

2022

**CPC
Corporation, Taiwan**





Quality-Exploration

Domestic exploration

110

Yield: 110 million cubic meters of natural gas

5,763

5,763 kiloliters of condensate

Overseas exploration

5.4824

5.4824 million barrels of crude oil

507

507 million cubic meters of natural gas

114.5

114.5 thousand barrels of LPG



Service-Products

16.74

Total domestic sales of oil products: 16.74 million kiloliters

25.56

Total domestic sales of natural gas: 25.56 billion cubic meters



Contribution-Social Responsibility

463.6

Regional education activities and care for the disadvantaged: NT\$463.6 million

17,103

Blood donation activity: 17,103 individuals

647

Donation of 647 recycled computers

11,000

Over 11,000 visitors to the CPC Petroleum Discovery Museum

2.436

Donation of NT\$2.436 million by employees to sponsor disadvantaged children

Front cover design concept:

With the CPC Taiwan torch logo at the center, the design symbolizes the sun shining on the people, while the multi-level ridge line highlights that CPC Taiwan moves with the times, that it implements a diverse energy strategy, and continuously makes an strives for net zero carbon emissions and sustainability.



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The 3 pillars of ESG a new page for carbon neutrality

In 2021, with COVID-19 continuing to affect the world, a glimmer of hope in the form of herd immunity arose as the vaccination rate gradually increased. However, mutation of the virus brought back lockdowns, casting uncertainty over global economic recovery. The surge in oil prices in the second half of the year led to an unprecedented energy crisis. In compliance with the government's policy of price stabilization, and to reduce the impact of the COVID-19 pandemic on the domestic economy and people's livelihoods, CPC absorbed the fluctuations in oil and gas prices, further worsening our annual financial performance.

In spite of severe challenges, CPC colleagues stayed at their posts and strove to stabilize oil, gas and petrochemical supply in Taiwan and, in line with the government's new energy policies, achieved significant results in all aspects of business. In terms of international exploration and production cooperation, CPC obtained the Pirity block working interest in Paraguay, and SL10B/13 block working interest in Somaliland, in an attempt to find oil and gas deposits with commercial value, and to increase Taiwan's energy independence. In the area of natural gas business, with the joint efforts of environmental protection, ecology and external communication, we were pleased to see a majority of the voters disapprove the proposition to relocate the new third liquefied natural gas (LNG) terminal away from the coast of Datan in the referendum on December 18, 2021, supporting a major construction project vital not only for CPC's long-term development but also for national energy transformation. To continue to increase CPC's overall transmission and storage capability, CPC plans to expand its existing receiving terminals and related facilities. In 2021, the first liquefied gas cargo arrived at the Taichung terminal on contract with Cheniere in the US. A long-term contract was signed with Qatar Energy, as well, to further stabilize domestic gas supply.

In terms of importing carbon neutral products, following the first attempt at carbon neutral cooperation with Shell in 2020, CPC continues to cooperate with international energy groups, and three carbon neutral LNG cargoes with third-party certification arrived in Taiwan in 2021. The carbon credit obtained was equal to the annual carbon absorption of 1,645 Da-an Forest Parks in Taipei City. On September 16, CPC signed the Natural Gas Carbon Neutral Plan MOU with TSMC, providing certified carbon neutral natural gas to a customer for the first time. On December 10, CPC also imported carbon neutral ethylene through cooperation with Japan's Marubeni Corporation, a first for Taiwan and the world. The number of carbon offset credits obtained was equal to the annual carbon absorption of 50 Da-an Forest Parks, writing a new page in history from low carbon to zero carbon emission.

With regards to innovative marketing services, combining energy creation, energy storage, energy use and smart managements R&D results, CPC continued to set up Smart Green gas stations-Jiadong Station in Taoyuan and Guangfu Station in Hualien; CPC achieved the target of establishing 216 charging stations for electric scooters on time and established the first electric automobile charging station at the car park of Fulin Gas Station in Taipei; CPC also promoted Cup & Go cafes next to gasoline pumps, an innovation in integrated operating models.

In terms of R&D and green energy applications, CPC follows government policy to localize the domestic production of catalysts. CPC established the Advanced Catalyst Center to research the carbon reduction economy, energy conservation and environmental protection, and green products, in order to develop independent key technologies in catalysts and to facilitate the development of a "circular" economy. A steel and chemical joint production strategy has been established with China Steel with the aim of capturing carbon emissions at source and for the processing of green products. On December 10, 2021, CPC received an A-grade certification from TIPS (the Taiwan Intellectual Property Management System). We have also disclosed a company-wide intellectual property management plan and published an annual execution report, as well as implemented a corporate governance evaluation, linking operational objectives with an intellectual property strategy, and grounding future innovation. In terms of applying new digital technologies, in 2021, the CPC 5G AIoT Promotion Project Office was established. Combining ICT technology and intelligent IoT, the potential applications can be used in various management systems for production, sales, logistics and storage, and lead CPC toward a fully developed smart enterprise.

In terms of Corporate Social Responsibility, in 2021, and in line with the epidemic prevention policy, CPC continued to offer an 8% discount to taxi drivers on gas purchases using deposits. We also enhanced the disinfection of the toilets in our gas stations during the COVID-19 pandemic and provided free CUP&GO coffees to support frontline medical and police staffs in different areas. Construction work on the Baling Gas Station in Fuxing Township in Taoyuan began to provide gas to people in remote areas, showing our sincere care for local people. In response to World Toilet Day on November 19, and to achieve the UN SDGs, we cooperated with franchisee partners to enhance our public toilet hygiene and provide people with a quality toilet environment.

Also, CPC's Dalin plant and Hsiaogang High School in Kaohsiung signed the CPC Science Class Industry-School Cooperation Plan, further acting to contribute to the local community and nurturing local students.

In 2021, CPC received various international and domestic awards. Our gas stations have received the Readers Digest Trusted Brand Platinum Award for 21 consecutive years; our Gas Tanker Electronic IoT Management System won the Model Award in the Outstanding Operation Category of the first Harvard Business Review Digital Transformation Dynastic Change Award. In terms of sustainability category awards, CPC received the Top 50 Sustainable Enterprise Award, the Energy Industry Platinum Award, seven TCOSA sustainability awards, the National First Prize for Most Popular Brand, and First Prize for Best Product of the National Brand Yushan Award, vividly showing that CPC's efforts to combine environment protection, CSR and ESG have been strongly recognized.

In response to the Net Zero Emissions 2050 target, global energy faces drastic changes, and international energy companies are adjusting their objectives and directions, undergoing corporate transformation and restructuring their businesses. With the main themes of quality oil, carbon reduction and clean energy, CPC will continue to develop various technologies and products and expand potential applications. In terms of quality oil, and in line with changes in the market's energy composition, we will gradually adjust the refining and petrochemical structure, including moving in the direction of COTC to reduce oil output, increase petrochemical ratio, and develop high-value petrochemical materials. In the area of carbon reduction, we will continue to improve the manufacturing process and energy efficiency in refining and petrochemicals. In addition, we are also simultaneously developing negative carbon emission technology, such as carbon capture, utilization and storage (CCUS), to create a domestic carbon "circular economy" ecosystem. As for clean energy, we will explore domestic geothermal energy resources, promote the building of solar photovoltaic systems and develop hydrogen energy and zero carbon technologies.

With the global trend toward net zero carbon emissions, CPC will continue to keep track of the pulse of the energy market and, in line with the the government's policies on energy transformation, on the foundation of the "worker safety, environmental safety, cyber security and integrity security" safety culture, strengthen the development of the core businesses to ensure the steady supply of oil, gas and petrochemical materials in Taiwan. We will move with the times and adjust the company's operating objectives and policies on a rolling basis, aiming to drive transformation through R&D and expand the existing business scope. At the same time, we will pay attention to environmental protection, ecological conservation, and caring for the disadvantaged, and we will contribute to the community and fulfill CSR, as we pursue sustainable operations.



Message from the Chairman & President

Lee, Shun-chin Fang, Jeng-Zen

Model Spirit Leading International Businesses

The formation and development of CPC



1946 CPC was established in Shanghai on June 1, 1946, initially under the aegis of the Council of Resources - the precursor of today's State-owned Enterprise Commission, Ministry of Economic Affairs.

1949 Following the ROC government's relocation to Taiwan in 1949, the corporate headquarters was set up in Taipei, and the company's affiliation was transferred to the Ministry of Economic Affairs. Its business scope and facilities are carried out throughout Taiwan, encompassing importing; procurement; exploration; production; refining; storage, and distribution of oil and gas. In addition, CPC produces petrochemical raw materials.

2003 In line with both the global trend and environmental protection, in 2003 CPC instituted a policy for sustainable development.

2007 On February 9, 2007, the board of directors approved to change the company's English name from "Chinese Petroleum Corporation" to "CPC Corporation, Taiwan"

2016 On June 17, 2016, the board of directors approved a revision of the company's articles of association and moved its headquarters from Taipei City to Kaohsiung City.



CPC's Sustainable Operation Policy



- Comply with both Taiwan's national regulations and international protocols.
- Practice comprehensive clean manufacturing methodology to protect the environment.
- Conserve water and energy resources through efficient utilization.
- Place importance on fulfilling CSR commitments and expanding its service area.
- Establish indicators for environmental protection while maintaining transparency.
- Actively research and develop products while expanding new areas of business.



2021 Affirmation and honors



- Reader's Digest Trustworthy Brand Platinum Award for 21st year in succession.
- Readers Digest Trustworthy Brand Gold Award, Lubrication Oil Product Category for 3rd year in succession.
- In the 2021 Asia Corporate Excellence & Sustainability Awards (ACES), awarded the "Sustainability Award—Top Sustainability Advocates in Asia", and Chairman Shun-Chin Lee named the "Leadership Award—Individual—Outstanding Leaders in Asia Award".
- 2021 Asia Responsible Enterprise Awards (AR-EA) awarded "Green Leadership Award" and "Social Empowerment Award".
- Received nine major awards in the Taiwan Corporate Sustainability Awards (TCSA) including Comprehensive Performance Award-Taiwan Top 50 Sustainable Enterprise Award, Enterprise Sustainability Report Awards-Energy Industry Platinum Award, and seven Outstanding Case awards.
- Taiwan Sustainability Action Award (TSAA) awarded a gold and two silver awards, showing the best model of sustainable development of enterprises.
- Received eight major awards in the 18th National Brand Yushan Award, including two National First Prizes with 95 Unleaded Gasoline and Smart & Green e-Stations.

In 2005, CPC set up the Sustainable Operations Promotion Committee, with a focus on strategy formulation and objective setting, to address sustainable operation issues. The company's actions for sustainable operation fall into four major fields: environmental and ecological conservation; social care; strategy formulation and development; and environmental accounting and information. The Committee's level was upgraded in 2007 and it is directed by the CPC's Chairman personally. CPC's President holds the post of associate director of the committee, and the Vice Presidents, Spokesman and CEOs of the five major business units serve as committee members. Since 2008, it has recruited external scholars and experts as its members. The committee convenes three times a year to discuss reports and proposals regarding the aforementioned four fields. In this way, the committee is able to gain a timely grasp of the social pulse, promote sustainability issues and keep track of implementation progress.

With regard to communication with stakeholders, apart from providing related information in a specific section of its website for this purpose and issuing annual reports, CPC has released annual Sustainability Reports since 2007 for explanation and disclosure purposes to show its determination to communicate with all stakeholders. Such efforts have been acclaimed by society and received multiple awards. In the future, CPC will apply the UN's Sustainable Development Goals (SDGs) as benchmarks for its own sustainable development program, continue to highlight sustainable operation issues through the work of the Sustainable Operations Promotion Committee, and disclose information related to sustainable development. CPC strives to benefit both "environmental protection", "economic development", and "social care" and work with all parties to create a better future.

Group Power Planning a New Situation



Board and Corporate Officers

Chairman & Standing Director |
Shun-Chin Lee

Directors

Standing Director & President |
Jeng-Zen Fang

Standing Director & Independent Director |
Ming-Chang Hsu

Independent Director | Chih-Chheng Shen
Syang-Peng Rwei
Chung-Pao Wu
Pei-Li Chen
Li-Chen Lin
Chung-Hsien Chen
Chao-Chung Kuo
Shih-Yuan Su
Kuo-Cheng Chou
Sheng-Ching Huang

Supervisors

Tsang-Fu Wu
Hui-Shan Wei
Feng-Yuan Chien



Corporate Officers

President Jeng-Zen Fang

Vice Presidents Jen-Hung Huang

Chia-Shou Chiu

Jane H.J. Liao

Michael Chang

Huang-Chang Lee

Spokesman Ray-Chung Chang

CEO, Exploration & Production
Business Division Chenners C.H. Fan
(acting)

CEO, Refining Business Division Jil-Chyn Shin

CEO, Petrochemical Business
Division Kuo-Tung Chen

CEO, Marketing Business Division Po-Tung Lo

CEO, Natural Gas Business
Division Huang-Chang Lee

CEO, Lubricants Business
Division Chung-Liang Lin

CEO, Liquefied Petroleum Gas
Business Division Feng-Cheng Chu

CEO, Solvent & Chemical
Business Division Angela Koju Lin

Director, Refining &
Manufacturing Research Institute Ming-Chang Tsai

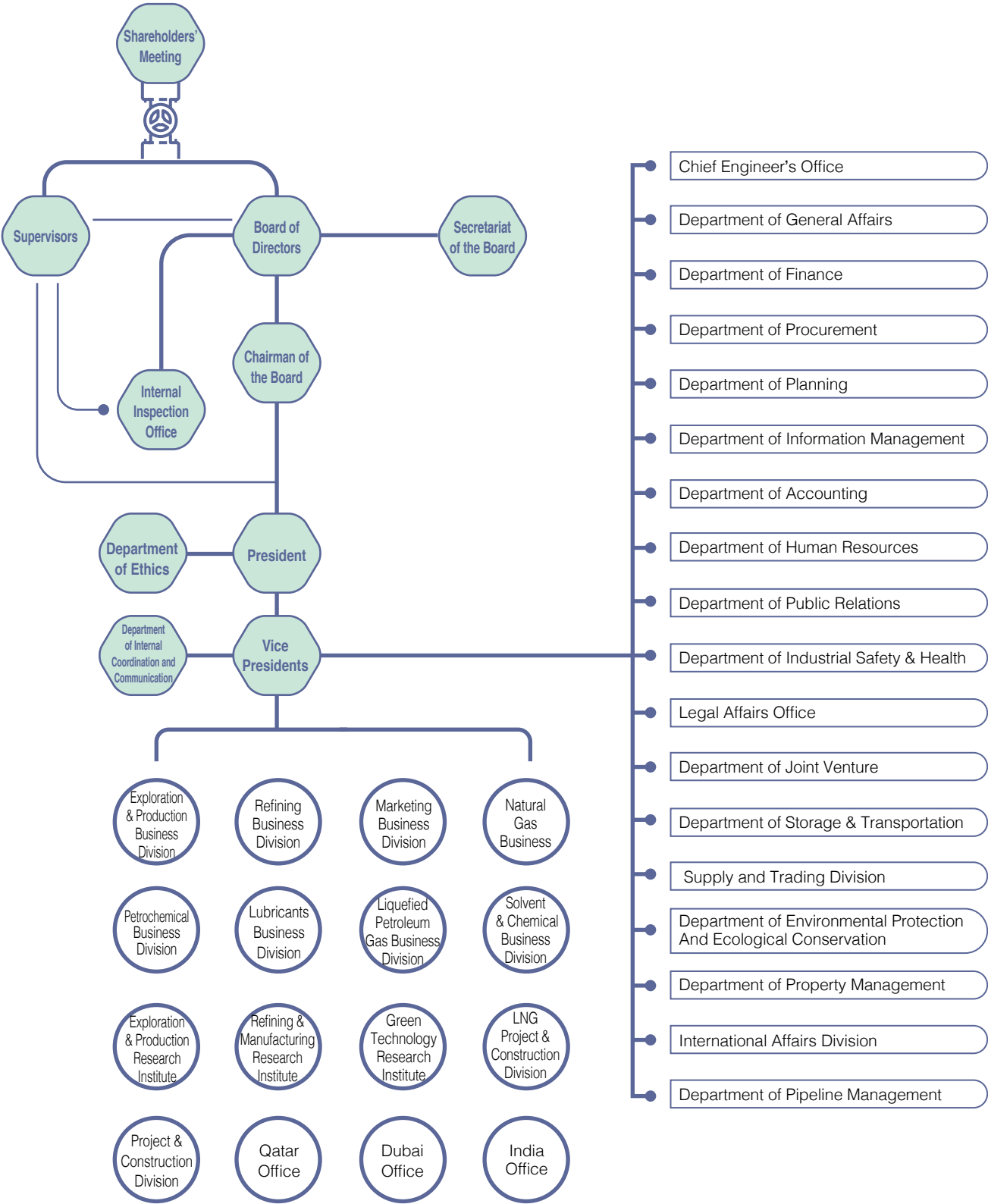
Director, Exploration &
Development Research Institute Ta-Lin Chen

Director, Green Technology
Research Institute Guo-Hsu Lu

Director, LNG Project Division Rounq-Yuh Hwang

Director, Project & Construction
Division Ching-Tang Hung

Organizational Chart



2022

Board and Corporate Officers

Corporate Officers



**Chenners
C.H. Fan**

CEO, Exploration &
Production Business
Division (acting)

Kuo-Tung Chen

CEO, Petrochemical
Business Division

Ray-Chung Chang

Spokesman

**Jane
H.J. Liao**

Vice President

Jen-Hung Huang

Vice President

Shun-Chin Lee

Chairman



Jeng-Zen Fang

President

Chia-Shou Chiu

Vice President

Huang-Chang Lee

Vice President/
CEO, Natural Gas
Business Division

Michael Chang

Vice President

Po-Tung Lo

CEO, Marketing
Business Division

Jil-Chyn Shin

CEO, Refining
Business Division

Launching cooperation Entering the green energy field

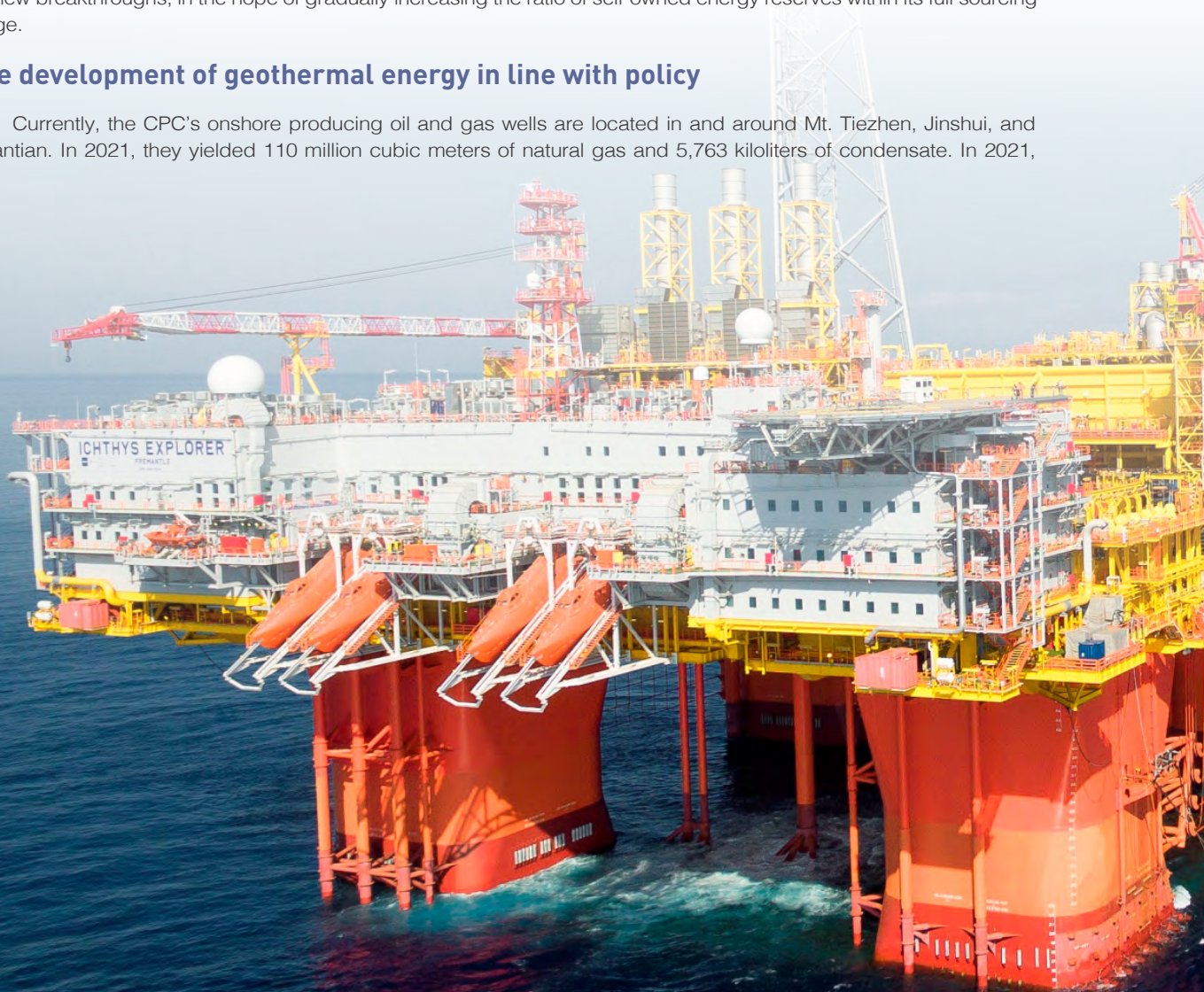
Exploration and Production

Taiwan has limited indigenous energy resources; therefore, it depends on imports for most of its fossil fuel needs. As a result, CPC has cooperated with the government's "furthering energy supply security mechanism and forging international energy cooperation" policy. CPC is dedicated to the improvement of its performance in new energy development, the expansion of upstream operations and the increase of overseas production, to stabilize the supply of crude oil and natural gas to the domestic market and alleviate the impact brought by oil price fluctuation.

In order to improve overall strategic planning, and on the basis of active expansion and focus, CPC has adopted exploration and production strategies which aim to expand overseas operations and exploiting domestic operations, simultaneously undertaking mergers and acquisitions and exploration and production, as well as the training of talent for new breakthroughs, in the hope of gradually increasing the ratio of self-owned energy reserves within its full sourcing range.

The development of geothermal energy in line with policy

Currently, the CPC's onshore producing oil and gas wells are located in and around Mt. Tiezhen, Jinshui, and Guantian. In 2021, they yielded 110 million cubic meters of natural gas and 5,763 kiloliters of condensate. In 2021,



CPC carried on domestic onshore oil and gas resources exploration projects and completed a 32.78 km 2D seismic survey of geological structures on the Pingtung Plain and at Guanmiao, Tainan. Seventy-two square kilometer surface geologic surveys in the Chuhuangkeng field and Shangtao area in Miaoli were also conducted. In order to implement national energy policy and fully participate in the development of the green energy industry, CPC has also completed the production test of Tuchang No. 14 and No.15 geothermal wells in the Tuchang area of Yilan and cautiously evaluated their potential for 1.2MW geothermal power generation. Based on the potential evaluation, CPC plans to complete Tuchang No. 16, 17 and 18 geothermal wells and operate a Tuchang 5MW geothermal power plant bids in 2022, with the expectation of generating electricity and supplying the grid in August 2023.

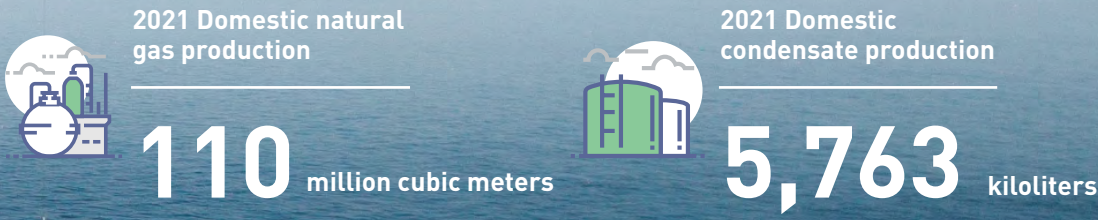


Sea area cooperation & Independent potential research

CPC, Total E&P Chine (TOTAL, the Operator), and China National Offshore Oil Corporation (CNOOC) signed a Petroleum Contract of Taiyang Block on May 3, 2017. Approximately 8,131.6 km 2D seismic survey data have been processed in 2021. A 2,500 square kilometers 3D seismic commitment will be completed in 2022.

CPC has also worked with Husky Energy International Corporation to search for oil and gas in deep-water areas in the Tainan basin. The joint venture completed 2D and 3D seismic survey data acquisition, and completed data processing and data explaining as of 2021. The joint research for common risk segment (CRS) mapping is expected to finish in 2022.

CPC is also evaluating the upside hydrocarbon potential of Taihsi and Tainan basins in Taiwan, viewing potential exploration and extraction subjects and sites suitable for carbon storage sequestration; and it is integrating resources with the Exploration & Development Research Institute to achieve development objectives.



CPC's overseas E&P Projects



natural gas

507

million cubic meters



crude oil

5.4824

million barrels



LPG

114.5

thousand barrels

Overseas cooperation: Two new mining concessions obtained

In 2021, CPC was engaged in oil and gas exploration and production joint-ventures with international oil companies, participating in ten projects in eight countries. According to the proportion of working interest, 5.48 million barrels of crude oil, 507 million cubic meters of natural gas and 114.5 thousand barrels of LPG were allocated to CPC. The oil and gas were from the development and operation of fields in Ecuador, Niger, Australia, and Chad.

CPC is continuously making progress toward the goal of increasing domestic sources and the stability of energy supply. Its important achievements in this regard include committing to the Niger development plan with the aim of exporting its crude oil as soon as possible. The Ichthys Project in Australia has continued with the Phase 2 development plan and maintains stable production, which has promising prospects. The Prelude Project in Australia has reached a record high of LNG production in November 2021. The Chad block, which CPC has operated since 2006, entered the production stage in February 2020. The first cargo of crude oil produced from the Oryx Field arrived in Taiwan at the end of November 2020. The Oryx Field produced crude oil stably and two more cargoes were shipped back to Taiwan in 2021. Two new mining concessions were obtained in 2021, namely, Pirity in Paraguay and SL10B/13 in Somaliland, both with oil and gas potential.

CPC's upstream business was launched in 1959. Today, it comprises exploration and production in both onshore and offshore oil and gas fields, both in Taiwan and overseas. To date, CPC has yielded a value of over TWD179 billion in upstream business. Looking to the future, CPC will actively enhance the value of producing asset and plans M&A activities that is focused on exploration and raising its level of ownership over core oil and gas reserves. CPC will endeavor to acquire assets with appreciable upside potential, and above all, those with low risk by industry standards. In parallel with this, CPC will develop diversity in the company's scope of business and become a player in the green energy industries, aiming to become one of the world's valuable international oil and gas exploration and production business entities.



ongoing

8

countries

10

producing



Fields under development or now producing

- 1 **Guardfish, U.S**
OAI (50%)
Operator: CalNRG (50%)
- 2 **Block 16, Ecuador**
OPIC (31%)
Operator: Repsol (35%)
SINOPEC (20%)
SINOCEM (14%)
- 3 **Block 17, Ecuador**
OPIC (30%)
Operator: PetroOriental (70%)
- 4 **Agadem, Niger**
OPIC Niger (20%)
Operator: CNPCNP (65%)
The Republic of Niger (15%)



Fields under ongoing exploration

- 5 **Oryx, Chad**
Operator: OPIC Africa (35%)
CEFC (35%)
SHT (30%)
- 6 **Ichthys, Australia**
OPIC Ichthys (2.625%)
Operator: INPEX (66.245%)
Others (31.13%)
- 6 **WA-285-P, Australia**
OPIC Australia (2.625%)
Operator: INPEX (66.245%)
Others (31.13%)
- 7 **Prelude, Australia**
OPIC Australia (5%)
Operator: SHELL (67.5%)
Others (27.5%)
- 8 **East Seram, Indonesia**
OPIC East Seram (40%)
Operator: Balam Energy (60%)
- 9 **Pirity, Paraguay**
OPIC Paraguay (50%)
Operator: President Energy (47.5%)
LCH S.A. (2.5%)
- 10 **SL10B/13, Somaliland**
OPIC Somaliland (49%)
Operator: Genel Energy (51%)

Growing with the times and Innovative diverse operations

Importing & Refining

As Taiwan's domestic production of crude oil yields only extremely low volumes, CPC needs to import virtually all of the crude it refines to supply its domestic market. To ensure stability, CPC works to both maximize procurement on long-term contracts and to diversify its sources of crude.

Imports of crude oil reached 136.89 million barrels in 2021: 52.63% from the Middle East, 38.96% from USA, and 7.98% from Africa. In recent years, to meet with the more stringent environmental laws, low sulfur crude oil still makes up some crude oil imports.

To import crude oil, CPC has installed offshore mooring pontoons to unload large oil tankers at Shalun in Taoyuan and at Dalinpu in Kaohsiung. The company has also built dedicated tanker loading/unloading berths in the ports of Kaohsiung, Taichung and ShenAo.

Continuing improvement in oil product quality

CPC now operates two refineries in Taiwan — at Taoyuan and Dalin — with a combined daily refining capacity of 600,000 barrels of crude. Following government policy for industry relocation, the Kaohsiung Refinery, an integrated refining and petrochemical production and storage complex with a daily refining capacity of 220,000 barrels of crude as well as 500,000 tons of ethylene annually, ceased operations in late 2015. Upon closure, its refining activity was transferred to the expanded Dalin refinery, and its ethylene production to the then new Third Naphtha Cracker in the Linyuan Petrochemical Complex.

The Dalin Refinery became operationally independent from the Kaohsiung Refinery in 1996. After expansion, there are now 4 offshore mooring pontoons as well as large and small wharves for handling both



imports and exports, holding a daily capacity of up to 400,000 barrels of crude. The Taoyuan Refinery came on stream in 1976; after engineering revamping and building the additional second topping unit, its daily refining capacity is now 200,000 barrels of crude. In 2021, the total refined products was 8.581 million kiloliters of gasoline, 2.041 million kiloliters of aviation fuel, 4.949 million kiloliters of diesel, 2.072 million kiloliters of fuel oil, and 361 kilotonnes of LPG.

Taiwan's increasingly stringent standards of environmental protection are largely in response to the demands of its people out of concern for their quality of life. At the same time, they exhibit increasing demand for a diverse range of oil-derived products. The company has gradually built additional refining facilities, such as reforming units, isomerization units, and gasoline/diesel desulfurization plant, an aviation fuel processing facility, together with normal paraffin, alkylation and residual fluid catalytic cracking (RFCC) units. CPC also plans to build VDU, SDA units and aromatic hydrocarbon extraction units in order to offer domestic consumers even better products and to improve production efficiency.

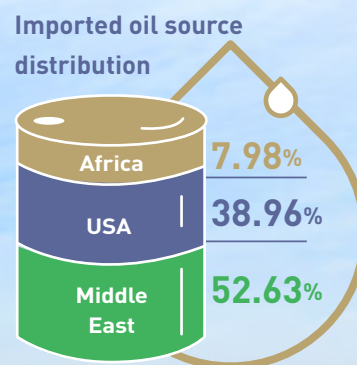
Optimization of refining to reduce pollutant emission

The EPA called for reductions in the sulfur content of gasoline and diesel fuel to under 10ppmw, of the aromatic hydrocarbon content of gasoline and diesel fuel to under 35vol%, and of the olefin content of gasoline to under 18 vol%, by 2011. By 2008, CPC had constructed a 30,000 barrels per day pyrolysis gasoline and hydro-desulfurization unit at the Taoyuan Refinery; a 20,000 barrels per day pyrolysis gasoline and hydro-desulfurization unit at the Dalin Refinery by 2009; and a 40,000 barrels per day diesel hydro-desulfurization unit at the Dalin Refinery by 2010. Furthermore, in 2011, a 18,000 barrels per day pyrolysis gasoline unit was moved from the Kaohsiung Refinery to the Dalin plant.

CPC began increasing its heavy oil conversion rate with the construction of an RFCC unit with a capacity of a 80,000 barrels per day at the Dalin Refinery. CPC also completed its testing and began volume production in 2013. CPC completed testing of the alkylation plant with a capacity of 14,000 barrels per day and began volume production in mid-2013; its operation has increased the value of our product and improved gasoline quality. In addition, to cope with the problem of acidic gas generated in the production process and to reduce the emission of the pollutant, CPC invested in the construction of a sulfur plant with a daily output of 250 tons, which started to produce qualified sulfur products at the end of June 2014.

In addition, the No. 3 Hydro-desulfurization Unit at the Dalin Refinery was expanded to increase its high-sulfur crude refining capacity, lowering the cost of crude oil procurement and stabilizing the quality of the RFCC-unit's feedstock. The revamped unit began operation in March 2017, which increased the production to 40,000 barrels per day.

To cope with the consequences of the Kaohsiung Refinery closure, the Dalin plant's capacity was expanded to include a 150,000 barrels per day atmospheric crude oil distillation unit (CDU); a 50,000 barrels per day condensate fractionating unit (CFU); a 40,000 barrels per day diesel hydro-desulfurization (DHDS); unit and a 30,000 barrels per day kerosene hydro-desulfurization (KHDS) unit. These units completed performance testing and began mass production in 2018, in so doing eliminating worries of the raw materials shortages (due to the closure of the Kaohsiung Refinery) needed for the future survival and development of Taiwan's petrochemical industry. With the completion of that expansion project, the capacity of the Dalin Refinery was boosted from 300,000 barrels per day to 400,000 barrels per day at present, raising CPC's overall daily crude oil refining capacity to 600,000 barrels per day.



To improve the refining configuration of Dalin Refinery, meet the standards of marine fuel oil for IMO 2020, the increasingly strict requirements imposed by domestic environment regulations for emissions of air pollutants, and to strengthen its competitiveness in asphalt market, CPC plans to construct a vacuum distillation unit (VDU) and a solvent deasphalting (SDA) unit at Dalin Refinery, along with Polymer-Modified Asphalt and asphalt cutback production facilities, asphalt storage facilities, an asphalt blending system, and a revamping of the No.9 diesel hydrodesulfurization unit and associated equipment. CPC aims to increase its competitiveness in domestically and overseas by these efforts.

Reduction of benzene in gasoline to meet regulatory requirements

With the awareness of the need for environmental protection and concerns over air pollution, the Environment Protection Administration (EPA) has enforced stricter standards for automobile gasoline. Since July 1, 2020, benzene levels in petroleum have gradually been reduced from 1.0 vol. % to 0.9 vol. %. The EPA plans to reduce benzene to less than 0.8 vol. % in future. In response to energy transition and the regulatory limits for benzene content of gasoline, CPC first invested in the project to create a 0.3 wt. % ultra-low sulfur fuel oil and asphalt cutback production center. In 2020, CPC produced an investment plan for the production of gasoline with a reduced benzene content and high quality products. The company will build a unit to extract aromatics content from pyrolysis gasoline with capacity of 32,000 barrels per day (including an aromatization unit) and its accessory equipment, including storage tanks and utility systems, in order to make its gasoline products comply with regulatory requirements and increase CPC's competitiveness in domestically and overseas.

The UN Climate Change Conference (COP26) held in 2021 urged governments to aggressively accelerate their actions toward the goal of energy conservation and carbon reduction. The official and private departments in Taiwan have also continued promoting the carbon emission reduction policies and investments in renewable energy. To respond to the call for a reduction in carbon emissions, CPC has planned to set up a carbon capture demonstration unit in Dalin Refinery. By doing so, CPC will reduce carbon emissions and make real progress in environmental protection.





CPC in Petrochemicals

CPC's major petrochemical production facilities are its Linyuan Petrochemical Plant run by the Petrochemical Business Division as well as the Taoyuan and Dalin refineries operating under its Refining Business Division. The RFCC units in the two refineries at Dalin and Taoyuan produce propylene products, while the naphtha crackers and butadiene extraction units at the Linyuan Petrochemical Plant produce ethylene, propylene and butadiene products. Aromatics extraction units produce benzene, toluene and mixed xylene. Currently, CPC's annual production capacities for basic petrochemical raw materials are 1.07 million metric tons of ethylene, 1.194 million tons of propylene, 158 thousand metric tons (KTA) of butadiene, 274 KTA of benzene, 321 KTA of toluene and 507 KTA of mixed xylene.

As a pioneer of the upstream petrochemical business in Taiwan, CPC has continued to invest in a variety of upstream petrochemical businesses to drive the development of domestic petrochemical industry, which has contributed to the economic miracle of Taiwan. In recent years, it has been dedicated to equipment upgrade and capacity expansion in order to reduce the shortage of petrochemical raw materials supply. Starting in 2005, CPC implemented the "New No. 3 Naphtha Cracker" project at the Linyuan Petrochemical Complex, with a total investment of over NT\$40 billion. This new No. 3 Naphtha Cracker started to produce ethylene that meets specific standards in 2013 with an ethylene capacity of 720 KTA, propylene capacity of 370 KTA and butadiene capacity of 100 KTA. It is a supplier of petrochemical raw materials to both downstream businesses in Linyuan Industrial Park, and businesses in Renda Industrial Park, whose supply was originally provided by the No.5 Naphtha Cracker, creating economic benefits that are worth around NT\$ 100 billion per year. CPC plans to evaluate the expansion of petrochemical production capacity based on market demand, so as to fully supply basic raw materials for downstream players.

Refining-petrochemicals integration with low-carbon transformation

In response to the growth of global electric vehicles market and support government's energy transition policy, CPC has conducted integration of its refining and petrochemical businesses, and it has reduced its production of gasoline and diesel and has produced more chemicals. In addition, CPC has reduced the severity of pollution from its plants, decreased the energy consumption of its operations and it has strengthened safety at its facilities, through the supply of raw materials among different business units, and its plan to create a synergy of its resources and public facilities through high-degree integration. In addition, the implementation of carbon capture, utilization and storage technology (CCUS) is under evaluation to establish a low-carbon operation field.

Towards high value materials in line with policy

In the face of the challenges posed by climate change and depletion of natural resources, CPC actively complies with the government's "Circular Economy" Policy by turning petrochemical by-products used as fuel or previously regarded as industrial waste into value-added products.

For example, the utilization of the heavy oil from naphtha cracker for soft-carbon material production to supply the lithium battery industry, and the purification of Dicyclopentadiene (DCPD) from pyrolysis gasoline for wind turbine blade production.

CPC aims to create benefits for both economic development and environmental protection by adhering to the principles of sustainable operations, which is also an important element in its efforts to surmount the challenge of industrial transformation.

Marketing CPC Petroleum Products

CPC's marketing of refined petroleum products in its domestic market is primarily focused on the transportation sector—specifically the gasoline, diesel, fuel oil and aviation fuel. In 2021, its sales of those products in Taiwan totaled 16.74 million kiloliters in volume and generated revenue of approximately NT\$ 351.8 billion. Automotive gasoline accounted for the largest share at approximately 53.6%, followed by diesel at about 27.9%, fuel oil at about 12.7% and aviation fuel at around 5.8%.

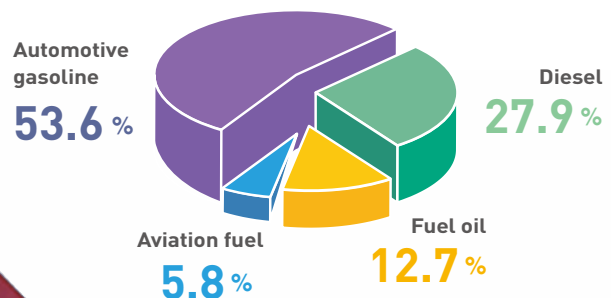
Taiwan's internal market for refined petroleum products is divided chiefly between CPC and the Formosa Plastics Group and competition between the two continues to grow increasingly intense. CPC has worked hard at leveraging the advantage of its marketing network, and to protect its market share, by consolidating its gas station network. Of the 2,512 sites operating in Taiwan at the end of 2021, 623 were directly run by CPC and other parties, and 1,292 were privately-owned by CPC franchisees, adding up to a total of 1,915 sites. Their sales as a part of the total market volume breaks down as 79.4% gasoline, 77.2% diesel, 95.7% fuel oil and 59.1% aviation fuel, with the overall market share being 78.8%.

Storage and transportation network meets the requirements of all areas

In terms of storage and transportation, CPC not only runs its own gas stations, but also operates aviation fueling stations at all of Taiwan's airports: Songshan, Taoyuan, Kaohsiung, Taichung, Hualien, Taitung, Kinmen, and Penghu. Around the coast, it has marine bunkering stations for international vessels at Keelung, Suao, Taichung, Kaohsiung, and Hualien ports.

As of the end of 2021, CPC operated 14 product distribution centers located country-wide at Keelung, Shimen, Hsinchu, Taichung, Taichung Harbor, Wangtian, Minxiang, Tainan, Fengde, Qiaotou, Suao, Hualien, Huxi, Kinmen and Matsu. They supplied products to gas stations in their surrounding areas with a total of 17,716,000 kiloliters of product over the course of the year. CPC has three chemical analysis centers/petroleum laboratories in Keelung, Taichung and Kaohsiung, plus six testing laboratories, which are in charge of testing products for quality control, and altogether these handled 28,994 samples in 2021. The transportation department transported 11,566,000 kiloliters of oil in 2021, and the total distance covered was 39,783,000 kilometers.

Proportion of each oil product/sales revenue





Integrated operation Mobile payment convenience

In terms of gas station operation, CPC is unquestionably the market leader by virtue of offering the consumers superior-quality services across the board differentiating it from its competitors. The company further leverages its service advantage by implementing total customer experience management by having created and maintained a culture of hygiene of lavatories, vigorously promoting VIP membership cards, introducing new business lines and services in line with contemporary trends, and reinforcing customer relationship management. CPC has taken the lead in offering card-based self-service refueling as a means of lowering operating costs and working around the difficulty of recruiting filling station attendants. At the same time, as promoting a multi-service business model featuring a diversity of offerings, the company has boosted non-operating income by strengthening cross-industry alliances.

Because of the popularity of mobile payments, CPC introduced and promoted contactless payment (Near-field Communications, NFC) in June 2018. With a view to optimizing the mobile payment program, CPC's own payment tool, CPC Pay, was released on November 12, 2019. It can be considered to be a pioneer of an app exclusively designed for making mobile payments at gas stations. CPC Pay combines diverse functions, such as payment, membership services, special offers, and vehicle-related services. Users can access a variety of information efficiently using CPC Pay, and the brand value of CPC and the loyalty of consumers have enormously improved.

In order to provide customers with a variety of ways to pay, since July 15, 2020 CPC gas station customers are able to use six third-party payment services for e-payment transactions at the full-service areas: Line Pay, Line Pay Money, Pi Mobile Wallet, JKOPay, O'Pay, GAMA PAY. Furthermore, complying with the government's policy, CPC has newly added Taiwan Pay mobile payment services (restricted to debit cards and bank accounts) since March 31, 2021. CPC provides a more convenient petrol-filling service to its customers with wireless barcode readers, which allows customers to accomplish the payment without leaving their cars.

In order to improve the user experience of CPC Pay, customers have been able to add VISA/MasterCard/JCB credit cards to their CPC Pay since December 29, 2020. CPC has continued to optimize the CPC Pay functions and it has launched promotional campaigns that feature its use in order to increase customers' willingness and in turn forge a brand identity to its customers.

Diverse services bring record high performance

The multi-service business model for gas stations comprises the provision of car-washing, quick maintenance, CUP&GO coffee, on-site convenience stores, and the sale of superior-quality products. In response to the green energy policy, we are actively developing charging and swapping stations for electric vehicles. Currently, 774 stations have been built, and more stations are planned to be built in 2022. As of 2021, there are 273 stations offering car washing services, 67 stations offering quick maintenance services, and 61 stations selling CUP&GO coffee. In 2021, the gross profit of the diversification business exceeded NT\$1.29 billion with, Kuo-Kuang scooters, and intake valve cleaners for cars and diesel vehicles, and other vehicles selling more than two million bottles, and the sales of eco-friendly laundry detergent and dishwashing detergent reached 700,000 bottles and 270,000 bottles respectively. Mid-Autumn Festival moon cake gift boxes set a sales record of 134,000 boxes, and more than 580,000 cups of CUP&GO coffee was sold. This fully demonstrates the channel value of gas stations, and diversified services have been recognized by customers.

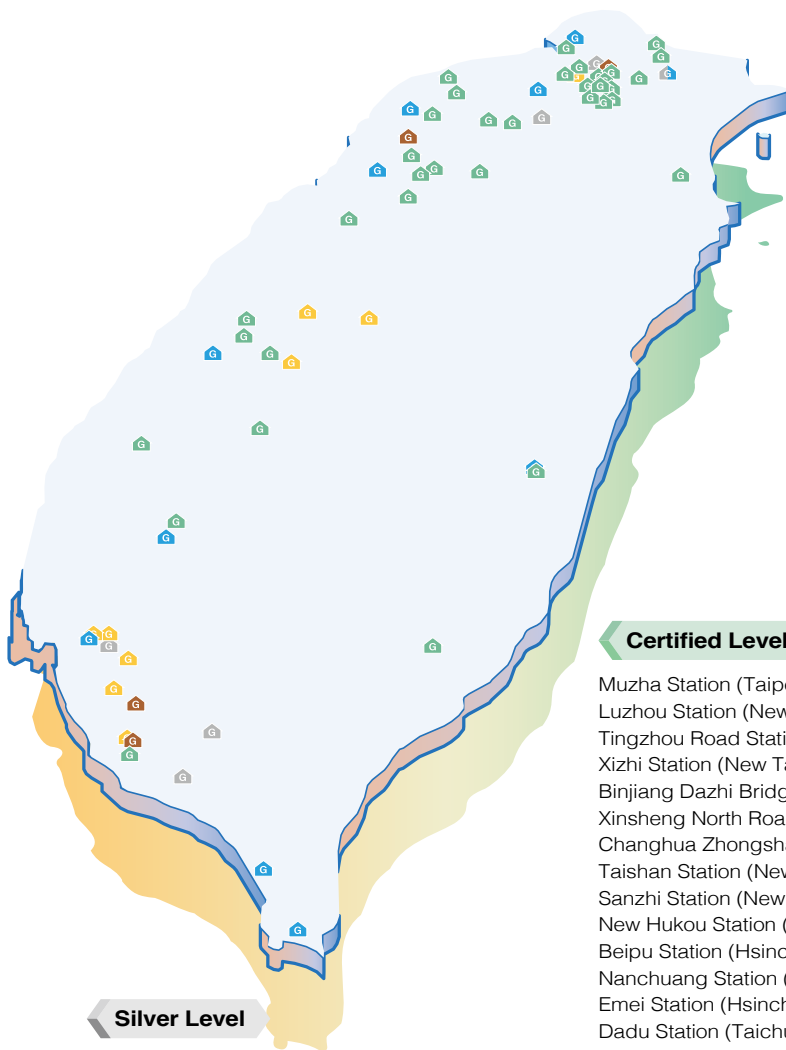
In regard to customer service, in 2000, CPC set up the 0800-036-188 customer hotline to coordinate the handling and response of customer issues, after the integration of a variety of professional services provided by different internal units. The 1912 CPC service hotline came into use in 2011, an English-language service was added in 2020, and a Taiwanese-language service in 2021, expanding the company's window for communication with the public.



Green gas stations Environmental inclusion and mutual benefit

The global trend towards environmental protection means there is now an emphasis on constructing buildings in a way that is sustainable. Various terms “ecological buildings” in Japan, “eco-buildings” or “sustainable buildings” in Europe, and “green buildings” in the USA and Taiwan, they all aim to protect ecological systems, encourage a mutually beneficial relationship between the structures and the environment, conserve energy and reduce both pollution and overall environmental impact. These sustainable design and green concepts align with CPC’s dedication to achieving sustainability in its operations. CPC launched a program to green its gas stations in 2013. As of December 2021, 67 gas stations had received “green building” certification.

Location Of CPC Gas Stations With ‘Green Building’ Certification



Diamond Level

- Badu Gas Station (Keelung City)
- Guishan Station (Taoyuan City)
- Xin Zhuangzi Station (Hsinchu County)
- Kenting Station (Pingtung County)
- Fengang Station (Pingtung County)
- Matai'an Station (Hualien County)
- Houbi Station (Tainan City)
- Guangzhou Station (Tainan City)
- Ziqiang Road Station (Miaoli County)
- Danhai New Town Station (New Taipei City)
- Puyan Station (Changhua County)

Gold Level

- Guiren High Speed Rail Station (Tainan City)
- Heping Station (Taichung City)
- Wugu Industrial Park Station (New Taipei City)
- Dongshan Road Station (Taichung City)
- Yunhe South Road Station (Kaohsiung City)
- Qianfeng Station (Tainan City)
- Yongan Station (Kaohsiung City)
- Anping Fort Station (Tainan City)
- Tsaotun XinFeng Station (Nantou County)

Certified Level

- Muzha Station (Taipei City)
- Luzhou Station (New Taipei City)
- Tingzhou Road Station (Taipei City)
- Xizhi Station (New Taipei City)
- Binjiang Dazhi Bridge Station (Taipei City)
- Xinsheng North Road Station (Taipei City)
- Changhua Zhongshan Road Station, (Changhua County)
- Taishan Station (New Taipei City)
- Sanzhi Station (New Taipei City)
- New Hukou Station (Hsinchu County)
- Beipu Station (Hsinchu County)
- Nanchuang Station (Miaoli County)
- Emei Station (Hsinchu County)
- Dadu Station (Taichung City)
- Fenyuan Station (Changhua County)
- Jhonghe Station (New Taipei City)
- Huanhe South Road Station (Taipei City)
- Jhonglun Station (Taipei City)
- Guanyinsanhe Station (Taoyuan City)
- Dasi Station (Taoyuan City)
- Jianlong Station (Taoyuan City)
- Guangfu Station (Hualien County)
- Linnei Station (Yunlin County)
- Jhuangwei Station (Yilan County)
- Yunlin Dongshih Station (Yunlin County)
- Bali Station (New Taipei City)
- Qian zhen Station (Kaohsiung City)

- Da Feng Station (New Taipei City)
- Gongguan Station (Miaoli County)
- Fuyang Street Station (Taipei City)
- Wangli Station (New Taipei City)
- Dawulun Station (Keelung City)
- Xinwu Station (Taoyuan City)
- Kwanshang Station (Taitung County)
- NanJing Station (Jiayi County)
- Jianshi Station (Hsinchu County)
- Baoshan Station (Hsinchu County)

Silver Level

- Bailing 4th Road Station (Taipei City)
- Badu Gas Station (Keelung City)
- Tai Po Station (New Taipei City)
- Shinyuan Station (Pingtung County)
- Shengchang Road Station (Tainan City)
- Changzhi Station (PingTung County)

Bronze Level

- Dazhi Station (Taipei City)
- Qiaotou Station (Kaohsiung City)
- Zhongzheng 3rd Road Station (Kaohsiung City)
- Minhua Station (Hsinchu City)

Natural Gas Supply

CPC promotes natural gas as the fuel of the future, in keeping with Taiwan's policy aim of energy diversification. It is based on its inherent advantages in terms of high thermal efficiency, low pollution profile, and convenience that allows for safe handling. A new era of clean energy for Taiwan was ushered in with the completion of the country's first LNG receiving terminal in Kaohsiung's Yongan District in 1990, and a second-phase expansion project was completed in December 1996, boosting the capacity to 4.5 million tons annually; A third-phase expansion project to satisfy demand from independent power producers (IPP) as well as consumer and industrial end-users in northern Taiwan commenced in July 1996. In addition to terminal-area expansion, this involved laying a 36-inch diameter, 238 km long undersea pipeline from the Yongan plant to Tongxiao. Its completion in December 2002 expanded CPC's annual LNG handling capacity to 7.44 million tons.

Increasing handling capacity to meet requirements

With the primary purpose of supplying natural gas to the Taiwan Power Company (Taipower), industrial firms and household users in central and northern Taiwan, CPC built a LNG receiving terminal sited close to Taichung's Port West Pier 13 and the hinterland, with capacity of three million tons; three LNG storage tanks each of 160,000 kiloliter capacity; gasification and gas supply facilities; and a 135-kilometer, 36-inch sea long-distance gas transportation pipeline from Taichung Harbor through the Tongxiao distribution center to the Datan metering plant. This plan was launched on July 13, 2009. The recently-completed Taichung LNG Terminal Phase II Investment Project calls for the construction of three additional 160,000 kiloliter above-ground storage tanks, plus another gasification facility at the terminal itself; a 26-inch, 21.8 km terrestrial gas pipeline between the terminal and the Wuxi Separation Station; and a further switching station linked to the existing 26-inch pipeline at the Wuxi site. The project will boost the annual LNG handling capacity of the Taichung terminal to over six million tons and ensure a stable, dependable supply of natural gas during the winter's often inclement monsoon period, as well as—and partly because of—greater storage capacity in terms of the number of days' supply of LNG on hand.



Currently, Taiwan government policies to phase out nuclear power plants and to reduce greenhouse gas emissions mandate 50% of Taiwan's total electricity to come from natural gas by 2025. To help reach this target, CPC will lease Wharves 11 and 12 and their associated facilities from the Port of Taichung to create the Taichung LNG Terminal's second dedicated LNG-unloading wharf. Execution of its Phase III expansion module will add two 180,000 kiloliter above-ground storage tanks and their associated gasification plant. These projects are expected to improve the unloading energy and gas supply stability upon completion.

In order to comply with the "Capacity of Self-provided Storage Tanks for Natural Gas Production or Import Enterprises" revised on August 27, 2019, and the requirements to increase the number of storage tank capacity days and business inventory days year-on-year, CPC will continue with the Taichung Receiving Terminal New Pier & Terminal Expansion exterior Taichung Harbor Investment Project (which will add four above-ground full-capacity 180,000 kiloliter LNG storage tanks, gasification facilities, and two LNG-unloading wharves and other related facilities). After completion of the land reclamation of the North Reclamation Area (III) and the South Reclamation Area (IV)-2, the Nanti Rd.-crossing pipelines will connect to the existing plant area to support each other. It is expected that after the completion at the end of 2028, the overall equipment utilization rate can be reduced and the gas supply stability and safety can be improved.

CPC has constructed an extensive natural gas transmission and distribution system on Taiwan's western side. It comprises approximately 2,221 kilometers of terrestrial trunk pipeline, extending from Pingtung in the south to Keelung in the north; and which includes eight supply centers, one transfer center and 50 distribution stations along its length. Current plans are centered on the goal of constructing interlocking ring-shaped networks to produce a figure-of-eight configuration. This will involve laying down a 238-kilometer undersea pipeline from the Yongan LNG Terminal to Tongxiao and a 500-kilometer terrestrial pipeline onwards from Yongan to Taoyuan. In addition, after the 36-inch undersea gas pipeline from the Taichung LNG plant to Datan power station has come on stream, it will be linked with terrestrial pipelines in central and northern Taiwan to form another circular formation, thus completing the planned island-wide, integrated figure-of-eight natural gas transmission network.



Natural gas transmission and distribution system comprised of

2,221 kilometers of terrestrial trunk pipeline



Total domestic sales of natural gas in 2021 was

25.56 billion cubic meters





Gas supply by area increases system security

In compliance with government policies to phase out nuclear power plants and to create an environmentally-friendly, low-carbon environment, CPC plans to set up three gas-fired generating units at Datan Power Station. To generate abundant energy for Datan Power Station, the commodity sectors in the north and other customers of the power station, CPC plans to set up a third LNG terminal in Kuantang Industrial Centre, comprising reception facilities which can hold up to three million metric tons of import quantum, two LNG storage tanks each of 160,000 kiloliter capacity; gasification and gas supply facilities to connect with the existing gas supply system.

CPC's Third LNG Receiving Terminal project got under way in 2016 and is currently scheduled to come on stream in June 2025. In the future, with the three terminals-one each in northern, central and southern Taiwan-supplying natural gas to users in their respective areas, there should be some reduction in the cost and risk of transmitting gas over long distances. The figure-of-eight combined undersea and terrestrial gas pipeline network will enhance both the safety and stability of gas supply through its transfer and backup functions. The completion of this third LNG receiving terminal project will enable CPC to construct and operate a national level natural gas supply system that is fully functional, stable and safe.

Towards net zero, introducing carbon neutral LNG

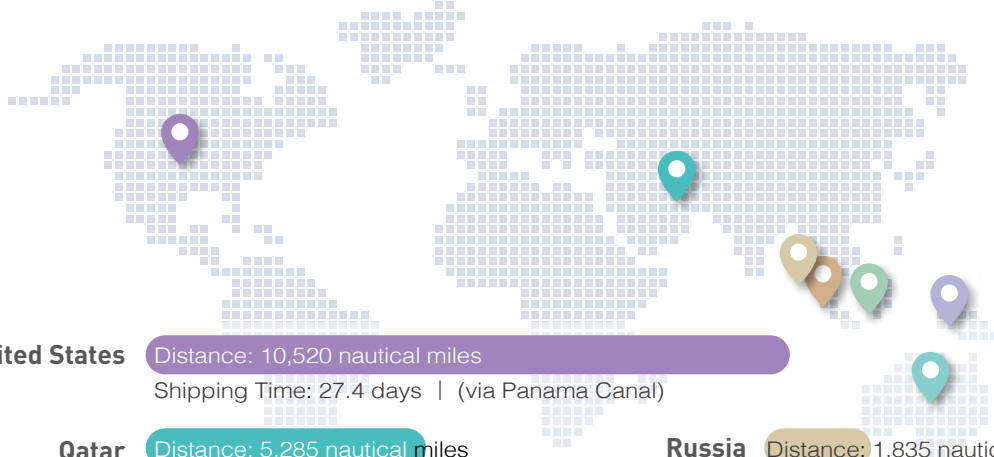
As a first step toward energy transition and net zero, CPC received its first carbon neutral LNG cargo in 2020. To ensure the credibility of the net zero products, high quality nature-based carbon credits have been used to offset the overall greenhouse gas (GHG) emissions of the relevant LNG cargo, including exploration, transmission, liquefaction, shipping, regasification, distribution and end-use. In 2021, CPC received the PAS 2060 third-party validation report, a globally recognized carbon neutrality standard. In the future, CPC will keep endeavoring in importing carbon neutral LNG, not only to reduce our carbon intensity, but also to provide a net-zero solution for our customers in Taiwan.

Global strategy for a stable gas supply

CPC has devoted considerable efforts diversifying its sources of LNG imports to ensure a stable supply of natural gas for Taiwan. The source of LNG imports is all over the world, including the Middle East, the Asia-Pacific region, Russia, Australia, North America, Central and South America, Africa and Europe.

In addition to mid to long-term LNG procurement contracts, CPC acquires additional supplies through short-term/spot transactions to achieve the security and diversification of gas supply in Taiwan. In 2021, CPC imported most of its LNG from Qatar, Papua New Guinea, Australia, the United States and Russia.

CPC's LNG sources Global distribution



The United States Distance: 10,520 nautical miles
Shipping Time: 27.4 days | (via Panama Canal)

Qatar Distance: 5,285 nautical miles
Shipping Time: 13 days

Russia Distance: 1,835 nautical miles
Shipping Time: 6 days

Papua New Guinea Distance: 2,835 nautical miles
Shipping Time: 7.4 days

Indonesia Distance: 1,470 nautical miles
Shipping Time: 3.8 days

Australia Distance: 2,275 nautical miles
Shipping Time: 5.9-7 days

Malaysia Distance: 1,345 nautical miles
Shipping Time: 3.5 days





Other Products

Liquefied petroleum gas—taking advantage of our strengths and accomplishing the mission of stable supply

CPC's long-standing monopoly in the LPG market was broken when the government opened it up to competition in 1999. Formosa Petrochemical Corp. began competing with CPC as a producer and importer. In response to market competition, CPC has maintained its leading market share in the household gas market by making full use of its quality advantages, north-south transport, storage systems, comprehensive marketing, retail network, full grasp of international market price fluctuations and reductions in procurement costs. In selling industrial gas, the company aims to raise the quality of its customer service and to promote the value of its products so as to both retain existing customers and win new ones.

As a state-owned enterprise, CPC undertook its mission of implementing LPG price levels set by government when there were price hikes during the COVID-19 pandemic in 2021, in order to reduce their impact to domestic industry and economy. Meanwhile, CPC has complied with the government's LPG safety reserve policy to increase storage tank turnover rate and revenue. At the same time, it endeavors to reinforce both occupational safety and environmental protection protocols as part of its mission to stabilize LPG supply in the domestic market and deliver operational performance.

CPC LUBRICANTS: expanding business territory and multiple international certifications

CPC's Lubricants Business Division (LBD) was founded on March 16, 1999. CPC is now the leader in Taiwan's lubricants market with two brands: CPCLUBE ("a brand with mission"), Mirage ("professional automotive lubricants") and it sells its products to both domestic and overseas consumers. In terms of the domestic market, the LBD now has over 30 distributors and sells its products at over 600 domestic gas stations directly operated by CPC and leading hypermarket chains, providing comprehensive, convenient and diversified after-sales support.

In addition to cultivating its domestic market, the LBD is also vigorously expanding in the Asia-Pacific region: China, Philippines, Indonesia, Vietnam, Myanmar, India, Thailand, Australia, Congo and Surinam all have distribution outlets and direct customers. To circumvent the ASEAN tariff barrier to non-members, CPC has worked with a domestic warehousing company to set up Maxihub Corporation in Vietnam's Tong-Nai Province as a joint-venture. This company will specifically operate facilities for receiving and warehousing of petrochemicals, and lubricant blending, and it is projected to begin operating in 2022.

With the gradual rise of electric vehicles and the shrinking of the automotive lubricants market, marine engine oil has become an important direction of future development for LBD. In the past few years, the certification team has obtained over 60 important international certifications, including MAN ES, WinGD, Wartsila, YANMAR, J-EN, MTU, Bosch Rexroth, Parker Denison, etc. In 2019, 2020, and 2021, CPC's lubricant products were not only awarded the National Brand Yushan Award for Best Product, but they also won the Reader's Digest "Reputable Brand" gold award in the lubricant category for three consecutive years. It shows that LBD is seen as a trustworthy brand by the general public.



SOLVENTS & CHEMICALS: breaking into the international market and the development of green products

CPC created its Solvent and Chemical Business Division in April, 1999. It mainly produces petroleum solvents, additives for refinery processes, and a variety of products in small packages at the Chiayi plant. The Division outsources the production of specialty coatings to a producer in Kaohsiung. In terms of sales, its four major product lines include asphalt, solvents, chemicals, additives and coating for storage tanks, pipeline equipment.

The asphalt products the Division produces are of high-quality, have a good reputation, and are mainly used for domestic pavement projects. In 2021, it took about 55% domestic market share. In response to climate change, the Division has continued to produce Polymer-Modified Asphalt that can adapt to high temperatures and wet weather, and it has invested in new asphalt storage tanks in recent years, in order to further enhance its asphalt production and storage system and improve domestic road quality.

Solvents produced by the Division include Aliphatic Hydrocarbon solvents, aromatics solvents, toluene, mixed xylene and a variety of products in small packages. Thanks to its sound development capabilities and technologies, complete transport and storage system, and the quality of its premium products, the Division had about 60% market share in 2021. It is the market leader in the domestic petroleum solvents industry.

Chemicals produced by the Division include normal paraffin, octene dimate, methanol, etc. In particular, its normal paraffin has not only been sold to domestic detergent producers as a raw material, but it has also been exported to China, India, the U.S and some European countries during the COVID-19 pandemic, successfully expanding its business territory by satisfying the needs of different international customers with adjustments to the product ingredients.

In order to meet processing needs and occupational safety and environmental regulations, CPC has developed its own additives and specialty coatings to meet the maintenance and operational needs of its refineries, in order to reduce the operating processing risks. In 2019 and 2020, CPC's intake-system cleaners and fluorinated paint won the National Brand Yushan Award for Best Product.

CPC has actively integrated the sales channels of its specialty chemicals and solvent products, refined its services to improve its product quality and image, and has committed itself to the development of new green products and new business in the pursuit of sustainable development, in line with the international community's continuing push for carbon-reduction.



2022

Industrial safety & health

Pursuing Environmental Sustainability With Health and Safety First





Industrial safety & health

Petroleum products and natural gas are highly flammable substances. In handling them, CPC places heavy emphasis on industrial and health safety, as well as on fire prevention, in order to maintain continuity in operations, and prevent harm to employees, local communities and the properties of local people. Apart from compliance with Taiwan's relevant laws and regulations, CPC has also drafted – and strictly enforces – its own safety and loss prevention protocols by reference to those of advanced countries in Europe, USA and Japan. Such protocols have been suitably adapted to reflect local conditions and operational characteristics.

Enhancing occupational safety management with risk control as priority

Industrial safety is the key for the continued sustainable future of CPC. To achieve the goal of 100% industrial safety, with no accidents at all, CPC has constantly and actively strengthened its safety culture through the implementation of a policy based on safety disciplines, “All staff safety awareness, Risk management and Health care.” CPC's industrial safety performance has been recognized by wider society; it has also often been a recipient of the annual Excellence in Organizational and Personnel Promotion of Occupational Safety and Health awards from Taiwan's Ministry of Labor.

The company has continued to raise awareness of issues to both its employees and external vendors in the interest of creating a safe and comfortable working environment through a collective effort. In line with its emphasis on a culture of industrial safety, CPC is putting particular effort to focus on the following points:

- Implementation of the Taiwan Occupational Safety and Health Management System (TOSHMS) and continuous improvement with respect to its operational environment. CPC received ISO45001 reversion verification, aligning with international norms. To reinforce industrial safety practice mandates, CPC has established inspection and auditing teams to go onto construction sites for non-scheduled on-site inspection and auditing, and set out the “Management procedures for safety and health of contractors” and “Guidance on safe work permit.” CPC has also established contractor evaluation system in order to urge the implementation of self-management and reduce occupational accidents among their employees on CPC sites.
- In conjunction with the implementation of occupational safety laws, CPC conducts periodic reviews of industrial safety and health rules, as well as continuously reviewing and revising standard operating procedures.
- CPC is strengthening industrial health management protocols, scheduling regular employee health checkups, analyzing and tracking those health checkup results, promoting a healthy lifestyle and emphasizing the importance of employees' mental health.
- CPC is implementing a risk management and process safety management (PSM) and establishing equipment safety management processes—periodic, regular thorough inspection of oil tanks and pipelines and the installation of monitors and leak detection systems along their extended sections.
- CPC is strengthening fire prevention and response capabilities, organizing local joint emergency response teams, ensuring that the personnel, facilities and emergency response and rescue gear used by all units are mutually supportive in application, so as to minimize losses due to fire and other disasters.
- CPC is implementing on-site safety inspections with graded results, continuously improving systems, equipment and implementation through observation of their preparedness, and raising awareness of the importance of industrial safety disciplines.
- Empowering industrial safety inspections team with senior managers using “management by walking around”, professional industrial safety inspections, pre-operational industrial safety inspections of new and renovated workplaces, and tracking all deficiencies discovered through the information system until remedial improvements have been completed.
- Planning and executing health and safety training and awareness programs, developing and providing online study courses and establishing an industrial safety test-question database, as well as compiling and publishing industrial accident case study-based teaching materials.
- Based on classifying the identified emergencies, developing a plan for various emergency response drills and regularly conducting emergency simulations to strengthen contingency and disaster prevention capacity. In 2021, CPC held a total of 344 disaster prevention drills, including five no-warning emergency response drills and four large-scale emergency drills.

Continuing improvement to increase safety effectiveness

In 2021, CPC has investigated and analyzed all workplace incidents and accidents to find the root cause, drawn up action plans, improvement plans and scheduled follow-ups. The action plans and improvement plans are as follows:

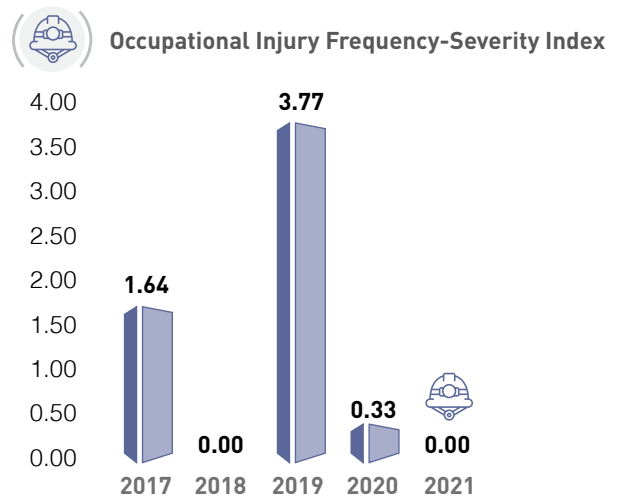
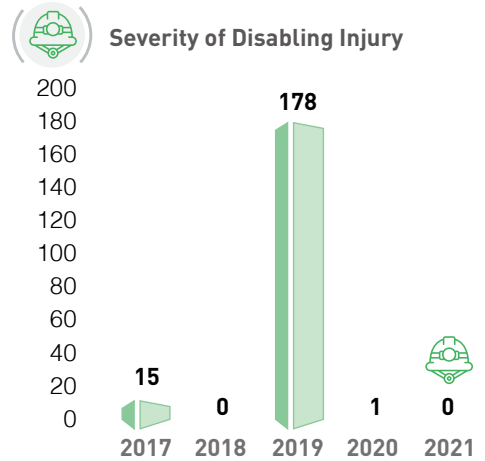
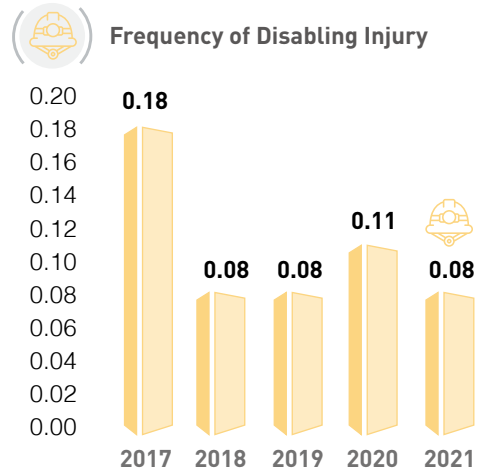
Action plans

- Implementing PSM in CPC: There were five key facilities establishing PSM in Linyuan, Dalin, Taoyan, Yongan and Taichung separately as the first step. The next step is to carry out all-round implementation to all manufacturing units in CPC.
- E-management: CPC has introduced the use of digital platforms, which allows construction workers to provide work permits and allow inspectors to confirm the tasks by computer, mobile phone or tablet, in order to work efficiently and safety.
- Enhancement of training for contractors: we have enhanced safety and technical training for contractors on high-risk operations, including three-in-one scaffold safety training, equipment dismantling training, and aerial work platform safety training. Only qualified contractors who have completed the training can start their work in CPC.

Improvement plans

- Enhancement of training for contractor supervisors: CPC provides training to contract supervisors in northern, central and southern of Taiwan, and improves their professional knowledge and capabilities about recognizing hazards and risks.
- Procurement control: CPC has strengthened its review of job description documents for procurement activities to contractors, urging contractors to conduct self-management.
- Utilization of AI technology: CPC has utilized technology tools to improve its contractor management performance. For example, CPC has integrated its access control measures for its contractors, carried out inspections for operational safety purposes, and installed a CCTV system to continuously supervise at-risk behaviors or site safety.

CPC's occupational accident statistics for the past five years



Pollution Prevention and Environmental Protection

In order to fulfill its corporate responsibility, CPC has long been dedicated to a variety of environmental protection efforts, including the improving: wastewater disposal; air pollution; waste treatment, and soil and groundwater contamination; the implementation of environmental protection policies; the active prevention of pollution; strengthening the control of the sources of pollution; the utilization of low pollution production processes; and the latest pollution control facilities. The best available control technology (BACT) and equipment are used to reduce pollution that may be caused by production, as well as transportation and storage processes, in its new projects.

Ecological protection and implementation of environment policies

In recent years, CPC has further deepened its commitment to ecologically beneficial measures that include improving the quality of its petroleum products, reducing energy consumption and waste, and adapting to climate change. In order to prevent pollution, energy and waste reduction, and help create a sustainable environment, CPC has invested more than NT\$50 billion in its environmental protection efforts since 1989. Since 1995, all of the Company's business units introduced the ISO 14001 standard of environmental management system. As of the end of 2021, 24 units had received official certification. In response to the global trend, CPC has deployed an environmental accounting system in 2004 to improve its environment protection performance.

In all its development projects, CPC has followed through on commitments written into the respective environmental impact assessment (EIA), introducing the appropriate environmental protection measures in response to the potential risks posed by specific development undertakings, maintaining comprehensive monitoring systems designed to protect environmental quality and biological diversity around its facilities, and achieving standards in the quality of their atmospheric emissions higher than those stipulated in current national environmental protection regulations, in order to improve its environment protection performance.

With regard to ecology preservation, CPC set up the Guantang Industrial Park (Port) Ecological Preservation Committee on November 7, 2018 for consultation and review of its environment protection efforts and achievements, with the aim of achieving the goals of marine environmental conservation and sustainable community development. In the monitoring of algal reef ecology, six stations have been set up throughout Taiwan. In 2021, the Taoyuan algal reefs coast survey results showed that there were 42 algal species in total: 20 macroalgae and 22 crustose coralline algae. The total number of algae species in the Guanxin Algae Reef is the highest, at 37 species; there are 34 algae species in the Datan Algae Reef and 25 in the Baiyu Algae Reef. Guanxin Algae Reef has the highest number of crustose coralline algae (22 species); there are 19 crustose coralline algae species at Datan algal reef and the lowest was 10 crustose coralline algae at the Baiyu algae reef.



In addition to the regular monitoring and surveying of algal reef ecology, CPC has completed habitat restoration for little terns since 2019. CPC has worked with the Wild Bird Society of Taoyuan and the Taoyuan City Government, and the reproductive success rate increased significantly from 17%-30% to 68% recently. In 2021, the reproduction success rate for little terns in Taoyuan, moreover, increased to 72%, which shows that CPC has spared no effort in ecological conservation. It also shows that cooperation with environmental protection organizations has made fruitful conservation achievements.

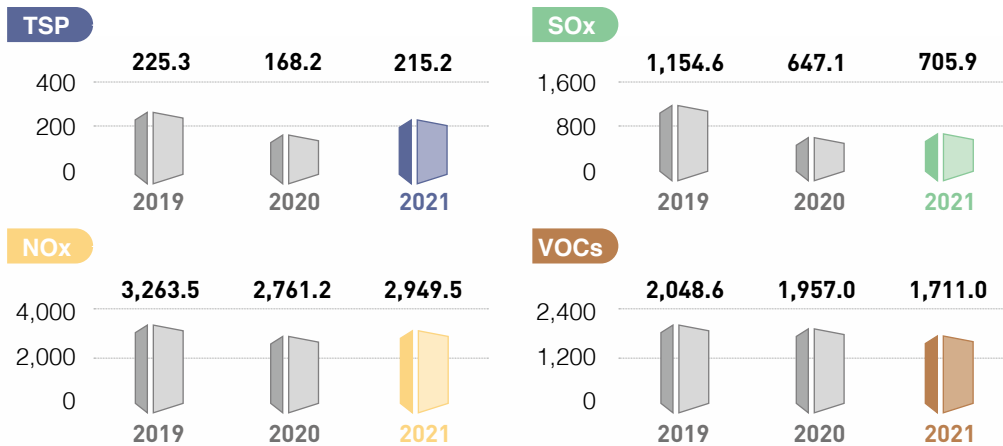
Significant reduction of greenhouse gases and carrying out climate risk assessments

Taiwan's Greenhouse Gas Reduction and Management Act was formally promulgated on July 1, 2015. CPC has set goals to reduce greenhouse gases in compliance with national policies, and it continues to monitor its emissions through the calculation of its greenhouse gas inventory. In order to achieve the national goal of long-term greenhouse emissions reduction, CPC introduced the ISO 14064-1 system in 2004 for the calculation of its greenhouse gas inventory, actively implemented its energy saving carbon emission reduction plan, and set targets and timelines for carbon emission reduction for its existing plants. CPC has also imposed reduction measures according to the plan with use of clean fuel, clean production, equipment efficiency improvement, energy saving and waste reduction, etc. In recent years, CPC has used the latest technology to effectively improve the energy efficiency of its plants. As a result, the company's reduction in greenhouse emissions from 2005 to 2020, which was verified by a third-party, was about 38.6%.

In addition, CPC has implemented electricity conservation in its offices in compliance with the guidelines on the management plan for power usage effectiveness for government agencies and schools laid down by the Executive Yuan, saving 1.5% electricity costs from 2021 from Jan. to Nov., according to the statistics of the Ministry of Economic Affairs, and achieving its annual power consumption goal. CPC's offices of monitored units had switched to all-LED lighting by September, 2020. In response to the risks from climate change, the company has participated in the climate change adaptation strategy and guidance program for the energy sector; climate risk assessments and reports of 24 plants were completed between 2018 and 2020.

Comparison of CPC's oil refinery environmental quality and the national standard

Unit: metric ton



Note 1: The increase in emissions of TSP, SOx and NOx from CPC's oil refining and the petrochemical plants in 2021 compared with 2020 is due to the increase in the number of operating days of the heavy oil cracking process in the Taoyuan Refinery and Dalin Refinery in that year, resulting in an increase in emissions.

Note 2: the emission levels of 2019 and 2020 meet the approved amounts of emission, while the emission levels of 2021 is the reported amount of emission.

Reducing air pollution and establishing environmental education facilities

CPC's air pollutants come mainly from its oil refineries and petrochemical plants. The pollutants include total suspended particulate (TSP), sulfur oxides (SOx), nitrogen oxides (NOx), volatile organic compounds (VOCs), etc. In 2020, there was a significant fall of air pollutant emissions at the company's oil refineries and petrochemical plants as their capacity decreased, which resulted in an overall drop in air pollution from the refineries and plants over the last three years. In terms of the average emission of air pollutants in the last two years, Flue Gas quality has also been better than the national standard. CPC will continue to implement a variety of measures to reduce air pollution.



Since the enactment of the Environmental Education Act in 2011, CPC has actively promoted environment-related education and similar activities, and the concepts of environmental protection and of cherishing Taiwan's natural resources. It has called on the public to come together on local ecological issues, shown concern for the development of local communities, and taken concrete actions, like park and forest adoption, supporting garbage clean-ups and marine pollution remediation, in order to leave a clean environment for future generations. In further educational developments in recent years, CPC's Taiwan Oil Field Exhibition Hall at Chuhuangkeng in Miaoli County was officially certified as an environmental education facility on August 22, 2017. It is the only educational facility for oil extraction. Another company-developed environmental education site is the CPC Kaohsiung Refinery Environmental Education Park, which was certified as the only petrochemical industry environmental educational facility on January 22, 2018.

CPC is deeply loyal to its home country and so is passionate about protecting the nation's environment. In that cause, it will strive to raise its environmental performance by deploying the latest pollution-control technology, actively introducing highly efficient processes, investing in the circular economy, waste recycling and increasing value—all in the pursuit of developing sustainability in its operations and the sharing of good health and prosperity with citizens.

Effluent* is the monthly average

Item	Year		Current National Standards Effluent	Current National Standards Ocean Effluent
	2021 Levels			
COD (ppm)	< 75		100	280
Oil (ppm)	< 4		10	20
SS (ppm)	< 23		30	100
Phenol (ppm)	<0.01		1.0	1.0

2021 Environmental Footprint

Material investment

Water Usage	32,337	Thousand kiloliters
Crude oil	21,852	Thousand kiloliters
Fuel Oil	168	Thousand kiloliters
Fuel Gas	1,618,868	Thousand cubic meters
Natural Gas	1,217,498	Thousand cubic meters
Gasoline additives (MTBE)	416	Thousand kiloliters
Purchased Electricity	2,053,482	Thousand kWh

Material emissions

Gas emissions	CO ₂	6,972,739 ^註	Tons
	NO _x	2,977	Tons
	SO _x	706	Tons
	TSP	216	Tons
	VOC	3,450	Tons
	COD	490	Tons
Waste Water	12,002	Thousand cubic meters	
Waste	134,587	Tons	

Note: the amount of CO₂ emission is 2020 figure.

Refinery/petrochemical output

Diesel	5,474	Thousand kiloliters
Fuel oil	3,079	Thousand kiloliters
Vehicle fuel	8,846	Thousand kiloliters
Jet fuel	2,153	Thousand kiloliters
Liquefied petroleum gas	361	Kilotons
Ethylene	1,132	Thousand kiloliters
Propene	979	Kilotons
Butadiene	161	Thousand kiloliters





Continued compliance with regulatory requirements for pollution remediation

Following the promulgation of the Soil and Groundwater Pollution Remediation Act by the President in 2000, Taiwan's Environmental Protection Agency (EPA) has introduced related Enforcement Rules, subsidiary legislation and related control standards for the Soil and Groundwater Pollution Remediation Act. Many CPC plant locations have been listed as sites for pollution response, pollution control or pollution remediation. CPC has proposed appropriate and respective pollution response, control and remediation plans, and the company has implemented related soil and groundwater pollution surveys and pollution remediation measures in accordance with related regulations. In 2021, CPC has one site listed for implementing response measures; 28 sites listed for pollution control; and eight sites listed for remediation. Meanwhile, remediation had been completed at 43 sites by the end of 2021.

CPC's Kaohsiung Refinery was shut down at the end of November 2015. As it was an old facility and had been in operation for many years, almost all of the soil and groundwater across its total area were classified as contaminated and in need of remediation due to pollution of different levels. CPC presented a pollution control plan to Environmental Protection Bureau of Kaohsiung City Government for its review, which the bureau approved on December 16, 2016. The overall pollution improvement period is 17 years. However, in order to speed up the revitalization of Kaohsiung Refinery land, CPC signed an administrative contract with Kaohsiung City Government on May 13, 2021, entrusting Kaohsiung City Government to remediate and complete the delisting of polluted sites.

2022

Research and Development

Research and Innovation for business transformation



Research and Development

Research and Development (R&D) has been a core value for both technological innovation and corporate sustainability for CPC. Three major institutes are responsible for R&D in their respective areas: the Exploration & Development Research Institute (EDRI) in Miaoli, the Refining & Manufacturing Research Institute (RMRI) in Chiayi and the Green Technology Research Institute (GTRI) in Kaohsiung.

The EDRI primarily focuses on the analysis of domestic and foreign geological/stratigraphic data for the evaluation of oil and gas reserves, technological development on exploration, drilling and extraction methodology, environmental monitoring, geothermal resource development and carbon sequestration. The RMRI plays a leading role in the R&D of high value-added petrochemicals, the promotion of the circular economy, pollution control, the improvement of refinery structure or configuration, and resolving on-site production problems. The GTRI is dedicated to R&D related to biofuels, renewable energy and green materials, and is responsible for pilot production on advanced projects.

CPC's expenditure on R&D in 2021 amounted to about NT\$3.666 billion. The R&D achievements are described below:

Exploration & Development Research Institute

- Re-evaluated Oryx fields' Original Oil in Place (OOIP) and reserve based on an updated reservoir structure and 3D geological models.
- Evaluated the feasibility of contract extension for Block 17 in Ecuador.
- Conducted an analysis of the petroleum system of the Roebuck Basin on the North Western Australian shelf.
- Conducted an analysis of the impact of COVID-19 on the shale oil and gas industry in North America.
- Planned a road map for carbon capture, utilization and Storage (CCUS) technological development in cooperation with the RMRI and conducted a preliminary assessment of the domestic potential carbon storage sites.
- Established casing materials screening technology for the Matsao area, in Yangmingshan, and collected information on strategies for overcoming acid geothermal fluid among different countries.
- Assisted the LNG Project & Construction Division in analyzing mud samples from Datan algal reef at the LNG Terminal Reservation Area.
- Assisted the Lubricants Business Division in investigating the soil and groundwater samples from the Longtan Oil Depot.



Refining & Manufacturing Research Institute

- Developed new production processes, including the introduction and evaluation of a new light diesel engine motor oil formulation to meet the European Automobile Manufacturers Association (ACEA) C3 5W/30 standards; the development and application of CPC amorphous soft-carbon in electric-vehicle batteries electrochemical/mechanical hybrid shear exfoliation graphene of artificial graphite; environmentally-friendly precision machinery cutting oil; the on-site application of chemical oxidation technology in Xinguang Community; the development of styrene recycling technology; the establishment of alicyclic polycarboxylate hydrogenation technology; the planning of the trial production process for refined bitumen; and the development and application of magnetic filters and packing technology.
- Completed the performance evaluation of commercial gasoline and diesel, heavy-duty diesel engine testing, gasoline and diesel fuel additive cleaning performance tests, and the promotion of natural gas heating value integration and stove specification unification standardization for environmental protection.

- Completed groundwater soil remediation and detection services in refinery polluted sites; airborne volatile organic compounds (VOC) monitoring; VOC recovery of gasoline filling exhaust; health risk assessment; and planning for special waste-liquid pretreatment and waste-water recycling to meet the environmental regulations and the requirements of environmental impact assessments.
- Continuous surveillance of the effect of stray electric currents from the Kaohsiung and Taipei MRT systems on pipelines, and assistance in diagnosing refinery boiler pipe problems in order to ensure pipeline safety.
- Successful conversion of CPC's own heavy oil through a self-developed proprietary refining process to exploit a long-life amorphous soft carbon material with the great potential to be used in the anodes of lithium ion batteries.
- Implementation and operation of Smart & Green e-station: completed the planning and construction of the "Taoyuan Jiadong Smart & Green Demo e-Station,"; deployed mobile LiFe battery storage modules for not only the verification of CPC's own soft carbon materials, but also for the potential application in emergency rescue in distress areas; conducted ongoing solar power generation and the verification of the Smart EMS (Energy Management System) at the "Chiayi Xinyi Smart & Green Demo e-Station".
- Optimized gasoline, diesel and petrochemical raw material production processes, and offered advisory services to resolve on-site problems and to enhance operational efficiency, in order to achieve energy-saving goals.
- The technology transfer of newly-formulated CPC Marilube, Guoguang brand low-alkali marine motor oil, environmentally-friendly metalworking fluid, and long-life equipment oil.
- Development of CPC Racing CVT; Mirage PRO CVTF; CPC Superpower C3/SN Fully Synthetic Motor Oil 5W/30; CPC Racing C3/SN Fully Synthetic Motor Oil 5W/30; CPC Racing MB SN Fully Synthetic Motor Oil 5W/40; and American Petroleum Institute (API) ST 0W/20 passenger car engine oil and related products.
- Improved the dielectric properties of traditional substrate resin materials to meet the requirements of high frequency/speed transmission of 5G communication and successfully entered ton-scale pilot production. The resulting novel resin material has been certified by copper clad laminate (CCL) manufacturers for subsequent downstream promotion.



- Development of bio-based and bio-degradable plastics in compliance with the national plastic restriction policy. Bio-based plastics use biomaterials as feedstocks, while bio-degradable plastics can undergo further microbial decomposition to carbon dioxide and water. For bio-degradable plastics, CPC focused on polylactic acid (PLA) in the short-term and the more-environmentally-friendly polyhydroxyalkanoates (PHAs) in the long-term, in order to reduce pollution caused by synthetic plastics. Regarding the selection of feedstocks, non-food types, such as lignocellulose, methanol or natural gas, are among CPC's priority for the mutual benefit of economic development and environmental protection.
- Development of novel biomaterials, including whitening and antimicrobial ingredients in cosmetics/ medical products, in order to break into the retail market with cosmetics made from CPC's own materials.

Green Technology Research Institute

- Established an Operations and Maintenance Center for PV Systems (OMCPVS), responsible for developing technologies for independent operation/management and the promotion of PV system installation. The OMCPVS currently ensures the stable operation of more than 230 sites installed with roof-type PV systems, with a total capacity of 11.337MW.
- Operation of Smart & Green e-station: with the integration of solar PV, fuel cell and lithium titanate (LTO) batteries, the Tainan-Qianfeng gas station was transformed into a "Smart and Green Demo e-station." By collecting local climate data and environmental information, a big data system was developed which was used to build the solar PV power forecasting model. The Hualien-Guangfu gas station is another "Smart & Green Demo e-Station," which deployed a 25kWh mobile LTO energy storage system and an energy management system (EMS) with an online inspection function of energy storage system in order to improve safety management.
- A 1200F super-capacitor (charge and discharge between 1.35V to 2.7V at 40A with a capacity retention of 80% over 20,000 cycles) was developed, and the verification of 48V super-capacitor module was carried out.
- Conducted ongoing field verification of high and low temperature fuel cells for distributed power generation, and established a monitoring system and a big data database to conduct data collection, analysis and further applications.





- Received the “18th National Innovation Award” with “The development of high-safety and fast-charging lithium titanate energy storage materials,” while the LTO demonstration plant with a thousand-ton per year scale is currently under construction. Proprietary new low-cost LTO materials have been sold to a battery company to be used in an LTO battery system as an emergency power backup in buildings.
- Completed the core technology development of electric bus battery system by using self-produced LTO materials, and successfully integrated and manufactured the first LTO electric bus and energy storage and charging system. The LTO electric bus passed the six critical performance tests through the Automotive Research & Testing Center.
- Developed a new low-carbon emission polyol-based polyurethane material for thermal insulation coatings which was then applied to the roof of oil tanks to reduce the average liquid temperature inside and roof VOC emissions, emphasizing the efficacy of practicing bio-low-carbon concept and reduction of corrosion spreading.
- Completed the automation of a batch-type pilot process for soft carbon production. The yield and capacity were both improved while also effectively suppressing particulate emission. The resulting soft carbon materials met the targeted specifications.
- Awarded with 2021 EU Seagriculture Innovation Gold Award with the topic “Cultivation of seaweeds using the cold seawater drainage from the Yongan LNG terminal to fulfill the circular economy for energy and water.” The Development of seaweed extracts can enhance the growth of Human Follicle Dermal Papilla Cells, which has great potential for the future development of scalp care products.
- Developed the biorefinery production process for 5-Hydroxymethylfurfural (5-HMF) in compliance with national restrictions on plastics, and completed the continuous trial production equipment setup at laboratory-level and solvent/catalyst testing.

Information Management

Faced with the new era of rapid informatization, digitization, and globalization, CPC is building up its overall information capability based on enterprise resource planning, customer relationship management, business intelligence, knowledge management and information communications infrastructure. It continues to integrate corporate information systems, provide real-time management information for decision-making, and expand the industry value chain by integrating physical and virtual channels. The company will move towards the goals of smart production and digital transformation and promote 5G and AIoT smart applications.

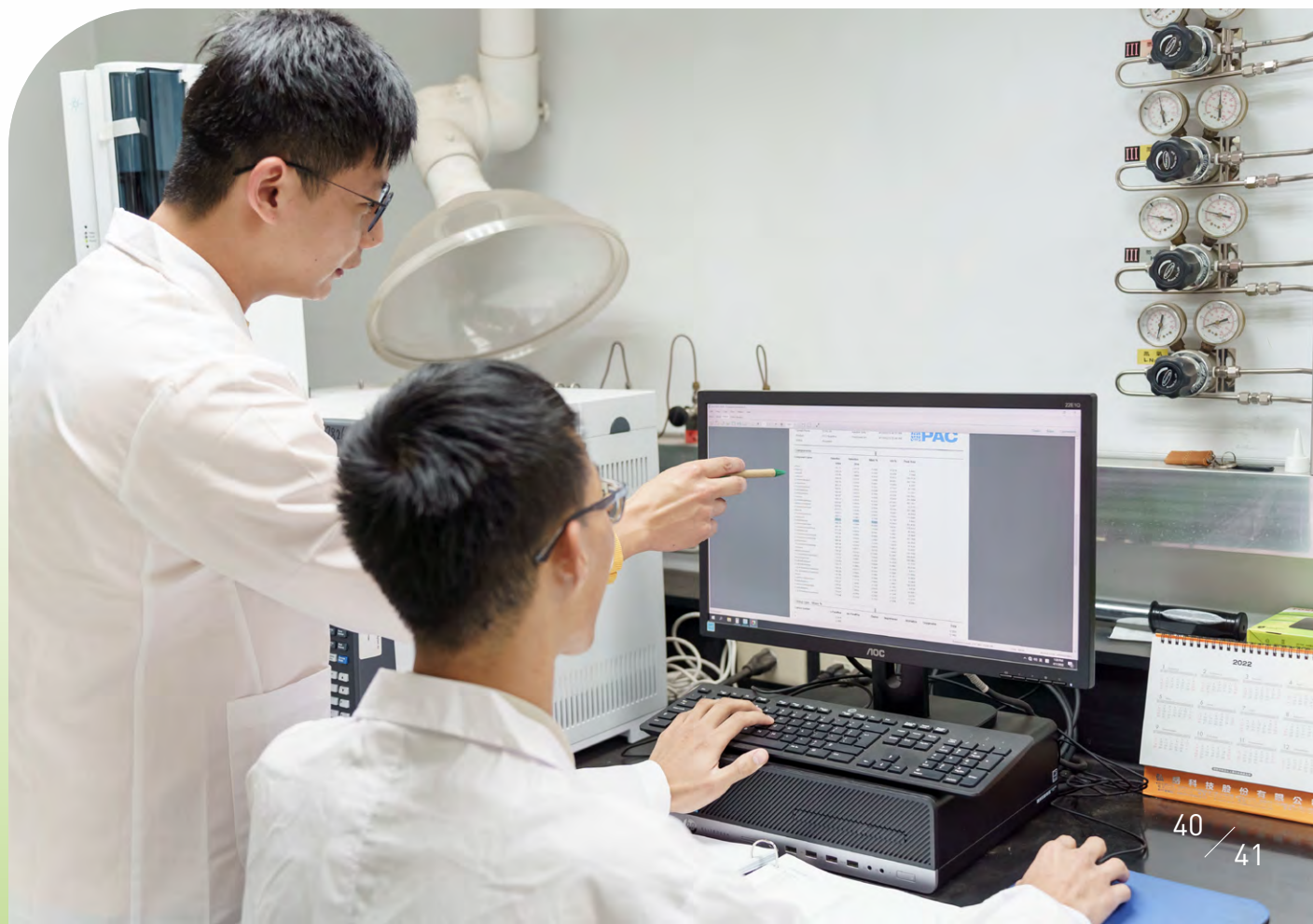
Introducing smart technologies and upgrading information security

With regard to information management, CPC has strengthened external customer relationship management, provided premium services, decreased the time for settlement through the implementation of integrated operation processes and specialized information technology, and improved its management performance. CPC has run its operation processes through an integrated IT resource operating platform and synchronized integration of internal IT resources, processes and infrastructure. It has followed a policy of providing a thematic open data set platform, promoted the open document format (ODF-CNS15251), prepared a smart government action plan, and continued to enhance IT organization and control. In order to promote information security governance system and cultivate IT/OT talent, CPC has a strong cyber security structure and continuously achieves ISO 27001 certification.

With regard to information and communications systems, CPC has adopted new technology to enhance various information operation and service processes and is able to complete settlement every month. It has improved POS of gas stations, integrated e-commerce systems for petroleum products; diversified its business scope and marketing channels; introduced “smart gas station system” in a step-by-step manner; deployed a refining and petrochemicals information system; integrated production information and oil bookkeeping system; deployed big data platforms for storage, transportation and sales information; deployed exploration information system and 3D pipeline system; and integrated exploration and production management and geographic information. These operations are core tasks of the IT department. In addition, CPC has also continued to promote the web sites and its mobile e-commerce services of its application system to meet the demand for mobile services. In response to the development of new technologies, including big data, artificial intelligence, the internet of things, cloud computing, virtual reality, augmented reality, 5G and Industry 4.0, and other new technologies, CPC has set up an office to promote 5G AIoT, integrated external and internal resources to prioritize the development of applications related to industrial safety and environment protection, in order to move toward becoming a “smart enterprise.”

In the area of information and communications network, working with the government's Internet Protocol Upgrade Promotion Program, CPC has also upgraded its Internet and fiber optic backbone systems to IPv6. It has strengthened infrastructure and communications integration work for mobile e-commerce; continued to improve equipment performance; and strengthened remote backup and offline backup mechanisms, in order to ensure business continuity, to facilitate the delivery of services and to improve the continuous availability of operations. It has also consolidated hardware and software resources, employed broadband networks to provide digital services, adopted cloud technology and implemented server virtualization to increase its efficiency. CPC has also taken advantage of its own fiber optic backbone systems, provided services that integrate voice system and multimedia communications, and has gradually created a mobile e-commerce operating environment through a combination of mobile communications technology, and services through the enhancement of its existing transmission system and e-environment.

To terms of information security, CPC has implemented several information security management and control measures, including strengthening standards, improving information security activities and capabilities, launching a security operation center (SOC), and managing all firewalls and implemented solutions such as intrusion detection system, APT and other protection systems. CPC has engaged an external information security team to test and verify performance of its information security systems, and has taken advantage of its information sharing and emergency response mechanism to improve its overall information security performance. It has also enhanced the capabilities and the protection framework of its industrial control system to ensure the normal operation of core activities of critical information infrastructure.





Human Resources

As of the end of 2021, CPC had 16,293 employees. In order to fully develop their potential, CPC provides long-term training and career guidance, while at the same time making both incentives and benefits more attractive. CPC has also actively discovered managerial talent in order to facilitate corporate development with talented people of outstanding ability.

Integration of talent selection and training to facilitate corporate development

In terms of human resource utilization, CPC has recently engaged in organizational and process reengineering, as well as formulating and carrying out a policy whereby selected employees are rotated through different jobs, units and departments, in order to use its human capital effectively. It has also actively recruited a cohort of young professionals to both inject new blood and to provide a smooth transfer of technical and operational knowledge, as well as commercial and competitive skills, in order to increase competitiveness of its employees and prepare for a wave of retirements.

In addition to using professional qualifications and personal traits as the basis for the selection of entrants to its supervisors, CPC provides management and leadership development training to help its employees achieve their full potential and contribute to accomplishing corporate growth objectives. At the same time, the company is strengthening its on-the-job training programs at all levels, and has integrated pre-existing training systems into the establishment of the CPC Corporate University (CPCCU). This system offers beginner, intermediate and advanced level courses in exploration, refining, marketing and engineering areas—the four key areas comprising CPC's core competencies. CPC has systematically enhanced specific professional expertise for employees through experiences passed on by senior employees, which has helped them develop a broader range of skills for optimization of workforce utilization. The company also encourages its employees to take national qualification examinations in skills and helps them to obtain professionally-required certification in industrial safety, environmental protection, and other relevant disciplines. In the context of its corporate transformation process, the company is also strengthening its secondary-skill training programs. Beyond this, employees are selectively sent abroad for higher education, research assignments and internships, as well as to participate in conferences and seminars on a range of topics.

Experience passing on and professional talent cultivation

Considering that CPC has hired new employees in recent years, on-the-job training is now combined with formal skills development courses. Senior employees are also designated as mentors to help new colleagues adapt to their workplace and responsibilities. These new employees are rotated, with job training provided, allowing them to gain experience in a wide range of positions and develop their talent at every level. Seniority requirements in consideration for promotion have been shortened for outstanding managers, lowering the age distribution in the upper management echelons, and thus helping to motivate those with ambition. With regard to employee training, each department reviews its professional-skill shortfalls at the beginning of the year and formulates a corresponding training plan in which outstanding personnel are recruited as instructors and tasked with passing on their operational knowledge and experience. Some departments also make on-site or outside training arrangements for their younger employees, lasting from several weeks up to a year, depending on departmental needs. Following the trend of e-learning, various knowledge elements and physical courses have also been digitized and uploaded to CPC's knowledge base and e-learning center. This helps CPC to not only preserve, share and pass on core knowledge, techniques, and experiences, but also facilitate their value-adding applications. With the application of digital technology, multiple learning programs based on virtual-physical technology integration are developed step-by-step to help employees learn related knowledge and expertise anytime, anywhere.

The CPC Training Center (CPCTC), located in Chiayi, not only serves as an incubator for internal talent and a hub for passing on experience, but it is also tasked with building a talent pool of energy and petrochemical expertise. In compliance with the government's New Southbound Policy and Energy Consumption, Energy Saving, Carbon Reduction and Digital Transformation strategies, CPC has not only recruited professional talent with engineering, investment, trading, and management backgrounds for these business activities, but also expanded domestic and overseas government-industry-university-institute collaboration, and actively formulated various courses in pre-employment training and on-the-job training for talent in various fields, in order to maximize its contribution to the cultivation of energy and petrochemical talents for our country.

Fostering a caring and warm workplace, Providing various employee benefits for education and entertainment

In terms of employee incentives and benefits, the policy of CPC is to award an annual bonus on the basis of overall corporate performance as well as the scale of contribution and performance of the job of the individual employee. All employees are covered by national health insurance, civil servant insurance, labor insurance, group life insurance and accident insurance. Consolation and compassionate payments are made in cases of job-related injuries, disability or death, and employee welfare committees organize a variety of welfare and entertainment activities.

CPC also operates clinics, restaurants, libraries, general stores and other welfare amenities for its employees, along with sports facilities, such as swimming pools, various ball parks and gyms, at or near the workplace. There are scholarships for employees' children; educational loans for dependents attending college and university; medical subsidies for employees and their family members; wedding, funeral and retirement subsidies; and interest-free emergency loans. The company also supports employee group activities dedicated to baseball, bridge, mountain climbing, swimming, painting, film watching and other leisure pursuits, in order to provide physical and mental relaxation, boosting their morale and sense of well-being at work.

With regard to employee assistance programs, CPC has provided its employees with multiple services in order to boost their morale, and to assist them in solving and preventing problems that affect their work performance. Through diverse health enhancement measures, CPC has created a warm, caring work environment and fostered a business culture of healthy interaction to increase its competitiveness.

CPC has also worked hard to implement a variety of measures to promote gender equality and has actively designed related practices to create a gender-friendly workplace. CPC will continue to increase the number of female employees and change gender stereotypes in this industry in order to achieve gender equality in CPC.



CPC's joint venture strategy can be summarized as "on the foundation of core business, active expansion into fields of petrochemicals (upstream and downstream), new energy, high value-added petrochemicals and international investments." The company now sets out to boost its bottom line by selectively introducing patented technologies to develop high value-added products with their own materials and technologies for petrochemical products. Total investment on these 15 joint venture entities, as of the end of 2021, was NT\$21.109 billion, generating an unaudited investment income of NT\$773 million in 2021 and cash dividends of NT\$1.173 billion over the same period.

CPC's current 15 affiliates can be divided into four main categories: petroleum products, petrochemicals, natural gas, and implementation of government policy. Of the 15, eight are based in Taiwan and seven overseas. The principal entities are briefly described as below.

CHINA AMERICAN PETROCHEMICAL CO. LTD. (CAPCO)

Established in 1976, CAPCO is the major supplier of purified terephthalic acid (PTA) to Taiwan's polyester textile industry; its plant is located in the Taichung Harbor in Taiwan's central region. CPC holds 38.57% of the company's equity, including preferred stock. CAPCO's production units have carried out improvement programs with the aim of lowering production costs and boosting market competitiveness.

DAI HAI PETROL CORP. (DHP)

Established in 1994, with CPC holding 35% of the equity, DHP is headquartered in Haiphong, Vietnam. The branch station is located in HaTay province. The company mainly engaged in storage, transportation, supply and marketing of liquefied petroleum gas in northern Vietnam.

QATAR FUEL ADDITIVES COMPANY LIMITED (QAFAC)

Qatar Fuel Additives Company Limited (QAFAC) was established in 1996, with CPC holding 20% of the equity. Located in Mesaieed Industrial Zone in Qatar, it produces chiefly methanol and methyl tert-butyl ether (MTBE).

CHUN PIN ENTERPRISE CO., LTD. (CPEC)

Chun Pin Enterprise Co. was established in 1998, with CPC holding 49% of the equity, to set up and operate a storage and transportation center as part of the Phase II development of Taipei Harbor. CPEC is engaged in the storage and transshipment of petroleum and petrochemical products and is currently engaged in formulating a plan to move its storage tanks to reclaimed land in the outer harbor of the Port of Taipei.

KUOKUANG POWER CO., LTD. (KKPC)

KuoKuang Power Co. was established in 2000, with CPC holding 45% of the equity, under the government's policy of opening up power generation to private operators in order to alleviate the power supply shortfall in northern Taiwan. The project entailed the construction and operation of a natural gas-fired power plant with an installed capacity of 480 MW and located in the Guishan District of Taoyuan City.

NIMIC SHIP HOLDING CO., LTD. (NSHC)

Established in 2006, with CPC holding 45% of the equity, NSHC has four ship-owning companies under its umbrella. It has built four LNG carriers engaged in transporting LNG from Qatar's Ras Laffan II. In compliance with the IMO's environmental protection regulations, NSHC has planned and implemented modifications to burn low-sulfur fuel oil and the installation of a ballast water management system for its LNG carriers since 2018.

NIMIC SHIP MANAGEMENT CO., LTD. (NSMC)

Established in 2006, with CPC holding 45% of the company's equity, NSMC is responsible for the operation and management of the four LNG carriers built by NSHC. In addition to assisting in the implementation of modifications to burn low-sulfur fuel oil and the installation of a ballast water management system for the four LNG carriers in 2018, NSMC also has an ongoing cooperative program with NTOU and NKMU aimed at developing a pool of Taiwanese seafarers.

GLOBAL ENERGY MARITIME CO. (GEMCO)

Established in 2011, with CPC holding 48% of the company's equity, GEMCO has built three double-hulled VLCCs with a capacity of 300,000 DWT, and a double-hulled LR1 vessel with a capacity of 80,000 DWT, engaged in shipping crude oil and petroleum products. In compliance with the IMO's environmental protection regulations, GEMCO had completed retrofitting of the scrubber system for VLCCs.

ICHTHYS LNG PTY LTD (ILPL)

Established in 2011, with CPC holding 2.625% of the company's equity, ILPL pipes natural gas from Australia's offshore Ichthys field to an onshore gas liquefaction plant near Darwin for the production of LNG, LPG, and condensate. The first LNG cargo was shipped in November 2018.

MAXIHUB COMPANY LIMITED (MAXIHUB)

Established in 2014, with CPC holding 40% of the equity since 2016, MAXIHUB plans to build a wharf, tank farm and a lubricant blending factory in Dong Nai Province, Vietnam. The company was founded to manufacture and process lubricating oils, base oil and solvent chemicals, and also to provide storage and warehouse services. The lubricant blending factory had finished Mechanical Completion on July 19, 2021, and was commissioned on December 18, 2021.



2021
Financial
Statements

Compared with 2020, the Natural Gas Business Division's profits before tax for 2021 decreased, primarily because the selling price of natural gas was not adjusted to reflect the cost; the Exploration & Production Business Division's profits before tax went from negative to positive because the impairment losses on assets were reversed; the Refining and Marketing Business Division's profit margin increased because of crude oil price and smooth on site operation.

The capital expenditure incurred in 2021 was NT\$30,018 million, a 11.02% decrease from 2020.

The breakdown of the expenditure was as follows:

Production & manufacturing 41.53%

Marketing & transportation 18.31%

Others 40.16%

The exchange rate between the NT dollar and the US dollar was 27.660:1 on December 31, 2021.

STATEMENTS OF INCOME FOR THE YEARS ENDED DECEMBER 31, 2021 AND 2020

(In Thousands of New Taiwan Dollars)

	<u>2021</u>	<u>2020</u>
Operating Revenues		
Sales	\$ 885,554,926	\$ 713,747,247
Other operating revenues	<u>18,217,796</u>	<u>7,953,696</u>
Total operating revenues	<u>903,772,722</u>	<u>721,700,943</u>
Operating Costs and Expenses		
Cost of goods sold	891,280,130	682,590,726
Exploration expenses	2,119,987	1,712,403
Oil and gas transmission and storage expenses	12,843,525	12,156,335
Other operating costs	<u>4,839,965</u>	<u>15,807,765</u>
Total operating costs	<u>911,083,607</u>	<u>712,267,229</u>
Gross Profit(Loss)	<u>(7,310,885)</u>	<u>9,433,714</u>
Operating Expenses	<u>22,067,454</u>	<u>20,153,836</u>
Non-Operating Income and Gains	<u>5,097,908</u>	<u>9,724,748</u>
Non-Operating Expenses and Losses	<u>22,851,284</u>	<u>6,707,832</u>
INCOME (LOSS) BEFORE INCOME TAX	<u>(47,131,715)</u>	<u>(7,703,206)</u>
Income Tax Expense (Benefit)	<u>(7,847,293)</u>	<u>(361,653)</u>
NET INCOME (LOSS) FOR THE YEAR	<u>\$(39,284,422)</u>	<u>\$(7,341,553)</u>

BALANCE SHEETS

DECEMBER 31, 2021 AND 2020

(In Thousands of New Taiwan Dollars)

Assets	<u>2021</u>	<u>2020</u>
Current Assets		
Cash and cash equivalents	\$ 2,710,867	\$ 3,005,625
Current financial assets at fair value through profit or loss	863	-
Accounts receivable, net	56,666,521	38,408,233
Accounts receivables from related parties, net	332,899	379,697
Other receivables	6,792,577	5,864,711
Inventories	127,147,077	80,176,537
Prepayments	20,582,107	15,811,173
Other current assets	<u>2,288,097</u>	<u>1,385,559</u>
Total Current Assets	<u>216,521,008</u>	<u>145,031,535</u>
Non-current Assets		
Non-current financial assets at fair value through other comprehensive income	16,409,518	9,239,672
Investments accounted for using equity method	11,837,200	11,988,290
Property, plant and equipment	446,820,912	434,621,786
Right-of-use assets	36,295,738	38,865,819
Investment property	19,218,218	19,235,656
Intangible assets	447,680	318,126
Deferred income tax assets	16,762,028	8,795,694
Oil and gas investments	59,089,839	50,336,445
Refundable deposits	249,390	293,498
Long-term receivables	16,504,018	16,419,096
Long-term prepayments	1,886,101	1,880,973
Other non-current assets	<u>243,101</u>	<u>252,337</u>
Total Non-current Assets	<u>625,763,743</u>	<u>592,247,392</u>
Total Assets	<u>\$ 842,284,751</u>	<u>\$ 737,278,927</u>

BALANCE SHEETS
DECEMBER 31, 2021 AND 2020

(In Thousands of New Taiwan Dollars)

Liabilities and Equity	<u>2021</u>	<u>2020</u>
Current Liabilities		
Short-term borrowings	\$ 26,974,075	\$ 2,840,114
Short-term notes and bills payable	157,562,442	104,839,038
Financial liabilities at fair value through profit or loss-current	3,806	698
Contract liabilities	12,641,764	10,347,783
Accounts payable	73,922,271	35,409,518
Payable to constructors	6,558,364	4,512,673
Other payables	20,849,412	21,150,048
Lease liabilities-current	1,991,939	69,549
Long-term borrowings, current portion	23,400,000	18,600,000
Other current liabilities	<u>10,718,244</u>	<u>9,890,514</u>
Total Current Liabilities	<u>334,622,317</u>	<u>207,659,935</u>
Non-current Liabilities		
Bonds payable	75,000,000	75,150,000
Non-current provisions	42,324,544	28,481,086
Deferred tax liabilities	84,782,837	84,749,536
Lease liabilities-non-current	32,079,605	36,548,464
Post-employment benefits payable	4,096,145	3,593,816
Guarantee deposits received	1,598,895	1,475,969
Other non-current liabilities	<u>5,659,224</u>	<u>5,520,992</u>
Total Non-current Liabilities	<u>245,541,250</u>	<u>235,519,863</u>
Total Liabilities	<u>580,163,567</u>	<u>443,179,798</u>
Equity		
Share capital		
Common shares	130,100,000	130,100,000
Retained earnings		
Legal reserve	3,390,331	3,390,331
Special earning reserve	127,195,339	127,291,214
Accumulated profit (deficit)	<u>(5,805,386)</u>	<u>33,555,793</u>
Total retained earnings	<u>124,780,284</u>	<u>164,237,338</u>
Other equity	<u>7,240,900</u>	<u>(238,209)</u>
Total Equity	<u>262,121,184</u>	<u>294,099,129</u>
Total Liabilities and Equity	<u>\$ 842,284,751</u>	<u>\$ 737,278,927</u>

CPC CORPORATION, TAIWAN
STATEMENTS OF CASH FLOWS
FOR THE YEARS ENDED DECEMBER 31, 2021 AND 2020

(In Thousands of New Taiwan Dollars)

	<u>2021</u>	<u>2020</u>
Cash flows from operating activities:		
Net income before tax	\$ (47,131,715)	\$ (7,703,206)
Adjustments:		
Non-cash adjustment items:		
Depreciation expense	17,705,512	18,948,062
Amortization expense	2,571,328	2,570,117
Expected credit loss	154,798	53,242
Net loss (gain) on financial assets or liabilities at fair value through profit or loss	66,258	17,023
Interest expense	1,990,054	2,591,528
Interest revenue	(317,023)	(592,828)
Dividend income	(675,342)	(232,008)
Share of profit of associates accounted for using equity method	(82,161)	(1,345)
Loss (gain) on disposal of property, plant and equipment	(56,521)	(54,015)
Provision for (Reversal of) write-down (recover benefit) of inventories	15,526,673	(100,139)
Impairment loss (gain) recognized on non-financial assets	(8,369,000)	11,999,170
Loss (gain) on foreign exchange	(3,207,283)	(1,725,927)
Loss on oil and gas investment	630,900	74,757
Others	<u>(721,416)</u>	<u>(815,626)</u>
Total non-cash adjustment items	<u>25,216,777</u>	<u>32,732,011</u>
Changes in operating assets and liabilities:		
Accounts receivable	(18,355,601)	5,363,150
Other accounts receivable	(969,860)	(71,435)
Inventories	(62,497,213)	31,923,444
Prepaid expenses	(2,016,160)	6,520,735
Other current assets	(902,180)	(608,330)
Contract Liabilities	2,293,981	526,605
Accounts payable	38,591,314	(7,915,031)
Provision-non-current	13,685,844	(341,177)
Other current liabilities	2,091,661	(2,700,326)
Post-employment benefits payable	<u>284,143</u>	<u>(911,362)</u>
Total adjustments	<u>(2,577,294)</u>	<u>64,518,284</u>
Cash inflow (outflow) generated from operations	(49,709,009)	56,815,078
Interest received	62,039	182,575
Interest paid	(2,024,221)	(2,660,098)
Income taxes paid	<u>(358)</u>	<u>(6,605)</u>
Net cash flows provided by operating activities	<u>(51,671,549)</u>	<u>54,330,950</u>

	<u>2021</u>	<u>2020</u>
Cash flows from investing activities:		
Acquisition of investments accounted for using equity method	-	(39,647)
Acquisition of property, plant and equipment	(23,977,883)	(28,455,578)
Proceeds from disposal of property, plant and equipment	235,700	355,124
Acquisition of intangible assets	(276,360)	(228,235)
Increase in oil and gas interests	(2,958,167)	(3,675,816)
Increase in refundable deposits	(92,252)	(199,720)
Decrease in refundable deposits	136,360	143,111
Increase (Decrease) in long-term receivables	411,110	(643,830)
Increase in other non-current assets	(467,368)	(604,766)
Dividends received from associates and others	<u>1,172,788</u>	<u>991,395</u>
Net cash flows used in investing activities	<u>(25,816,072)</u>	<u>(32,357,962)</u>
Cash flows from financing activities:		
Distribution of retained earnings	-	(24,678,319)
Increase in short-term borrowings	64,633,803	34,448,047
Decrease in short-term borrowings	(40,545,559)	(59,447,739)
Increase in short-term bills payable	348,662,411	261,733,205
Decrease in short-term bills payable	(295,939,007)	(245,993,152)
Payments to bonds payable	(18,600,000)	(20,900,000)
Payments to long-term borrowings	-	(1,900,000)
Increase in other borrowings	23,250,000	17,700,000
Proceeds from guarantee deposits received	2,402,424	2,645,296
Refund of guarantee deposits received	(2,186,683)	(2,455,641)
Payment of lease liabilities	(4,508,525)	(4,211,783)
Decrease in other non-current liabilities	<u>(21,718)</u>	<u>(82)</u>
Net cash flows used in financing activities	<u>77,147,146</u>	<u>(43,060,168)</u>
Net increase (decrease) in cash and cash equivalents	(340,475)	(21,087,180)
Cash and cash equivalents at beginning of period	<u>2,670,592</u>	<u>23,757,772</u>
Cash and cash equivalents at end of period	<u>\$ 2,330,117</u>	<u>\$ 2,670,592</u>
Components of cash and cash equivalents		
Cash and cash equivalents reported in the statement of Financial position	2,710,867	3,005,625
Bank overdrafts	<u>(380,750)</u>	<u>(335,033)</u>
Cash and cash equivalents at end of period	<u>\$ 2,330,117</u>	<u>\$ 2,670,592</u>

CPC CORPORATION, TAIWAN

NOTES TO FINANCIAL STATEMENTS

FOR THE YEARS ENDED DECEMBER 31, 2021 AND 2020

(In Thousands of New Taiwan Dollars, Unless Stated Otherwise)

(1) Company history

CPC Corporation, Taiwan (the “Company” or CPC) was established on June 1, 1946 and engages mainly in oil and gas exploration, refining, procurement, transport, storage and marketing.

(2) Approval date and procedures of the financial statements:

The financial statements were authorized for issuance by the Board of Directors on April 20, 2022.

(3) New standards, amendments and interpretations adopted:

(a) The impact of the International Financial Reporting Standards (“IFRSs”) endorsed by the Financial Supervisory Commission, R.O.C. which have already been adopted.

The Company has initially adopted the following new amendments, which do not have a significant impact on its financial statements, from January 1, 2021:

- Amendments to IFRS 4 “Extension of the Temporary Exemption from Applying IFRS 9”
- Amendments to IFRS 9, IAS39, IFRS7, IFRS 4 and IFRS 16 “Interest Rate Benchmark Reform—Phase 2”
- Amendments to IFRS 16 “Covid-19-Related Rent Concessions beyond June 30, 2021”

(b) The impact of IFRS issued by the FSC but not yet effective

The Company assesses that the adoption of the following new amendments, effective for annual period beginning on January 1, 2022, would not have a significant impact on its financial statements:

- Amendments to IAS 16 “Property, Plant and Equipment—Proceeds before Intended Use”
- Amendments to IAS 37 “Onerous Contracts—Cost of Fulfilling a Contract”
- Annual Improvements to IFRS Standards 2018–2020
- Amendments to IFRS 3 “Reference to the Conceptual Framework”

(c) The impact of IFRS issued by IASB but not yet endorsed by the FSC

The following new and amended standards, which may be relevant to the Company, have been issued by the International Accounting Standards Board (IASB), but have yet to be endorsed by the FSC:

Standards or Interpretations	Content of amendment	Effective date per IASB
Amendments to IAS 1 “Classification of Liabilities as Current or Non-current”	The amendments aim to promote consistency in applying the requirements by helping companies determine whether, in the statement of balance sheet, debt and other liabilities with an uncertain settlement date should be classified as current (due or potentially due to be settled within one year) or non-current. The amendments include clarifying the classification requirements for debt a company might settle by converting it into equity.	January 1, 2023
Amendments to IAS 1 “Disclosure of Accounting Policies”	The key amendments to IAS 1 include: <ul style="list-style-type: none"> • requiring companies to disclose their material accounting policies rather than their significant accounting policies; • clarifying that accounting policies related to immaterial transactions, other events or conditions are themselves immaterial and as such need not be disclosed; and • clarifying that not all accounting policies that relate to material transactions, other events or conditions are themselves material to a company’s financial statements. 	January 1, 2023

Standards or Interpretations	Content of amendment	Effective date per IASB
Amendments to IAS 8 "Definition of Accounting Estimates"	<p>The amendments introduce a new definition for accounting estimates: clarifying that they are monetary amounts in the financial statements that are subject to measurement uncertainty.</p> <p>The amendments also clarify the relationship between accounting policies and accounting estimates by specifying that a company develops an accounting estimate to achieve the objective set out by an accounting policy.</p>	January 1, 2023

The Company is evaluating the impact of its initial adoption of the abovementioned standards or interpretations on its consolidated financial position and financial performance. The results thereof will be disclosed when the Company completes its evaluation.

The Company does not expect the following other new and amended standards, which have yet to be endorsed by the FSC, to have a significant impact on its financial statements:

- Amendments to IFRS 10 and IAS 28 "Sale or Contribution of Assets Between an Investor and Its Associate or Joint Venture".
- IFRS 17 "Insurance Contracts" and amendments to IFRS 17 "Insurance Contracts"
- Amendments to IAS 12 "Deferred Tax related to Assets and Liabilities arising from a Single Transaction"

(4) Summary of significant accounting policies:

The Company is operated and managed by the Government of the Republic of China (ROC). The Company's significant accounting policies conform to the accounting laws and regulations governing state-owned enterprises, the Regulations Governing the Preparation of Financial Reports by Securities Issuers (the "Regulations") and with the International Financial Reporting Standards ("IFRSs"), International Accounting Standards ("IASs"), as well as related guidance endorsed by the Financial Supervisory Commission of the Republic of China.

The Company's annual financial statements are required to be examined by the Executive Yuan and the Ministry of Audit of the Control Yuan. The examinations are primarily aimed at determining the extent to which the Company meets its budget as approved by the Legislative Yuan. The Company's financial statements are finalized on the basis of the results of these examinations. The Ministry of Audit's adjustments should be reflected in the financial statements audited by independent certified public accountants. The opening balance of the following year of the Company's books of accounts is based on the balance after the adjustments made by the Ministry of Audit. The examination of the Company's financial statements as of and for the year ended December 31, 2020 had already been completed, as explained in Note 12(b). The examinations of the Company's financial statements as of and for the year ended December 31, 2021 by these government agencies were not yet completed as of the auditor's report date.

(a) Statement of compliance

The financial statements have been prepared in accordance with the accounting laws and regulations governing state-owned enterprises, the Regulations and the IFRSs as endorsed and issued into effect by the FSC.

(b) Basis of preparation

(i) Basis of measurement

Except for the following significant accounts, the financial statements have been prepared on a historical cost basis:

Financial instruments measured at fair value through profit or loss are measured at fair value;

Fair value through other comprehensive income are measured at fair value;

Hedging derivative financial instruments are measured at fair value;

The defined benefit liability (asset) is recognized as the fair value of the plan assets less the present value of the defined benefit obligation.

(ii) Functional and presentation currency

The functional currency is determined based on the primary economic environment in which the entity operates. The financial statements are presented in New Taiwan dollars, which is the Company's functional currency. All financial information presented in New Taiwan dollars has been rounded to the nearest thousand.

(c) Foreign currencies

(i) Foreign currency transactions

Transactions in foreign currencies are translated into the respective functional currencies of Group entities at the exchange rates at the dates of the transactions. At the end of each subsequent reporting period, monetary items denominated in foreign currencies are translated into the functional currencies using the exchange rate at that date. Non-monetary items denominated in foreign currencies that are measured at fair value are translated into the functional currencies using the exchange rate at the date that the fair value was determined. Nonmonetary items denominated in foreign currencies that are measured based on historical cost are translated using the exchange rate at the date of the transaction.

Exchange differences are generally recognized in profit or loss, except for those differences relating to the following, which are recognized in other comprehensive income:

- an investment in equity securities designated as at fair value through other comprehensive income;
- a financial liability designated as a hedge of the net investment in a foreign operation to the extent that the hedge is effective; or
- qualifying cash flow hedges to the extent that the hedges are effective.

(ii) Foreign operations

The assets and liabilities of foreign operations are translated to the reporting currency at exchange rates at the reporting date. The income and expenses of foreign operations are translated at the average exchange rate. Translation differences are recognized in other comprehensive income.

(d) Classification of current and non-current assets and liabilities

An asset is classified as current under one of the following criteria, and all other assets are classified as noncurrent.

- (i) It is expected to be realized, or intended to be sold or consumed, in the normal operating cycle;
- (ii) It is held primarily for the purpose of trading;
- (iii) It is expected to be realized within twelve months after the reporting period; or
- (iv) The asset is cash or a cash equivalent unless the asset is restricted from being exchanged or used to settle a liability for at least twelve months after the reporting period.

A liability is classified as current under one of the following criteria, and all other liabilities are classified as noncurrent.

An entity shall classify a liability as current when:

- (i) It is expected to be settled in the normal operating cycle;
- (ii) It is held primarily for the purpose of trading;
- (iii) It is due to be settled within twelve months after the reporting period; or
- (iv) It does not have an unconditional right to defer settlement of the liability for at least twelve months after the reporting period. Terms of a liability that could, at the option of the counterparty, result in its settlement by issuing equity instruments do not affect its classification.

(e) Cash and cash equivalents

Cash and cash equivalents comprise cash, cash in bank, and short term, highly liquid investments that are readily convertible to known amounts of cash and are subject to an insignificant risk of changes in value. Time deposits which meet the above definition and are held for the purpose of meeting short term cash commitments rather than for investment or other purposes should be recognized as cash equivalents.

Bank overdrafts that are repayable on demand and form an integral part of the Company's cash management are included as a component of cash and cash equivalents for the purpose of the statement of cash flows.

(f) Financial instruments

Trade receivables and debt securities issued are initially recognized when they are originated. All other financial assets and financial liabilities are initially recognized when the Company becomes a party to the contractual provisions of the instrument. A financial asset (unless it is a trade receivable without a significant financing component) or financial liability is initially measured at fair value plus, for an item not at fair value through profit or loss (FVTPL), transaction costs that are directly attributable to its acquisition or issue. A trade receivable without a significant financing component is initially measured at the transaction price.

(i) Financial assets

All regular way purchases or sales of financial assets are recognized and derecognized on a trade date basis.

On initial recognition, a financial asset is classified as measured at: amortized cost; fair value through other comprehensive income (FVOCI) and fair value through profit or loss (FVTPL). Financial assets are not reclassified subsequent to their initial recognition unless the Group changes its business model for managing financial assets, in which case all affected financial assets are reclassified on the first day of the first reporting period following the change in the business model.

1) Financial assets at amortized cost

A financial asset is measured at amortized cost if it meets both of the following conditions and is not designated as at FVTPL:

- it is held within a business model whose objective is to hold assets to collect contractual cash flows; and
- its contractual terms give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

These assets are subsequently measured at amortized cost, which is the amount at which the financial asset is measured at initial recognition, plus/minus, the cumulative amortization using the effective interest method, adjusted for any loss allowance. Interest income, foreign exchange gains and losses, as well as impairment, are recognized in profit or loss. Any gain or loss on derecognition is recognized in profit or loss.

2) Fair value through other comprehensive income (FVOCI)

A debt investment is measured at FVOCI if it meets both of the following conditions and is not designated as at FVTPL:

- it is held within a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets; and
- its contractual terms give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

On initial recognition of an equity investment that is not held for trading, the Company may irrevocably elect to present subsequent changes in the investment's fair value in other comprehensive income. This election is made on an instrument-by-instrument basis.

Debt investments at FVOCI are subsequently measured at fair value. Interest income calculated using the effective interest method, foreign exchange gains and losses and impairment are recognized in profit or loss. Other net gains and losses are recognized in other comprehensive income. On derecognition, gains and losses accumulated in other comprehensive income are reclassified to profit or loss.

Equity investments at FVOCI are subsequently measured at fair value. Dividends are recognized as income in profit or loss unless the dividend clearly represents a recovery of part of the cost of the investment. Other net gains and losses are recognized in other comprehensive income and are never reclassified to profit or loss.

Dividend income is recognized in profit or loss on the date on which the Group's right to receive payment is established.

3) Fair value through profit or loss (FVTPL)

All financial assets not classified as amortized cost or FVOCI described as above are measured at FVTPL, including derivative financial assets and accounts receivable, which is presented as accounts receivable. On initial recognition, the Company may irrevocably designate a financial asset, which meets the requirements to be measured at amortized cost or at FVOCI, as at FVTPL if doing so eliminates or significantly reduces an accounting mismatch that would otherwise arise.

These assets are subsequently measured at fair value. Net gains and losses, including any interest or dividend income, are recognized in profit or loss.

4) Business model assessment

The Company makes an assessment of the objective of the business model in which a financial asset is held at portfolio level because this best reflects the way the business is managed and information is provided to management. The information considered includes:

- the stated policies and objectives for the portfolio and the operation of those policies in practice. These include whether management's strategy focuses on earning contractual interest income, maintaining a particular interest rate profile, matching the duration of the financial assets to the duration of any related liabilities or expected cash outflows or realizing cash flows through the sale of the assets;
- how the performance of the portfolio is evaluated and reported to the Company's management;
- the risks that affect the performance of the business model (and the financial assets held within that business model) and how those risks are managed;

- how managers of the business are compensated— e.g. whether compensation is based on the fair value of the assets managed or the contractual cash flows collected; and
- the frequency, volume and timing of sales of financial assets in prior periods, the reasons for such sales and expectations about future sales activity.

Transfers of financial assets to third parties in transactions that do not qualify for derecognition are not considered sales for this purpose, and are consistent with the Company's continuing recognition of the assets.

Financial assets that are held for trading or are managed and whose performance is evaluated on a fair value basis are measured at FVTPL.

- 5) Assessment whether contractual cash flows are solely payments of principal and interest For the purposes of this assessment, 'principal' is defined as the fair value of the financial assets on initial recognition. 'Interest' is defined as consideration for the time value of money and for the credit risk associated with the principal amount outstanding during a particular period of time and for other basic lending risks and costs, as well as a profit margin.

In assessing whether the contractual cash flows are solely payments of principal and interest, the Company considers the contractual terms of the instrument. This includes assessing whether the financial asset contains a contractual term that could change the timing or amount of contractual cash flows such that it would not meet this condition. In making this assessment, the Company considers:

- contingent events that would change the amount or timing of cash flow;
- terms that may adjust the contractual coupon rate, including variable rate features;
- prepayment and extension features; and
- terms that limit the Company's claim to cash flows from specified assets (e.g. non-recourse features).

- 6) Impairment of financial assets

The Company recognizes loss allowances for expected credit losses on financial assets measured at amortized cost (including cash and cash equivalents, amortized costs, accounts receivable, other receivable, guarantee deposit paid and other financial assets), debt investments measured at FVOCI, accounts receivable measured at FVOCI and contract assets.

The Company measures loss allowances at an amount equal to lifetime expected credit loss (ECL), except for the following which are measured as 12-month ECL:

- debt securities that are determined to have low credit risk at the reporting date; and
- other debt securities and bank balances for which credit risk (i.e. the risk of default occurring over the expected life of the financial instrument) has not increased significantly since initial recognition.

Loss allowance for trade receivables and contract assets are always measured at an amount equal to lifetime ECL.

Lifetime ECLs are the ECLs that result from all possible default events over the expected life of a financial instrument.

12-month ECLs are the portion of ECLs that result from default events that are possible within the 12 months after the reporting date (or a shorter period if the expected life of the instrument is less than 12 months).

The maximum period considered when estimating ECLs is the maximum contractual period over which the Group is exposed to credit risk.

When determining whether the credit risk of a financial asset has increased significantly since initial recognition and when estimating ECL, the Company considers reasonable and supportable information that is relevant and available without undue cost or effort. This includes both quantitative and qualitative information and analysis based on the Company's historical experience and informed credit assessment as well as forward-looking information.

The Company considers a debt security to have low credit risk when its credit risk rating is equivalent to the globally understood definition of 'investment grade which is considered to be BBB- or higher per Standard & Poor's, Baa3 or higher per Moody's or twA or higher per Taiwan Ratings'.

ECLs are a probability-weighted estimate of credit losses. Credit losses are measured as the present value of all cash shortfalls (i.e the difference between the cash flows due to the Company in accordance with the contract and the cash flows that the Company expects to receive). ECLs are discounted at the effective interest rate of the financial asset.

At each reporting date, the Company assesses whether financial assets carried at amortized cost and debt securities at FVOCI are credit-impaired. A financial asset is 'credit-impaired' when one or more events that have a detrimental impact on the estimated future cash flows of the financial asset have occurred. Evidence that a financial asset is credit-impaired includes the following observable data:

- significant financial difficulty of the borrower or issuer;
- a breach of contract such as a default or being more than 90 days past due;
- the lender of the borrower, for economic or contractual reasons relating to the borrower's financial difficulty, having granted to the borrower a concession that the lender would not otherwise consider;
- it is probable that the borrower will enter bankruptcy or other financial reorganization; or
- the disappearance of an active market for a security because of financial difficulties.

Loss allowances for financial assets measured at amortized cost are deducted from the gross carrying amount of the assets. For debt securities at FVOCI, the loss allowance is charged to profit or loss and is recognized in other comprehensive income instead of reducing the carrying amount of the asset. The Company recognizes the amount of expected credit losses (or reversal) in profit or loss, as an impairment gain or loss.

The gross carrying amount of a financial asset is written off when the Company has no reasonable expectations of recovering a financial asset in its entirety or a portion thereof. For corporate customers, the Company individually makes an assessment with respect to the timing and amount of write-off based on whether there is a reasonable expectation of recovery. The Company expects no significant recovery from the amount written off. However, financial assets that are written off could still be subject to enforcement activities in order to comply with the Group's procedures for recovery of amounts due.

7) Derecognition of financial assets

The Company derecognizes a financial asset when the contractual rights to the cash flows from the financial asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all of the risks and rewards of ownership of the financial asset are transferred or in which the Company neither transfers nor retains substantially all of the risks and rewards of ownership and it does not retain control of the financial asset.

The Company enters into transactions whereby it transfers assets recognized in its statement of balance sheet, but retains either all or substantially all of the risks and rewards of the transferred assets. In these cases, the transferred assets are not derecognized.

(ii) Financial liabilities

(1) Financial liabilities

Financial liabilities are classified as measured at amortized cost or FVTPL. A financial liability is classified as at FVTPL if it is classified as held-for-trading, it is a derivative or it is designated as such on initial recognition. Financial liabilities at FVTPL are measured at fair value and net gains and losses, including any interest expense, are recognized in profit or loss.

Other financial liabilities are subsequently measured at amortized cost using the effective interest method. Interest expense and foreign exchange gains and losses are recognized in profit or loss. Any gain or loss on derecognition is also recognized in profit or loss.

(2) Derecognition of financial liabilities

The Company derecognizes a financial liability when its contractual obligations are discharged or cancelled, or expire. The Company also derecognizes a financial liability when its terms are modified and the cash flows of the modified liability are substantially different, in which case a new financial liability based on the modified terms is recognized at fair value.

On derecognition of a financial liability, the difference between the carrying amount of a financial liability extinguished and the consideration paid (including any non-cash assets transferred or liabilities assumed) is recognized in profit or loss

(iii) Derivative financial instruments

The Company enters into a variety of derivative financial instruments to manage its exposure to price changes and foreign exchange rate risks, including foreign exchange forward contracts and petroleum swap contracts.

Derivatives are initially measured at fair value. Subsequent to initial recognition, derivatives are measured at fair value, and changes therein are generally recognized in profit or loss.

(g) Inventories

Inventories include raw materials, finished goods, work in process, semi-finished goods, merchandise, construction in progress, merchandise in transit-crude oil, and merchandise in transit-fuel oil. Inventories are stated at the lower of cost or net realizable value. Inventory write-downs are made by item, except where it may be appropriate to Company similar or related items. Net realizable value is the estimated selling price of inventories less all estimated costs of completion and costs necessary to make the sale.

Inventories are recorded at weighted-average cost on the balance sheet date.

(h) Investment in associates

An associate is an entity over which the Company has significant influence and that is neither a subsidiary nor an interest in a joint venture.

The Company uses the equity method to account for its investments in associates.

Under the equity method, investments in an associate are initially recognized at cost and adjusted thereafter to recognize the Company's share of the profit or loss and other comprehensive income of the associate. The Company also recognizes the changes in the Company's share of equity of associates.

If the cost of acquisition exceeds the Company's share of the net fair value of the identifiable assets and liabilities of an associate recognized at the date of acquisition, this excess is recognized as goodwill, which is included in the carrying amount of the investment and is not amortized. If the Company's share of the net fair value of the identifiable assets and liabilities exceeds the cost of acquisition, after reassessment, this excess is recognized immediately in profit or loss.

The entire carrying amount of the investment (including goodwill) is tested for impairment as a single asset by comparing its recoverable amount with its carrying amount. Any impairment loss recognized is deducted from the carrying amount of the investment. Any reversal of that impairment loss is recognized to the extent that the recoverable amount of the investment subsequently increases.

When the Company transacts with its associate, profits and losses resulting from the transactions with the associate are recognized in the Company's financial statements only to the extent of interests in the associate that are not related to the Company.

(i) Property, plant and equipment

(i) Recognition and measurement

Items of property, plant and equipment are measured at cost less accumulated depreciation and accumulated impairment losses. Cost includes professional fees and borrowing costs eligible for capitalization.

Each part of an item of property, plant and equipment with a cost that is significant in relation to the total cost of the item shall be depreciated separately unless the useful life and depreciation method of that significant part are the same as those of another significant part of that same item.

The gain or loss arising from the derecognition of an item of property, plant and equipment is determined as the difference between the net disposal proceeds, if any, and the carrying amount of the item, and it shall be recognized in profit or loss.

(ii) Subsequent cost

Subsequent expenditure is capitalized only when it is probable that future economic benefits associated with the expenditure will flow to the Company. The carrying amount of those parts of fixed assets that are replaced is derecognized. Ongoing repairs and maintenance are expensed as incurred.

(iii) Depreciation

Such properties are depreciated and classified to the appropriate categories of property, plant and equipment when completed and ready for intended use.

Depreciation of the equipment in oil and gas production mine is computed using the unit-of-output method. Depreciation of the remaining property, plant and equipment is computed using the straight-line method. Each significant part is depreciated separately. The estimated useful lives, residual values and depreciation method are reviewed at the end of each reporting period, with the effect of any changes in estimates accounted for prospectively.

On derecognition of an item of property, plant and equipment, the difference between the sales proceeds and the carrying amount of the asset is recognized in profit or loss.

(j) Lease

(i) Lease

1) Identifying a lease

At inception of a contract, the Company assesses whether a contract is, or contains, a lease. A contract is, or contains, a lease if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration. To assess whether a contract conveys the right to control the use of an identified asset, the Company assesses whether:

- a) the contract involves the use of an identified asset – this may be specified explicitly or implicitly, and should be physically distinct or represent substantially all of the capacity of a physically distinct asset. If the supplier has a substantive substitution right, then the asset is not identified; and
- b) the Company has the right to obtain substantially all of the economic benefits from use of the asset throughout the period of use; and
- c) the Company has the right to direct the use of the asset when it has the decision-making rights that are most relevant to changing how and for what purpose the asset is used. In rare cases where the decision about how and for what purpose the asset is used is predetermined, the Company has the right to direct the use of an asset if either:
 - the Company has the right to operate the asset; or
 - the Company designed the asset in a way that predetermines how and for what purpose it will be used.

2) Lessee

The Company recognizes a right-of-use asset and a lease liability at the lease commencement date. The right-of-use asset is initially measured at cost, which comprises the initial amount of the lease liability adjusted for any lease payments made at or before the commencement date, plus any initial direct costs incurred and an estimate of costs to dismantle and remove the underlying asset or to restore the underlying asset or the site on which it is located, less any lease incentives received.

The right-of-use asset is subsequently depreciated using the straight-line method from the commencement date to the earlier of the end of the useful life of the right-of-use asset or the end of the lease term. In addition, the right-of-use asset is periodically reduced by impairment losses, if any, and adjusted for certain remeasurements of the lease liability.

The lease liability is initially measured at the present value of the lease payments that are not paid at the commencement date, discounted using the interest rate implicit in the lease or, if that rate cannot be reliably determined, the Company's incremental borrowing rate. Generally, the Company uses its incremental borrowing rate as the discount rate.

Lease payments included in the measurement of the lease liability comprise the following:

- fixed payments;
- variable lease payments that depend on an index or a rate, initially measured using the index or rate as at the commencement date;
- amounts expected to be payable under a residual value guarantee; and
- payments for purchase or termination options that are reasonably certain to be exercised.

The lease liability is measured at amortized cost using the effective interest method. It is remeasured when:

- there is a change in future lease payments arising from the change in an index or rate; or
- there is a change in the Company's estimate of the amount expected to be payable under a residual value guarantee; or
- there is a change of its assessment on whether it will exercise a purchase, extension or termination option; or
- there is a change of its assessment of lease period on whether it will exercise extension or termination option; or
- there is any lease modifications

When the lease liability is remeasured, other than lease modifications, a corresponding adjustment is made to the carrying amount of the right-of-use asset, or in profit and loss if the carrying amount of the right-of-use asset has been reduced to zero.

When the lease liability is remeasured to reflect the partial or full termination of the lease for lease modifications that decrease the scope of the lease, the Company accounts for the remeasurement of the lease liability by decreasing the carrying amount of the right-of-use asset to reflect the partial or

full termination of the lease, and recognize in profit or loss any gain or loss relating to the partial or full termination of the lease.

The Company presents right-of-use assets that do not meet the definition of investment and lease liabilities as a separate line item respectively in the statement of financial position.

The Company has elected not to recognize right-of-use assets and lease liabilities for short-term leases of machinery that have a lease term of 12 months or less and leases of low-value assets, including IT equipment. The Company recognizes the lease payments associated with these leases as an expense on a straight-line basis over the lease term.

3) Lessor

When the Company acts as a lessor, it determines at lease commencement whether each lease is a finance lease or an operating lease. To classify each lease, the Company makes an overall assessment of whether the lease transfers to the lessee substantially all of the risks and rewards of ownership incidental to ownership of the underlying asset. If this is the case, then the lease is a finance lease; if not, then the lease is an operating lease. As part of this assessment, the Company considers certain indicators such as whether the lease is for the major part of the economic life of the asset.

When the Company is an intermediate lessor, it accounts for its interests in the head lease and the sub-lease separately. It assesses the lease classification of a sub-lease with reference to the right-of-use asset arising from the head lease, not with reference to the underlying asset. If a head lease is a short-term lease to which the Company applies the exemption described above, then it classifies the sub-lease as an operating lease.

If an arrangement contains lease and non-lease components, the Company applies IFRS15 to allocate the consideration in the contract.

(k) Investment property

Investment properties are properties held to earn rentals and/or for capital appreciation (including property under construction for such purposes). Investment properties also include land held for a currently undetermined future use.

Investment properties are measured initially at cost, including transaction costs. Subsequent to initial recognition, investment properties are measured at cost less accumulated depreciation and accumulated impairment loss. Depreciation is recognized using the straight-line method.

On derecognition of an investment property, the difference between the net disposal proceeds and the carrying amount of the asset is included in profit or loss.

(l) Intangible assets

Intangible assets with finite useful lives that are acquired separately are initially measured at cost and subsequently measured at cost less accumulated amortization and accumulated impairment loss.

Amortization is recognized on a straight-line basis over the estimated useful lives of intangible assets from the date that they are available for use. The estimated useful life, residual value, and amortization method are reviewed at the end of each reporting period, with the effect of any changes in estimate accounted for on a prospective basis. The residual value of an intangible asset with a finite useful life should be assumed to be zero unless the Company expects to dispose of the intangible asset before the end of its economic life.

(m) Oil and gas interests and exploration expenses

All geological and geophysical exploration costs are charged to current income.

The costs of drilling exploratory wells ("exploration well expenses") in sites that have not yet proven to contain reserves of commercial quantities ("unproven sites") are initially charged to current income. Exploration well expenses are subsequently capitalized as part of "oil and gas interests" accounts when (i) sites are proven to contain mineral reserves of commercial quantities and (ii) the construction of the wellhead equipment or offshore production platforms and flow lines is complete. The exploration expenses incurred in the current year are reclassified from "exploration expenses" to assets. Costs already charged to income in prior years are recognized as assets and as "non-operating income."

The costs of drilling commercial wells, which are constructed after the sites are proven to contain mineral reserves of commercial quantities, are capitalized as assets. However, if the commercial wells turn out to be dry, such costs are charged to current income.

For oil site acquisitions, the Company's payments for this purchase or investments in foreign joint ventures involving interest in oil sites-including the Company's share in the costs of drilling commercial wells, production, transport and storage equipment but excluding the Company's share in the costs of drilling exploratory wells and other exploration expenses-are capitalized as oil and gas interests. The Company's share in joint ventures' net earnings (or net losses) is recognized as other operating revenues (or other operating costs). The Company

recognizes earnings remitted by joint ventures as a reduction of oil and gas interests. These costs are amortized at the ratio of the actual quantity of minerals extracted from the wells for the year to the estimated mineral reserve. The amortized costs and operating expenses paid to joint ventures are regarded as the cost of the Company's share of the oil and gas extracted. The accompanying financial statements included the related sales and cost of goods sold attributable to the Company's share of the oil and gas sold by the joint ventures.

For domestic sites and sites of product-sharing contracts, the Company amortizes the amount recognized in oil and gas interests by the ratio of actual quantity produced in the period over total estimated production quantity of the site. The Company accounts for minerals produced at amortized cost plus the site operation expenses paid, and recognizes crude oil inventory and natural gas inventory by the output value method. The Company recognizes sales and cost of goods sold on the sale of inventory.

For sites of Provision of Services Contract, the Company amortized the amount recognized in oil and gas interests in the same method of that of domestic sites and sites of product-sharing contract. The Company accounts for the amortized amount and the site operation expenses paid as other operating costs. On the other hand, the Company recognized other operating income by multiplying produced quantity to a revenue rate contracted with local oil site governments.

The Company recognizes earnings from Sanga Sanga and translation adjustments based on the financial statements of Sanga Sanga for the same reporting period as that of the Company.

Profit and loss generated from the derecognition of oil and gas interest is measured as the difference between the net disposal proceeds and the carrying amount of the asset and recognized in statement of income in the period of derecognition.

(n) Impairment of non-financial assets

The carrying amounts of the Company's non-financial assets, other than assets arising from inventories and deferred tax assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. If it is not possible to determine the recoverable amount (the higher of its fair value less costs of disposal and its value in use) for the individual asset, then the Company will have to determine the recoverable amount for the asset's cash generating unit (CGU).

The recoverable amount for an individual asset or a CGU is the higher of its fair value less costs to sell and its value in use. When evaluating value in use, the pretax discount rate is used to estimate the future cash flows. The discount rate should reflect the evaluation of specific risk resulting from the impact of the current market on the time value of money and on the asset or CGU.

If, and only if, the recoverable amount of an asset is less than its carrying amount, the carrying amount of the asset shall be reduced to its recoverable amount; and that reduction will be accounted as an impairment loss, which shall be recognized immediately in profit or loss.

An assessment is made at the end of each reporting period as to whether there is any indication that an impairment loss recognized in prior periods for an asset may no longer exist or may have decreased. If any such indication exists, the recoverable amount of that asset is estimated.

An impairment loss recognized in prior periods for an asset is reversed if, and only if, there has been a change in the estimates used to determine the asset's recoverable amount since the last impairment loss was recognized.

(o) Provisions

A provision, including those arising from the contractual obligation specified in a service concession arrangement to maintain or restore the infrastructure before it is handed over to the grantor, is recognized if, as a result of a past event, the Group has a present obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects the current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount is recognized as finance cost.

(p) Revenue recognition

Revenue is measured based on the consideration to which the Company expects to be entitled in exchange for transferring goods or services to a customer. The Company recognizes revenue when it satisfies a performance obligation by transferring control of a good or a service to a customer. The accounting policies for the Company's main types of revenue are explained below.

(i) Sale of goods

The Company manufactures and sells its products to consumers in the retail market. The Company recognizes revenue when a customer takes possession of the product. Payment of the transaction price is due immediately when the customer purchases the product.

(ii) Customer loyalty program

The Company operates a customer loyalty program to its customers. Customers obtain points for purchases made, which entitle them to discount on future purchases. The Company considers that the points provide a material right to customers that they would not receive without entering into a contract. Therefore, the promise to provide points to the customer is a separate performance obligation. The transaction price is allocated to the product and the points on a relative stand-alone selling price basis. Management estimates the stand-alone selling price per point on the basis of the discount granted when the points are redeemed and on the basis of the likelihood of redemption, based on past experience. The stand-alone selling price of the product sold is estimated on the basis of the retail price. The Company has recognized contract liability at the time of sale on the basis of the principle mentioned above. Revenue from the award points is recognized when the points are redeemed or when they expire.

(q) Employee benefits

(i) Short-term employee benefits

Liabilities recognized in respect of short-term employee benefits are measured at the undiscounted amount of the benefits expected to be paid in exchange for the related service.

(ii) Retirement benefits

Payments to defined contribution retirement benefit plans are recognized as an expense when employees have rendered service entitling them to the contributions.

Defined benefit costs (including service cost, net interest and rereasurement) under the defined benefit retirement benefit plans are determined using the projected unit credit method. Service cost (including current service cost) and net interest on the net defined benefit liability (asset) are recognized as employee benefits expense in the period they occur. Rereasurement, comprising actuarial gains and losses and the return on plan assets (excluding interest), is recognized in other comprehensive income in the period in which they occur. Rereasurement recognized in other comprehensive income is reflected immediately in unappropriated earnings and will not be reclassified to profit or loss.

Net defined benefit liability represents the actual deficit in the Company's defined benefit plan.

(iii) Other long-term employee benefits

Other long-term employee benefits are accounted for in the same way as the accounting required for defined benefit plan except that rereasurement is recognized in profit or loss.

(r) Borrowing costs

Borrowing costs directly attributable to the acquisition, construction or production of qualifying assets are added to the cost of these assets until such time as the assets are substantially ready for their intended use or sale.

Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization.

Other than stated above, all other borrowing costs are recognized in profit or loss in the period in which they are incurred.

(s) Income taxes

Income tax expenses include both current taxes and deferred taxes. Except for expenses related to business combinations or recognized directly in equity or other comprehensive income, all current and deferred taxes are recognized in profit or loss.

Current taxes include tax payables and tax deduction receivables on taxable gains (losses) for the year calculated using the statutory tax rate on the reporting date or the actual legislative tax rate, as well as tax adjustments related to prior years.

Deferred taxes arise due to temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and their respective tax bases.

A deferred tax asset is recognized for the carry forward of unused tax losses, unused tax credits, and deductible temporary differences to the extent that it is probable that future taxable profit will be available against which the unused tax losses, unused tax credits, and deductible temporary differences can be utilized. Such unused tax losses, unused tax credits, and deductible temporary differences are also revaluated every year on the financial reporting date, and adjusted based on the probability that future taxable profit will be available against which the unused tax losses, unused tax credits, and deductible temporary differences can be utilized.

Deferred tax liabilities are recognized for taxable temporary differences associated with investments in associates, except where the Company can control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. Deductible temporary differences associated with such investments and interests are only recognized to the extent that it is probable that there will

be sufficient taxable profits against which to utilize the temporary differences and they are expected to reverse in the foreseeable future.

Deferred tax liabilities and assets are measured at the tax rates that are expected to apply in the period in which the liability is settled or the asset realized, based on tax rates and laws that have been enacted or substantively enacted by the end of the reporting period. The measurement of deferred tax liabilities and assets reflects the tax consequences that would follow from the manner in which the Company expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

(t) Earnings per share

Basic earnings per share is calculated as the profit attributable to ordinary shareholders of the Company divided by the weighted average number of ordinary shares outstanding. Diluted earnings per share is calculated as the profit attributable to ordinary shareholders of the Company divided by the weighted average number of ordinary shares outstanding after adjustment for the effects of all potentially dilutive ordinary shares. The Company does not have potentially dilutive ordinary shares.

(u) Operating segments

An operating segment is a component of the Company that engages in business activities from which it may earn revenues and incur expenses (including revenues and expenses relating to transactions with other components of the Company). Operating results of the operating segment are regularly reviewed by the Company's chief operating decision maker to make decisions about resources to be allocated to the segment and to assess its performance. Each operating segment consists of standalone financial information.

(5) Significant accounting assumptions and judgments, and major sources of estimation uncertainty:

The preparation of the financial statements in conformity with the accounting laws and regulations governing state-owned enterprises, the Regulations and with the IFRSs, IASs, interpretations as well as related guidance endorsed by the FSC of the Republic of China requires management to make judgments, estimates, and assumptions that affect the application of the accounting policies and the reported amount of assets, liabilities, income, and expenses. Actual results may differ from these estimates.

The management continues to monitor the accounting estimates and assumptions. The management recognizes any changes in accounting estimates during the period and the impact of those changes in accounting estimates in the following period.

Information about judgments made in applying accounting policies that have the most significant effects on the amounts recognized in the financial statements is as follows:

Judgment regarding significant influence of investees

The company holds 35%-49% of the voting shares of several investee companies, but because the remaining equity of these investee companies are concentrated in very few shareholders, the company cannot exercise more than half of the voting rights, nor can it obtain a majority of directors' seats. Therefore, the company has only significant influence on these investee companies.

Among the uncertainties of the assumptions and estimates, the relevant information that has significant risks may cause critical adjustments in the following years is as follows:

(a) Estimated impairment of trade receivables

The Company has estimated the loss allowance of trade receivable that is based on the risk of a default occurring and the rate of expected credit loss. The Company has considered historical experience, current economic conditions and forward-looking information at the reporting date to determine the assumptions to be used in calculating the impairments and the selected inputs. The relevant assumptions and input values, please refer to note 6 (c).

A Five-year Financial Summary

(In Thousands of New Taiwan Dollars)

	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>
Sales and other operating revenues	903,772,722	721,700,943	1,014,108,034	1,034,575,286	896,642,121
Profit (loss) before income tax	(47,131,715)	(7,703,206)	33,337,332	43,762,837	48,542,061
per dollar of sales and other operating revenues (NT\$)	-0.052	-0.011	0.033	0.042	0.054
Cash dividends	0	0	24,678,319	1,314,441	–
per dollar of capital(NT\$)	0.00	0.00	0.19	0.01	–
Owner's equity	262,121,184	294,099,129	306,048,146	297,598,941	260,417,391
per dollar of capital (NT\$)	2.01	2.26	2.35	2.29	2.00
General taxes and import duties	41,285,677	36,921,621	46,614,084	58,228,141	51,348,334
Commodity tax	66,285,387	71,066,139	71,598,649	72,007,592	74,288,029
Total taxes	107,571,064	107,987,760	118,212,733	130,235,733	125,636,363
Working capital (current assets less current liabilities)	(118,101,309)	(62,628,400)	(48,410,303)	(52,777,478)	(56,879,637)
Ratio of current assets to current liabilities	64.71%	69.84%	81.17%	79.91%	75.93%
Long-term Liabilities	75,000,000	75,150,000	76,050,000	88,050,000	126,590,000
Properties, plant, and equipment-gross	940,305,423	924,745,805	909,097,079	914,752,212	913,710,040
Properties, plant, and equipment-net	446,820,912	434,621,786	421,334,223	423,460,997	430,577,501
Exploration expenses (including all dry holes)	2,119,987	1,712,403	2,031,934	2,573,975	2,195,701
Total assets	842,284,751	737,278,927	801,948,280	769,502,334	745,046,121
Employed capital (Equity, long-term debt)	337,121,184	369,249,129	382,098,146	385,648,941	387,007,391
Employees on December 31	16,374	16,123	15,836	15,712	14,814
Sales and other operating revenues per employee	55,196	44,762	64,038	65,846	60,527

A Five-year Operation Summary

	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>
Crude oil produced-total KL	285,671	261,688	265,278	180,062	193,474
daily average KL	783	717	727	493	530
Natural gas produced-total MCM	502,328	494,772	519,833	240,026	268,115
MCM per day	1,376	1,356	1,424	658	735
Liquefied petroleum gas produced-total MT	8,999	2,184	3,929	-	-
MT per day	25	6	11	-	-
Wells drilled during the year	1	3	3	2	2
Crude oil processed-total KL	21,854,071	20,543,276	23,763,205	22,213,776	21,661,811
daily average KL	59,874	56,283	65,105	60,860	59,347
Natural gas sold-total MCM	25,560,250	23,554,348	21,733,213	22,171,345	21,967,834
MCM per day	70,028	64,532	59,543	60,743	60,186
Refined products sold-total KL	22,949,808	30,453,406	34,312,260	34,661,601	35,524,415
daily average KL	62,876	83,434	94,006	94,963	97,327
Petrochemicals sold-MT	4,388,136	4,147,178	4,253,913	4,281,652	4,016,126
daily average MT	12,022	11,362	11,655	11,731	11,003

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