

**2020** CPC Corporation, Taiwan





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July 2020

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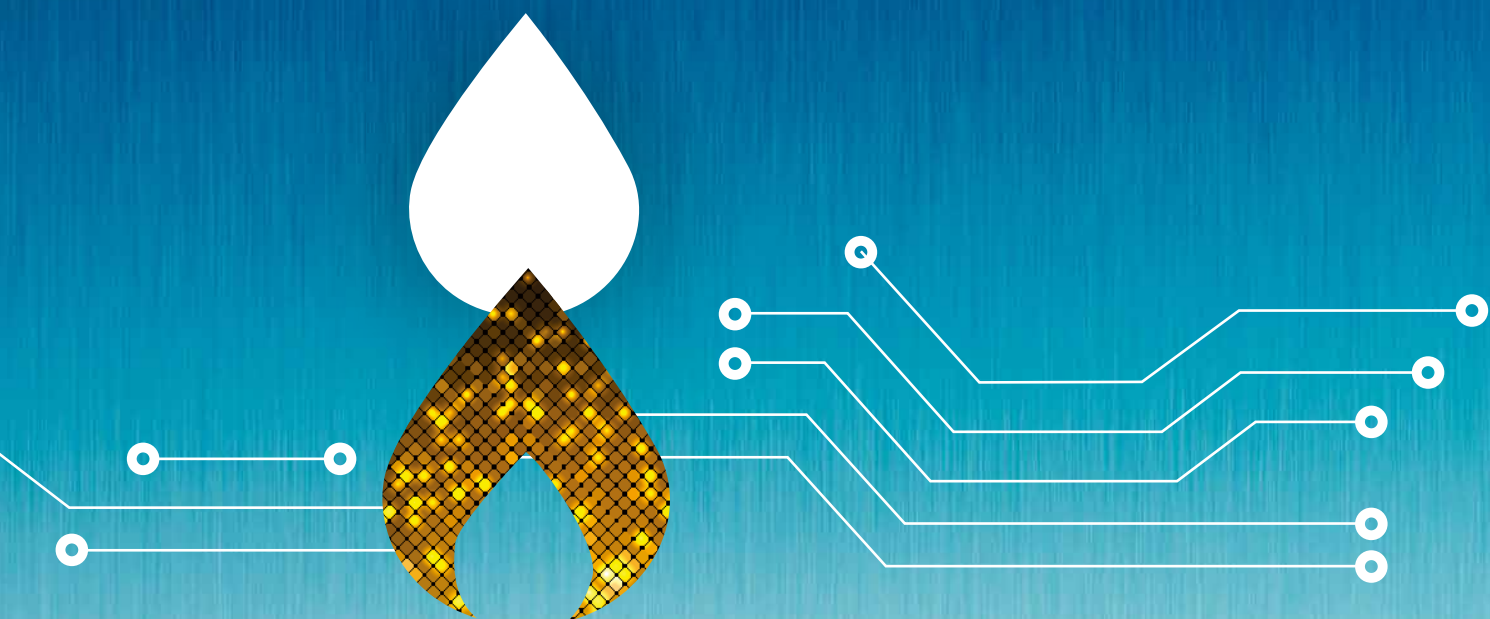
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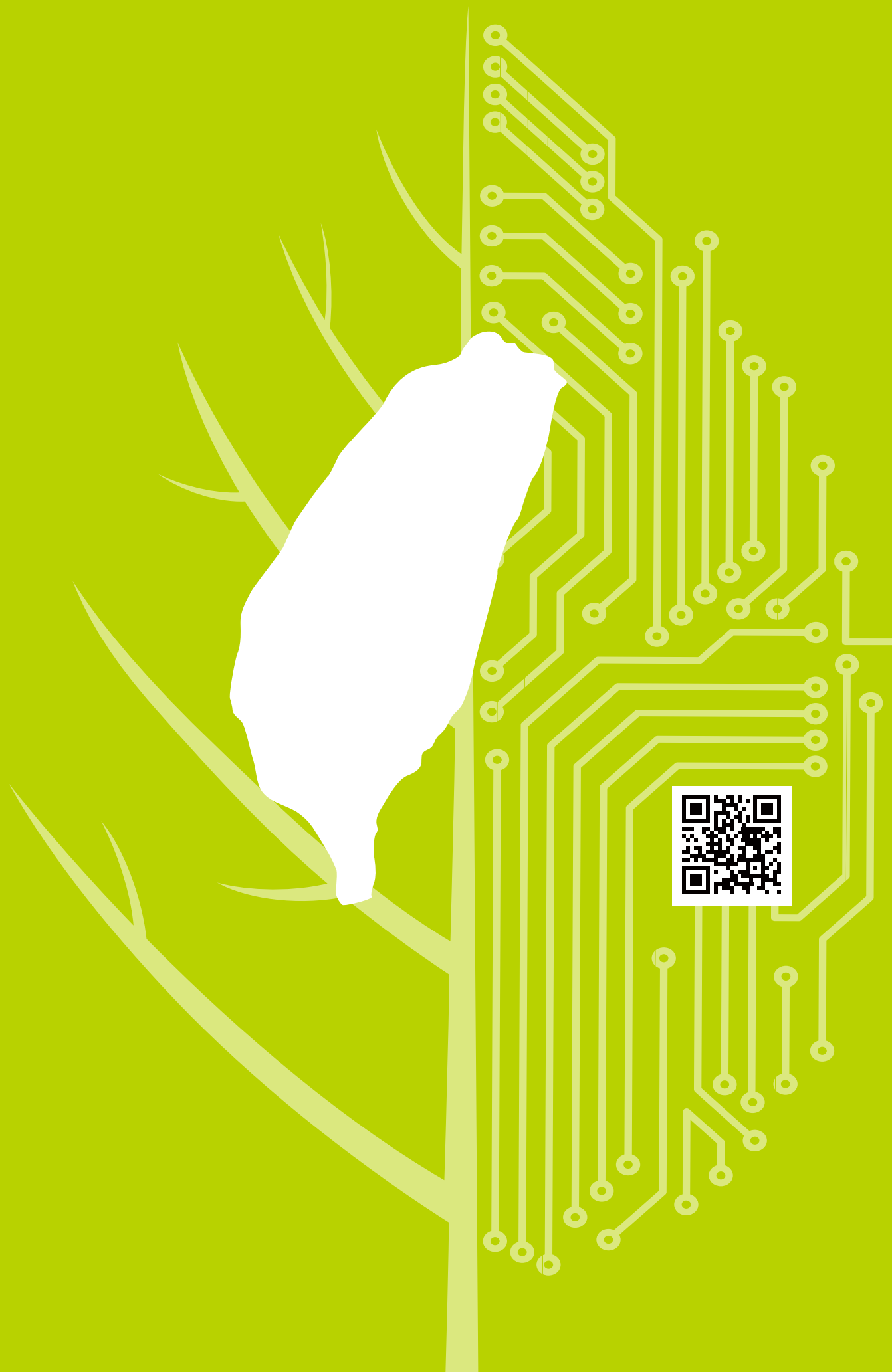
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# The Chairman's Preface

## Overcoming adversity, rising to new heights of performance



The world was troubled by a constant stream of trade disputes in 2019, political crises in oil-producing countries intensified geopolitical risks, oil production in the U.S. reached new highs, international oil and gas prices remained unsettled but turned downward after the middle of the year, and overall economic growth momentum weakened. These factors brought pressures to the operations of CPC. Thanks to the efforts of our staff, we were able not only to fulfill our mission of providing a stable supply of the oil, gas, and petrochemical raw materials needed in Taiwan but also managed to achieve a brilliant performance with more than NT\$1 trillion in revenues and a before-tax profit of NT\$33.3 billion.


CPC recorded major achievements in all of fields of business. In the area of international cooperation in exploration, we achieved self-production and self-lifting for the first time (Australia's Prelude floating platform LNG development project), with the first ship arriving in Kaohsiung's Yongan Harbor in November. We obtained a 40% working interest in Indonesia's East Seram PSC block and will restart exploration there. In the field of natural gas, CPC and Japan's JERA, the world's largest LNG importer, jointly signed a contract with Mozambique LNG1 for the co-purchase of 1.6 million tons of LNG annually from Mozambique in East Africa, thereby diversifying our sources of gas. In addition, the first ship carrying U.S. shale gas under a long-term agreement arrived in Taiwan in September. In the area of innovative marketing, CPC Pay was launched in 12 November, initiated to provide customers with a new payment option and create a convenient consumption environment. To accommodate the development of electric vehicles, we installed 216 charging and replacing stations. In the field of green energy, we completed drilling and production testing of the Renze No. 3 and No. 4 geothermal wells in Yilan; we also put two demonstration smart green gas stations in operation, one on Qianfeng Road in Tainan and the other on Xinyi Road in Chiayi.



CPC has always devoted efforts toward caring for and paying back to society. In 2019, for the seventh year in a row, we organized the Green Dragon Creativity Summer Camp, inviting schoolchildren from neighboring areas, disadvantaged groups, and remote areas to participate and take away happy summer memories while setting down the roots of energy education. We held simultaneous mountain cleanup activities in northern, central, southern, and eastern Taiwan, showing the concern for the earth through concrete action. Together with the Panasonic Taiwan group, CPC co-organized the 2019 Green Life Creative Design Competition to stimulate the creative brainpower of students and implant the seeds of green living. We renovated and reopened the Petroleum Discovery Museum in the CPC Building in Taipei and the Taiwan Oil Field Exhibition Hall in Miaoli County to boost the public's understanding of petroleum energy. We inventoried and repaired computers in all business units, and donated suitable computers to schools in remote areas and to disadvantaged groups, helping to upgrade administrative efficiency and educational quality while shortening the digital gap between urban and rural areas. For many years, CPC has manifested the spirit of corporate charity by organizing the One Million CC of Blood Donation. We also worked to promote sports in Taiwan by sponsoring the development of elite athletes and adopting school ball teams in remote areas.

After years of devotion, CPC has won the general acclaim of society. In 2019, CPC received the *Reader's Digest* Trusted Brand - Platinum Award for the 19th consecutive year; four top honors in the National Brand Yushan Awards, and CPC gas stations took first place in the Consumers Ideal Gas Station Brand category; the 11th Sports Activist Gold Awards held by the Sports Administration, Ministry of Education; we received a Happy Business Award and the 14th Arts & Business Award held by the Ministry of Culture. CPC also won top honors in the 2019 National Talent Development Awards, representing the highest recognition for the development of talent. In the field of sustainability, CPC won a BSI Excellence Award from the British Standards Institute, an Asia Corporate Excellence & Sustainability Award from Malaysia, and a 2019 Taiwan Corporate Sustainability Award from the Taiwan Institute for Sustainable Energy. These honors all reflect the CPC's pursuit of a win-win-win for "economy, environment, society."

## Anticipating Trends with Forward-looking Planning



With the "low-carbon, clean energy, and energy conservation" trends in energy consumption, the restructuring and transformation of the energy industry, and the growing application of new technologies in traditional industries, international oil majors are developing new fields of business. CPC is also anticipating this trend with forward-looking strategic planning in the interest of sustainable operation. First, low-carbon, and clean natural gas will play an important role in the process of energy transition; CPC is responding to the growing domestic demand for natural gas by working vigorously to diversify import sources as well as expand transmission and storage facilities to make them more comprehensive and achieve the goal

of stable supply while boosting natural gas usage. At the same time, CPC will strive to develop green energy; in line with the government's renewable-energy policy, CPC will work constantly with the Taiwan Power Co. to promote the exploration and production of geothermal energy in Taiwan. CPC will respond to the low-sulfur, reduced-benzene trend in petroleum products by readjusting our refining structure and bringing in brand-new technologies and processes so that we can meet regulatory requirements and upgrade our quality. CPC is planning to move our gas stations in the direction of becoming multi-functional supply stations that provide a diverse range of services. CPC will also pursue the policy of adding more battery charging and replacing stations for electric vehicles, and will strive for transition in the direction of smart green energy.

CPC works hard at research and development, and has achieved promising preliminary results in the development of environmental forensics technology, key technologies for C5/C6 high-value products, and key materials for lithium batteries. We are introducing new technologies such as artificial intelligence (AI) and Big Data analysis into our production plants and related facilities with the aim of strengthening operational safety and upgrading management synergies.

With the year 2020, the world is ravaged by the COVID-19, and countries everywhere have moved to prevent its spread by locking down cities, restricting movement, and even closing their borders. This has brought severe shocks to global economic and productive activity; international crude oil prices collapsed overnight, falling to the lowest level since 1999. As a result, CPC has encountered serious operational challenges. Faced with the uncertainties caused by the pandemic, CPC is devoting to prevent the disease, ensure the safety of all our employees, and maintain the smooth operation of facilities; in addition, CPC is working on a safe-environment basis to carry out a strategy of flexible control of production, marketing, transmission, and storage designed to assure continuity and stability in domestic energy supply and security. At the same time, CPC is carrying out new investment, joint venture, and R&D projects to lay down a solid foundation for the company's transformation and development, once the epidemic is over and the economy recovers, we can continue working toward new heights of performance.

With the epidemic still raging, CPC, as a state-owned enterprise, will work in line with government policy to help implement bailout and recovery measures. We will strive constantly toward energy conservation and carbon reduction while also giving consideration to ecological protection, care for disadvantaged groups, and fulfillment of corporate social responsibility. We will pursue a win-win-win of "economic development", "environmental protection" and "social care" as we advance toward our corporate vision of sustainable energy and the realization of co-existence with the environment and prosperity for all.



Chairman

*Jia Ruoyou*

President

*Lee, Shun-chin*



# The origin

remembering where  
everything comes from

# Sustainable Development

Look ahead of international trends and focus on sustainable operations



## CPC's timeline of innovative development

**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 carry out throughout Taiwan, encompassing import; 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 its 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 the revision of the company's articles of association and moved the headquarter from Taipei City to Kaohsiung City.



In order to meet global trend and achieve worldwide environmental protection, in 2003, CPC instituted a policy of sustainable operation. CPC based on the policy to set up key performance indicators, striving to hit the responding targets:

## Sustainable Development Policy

- Comply with both Taiwan's governmental regulations and international protocols.
- Practice comprehensive clean manufacturing methodology to protect the environment.
- Conserve water and energy resources through efficient utilization.
- Place a high value on fulfilling CSR commitments and expand the service area.
- Establish indicators of environmental protection while keeping information transparent.
- Actively research and develop products while expanding new areas of business.

In addition, in 2005, CPC set up the Sustainable Operations Promotion Committee – focus on strategy formulation and objectives setting regarding sustainable operation issues. The operations development project was divided into four major fields: environmental and ecological conservation; social care; strategy formulation and development, environmental accounting and information. The Committee's level was upgraded in 2007 and was directed by CPC's Chairman of the time personally. CPC's President holds the post as associate director of committee, the Vice Presidents and CEO of the five major business units serve as committee members. Since 2008, it has begun recruiting external scholars and experts as members. The committee convenes three times a year to discuss progress and raise proposals in the four fields mentioned above. In this way, the committee is able to gain a timely grasp of the society pulse, promote sustainability issues and keep track of implementation progress.

Concerning the communication with our stakeholders, apart from setting the world wide web and issuing annual reports, CPC began issuing annual Sustainability Reports in 2007. The reports manifest to communicate and engage all of our stakeholders in that issue.

In the future, CPC will adopt the UN's Sustainable Development Goals (SDGs) as benchmarks for our own sustainable corporate development program. Nonetheless, the Sustainable Operations Promotion Committee will focus on implementing sustainable development issues and use social media and the sustainability report to inform the relative information. CPC strives to create a win-win-win situation encompassing "environmental protection", "economic development", and "social care" while engaging each industry to create a better future.



## 2019 Recognition and Honors

- *Management Magazine* - No.1 Consumers' Ideal Gas Station Brand for the 15th consecutive year.
- *Reader's Digest* Trusted Brand - Platinum Award for the 19th consecutive year.
- 2019 *Reader's Digest* Trusted Brand Gold Award in the lubricating oil product category.
- Received Seven Taiwan Corporate Sustainability Awards, including Corporate Sustainability Award, Corporate Sustainability Report Award – Platinum and five awards in specific categories: Gender Quality Award, Climate Leadership Award, Creativity in Communication Award, Growth through Innovation Award, and Circular Economy Leadership Award.
- Received four awards at the 16th National Brand Yushan Awards: Best Brand Award, First-place Best Brand Award and two Best Product Awards.

## Board and Corporate Officers

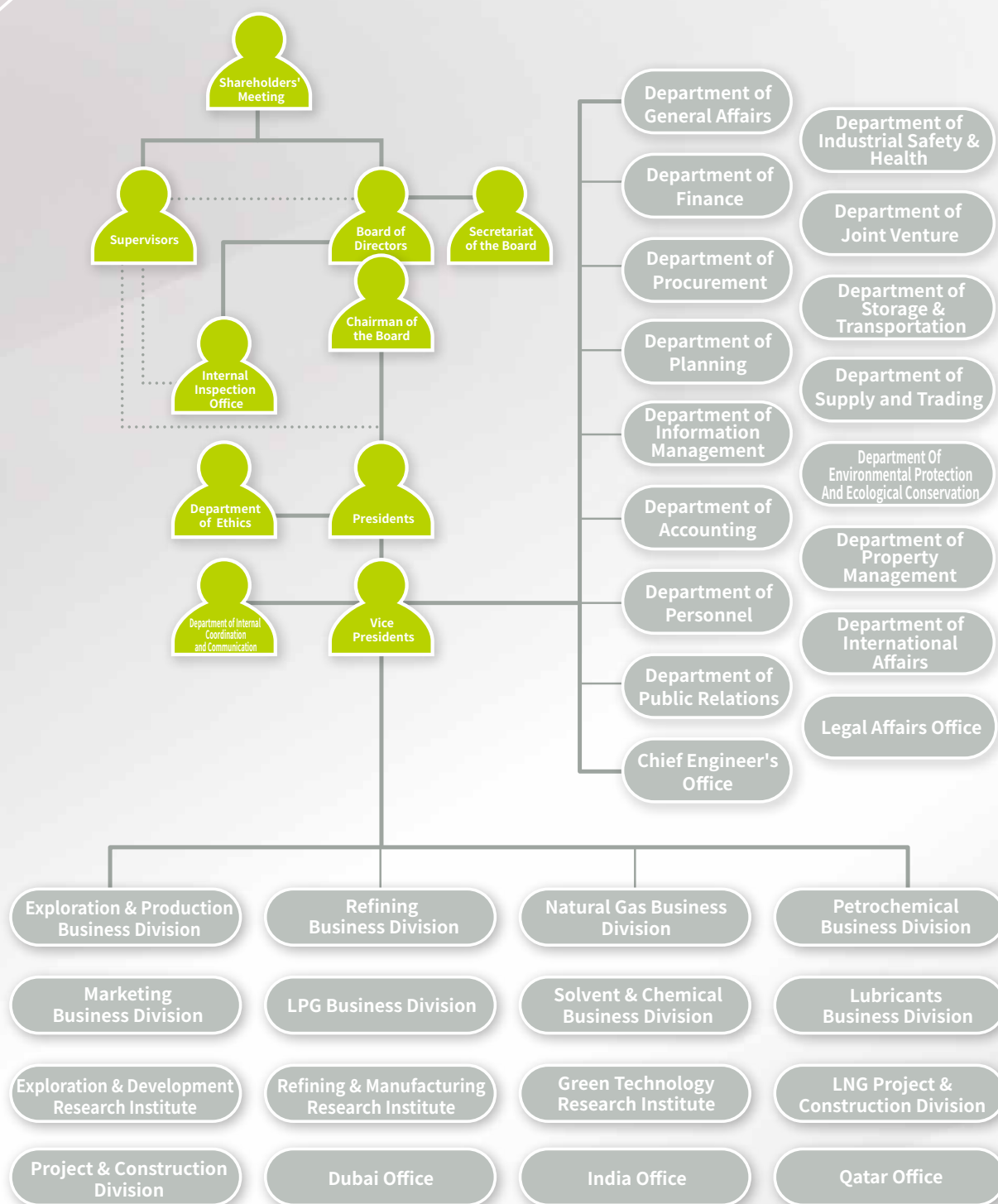
### Board of Directors

Chairman & Standing Director	Jia-Ruey Ou		Chung-Hsien Chen Chao-Chung Kuo Chih-Chang Chen Kuo-Cheng Chou Sheng-Ching Huang
Directors			
Standing Director	Shun-Chin Lee		
Standing Director & Independent Director	Ming-Chang Hsu	Supervisors	
Independent Director	Chih-Cheng Shen Syang-Peng Rwei Engel Wu Pei-Li Chen Peggy L. Lin		Hui-Shan Wei Feng-Yuan Chien

### Corporate Officers

President	Shun-Chin Lee	CEO, Lubricants Business Division	Ting-Pang Chi
Vice Presidents	Ming-Huei Chen Jeng-Zen Fang Jen-Hung Huang Shu-Chen Chen Chia-Shou Chiu	CEO, LPG Business Division	Feng-Cheng Chu
CEO, Exploration & Production Business Division	Michael Chang	CEO, Solvent & Chemical Business Division	Angela Ko-Ju Lin
CEO, Refining Business Division	Henry Hsu	Director, Refining & Manufacturing Research Institute	Kun-Hai Lin
CEO, Petrochemical Business Division	Yi-Fang Wu	Director, Exploration & Development Research Institute	Ta-lin Chen
CEO, Marketing Business Division	Po-Tung Lo	Director, Green Technology Research Institute	Tung-Li Huang
CEO, Natural Gas Business Division	Jane Liao	Director, LNG Project Division	Roung-Yuh Huang
		Director, Project & Construction Division	Jack S.J. Wang

## Organization Chart



## Corporate Officers



Jane Liao

CEO,  
Natural Gas  
Business Division

Po-Tung Lo

CEO,  
Marketing  
Business Division

Yi-Fang Wu

CEO,  
Petrochemical  
Business Division

Chia-Shou Chiu

Vice President

Jen-Hung Huang

Vice President

Jia-Ruey Ou

Chairman



Shun-Chin Lee

President

Shu-Chen Chen

Vice President



Ming-Huei Chen

Vice President

Jeng-Zen Fang

Vice President

Henry Hsu

CEO,  
Refining Business  
Division

Michael Chang

CEO,  
Exploration &  
Production  
Business Division



# Working Together

**Manifesting the Infinite  
Power of Teamwork**



# Upstream Operations

Expand international cooperation to boost energy independence

## Exploration and Production

Taiwan has limited indigenous energy resources; therefore, it depends on import for most of its fossil fuel needs. As a result, CPC has cooperated with the government to implement the policy of "Expanding upstream energy operations by acquiring and forging international energy cooperation". CPC dedicated to ramp up energy production, expand upstream operations, increase oversea production to stabilize the supply of crude oil and natural gas of the domestic market and alleviates the impact brought by oil price fluctuation.

In order to improve the overall strategic positioning and stay in alignment with the key corporate philosophy of "active expansion, focused development", CPC has adopted exploration and production strategies aimed at gradually increasing the ratio of self-owned and therefore self-controlled energy reserves within its full sourcing range. Achieving this means, in summary: expanding the development of overseas resources while exploiting the indigenous ones to their maximum capacity; expanding the scope and quickening the pace of exploration activity through both acquisitions and organic growth; and the training and retention of talent – an essential step to success.

## Continuous Development of Geothermal Energy

In 2019, CPC made progress in testing the potential of Taiwan's indigenous energy resources. A 135.7 km 2D seismic survey of geological structures on the eastern edge of the Pingtung Plain was completed; the geothermal characteristics of a 72 km<sup>2</sup> block running from Chiayi to west of the Pingxi Fault in Tainan were verified, as were they also around Renze in Yilan County and in the Mt. Datun area. All told, the company's 28 currently-producing oil and gas wells – located in and around Mt. Tiezhen, Qingcao Lake, Jinshui, Chuhuangkeng and Guantian yielded 167 million cubic meters of natural gas and 3,852 kiloliters of condensate in 2019. In line with national energy policy and actively burnishing its green energy industry credentials, CPC has also successfully completed the Renze No. 3 and No.4 geothermal wells with expected producing enthalpy.

## Deep-water exploration in the Taiwan Strait and planning for offshore exploration

CPC, Total E&P Chine (TOTAL), and China National Offshore Oil Corporation (CNOOC) signed the Petroleum Contract of Taiyang Block on May 3, 2017. TOTAL, as the Operator, has conducted over 8,000 km 2D seismic survey data acquisition during 2017-2019, and the ongoing data processing and interpretation jobs will continue into 2020.

CPC has joined forces contractually with Husky Energy International Corporation to search for oil and gas in deep-water areas within the Block Deep Water 1 (DW-1) in Tainan basin. 3D seismic inversion and AVO analysis were completed in 2019. Refinement of seismic interpretation collaborated source rock study and assessment for resource scale of prospects are ongoing through 2020. Meanwhile, CPC is evaluating the upside hydrocarbon potential of Tainan and Taihsi Basins Taiwan as the reference for the further exploration on those areas.



2019 Domestic natural gas production

167 million cubic meters



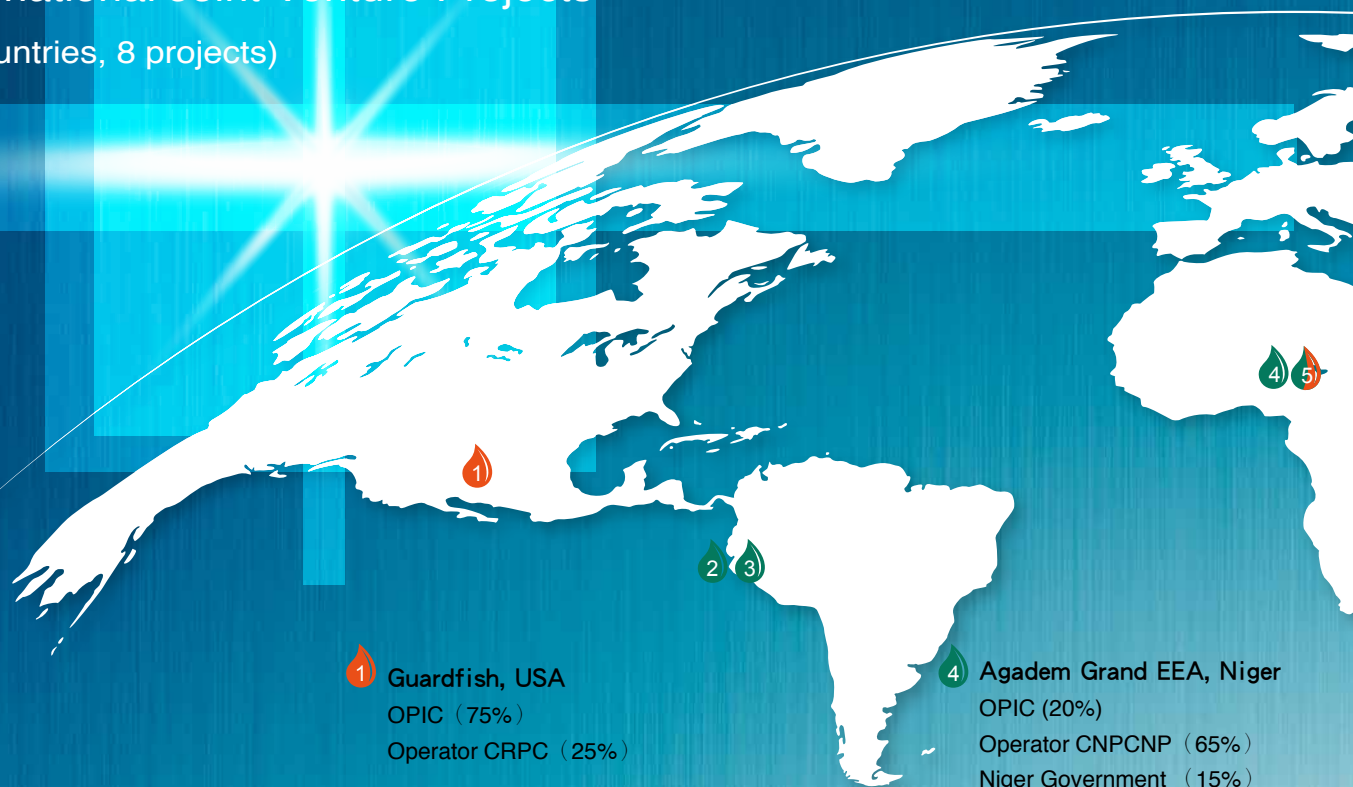
2019 Domestic condensate production

3,852 kiloliters



## International Joint Venture Projects

(6 countries, 8 projects)



**1 Guardfish, USA**  
OPIC (75%)  
Operator CRPC (25%)

**2 Block-16, Ecuador**  
OPIC (31%)  
Operator Repsol (35%)  
Sinopec (20%)  
Sinochem (14%)

**3 Block-17, Ecuador**  
OPIC (30%)  
Operator PetroOriental (70%)

**4 Agadem Grand EEA, Niger**  
OPIC (20%)  
Operator CNPCNP (65%)  
Niger Government (15%)

**5 Oryx, Chad**  
Operator OPIC AFRICA (35%)  
CEFC (35%)  
SHT (30%)

**5 BCO III, BCS II, BLTI, Chad**  
Operator OPIC AFRICA (35%)  
CEFC (35%)  
SHT (30%)

### Putting overseas exploration plan into production

In 2019, CPC has been engaged in oil and gas exploration and production joint-ventures with international oil companies in eight locations spanning six countries. About 241 producing wells across these geographies yielded a CPC production share amounting to 4.87 million barrels of crude oil, 404 million cubic meters of natural gas and 58.7 thousand barrels of LPG, with blocks in Ecuador, Niger and Australia. Moreover, Chad and Niger set to follow suit sometime soon, the outlook for upstream operations' profitability in the near term looks promising.

In Chad, where CPC has been acting as operator in exploration since 2006, the concession for a 25-year development and production of certain discoveries was

granted by a presidential decree on July 14, 2017. This is the first time for CPC's teams to discover oil in commercial quantities and embarked on development and production programs with the status of operator. The drilling of development wells and the installation of production facilities was completed progressively and the first oil production was launched in February 2020. It will be another exemplary performance of CPC for achieving the twin goals of boosting the number of oil and gas sources under its control and upgrading the stability of Taiwan's energy supplies.

The fact that Taiwan's onshore oil and gas reserves could be depleted within 10 years from now drives CPC's continued engagement in overseas exploration and production as well as M&A activities. CPC has also reset its overseas exploration strategy in line with both the



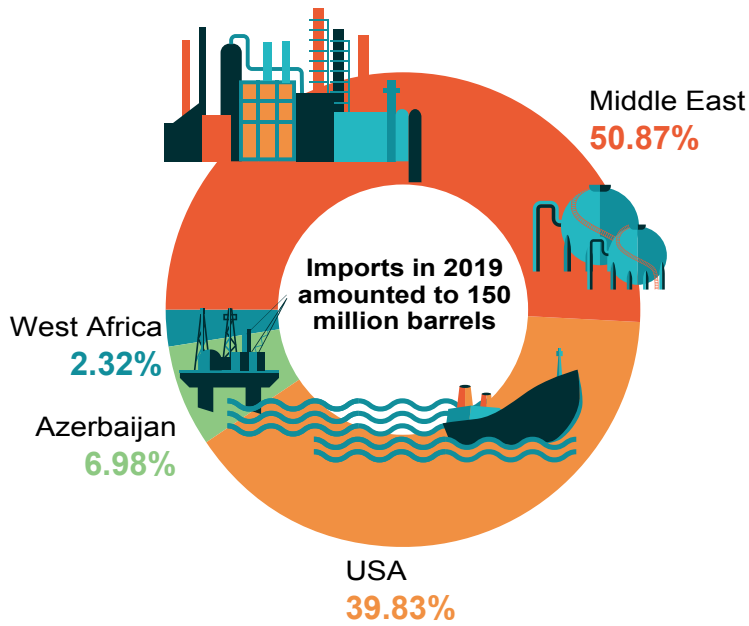
government's New Southbound Policy and with trends in the international energy industry – which means being active in joint-ventures and/or acquisitions pertaining to oil and natural gas producing assets in places such as Southeast Asia and the United States and then developing them for commercial production. Exploration for conventional oil and gas is currently focused on North America (including California and offshore Canada), Southeast Asia, Australia and offshore West Africa; for unconventional resources, the focus is on acquiring shale oil and gas assets in the United States, building up relevant technical capabilities and pursuing global unconventional resources opportunities. In all of the aforementioned activities, CPC is working vigorously to deploy its available resources to best advantage, on core overseas target areas that hold out the possibility of discovering oil and gas

resources with commercial production value and that will materially raise the degree of self-sufficiency.

CPC's upstream operations were launched in 1959. Today, it comprises exploration and production in both onshore and offshore oil and gas fields in Taiwan, the Taiwan Strait and overseas. To date, CPC has yielded the value of over NT\$200 billion. Looking to the future, CPC actively enhances the asset value of production sites and plans M&A activities that is centered on exploration and raising its level of ownership over core oil and gas reserves. CPC will endeavor to acquire assets with high upside production potential, above all those with low risk by industry standards. In parallel with this, CPC has initiatives to develop diversity in the company's scope of business and to be a player in the green energy industries, aiming to be the most valuable oil and gas production business.

## Downstream Operations

Being responsible for stable domestic oil and gas supply



### 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 in 2019 amounted to 150 million barrels; of that total, 50.9% came from the Middle East, 39.8% from the USA, 7% from Azerbaijan and 2.3% from West Africa. Imports of low-sulfur crude are maintained at a set ratio of the total to enable compliance with Taiwan's ever more stringent environmental protection standards.





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

### Quality and Performance improvement

CPC now operates two refineries in Taiwan — at Taoyuan and Dalin— with a combined daily refining capacity of 600 thousand barrels of crude. Under government policy for industry relocation, Kaohsiung Refinery, an integrated refining and petrochemical production complex with a daily refining capacity of 220 thousand barrels of crude as well as 500 thousand 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 4 offshore mooring buoys as well as large and small wharves for handling both imports and exports, holding the capacity of up to 400 thousand barrels of crude. The Taoyuan Refinery came on stream in 1976; after

engineering modifications and the addition of the second topping unit, its daily refining capacity now amounts to 200 thousand barrels of crude. In 2019, the total of refined products was 9,057 thousand kiloliters of gasoline, 2,360 thousand kiloliters of aviation fuel, 6,924 thousand kiloliters of diesel, 1,510 thousand kiloliters of fuel oil, and 431 thousand metric tons 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 and CPC has moved to enhance the quality of those goods. Going further, the company has in recent years raised the production value of its products by building additional and more technologically-advanced refining facilities such as reforming units, isomerization units, a tert-Amyl methyl ether and gasoline/diesel desulfurization plant, an aviation fuel processing facility, together with n-alkane, alkylation and residual fluid catalytic cracking (RFCC) units. All of the foregoing evidences the company's aim to provide Taiwan's people with a continually-improving range of petroleum products while upgrading the efficiency of its production methods.





## Increase in performance while cutting down pollution

CPC responds to the EPA's call for certain reductions in the area of fuel quality in 2011: of the sulfur content of gasoline and diesel fuel to under 10ppmw, of the aromatic hydrocarbon content of gasoline and diesel fuel to 35vol% and of the alkene content of gasoline to 18 vol%, CPC had constructed a 30 thousand barrels per day gasoline pyrolysis and hydro-desulfurization unit at the Taoyuan Refinery by 2008, a 20 thousand barrels per day gasoline pyrolysis and hydro-desulfurization unit at the Dalin Refinery by 2009 and a 40 thousand barrels per day diesel hydro-desulfurization unit at the Dalin Refinery by 2010. Furthermore, an 18 thousand barrels per day gasoline pyrolysis and quality improvement unit was moved in 2011 from the Kaohsiung Refinery to the Dalin plant.

Since 2006, CPC began increasing its heavy oil conversion rate by enhancing construction of both an 80 thousand barrels per day RFCC unit at the Dalin Refinery. The RFCC unit at the Dalin Refinery began testing and volume production in 2013. In order to ensure an adequate supply of olefin as feedstock, CPC also built a 14 thousand barrels per day alkylation unit at the Dalin Refinery to further upgrade the quality of its gasoline; and that unit came on stream in the middle of 2013. In addition, to cope with the acid gas in the process and reduce pollution, it invested in the construction of a sulfur plant with a daily output of 250 tons and produced qualified sulfur products at the end of June 2014.

In addition, CPC carried out an expansion of the No. 3 Hydro-desulfurization Unit at the Dalin Refinery to increase its high-sulfur crude refining capacity which increases from 30 thousand to 40 thousand barrels per day, lower the cost of crude oil procurement and stabilize the quality of the RFCC-unit's feedstock. The expanded unit began production in March 2017.

To cope with the consequences of the Kaohsiung Refinery closure, the Dalin plant's capacity was expanded with the following: a 150 thousand barrels per day atmospheric crude oil distillation unit (CDU), a 50 thousand



barrels per day light crude fractionating unit (CFU), a 40 thousand barrels per day diesel hydro desulfurization (DHDS) unit and a 30 thousand barrels per day kerosene hydro-desulfurization (HDS) unit. These units completed performance testing and began volume production in 2018, in so doing eliminating worries about a shortage of the raw materials needed for the future survival and development of Taiwan's petrochemical industry. With the completion of that expansion project, the 100 thousand barrels per day No. 9 Topping Unit at the Dalin Refinery, which had been operation for some 40 years was shut down. The capacity of the Dalin Refinery was boosted from 300 thousand barrels per day to its present 400 thousand barrels per day, raising CPC's overall daily crude oil refining capacity to 600 thousand barrels per day.

To improve the refining configuration of Dalin Refinery and to meet the more stringent standards of marine fuel oil for IMO 2020, CPC plans to construct a 30 thousand barrels per day vacuum distillation unit (VDU) and a 8 thousand barrels per day solvent deasphalting (SDA) unit at Dalin Refinery along with asphalt storage facilities, an asphalt blending system, revamping of No.9 diesel hydro-desulfurization unit, and associated equipment. CPC aims to increase its competitiveness in oversea and domestic market by these efforts.





2019 Total domestic sales of petroleum products: approximately

**389.7** billion



2019 Domestic petroleum product sales

**18.4** million kiloliters



Downstream Operations



Exports of refined products—primarily to South Korea, Indonesia, the Philippines, Pakistan, Singapore, the UAE, Papua New Guinea and Australia – have increased year by year until in 2019 they amounted to approximately 4.5 million kiloliters. This trend looks set to continue, with additional export markets being developed in the future as a means of the company drawing the maximum possible benefit from this valuable area of business.

### CPC in Petrochemicals: The Essential Elements of Production

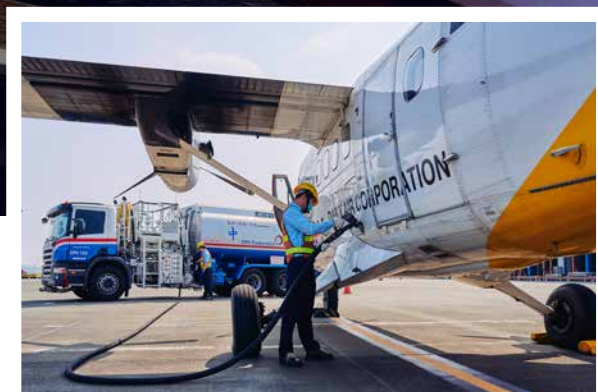
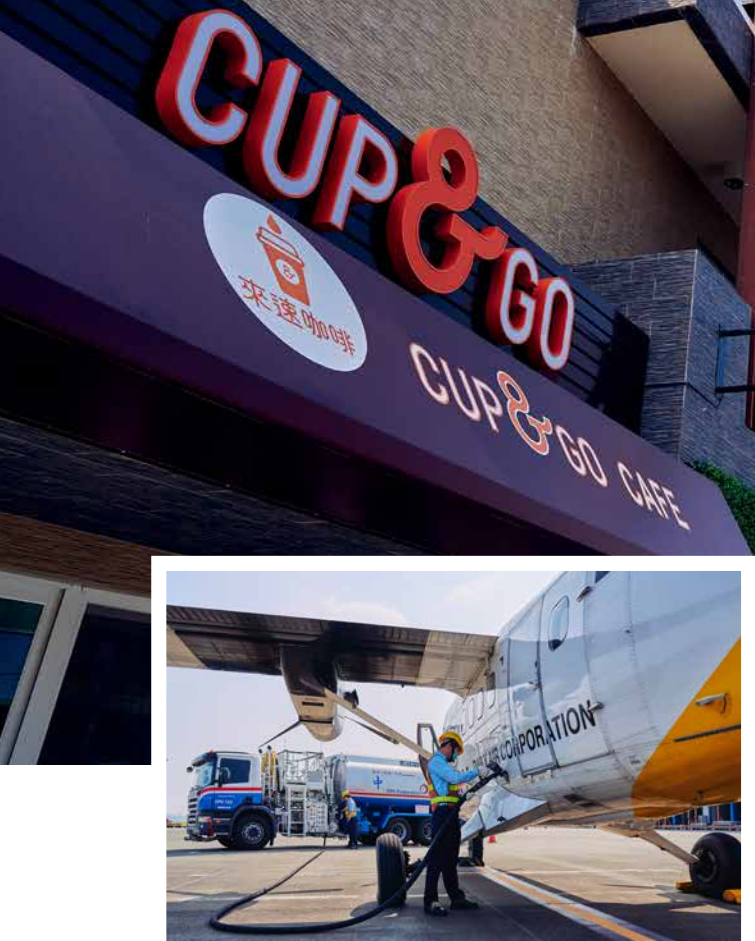
CPC's petrochemical complex is in Linyuan, which is run by Petrochemical Business Division (PBD). There are two existing naphtha crackers in Linyuan- ethylene, propylene and butadiene are major products of these crackers. Besides this, we have additional propylene capacity from our refineries (RFCC), which are operating under our Refining Business Unit (RBU). Total ethylene capacity of this corporation is 1.07 million metric tons. Total propylene capacity is 1.194 million metric tons. As for butadiene, total capacity is 158 thousand metric tons (KTA). These are olefins. As for aromatics, we get them from BTX (benzene/toluene/xylene) extraction units and reforming units. Total benzene capacity is 274 KTA. Total toluene capacity is 321KTA and 507 KTA for mixed xylene.

### CPC organizes and supports the circular economy to create a win-win situation

As a pioneer of the upstream petrochemical business in Taiwan, this corporation has endeavored itself in variety of upstream petrochemical investment to create economic progress in Taiwan. From 2005 years on, CPC has promoted replacement program for old No. 3 cracker in to new No. 3 cracker, with total capex NT\$40 billion. This new No. 3 cracker commercialized in 2013, with ethylene capacity of 720 KTA, propylene 370 KTA and 100 KTA for butadiene. Not only Linyuan but also Ren Da Industrial Park has been benefited by this new cracker. In the future, CPC will keep going for new technology, low energy consumption and economies of scale for our crackers to keep competitiveness of our downstream players

In the face of the challenges posed by climate change and depletion of natural resources, CPC actively follows the government's "Circular Economy" Policy by turning petrochemical by-products used as fuel or previously regarded as industrial waste into value-added products. CPC aims to create a win-win situation between economic development and environmental protection by adhering to the principles of sustainable operations – 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 2019, its sales of those products in Taiwan totaled 18.4 million kiloliters in volume and generated revenue of approximately NT\$389.7 billion. Automotive gasoline accounted for the largest share at approximately 52.3%, followed by diesel at about 26.3%, fuel oil at about 11.7% and aviation fuel at around 9.7%.

Taiwan's internal market of 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 2,501 sites operating in Taiwan at the end of 2019, 614 were directly run by CPC, 1 were jointly run by CPC and other parties, and 1,374 were privately-owned by CPC franchisees, adding up to a total of 1,989 sites. Their sales as a part of the total market volume break down as gasoline 81.1%, diesel 79.3%, fuel oil 93.0% and aviation fuel 59.1%, with the overall market share being 78.4%.

## Improving storage and transportation to meet the needs

CPC operates aviation fueling stations at all of Taiwan's airports - Songshan, Taoyuan, Taichung, Hualien, Taitung, Kaohsiung, Penghu, and Kinmen. Around the coast, it has marine bunkering stations for international vessels at Keelung, Suao, Taichung, Kaohsiung, and Hualien ports.

As of end-2019, CPC operated 13 product distribution

centers, located country-wide at Keelung, Shimen, Taichung, Taichung Harbor, Wangtian, Minxiong, Tainan, Fengde, Qiaotou, Suao, Hualien, Magong, Kinmen and Matsu. These depots supplied filling stations in their surrounding areas with a total of 19.5 million kiloliters of product over the course of the year. Three chemical analysis centers in Keelung, Taichung and Kaohsiung, plus six testing laboratories, were charged with testing products for quality control and altogether handled 36.7 thousand samples during the year. The transportation department has transported 12.4 million kiloliters of oil in 2019, and the mileage was 22.2 million kilometers.

## Mobile payment, optimization of services

In the gas station operation, CPC is unquestionably the market leader by virtue of offering the consumer superior-quality services across the board that differentiates it from competitors. The company further leverages its service advantage by implementing total customer experience management: having created and maintained the 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 it has promoted this combined-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 has introduced and promoted contactless payment (Near-field Communications, NFC) since June 2018. With a view to optimizing the program of Mobile payment, strengthening loyalty of VIP membership, integrating the payment tools and so on, CPC's own payment tool, CPC Pay, was released on November 12, 2019, and it can be considered as the pioneer of exclusively designed for making payments at gas stations. "CPC Pay" combines

diverse functions such as payment, VIP membership services, management, promotions and inquiry services related to vehicles, such as query of parking lot, gas station, fuel price and eTag toll fee. Users can grasp some information efficiently by “CPC Pay”, and the value of CPC and satisfaction of consumer could be improved.

The aforementioned combined-service business model for filling stations comprises the provision of car-washing, quick maintenance and repairs, on-site convenience stores and the sale of superior-quality automotive and consumer products. In a proactive response to the government's policy for developing green energy applications, CPC is busy installing battery-charging and battery-switching stations for electric motorcycles and other EVs. 376 battery-charging and battery-switching stations have been installed and 216 stations are scheduled for completion in 2020. Sales of a range of CPC products through the gas station channel in 2019 included 1.46 million bottles of Kuo-Kuang brand intake-system cleaner for motorcycles, automobiles and diesel vehicles; 450 thousand bottles of See Clean Eco-Friendly Laundry Detergent; and a record 117 thousand mooncake gift boxes. Revenues from car-washing and quick-maintenance services also set new highs. Overall gross profit from these diverse operations exceeded NT\$1.27 billion for the year, abundantly manifesting both the value of CPC-branded gas stations as

a sales and marketing channel and the fact that their range of services meets with customer approval.

CPC set up the 0800-036-188 customer hotline in 2000 to generally enhance its customer service and in particular provide quicker handling of, and response to customers' questions. The 1912 CPC service hotline came into use in 2011, and English service was added in 2020, expanding the company's window for communication with the public.

## Well-recognized green buildings

Within the global trend towards environmental protection, there is now an emphasis on constructing buildings in a way that serves the cause of sustainability. Various terms are used: 'ecology buildings' in Japan, 'eco-buildings' or 'sustainable buildings' in Europe and 'green buildings' in the USA and Taiwan, the aim is to build so as to protect ecological systems, encourage a mutually beneficial relationship between the structures and the environment, conserve energy and reduce both pollution and the overall environmental impact. These sustainable design and eco-protection principles align with CPC's dedication to achieving sustainability in its operations and accordingly a program to green its gas stations began in 2013. As of December 2019, 57 sites have received 'green building' certification.

## Location Of CPC Gas Stations With 'Green Building' Certification



## Natural Gas:

CPC's 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 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. To cope with growing demand, its capacity was later boosted to 4.5 million tons annually; and a second-phase expansion project was completed in December 1996. 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.

### Building up Taiwan's natural gas production, transmission and storage infrastructure

Taiwan's aforementioned second LNG receiving terminal is sited close to Taichung's Port West Pier 13 and the hinterland. With the primary purpose of supplying natural gas to Taiwan Power Company's (Taipower) industrial firms and household users in central and northern Taiwan, CPC built an annual LNG handling capacity of 3.0 million tons, three LNG storage tanks each of 160 thousand-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 currently-ongoing Taichung LNG Terminal Phase II Investment Project calls for the construction of three additional 160 thousand-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 5.0 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.

Further expansion of the Taichung LNG Terminal's capacity is under way. Currently, Taiwan government policies for phasing out nuclear power plants and for reducing greenhouse gas emissions mandate a 50% share for natural gas in fueling Taiwan's total electricity generation 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; and execution of its Phase III expansion module will add two 180 thousand-kiloliter above-ground storage tanks and their associated gasification plant. These projects are scheduled for completion in 2022 and 2026 respectively to improve the unloading energy and gas supply stability.

CPC has constructed an extensive natural gas transmission and distribution system on Taiwan's western side. It comprises approximately 2.1 thousand kms of terrestrial trunk pipeline, extending from Pingtung in the south to Keelung in the north; and which includes 8 supply centers, one transfer center and 47 distribution stations



along its length. Current plans are centered on the goal of constructing interlocking ring-shaped networks to produce a figure-8 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 the 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-8 natural gas transmission network.

### Active expansion and assuring secure gas supply

Complying the government policies for phasing out nuclear power plants and creating an environmental-friendly, low carbon environment, CPC plans to set up four gas-fired generating units in Datan Power Station. To generate abundant energy for Datan Power Station, commodity sectors in the north and other customers of the power station, CPC plans to set up the third LNG terminal in Kuantang Industrial Centre, comprising reception facilities which can hold up to 3 million metric tons of import quantum, two LNG storage tanks each of 160 thousand-kiloliter capacity; gasification and gas supply facilities to connect with the existing gas supply system.

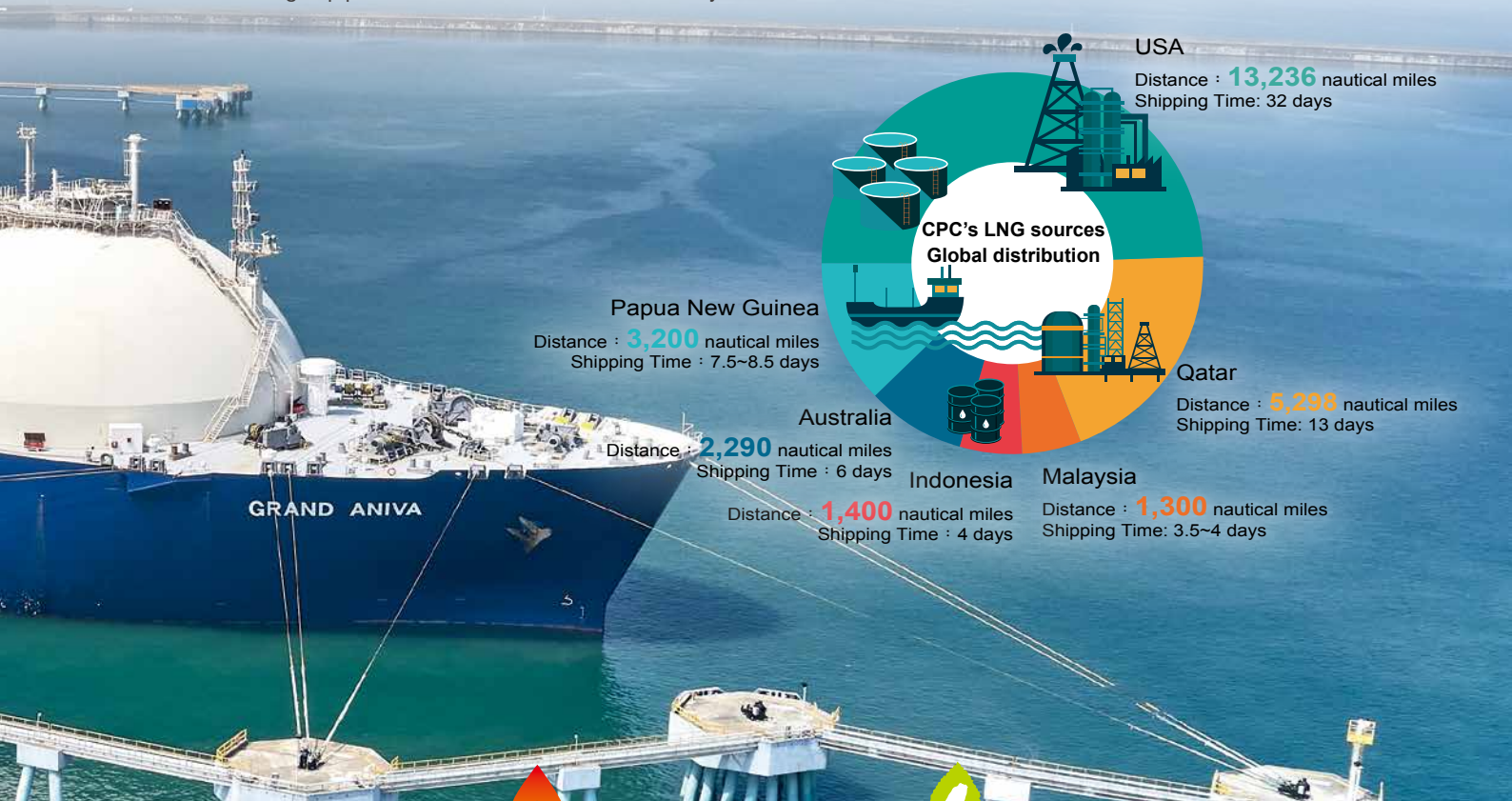
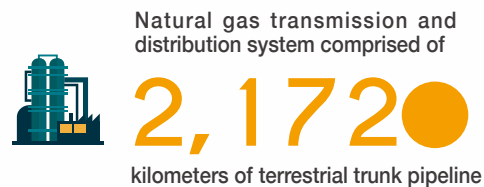
CPC's Third LNG Terminal project got under way in 2016 and is currently scheduled to come on stream in October 2022. At that point, with the three terminals-one in each of northern, central and southern Taiwan-supplying natural gas to users in their respective areas, there should be some reduction in the cost and risk of transmitting gas over long distances-in that figure-8 combined undersea and terrestrial gas pipeline network will enhance the safety

and stability of gas supply through its transfer and backup functions. Completion of this third LNG receiving terminal project will enable CPC to construct and operate national level natural gas supply system that is fully-functional, stable and safe.

### Global arrangement, stabilization of gas supply

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

In addition to long-term LNG procurement contracts, CPC acquires yet more supplies through medium/short-term/spot transactions to achieve the goal of stable supply and decentralized gas supply. In 2019, CPC imported most of its LNG from Malaysia, Qatar, Papua New Guinea and Australia, with some coming from Russia.



## Other Products

### Liquefied petroleum gas-make use of great quality and achieve excellence

CPC's long-standing monopoly in the LPG market was broken when the government opened it up to competition in 1999. Formosa Petrochemical Corp. and independent traders began importing their own supplies. With household gas, CPC's LPG Business Division has been able to maintain its leading market share by making full use of its quality advantages, north-south transport, storage systems, comprehensive marketing, and retail network. In selling industrial gas, the company aims at lifting the quality of its customer service so as to both retain existing customers and win new ones. CPC has to balance compliance with the government's LPG safety reserve policy against optimizing the rate of turnover in its storage tanks, which is crucial to profitability; at the same time, it must endeavor to reinforce both occupational safety and environmental protection protocols. Therefore, CPC can achieve the task of stabilizing the LPG supply in the domestic market and create operating performance.

### CPC LUBRICANTS: internationally recognized, honorable brand

CPC is the leader in Taiwan's lubricants market with its dual brand- 'CPC' and 'Mirage' that appeal to both consumers and professional users in domestic and overseas markets, supported by strong, well-defined and diversified sales channels. Those include more than 30 contracted distributors, the 600-plus gas stations directly operated by CPC and many retail chain stores. CPC's Lubricants Business Division (LBD), founded in 1999, March 16, and is committed to providing quality products, premium services and full technical support to meet the needs of both its community and corporate customers.

Since 2011, The LBD operates an automated precision blending system, unique in Taiwan, for its products. Located in Chiayi, its construction was completed in 2016, taking five years. This plant has sharply lifted the level of efficiency and accuracy in lubricants production, which runs at an annual output of up to 90 thousand kiloliters. After the installation of lubricating grease production machinery with an annual output of more than 3,300 tons as part of a renovation project, CPC's lubricant production equipment and technology is second to none, not only in Taiwan but also in the wider Asia-Pacific region.

In addition, CPC has set up a highly efficient logistics network, based on four warehouses for finished products respectively located in northern, central and southern Taiwan, which works as a distinct competitive advantage in making sales. In current developments, as of early 2018 CPC embarked on the two-phase construction of bonded storage and blending facilities for base oils and additives at a site within Taichung Port to both strengthen its supply capacity and to enable international trading in lubricant materials and customized products. In addition to cultivating its domestic market, the LBD is also vigorously expanding in the Asia-Pacific region. Distributorships, direct customer shipments and agencies are currently operational in China, Philippines, Indonesia, Vietnam, Myanmar, Cambodia, India and other locations. To circumvent the ASEAN tariff barrier to non-members, CPC is recently formed Maxihub Corporation joint-venture located in Vietnam's Tong-Nai province. Formed by CPC along with Taiwanese and local firms with specialist know-how, this company will operate a lubricant blending, storage, packaging and logistics complex. Production is projected to begin in the end of 2021. In the future, CPC will use the Maxihub Co. as its second production base and move toward the operational model of diversified international trade in oil-derived products as a means of expanding its presence in overseas markets.





With the gradual rise of electric vehicles and lubricants market shrinks, marine engine oil becomes an important development for the future of LBD. In the past few years, the certification team has overcome difficulties and experienced complex testing processes and has kept making the significant history of LBD. With indomitable perseverance and continuous efforts of teamwork, many major international certifications have been obtained, including MAN ES, WinGD, YANMAR, Daihatsu, Mitsubishi, KEMEL, and Wartsila etc. Aforesaid breakthroughs have been the model and innovation indicators for CPC.

In addition, LBD has also been committed to the establishment of a brand image in recent years. In 2019, CPC's lubricant product not only awarded the 16th National Brand YuShan Award for Best Product, but also won the "Reputable Brand" gold award of lubricant category by *Reader's Digest*. It shows that LBD's trustworthy brand image is affirmed by the general public.

LBD will continue to leverage its core competencies in manufacturing and marketing lubricants – skills such as R&D, formulation and blending, logistics, quality control and technical support services – while focusing on developing innovative and premium-level products, exquisite service, and technical consultancy to enhance customer satisfaction. Looking to the future, the LBD's vision encompasses maintaining its lead over the competition in the domestic market and make the lubricant brands-CPC and Mirae, become well-known worldwide.





# Totally Clean

**Maintaining the Primeval  
Beauty of the Land**



# Industrial safety & health

## Risk management-Comprehensive implementation of safety regulations

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, prevent harm to employees, local communities and the environment. Apart from compliance with Taiwan's relevant laws and regulations, CPC has also drafted – and strictly enforces – its own safety and loss prevention protocols. These are modeled on those of the advanced countries of the Europe, USA and Japan and have been suitably adapted to reflect local conditions and operational characteristics.

### Safety disciplines and priority-Safety management get first

Industrial safety is the key for the continued sustainable future of CPC. To achieve the goal of 100% industrial safety, zero accidents; CPC is constantly and actively strengthening its safety culture through 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 not only in Taiwan but also internationally recognized. CPC received the certification of the World Safety Organization in 2005. CPC also has 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.

### Key points in CPC's industrial safety & health policies




In line with its emphasis on a culture of industrial safety, CPC is putting particular effort into the following focal points. The company is working especially hard at raising awareness of these issues and team spirit among both employees and external vendors in the interest of creating a safe and comfortable working environment.

- ▣ Implementation of the Taiwan Occupational Safety and Health Management System (TOSHMS) together with a continuous process of improvement with respect to its operational environment.
- ▣ To reinforce industrial safety practice mandates, CPC established "inspection and auditing teams" to go to construction sites for non-scheduled on-site inspection and auditing, and set "Management procedures for safety and health of contractors " and "Guidance on safe work permit". We 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, conducting periodic reviews of industrial safety and health regulations as well as continuous review and revision of standard operating procedures.
- ▣ Strengthening industrial health management protocols, scheduling employee health checkups, analysis and tracking of those health checkup results, promotion of a healthy lifestyle and emphasizing the importance of employees' mental health.
- ▣ Implementation of risk management and process safety control techniques and the establishment of 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.
- ▣ Strengthening of fire prevention and response capabilities, along with the organization of local joint emergency response teams – ensuring that the manpower, facilities and emergency response and rescue gear used by all units are mutually supportive, so as to minimize losses due to fire and other disasters.
- ▣ Implementation of on-site safety inspections with graded results, continuous improvement





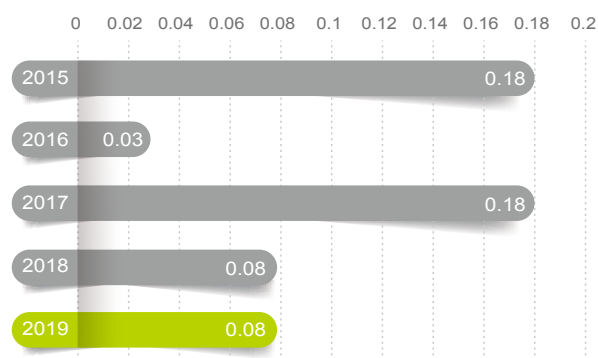
through observing preparedness at system, equipment and implementation levels; and heightening general awareness of the importance of industrial safety disciplines.

-  Empowering industrial safety inspections with the inclusion of 'management by walking around' by senior managers; and by carrying out professional-standard pre-operational industrial safety inspections of new and renovated workplaces, with any and all deficiencies discovered to be tracked through the information system until remedial improvements have been completed.
-  Planning and execution of safety and health training and awareness programs, the development and provision of online study courses and the establishment of an industrial safety test-question database. Additionally there will be the compilation and publication of industrial accident case study-based teaching materials.
-  By classifying the identified emergencies, CPC has developed various emergency response drills and regularly conducted emergency simulations to strengthen contingency and disaster prevention capacity. In 2019, CPC held a total of 363 disaster prevention drills, including 7 no-warning emergency response drills and 4 large-scale emergency drills.

## CPC's occupational accident statistics for the past five years

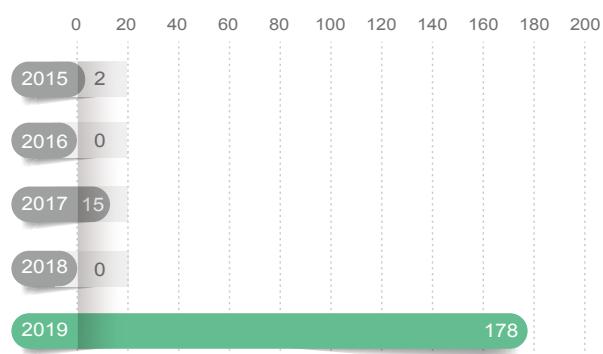


### Frequency of Disabling Injury

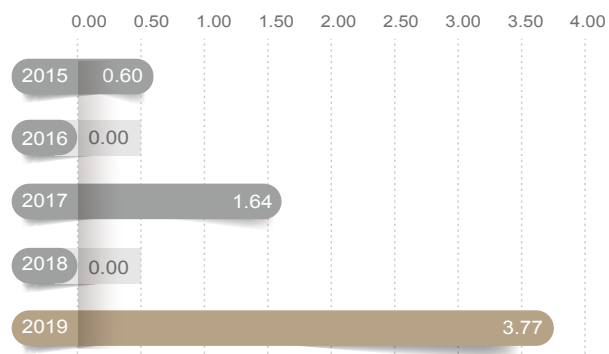




### Severity of Disabling Injury



### Occupational Injury Frequency-Severity Index





## Pollution Prevention and Environmental Protection

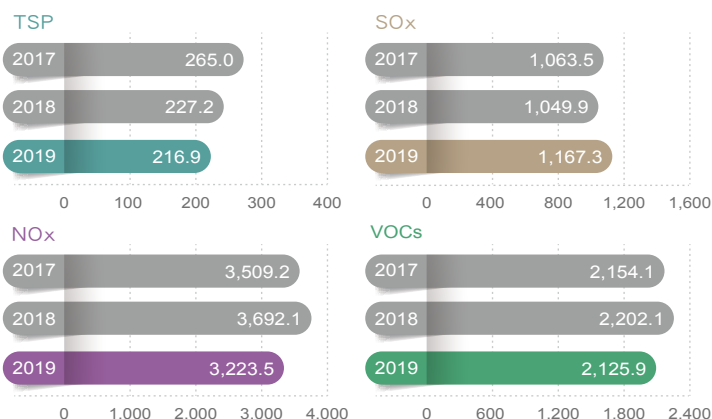
Adopting international technology, achieving sustainability

### Implementation of environmental protection and energy conservation

CPC has long been cognizant of environmental protection issues and in its commitment to finding solutions to the problems of waste-water disposal, air pollution and soil and groundwater contamination, it has both upheld the principle of sustainability in its corporate development. In doing so, the company strictly adheres to generally accepted environmental protection policies, is active in pollution prevention and exercises strong control over its resource usage. Additionally, CPC utilizes low-pollution production processes and the latest pollution-control facilities; in all of its new projects the best available control technology (BACT) and equipment for that purpose is installed to reduce pollution that may be caused by production and storage processes. On top of all that, CPC has further deepened its commitment to ecologically beneficial measures that include improving the quality of its petroleum products, reducing pollutant and energy waste and adapting to the climate change to implement

the environmental policy of pollution prevention, energy waste reduction and sustainable environment. From 1989 to present, CPC has invested more than NT\$50 billion in its environmental protection practice; and since 1995, all of the company's business units have been required to compile ISO 14001 environmental management system programs; and as of end-2019, 21 of them had received official certification. Following global business practice, a cross-company environmental accounting system for tracking the effectiveness of the company's environment friendly measures was set up as far back as 2004.

In all its development projects, CPC follows through on the commitments written into the respective environmental impact assessment (EIA) results; and will propose the appropriate environmental protection measures in response to the potential risks posed by specific development undertakings. The company maintains comprehensive monitoring systems designed to protect environmental quality and biological diversity around its refineries and other work sites and aims to achieve standards in the quality of their atmospheric emissions higher than those stipulated in Taiwan's current national environmental protection regulations. As evidence of its determination to protect and preserve the environment, CPC set up the Guantang Industrial Park (Port) Ecological Preservation Committee on November 7, 2018 to carry out surveying, monitoring and preservation—motivated by the further aim of achieving the twin goals of environmental conservation and sustainable community development.





Taiwan's own Greenhouse Gas Reduction and Management Act was formally promulgated on July 1, 2015. Its goal is the reduction of nationwide annual greenhouse gas (GHG) emissions to no more than 50% of the 2005 level by 2050. CPC has vigorously expanded its carbon reduction plan, committing the entire company to GHG emissions reduction, and setting targets and timelines for its existing plants. Using clean fuel, clean production, equipment efficiency improvement, energy saving and waste reduction, etc., we implement the reduction measures according to the plan. In recent years, we have used the latest technology to effectively improve the energy efficiency of the factories. As a result, the company's reduction in greenhouse emissions from 2005 to 2018, according to third-party verification, the performance exceeded 25%. Regarding energy saving, CPC has already implemented electricity conservation in its offices along the guidelines in the Energy Conservation Action Plan for Government Organizations and Schools, achieving savings of 4.6% in 2019 compared with the year before. The offices at industrial plants will switch to all-LED lighting by the end of 2020. In its strategic approach to the risks posed by climate change, the company is participating in the Climate Change Adaptation Strategy and Guidance Program for the Energy Sector formulated by international organizations; by the end of 2019, climate risk assessments and reports of the nine plants had been completed.

CPC's air pollutants come mainly from its oil refinery and petrochemical plant. The pollutants include total suspended particulate (TSP), sulfur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>),

volatile organic compounds (VOCs) etc. Following are the air pollution emissions of the oil refinery and the petrochemical plant. There has been a fall of TSP, NO<sub>x</sub> and VOCs. The Flue Gas quality is also superior to the national standard, indicating that the measures has an effective outcome.

## 2019 Environmental Footprint

### Material investment

Water usage	33,051	Thousand kiloliters
Crude oil	23,763	Thousand kiloliters
Fuel oil	156	Thousand kiloliters
Fuel gas	1,697,879	Thousand cubic meters
Natural gas	894,870	Thousand cubic meters
Gasoline additives (MTBE)	499	Thousand kiloliters
Purchased electricity	1,999,298	Thousand kWh

### Material emissions

Gas emissions	CO <sub>2</sub>	7,687,246 <sup>註</sup>	Tons
	NO <sub>x</sub>	2,873	Tons
	SO <sub>x</sub>	1,146	Tons
	TSP	209	Tons
	VOC	3,522	Tons
	COD	433	Tons
Wastewater		11,814	Thousand cubic meters
Waste		97,678	Tons

Note: Data on CO<sub>2</sub> emissions are for 2018.

### Refinery/petrochemical output

Diesel	6,975	Thousand kiloliters
Fuel oil	2,220	Thousand kiloliters
Vehicle fuel	9,469	Thousand kiloliters
Jet fuel	2,487	Thousand kiloliters
Liquefied petroleum gas	348	Kilotons
Ethylene	1,112	Thousand kiloliters
Propene	940	Kilotons
Butadiene	155	Thousand kiloliters

## Comparison Between CPC Refinery Environmental Quality Control Standards And Their National Equivalents

Effluent\* is the monthly average

Item \ Year	2019 Levels	Current National Standards Effluent	Current National Standards Ocean Effluent
Chemical oxygen demand (COD) (ppm)	< 40	100	280
Oil (ppm)	< 5	10	20
Suspended solids SS (ppm)	< 15	30	100
Phenol (ppm)	< 0.1	1.0	1.0

## Creating an environmentally friendly business and providing high quality oil

In January 2000, CPC proactively ceased supplying the local market with leaded gasoline. Since June 2004, the sulfur content of its diesel fuel was reduced from 375ppmw to 50ppmw and in July 2011 reduced further to 10ppmw; and on January 1, 2007, high-quality gasoline with a sulfur content of 50ppmw - reduced to 10ppmw in 2012 – and provide 0.5wt.% of low sulfur fuel oil. In the same context, the fuel pumps at all CPC-branded gas stations have been retrofitted with vapor recovery nozzles; and the company's distribution depot fuel-filling areas have received similar equipment. The gasoline consequently recovered now amounts to more than 3,200 kiloliters per year, in the process helping to improve air quality by avoiding emission of the same amount of volatile organic compounds (VOCs). After years of hard work, the quality of oil products in Taiwan has been continuously improved, which is comparable to Japan, the United States and other countries. However, CPC has not stopped because of this, and it continues to use the "new environmental protection oil standards" in advanced countries as the benchmark. CPC pursues higher quality oil products, promotes energy resource integration, increases natural gas transmission and storage capacity to expand the use of low-carbon energy. CPC strengthens green energy-related technology research and application, develops high-value petrochemical products, creates a green corporate image and create low-carbon homes.

Since the enactment of the Environmental Education Act in 2011, CPC has energetically promoted environment-related education and similar activities. Its own eco-experiences and teaching are used to popularize the



concepts of environmental protection, of cherishing Taiwan's natural resources and of committing to leave a clean environment for the generations that will follow. The company takes the lead in calling on communities to come together on local ecological issues and in showing concern for local commercial development to be environment friendly; and also in practical measures like park and forest adoption, supporting garbage clean-ups and marine pollution remediation. In further educational developments, 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 in pollution-control technology, systematizing its processes for higher efficiency and greater added-value, investing in the circular economy and waste recycling and value increase – all in the pursuit of developing sustainability in its operations and the sharing of good health and prosperity with the national community.

## Adapt proactively to cope with pollution issues

Since the promulgation of the Soil and Groundwater Pollution Remediation Act by the administration of President in 2000, Taiwan's Environmental Protection Agency (EPA) has several times publicized the Soil and Groundwater Pollution Remediation Act Enforcement Rules, subsidiary legislation and related control standards. Many CPC plant locations have been listed as sites for pollution response, pollution control or pollution remediation. The





appropriate and respective pollution response, control and remediation plans have been proposed and the company has implemented the related soil and groundwater pollution surveys and pollution remediation measures in accordance with the EPA regulations. In 2019, CPC has 4 sites listed for response, 22 listed for control and 7 listed for remediation, while remediation has been completed at 30 sites by 2019.

Kaohsiung Port Terminal site was leased by CPC from the Port of Kaohsiung and used for loading and unloading crude oil cargoes until those operations were suspended in 1996. Listed the Terminal as a soil remediation site on December 23, 2015 and the action plan subsequently proposed by the company was approved by the EPA on November 4, 2016. The task of soil classification treatment operation in Qianzhen yard has been completed and the project's monitoring status with the EPA was lifted on April 12, 2018.

CPC's Kaohsiung Refinery was shut down at the end of November 2015. As it was built some time ago and in fact was in operation for many years, almost all of the soil and groundwater across its total area have been classified as contaminated and in need of remediation. The company is consequently dismantling the above-ground structures - process plant, pipework and related facilities - and also removing pipelines from where they were buried two meters underground. In addition, gas pumping/injection pollution control technology is being deployed as also is strengthening the downstream gas injection interception system to prevent pollutants from flowing out of the site. The natural tendency of groundwater to flow from upstream to downstream will be incorporated into the process. The overall remediation process will take about 17 years to complete; and the plan calls for the work to be carried out across separate areas in discrete phases.





# Ongoing Existence

**Corporate Operation for the  
Long Term**



# R&D and Information Management

## Promote overall R&D and carry out Information Security

### Research and Development

Research and Development (R&D) has been the core value for both technological innovation and corporate sustainability in CPC. Three major institutes are responsible for the R&D in respective domains including 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 while the Department of Planning in head office is responsible for the management and supervision of company-wide R&D operations.

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

CPC's expenditure on R&D in 2019 amounted to about NT\$2.291 billion. The R&D achievements are described below:

### Exploration & Development Research Institute

- Chad Block: CPC completed an evaluation of oil and gas resource and its exploration risk. The assessment will be an important guideline for further exploration or development. We completed an evaluation of production capacity and reserve for all structures in Oryx Field with most conservative conditions. It helps us to make optimal production plan. CPC completed a design of production separator and long-distance pipeline, which helps to suitably plan the surface facilities and pipeline clearing. CPC applied AI and Big Data technology to analysis of well test data and seismic image.
- CPC researched on the petroleum systems of Paleozoic, Jurassic, and Cretaceous in the Rub al Khali Basin, and performed a simulation of the hydrocarbon generation and migration in Abu Dhabi. It shows that the oil and gas storage potential of the Middle Jurassic and Early Cretaceous structures in the west section is good, while the oil and gas saturation rate in the early Cretaceous structures in the mining area to the north of the east section is relatively higher. The results will helps to bid for new blocks in the Mideast area in the future.
- CPC evaluated the hydrocarbon potential of areaconcession and found two structural closures with 30 km<sup>2</sup> and 12 km<sup>2</sup>, and other stratigraphic traps formed by four channels. The Class I AVO anomaly shown in the AVO analyses implies probable hydrocarbon reserves.
- CPC evaluated the potential of methane hydrate in Yongan and Good Weather Ridges, area off SW Taiwan based on BSR interpretation, characteristics analysis and volume method estimation of 3D seismic data. It shows a positive result.
- CPC strived to ask Natural Gas Business Division put the gas of Tiehchenshan cellar as the safety reserve. Currently there is gas of 337 million cubic meters has been agreed to be counted as safety reserve. CPC is striving to ask Bureau of Energy to put it as the safety reserve.
- CPC established a preliminary 3D model of geological structure and fracture permeability distribution for the geothermal potential area Tuchang based on the data from geological





survey and Wells 3 and 4. The understanding of spatial distribution of the geothermal reservoir enables us to perform a regional simulation of geothermal fluid and groundwater circulation.

- CPC completed a project committed by EPA: “Identify the Source of Petroleum Contamination in Soil and Groundwater.” It allowed us to establish a method of fresh gasoline identification which enables EPA or CPC to quickly clarify the responsibilities of contamination. We also have established some systematic techniques to identify other petroleum products such as fuel oil, lubricant oil and crude oil. With these methods, CPC effectively assisted EPA or CPC in identifying the contamination source and expediting decontamination process. It prevented contamination expansion and made a contribution to environmental protection.

### Refining & Manufacturing Research Institute

- Developments in new production processes: these included the introductory assessment of a new light diesel engine motor oil formulation to meet the European Automobile Manufacturers Association (ACEA) C3 5W/40 standards; development and application of CPC amorphous soft carbon anode vehicular battery research; electrochemical/mechanical hybrid shear exfoliation

graphene of artificial graphite; environmentally-friendly precision machinery cutting oil; on-site application of chemical oxidation technology in Xinguang Community; analysis and discussion of the styrene recycling project; establishment of alicyclic polycarboxylate hydrogenation technology; development of high-frequency substrate materials; planning of a trial production process for refined bitumen; development and application of magnetic filters and packing technology.

- Completion of the commercial gasoline and diesel quality and performance evaluation study; heavy-duty diesel engine testing; gasoline and diesel fuel additive cleaning performance tests; and testing the impact of natural gas blended with nitrogen on nitrogen oxides (NOx) emissions from furnaces were carried out to ensure environmental protection.
- Groundwater soil remediation and testing services in refinery’s polluted sites; airborne volatile organic compounds (VOC) monitoring; VOC recovery of gasoline filling exhaust; health risk assessment; and planning for waste-water treatment and recycling.
- The effect on pipelines of stray electric currents from the Kaohsiung and Taipei MRT systems was continuously monitored; and assistance was provided in diagnosing boiler pipe problems in order to ensure pipeline safety



- Successfully using its own heavy oil through a self-developed refining process to exploit a long-life amorphous soft carbon material as a powerful lithium-ion battery in the anode material. In light of the recent booming of green energy industry, our research mission is about the design of battery systems and the smart gas station.
- Optimization research was carried out on the gasoline and diesel production processes and petrochemical raw material processes. Related advisory services were offered so as to resolve on-site problems, enhance operational efficiency to achieve energy-saving goals.
- Technology was transferred for newly-formulated CPC Marilube CO400, environmentally-friendly metalworking fluid, and long-life equipment oil.
- Developed 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) SP 5W/30, 10W-40 passenger car engine oil and other products.
- Microparticle of diffusion and elastic synthesis technology was established; continue to incorporate with well-known global companies to develop and promote eye protection lighting.

- Obeying the plastics restriction policy in Taiwan, bio-based and bio-degradable plastics are our research targets. Bio-based plastics use biomaterials as feedstock, and bio-degradable plastics undergo microbial decomposition to carbon dioxide and water. We focus on polylactic acid (PLA) as the short-term target, and polyhydroxyalkanoates (PHAs) which is more environmental friendly as the long-term target. Non-food feedstock such as lignocellulose, methanol or natural gas is considered owing to economic and environmental issue.
- Another research topics are novel biomaterials development, including whitening and antimicrobial ingredients as well as new medicines. We also use these ingredients to produce cosmetics, trying to break into retail market.

### Green Technology Research Institute

- Assisted CPC in the installation of solar photovoltaic systems. So far, the installed stations are more than 200 that the total capacity has reached 8.12MW.
- Established a cloud management system to monitor and maintenance the photovoltaic power stations, and created the standard operation procedures for operation and maintenance. The all of photovoltaic power stations have been real-time monitoring the state of power generation by the cloud management system.
- Developed transesterification process technology, which can be widely used in the application of biodiesel, biolubricants, and special chemicals.
- Developed bio-based carbon technology, which can be widely used in the application of supercapacitor, capacitive deionization (CDI), battery energy storage system.
- Completed the planning and construction of smart green energy gas stations (Qianfeng Rd. Gas Station, Tainan) and smart green energy houses (CPC Hongnan Dormitory).
- Completed the production verification of 18 tons of lithium titanate (LTO) powders as anode materials with a high rate capability, excellent cyclic performance and safety.
- Completed the development of environmentally friendly low VOC (50 g/L) heavy anti-corrosion coatings in accordance with ISO 12944 specifications, which can be used in heavy anti-corrosion coatings for offshore wind power and marine industries in the future.
- Developed a new generation of eddy current detection technology to penetrate FRP to analyze defects and residual thickness of the oil tank floor and corrosion on the soil side.
- The cold seawater discharge from the Yongan LNG terminal of the Natural Gas Business Division was used



as feed seawater for growing seaweeds. A pilot plant with production capacity of 2 tons of seaweeds was built adjacent to the stream way of the cold seawater discharge. This research won the 16th National Innovation Award-Enterprise Innovation Award in 2019.

- Established seaweed raw material production processes, COA, preservation protocols and analytical methods, and applied to the development of algae products for food applications.
- Completed the establishment of quality control standards for  $\gamma$ -oryzanol powder, rice bran extract powder (glucosylceramide) and rice bran polysaccharides, and established packaging and storage conditions for functional raw materials.
- Completed the pilot production process of 40 kg per batch of rice bran lipase, developed a laundry detergent formula and trial production of products.
- Completed the expansion of the carbon material (the precursor of soft carbon) pilot production plant and the installation of batch-type post-processing pilot equipment, increasing annual soft carbon capacity to 12 tons.
- The development and design for dicyclopentadiene (DCPD) demonstration plant are completed.

## Information Management

### Applying technology to strengthen Information security

CPC's vision for information development comprises free-flowing information over secure networks, precise real-time settlements, universal access to information and most importantly, user-oriented and convenient services. The goal is to get closer to the market and embrace customers. To realize this vision while upholding strategic business goals and meeting the challenge of competition, CPC's information development initiatives emphasize the continuous integration of corporate information systems, provision of real-time management information for decision-making, expansion of the industry value chain by integrating physical and virtual channels, establishment of customer relationship management (CRM) practice, expansion of the scope of high-quality services, aiming to support the competitiveness in market.

Faced with the new era of rapid informatization, digitization, and globalization, CPC is building up its overall information capability based on the enterprise resource planning system, customer relationship management, business intelligence, knowledge management and information communications infrastructure. In terms of systems, integrated operations processes are shortening the time needed for settlement of accounts and the use of specialized information technology is upgrading production

performance. In the field of service, the deepening of customer relationship management is providing excellent-grade services for external customers and the information management service system is providing internal customers with real-time and transparent service management. Regarding coordination with government policy, the company provides customers with a thematic open data set platform and also promoting the open data format (ODF). In the field of business intelligence, the use of knowledge management is deeply implanting business knowledge as a capital resource; and the implementation of decision support systems is stimulating the diffusion of information applications. In the area of information and communications, building of the infrastructure environment, integration of mobile e-commerce and the integration of communications services are all being strengthened. The security of key information infrastructure is being upgraded, an information security governance mechanism is being introduced and information security is a continual priority. In the management area, the organization of information is being reinforced in order to upgrade management performance; and overall process operation capability is being built on an integrated IT resource operating platform with an open environment. In addition, synchronized integration of internal IT resources, processes and infrastructure is being carried out with the aim of upgrading the company's overall performance.

The company is taking steps to maintain a steady grasp of mission-critical information systems and they include: the use of information technology to enhance information operating processes and enable complete settlement every month; the development and extension of integrated e-commerce systems for petroleum products, mobile payment and electronic stored-value cards, plus the strengthening of the POS and diversified business marketing network; the establishment of a refining and petrochemicals information system, and integration of the production scheduling system and oil accounts; the establishment of an exploration information system and integrating exploration and production management and geographical information systems.

To adapt to the growth of its business units, the development of corporate core services as well as web-based application upgrades, CPC completed the replacement of its mainframes. Owing to the consequent enhancement of computer performance, the operation time is reduced. Moreover, the replacement not only greatly boosted computer performance, but also reinforced the remote backup policy for disaster recovery provided by the upgraded infrastructure. As a result, it guarantees business continuity as well as high availability, and non-stop business transactions to facilitate future expansion. The widespread adoption of cloud technology, along with implementing server virtualization, has significantly improved business efficiency and resulted in considerable cost reduction; it has as well helped consolidate hardware





and software resources and the employment of broadband networks providing digital services.

To boost the quality and in-service reliability of its telecommunications services network, the company has an ongoing diversified plan for providing integrated voice and multimedia communications services and, using the existing transmission system and the electronic environment as a foundation, is integrating mobile communications technology in establishing a mobile e-commerce operating environment. In coordination with the government's Internet Protocol Upgrade Promotion Program, CPC is also upgrading its Internet and fiber optic backbone systems to IPv6 to meet the advent of the new-generation network and set up internet voice system and video conference system.

In the field of information security, information security baseline protection will be carried out, the depth of information security reinforced, an information security monitoring center established, and risk management strengthened; in addition, a joint defense and reporting mechanism will be set up to enhance information security capabilities. In regard to protection of the core operations of the critical information infrastructure (CII), in addition to placing the firewall, intrusion detection, and advanced persistent threat (APT) measures under monitoring by the Security Operations Center (SOC), which has already been done, overall enhancement of the information security framework for industrial control systems will be carried out. In the field of information security management, an information security governance system will be instituted,

information security governance maturity assessment will be introduced, the information security skills of IT/OT personnel will be cultivated, personnel capabilities will be deeply instilled, and the quality of the information security system will be strengthened. The information security management system has already passed ISO 27001: 2013 certification.

In response to development trends in Big Data, artificial intelligence, the internet of things, cloud computing, blockchains, 5G, Industry 4.0, and other new technologies, process innovation will be speeded up, intelligent data analysis will be pursued vigorously, and intelligent technologies will be introduced as means of boosting quick decision-making response ability and enhancing the CPC's overall operating performance.





## Human Resources

### Lead the development of enterprises by strengthened incentive measures

CPC aims to fully develop the potential of every one of its current (as of end-December 2019) 15,836 employees through long-term training and career guidance, while at the same time making both incentives and standard benefits more attractive. Managerial talent is selectively assessed with the aim of ensuring continuity in both corporate development and leadership through participation by talented people of outstanding ability.

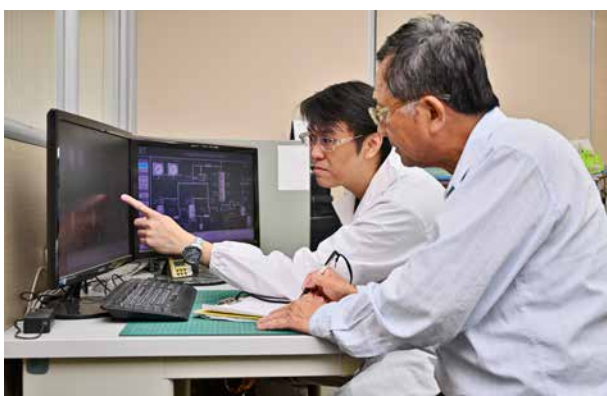
In terms of human resource utilization, CPC has recently engaged in organizational and process re-engineering and has also formulated and carried out a policy whereby selected employees are rotated through different jobs, businesses and departments in order to use its human capital to best advantage. It has also recruited a cohort of young professionals to both inject new blood into the corporate body and to provide a smooth transfer of technical and operational know-how, as well as commercial and competitive skills, in preparation for a wave of retirements.

Beyond using professional qualifications and personal traits as the basis for the selection of entrants to its executive group, CPC provides management and leadership development training to help candidates 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 - the four key areas comprising CPC's core competencies. By systematically enhancing employees' specific professional expertise and helping them develop a broader range of skills, the CPCCU also helps to optimize workforce utilization. The company also encourages its employees to participate in national skill-qualification examinations and helps them 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 to develop employee versatility. Beyond this, people 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 relevant to the needs of the core businesses.

### Cultivate professional talents by digital learning program

In recent years, CPC has tended to cultivate new employees with comprehensive guidance and training to ensure a smooth transfer of functionality. On-the-job training is now combined with formal skills development courses; and senior employees are designated as mentors to help new colleagues adapt to their workplace and responsibilities. These new employees are typically rotated



each year to allow them to gain experience in a wide range of jobs 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. Each department reviews its professional-skill shortfalls at the beginning of the year and formulates a corresponding training plan in which outstanding performers are recruited as instructors, tasked with passing on their operational knowledge and experience. Some departments also make arrangements for on-site or expatriate experience for their younger employees, lasting from several weeks up to a year depending on departmental needs. Online learning is also provided to eliminate time and location limitations: training courses are digitized and uploaded to CPC's e-learning center and knowledge archives, allowing the knowledge and expertise of senior and former employees accumulated over many decades to be preserved and passed on. With digital learning, new employees can gain the professional knowledge and workplace information they need without ever having to step into a classroom.

CPC Training Center located in Chiayi not only serves as an incubator for internal talent, but also tasked with building a talent pool for fulfilling the government's New Southbound Policy - by providing talent with relative background in field of engineering, investment, trading and management, etc. It also assists other domestic companies in the pre-employment training and on-the-job training of new southbound policy talents, aiming to making the greatest contribution to the cultivation of energy and petrochemical talents for our country.

## A welfare system which guarantees a fulfilling life

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 on the job of the individual employee. All employees are entered in the national health insurance, civil servant insurance, labor insurance, group life insurance and accident insurance programs. 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.

A number of CPC's business divisions also operate clinics, restaurants, libraries, general stores and other welfare amenities along with sports facilities such as swimming pools, 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 chips in to support the activities of employee interest groups dedicated to baseball, bridge, mountain climbing, swimming, painting, film appreciation and other leisure pursuits in order to provide physical and mental relaxation, boosting their morale and sense of well-being at work.



# CPC's Affiliates and Subsidiaries

## CPC concentrates on its core competencies while investing in business diversification

CPC's strategy for its affiliates and subsidiaries can be summarized as concentration on its core businesses of oil and gas and petrochemicals, both upstream and downstream, new energy forms, upgrading the production value of petrochemicals and widening its international footprint. The company now sets out to selectively bring in patented technologies that will deliver high value-added products to boost the bottom line. The total investment of these 16 entities, as of end-2019, is NT\$21.5 billion; unaudited income from these investments in 2019 amounted to NT\$648 million.

CPC's current 16 affiliates and subsidiaries can be divided into four main categories: petroleum products; petrochemicals; natural gas; and government policy. Of the 16, 9 are based in Taiwan and 7 overseas. The principal entities are briefly described 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 the island's central region. CPC holds 38.57% of the company's equity, including preferred stock. CAPCO's production units carried out improvement programs with the aim of lowering production costs and boosting market competitiveness.

### DAI HAI PETROLEUM CORP. (DHP)

Established in 1994, with CPC holding 35% of the equity, DHP is headquartered in Haiphong, Vietnam. The company is primarily engaged in the storage, transport and distribution of LPG and 1,050 tons of liquefied petroleum gas storage and transportation equipment. The branch station in Hanoi province mainly engaged in the storage, transportation and supply and marketing of liquefied petroleum gas in northern Vietnam and is committed to the management of industrial safety.

### 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).

### FARAWAY MARITIME SHIPPING CO. (FMSC)

Faraway Maritime Shipping Co. was established in 1997, with CPC holding 40% of the equity, to build and operate the LNG carrier Golar Mazon which had been engaged in transporting LNG from Indonesian Badak VI from 2000 to 2017. FMSC has been engaging in short chartering since 2018.

### 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 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 IMO's environmental protection regulations, NSHC has begun planning and implementing modification for burning low-sulfur fuel oil and installation of 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 modification for burning low-sulfur fuel oil and installation of ballast water management system for the four LNG carriers in 2018, NSMC also has an ongoing cooperative arrangement with NTOU 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 one double-hulled LR1 vessel with a capacity of 80,000 DWT engaged in shipping crude oil and petroleum products. In compliance with IMO's environmental protection regulations, GEMCO has begun retrofitting the scrubber system for VLCCs since 2019.

### 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 the onshore gas liquefaction plant near Darwin for the production of LNG, LPG, and condensate commercial production began in November of 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 lubricant blending factory in Dong Nai Province, Vietnam. The company was founded to manufacture and process lubricating oils, base oil, solvent chemicals and also provide the required related storage and warehouse services. Completion of the plant and supporting facilities and the beginning of commercial production are planned for end-2021.



2019

Financial  
Statements

During the year ended 2019, the profit before tax of Exploration and exploitation business division has decreased as compared to the year ended 2018; this was mainly due to the impairment loss and the provisions for decommissioning. In other divisions, the gross profit from export sales has increased and the non-operating expense has decreased as compared to the year ended 2018.

The capital expenditure incurred in 2019 was NT\$55,094 million, a 295.85% increase from 2018; this was mainly due to adopt IFRS 16 from the beginning on January 1, 2019. On transition to IFRS 16, the Company recognized additional NT\$40,187 million of right-of-use assets.

The breakdown of the expenditure was as follows:

Production & manufacturing 12.64%

Marketing & transportation 79.17%

Others 8.19%

The exchange rate between the NT dollar and the US dollar was 30.018:1 on December 31, 2019.

## STATEMENTS OF INCOME FOR THE YEARS ENDED DECEMBER 31, 2019 AND 2018

(In Thousands of New Taiwan Dollars)

	2019	2018
<b>Operating Revenues</b>		
Sales	\$1,004,844,431	\$1,023,806,315
Other operating revenues	<u>9,263,603</u>	<u>10,768,971</u>
<b>Total operating revenues</b>	<u>1,014,108,034</u>	<u>1,034,575,286</u>
<b>Operating Costs and Expenses</b>		
Cost of goods sold	931,947,648	950,064,962
Exploration expenses	2,031,934	2,573,975
Oil and gas transmission and storage expenses	10,631,088	11,422,090
Other operating costs	<u>11,737,534</u>	<u>4,449,169</u>
<b>Total operating costs</b>	<u>956,348,204</u>	<u>968,510,196</u>
<b>Gross Profit(Loss)</b>	<u>57,759,830</u>	<u>66,065,090</u>
<b>Operating Expenses</b>	<u>21,546,875</u>	<u>20,340,803</u>
<b>Non-Operating Income and Gains</b>	<u>4,819,308</u>	<u>11,115,258</u>
<b>Non-Operating Expenses and Losses</b>	<u>7,694,931</u>	<u>13,076,708</u>
<b>INCOME (LOSS) BEFORE INCOME TAX</b>	<u>33,337,332</u>	<u>43,762,837</u>
<b>Income Tax Expense(Benefit)</b>	<u>894,513</u>	<u>9,464,043</u>
<b>NET INCOME (LOSS) FOR THE YEAR</b>	<u>\$32,442,819</u>	<u>\$34,298,794</u>

## BALANCE SHEETS

### DECEMBER 31, 2019 AND 2018

(In Thousands of New Taiwan Dollars)

Assets	2019	2018
<b>Current Assets</b>		
Cash and cash equivalents	\$23,977,809	\$2,015,092
Current financial assets at fair value through profit or loss	406	1,063
Accounts receivable, net	43,830,204	49,520,381
Accounts receivables from related parties, net	433,829	178,408
Other receivables	5,752,498	7,366,005
Inventories	111,999,842	127,779,804
Prepayments	21,949,844	21,613,489
Other current assets	<u>770,624</u>	<u>1,453,324</u>
<b>Total Current Assets</b>	<b><u>208,715,056</u></b>	<b><u>209,927,566</u></b>
<b>Non-current Assets</b>		
Non-current financial assets at fair value through other comprehensive income	13,029,923	12,552,680
Investments accounted for using equity method	13,054,884	13,279,548
Property, plant and equipment	421,334,223	423,460,997
Right-of-use assets	38,472,773	-
Investment property	19,244,570	19,552,820
Intangible assets	235,814	180,594
Deferred tax assets	8,480,342	9,253,501
Oil and gas investments	60,770,776	65,326,874
Refundable deposits	236,889	238,708
Other long-term receivables	16,380,382	13,725,173
Long-term prepayments	1,741,025	1,786,757
Other non-current assets	<u>251,623</u>	<u>217,116</u>
<b>Total Non-current Assets</b>	<b><u>593,233,224</u></b>	<b><u>559,574,768</u></b>
<b>Total Assets</b>	<b><u>\$ 801,948,280</u></b>	<b><u>\$ 769,502,334</u></b>



## BALANCE SHEETS

### DECEMBER 31, 2019 AND 2018

(In Thousands of New Taiwan Dollars)

Liabilities and Equity	2019	2018
<b>Current Liabilities</b>		
Short-term borrowings	\$ 27,724,810	\$ 33,346,452
Short-term notes and bills payable	89,098,985	87,850,830
Financial liabilities at fair value through profit or loss-current	1,141	4,614
Contract liabilities	9,821,178	9,806,301
Accounts payable	43,383,667	51,169,896
Payable to constructors	4,269,663	7,292,510
Other payables	49,148,711	25,143,685
Lease liabilities-current	146,711	-
Long-term borrowings, current portion	22,800,000	38,940,000
Other current liabilities	<u>10,730,493</u>	<u>9,150,756</u>
<b>Total Current Liabilities</b>	<b><u>257,125,359</u></b>	<b><u>262,705,044</u></b>
<b>Non-current Liabilities</b>		
Bonds payable	76,050,000	86,150,000
Long-term borrowings	-	1,900,000
Non-current provisions	28,642,535	25,231,534
Deferred tax liabilities	85,033,789	84,833,401
Lease liabilities-non-current	38,198,400	-
Post-employment benefits payable	3,833,769	4,758,994
Guarantee deposits received	1,439,302	1,124,431
Other non-current liabilities	<u>5,576,980</u>	<u>5,199,989</u>
<b>Total Non-current Liabilities</b>	<b><u>238,774,775</u></b>	<b><u>209,198,349</u></b>
<b>Total Liabilities</b>	<b><u>495,900,134</u></b>	<b><u>471,903,393</u></b>
<b>Equity</b>		
Share capital		
Common shares	130,100,000	130,100,000
Retained earnings		
Special earning reserve	127,421,220	127,594,713
Legal reserve	3,390,331	146,049
Retained earnings	<u>41,304,673</u>	<u>36,093,867</u>
Total retained earnings	<u>172,116,224</u>	<u>163,834,629</u>
Other equity	<u>3,831,922</u>	<u>3,664,312</u>
<b>Total Equity</b>	<b><u>306,048,146</u></b>	<b><u>297,598,941</u></b>
<b>Total Liabilities and Equity</b>	<b><u>\$801,948,280</u></b>	<b><u>\$769,502,334</u></b>

# CPC CORPORATION, TAIWAN

## STATEMENTS OF CASH FLOWS

### FOR THE YEARS ENDED DECEMBER 31, 2019 AND 2018

(In Thousands of New Taiwan Dollars)

	2019	2018
<b>Cash flows from operating activities:</b>		
<b>Net income before tax</b>	\$ 33,337,332	\$ 43,762,837
<b>Adjustments:</b>		
Non-cash adjustment items:		
Depreciation expense	19,565,145	20,544,702
Amortization expense	2,669,454	1,324,043
Expected credit loss	459,687	96,865
Net loss (gain) on financial assets or liabilities at fair value through profit or loss	(105,347)	(191,548)
Interest expense	3,134,646	2,771,191
Interest revenue	(832,436)	(580,815)
Dividend income	(438,347)	(1,155,186)
Share of loss of associates accounted for using equity method	(198,135)	201,180
Loss (gain) on disposal of property, plant and equipment	(303,548)	41,148
Gain on disposal of Investment Property	298,728	(672)
Provision for (Reversal of) write-down of inventories	(5,802,361)	7,020,400
Impairment loss recognized on non-financial assets	7,401,799	27,085
Loss (gain) on foreign exchange	(876,938)	(311,675)
Others	(893,893)	120,529
Total non-cash adjustment items	<u>24,078,454</u>	<u>29,907,247</u>
Changes in operating assets and liabilities:		
Accounts receivable	5,391,092	(3,674,858)
Other accounts receivable	2,445,943	1,228,582
Inventories	21,582,323	(29,443,601)
Prepaid expenses	(336,355)	(3,904,359)
Other current assets	(201,051)	(758,394)
Contract Liabilities	14,877	(7,835,697)
Accounts payable	(7,597,194)	11,076,785
Provision - non-current	3,190,938	(726,240)
Other current liabilities	3,573,088	(2,319,408)
Post-employment benefits payable	(278,718)	(344,227)
Total adjustments	<u>51,863,397</u>	<u>(6,794,170)</u>
Cash inflow generated from operations	85,200,729	36,968,667



	<u>2019</u>	<u>2018</u>
Interest received	280,504	384,807
Interest paid	(2,988,365)	(2,880,170)
Income taxes paid	(10,762)	(4,500)
<b>Net cash flows provided by operating activities</b>	<b><u>82,482,106</u></b>	<b><u>34,468,804</u></b>
<b>Cash flows from investing activities:</b>		
Acquisition of financial assets at fair value through other comprehensive income	(198,523)	(788,500)
Return of capital of financial assets using equity method due to capital reduction	-	270,952
Acquisition of property, plant and equipment	(15,822,260)	(11,198,848)
Proceeds from disposal of property, plant and equipment	414,398	198,955
Increase in refundable deposits	(125,306)	(160,166)
Decrease in refundable deposits	127,125	203,604
Acquisition of intangible assets	(174,194)	(127,723)
Acquisition of investment Property	-	(99,304)
Disposal of investment Property	-	870
Increase in other long-term receivables	(3,033,768)	(3,111,608)
Decrease (increase) in other non-current assets	(84,696)	169,694
Dividends received from associates and others	737,681	1,704,457
Increase in oil and gas interests	(5,042,584)	(4,016,382)
<b>Net cash flows used in investing activities</b>	<b><u>(23,202,127)</u></b>	<b><u>(16,953,999)</u></b>
<b>Cash flows from financing activities:</b>		
Distribution of retained earnings	(1,314,441)	-
Increase in short-term borrowings	88,719,817	111,372,417
Decrease in short-term borrowings	(91,443,076)	(103,542,664)
Increase in short-term bills payable	208,721,895	190,806,774
Decrease in short-term bills payable	(207,473,740)	(180,315,134)
Payments to bonds payable	(28,800,000)	(22,200,000)
Payments to long-term borrowings	(10,140,000)	(13,540,000)
Increase in other borrowings	10,800,000	-
Proceeds from guarantee deposits received	2,183,216	2,493,180
Refund of guarantee deposits received	(2,080,852)	(2,068,499)
Payment of lease liabilities	(3,541,970)	-
Increase (decrease) in other non-current liabilities	(49,728)	4,324
Decrease in bank overdraft	(2,898,383)	(71,953)
<b>Net cash flows used in financing activities</b>	<b><u>(37,317,262)</u></b>	<b><u>(17,061,555)</u></b>
<b>Net increase (decrease) in cash and cash equivalents</b>	<b>21,962,717</b>	<b>453,250</b>
<b>Cash and cash equivalents at beginning of period</b>	<b><u>2,015,092</u></b>	<b><u>1,561,842</u></b>
<b>Cash and cash equivalents at end of period</b>	<b>\$ <u>23,977,809</u></b>	<b>\$ <u>2,015,092</u></b>



# CPC CORPORATION, TAIWAN

## NOTES TO FINANCIAL STATEMENTS

### FOR THE YEARS ENDED DECEMBER 31, 2019 AND 2018

(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 15, 2020.

#### (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. ("FSC") which have already been adopted.

The following new standards, interpretations and amendments have been endorsed by the FSC and are effective for annual periods beginning on or after January 1, 2019.

New, Revised or Amended Standards and Interpretations	Effective date per IASB
IFRS 16 "Leases"	January 1, 2019
IFRIC 23 "Uncertainty over Income Tax Treatments"	January 1, 2019
Amendments to IFRS 9 "Prepayment features with negative compensation"	January 1, 2019
Amendments to IAS 19 "Plan Amendment, Curtailment or Settlement"	January 1, 2019
Amendments to IAS 28 "Longterm interests in associates and joint ventures"	January 1, 2019
Annual Improvements to IFRS Standards 2015-2017 Cycle	January 1, 2019

Except for the following items, the Company believes that the adoption of the above IFRSs would not have any material impact on its financial statements. The extent and impact of signification changes are as follows:

##### (i) IFRS 16 "Leases"

IFRS 16 replaces the existing leases guidance, including IAS 17 Leases, IFRIC 4 Determining whether an Arrangement contains a Lease, SIC-15 Operating Leases – Incentives and SIC-27 Evaluating the Substance of Transactions Involving the Legal Form of a Lease.

The Company applied IFRS 16 using the modified retrospective approach, under which the cumulative effect of initial application is recognized in retained earnings on January 1, 2019. The details of the changes in accounting policies are disclosed below,

##### 1) Definition of a lease

Previously, the Company determined at contract inception whether an arrangement is or contains a lease under IFRIC 4. Under IFRS 16, the Company assesses whether a contract is or contains a lease based on the definition of a lease, as explained in Note 4(j).

On transition to IFRS 16, the Company elected to apply the practical expedient to grandfather the assessment of which transactions are leases. The Company applied IFRS 16 only to contracts that were previously identified as leases. Contracts that were not identified as leases under IAS 17 and IFRIC 4 were not reassessed for whether there is a lease. Therefore, the definition of a lease under IFRS 16 was applied only to contracts entered into or changed on or after January 1, 2019.



## 2) As a lessee

As a lessee, the Company previously classified leases as operating or finance leases based on its assessment of whether the lease transferred significantly all of the risks and rewards incidental to ownership of the underlying asset to the Company. Under IFRS 16, the Company recognizes right-of-use assets and lease liabilities for most leases – i.e. these leases are on-balance sheet.

The Company decided to apply recognition exemptions to short-term leases of Office and leases of machinery.

At transition, lease liabilities were measured at the present value of the remaining lease payments, discounted at the Company's incremental borrowing rate as at January 1, 2019. Right-of-use assets measured at an amount equal to the lease liability, adjusted by the amount of any prepaid or accrued lease payments.

In addition, the Company used the following practical expedients when applying IFRS 16 to leases.

- Applied a single discount rate to a portfolio of leases with similar characteristics.
- Adjusted the right-of-use assets by the amount of IAS 37 onerous contract provision immediately before the date of initial application, as an alternative to an impairment review.
- Applied the exemption not to recognize right-of-use assets and liabilities for leases with less than 12 months of lease term.
- Excluded initial direct costs from measuring the right-of-use asset at the date of initial application.
- Used hindsight when determining the lease term if the contract contains options to extend or terminate the lease.

## 3) As a lessor

The Company is not required to make any adjustments on transition to IFRS 16 for leases in which it acts as a lessor, except for a sub-lease. The Company accounted for its leases in accordance with IFRS 16 from the date of initial application.

Under IFRS 16, the Company is required to assess the classification of a sub-lease by reference to the right-of-use asset, not the underlying asset. On transition, the Company reassessed the classification of a sub-lease contract previously classified as an operating lease under IAS 17. The Company concluded that the sub-lease is a finance lease under IFRS 16.

## 4) Impacts on financial statements

On transition to IFRS 16, the Company recognized additional \$40,186,634 thousands of right-of-use assets and lease liabilities, recognizing the difference in retained earnings. When measuring lease liabilities, the Company discounted lease payments using its incremental borrowing rate at January 1, 2019. The weighted-average rate applied is 1.4421%.

The explanation of differences between operating lease commitments disclosed at the end of the annual reporting period immediately preceding the date of initial application, and lease liabilities recognized in the statement of financial position at the date of initial application disclosed as follows:

	<b>January 1, 2019</b>
Operating lease commitment at December 31, 2018 as disclosed in the Company's financial statements	\$ 45,032,718
Recognition exemption for:	
short-term leases	(589,588)
leases of low-value assets	(19,462)
leases of evaluated as Service contract	(177,103)
	<u>\$ 44,246,565</u>
Discounted using the incremental borrowing rate at January 1, 2019	\$40,186,634
Finance lease liabilities recognized as at December 31, 2018	-
Lease liabilities recognized at January 1, 2019	<u>\$ 40,186,634</u>

(ii) IFRIC 23 “Uncertainty over Income Tax Treatments”

In assessing whether and how an uncertain tax treatment affects the determination of taxable profit (tax loss), tax bases, unused tax losses, unused tax credits, as well as tax rates, an entity shall assume that a taxation authority will examine the amounts it has the right to examine and have a full knowledge on all related information when making those examinations.

If an entity concludes that it is probable that the taxation authority will accept an uncertain tax treatment, the entity shall determine the taxable profit (tax loss), tax bases, unused tax losses, unused tax credits, as well as tax rates consistently with the tax treatment used or planned to be used in its income tax filings. Otherwise, an entity shall reflect the effect of uncertainty for each uncertain tax treatment by using either the most likely amount or the expected value, depending on which method the entity expects to better predict the resolution of the uncertainty.

The Company recognizes the cumulative effect upon its initial application of the new standard on January 1, 2019, in which, the deferred tax liabilities and retained earnings has no effect.

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

The following new standards, interpretations and amendments have been endorsed by the FSC and are effective for annual periods beginning on or after January 1, 2020 in accordance with Ruling No. 1080323028 issued by the FSC on July 29, 2019:

New, Revised or Amended Standards and Interpretations	Effective date per IASB
Amendments to IFRS 3 “Definition of a Business”	January 1, 2020
Amendments to IFRS 9, IAS39 and IFRS7 “Interest Rate Benchmark Reform”	January 1, 2020
Amendments to IAS 1 and IAS 8 “Definition of Material”	January 1, 2020

The Company assesses that the adoption of the abovementioned standards would not have any material impact on its financial statements.

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

As of the date, the following IFRSs that have been issued by the International Accounting Standards Board (IASB), but have yet to be endorsed by the FSC:

New, Revised or Amended Standards and Interpretations	Effective date per IASB
Amendments to IFRS 10 and IAS 28 “Sale or Contribution of Assets Between an Investor and Its Associate or Joint Venture”	Effective date to be determined by IASB
IFRS 17 “Insurance Contracts”	January 1, 2021
Amendments to IAS 1 “Classification of Liabilities as Current or Non-current”	January 1, 2022

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

#### (4) Summary of significant accounting policies:

The Company is operated and managed by the Government of the Republic of China (ROC). The Company’s accounts are maintained in accordance with the accounting laws and regulations governing state-owned enterprises. 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, 2018 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, 2019 by these government agencies were not yet completed as of the auditor's report date. 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. The necessary accounting adjustments were made into the current financial statements accordingly.

**(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 (policy applicable from January 1, 2019)**

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.

At inception or on reassessment of a contract that contains a lease component, the Company allocates the consideration in the contract to each lease component on the basis of their relative stand-alone prices. However, for the leases of land and buildings in which it is a lessee, the Company has elected not to separate non-lease components and account for the lease and non-lease components as a single lease component.



## 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.



(ii) **Leases (applicable before December 31, 2018)**

Leases are classified as finance leases whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases.

1) **Lessor**

Lease income from an operating lease is recognized in income on a straight-line basis over the lease term. Initial direct costs incurred in negotiating and arranging an operating lease are added to the carrying amount of the leased asset, and recognized as an expense over the lease term on the same basis as the lease income. Incentives granted to the lessee to enter into the operating lease are spread over the lease term on a straight-line basis so that the lease income received is reduced accordingly.

2) **Lessee**

Leases in which the Company does not assume substantially all of the risks and rewards of ownership are classified as operating leases.

Payments made under operating leases (excluding insurance and maintenance expenses) are recognized in profit or loss on a straight-line basis over the term of the lease.

(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**

Provisions, 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, are measured at the best estimate of the discounted cash flows of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation.

**(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 remeasurement) 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. Remeasurement, 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. Remeasurement 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 remeasurement 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.

**(v) Changes in accounting policy**

The management of the Company evaluated the changes in accounting policy in order to faithfully reflect the actual consumption pattern of real estate, plant, equipment (including decommissioning assets) and right-of-use assets, and enable the financial statements to provide reliable and more relevant information on the influence of related transactions on the Company's financial condition, financial performance and cash flow. Therefore, beginning 2019, the Company has changed the depreciation method of partial real estate, plant and equipment (including decommissioning assets) and right-of-use assets from the depreciation-fixed percentage of diminishing value method to the straight-line method. The change on depreciation method is expected to reduce the depreciation expense by NT\$ 6.505 billion, and the net profit after tax is expected to increase by NT\$ 5.204 billion in 2019. In accordance with International Accounting Standard 8 Accounting Policies, Changes in Accounting Estimates and Errors ("IAS 8"), the changes in accounting policy shall be applied to deferred recognition.

## **(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.

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).

**(b) Useful lives of property, plant and equipment**

The Company estimates the useful lives and depreciation method applied on the basis of actual past experiences for property, plant and equipment of similar nature and function. The Company reviews the estimated useful lives of property, plant and equipment at each balance date. When there are changes in the estimates, depreciation expenses will be affected prospectively.

**(c) Impairment evaluation of tangible and intangible assets**

In evaluating impairment loss on tangible and intangible assets, the Company relies on management's judgment as well as asset usage and industry patterns and practices to determine the useful lives of independent cash-generating assets and future possible income and expenses of a certain asset unit. Significant changes in the aforementioned assessment factors may give rise to material impairment losses.

**(d) Income taxes**

The realizability of the deferred tax asset mainly depends on whether sufficient future profits or taxable temporary differences will be available. If the actual future profits generated are less than expected, a material reversal of deferred tax assets may arise, which would be recognized in profit or loss for the period in which such a reversal takes place.

**(e) Recognition and measurement of defined benefit plans**

The resulting defined benefit costs under defined benefit pension plans and the net defined benefit liabilities (assets) are calculated using the projected unit credit method. Actuarial assumptions comprise the discount rate, rate of employee turnover, and future salary increase, etc. Changes in economic circumstances and market conditions will affect these assumptions and may have a material impact on the amount of the expense and the liability.

(f) Decommissioning liability

Under IFRSs, the Company uses the effective interest rate to discount estimated decommissioning cost to its present value as carrying amount at the end of the reporting period. The estimation of the decommissioning cost and its discount rate is based on the Company's research report, and is reviewed and adjusted periodically to meet its best estimation. Changes in decommissioning cost and its discount rate may have a material impact on the amount of the decommissioning liabilities.

## A Five-year Financial Summary

(In Thousands of New Taiwan Dollars)

	2019	2018	2017	2016	2015
Sales and other operating revenues	1,014,108,034	1,034,575,586	896,642,121	764,629,993	843,615,422
Profit (loss) before income tax	33,337,332	43,762,837	48,542,061	35,430,707	(1,402,323)
per dollar of sales and other operating revenues (NT\$)	0.033	0.042	0.054	0.046	(0.002)
Cash dividends	24,678,319	1,314,441	—	—	—
per dollar of capital(NT\$)	0.19	0.01	—	—	—
Owner's equity	306,048,146	297,598,941	260,417,391	221,475,417	192,157,075
per dollar of capital (NT\$)	2.35	2.29	2.00	1.70	1.48
General taxes and import duties	46,614,084	58,228,141	51,348,334	44,638,861	43,259,598
Commodity tax	71,598,649	72,007,592	74,288,029	74,581,051	72,054,757
Total taxes	118,212,733	130,235,733	125,636,363	119,219,912	115,314,355
Working capital (current assets less current liabilities)	(48,410,303)	(52,777,478)	(56,879,637)	(87,227,141)	(87,408,206)
Ratio of current assets to current liabilities	81.17%	79.91%	75.93%	64.93%	64.81%
Long-term Liabilities	76,050,000	88,050,000	126,590,000	147,930,000	177,920,000
Properties, plant, and equipment-gross	909,097,079	914,752,212	913,710,040	911,364,127	904,641,954
Properties, plant, and equipment-net	421,334,223	423,460,997	430,577,501	428,542,522	428,472,574
Exploration expenses (including all dry holes)	2,031,934	2,573,975	2,195,701	2,267,889	2,947,919
Total assets	801,948,280	769,502,334	745,046,121	741,353,122	741,965,890
Employed capital (Equity, long-term debt)	382,098,146	385,648,941	387,007,391	369,405,417	370,077,075
Employees on December 31	15,836	15,712	14,814	14,708	14,693
Sales and other operating revenues per employee	64,038	65,846	60,527	51,987	57,416



## A Five-year Operation Summary

	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>
Crude oil produced-total KL	265,278	180,062	193,474	182,265	169,797
daily average KL	727	493	530	499	465
Natural gas produced-total MCM	519,833	240,026	268,115	325,700	377,952
MCM per day	1,424	658	735	892	1,035
Liquefied petroleum gas produced-total MT	3,929	-	-	-	-
MT per day	11	-	-	-	-
Wells drilled during the year	3	2	2	2	1
Crude oil processed-total KL	23,763,205	22,213,776	21,661,811	21,635,119	20,525,008
daily average KL	65,105	60,860	59,347	59,274	56,233
Natural gas sold-total MCM	21,733,213	22,171,345	21,967,834	20,042,777	18,950,917
MCM per day	59,543	60,743	60,186	54,912	51,920
Refined products sold-total KL	34,312,260	34,661,601	35,524,415	36,112,964	33,448,897
daily average KL	94,006	94,963	97,327	98,940	91,641
Petrochemicals sold-MT	4,253,913	4,281,652	4,016,126	4,253,360	4,351,223
daily average MT	11,655	11,731	11,003	11,653	11,921







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