



**2019**  
CPC Corporation, Taiwan





TO SEE

CPC

from a  
DIFFERENT VIEW



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without Limits

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2019

CPC Corporation, Taiwan



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# The Chairman's Preface

## Strategic deployment to realize the vision

The global economy was adversely affected in 2018 chiefly by both the USA-China confrontation over trade and the turbulence surrounding Brexit - with the result that its growth outlook turned from stable to uncertain. There was fluctuation in international oil prices; and as the market for electric vehicles continued to expand, that for vehicles powered solely by gasoline or diesel correspondingly contracted. Petrochemicals prices took a downward turn globally as, one after another, ethane-producing naphtha cracker plants came on stream in the United States and boosted supply above demand; and the international energy industry was roiled by rapid change. Amidst all this, CPC continued to focus on fulfilling its mission to both maintain a stable and sufficient supply of petroleum products, natural gas and petrochemicals feedstock on to Taiwan's domestic market and to stimulate the development of downstream petrochemicals-related industries. Thanks to the hard work and dedication of everyone at CPC, our revenue in 2018 again passed the trillion NT dollar mark - a brilliant performance, closing out the year with pre-tax profits of NT\$4.23 billion that more than made up for the losses incurred earlier.

Looking back at 2018, we can see that CPC notched up some notable achievements across all of its core areas of business. In Exploration & Production, we acquired a working interest in the exploration of two Californian oil fields; and the Ichthys and Prelude natural gas fields offshore north-west Australia went into production. In the field of oil refining, we implemented a Process Safety Management (PSM) program using a systematized management model to identify and evaluate potential dangers and risks, in the light of which effective process controls were adopted. The investment plan for the Dalin Petrochemical Products Terminal within the Kaohsiung Intercontinental Container Terminal (ICT) Project Phase 2 was further developed, as were feasibility studies for prospective joint-venture investment in petrochemicals parks in India and Indonesia. For our Natural Gas Business Division, August saw the signing of a long-term supply contract with Cheniere Corporation - America's largest LNG exporter - and thus the opening of a new chapter in the diversification of Taiwan's natural gas sources at a time of global restructuring in LNG trading. Our Third LNG Terminal project's Environmental Impact Assessment passed muster in October, putting in place another milestone in expanding the country's capacity in LNG imports and natural gas distribution. For CPC's Marketing Business Division, June 2018 saw an NFC-based cashless payment service inaugurated at all of the 600-plus gas stations directly operated by the company - yet another instance of our creating time-saving and satisfaction-boosting convenience for our customers. Coming to reinvestment and joint-ventures, progress has been made: notably, beginning construction of the Maxihub Company's lubricant blending and storage plant in Vietnam. Following up on our commitment to developing green energy sources, in March CPC signed a letter of intent with Taiwan Power Company for cooperation on the Renze-Tuchang geothermal energy development project, this in turn leading to drilling of the Renze No. 3 exploration

well beginning in November. Installation of rooftop photovoltaic panels at a number of CPC operational locations, including prototype smart green gas stations, was either commenced or completed.

Amid the bustle of business, fulfillment of our corporate social responsibility (CSR) commitment is never far from our minds. It takes many forms: educational, social, cultural, sports-oriented, environmental and technical. Beginning with educational: for the sixth year in a row we organized a Green Dragon Creativity Summer Camp to help young minds understand how important is the deep-rooting of green energy applications in their communities; we subsidized a community literacy development facility at Nanyang Elementary School in Kaohsiung; we donated refurbished computers to schools in remote areas to help them raise the quality of their educational programs. In the social sphere we co-sponsored the 2018 Taichung World Floral Exposition, by providing 600,000 liters of fuel for shuttle buses as a means of encouraging people to take public transportation and thereby do something for energy conservation and carbon reduction; to help support Taiwan's farmers, we assisted in organizing farmers' market events for such native produce as onions, mountain-grown bananas and pineapples; we encouraged corporate blood donation: our various business units initiated drives to reach the target of One Million CC of Blood from CPC out of a spirit of concern for the public good. We were active in defense of the environment. The former Kaohsiung Refinery site acquired Environmental Education Facility certification, thereby achieving the goals of both delivering environmental education and furthering sustainable development; to demonstrate our concern for protecting the environment and its ecological systems, we held tree-planting events (for which we also donated the seedlings), mountain, river and beach cleanups and suchlike activities in which we worked alongside members of the public to create more pleasant living surroundings; we made a consistent practical commitment towards the implementation of measures for reducing greenhouse gas emissions, waste-water recycling and workplace energy conservation programs; we changed the name of our Department of Environmental Protection to the Department of Environmental Protection and Ecological Conservation; and we added a new business unit - the Ecological Conservation Division - tasked with carrying out the work of ecological conservation and implementing conservation measures generally. We believe that sports and cultural activities are essential to a healthy society. Accordingly, in 2018 we again supported the individual ambitions of elite athletes, adopted and supported baseball teams at schools in remote areas and subsidized the organization of cultural and artistic activities for regional and township communities, as both a public benefit and a way to stimulate domestic tourism.

**CPC is taking a 3-track approach to achieving sustainable corporate development.**

CPC will respond to the challenges of climate change, restructuring of the international energy and petrochemical industries and the movement towards the oncoming era of low carbon and



diverse new forms of energy by channeling its pursuit of sustainable corporate development into three major directions. In our primary industry – energy - we will constantly reinforce our core businesses, speed up the development and production process in our existing overseas oil and gas fields; and further, look to increase our participation in joint-ventures for investment-worthy projects overseas in general and the area of new energy in the form of shale oil and gas in particular. We will also continue to seek involvement in energy-related projects arising from the national New Southbound Policy. In our refining business, in addition to seeking high yields we will also work at raising the higher value-added quotient in our products as well as put into practice the protocols of the circular economy. In line with current government policy for transitioning to a new national energy mix by 2025, we will play our part in boosting the percentage of natural gas used in electricity generation to the required 50%; and besides widening our sources of natural gas, we will devote vigorous effort to upgrading our natural gas operational capabilities in a number of ways: by completing the Third LNG Terminal project on time, by completing the north-center-south natural gas transmission network, by ensuring a stable supply of natural gas on to the market and by promoting yet further applications for it as low-carbon energy. We will carry forward our green energy R&D programs, including the installation of distributed photovoltaic systems and developing geothermal source infrastructure. In developing new fields of business we will build on the foundation of our existing core technologies and work with other companies, both domestic and international, to expand our capability into innovative energy technologies.

Going forward, the company will face strong headwinds in the international operating environment and in the domestic one as well. But we at CPC will tackle those challenges head on, holding all the time to our two guiding principles of safety and stability; while also making the best use of our human talent and encouraging teamwork – all so as to reinforce our core businesses and accelerate the transition to sustainability; and, above all, to carry on with providing Taiwan's consumers with the very finest energy products and services. We will also put our best efforts into coordination with central government in the promotion and implementation of its policies for transitioning to a new national energy mix. Similarly, we will give high priority to putting in place measures for energy saving, reducing carbon emissions and environmental and ecological conservation. As an involved corporate citizen, CPC will, as now, show in practical ways our concern for society's disadvantaged groups; and will add to its CSR commitment its best efforts to make real the vision of sustainable corporate development along with the status of a competitive, internationally-operating energy enterprise.



Chairman

*Jia Ruoyou*

President

*Lee, Shem-chin*



In its position as a key leader of Taiwan's soaring economic development, the CPC Corp. embraces a forward-looking vision, fulfills its corporate social responsibility, and constantly climbs to new peaks where even more beautiful horizons stretch in the distance.

# Vision

Corporate  
Advancement  
Without Limits

# The Evolution of Business Management



# Towards Sustainable Corporate Development

On Track with the World, A Win-win-win for Environment, Economy, and Society

## CPC's timeline of innovative development

- 2016** ■ On June 17, 2016 the board of directors approved the revision of the company's articles of association required for moving the head office location from Taipei City to Kaohsiung City.
- 2007** ■ At the 550th meeting of the Board of Directors in February 2007, the company's English name was changed from the original 'Chinese Petroleum Corporation' to CPC Corporation, Taiwan – so as to preserve the former title in vestigial form in the prefix.
- 2003** ■ In line with both the global trend and forward-looking corporate thinking towards achieving worldwide environmental protection, in 2003 CPC instituted a policy for its future sustainable corporate development.
- 1949** ■ Following the ROC government's relocation to Taiwan in 1949, corporate headquarters was set up in Taipei and the company's affiliation transferred to the Ministry of Economic Affairs. Its scope of business, then as now carried out at workplaces throughout Taiwan, primarily encompassed oil and natural gas operations: exploration and production; procurement and import; refining, storage and distribution; sales and marketing; and the production of petrochemical raw materials.
- 1946** ■ CPC was formally established in Shanghai on 1 June 1946, initially under the aegis of the then Council of Resources - the precursor of today's State-owned Enterprise Commission, Ministry of Economic Affairs.





In line with both the global trend and forward-looking corporate thinking towards achieving worldwide environmental protection, in 2003 CPC instituted a policy for its future sustainable corporate development. That has since served as the basis for the pursuit of key performance indicators and for striving to hit a number of operational targets - all within the context of ongoing efforts to raise the level of corporate practice, as follows:

### Sustainable Development Policy

- Compliance with both Taiwan's governmental regulations and international protocols.
- Comprehensive clean manufacturing methodology coupled with environmental protection.
- Conservation of water and energy resources through efficient utilization.
- Emphasis on the importance of fulfilling CSR commitments and of expanding the range of energy services available to the consuming public.
- Establishment of both key environmental protection indicators and of the practice of fully transparent information disclosure on their achievement.
- Active commitment to R&D as key to the creation of new areas of business.

As follow-up, in 2005 CPC put in place the Sustainable Operations Promotion Committee – a body tasked with maintaining the company's focus on in-house compliance, strategy formulation and setting objectives with regard to sustainable operations issues. The organization of sustainable operations development was divided into four major fields: environmental and ecological conservation; societal concerns; strategy formulation and R&D; and environmental accounting and information. The Committee's status was upgraded in 2007, with CPC's Chairman of the time personally taking over its leadership; and further, in 2008 it began recruiting academics and outside experts to serve as members. The committee convenes three times a year to discuss progress and raise proposals in the four fields of activity mentioned above. In this way it is able to gain a timely grasp of the pulse of society, promote sustainability issues and keep track of progress with implementation.

In 2007 CPC began issuing an annual Sustainability Report as a manifestation of our determination to both communicate and engage with all of our stakeholders on that issue. As well as connecting to the relevant global information networks and publishing the aforementioned annual report as one means of communication with them, we provide ongoing insights and analysis on key matters of concern. These efforts have been recognized by awards from a number of organizations. In future we will adopt the UN's Sustainable Development goals (SDGs) as benchmarks for our own sustainable corporate development program, and also, through the Sustainable Operations Promotion Committee, focus on familiarizing our stakeholders with the challenges and achievements relevant to it. In that respect we will use both selected social media and our Sustainability Report for information disclosure. In all this our overriding aim will be to create a win-win-win situation encompassing environmental protection, economic development and corporate social responsibility as we join hands with all sectors of industry to build an even better future.





## Recognition and Honors in 2018

- Management Magazine - No.1 Consumers' Ideal Gas Station Brand for the 14th consecutive year.
- Reader's Digest Trusted Brand - Platinum Award for the 18th consecutive year.
- Climate Leadership Award from the Taiwan Corporate Sustainability Report Awards.
- Taiwan Corporate Sustainability Awards - Energy Sector Gold Award in the 'Top 50 Corporate Sustainability Reports' category.
- The East Region Department of the Marketing Business Division won Silver in the 25th & 26th Annual ROC Enterprise Environmental Protection Awards.

# Board and Corporate Officers



## Board of Directors

Jia-Rueey Ou | Chairman & Standing Director

### Directors

Shun-Chin Lee | Standing Director

Ming-Chang Hsu | Standing Director & Independent Director

Chih-Chreng Shen | Independent Director

Syang-Peng Rwei

Engel Wu

Pei-Li Chen

Peggy L. Lin

Chung-Hsien Chen

Chao-Chung Kuo

Chih-Chang Chen

Chih-Wei Sun

Sheng-Ching Huang

### Supervisors

Shi-Jeng Yang

Hui-Shan Wei

Feng-Yuan Chien



## Corporate Officers

President Shun-Chin Lee

Vice Presidents Ming-Huei Chen

Jeng-Zen Fang

Jen-Hung Huang

Shu-Chen Chen

Chia-Shou Chiu

CEO, Exploration & Production Business Division Michael Chang

CEO, Refining Business Division Henry Hsu

CEO, Petrochemical Business Division Yi-Fang Wu

CEO, Marketing Business Division Po-Tung Lo

CEO, Natural Gas Business Division Jane Liao

CEO, Lubricants Business Division Ting-Pang Chi

CEO, LPG Business Division Cheng Ping Wang

CEO, Solvent & Chemical Business Division Angela Ko-Ju Lin

Director, Refining & Manufacturing Research Institute Kun-Hai Lin

Director, Exploration & Development Research Institute Ta-lin Chen

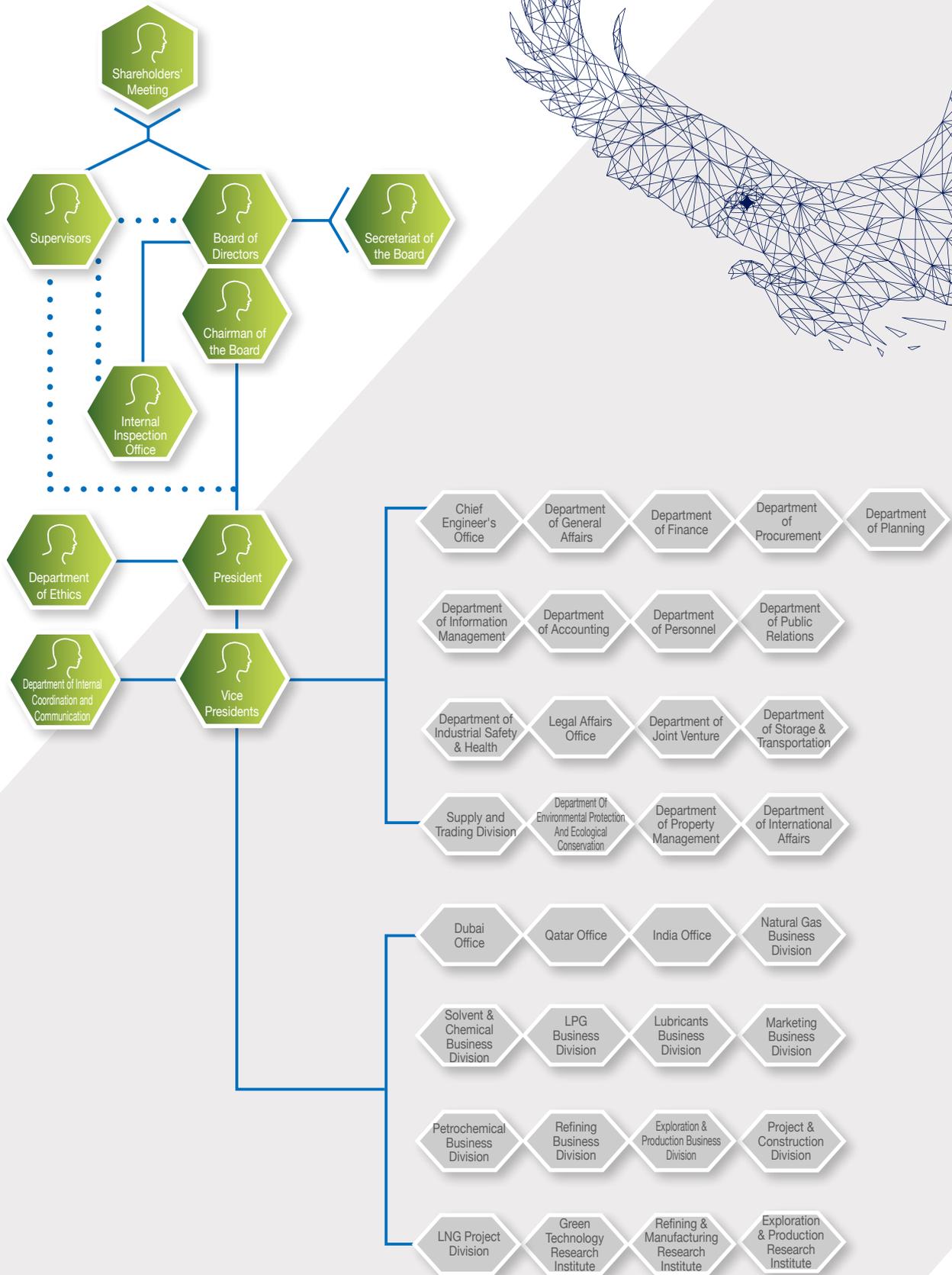
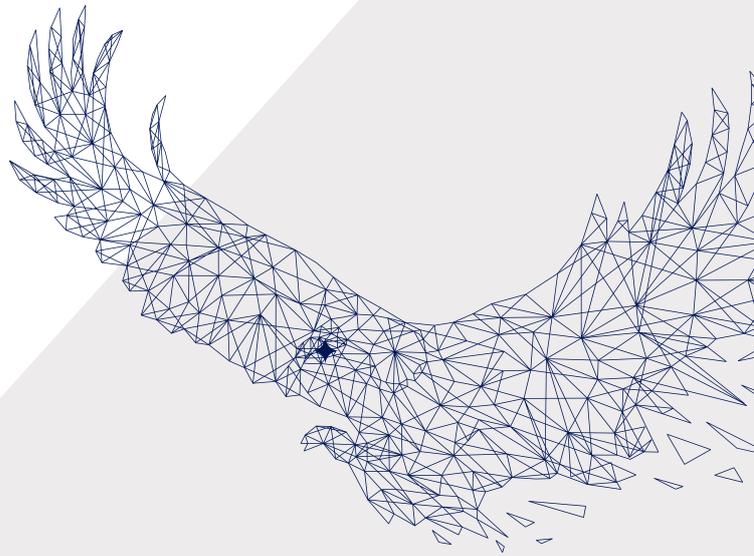
Director, Green Technology Research Institute Tung-Li Huang

Director, LNG Project Division Rong-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

Shun-Chin Lee

President



**Jia-Rueey Ou**

Chairman

**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



Holding firmly to its original commitment to the industry, the CPC Corp. deeply cultivates its local strengths, boldly develops overseas markets, widely deploys in up- and downstream industries, performs vigorously on the world stage, and beats to the pulse of Taiwan's industrial capabilities, winning repeated plaudits from all sectors.

# The Boundary of Global Development

## View

Operating  
Throughout the  
Worldwide  
Domain



2018 Condensate production  
 **4,678**  
 kiloliters

2018 Natural gas production  
 **198**  
 Million cubic meters

## Upstream Operations

Widening the scope of joint-ventures to boost ownership of energy sources

### Exploration and Production: Overseas Resources are Key

Taiwan has only very limited indigenous energy resources and depends on imports for almost all of its fossil fuel needs. CPC has therefore focused on achieving effective expansion of its upstream operations by acquiring and developing its own reserves overseas - and ramping up production there - so as to stabilize the supply of crude oil and natural gas (imported as LNG) into the domestic market and thus ease the impact on the public of global price fluctuations. This development has taken place in the context both of the government's policy for strengthening Taiwan's energy security mechanisms and of the company's greater participation in cross-border cooperation on energy-related matters.

In order to improve its 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; widening the scope and quickening the pace of exploration activity through both M&A and joint-ventures; and the training and retention of talent – an important renewable resource, and one essential to success.

### Developing Taiwan's onshore energy resources

Through 2018, CPC made progress in realizing the potential of Taiwan's indigenous energy resources. A 137.54-kilometer 2D seismic survey of potentially hydrocarbon-bearing geological structures on the eastern edge of the Pingtung Plain was completed; the geothermal characteristics of a 72 sq. km 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 30 currently-producing oil and gas wells – located in and around Mt. Tiezhen, Qingcao Lake, Jinshui, Chuhuangkeng and Guantian yielded 198 million cubic meters of natural gas and 4,678 kiloliters of condensate in 2018. In line with national energy policy and incidentally burnishing its green energy industry credentials, CPC began drilling the Renze No. 3 geothermal well in November 2018.

### Deep-water exploration in the Taiwan Strait moves to new areas

A post-operational review and overall assessment of the oil and gas resources revealed by drilling deep-water well ST18-6-1 in the Taichao contract block were carried out in 2018. After careful consideration it was decided that none of the three exploratory wells covered by this contract had the potential for commercial development, and



that continuing the search for oil and gas in commercially viable volumes would require the commitment to an unfeasible extent of both capital investment and skilled manpower. In view of these pessimistic prognostications, it was resolved to not extend the contract beyond its expiration on 31 December 2018 and further to dissolve the Taichao Petroleum Corporation. In another move, CPC has joined forces contractually with the China National Offshore Oil Exploration Corporation (CNOOC) and France's Total to search for oil and gas in deep-water areas within the Nanhai-Taiyang block, which lies on either side of the Taiwan Strait's center line. A 2D seismic survey of the western half of that contract block was completed in 2018 and processing and interpretation of the resulting data is now under way.

### CPC's overseas joint-venture natural gas fields come on stream

As of end-2018, CPC was engaged in oil and gas exploration and development joint-ventures with international oil companies in eight locations spanning five countries. About 220 producing wells across those geographies yielded a CPC production share amounting to 4.201 million barrels of crude oil and 100 million cubic meters of natural gas, with blocks in Ecuador and Niger contributing the lion's share. Moreover, as the Ichthys and Prelude gas fields offshore Australia began production and export in 2018 and with blocks in Chad and Niger set to follow suit sometime soon, the outlook for company's profitability in the near term looks promising. In Chad, where CPC has had a presence in exploration for many years, back in July 2017 the government issued a license to the company for development and production in certain blocks where CPC acts as operator; and that same year saw a 25-year development and production phase begin. Those blocks are the first in which CPC has engaged in oil and gas exploration overseas with the status of operator; not only that, but in that location our teams discovered oil in commercial quantities and embarked on development and production programs. The company is now moving full speed ahead on bringing those fields into production by the end of 2019 – which, if that deadline is met, will be one more good instance of CPC achieving the twin goals of boosting the number of oil and gas sources under its control and of upgrading the stability of Taiwan's energy supplies.

The fact that Taiwan's known onshore oil and gas reserves could be exhausted within 10 years from now helps to drive CPC's continual engagement in overseas exploration and production as well as M&A activity. The company 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 fields in such places as south-east Asia and the United States and then developing them for commercial production. Exploration for conventional oil and gas is currently focused on fields in California, Abu Dhabi, south-east Asia and central Africa; for unconventional sources, the focus is on acquiring shale oil and gas assets in the United States. In all of the aforementioned activities, the company is working vigorously to deploy its limited resources to best advantage, on core overseas targets that hold out the possibility of discovering oil and gas reserves with development value and that will materially raise its degree of ownership and control over its raw material sources.

CPC's upstream operations were launched in 1959 and today comprise exploration and production in both onshore and offshore oil and gas fields in Taiwan, the Taiwan Strait and overseas. In the main successful, they have to date yielded oil and gas to the value of over NT\$200 billion. Looking to the future, the CPC corporate vision is that of becoming a high asset-value, integrated international oil and gas business; it is now heavily engaged in upstream collaboration with multinational energy companies and M&A activity that is centered on exploration and raising its level of ownership and control over its core oil and gas reserves. The company will endeavor to acquire fields with high production potential, above all those with low risk by industry standards, and to seek long-term contractual rights in its currently-producing locations. In parallel with this, there are initiatives to both develop diversity in the company's scope of business and to be a player in the fast-growing green energy industry.

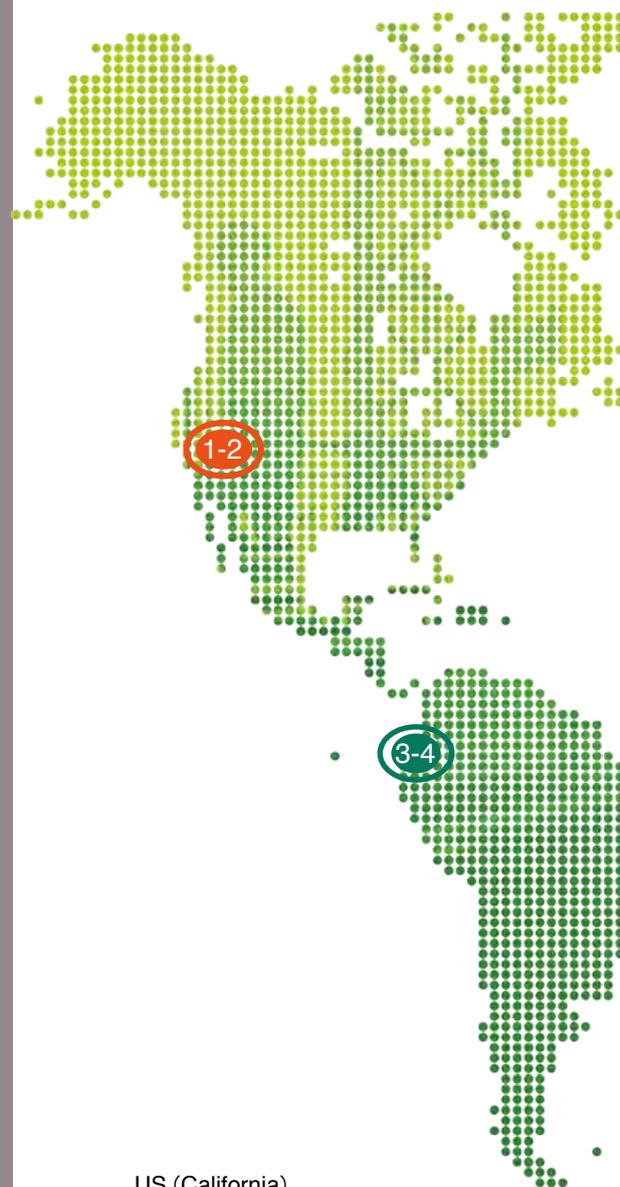
### CPC'S EXPLORATION AND PRODUCTION: FINANCIAL PERFORMANCE OVER THE LAST 3 YEARS

Unit: In Millions of New Taiwan Dollars

Year	2016	2017	2018
Operating revenue	10,350	6,509	10,025
Operating costs	11,439	6,353	7,347
Earnings	(1,089)	156	2,678
Pre-tax profit	(6,749)	(10,362)	191
Operating revenue as a share of company's total turnover*	1.35%	0.72%	0.97%

\* Total revenue: 2016 - NT\$764 billion; 2017 - NT\$897 billion; 2018 - NT\$1,036 billion.

## CPC Produces Oil and Gas Worldwide

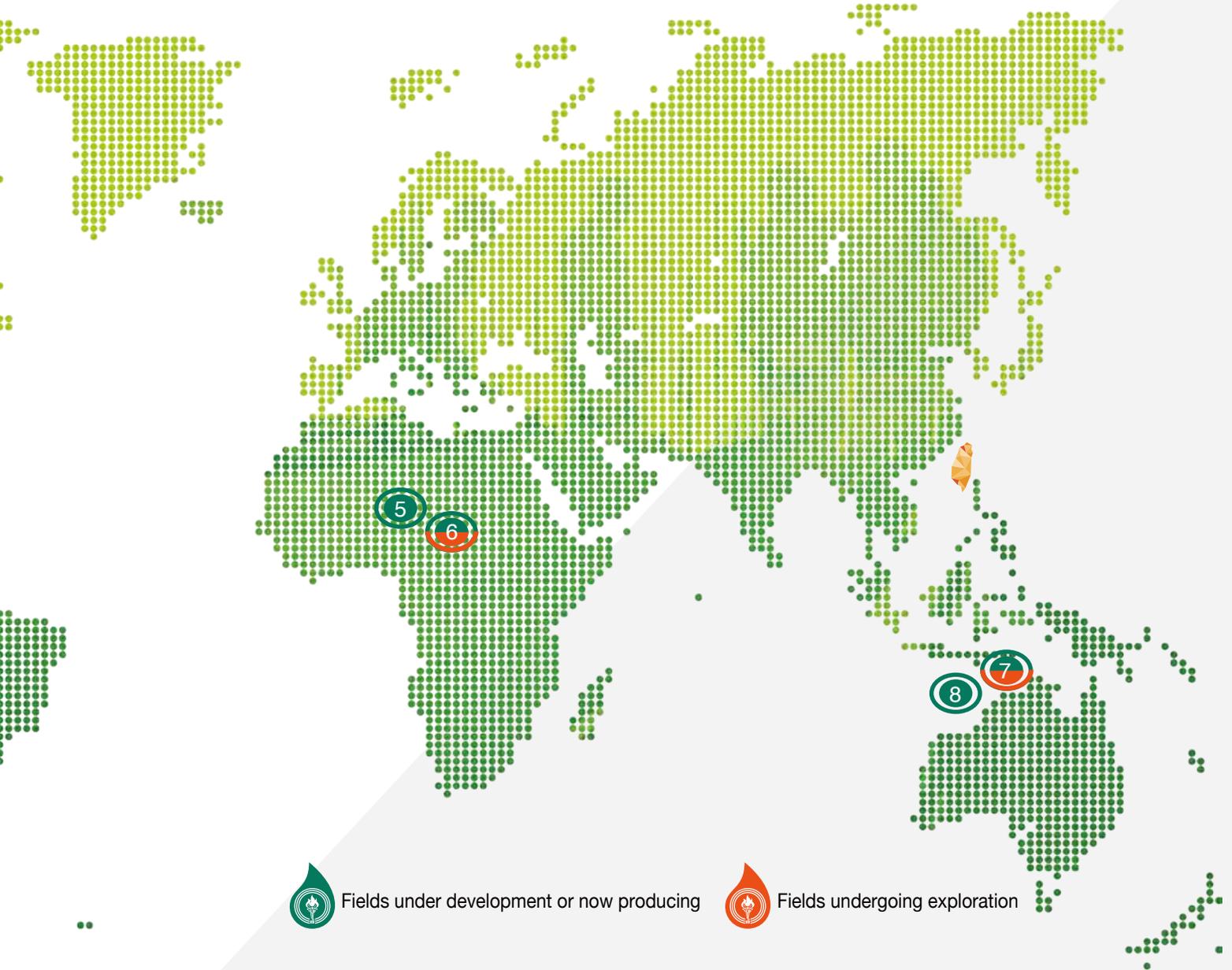


1 US (California)  
Guardfish OPIC (75%)  
Operator : CRPC

2 Lynx OPIC (75%)  
Operator : CRPC

3 Ecuador  
Block-16 OPIC (31%)  
Operator : Repsol

4 Block-17 OPIC (30%)  
Operator : PetroOriental



Fields under development or now producing



Fields undergoing exploration

Niger

5 Agadem Grand EEA OPIC (20%)  
Operator : CNPCNP

Chad

6 Oryx OPIC AFRICA (35%)  
Operator : OPIC AFRICA

6 BCO III, BCS II, BLT I OPIC AFRICA (35%)  
Operator : OPIC AFRICA

Australia

7 Ichthys OPIC (2.625%)  
Operator : INPEX

7 WA-285-P OPIC (2.625%)  
Operator : INPEX

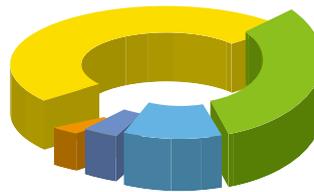
8 Prelude OPIC (5%)  
Operator : SHELL





**2018**  
TOTAL CRUDE OIL IMPORTS

**138.05** million barrels



-  Middle East 49.94%
-  United States 31.06%
-  Africa 4.39%
-  Southeast Asia 3.34%
-  Other Locations (Abyssin, Brazil) 11.27%

## Downstream Operations

CPC bears the burden of bringing stability to Taiwan’s oil and gas supplies

### 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 home market. To ensure stability, CPC works to both maximize procurement on long-term contracts and to diversify its sources of crude. Imports in 2018 amounted to 138.05 million barrels; of that total, 49.94% came from the Middle East, 31.06% from the USA, 3.34% from south-east Asia, 4.39% from Africa and 11.27% from other sources such as Azerbaijan and Brazil. Imports of low-sulfur, ‘sweet’ crude are maintained at a set ratio of the total to enable compliance with Taiwan’s ever more stringent environmental protection standards.

To ensure safe and speedy handling of its crucially-important crude oil imports, CPC has installed purpose-built offshore mooring pontoons for unloading large oil tankers: at Shalun near Taoyuan in Taiwan’s north and at Dalinpu near Kaohsiung in the south. The company has also built dedicated tanker loading/unloading berths in the ports of Kaohsiung, Taichung and Shen’ao.

### CPC’s diversification of its crude oil sources is ongoing

CPC now operates two refineries in Taiwan — at Taoyuan in the north and Dalin in the south— with a combined daily refining capacity of 600,000 barrels. The company’s Kaohsiung Refinery, which ceased operations in late 2015 under government policy for industry relocation, was its first and oldest and at its peak comprised a large-scale, integrated refining and petrochemical production complex with a daily refining capacity of 220,000 barrels as well as turning out 500,000 tons of ethylene annually. Upon closure, its refining activity was transferred to the expanded Dalin plant and its ethylene production to the then new Third Naptha Cracker in the Linyuan Petrochemical Complex.

The Dalin site became operationally independent of the Kaohsiung Refinery in 1996 and after expansion now has a refining capacity of up to 400,000 barrels of crude daily. Its tanker loading/unloading facilities comprise 4 offshore mooring buoys as well as large and small wharves for handling both imports and exports. The Taoyuan Refinery came on stream in 1976; after engineering modifications and the addition of a second topping unit, its daily



refining capacity now amounts to 200,000 barrels. In 2018 the total of refined products was 9,318,000 kiloliters of gasoline; 2,087,000 kiloliters of aviation fuel; 10,445,000 kiloliters of diesel; 2,099 kiloliters of fuel oil; and 411,000 kiloliters 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 third tert-methyl-ether and gasoline/diesel desulfurization plant, an aviation fuel processing facility, together with n-alkane, alkylation and residual oil conversion 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.

### In pursuit of enhanced quality and higher added-value

Ever since the announcement, over a decade ago, by the central government Environmental Protection Agency (EPA) of medium- and long-term environmental protection standards in the area of fuel quality, CPC has responded affirmatively. Specifically, the EPA called for certain reductions by 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 18vol%. CPC's response was to construct a 30,000-barrel-per-day gasoline pyrolysis and hydro-desulfurization unit at the Taoyuan Refinery by 2008, a 20,000-barrel-per-day gasoline pyrolysis and hydro-desulfurization unit at the Dalin Refinery by 2009 and a 40,000-barrel-per-day diesel hydro-desulfurization unit at the Dalin Refinery by 2010. Further, an 18,000-barrel-per-day gasoline pyrolysis and quality improvement unit was moved in 2011 from the Kaohsiung Refinery to the Dalin plant, where after testing it began volume production in 2013.

As far back as 2006 CPC began improving its heavy oil conversion rate by beginning construction of both an 80,000-barrel-per-day residual fluid catalytic cracking (RFCC) unit at the Dalin Refinery and a 70,000-barrel-per-day residue desulfurization (RDS) unit at the Taoyuan site, along with their associated hydrogen and sulfur units. The RFCC unit at the Dalin Refinery began testing in late 2012 and volume production in 2013. In order to ensure an adequate supply of olefin as feedstock, CPC also built a 140,000-barrel-per-day alkylation unit at the Dalin Refinery to further upgrade the quality of its gasoline; and that unit came on stream in late 2013. In addition around that time, planning got under way for a joint-venture producing high-value petrochemical products: this entailed constructing a 180,000-ton-per-year isononyl alcohol (INA) plant and

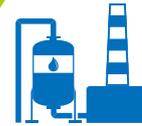


a 144,000-ton-per-year methyl tert-butyl ether (MTBE) unit, together with associated technology, in order to boost the added-value of the mixed C4 hydrocarbons produced by the RFCC unit. The project was fully commissioned when volume production began in 2016.

In addition, the company carried out an expansion of the No. 3 Hydro-desulfurization Unit at the Dalin Refinery to increase its high-sulfur 'sour' crude refining capacity, 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 closing down in late 2015, the Dalin plant's capacity was expanded with the following: a 150,000 barrels-per-day atmospheric crude oil distillation unit, a 50,000-bpd light crude fractionating unit, a 40,000 bpd diesel hydro-desulfurization unit and a 30,000-bpd kerosene hydro-desulfurization facility. 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 100,000-bpd 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 300,000 bpd to its present 400,000 bpd, raising CPC's overall daily crude oil refining capacity to 600,000 bpd.

Exports of refined products – now primarily to Korea, Indonesia, the Philippines, Pakistan, Singapore, the UAE, Papua New Guinea and Australia – have increased year by year until in 2018 they amounted to approximately 2,884,000 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.



2018 Total annual revenue from  
petrochemical products NT\$

**111.844** billion

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

CPC's principal petrochemicals production sites are its Linyuan Petrochemicals Complex - run by the Petrochemicals Business Division and the Taoyuan and Dalin refineries, operating under the Refining Business Division. The heavy fuel oil conversion plants at Taoyuan and Dalin produce propylene. The naphtha cracker and butadiene extraction plants at the Linyuan site also produce propylene, along with ethylene and butadiene; while its aromatics extraction facility produces benzene, toluene and xylene. CPC's current annual production capacity for petrochemical raw materials is comprised of 1.07 million tons of ethylene, 1.194 million tons of propylene, 158,000 tons of butadiene, 274,000 tons of benzene, 321,000 tons of toluene and 507,000 tons of xylene.

### CPC organizes the industry supply chain and supports the circular economy

CPC's long-term investment in upstream petrochemicals manufacturing has helped drive the industry's development and also support and sustain the rise of Taiwan's economy. In recent years, the company has put considerable effort into updating its technical equipment and expanding production capacity so as to eliminate any possibility of a shortfall in the supply of raw materials to downstream users. By way of example: starting in 2005, a total of NT\$40 billion was invested in upgrading the Linyuan site's Third Naphtha Cracker; and production of high-quality ethylene began in 2013. That renovated and expanded plant now produces annually 720,000 tons of ethylene, 370,000 tons of propylene and 100,000 tons of butadiene. As well as supplying downstream manufacturers in the adjacent industrial park, the Linyuan plant provides petrochemical materials to companies in the Renda Industrial Park that were previously supplied by the Fifth Naphtha Cracker. The Linyuan complex generates about NT\$60 billion in annual revenue for the company and its evident success has both encouraged downstream companies to invest and helped raise profitability in the industry to a new level. Looking ahead, CPC plans to employ state-of-the-art processes, low-energy consumption technologies and economies of scale to provide the downstream sector of the petrochemical industry with reliably adequate supplies of such key raw materials as ethylene and propylene.

In the context of the challenges posed by climate change and depletion of natural resources, CPC lends practical support to the government's Circular Economy policy by turning petrochemical by-products used as fuel or previously regarded as industrial waste into value-added products. Going further, the company 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: Keeping Taiwan's Wheels Turning

CPC's marketing of refined petroleum products in its home territory is primarily focused on the transportation sector – specifically for gasoline, diesel, fuel oil and aviation fuel. In 2018 its sales of those products in Taiwan totaled 19.208 million kiloliters in volume and generated revenue of approximately NT\$416.6 billion – the latter sum a significant increase over 2017. Automotive gasoline accounted for the largest share at approximately 51.1%, followed by diesel at about 25.1%, fuel oil at about 14.4% and aviation fuel at around 9.4%.

Taiwan's internal market for refined petroleum products is divided chiefly between CPC and the Formosa Plastics Group and competition between the two continues to grow increasingly intense. CPC has worked hard at leveraging the advantage of its marketing network, and to protect its market share, by consolidating its gas station network: of the 2,491 sites operating in Taiwan at the end of 2018, 610 were directly run by CPC, 4 were jointly run by CPC and other parties, and 1,370 were privately-owned by CPC franchisees. These 1,984 CPC-branded locations give CPC an unbeatable advantage; their sales as a part of the total market volume break down as gasoline 81.8%, diesel 78.9%, fuel oil 93.6% and aviation fuel 59.0%, with the overall market share being 79.5%.

### CPC supplies most of Taiwan's fuel needs with unfailing reliability

CPC operates aviation fueling stations at all of Taiwan's airports - Songshan, Taoyuan, Taichung, Hualien, Taitung and Kaohsiung as well as offshore on Penghu (Magong), Wuhu, Matsu and Kinmen. Around the coast, it has marine bunkering stations for both local and international vessels at Keelung, Suao, Taichung, Kaohsiung and Hualien ports, as well as on the offshore islands.

As of end-2018 CPC operated 13 product distribution centers, located country-wide at Keelung, Shimen, Taichung, Taichung Harbor, Wangtian, Minxiong, Tainan, Fengde, Qiaotou, Suao,

In 2018 total domestic sales of petroleum products was



**19.208** million kiloliters



2018 Total sales revenue

**416.6** billion

Hualien, Magong, Kinmen and Matsu. These depots supplied filling stations in their surrounding areas with a total of 21,289,000 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 analyzing products for quality control and altogether handled 30,788 samples during the year.

### Innovation in gas station operations, coupled with diversity in supply channels

In the gas station business, CPC is unquestionably the market leader by virtue of offering the consumer superior-quality services across the board that differentiate it from competitors. The company further leverages its service advantage by implementing total customer experience management: having created and now practicing a clean-toilet culture; 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.

The aforementioned combined-service business model for filling stations comprises the provision of car-washing, quick



technical 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. The project calls for 1,000 such stations to be installed within three years: 160 was the tally for 2018, actually completed by the end of January 2019. Sales of a range of CPC products through the gas station channel in 2018 included 1.33 million bottles of Kuo-Kuang brand intake-system cleaner for motorcycles, automobiles and diesel vehicles; 480,000 bottles of See Clean Eco-Friendly Laundry Detergent; and a record 117,000 moon cake gift boxes. Revenues from car-washing and quick-maintenance services also set new highs. Overall gross profit from these diverse operations exceeded NT\$1.17 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.

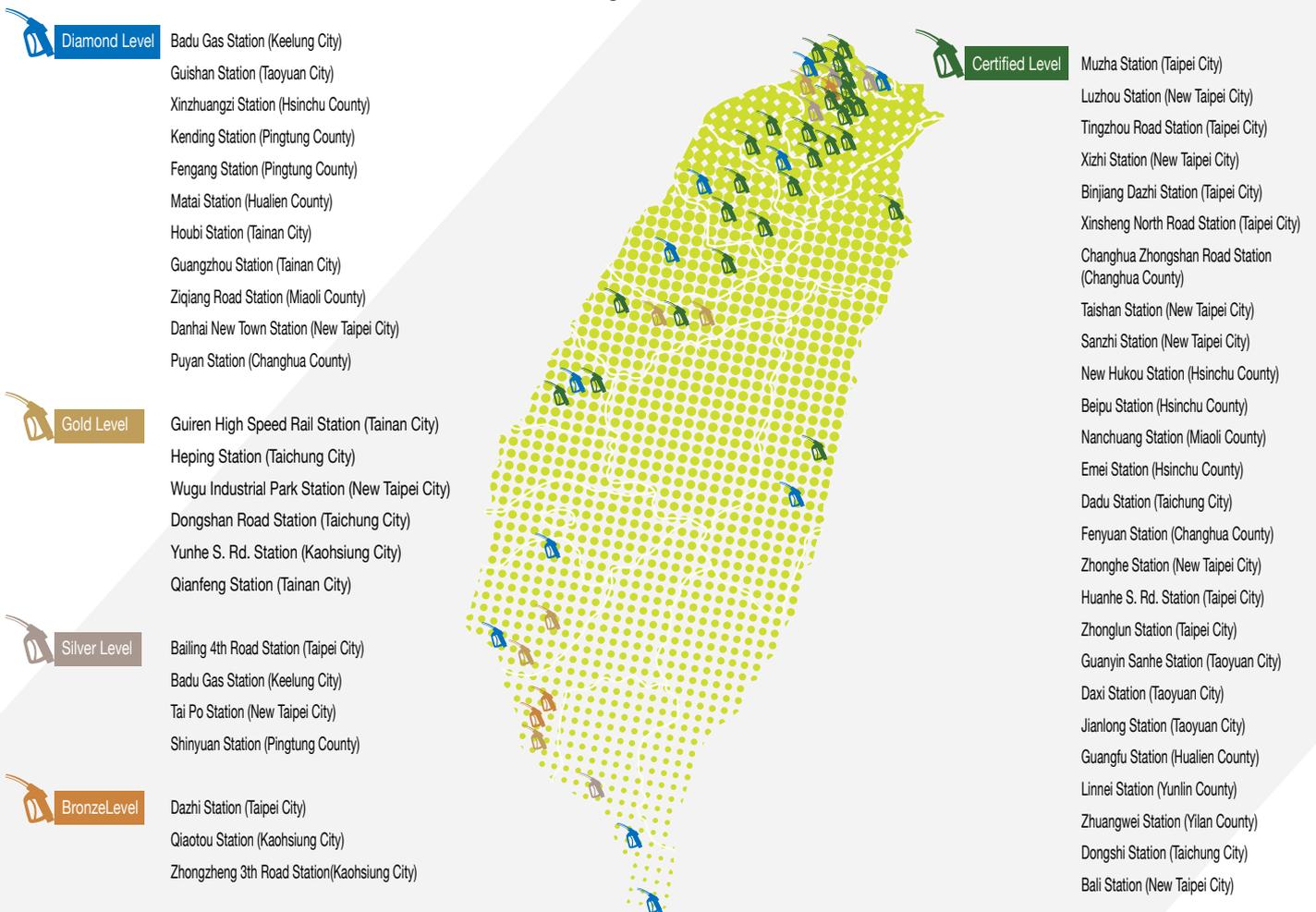
CPC set up the 0800-036-188 customer hotline in 2000 to generally enhance its customer service and in particular provide quicker handling of, and response to, customers' questions. The 1912 CPC service hotline went into use in 2011, expanding the

company's window for communication with the public. The number connects to an integrated customer service center providing fast and friendly interaction; added to that, the professional services offered by the company's various business units have raised the level of service to the public to that of a general benefit, and along the way have helped the company fulfill its CSR commitment.

### CPC's green gas stations: thriving while protecting the environment

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 '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 2018, 50 sites have received 'green building' certification.

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





Natural gas transmission and distribution system comprised of

**2,164**

kilometers of terrestrial trunk pipeline

## Natural Gas: CPC Secures Taiwan's Supply of This Vital Fuel

CPC's promotion of natural gas as the fuel of the future, in keeping with Taiwan's policy aim of energy diversification, 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 then-annual LNG handling capacity to 7.44 million tons.

In the years since those projects were completed, a second terminal has been built at Taichung – it came on stream in 2009 – and planning of a third terminal in northern Taiwan is now under way.

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

Taiwan's aforementioned second LNG receiving terminal is sited close to Taichung's harbor. Originally designed with an annual LNG handling capacity of 3.0 million tons, it became fully operational in 2009 with the primary purpose of supplying natural gas to Taiwan Power Company's (Taipower) Datan Power Station as well as industrial firms and household users in central and northern Taiwan. The project entailed building three LNG storage tanks each of 160,000-kiloliter capacity; gasification and gas supply facilities; and

a 135-kilometer, 36-inch sea/land long-distance gas transportation pipeline from Taichung Harbor through the Tongxiao distribution center to the Datan power plant. The currently-ongoing Taichung LNG Terminal Phase II Investment Project calls for the construction of three additional 160,000-kiloliter above-ground storage tanks plus another gasification facility at the terminal itself; a 26-inch, 21.8 km terrestrial gas pipeline between the terminal and the Wuxi Separation Station; and a further switching station linked to the existing 26-inch pipeline at the Wuxi site. Once completed (as scheduled) in late 2019, 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. Current central 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 180,000-kiloliter above-ground storage tanks and their associated gasification plant. These projects are scheduled for completion in 2022 and 2026 respectively.

CPC has constructed an extensive natural gas transmission and distribution system on Taiwan's western side. It comprises approximately 2,164 kilometers 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 (near Kaohsiung) to Tongxiao in Miaoli County and a 500-kilometer terrestrial pipeline onwards from Tongxiao 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.

### CPC's vigorous build-out of Taiwan's natural gas infrastructure reinforces stability in supply

Taiwan's aforementioned second LNG receiving terminal is sited close to Taichung's harbor. Originally designed with an annual LNG handling capacity of 3.0 million tons, it became fully operational in 2009 with the primary purpose of supplying natural gas to Taiwan Power Company's (Taipower) Datan Power Station as well as industrial firms and household users in central and northern Taiwan. The project entailed building three LNG storage tanks each of 160,000-kiloliter capacity; gasification and gas supply facilities; and a 135-kilometer, 36-inch sea/land long-distance gas transportation pipeline from Taichung Harbor through the Tongxiao distribution center to the Datan power plant. The currently-ongoing Taichung LNG Terminal Phase II Investment Project calls for the construction of three additional 160,000-kiloliter above-ground storage tanks plus another gasification facility at the terminal itself; a 26-inch, 21.8 km terrestrial gas pipeline between the terminal and the Wuxi Separation Station; and a further switching station linked with the existing 26-inch pipeline at the Wuxi site. Once completed in late 2019, the project will boost the annual LNG handling capacity of the Taichung terminal to over 50 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 on hand.

CPC's Third LNG Terminal project got under way in 2016 and is currently scheduled to come on stream in 2024. 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 the 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 an extensive, world-class natural gas supply system that is fully-functional, stable and safe.

### Global sourcing of LNG assures Taiwan's vital supply of natural gas

CPC has devoted considerable effort to diversifying its LNG sources to ensure a reliably stable supply of natural gas for Taiwan. This has entailed signing multiple, long-term procurement contracts around the world – including the Middle East, the Asia-Pacific region, Russia, Australia, the USA, South America, Africa and Europe.

In addition to those long-term LNG procurement contracts, CPC acquires yet more supplies through medium/short-term spot transactions. In 2018, CPC imported most of its LNG from Malaysia, Qatar, Papua New Guinea and Australia, with some coming from Russia also.



## CPC'S LNG SOURCES: GLOBAL DISTRIBUTION



**USA**

Distance : 13,236 nautical miles  
Shipping Time: 32 days



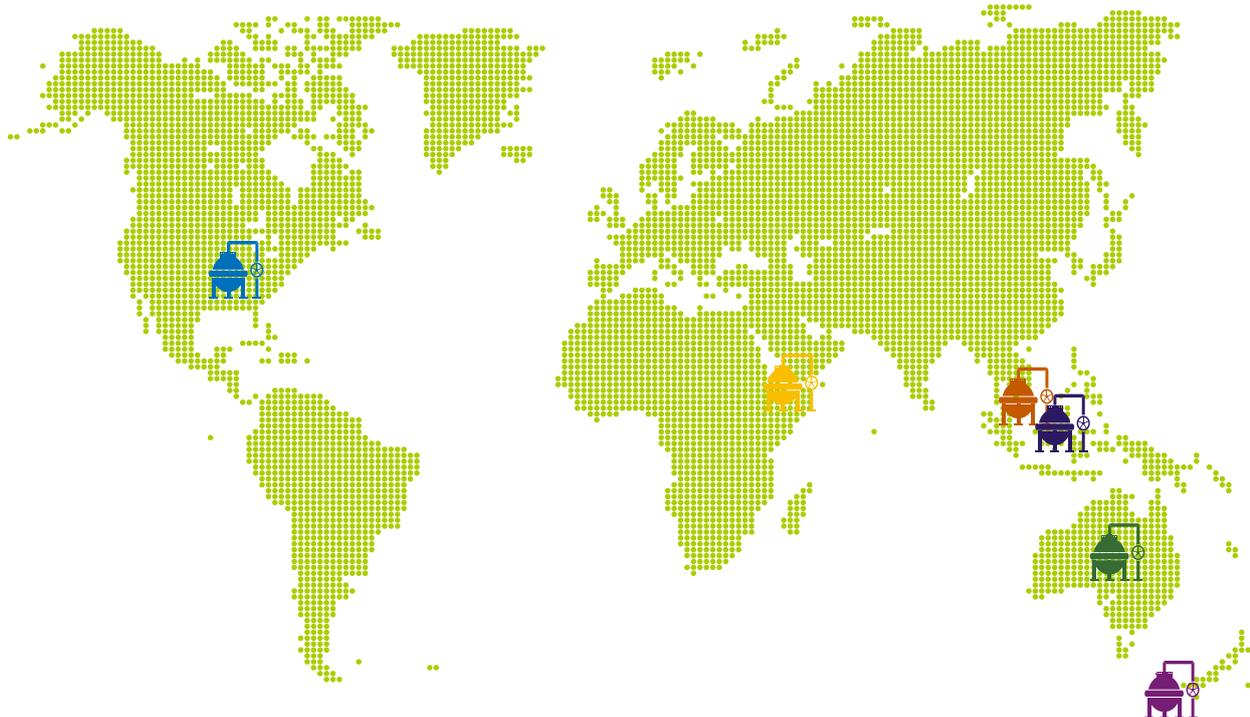
**Qatar**

Distance : 5,298 nautical miles  
Shipping Time: 13 days



**Malaysia**

Distance : 1,300 nautical miles  
Shipping Time: 3.5~4 days



**Indonesia**

Distance : 1,400 nautical miles  
Shipping Time : 4 days



**Australia**

Distance : 2,290 nautical miles  
Shipping Time : 6 days



**Papua New Guinea**

Distance : 3,200 nautical miles  
Shipping Time : 7.5~8.5 days

### Other Products

#### CPC stays strong in the LPG market through sales and superior customer service

CPC's long-standing monopoly in the LPG market was broken when the government opened it up to competition in 1999. Formosa Petrochemical Corp. came in as a producer and independent traders began importing their own supplies. As both

a state-owned enterprise and one of the market's main suppliers, CPC is charged with maximizing its operating performance while at the same time ensuring sufficiency of supply on to the domestic market. 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 and also fully utilizing the company's north-south transport and storage systems and 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. On the downside, 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; and at the same time it must endeavor to reinforce both occupational safety and environmental protection protocols. And along with those preoccupations the company must be seen to be a good corporate citizen as well be seen to be fulfilling its CSR commitments, an obligation not shared by all of the players in the LPG market.

### CPC LUBRICANTS: innovative marketing of the brand while expanding exports

CPC is the leader in Taiwan's automotive lubricants market with its duo of brands 'CPC' and 'Mirage' that appeal to both consumers and professional users - a position 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, systematically integrates production, logistics, marketing, technical capacity and other resources to construct a uniquely competitive profile; and is committed to providing quality products, premium services and full technical support to meet the needs of both its community and corporate customers.

The LBD operates an automated precision blending system, unique in Taiwan, for its products. Located in Chiayi, its construction took more than three years from the start in 2011 to complete, at a cost of NT\$400 million. This plant has sharply lifted the level of efficiency and accuracy in lubricants production, which runs at an annual output of up to 90,000 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. All production is carried out in strict accordance with CPC-researched formulas and rigorous and reliable inspection, backed by a strong sales team - evidencing CPC's dedication to creating a gold-standard brand.

In addition, CPC's LBD 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, the Philippines, Indonesia, Vietnam, Myanmar, Cambodia, India and other locations. CPC's future focus with regard to expansion into overseas territories will be on developing international trade in lubricant materials and on OEM manufacturing. An example of the latter approach, designed to circumvent the ASEAN tariff barrier to non-members, is the 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 lubricants blending, storage, packaging and logistics complex producing both CPC-branded and OEM products for distribution across ASEAN markets. Production is projected to begin in 2020. 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.

CPC's 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, premium-level products, technical consultancy and raising the bar on customer satisfaction. Looking to the future, the LBD's corporate vision encompasses maintaining its lead over the competition in the home market while significantly expanding its presence in Asia-Pacific and other overseas markets so as to make the lubricant brands 'CPC' and 'Mirage' become well-known worldwide.

### SOLVENTS & CHEMICALS — dominant home market position is the basis for Asia-Pacific export ambition

CPC holds a dominant market share position in Taiwan's solvents and chemicals sector: around 80% in solvents, 35% in toluene, 50% in xylene, 50% in asphalt and 45% in sulfur.

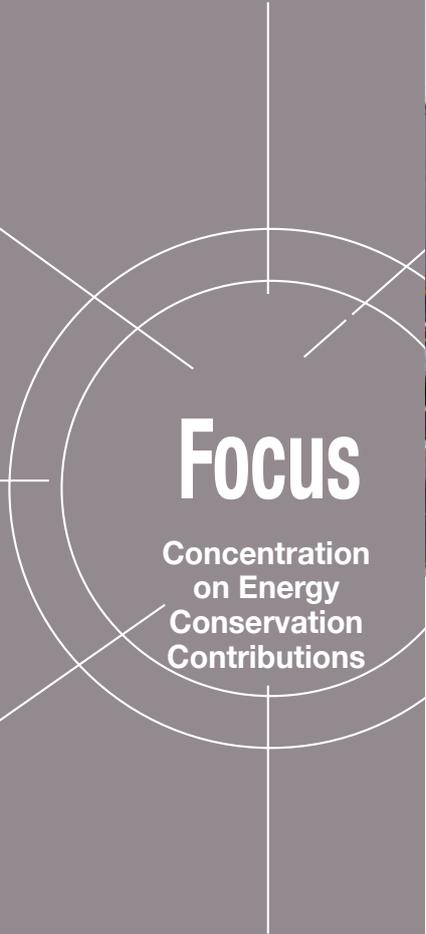
CPC's Solvents & Chemicals Business Division aims to achieve its expansion-oriented operational objectives in a number of ways. This initially involves taking a vigorous and rigorous approach to providing efficient customer service, as well as expanding exports to promising markets such as China, Vietnam, and other promising ASEAN /Asia Pacific markets - which is very much in line with the central government's New Southbound Policy. There is also much effort going into a number of initiatives, such as: enhancing product quality and image, continuous improvement of the refining process and lowering production costs. Most important of all, at Solvents & Chemicals they are developing new and innovative products and new areas of business.



2018 automatic lubricating oil output can reach  
 **90,000** KL



With its long-term efforts to carry out environmental policy, the CPC Corp. is fully committed to green action, carries out strata management, and strictly maintains the highest standards from raw materials sources to the reduction of waste, thereby optimizing the benefits of energy conservation.



# The Contribution of Energy Conservation



## Industrial Safety & Health

Risk management comes first at CPC: safety and disaster prevention protocols are strictly enforced



Petroleum products and natural gas are highly flammable substances. In handling them, CPC has consequently always placed heavy emphasis on safe working practice as well as specific fire prevention measures. That is vital to maintaining continuity in its operations, protecting its employees from harm and safeguarding lives and property in the communities adjacent to the company's workplaces. Apart from compliance with Taiwan's relevant laws and regulations, CPC has also drafted – and strictly enforces – its own workplace safety and disaster prevention protocols. These are modeled on those of the advanced countries in the EU, as well as the USA and Japan, and have been suitably adapted to reflect local conditions and operational characteristics.

### A safe workplace for everyone: fulfilling safety and health policy objectives

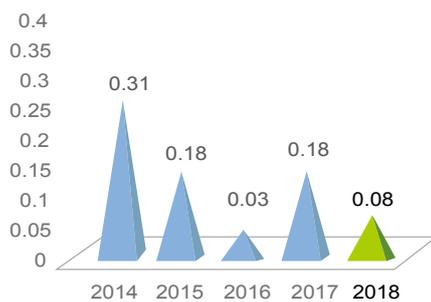
Industrial safety is the foundation of corporate development. CPC has a goal in that respect, sloganized as '100% industrial safety, 0% accidents' and to achieve it has adopted policies that will deliver a universally safe workplace, enlightened risk management and general concern for employees' state of health. The company is constantly working to beef up its workplace safety culture through the implementation of basic and well-tried disciplines – such as thorough inspection, concern for employees' well-being, responsive healthcare, informed risk management and systematized operations – in which employee buy-in and continuous, incremental improvement are key elements. Accordingly, CPC's industrial safety performance has been recognized not only at home but also internationally, as is demonstrated by the medal awarded by the World Safety Organization in 2005; and it has several times been a recipient of the annual Excellence in Promotion of Occupational Safety and Health awards from Taiwan's Ministry of Labor.



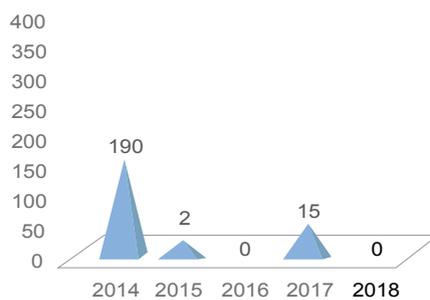
### CPC'S OCCUPATIONAL ACCIDENT STATISTICS FOR 2014-2018



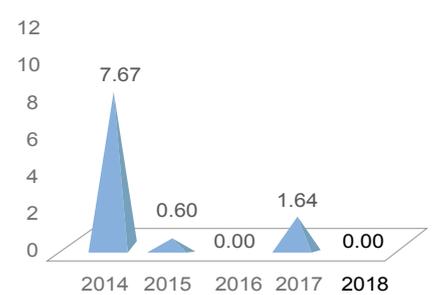
Frequency of Disabling Injury

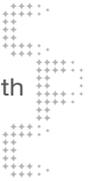


Severity of Disabling Injury



Occupational Injury Frequency-Severity Index





## Key Points In CPC's Industrial Safety & Health Policies

In line with its emphasis on fostering a culture of industrial safety and proactive healthcare, CPC is putting particular effort into the following focal points. The company is working especially hard at raising awareness of these issues and also lifting the level of 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 improvement of the working and operational environment as a continuous process.
- Reinforcement of industrial safety practice mandates for contractors and the establishment of contractor self- management in order to reduce occupational accidents among their employees on CPC sites.
- In conjunction with the implementation of national occupational safety laws, conducting periodic reviews of industrial safety and health regulations as well as continuous review and revision of standard operating procedures in line with the aforementioned protocols.
- Strengthening industrial health management protocols, scheduling employee health checkups (plus analysis and tracking of their 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 and gas tanks and pipelines and the installation of monitors and leak detection systems along their extended sections.
- Strengthening of fire prevention and first 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 standard and mutually supportive, so as to minimize losses due to fire and other disasters.
- Implementation of on-site safety inspections with recorded and graded results, continuous improvement of safety protocols 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 the top echelons; and by carrying out professional-standard pre-operational industrial safety inspections of new and renovated workplaces, with any and all deficiencies discovered 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 its identifiable emergency scenarios, CPC has developed the appropriate specific emergency response drills and regularly conducts emergency simulations to strengthen its contingency and disaster prevention capacity. A total of 310 emergency response drills were held in 2018, including eight in the no-warning category and four expanded exercises.





## Pollution Prevention And Environmental Protection

CPC adopts clean production methodology to lower its greenhouse gas emissions

### CPC Aims for Energy Conservation Implementing Practical Environmental Protection Policies

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 and helped fulfill its CSR commitments. 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; it adheres to EIA commitments in its projects, has established a comprehensive environmental protection monitoring system and conducts education and training programs on environmental issues. In recent years the firm has more systematically engaged in CO<sub>2</sub> emission inventory and reduction endeavors and 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, thereby helping reduce the PM<sub>2.5</sub> element in air pollution and lending support to the circular economy principle. In monetary terms, from 1989 through

2018 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-2018, 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 environmentally-friendly measures was set up as far back as 2004.

In all of 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, and in connection with its Third LNG Terminal project, CPC set up the Guantang Industrial Park (Port) Ecological Preservation Committee on 7 November 2018 to carry out surveying, monitoring and preservation of the unique Guantang algae reef – motivated by the further aim of achieving the twin goals of environmental conservation and sustainable community development.



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

Effluent\* is the monthly average

Item	Year	2018 Levels	Current National Standards Effluent	Current National Standards Ocean Effluent
Chemical oxygen demand (COD) (ppm)		< 40	100	280
Oil (ppm)		< 3	10	20
Suspended solids (ppm)		< 15	30	100
Phenol (ppm)		<0.1	1.0	1.0

### Stack exhaust

Item	Year	2018 Levels	Current National Standards <sup>1</sup>
Sulfur oxides (SO <sub>x</sub> ) (ppm)	Gas fuel	< 86	100
	Liquid fuel		300
Nitrogen oxides (NO <sub>x</sub> ) (ppm)	Gas fuel	< 84	150
	Liquid fuel		250
Total suspended particles (TSP) (mg/Nm <sup>3</sup> )	Determined by the volume of gas emissions	< 23	25-500

\*Note 1: Stationary Pollution Source Air Pollutant Emissions Standards

### 2018 Environmental Footprint

#### Material investment

Water usage	32,948	Thousand kiloliters
Crude oil	22,214	Thousand kiloliters
Fuel oil	154	Thousand kiloliters
Fuel gas	1,668,675	Thousand cubic meters
Natural gas	814,142	Thousand cubic meters
Gasoline additives (MTBE)	537	Thousand kiloliters
Purchased electricity	1,865,131	Thousand kWh

#### Material emissions

Gas emissions	CO <sub>2</sub>	7,687,246 <sup>1</sup>	Tons
	NO <sub>x</sub>	3,203	Tons
	SO <sub>x</sub>	1,081	Tons
	TSP	213	Tons
	VOC	3,623	Tons
	COD	377	Tons
Wastewater		11,691	Thousand cubic meters
Waste		47,791	Tons

\*Note: Data on CO<sub>2</sub> emissions are for 2017.

#### Refinery/petrochemical output

Diesel	6,050	Thousand kiloliters
Fuel oil	2,654	Thousand kiloliters
Vehicle fuel	9,318	Thousand kiloliters
Jet fuel	2,347	Thousand kiloliters
Liquefied petroleum gas	348	Kilotons
Ethylene	1,139	Thousand kiloliters
Propene	1,005	Kilotons
Butadiene	169	Thousand kiloliters



Taiwan's own Greenhouse Gas Reduction and Management Act was formally promulgated on July 1, 2015. Its goal was and is the reduction of nationwide annual greenhouse gas (GHG) emissions to no more than 50% of their 2005 level by 2050. Following the Paris COP 21 Agreement on limiting global temperature rise becoming effective on November 4 2016, CPC has vigorously expanded its carbon reduction plan, committing the entire company to GHG emissions reduction and setting targets and time-lines for its existing plants. As a result, the company's reduction in greenhouse emissions from 2005 to 2017, according to third-party verification, exceeded 25%. Going further, it will employ measures such as utilizing low-carbon fuels, energy conservation, raising the level of equipment efficiency and other actions consistent with the plan. In 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 2018 compared with the year before; and 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 2018, climate risk assessments and reports had been completed for four natural gas distribution centers and four depots for fuel supplies. Greenhouse gas emissions data for 2018 are currently being collated by the CPC business units involved; third-party verification of the numbers will be completed by the end of July 2019.



## Improving Air Quality Promoting Environmental Education

In January 2000 CPC proactively ceased supplying the local market with leaded gasoline, in line with the greener fuel standards of other advanced countries and as a contribution to improving the quality of the air that Taiwan's people breathe. In 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 - was launched. 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).

The quality of Taiwan-made petroleum products continues to steadily improve after the many years of effort to that end, such that it has now achieved comparability with, or even rivals, its equivalent in Europe, Japan and the United States. However, CPC has in no way taken this as cause for resting on its laurels; the company continues to embrace the new paradigm for ecologically-friendly petroleum products set by the world's most advanced countries in their pursuit of ever higher standards. Similarly in the wider energy field, the company will promote the cause of energy resource integration, as well as upgrade its natural gas production, storage and transport capacity to facilitate greater use of low-carbon

energy. CPC will lend stronger support to the application of R&D-based green energy technologies – incidentally creating a greener corporate image for itself in the process of helping build a low-carbon homeland for Taiwan's people.

Since the enactment of the Environmental Education Act in 2011, CPC has energetically promoted and practised ecology- and 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 environmentally-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 Production Exhibition Hall at Chuhuankeng in Miaoli County was officially certified as an environmental education facility in August 2017. It is the only one of its kind in Taiwan and functions as a high-level environmental education venue for the general public, special interest groups, schools and government agencies. The Exhibition Hall has reinvigorated Chuhuankeng, the site of a former producing oilwell, and it is also considered part of the Company's contribution towards a sustainable environment. Another company-developed environmental education site is the CPC Kaohsiung Refinery Environmental Education Classroom, which was certified in the same category as the Chuhuankeng facility on January 22, 2018.



CPC the corporate citizen 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 game by deploying the latest in pollution-control technology, systematizing its processes for higher efficiency and greater added-value, investing in the circular economy and promoting the cause of waste recycling – all in the pursuit of developing sustainability in its operations and the sharing of good health and prosperity with the national community.

### Pollution remediation: CPC cleans up its act

Since the promulgation of the Soil and Groundwater Pollution Remediation Act by the administration of President Chen Shui-Bian 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. CPC currently has 3 sites listed for response, 19 listed for control and 7 listed for remediation; while remediation has been completed at 30 sites in recent years.

CPC's Kaohsiung Port Terminal site was leased by the company from the Port of Kaohsiung and used for loading and unloading crude oil cargoes until those operations were suspended in 1996. The Environmental Protection Agency (EPA) 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 Agency on November 4, 2016. Over 105,000 tons of gravel and soil were lifted for classification and treatment at the Qianzhen disposal site. The task of remediation has been completed and the project's monitoring status with the EPA was lifted on 12 April 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 - workshops, process plant, pipework and related facilities - and also removing pipelines from where they were buried two meters or more 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.



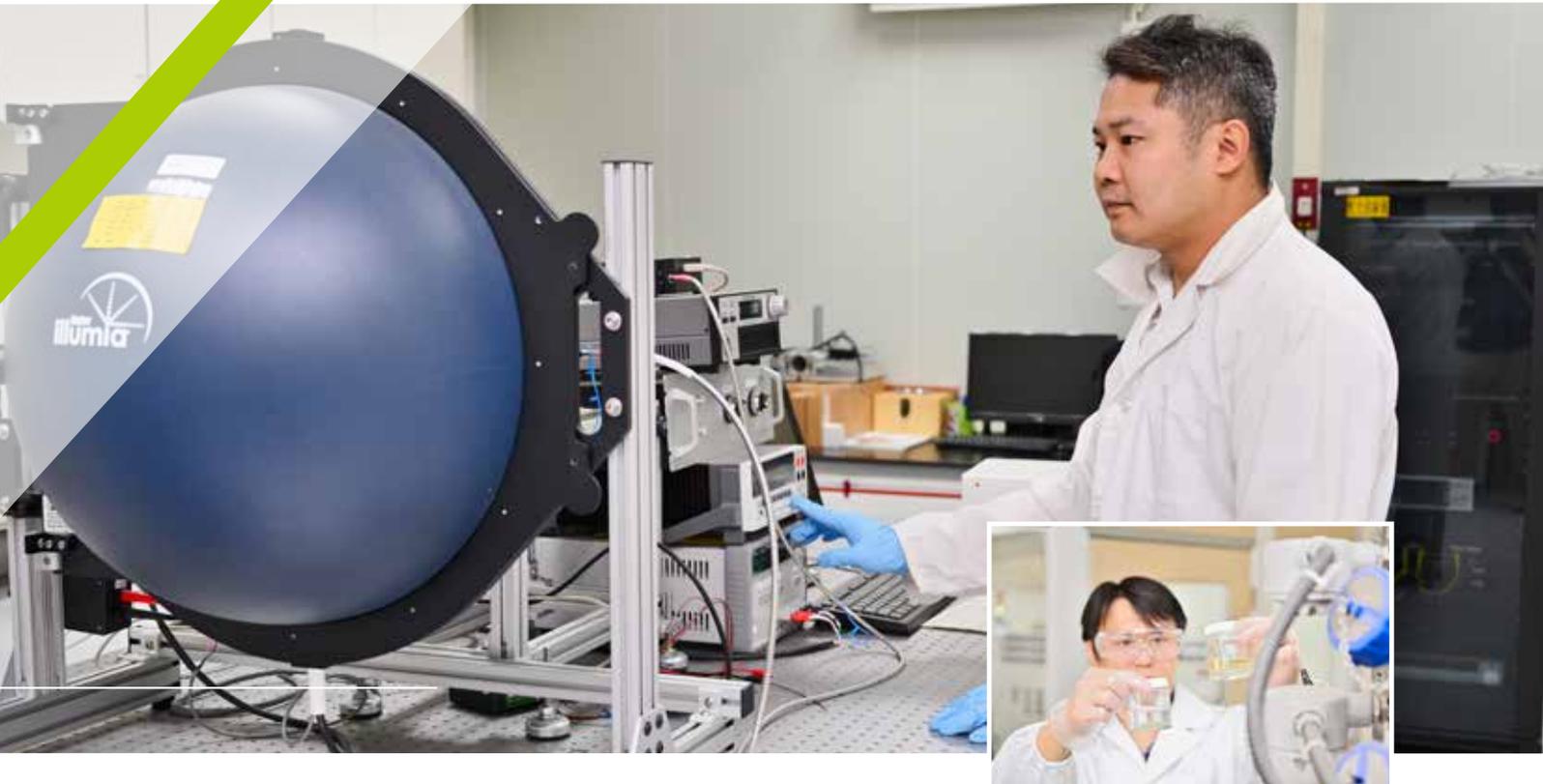
# Foresight

Looking Forward  
to Sustainable  
Services



To help employees live up to their full potential, the CPC Corp. devotes long-term efforts to personnel training and guidance, the strengthening of incentive and welfare measures, and the discovery and development of managerial talent so that the company will have the high-quality human resources needed to lead its development.

# Looking Forward to Sustainable Service



## R&D and Information Management

Consolidating innovative research capability Reinforcing ICT security

### Research and Development

Exploration & Production, Refining and Petrochemicals, Green Energy: like three arrows in flight.

CPC has always attached great importance to research and development (R&D) as being fundamental to corporate innovation and developing sustainability in its operations. The company now has an Exploration & Development Research Institute (EDRI) in Miaoli, its Refining & Manufacturing Research Institute in Chiayi and a Green Technology Research Institute as well as a Materials Testing & Certification Center in Kaohsiung. These facilities are responsible for all in-company research in their respective domains, with the Taipei office-based Planning Department responsible for oversight of all CPC R&D operations, as well as their management and control.

The Exploration & Development Research Institute is primarily focused on evaluating geological and stratigraphic data and samples for their oil and gas production potential and on research into exploration methodology and drilling/extraction technology. The Refining & Manufacturing Research Institute leads in developing solutions for on-site production bottlenecks in manufacturing lubricants, other refined products and petrochemicals. The Green Technology Research Institute is concerned with technological development related to biofuels, renewable energy and green materials; and with aiding the high-value petrochemical industry promotion policies of the Ministry of Economic Affairs, for example by assisting manufacturers with the methodology for conducting pilot production runs.

CPC's expenditure on R&D in 2018 amounted to about NT\$2.172 billion. The R&D results are described below:

- Exploration technology was refined in several ways: boosting the pre-processing efficiency of calcareous nano-fossil rock sample production, strengthening high-temperature gas chromatography technology for crude oil with a high wax content, effectively using a formation's water salinity to identify paleo-sedimentary environments, improving seismic data interpretation and attribution analysis, providing for more accurate forecasting of reservoir rock distribution and establishing non-conventional biogas assessment.
- Drilling technology was upgraded, in a number of respects, including: shale oil single well final recoverable volume analysis and application, estimation of porosity using well logs, use of well logging and core testing data to carry out underground stress analysis, sand control design for producing wells (grain size and mineralogical analysis), gasoline freshness determination and setup and analysis of soil gas simulation test models.
- Overseas oil field and prospect studies were carried out. These included pressure volume temperature (PVT) analysis of well-bottom oil samples at Benoy-1 Reentry well, along with capacity characteristic and instantaneous pressure analysis of Mouroumar-3, Benoy-4, and Mbaikora-2 wells in Chad. There were also comprehensive studies of geology and oil systems in the greater Gulf of Mexico area, with an eye to bidding on promising blocks there in the future.
- Assessment of onshore and offshore fields in Taiwan was carried out, including an economic evaluation of the development of the F Structure gas field along with appraisal of prospective resources (P10) and contingent resources (P50) in promising nearby areas. Appraisal of total contingent natural gas resources was carried out onshore in the Dongzailiao, Guanziling, and Zhonglun areas

in accordance with the interpretation of well data and follow-up work on six oil and gas formations. Further, dynamic geological simulation and verification were carried out on Formation 28 in the Jinshui gas field in order to understand the extent of the remaining reserves and predict the amount recoverable.

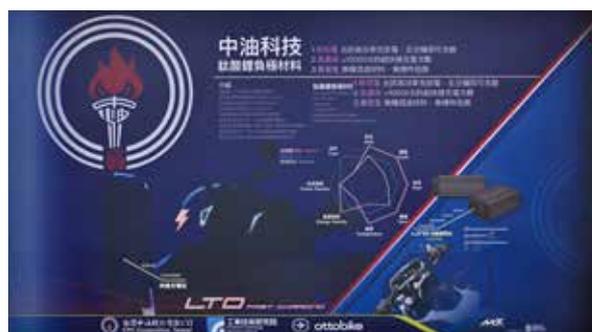
- Assistance was provided for geological studies related to geothermal energy exploration in the Tuchang and Renze areas of Yilan County; and the drilling of Renze Well No. 3 started in November 2018.

## Refining and Petrochemicals

- Developments in new production processes: these included the introductory assessment of a new light diesel engine motor oil formulation under the European Automobile Manufacturers Association (ACEA) C3 5W/40 standards; development and application of CPC's amorphous carbon anode vehicular battery research; artificial graphite electrochemical/mechanical hybrid shear exfoliation graphene; environmentally-friendly precision machinery cutting oil; on-site application of chemical oxidation technology for the Xinguang Community; analysis and discussion of the styrene recycling project; establishment of alicyclic polycarboxylate hydrogenation technology; utilization of distillates from microwave decomposition of waste solvents; planning of a trial production process for extract oil; and development and application of first-generation magnetic filters and packing technology.
- A study of quality, together with a performance assessment of gasoline and diesel for sale in urban areas; heavy-duty diesel engine testing; gasoline and diesel fuel additive and cleansing performance testing; and testing the effect of mixing nitrogen with natural gas on nitrogen oxides (NOx) emissions from furnaces were carried out in the interests of environmental protection.
- Groundwater pollution remediation and testing services in CPC's refinery sites; airborne volatile organic compounds (VOC) monitoring; planning for waste-water treatment and recycling; and testing for leaks in equipment components using infrared imaging were all carried out.
- 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 integrity and safety.
- Optimization research was carried out on the production process for gasoline and diesel and also petrochemical feedstock. Related advisory services were offered so as to resolve on-site problems, enhance operational efficiency and conserve energy.
- Technology was transferred for newly-formulated motorcycle engine oil, circulation oil, cold forging oil and anti-rust products.
- Kuo-Kuang brand Superpower SN Fully Synthetic Motor Oil 5W/40, Mirage Pro SN Fully Synthetic Motor Oil 5W/40, Mirage Vigor A3/B4 10W/40 Synthetic Motor Oil, Kuo-Kuang Racing C3 Fully Synthetic Diesel Engine Oil. 5W/40, Kuo-Kuang 9000 C3 Fully Synthetic Diesel Engine Oil 5W/30, Mirage Pro SN Synthetic Motor Oil 5W/30, and Kuo-Kuang Super Jetpower Motor Oil SN 5W/50 were developed.
- Microparticle diffusion synthesis technology was established; therapeutic eyecare lights were developed in cooperation with a well-known company in that field, and then were distributed to elementary schools in remote areas as a CSR public benefit activity.

## Green Energy Research and Development

- Established green energy-related technologies, including: a platform for the standardized quantitative analysis of rice bran enzyme activity; key technology for energy-saving imitation-stone paint; development of a formula for enzymatic shirt collar



- cleaner; an environmentally friendly green stone exterior wall coating system; development of rice bran oil products; supercritical extraction of gamma oryzanol from rice bran oil; development of low formaldehyde thermosetting biomass phenolic resins; water-based masonry paint; improvement of carbon deposits in 5kW-class natural gas reformers; lead-free perovskite solar battery production process technology; carbohydrate oxidation enzyme cloning and method for determination of activity; preparation of low-cost lithium-titanate anode material; technological research in the production of high-value 2,5-furandicarboxylic acid from water-based cellulose; improved technology for lithium-titanate first-irreversibility capacity damage; use of thermogravimetric analysis to rapidly evaluate the absorption capacity of activated carbon; preparation of composite nano titanium dioxide-nickel photocatalysts; use of the high-temperature steam method for activating carbon; under-insulation surface coating for steel material; application of reactive polyurea systems to storage tank rim corrosion prevention engineering; explosion-proof LED lighting; a rapid screening platform for antibacterial ability; technology for biocomposite 3D printing materials; and development of new ionization-purified sanitary drinking straw products.
- Assistance was provided for the installation of rooftop solar power panels at 160 CPC- branded filling stations; cloud monitoring of solar power generation was introduced; and 156 monitoring points were brought under monitoring and maintenance management. A standardized solar power system architecture was also laid out, improving convenience and safety in both operation and maintenance.
- Perovskite solar cells were developed using laser cutting technology; and both a module voltage of 5.5V and maximum power transfer of 25.5mW were achieved.
- Single-well coaxial thermal insulating coating was developed; and 2,000 meters of oil pipeline were painted using anti-corrosion high-hardness composite insulation material.
- Technology for two new environmentally-friendly paint formulas was transferred for CPC to use in establishing reference indicators for painting oil storage tanks.



- Four types of explosion-proof LED lamps passed explosion-proof electrical apparatus testing by the Industrial Technology Research Institute.
- Evaluation of adulterated and unadulterated specifications of high-voltage  $\text{LiNi}_0.5\text{Mn}_1.5\text{O}_4$  (LNMO) cathode material was carried out; and this material will be matched with the lithium titanium oxide (LTO) anode material currently under development as a means of boosting the overall energy density of batteries
- Three purified enzymes were successfully extracted from the purified esterase and lipase crude enzyme in rice bran.
- A platform for the rapid testing of polyhydric alcohol was established for screening out bacterial strains with the potential for use in its production.
- Completed production of 2,900 kilograms of soft carbon products, which matched expectations of both full battery 5C quick charge verification and prismatic cell full battery life verification.
- Trial mass production is scheduled to begin in 2019 for making the soft carbon needed for development of CPC own-brand batteries. An expanded plan for trial mass production was completed, with the addition of two coke reactors; basic testing and acceptance were also carried out.
- Production of the first batch of kilogram-class transesterification catalysts was completed, with testing results being the same as for small-volume-production catalysts.

## Information Management

### CPC keeps information secure while carrying out intelligent data analysis

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 and promotion of knowledge management. In addition, following promulgation of the Information and Communication Security Management Act, strengthening security measures for critical information infrastructure is a matter of urgency.

To adapt to the overall growth of its business units and the development of corporate core services, as well as web-based application upgrades, CPC completed the replacement of its mainframes by distributed computers in 2015. Owing to the consequent enhancement of computer performance and reduced operation time, since then all customer accounts can be settled promptly on the first day of each month. 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.

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 customer account settlement on the first day each month; the development and extension of integrated e-commerce systems for petroleum products 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; and integrating exploration and production management and geographical information systems. In addition, in response to the trend toward development of new Artificial Intelligence/Artificial Intelligence of Things (AI/AIoT) technology, the company is speeding up process innovation and the resolution of bottleneck problems in manufacturing; and is actively engaged in the establishment of an intelligent data analysis platform and the application of operational information analysis. When completed, this will enhance decision-making and quick-response capabilities.

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 and 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. In the area of coordination with government policy, the company is implementing the government configuration baseline (GCB) protocol for providing 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 arena, 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.



## Human Resources

### CPC helps people build their future using the corporate knowledge legacy as the foundation

CPC aims to fully develop the potential of every one of its current (as of end-December 2018) 15,704 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.

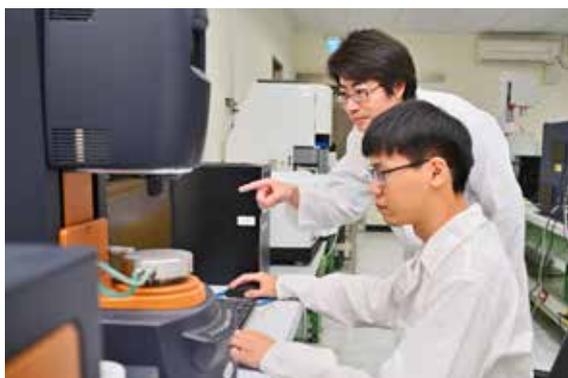
In terms of human resource utilization, CPC has in recent years engaged in organizational and process re-engineering and has also formulated and carried out a policy whereby selected employees are rotated through different jobs, businesses and departments in order to use its human capital to best advantage. 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 body 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.

### CPC is cultivating individual expertise so as to optimize corporate capability

As the number of people leaving, or more often retiring from, CPC in recent years has tended to rise, new employees have needed 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 their new colleagues adapt to their new 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 international learning experiences 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-Academy 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.

A CPC human resources training center has been established in Chiayi. This facility not only serves as an incubator for internal talent, but is also tasked with building a talent pool for fulfilling the government's New Southbound Policy - by providing people from Taiwanese companies with background and on-the-job training in the energy and petrochemical fields.

### CPC's wide range of employee benefits is important to maintaining morale

In terms of employee incentives and benefits, it is CPC policy 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 service 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, hobby 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 and boost 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. Of the 18 CPC-invested companies on the books at the beginning of 2018, one - Taiwan Advanced Materials Co. - was liquidated during the year, leaving 17 affiliates and subsidiaries. The total invested in these 17 entities, as of end-2018, is NT\$21.3 billion; unaudited income from these investments in 2018 amounted to NT\$962 million.

CPC's current 17 affiliates and subsidiaries can be divided into four main categories: petroleum products; petrochemicals; natural gas; and shipping. Of the 17, 10 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 West Terminal of 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 throughout 2018 with the aim of lowering production costs and so boosting market competitiveness.

## DAI HAI PETROLEUM CORP. (DHP)

Established in 1994 with CPC holding 35% of the equity, DHP is headquartered in the port of Haiphong, Vietnam. The company is primarily engaged in the storage, transport and distribution of LPG and other petroleum products in northern Vietnam. The company has its own receiving, storage and supply facilities, as well as a filling station in Ha Tay Province.

## 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 Qatar's Mesaieed Industrial Zone, it produces chiefly methanol and methyl tert-butyl ether (MTBE). Production ran smoothly in 2018 and annual maintenance was scheduled for the first quarter of 2019.

## FARAWAY MARITIME SHIPPING CO. (FMSC)

Faraway Maritime Shipping Co. was jointly established in 1997 by CPC - which holds 40% of the equity - and its Indonesian partner Golar to build and operate the Matsu-class LNG carrier vessel Golar Mazo specifically for transporting LNG from the Badak VI gas field offshore Indonesia to Taiwan. From 2000 to 2017 that was done under the Badak VI purchase contract between CPC and Pertamina; but beginning in 2018, that was switched to a short-lease operation.

## 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. Under the central government's non-nuclear power policy, KKPC is currently carrying out its second-phase capacity expansion, which is scheduled to go into commercial operation in 2021 and then help stabilize Taiwan's overall power supply.

## NIMIC SHIP HOLDING CO., LTD. (NSHC)

Established in 2006 by CPC and its Japanese partners NYK and Mitsui, with the company holding 45% of the equity, NSHC has four ship-owning companies under its umbrella. It has built four LNG tanker vessels that carry LNG to CPC's two receiving terminals from Qatar's RasGas II plant. In compliance with Taiwan's national environmental protection regulations, NSHC began planning and implementing low-sulfur bunker fuel and compression chamber water treatment system engineering for its LNG carriers in 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 vessels built by NSHC. In addition to assisting with the implementation of low-sulfur bunker fuel and compression chamber water treatment system engineering for the four LNG carriers in 2018, NSMC also has an ongoing cooperative arrangement with National Taiwan Ocean University aimed at developing a pool of Taiwanese nationals trained in shipping operations and management.

## GLOBAL ENERGY MARITIME CO. (GEMCO)

Established in 2011, with CPC holding 48% of the company's equity, GEMCO plans to build three VLCC vessels with a combined volume of 300,000 tons and one LR1 vessel with a volume of 80,000 tons for transporting crude oil. The strategy underlying GEMCO is the development of a business in shipping crude oil and chemicals.

## ICHTHYS LNG PTY LTD (ILPL)

Established in 2011, with CPC now holding 2.625% of the company's equity and a foundation customer, ILPL pipes natural gas from Australia's offshore Ichthys field to the onshore liquefaction plant near Darwin for the production of LNG, LPG, and condensate. Production began in November of 2017, at which time a grand commencement ceremony was held.

## 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 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-2020.

**2018**

**Financial Statements**



During the year ended 2018, the profit before tax of LNG, Refining and Marketing has decreased relative to year ended 2017, mainly due to the decline in global oil prices in the fourth quarter of 2018, which caused a decrease in the gross margins and profits before tax. The losses before tax on Exploration and Exploitation has decreased in 2018 as compared to 2017, mainly due to lower impairment losses from oil fields and mining sites in 2018.

The capital expenditure incurred in 2018 was NT\$13,918 million, a 33.61% decrease from 2017. The breakdown of the expenditure was as follows:

Production & manufacturing 43.50%

Marketing & transportation 23.26%

Others 33.24%

The exchange rate between the NT dollar and the US dollar was 30.775:1 on December 31, 2018.

## STATEMENTS OF INCOME FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

(In Thousands of New Taiwan Dollars)

	<u>2018</u>	<u>2017</u>
<b>Operating Revenues</b>		
Sales	\$1,022,615,576	\$886,989,480
Other operating revenues	<u>11,959,710</u>	<u>9,652,641</u>
<b>Total operating revenues</b>	<u>1,034,575,286</u>	<u>896,642,121</u>
<b>Operating Costs and Expenses</b>		
Cost of goods sold	950,071,908	794,402,697
Exploration expenses	2,573,975	2,195,701
Oil and gas transmission and storage expenses	11,422,090	13,418,883
Other operating costs	<u>4,449,169</u>	<u>16,404,888</u>
<b>Total operating costs</b>	<u>968,517,142</u>	<u>826,422,169</u>
<b>Gross Profit(Loss)</b>	<u>66,058,144</u>	<u>70,219,952</u>
<b>Operating Expenses</b>	<u>20,340,803</u>	<u>19,508,901</u>
<b>Non-Operating Income and Gains</b>	<u>11,115,258</u>	<u>5,952,712</u>
<b>Non-Operating Expenses and Losses</b>	<u>13,076,708</u>	<u>8,121,702</u>
<b>INCOME (LOSS) BEFORE INCOME TAX</b>	<u>43,755,891</u>	<u>48,542,061</u>
<b>Income Tax Expense (Benefit)</b>	<u>9,462,654</u>	<u>8,230,498</u>
<b>NET INCOME (LOSS) FOR THE YEAR</b>	<u>\$34,293,237</u>	<u>\$40,311,563</u>



## BALANCE SHEETS

### DECEMBER 31, 2018 AND 2017

(In Thousands of New Taiwan Dollars)

Assets	<u>2018</u>	<u>2017</u>
<b>Current Assets</b>		
Cash and cash equivalents	\$2,015,092	\$1,561,842
Current financial assets at fair value through profit or loss	1,063	-
Derivative financial assets for hedging - current	-	4,098
Accounts receivable, net	49,520,381	45,828,093
Accounts receivables from related parties, net	178,408	297,876
Other receivables	7,366,005	8,013,772
Inventories	127,704,194	105,356,603
Prepayments	21,627,219	17,709,130
Other current assets	<u>1,453,324</u>	<u>690,430</u>
<b>Total Current Assets</b>	<b><u>209,865,686</u></b>	<b><u>179,461,844</u></b>
<b>Non-current Assets</b>		
Available-for-sale financial assets	-	531,446
Financial assets at cost, net	-	7,197,416
Non-current financial assets at fair value through other comprehensive income	12,552,680	-
Investments accounted for using equity method	13,279,548	13,770,825
Property, plant and equipment	423,460,997	430,577,501
Investment properties	19,552,820	19,464,379
Intangible assets	180,594	149,613
Deferred tax assets	9,254,890	18,743,629
Oil and gas investments	65,326,874	61,999,568
Refundable deposits	238,708	282,146
Other long-term receivables	13,725,173	10,598,269
Long-term prepayments	1,841,691	2,044,633
Other non-current assets	<u>217,116</u>	<u>224,852</u>
<b>Total Non-current Assets</b>	<b><u>559,631,091</u></b>	<b><u>565,584,277</u></b>
<b>Total Assets</b>	<b><u>\$ 769,496,777</u></b>	<b><u>\$ 745,046,121</u></b>

## BALANCE SHEETS

### DECEMBER 31, 2018 AND 2017

(In Thousands of New Taiwan Dollars)

Liabilities and Equity	<u>2018</u>	<u>2017</u>
<b>Current Liabilities</b>		
Short-term borrowings	\$33,346,452	\$25,466,128
Short-term notes and bills payable	87,850,830	77,359,190
Financial liabilities at fair value through profit or loss-current	4,614	97
Derivative financial liabilities for hedging – current	-	24,687
Contract liabilities	9,806,301	-
Accounts payable	51,169,896	40,139,715
Payable to constructors	7,292,510	4,573,551
Other payables	25,138,684	26,252,796
Advance receipts	-	17,641,998
Long-term borrowings, current portion	38,940,000	36,140,000
Other current liabilities	<u>9,150,756</u>	<u>8,743,319</u>
<b>Total Current Liabilities</b>	<u>262,700,043</u>	<u>236,341,481</u>
<b>Non-current Liabilities</b>		
Bonds payable	86,150,000	114,950,000
Long-term borrowings	1,900,000	11,640,000
Non-current provisions	25,231,534	25,818,464
Deferred tax liabilities	84,833,401	84,942,769
Post-employment benefits payable	4,758,994	4,537,706
Guarantee deposits received	1,124,431	1,251,177
Other non-current liabilities	<u>5,199,989</u>	<u>5,147,133</u>
<b>Total Non-current Liabilities</b>	<u>209,198,349</u>	<u>248,287,249</u>
<b>Total Liabilities</b>	<u>471,898,392</u>	<u>484,628,730</u>
<b>Equity</b>		
Share capital		
Common shares	130,100,000	130,100,000
Retained earnings		
Special earning reserve	127,594,713	127,636,720
Legal reserve	145,493	-
Retained earnings	<u>36,093,867</u>	<u>3,636,905</u>
Total retained earnings	<u>163,834,073</u>	<u>131,273,625</u>
Other equity	<u>3,664,312</u>	<u>(956,234)</u>
<b>Total Equity</b>	<u>297,598,385</u>	<u>260,417,391</u>
<b>Total Liabilities and Equity</b>	<u>\$769,496,777</u>	<u>\$745,046,121</u>



## CPC CORPORATION, TAIWAN STATEMENTS OF CASH FLOWS FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

(In Thousands of New Taiwan Dollars)

	<u>2018</u>	<u>2017</u>
<b>Cash flows from operating activities:</b>		
Net income before tax	\$ 43,755,891	\$ 48,542,061
<b>Adjustments:</b>		
Non-cash adjustment items:		
Depreciation expense	20,544,702	18,597,377
Amortization expense	1,324,043	1,665,417
Expected credit loss	96,865	-
Provision for (Reversal of) bad debt expense	-	45,911
Net loss (gain) on financial assets or liabilities at fair value through profit or loss	(191,548)	267,690
Interest expense	2,771,191	3,056,608
Interest income	(580,815)	(372,561)
Dividend income	(1,155,186)	(811,600)
Share of loss of associates accounted for using equity method	201,180	(628,443)
Loss (gain) on disposal of property, plant and equipment	41,148	(115,545)
Gain on disposal of Investment Property	(672)	-
Provision for (Reversal of) write-down of inventories	7,020,400	(689,662)
Impairment loss recognized on non-financial assets	27,085	11,532,490
Loss (gain) on foreign exchange	(311,675)	(92,302)
Others	<u>120,529</u>	<u>(268,036)</u>
Total non-cash adjustment items	<u>29,907,247</u>	<u>32,187,344</u>
Changes in operating assets and liabilities:		
Accounts receivable	(3,674,858)	(5,653,578)
Other accounts receivable	1,228,582	(388,136)
Inventories	(29,367,991)	(13,641,678)
Prepaid expenses	(3,918,089)	1,098,563
Other current assets	(758,394)	1,002,972
Contract Liabilities	(7,835,697)	-
Accounts payable	11,076,785	(150,360)
Provision - non-current	(726,240)	(1,207,143)
Receipt in advance	-	1,276,028
Other current liabilities	(2,319,408)	1,641,323
Post-employment benefits payable	<u>(344,227)</u>	<u>(507,146)</u>
Total adjustments	<u>(6,732,290)</u>	<u>15,658,189</u>
Cash inflow generated from operations	37,023,601	64,200,250
	<u>2018</u>	<u>2017</u>

Interest received	384,807	258,172
Interest paid	(2,880,170)	(2,787,206)
Income taxes paid	<u>(4,500)</u>	<u>(1,843)</u>
<b>Net cash flows provided by operating activities</b>	<b><u>34,523,738</u></b>	<b><u>61,669,373</u></b>
<b>Cash flows from investing activities:</b>		
Acquisition of financial assets at fair value through other comprehensive income	(788,500)	-
Acquisition of financial assets measured at cost	-	(2,179,886)
Decrease (increase) in prepayments for investments	-	341,872
Return of capital of financial assets using equity method due to capital reduction	270,952	-
Acquisition of property, plant and equipment	(11,198,848)	(20,791,811)
Proceeds from disposal of property, plant and equipment	198,955	435,097
Increase in refundable deposits	(160,166)	(164,799)
Decrease in refundable deposits	203,604	82,800
Acquisition of intangible assets	(127,723)	(106,921)
Acquisition of investment Property	(99,304)	-
Disposal of investment Property	870	-
Increase in other long-term receivables	(3,111,608)	(521,143)
Decrease (increase) in other non-current assets	114,760	(495,380)
Dividends received from associates and others	1,704,457	1,110,132
Increase in oil and gas interests	<u>(4,016,382)</u>	<u>(3,044,334)</u>
<b>Net cash flows used in investing activities</b>	<b><u>(17,008,933)</u></b>	<b><u>(25,334,373)</u></b>
<b>Cash flows from financing activities:</b>		
Increase in short-term borrowings	111,372,417	92,517,717
Decrease in short-term borrowings	(103,542,664)	(92,234,111)
Increase in short-term bills payable	190,806,774	279,080,623
Decrease in short-term bills payable	(180,315,134)	(300,430,973)
Issuance of bonds payable	-	14,800,000
Payments to bonds payable	(22,200,000)	(15,250,000)
Payments to long-term borrowings	(13,540,000)	(14,740,000)
Proceeds from guarantee deposits received	2,493,180	2,136,363
Refund of guarantee deposits received	(2,068,499)	(1,810,459)
Increase (decrease) in other non-current liabilities	4,324	(21,418)
Decrease in bank overdraft	<u>(71,953)</u>	<u>(1,485,245)</u>
<b>Net cash flows used in financing activities</b>	<b><u>(17,061,555)</u></b>	<b><u>(37,437,503)</u></b>
<b>Net increase (decrease) in cash and cash equivalents</b>	<b>453,250</b>	<b>(1,102,503)</b>
<b>Cash and cash equivalents at beginning of period</b>	<b><u>1,561,842</u></b>	<b><u>2,664,345</u></b>
<b>Cash and cash equivalents at end of period</b>	<b>\$ <u>2,015,092</u></b>	<b>\$ <u>1,561,842</u></b>



# CPC CORPORATION, TAIWAN

## NOTES TO FINANCIAL STATEMENTS

### FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

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

#### (1) Corporation 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 financial statements

The financial statements were authorized for issuance by the Board of Directors on April 17, 2019.

#### (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, 2018:

New, Revised or Amended Standards and Interpretations	Effective date per IASB
Amendment to IFRS 2 "Classification and Measurement of Share-based Payment Transactions"	January 1, 2018
Amendments to IFRS 4 "Applying IFRS 9 Financial Instruments with IFRS 4 Insurance Contracts"	January 1, 2018
IFRS 9 "Financial Instruments"	January 1, 2018
IFRS 15 "Revenue from Contracts with Customers"	January 1, 2018
Amendment to IAS 7 "Statement of Cash Flows -Disclosure Initiative"	January 1, 2017
Amendment to IAS 12 "Income Taxes- Recognition of Deferred Tax Assets for Unrealized Losses"	January 1, 2017
Amendments to IAS 40 "Transfers of Investment Property"	January 1, 2018
Annual Improvements to IFRS Standards 2014–2016 Cycle:	
Amendments to IFRS 12	January 1, 2017
Amendments to IFRS 1 and Amendments to IAS 28	January 1, 2018
IFRIC 22 "Foreign Currency Transactions and Advance Consideration"	January 1, 2018

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:

##### 1. IFRS 15 "Revenue from Contracts with Customers"

IFRS 15 establishes a comprehensive framework for determining whether, how much and when revenue is recognized. It replaces the existing revenue recognition guidance, including IAS 18 "Revenue" and IAS 11 "Construction Contracts". The Company applies this standard retrospectively with the cumulative effect, it need not restate those contracts, but instead, continues to apply IAS 11, IAS 18 and the related Interpretations for comparative reporting period. The Company recognizes the cumulative effect upon the initially application of this Standard as an adjustment to the opening balance of retained earnings on January 1, 2018. The Company uses the practical expedients for completed contracts, which means it need not restate those contracts that have been completed on January 1, 2018.

The following are the nature and impacts on changing of accounting policies:

##### Sales of goods

For the sale of products, revenue is currently recognized when the goods are delivered to the customers' premises, which is taken to be the point in time at which the customer accepts the goods and the related risks and rewards of ownership transfer. Revenue is recognized at this point provided that the revenue and costs can be measured reliably, the recovery of the consideration is probable and there is no continuing management involvement with the goods. Under IFRS 15, revenue will be recognized when a customer obtains control of the goods.

For the loyalty program operated by the Company, revenue is currently allocated between the loyalty program and products using the residual value method. Consideration is allocated to the loyalty program based on their fair value, and the remainder of the consideration is allocated to products. The amount allocated to the loyalty program is deferred, and is recognized when the loyalty points are redeemed or expire. Under IFRS 15, consideration will be allocated between the loyalty program and products based on their relative stand-alone selling prices.

##### Impacts on financial statements

The following tables summarize the impacts of adopting IFRS15 on the Company's financial statements:

Impacted line items on the balance sheet	December 31, 2018			January 1, 2018		
	Balances prior to the adoption of IFRS 15	Impact of changes in accounting polices	Balances upon adoption of IFRS 15	Balances prior to the adoption of IFRS 15	Impact of changes in accounting polices	Balances upon adoption of IFRS 15
Advance Receipts	\$9,806,301	(9,806,301)	-	17,641,998	(17,641,998)	-
Non-current contract liabilities	-	<u>9,806,301</u>	9,806,301	-	<u>17,641,998</u>	17,641,998
<b>Impact on liabilities</b>		<u>\$ -</u>			<u>\$ -</u>	

There is impact on adjustment of cash flows from operating activities on transition to IFRS 15, but no material impact on all cash flows from operating activities.

## 2. IFRS 9 “Financial Instruments”

IFRS 9 replaces IAS 39 “Financial Instruments: Recognition and Measurement” which contains classification and measurement of financial instruments, impairment and hedge accounting.

As a result of the adoption of IFRS 9, the Company adopted the consequential amendments to IAS 1 “Presentation of Financial Statements” which requires impairment of financial assets to be presented in a separate line item in the statement of profit or loss and OCI. Previously, the Company’s approach was to include the impairment of trade receivables in administrative expenses. Additionally, the Company adopted the consequential amendments to IFRS 7 Financial Instruments: Disclosures that are applied to disclosures about 2018 but generally have not been applied to comparative information.

The detail of new significant accounting policies and the nature and effect of the changes to previous accounting policies are set out below:

### Classification of financial assets and financial liabilities

IFRS 9 contains three principal classification categories for financial assets: measured at amortized cost, fair value through other comprehensive income (FVOCI) and fair value through profit or loss (FVTPL). The classification of financial assets under IFRS 9 is generally based on the business model in which a financial asset is managed and its contractual cash flow characteristics. The standard eliminates the previous IAS 39 categories of held to maturity, loans and receivables and available for sale. Under IFRS 9, derivatives embedded in contracts where the host is a financial asset in the scope of the standard are never bifurcated. Instead, the hybrid financial instrument as a whole is assessed for classification. For an explanation of how the Company classifies and measures financial assets and accounts for related gains and losses under IFRS 9, please see note 4(f).

The adoption of IFRS 9 did not have any a significant impact on its accounting policies on financial liabilities.

### Impairment of financial assets

IFRS 9 replaces the ‘incurred loss’ model in IAS 39 with the ‘expected credit loss’ (ECL) model. The new impairment model applies to financial assets measured at amortized cost, contract assets and debt investments at FVOCI, but not to investments in equity instruments. Under IFRS 9, credit losses are recognized earlier than they are under IAS 39 – please see note 4(f).

### Transition

The adoption of IFRS 9 have been applied retrospectively, except as described below:

- Differences in the carrying amounts of financial assets and financial liabilities resulting from the adoption of IFRS 9 are recognized in retained earnings and reserves as on January 1, 2018. Accordingly, the information presented for 2017 does not generally reflect the requirements of IFRS 9 and therefore is not comparable to the information presented for 2018 under IFRS 9.
- The following assessments have been made on the basis of the facts and circumstances that existed at the date of initial application.
  - The determination of the business model within which a financial asset is held.
  - The designation and revocation of previous designations of certain financial assets and financial liabilities as measured at FVTPL.
  - The designation of certain investments in equity instruments not held for trading as at FVOCI.
- If an investment in a debt security had low credit risk at the date of initial application of IFRS 9, then the Company assumed that the credit risk on its asset will not increase significantly since its initial recognition.

### Classification of financial assets on the date of initial application of IFRS 9

The following table shows the original measurement categories under IAS 39 and the new measurement categories under IFRS 9 for each class of the Company’s financial assets as of January 1, 2018 (There is no change in financial liabilities).



	IAS 39		IFRS 9		Note
	<u>Measurement categories</u>	<u>Carrying amount</u>	<u>Measurement categories</u>	<u>Carrying amount</u>	
<b>Financial assets</b>					
Cash and cash equivalents	Loans and receivables	1,561,842	Amortized cost	1,561,842	
Derivative instruments	Held-for-trading	4,098	Mandatorily at FVTPL	4,098	
Debt securities	Available-for-sale	7,728,862	FVOCI	10,245,492	a.
Trade and other receivables	Loans and receivables	64,738,010	Amortized cost	64,738,010	
Guarantee deposits paid	Loans and receivables	282,146	Amortized cost	282,146	

a. These equity securities (including financial assets measured at cost) represent investments that the Company intends to hold for the long term for strategic purposes. As permitted by IFRS 9, the Company has designated these investments at the date of initial application as measured at FVOCI, resulting in an increase of \$2,516,630 thousand in those assets recognized, and an increase of \$2,516,630 thousand in the other equity.

The following table reconciles the carrying amounts of financial assets under IAS 39 to the carrying amounts under IFRS 9 upon transition to IFRS 9 on January 1, 2018.

	December 31, 2017			January 1, 2018	January 1, 2018	January 1, 2018
	<u>IAS 39 Carrying amount</u>	<u>Reclassifications</u>	<u>Remeasurements</u>	<u>IFRS 9 Carrying amount</u>	<u>Retained Earnings</u>	<u>Other equity</u>
<b>Fair value through profit or loss</b>						
Beginning balance of Held-for-trading (IAS 39)	\$4,098	(4,098)	-	-	-	-
From Held-for-trading to Mandatorily at FVTPL	-	4,098	-	-	-	-
<b>Total</b>	<b>\$ 4,098</b>	<b>-</b>	<b>-</b>	<b>4,098</b>	<b>-</b>	<b>-</b>
<b>Fair value through other comprehensive income</b>						
Beginning balance of available for sale (including measured at cost) (IAS 39)	\$7,728,862	(7,728,862)	-	-	-	-
From available for sale to FVOCI	-	7,728,862	2,516,630	-	-	2,516,630
<b>Total</b>	<b>\$ 7,728,862</b>	<b>-</b>	<b>2,516,630</b>	<b>10,245,492</b>	<b>-</b>	<b>2,516,630</b>
<b>Amortized cost</b>						
Beginning balance of cash and cash equivalents, trade and other receivables, and guarantee deposits paid	\$66,581,998	(66,581,998)	-	-	-	-
Adjustments for cash and cash equivalents, trade and other receivables, and guarantee deposits paid for Amortized cost	-	66,581,998	-	-	-	-
<b>Total</b>	<b>\$ 66,581,998</b>	<b>-</b>	<b>-</b>	<b>66,581,998</b>	<b>-</b>	<b>-</b>

### 3. Amendments to IAS 7 “Disclosure Initiative”

The amendments require disclosures that enable users of financial statements to evaluate changes in liabilities arising from financing activities, including both changes arising from cash flow and non-cash changes.

To satisfy the new disclosure requirements, the Company present a reconciliation between the opening and closing balances for liabilities with changes arising from financing activities as note 6(aa).

### 4. Amendments to IAS 12 “Recognition of Deferred Tax Assets for Unrealized Loss”

The amendments clarify the accounting for deferred tax assets for unrealized losses on debt instruments measured at fair value.

The Company does not expect the adoption of IAS 12 to have a material impact on the financial statements.

#### (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, 2019 in accordance with Ruling No. 1070324857 issued by the FSC on July 17, 2018:

<b>New, Revised or Amended Standards and Interpretations</b>	<b>Effective date per IASB</b>
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 “Long-term 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:

#### 1. 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.

IFRS 16 introduces a single and an on-balance sheet lease accounting model for lessees. A lessee recognizes a right-of-use asset representing its right to use the underlying asset and a lease liability representing its obligation to make lease payments. In addition, the nature of expenses related to those leases will now be changed since IFRS 16 replaces the straight-line operating lease expense with a depreciation charge for right-of-use assets and interest expense on lease liabilities. There are recognition exemptions for short-term leases and leases of low-value items. The lessor accounting remains similar to the current standard – i.e. the lessors will continue to classify leases as finance or operating leases.

Determining whether an arrangement contains a lease

On transition to IFRS 16, the Company can choose to apply either of the following:

- IFRS 16 definition of a lease to all its contracts; or
- a practical expedient that does not need any reassessment whether a contract is, or contains, a lease.

The Company plans to apply the practical expedient to grandfather the definition of a lease upon transition. This means that it will apply IFRS 16 to all contracts entered into before January 1, 2019 and identified as leases in accordance with IAS 17 and IFRIC 4.

Transition

As a lessee, the Company can apply the standard using either of the following:

- retrospective approach; or
- modified retrospective approach with optional practical expedients.

The lessee applies the election consistently to all of its leases.

On January 1, 2019, the Company plans to initially apply IFRS 16 using the modified retrospective approach. Therefore, the cumulative effect of adopting IFRS 16 will be recognized as an adjustment to the opening balance of retained earnings at January 1, 2019, with no restatement of comparative information.

When applying the modified retrospective approach to leases previously classified as operating leases under IAS 17, the lessee can elect, on a lease-by-lease basis, whether to apply a number of practical expedients on transition. The Company chooses to elect the following practical expedients:

- apply a single discount rate to a portfolio of leases with similar characteristics.
- adjust the right-of-use assets, based on the amount reflected in IAS 37 onerous

- contract provision, immediately before the date of initial application, as an alternative to an impairment review.
- apply the exemption not to recognize the right-of-use assets and liabilities to leases with lease term that ends within 12 months of the date of initial application.
- exclude the initial direct costs from measuring the right-of-use assets at the date of initial application.
- use hindsight when determining the lease term if the contract contains options to extend or terminate the lease.

So far, the most significant impact identified is that the Company will have to recognize the new assets and liabilities for the operating leases of its ship, factory, and oil warehouse. The Company estimated that the right-of-use assets and the lease liabilities to increase by \$ 40,196,157 thousand and \$ 40,196,157 thousand respectively on January 1, 2019. No significant impact is expected for the Company's finance leases. Besides, The Company does not expect the adoption of IFRS 16 to have any impact on its ability to comply with the revised maximum leverage threshold loan covenant. Also, the Company is not required to make any adjustments for leases where the Company is the intermediate lessor in a sub-lease.

## 2. 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.

So far, the Company estimated that the application of the amendments will not have a material impact on the financial statements.

The actual impacts of adopting the standards may change depending on the economic conditions and events which may occur in the future.

### (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 3 "Definition of a Business"	January 1, 2020
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 and IAS 8 "Definition of Material"	January 1, 2020

Those which may be relevant to The Company are set out below:

Issuance / Release Dates	Standards or Interpretations	Content of amendment
31 October, 2018	Amendments to IAS 1 and IAS 8 "Definition of Material"	The amendments clarify the definition of material and how it should be applied by including in the definition guidance that until now has featured elsewhere in IFRS Standards. In addition, the explanations accompanying the definition have been improved. Finally, the amendments ensure that the definition of material is consistent across all IFRS Standards.

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, 2017 had already been completed.

The examinations of the Company's financial statements as of and for the year ended December 31, 2018 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**

**1. 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 (Available-for-sale financial assets) 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.

**2. 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**

**1. Foreign currency transactions**

Transactions in foreign currencies are translated to the respective functional currencies of the Company at the exchange rates at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies at the reporting date are retranslated to the functional currency at the exchange rate at that date. The foreign currency gain or loss on monetary items is the difference between amortized cost in the functional currency at the beginning of the period, adjusted for effective interest and payments during the period, and the amortized cost in foreign currency translated at the exchange rate at the end of the period.

Non-monetary assets and liabilities denominated in foreign currencies that are measured at fair value are retranslated to the functional currency at the exchange rate at the date that the fair value was determined. Non-monetary items in a foreign currency that are measured based on historical cost are translated using the exchange rate at the date of the transaction.

Foreign currency differences arising on retranslation are recognized in profit or loss, except for those differences relating to the fair value through other comprehensive income (Available for sale) equity investment and financial liabilities designated as a hedge of the net investment in a foreign operation to the extent that the hedge is effective, which are recognized in other comprehensive income.

**2. 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 non-current.

1. It is expected to be realized, or intended to be sold or consumed, in the normal operating cycle;
2. It is held primarily for the purpose of trading;
3. It is expected to be realized within twelve months after the reporting period; or

4. 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 non-current.

An entity shall classify a liability as current when:

1. It is expected to be settled in the normal operating cycle;
  2. It is held primarily for the purpose of trading;
  3. It is due to be settled within twelve months after the reporting period; or
  4. 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**

**1. Financial assets (policy applicable from January 1, 2018)**

Financial assets are classified into the following categories: measured at amortized cost, fair value through other comprehensive income (FVOCI) and fair value through profit or loss (FVTPL).

The Company shall reclassify all affected financial assets only when it changes its business model for managing its financial assets.

**Financial assets measured 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.

A financial asset measured at amortized cost is initially recognized at fair value, plus any directly attributable transaction costs. These assets are subsequently measured at amortized cost using the effective interest method. Interest income, foreign exchange gains and losses, and impairment loss, are recognized in profit or loss. Any gain or loss on derecognition is recognized in profit or loss. A regular way purchase or sale of financial assets is recognized and derecognized, as applicable, using trade date accounting.

**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.

A financial asset measured at FVOCI is initially recognized at fair value, plus any directly attributable transaction costs. These assets are subsequently measured at fair value. Interest income calculated using the effective interest method, foreign exchange gains and losses, and impairment losses, deriving from debt investments are recognized in profit or loss; whereas dividends deriving from equity investments 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 of financial assets measured at FVOCI are recognized in OCI. On derecognition, gains and losses accumulated in OCI of debt investments are reclassified to profit or loss. However, gains and losses accumulated in OCI of equity investments are reclassified to retain earnings instead of profit or loss.

Dividend income derived from equity investments is recognized on the date that the Company's right to receive payment is established, which in the case of quoted securities is normally the ex-dividend date. A regular way purchase or sale of financial assets is recognized and derecognized, as applicable, using trade date accounting.

#### 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. 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.

Financial assets in this category are measured at fair value at initial recognition. Attributable transaction costs are recognized in profit or loss as incurred. Subsequent changes that are measured at fair value, which take into account any dividend and interest income, are recognized in profit or loss. A regular way purchase or sale of financial assets is recognized and derecognized, as applicable, using trade date accounting.

#### 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.

#### 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 flows;
- 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).

#### 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), 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 month 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 Company 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 assets 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 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 (either partially or in full) to the extent that there is no realistic prospect of recovery. This is generally the case when the Company determines that the debtor does not have assets or sources of income that could generate sufficient cash flows to repay the amounts subject to the write-off. However, financial assets that are written off could still be subject to enforcement activities in order to comply with the Company's procedures for recovery of amounts due.

#### Derecognition of financial assets

Financial assets are derecognized when the contractual rights to the cash flows from the assets expire, or when the Company transfers substantially all the risks and rewards of ownership of the financial assets.

On derecognition of a debt instrument in its entirety, the Company recognizes the difference between its carrying amount and the sum of the consideration received or receivable and any cumulative gain or loss that had been recognized in other comprehensive income and presented in "other equity – unrealized gains or losses on fair value through other comprehensive income", in profit or loss, and expenses in the statement of income.

On derecognition of a financial asset other than in its entirety, the Company allocates the previous carrying amount of the financial asset between the part it continues to recognize under continuing involvement, and the part it no longer recognizes on the basis of the relative fair values of those parts on the date of the transfer. The difference between the carrying amount allocated to the part that is no longer recognized and the sum of the consideration received for the part no longer recognized and any cumulative gain or loss allocated to it that had been recognized in income is recognized in profit or loss. A cumulative gain or loss that had been recognized in other comprehensive income is allocated between the part that continues to be recognized and the part that is no longer recognized on the basis of the relative fair values of those parts.

## 2. Financial assets (policy applicable before January 1, 2018)

Financial assets are classified into the following categories: financial assets at fair value through profit or loss, available-for-sale financial assets, and loans and receivables.

#### Financial assets at fair value through profit or loss

A financial asset is classified in this category if it is classified as held for trading or is designated as at fair value through profit or loss.

Financial assets at fair value through profit or loss are stated at fair value, with any gains or losses arising on remeasurement recognized in profit or loss. The net gain or loss recognized in profit or loss does not incorporate any dividend or interest earned on the financial asset.

#### Available-for sale financial assets

Available-for-sale financial assets are non-derivatives that are either designated as available-for-sale or are not classified as loans and receivables, held-to-maturity investments or financial assets at fair value through profit or loss.

Available-for-sale financial assets are measured at fair value. Changes in the carrying amount of available-for-sale monetary financial assets relating to changes in foreign currency exchange rates, interest income calculated using the effective interest method and dividends on available-for-sale equity investments are recognized in profit or loss. Other changes in the carrying amount of available-for-sale financial assets are recognized in other comprehensive income and will be reclassified to profit or loss when the investment is disposed of or is determined to be impaired.

Dividends on available-for-sale equity instruments are recognized in profit or loss when the Company's right to receive the dividends is established.

Available-for-sale equity investments that do not have a quoted market prices in an active market and whose fair value cannot be reliably measured and derivatives that are linked to and must be settled by delivery of such unquoted equity investments are measured at cost less any identified impairment loss at the end of each reporting period and are presented in a separate line item as financial assets carried at cost. If, in a subsequent period, the fair value of the financial assets can be reliably measured, the financial assets are remeasured at fair value. The difference between carrying amount and fair value is recognized in or other comprehensive income on financial assets. Any impairment losses are recognized in profit and loss.

#### Loans and receivables

Loans and receivables (including trade receivables, cash and cash equivalents) are measured at amortized cost using the effective interest method, less any impairment, except for short-term receivables, which are measured at their original invoice amounts with no stated interest rate if the effect of discounting is immaterial.

Cash equivalents include time deposits with original maturities of within three months from the date of acquisition and are highly liquid, readily convertible to a known amount of cash and be subject to an insignificant risk of changes in value. These cash equivalents are held for the purpose of meeting short-term cash commitments.

#### Impairment of financial assets

Financial assets, other than those at fair value through profit or loss, are assessed for indicators of impairment at the end of each reporting period. Financial assets are considered to be impaired when there is objective evidence that, as a result of one or more events that occurred after the initial recognition of the financial asset, the estimated future cash flows of the investment have been affected.

Financial assets carried at amortized cost, such as trade receivables, are assessed for impairment collectively even if they had been assessed as not impaired individually. Objective evidence of impairment for a portfolio of receivables could include the Company's past experience of collecting payments and impairment as well as observable changes in national or local economic conditions that correlate with default on receivables.

For financial assets carried at amortized cost, the amount of the impairment loss recognized is the difference between the asset's carrying amount and the present value of estimated future cash flows, discounted at the financial asset's original effective interest rate.

For financial assets measured at amortized cost, if, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related objectively to an event occurring after the impairment was recognized, the previously recognized impairment loss is reversed through profit or loss to the extent that the carrying amount of the investment at the date the impairment is reversed does not exceed what the amortized cost would have been had the impairment not been recognized.

For available-for-sale equity investments, a significant or prolonged decline in the fair value of the security below its cost is considered to be objective evidence of impairment.

When an available-for-sale financial asset is considered to be impaired, cumulative gains or losses previously recognized in other comprehensive income are reclassified to profit or loss in the period.

In respect of available-for-sale equity securities, impairment loss previously recognized in profit or loss are not reversed through profit or loss. Any increase in fair value subsequent to an impairment loss is recognized in other comprehensive income. In respect of available-for-sale debt securities, the impairment loss is subsequently reversed through profit or loss if an increase in the fair value of the investment can be objectively related to an event occurring after the recognition of the impairment loss.

For financial assets that are carried at cost, the amount of the impairment loss is measured as the difference between the asset's carrying amount and the present value of the estimated future cash flows discounted at the current market rate of return for a similar financial asset. Such impairment loss will not be reversed in subsequent periods.

The carrying amount of the financial asset is reduced by the impairment loss directly for all financial assets with the exception of trade receivables (please specify) where the carrying amount is reduced through the use of an allowance account. When a trade receivable is considered uncollectible, it is written off against the allowance account. Subsequent recoveries of amounts

previously written off are credited against the allowance account. Changes in the carrying amount of the allowance account are recognized in profit or loss except for uncollectible trade receivables that are written off against the allowance account.

### 3. Financial liabilities

Except in the following situations, all the financial liabilities are measured at amortized cost using the effective interest method:

Financial liabilities are classified as at fair value through profit or loss when the financial liability is either held for trading or designated as at fair value through profit or loss.

Financial liabilities held for trading are stated at fair value, with any gains or losses on remeasurement recognized in profit or loss. The net gain or loss recognized in profit or loss does not incorporate any interest or dividend generated from the financial liability.

### 4. Derecognition of financial assets and liabilities

Financial assets are derecognized when the contractual rights of the cash inflow from the assets are terminated, or when the Company transfers substantially all the risks and rewards of ownership of the financial assets. On derecognition of an entire financial asset, the difference between the carrying amount and the sum of the consideration received or receivable and any cumulative gain or loss that had been recognized in gains or losses.

The Company derecognizes a financial liability when its contractual obligation has been discharged or cancelled, or has expired. The difference between the carrying amount of a financial liability removed and the consideration paid (including any non-cash assets transferred or liabilities assumed) is recognized in profit or loss.

### 5. 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 recognized at fair value at the date the derivative contracts are entered into and are subsequently remeasured to their fair value at the end of each reporting period. The resulting gain or loss is recognized in profit or loss immediately. When the fair value of a derivative financial instrument is positive, the derivative is recognized as a financial asset; when the fair value of derivative financial instruments is negative, the derivative is recognized as a financial liability.

#### (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

##### 1. 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.

## **2. 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.

## **3. 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 telecommunication equipment is computed using the straight-line method. Depreciation of the remaining property, plant and equipment is computed using the fixed-percentage-on-declining-balance 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) 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 fixed-percentage-on-declining-balance 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.

### **(k) 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.

### **(l) 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.

**(m) 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 pre-tax 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.

**(n) 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.

**(o) Revenue from contracts with customers (policy applicable from January 1, 2018)**

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.

**1. Sale of goods**

The Company manufactures and sells consumer 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.

**2. 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.

**(p) Revenue Recognition (policy applicable before January 1, 2018)**

Revenue is measured at the fair value of the consideration received or receivable. Revenue is reduced for estimated customer returns, rebates and similar allowances. Allowance for sales returns and liability for returns are recognized at the time of sale based on the seller's reliable estimate of future returns and based on past experience and other relevant factors.

**1. Sale of goods**

Revenue from the sale of goods is recognized when all the following conditions are satisfied:

The Company has transferred to the buyer the significant risks and rewards of ownership of the goods;

The Company retains neither continuing managerial involvement to the degree usually associated with ownership nor effective control over the goods sold;

The amount of revenue can be measured reliably;

It is probable that the economic benefits associated with the transaction will flow to the Company; and

The costs incurred or to be incurred in respect of the transaction can be measured reliably.

Under the Company's customer loyalty program, sales of goods that result in reward credits for customers are accounted for as multiple-element revenue transactions, and the fair value of the consideration received or receivable is allocated both to the goods supplied and the reward credits granted. The portion of the consideration allocated to the reward credits should be measured at fair value and recognized as income when the customer receives the award.

## **2. Dividend and interest income**

Dividend income from investments is recognized when the shareholder's right to receive payment has been established and if it is probable that the economic benefits will flow to the Company and the income can be measured reliably.

Interest income from a financial asset is recognized when it is probable that the economic benefits will flow to the Company and the amount of income can be measured reliably. Interest income is accrued on a time basis, by reference to the principal outstanding and the effective interest rate applicable.

## **(q) Employee benefits**

### **1. 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.

### **2. 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.

### **3. 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) Lease**

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.

## **(s) 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.

**(t) 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.

**(u) Hedge accounting****1. Fair value hedge**

Changes in the fair value of a hedging instrument designated and qualified as a fair value hedge are recognized in profit or loss, together with any changes in the fair value of the hedged asset or liability that are attributable to the hedged risk.

If the hedging instrument no longer meets the criteria for hedge accounting, expires, or is sold, terminated, or exercised, or the designation is revoked, then hedge accounting is discontinued prospectively.

**2. Cash flow hedge**

When a derivative is designated as a cash flow hedge, the effective portion of changes in the fair value of the derivative is recognized in other comprehensive income. Any ineffective portion of changes in the fair value of the derivative is recognized immediately in profit or loss.

When the hedged item is recognized in profit or loss and retained in other comprehensive income is reclassified to profit or loss in the same period or periods during which the hedged item affects profit or loss, and is presented in the same accounting caption with the hedged item recognized in the statement of comprehensive income.

For a cash flow hedge of a forecast transaction recognized as a non-financial asset or liability and retained in other comprehensive income is reclassified as the initial cost of the non-financial asset or liability.

Hedge accounting is discontinued prospectively when the Company revokes the designated hedging relationship, or when the hedging instrument expires or is sold, terminated, or exercised, or when it no longer meets the criteria for hedge accounting. The cumulative gain or loss on the hedging instrument that has been previously recognized in other comprehensive income from the period when the hedge was effective remains separately in equity until the forecast transaction occurs. When a forecast transaction is no longer expected to occur, the gain or loss accumulated in equity is recognized immediately in profit or loss.

**(v) Business combination**

Goodwill is measured at the consideration transferred less the amounts of the identifiable assets acquired and liabilities assumed at the acquisition date. All transaction costs relating to a business combination are recognized immediately as expenses when incurred, except for the issuance of debt or equity instruments.

**(w) 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.

**(x) Operating segments**

An operating segment is a component of the Company that engages in business activities from which it may earn revenues and incur expenses (including revenues and expenses relating to transactions with other components of the Company). Operating results of

the operating segment are regularly reviewed by the Company's chief operating decision maker to make decisions about resources to be allocated to the segment and to assess its performance. Each operating segment consists of standalone financial information.

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

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

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

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**

#### **1. Estimated impairment of trade receivables (policy applicable from January 1, 2018)**

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(d).

#### **2. Estimated impairment of trade receivables (policy applicable before January 1, 2018)**

The Company assesses the impairment of trade receivables individually and collectively. Objective evidence of impairment for a portfolio of receivables could include the Company's past experience on collecting payments and an increase in the number of delayed payments beyond the Company's credit period as well as observable changes in national or local economic conditions that correlate with default on receivables. When there is objective evidence of impairment loss, the Company takes into consideration the estimation of future cash flows. Where the actual future cash flows are less than expected, a material impairment loss may arise. The carrying amounts of trade receivables as of December 31, 2017 are shown in note 6(d).

### **(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)

	2018	2017	2016	2015	2014
Sales and other operating revenues	1,034,575,586	896,642,121	764,629,993	843,615,422	1,191,814,302
Profit (loss) before income tax	43,755,891	48,542,061	35,430,707	(1,402,323)	(33,754,588)
per dollar of sales and other operating revenues (NT\$)	0.042	0.054	0.046	(0.002)	(0.028)
Cash dividends	1,309,440	-	-	-	-
per dollar of capital(NT\$)	0.01	-	-	-	-
Owner's equity	297,598,385	260,417,391	221,475,417	192,157,075	193,597,425
per dollar of capital (NT\$)	2.29	2.00	1.70	1.48	1.49
General taxes and import duties	58,226,752	51,348,334	44,638,861	43,259,598	57,752,016
Commodity tax	72,007,592	74,288,029	74,581,051	72,054,757	70,639,775
Total taxes	130,234,344	125,636,363	119,219,912	115,314,355	128,391,791
Working capital (current assets less current liabilities)	(52,834,357)	(56,879,637)	(87,227,141)	(87,408,206)	(67,175,456)
Ratio of current assets to current liabilities	79.89%	75.93%	64.93%	64.81%	79.37%
Long-term Liabilities	88,050,000	126,590,000	147,930,000	177,920,000	194,920,000
Properties, plant, and equipment-gross	914,752,212	913,710,040	911,364,127	904,641,954	895,488,908
Properties, plant, and equipment-net	423,460,997	430,577,501	428,542,522	428,472,574	433,250,831
Exploration expenses (including all dry holes)	2,573,975	2,195,701	2,267,889	2,947,919	5,479,270
Total assets	769,496,777	745,046,121	741,353,122	741,965,890	833,704,503
Employed capital (Equity, long-term debt)	385,648,385	387,007,391	369,405,417	370,077,075	388,517,425
Employees on December 31	15,712	14,814	14,708	14,693	14,787
Sales and other operating revenues per employee	65,846	60,527	51,987	57,416	80,599

## A Five-year Operation Summary

	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>
Crude oil produced-total KL	180,062	193,474	182,265	169,797	189,138
daily average KL	493	530	499	465	518
Natural gas produced-total MCM	240,026	268,115	325,700	377,952	393,019
MCM per day	658	735	892	1,035	1,077
Wells drilled during the year	2	2	2	1	3
Crude oil processed-total KL	22,213,776	21,661,811	21,635,119	20,525,008	22,380,439
daily average KL	60,860	59,347	59,274	56,233	61,316
Natural gas sold-total MCM	22,171,345	21,967,834	20,042,777	18,950,917	17,621,331
MCM per day	60,743	60,186	54,912	51,920	48,278
Refined products sold-total KL	34,661,601	35,524,415	36,112,964	33,448,897	33,380,385
daily average KL	94,963	97,327	98,940	91,641	91,453
Petrochemicals sold-MT	4,281,652	4,016,126	4,253,360	4,351,223	4,566,296
daily average MT	11,731	11,003	11,653	11,921	12,510





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