms. Jaroonsri Wankertphon) is a director of PTT International Trading Pte. Ltd.
Glow Energy Plc.	49	65	1	PTT Group holds 99.83 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT executive (Mr. Worawat Pitayasiri) is a director of Glow Energy Plc.
PTT Global Chemical Plc.	36	33	59	PTT Group holds 48.18 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director (M.L. Chayotid Kridakon) is a director of PTT Global Chemical Plc. - PTT executives (Mr. Chadil Chavanalikhorn and Mr. Cherdchai Boonchoochauy) are directors of PTT Global Chemical Plc. - PTT executive (Dr. Kongkrapan Intarajang) is a director, the secretary, CEO and president of PTT Global Chemical Plc.

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.6.2 Other Payables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTT International Trading London Ltd.	32	6	96	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTTEP Energy Development Co., Ltd.	27	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Mekha V Co., Ltd. (previously known as Mekha Technology Co., Ltd.)	26	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTTEP International Co., Ltd.	25	32	17	PTT Group holds 100.00 % of this subsidiary's shares.	—
IRPC Clean Power Co., Ltd.	23	23	23	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Exploration and Production Plc.	22	21	42	PTT Group holds 65.29 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director / executive (Mr. Auttapol Rerkpiboon) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Wuttikom Sthiti) is a director of PTT Exploration and Production Plc. - PTT executive (Mr. Montri Rawanchaikul) is a director and CEO of PTT Exploration and Production Plc.
GC Maintenance and Engineering Co., Ltd.	21	17	16	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.6.2 Other Payables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Business Professional Solutions Recruitment Co., Ltd.	19	12	9	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Chadil Chavanalikhikorn) is the chairman of Business Professional Solutions Recruitment Co., Ltd. - PTT executive Mrs. Nivadee Jaroensitipun is a director of Business Professional Solutions Recruitment Co., Ltd.
T-ECOSYS Co., Ltd.	18	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mrs. Chanamas Sasnanand) is the chairman of T-ECOSYS Co., Ltd.
NPC S&E Security Guard Co., Ltd.	11	19	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
NPC Safety and Environmental Service Co., Ltd.	10	7	7	PTT Group holds 100.00 % of this subsidiary's shares.	—
Cariva (Thailand) Co., Ltd.	5	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Retail Management Co., Ltd.	4	9	1	PTT Group holds 100.00 % of this subsidiary's shares.	—
IRPC Plc.	3	2,797	1	PTT Group holds 48.05 % of this subsidiary's shares.	- PTT executives (Ms. Peangpanor Boonklum, Mr. Chansak Chuenchom and Mr. Prasong Intaranongpai) are directors of IRPC Plc. - PTT executive (Mr. Kris Imsang) is a director, the secretary, CEO and president of IRPC Plc.

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.6.2 Other Payables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Nuovo Plus Co., Ltd.	3	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Dr. Buranin Rattanasombat) is the chairman of Nuovo Plus Co., Ltd.
EV ME Plus Co., Ltd.	2	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Innobic Nutrition Co., Ltd.	2	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Natural Gas Distribution Co., Ltd.	1	5	4	PTT Group holds 58.00 % of this subsidiary's shares.	- PTT executive (Mr. Wuttikorn Stithit) is the chairman of PTT Natural Gas Distribution Co., Ltd.
PTT Tank Terminal Co., Ltd.	1	1	1	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (M.L. Peekthong Thongyai) is a director of PTT Tank Terminal Co., Ltd.
Global Power Synergy Plc.	1	1	1	PTT Group holds 75.23 % of this subsidiary's shares.	- PTT executives (Mr. Wuttikorn Stithit, Mr. Noppadol Pinsupa, Miss Pannalin Mahawongtikul, M.L. Peekthong Thongyai, and Dr. Kongkrapan Intarajang) are directors of Global Power Synergy Plc. - PTT executive (Mr. Worawat Pitayasiri) is a director, the secretary, CEO and president of Global Power Synergy Plc.
Alpha Com Co., Ltd.	1	5	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Cherdchai Boonchoochaay) is the chairman of Alpha Com Co., Ltd.
Glow SPP 11 Co., Ltd.	1	1	4	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Worawat Pitayasiri) is a director of Glow SPP 11 Co., Ltd.

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.6.2 Other Payables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
Arun Plus Co., Ltd.	1	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT director (Professor Dr. Thosaporn Sirisumphand) is the chairman of Arun Plus Co., Ltd. - PTT directors (Mr. Danucha Pichayanan and M.L. Chayotid Kridakon) are directors of Arun Plus Co., Ltd. - PTT executive (Mr. Cherdchai Boonchoochauy) is a director of Arun Plus Co., Ltd.
PTTOR Singapore Pte. Ltd.	1	1	1	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT MEA Ltd.	1	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Innobic (Asia) Co., Ltd.	1	1	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Dr. Buranin Rattanasombat) is the chairman of Innobic (Asia) Co., Ltd. - PTT executive (Mrs. Chanamas Sasnanand) is a director of Innobic (Asia) Co., Ltd.
Siam Management Holding Co., Ltd.	1	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT LNG Co., Ltd.	1	-	1	PTT Group holds 100.00 % of this subsidiary's shares.	—
Sak Chaisidhi Co., Ltd.	1	1	1	PTT Group holds 80.52 % of this subsidiary's shares.	—
PTT Phenol Co., Ltd.	1	1	1	PTT Group holds 100.00 % of this subsidiary's shares.	—
GC-M PTA Co., Ltd.	-	-	1	PTT Group holds 74.00 % of this subsidiary's shares.	—
PTTEP Services Co., Ltd.	-	-	1	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.6.2 Other Payables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTT Energy Solutions Co., Ltd.	-	18	20	The registration of dissolution was on 29 December 2022, this subsidiary is now in the process of liquidation.	—
PTT (Cambodia) Limited	-	-	1	PTT Group holds 100.00 % of this subsidiary's shares.	—
Joint Ventures					
Map Ta Phut Air Products Co., Ltd.	5	6	2	PTT Group holds 51.00 % of this joint venture's shares.	—
Nava Nakorn Electricity Generating Co., Ltd.	3	3	3	PTT Group holds 30.00 % of this joint venture's shares.	—
PTT Asahi Chemical Co., Ltd.	2	2	2	PTT Group holds 50.00 % of this joint venture's shares.	—
HMC Polymers Co., Ltd.	1	1	1	PTT Group holds 41.44 % of this joint venture's shares.	—
District Cooling System and Power Plant Co., Ltd.	1	1	1	PTT Group holds 35.00 % of this joint venture's shares.	—
Trans Thai - Malaysia (Malaysia) Sdn. Bhd.	1	-	-	PTT Group holds 50.00 % of this joint venture's shares.	—
VEOLIA Sustainable Solutions (Thailand) Co., Ltd. (previously known as Suez Environmental Services Co., Ltd.)	-	3	5	PTT Group holds 40.00 % of this joint venture's shares.	—

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.6.2 Other Payables (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
PTT Raise Co., Ltd.	-	1	-	PTT Group holds 50.00 % of this joint venture's shares.	—
Associates					
Bangka-In Cogeneration Co., Ltd.	7	7	7	PTT Group holds 25.00 % of this associate's shares.	—
Thai Petroleum Pipeline Co., Ltd.	2	2	1	PTT Group holds 49.21 % of this associate's shares.	—
Eastern Fluid Transport Co., Ltd.	-	-	3	PTT Group holds 30.00 % of this associate's shares.	—
Other Related Companies					
Ratchaburi Power Co., Ltd.	32	32	32	PTT Group holds 15.00 % of this related company's shares.	- PTT executive (Mr. Worawat Pitayasiri) is a director of Ratchaburi Power Co., Ltd.
Dhipaya Insurance Plc.	-	-	10	As of 31 December 2022, PTT Group has not held any share of Dhipaya Insurance Plc.	—
Total	4,592	7,372	7,230		

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.6.3 Short-Term Borrowings

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
PTT LNG Co., Ltd.	1,969	1,615	816	PTT Group holds 100.00 % of this subsidiary's shares.	—
Siam Management Holding Co., Ltd.	1,962	893	131	PTT Group holds 100.00 % of this subsidiary's shares.	—
Arun Plus Co., Ltd.	1,957	2,729	-	PTT Group holds 100.00 % of this subsidiary's shares.	<ul style="list-style-type: none"> - PTT director (Professor Dr. Thosapom Sirisumphand) is the chairman of Arun Plus Co., Ltd. - PTT directors (Mr. Danucha Pichayanan and M.L. Chayotid Kridakon) are directors of Arun Plus Co., Ltd. - PTT executive (Mr. Cherdchai Boonchoochaay) is a director of Arun Plus Co., Ltd.

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies
(continued)

9.2.3.6.3 Short-Term Borrowings (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
PTT Tank Terminal Co., Ltd.	1,425	990	1,115	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (M.L. Peekthong Thongyai) is a director of PTT Tank Terminal Co., Ltd.
Innobic (Asia) Co., Ltd.	866	635	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Dr. Buranin Rattanasombat) is the chairman of Innobic (Asia) Co., Ltd. - PTT executive (Mrs. Chanamas Sasnanand) is a director of Innobic (Asia) Co., Ltd.).
EV ME Plus Co., Ltd.	312	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
T-ECOSYS Co., Ltd.	293	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mrs. Chanamas Sasnanand) is the chairman of T-ECOSYS Co., Ltd.
Alpha Com Co., Ltd.	175	161	84	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Cherdchai Boonchoochauly) is the chairman of Alpha Com Co., Ltd.
Innobic LL Holding Co., Ltd.	134	7	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Green Energy (Thailand) Co., Ltd.	85	74	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Innobic Nutrition Co., Ltd.	58	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Global LNG Co., Ltd.	56	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Global Management Co., Ltd.	50	56	300	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Cherdchai Boonchoochauly) is the chairman of Global Management Co., Ltd.
P-Dictor Co., Ltd.	44	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies
(continued)

9.2.3.6.3 Short-Term Borrowings (continued)

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries (continued)					
ReAcc Co., Ltd.	35	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
PTT Energy Resources Co., Ltd.	24	55	114	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Cherdchai Boonchoocha) is the chairman of PTT Energy Resources Co., Ltd.
Global Management Holding Co., Ltd.	2	2	1	PTT Group holds 100.00 % of this subsidiary's shares.	—
Total	9,447	7,217	2,561		

9.2.3.6.4 Long-Term Borrowing

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiary					
PTT Treasury Center Co., Ltd.	50,260	49,490	45,181	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mrs. Chanamas Sasnanand) is the chairman of PTT Treasury Center Co., Ltd.
Total	50,260	49,490	45,181		

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.6.5 Current Financial-Lease Liabilities

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
PTT Digital Solutions Co., Ltd.	41	2	2	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Terdkiat Prommool) is the chairman of PTT Digital Solutions Co., Ltd.
EV ME Plus Co., Ltd.	10	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Energy Complex Co., Ltd.	3	-	35	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Chansak Chuenchom) is the chairman of Energy Complex Co., Ltd. - PTT executive (Ms. Peangpanor Boonklum) is a director of Energy Complex Co., Ltd.
PTT LNG Co., Ltd.	2	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Business Service Alliance Co., Ltd.	1	1	1	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Suchat Ramarch) is the chairman of Business Service Alliance Co., Ltd. - PTT executives (Mr. Chadil Chavanalikhorn and Mrs. Nivadee Jaroensitipun) are directors of Business Service Alliance Co., Ltd.
Joint Venture					
Trans Thai-Malaysia (Thailand) Co., Ltd.	451	431	383	PTT holds 50.00 % of this joint venture's shares.	—
Total	508	434	421		

9.2.3.6 Trade Accounts Payable, Other Payables, Borrowings, and Financial-Lease Liabilities involving subsidiaries, joint operations, joint ventures, associates and other related companies

(continued)

9.2.3.6.6 Long-Term Financial-Lease Liabilities

Related Companies	Year 2022 (THB Million)	Year 2021 (THB Million)	Year 2020 (THB Million)	Relationship	
				Shareholding (as of 31 December 2022)	Management (as of 31 December 2022)
Subsidiaries					
PTT Digital Solutions Co., Ltd.	140	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Terdkiat Prommool) is the chairman of PTT Digital Solutions Co., Ltd.
PTT LNG Co., Ltd.	31	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
EV ME Plus Co., Ltd.	21	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	—
Energy Complex Co., Ltd.	3	-	-	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Chansak Chuenchom) is the chairman of Energy Complex Co., Ltd. - PTT executive (Ms. Peangpanor Boonklum) is a director of Energy Complex Co., Ltd.
Business Service Alliance Co., Ltd.	-	1	2	PTT Group holds 100.00 % of this subsidiary's shares.	- PTT executive (Mr. Suchat Ramarch) is the chairman of Business Service Alliance Co., Ltd. - PTT executives (Mr. Chadil Chavanalidikorn and Mrs. Nivadee Jaroensitipun) are directors of Business Service Alliance Co., Ltd.
Joint Venture					
Trans Thai-Malaysia (Thailand) Co., Ltd.	2,336	2,696	2,812	PTT Group holds 50.00 % of this joint venture's shares.	—
Total	2,531	2,697	2,814		



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