



CPC  
Corporation  
Taiwan  
2018



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CPC  
Corporation  
Taiwan  
2018

Quality, Service, Contribution

# INNOVATION AND TRANSFORMATION: A WINNING VISION FOR THE FUTURE

Although international political developments in 2017 were characterized by uncertainty, overall the global economy has continued its moderate recovery. Cooperation on production cuts between the major producers in the Organization of Petroleum Exporting Countries (OPEC) and Russia resulted in a slow increase in oil prices to around US\$65 per barrel in the second half of the year. In that situation, CPC has maintained a stable supply of oil and natural gas and petrochemicals for the domestic market as part of its commitment to accomplishing the missions assigned to it by the government. Thanks to the hard work and support of all of my colleagues, in 2017 we achieved the best earnings before tax performance since 1989.

CPC's business units made many significant achievements in 2017. These included:

- in exploration and production, obtaining the production license for the Oryx Oilfield in Chad; development plans are progressing on schedule.
- in the refining business, completing the update of the distillation and related processes in our Dalin Plant; and also finalizing the plan for investment that will enable improvements at the Third Heavy Oil Hydrodesulfurization Plant aimed at raising the quality of its products so as to meet future national standards.
- In our marketing business, completing the renovation of the public toilets in more than 200 gas stations in order to enhance the quality of service and hence also customer satisfaction.
- developments in our natural gas business saw the Yongan Plant unloading LNG from a Q-Flex class LNG carrier - second largest in the world - in November 2017 and the creation of more flexible shipping arrangements that will improve our overall capability in receiving LNG cargoes.
- launching a public green bond under our CSR program. This is the first such issued by a Taiwanese enterprise and evidences our support for the development of green energy financing on a national basis.
- sponsoring the "2017 Taipei Summer Universiade" international games by providing both the fuel for the vehicles transporting the athletes and CPC's own brand of eco-friendly detergent for their laundry service. This was in the context of our ongoing support for athletic pursuits and national sports development.
- relocating the Hsinchu tank farm in compliance with Hsinchu City Government's urban planning and regional prosperity development schemes.
- EPA approval on August 22, 2017 of the site for Taiwan's Oil Production Environmental Education Exhibition - the first oil-related resource for education in environmental and sustainable development issues.

Chairman



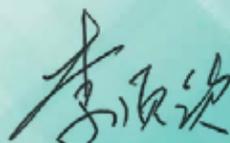
- advancing the development of solar energy photovoltaic systems and green building certification for our gas stations. This constitutes a constructive response to government policies for energy conservation and carbon emissions reduction and will help to create a green energy-based, low-carbon environment in Taiwan.

Climate change will continue to shape the global energy system in the future and so CPC's main challenge still lies in the consequent need for reorganization of the energy and petrochemicals industries. CPC actively embraces this challenge and aims to successfully develop new business models and create new business opportunities in the transformation process. As an example, and in response to the limited room for development of the domestic petrochemicals sector, we are engaged in evaluating the feasibility of, and then planning, the establishment overseas of Taiwanese petrochemicals industry clusters jointly with host-country domestic petrochemicals players. We shall also make full use of our existing foreign operations and reinvestment companies (e.g. the Maxihub Company in Vietnam) to develop our presence in those ASEAN and south Asian markets that have high growth potential.

In addition, and in response to government policy calling for full electrification (or hybridization) of all domestically-produced vehicles and motorcycles by 2040, CPC plans to accelerate the transition of its gas stations to green energy stations and in doing so go all out to develop the market for both EV charging stations and battery exchange. That plan mandates completing the installation of 1,000 electric vehicle charging and battery exchange facilities in gas stations and public areas within 3 years, based on the pilot CPC Green Energy Gas Station that will be completed this year (2018) and which will integrate the concepts of productivity, energy storage and energy consumption. Going further, we shall introduce new applications such as big data, smart applications and the IoT to build micro grids enabling those sites to become green energy suppliers to their neighboring communities.

CPC will continue to uphold and strive for the ideals of '100% labor safety, zero accidents and zero environmental pollution' through maintaining safe and consistent work practices in its operations. We shall also exemplify the spirit of 'giving back to the society from which we have benefited', while sharpening our competitive edge to increase profitability and so contribute to both Taiwan's economic growth and local area development. CPC will hold to providing Taiwan's people with high-quality and efficacious energy products and services, while remaining committed to energy saving, reducing carbon emissions and environmental and ecological conservation. We will carry on with our concern for the disadvantaged groups in our society and will implement a CSR program that will help us to achieve our goals for sustainable development and becoming a competitive, international energy company.

President



1946

1949

2007

CPC was formally established in Shanghai on June 1, 1946. It was in the beginning subordinate to the then Council of Resources (the predecessor of today's State-owned Enterprise Commission, Ministry of Economic Affairs).

After the ROC government's relocation to Taiwan in 1949 its headquarters was set up in Taipei and its allegiance transferred to the Ministry of Economic Affairs. Its scope of business, carried out in workplaces throughout Taiwan, primarily comes down to dealing with oil and natural gas: exploration and production, procurement and imports, refining, storage and transportation, marketing and sales and the production of petrochemical raw materials.

At the 550th meeting of the Board of Directors in February 2007 the original English name Chinese Petroleum Corporation was officially changed to CPC Corporation, Taiwan, with the former title preserved in vestigial form in the abbreviated prefix.

## SUSTAINABLE DEVELOPMENT

### CPC ALIGNS WITH FORWARD-LOOKING TRENDS: BRINGING PROGRESS TO THE ECONOMY, THE ENVIRONMENT AND THE COMMUNITY

#### POWERING ECONOMIC DEVELOPMENT FULFILLING CSR COMMITMENTS

CPC has for many years ensured a consistently stable supply of crude oil and natural gas to both meet domestic demand for raw energy as well as refined products and to drive development in the petrochemicals sector. That has helped bring about Taiwan's soaring economic growth, which in turn has brought prosperity to the people – achievements for which the company has earned praise from all quarters. Over the past two decades, following the liberalization of the domestic market for refined products, CPC has consolidated its operational advantages as well as sharpening and deepening its competitive strengths. Going beyond streamlining its human resources and a systematic engagement with organizational re-engineering, the company is continually looking for ways to reduce its production costs and to infuse its operations with an entrepreneurial spirit. Driven by the ambition to become an internationally-competitive energy group holistically encompassing oil and gas exploration and production, petrochemicals and advanced technologies, CPC actively seeks opportunities for cooperation with major international oil companies that will expand both its upstream scope of business and its downstream marketing channels. In that way it will be able to go on providing Taiwan's citizens with high-quality, value-for-money energy products and services as well as raising its profile internationally.

While CPC is a profit-seeking state-owned enterprise, it is always and everywhere it works conscious that it is a member of the local community. As such, it strives to serve as a good corporate citizen and one that takes its CSR obligations to heart. While over the years continually improving the quality of its products, it has at the same time - and as part of its environmental-protection efforts - introduced and promoted clean energy in the form of imported liquefied natural gas (LNG). Further, and in keeping with its belief in the role of delivering convenience and beneficial service to people wherever they may be regardless of the cost involved, CPC ensures provision of all of the fuel needed by both the military forces and civilians in Taiwan's remote areas and offshore islands.

Over the years CPC has been conscientiously active in areas of social concern - promoting public understanding of the petroleum industry, educating consumers in the safe use of gasoline and natural gas, conducting seminars on energy-saving and reducing the carbon footprint, running industrial health and safety workshops and providing leadership to other businesses in the energy sector in the common pursuit of sustainable development. In terms of community involvement, CPC has supported disadvantaged groups, participated in social-welfare activities, funded arts and cultural initiatives and sponsored elite athletes. Its public service role also includes putting in place environmental protection measures around its workplaces, supporting economic and



Capital  
NT\$ **130.1** billion

Revenue in 2017  
NT\$ **896.64** billion

### Corporate Ideals

Expand international businesses and deepen local roots

CPC continues to preserve the CPC name, trademarked torch logo and English name to retain the business reputation it has accumulated over the years – one based on providing sufficient supplies of energy for the domestic market and building an international energy group.

The Board of Directors amended the Company's Articles of Incorporation on June 17, 2016 to reflect the relocation of its registered headquarters from Taipei to Kaohsiung City.

social development in the neighborhoods around its industrial plants and exploration sites, encouraging ecological conservation (in particular, sparing no effort in regard to the eco-protection of areas surrounding its own sites) fostering local culture and promoting education on environmental issues. All of these activities are in keeping with the 21st-century trend towards a business model based on sustainability and demonstrate CPC's emphasis on balancing economic growth, environmental protection and the welfare of the wider community.

CPC joined the World Business Council for Sustainable Development (WBCSD) in 2006 and since then has divided its efforts towards sustainable operations into four areas: policy and R&D; environmental and ecological conservation; caring for the community; and environmental accounting and information. The company has presented the relevant information by publishing a Sustainability Report in 2007, 2009 and 2011-2016 that has garnered a number of awards for its excellence.

A cross-department Sustainable Operations Promotion Committee was formed in 2007 and started work the following year. Comprised of senior management representatives and chaired by CPC's current Chairman of the Board with the President of the day as Vice Chair, its membership includes foreign scholars and other experts invited to serve as advisers. The Committee promotes initiatives in the four task areas mentioned above, meeting three times a year and tracking the progress towards sustainability in operations. Details on what has been achieved can be found in the above-mentioned annual CPC Sustainability Report.

As global warming and the resulting climate change intensify, CPC – all the while working diligently at its core businesses and at fulfilling its role as Taiwan's principal provider of clean energy - remains committed to creating positive outcomes in terms of environmental protection, economic development and concern for the community in order to create a better future for all.

## 2017 RECOGNITION AND HONORS

- *Management Magazine* - No.1 Consumers' Ideal Gas Station Brand for 13th consecutive year.
- *Reader's Digest* Trusted Brand Platinum Award for 17th 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 26th Annual ROC Enterprise Environmental Protection Awards.



Active commitment to R&D for the creation of new areas of business

Compliance with government regulations and international agreements

Comprehensively clean production methods coupled with protection of the environment

CPC formulated the elements of its sustainability policy as far back as 2003 and they remain aligned with global trends in environmental protection:

Establishment of key environmental protection indicators and the practice of fully transparent information disclosure

Conservation of water and energy resources through efficient utilization

Emphasis on fulfilling CSR commitments and expanding services to the consuming public

# BOARD AND CORPORATE OFFICERS

## BOARD OF DIRECTORS

Chein Tai | Chairman

### Directors

Shun-Chin Lee  
(Standing Director)

Ming-Chang Hsu  
(Standing Director & Independent Director)

Jing-Tang Yang  
(Independent Director)

Shone Wei-Shyang Chen

Engel Wu

Peggy L. Lin

Jui-Chang Chang

Jhy-Chern Liu

Yuan-Fung Dai

Chih-Chang Chen

Chih-Wei Sun

Jui-An Yeh

### Supervisors

Shi-Jeng Yang

Hui-Shan Wei

Po-Jen Hsiao

## CORPORATE OFFICERS

President

Shun-Chin Lee

Vice Presidents

Ann S. C. Bih

Jeng-Zen Fang

Jen-Hung Huang

Shu-Chen Chen

Chia-Shou Chiu

CEO, Exploration &  
Production Business  
Division

Michael Chang

CEO, Refining Business  
Division

Yao-Chiuan Chen

CEO, Petrochemical  
Business Division

Yi-Fang Wu

CEO, Marketing  
Business Division

Peter Chan(Acting)

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

Vincent Y.S. Ho

Director, Exploration &  
Development Research  
Institute

Jung-Nan Oung

Director, Green  
Technology Research  
Institute

Tung-Li Huang

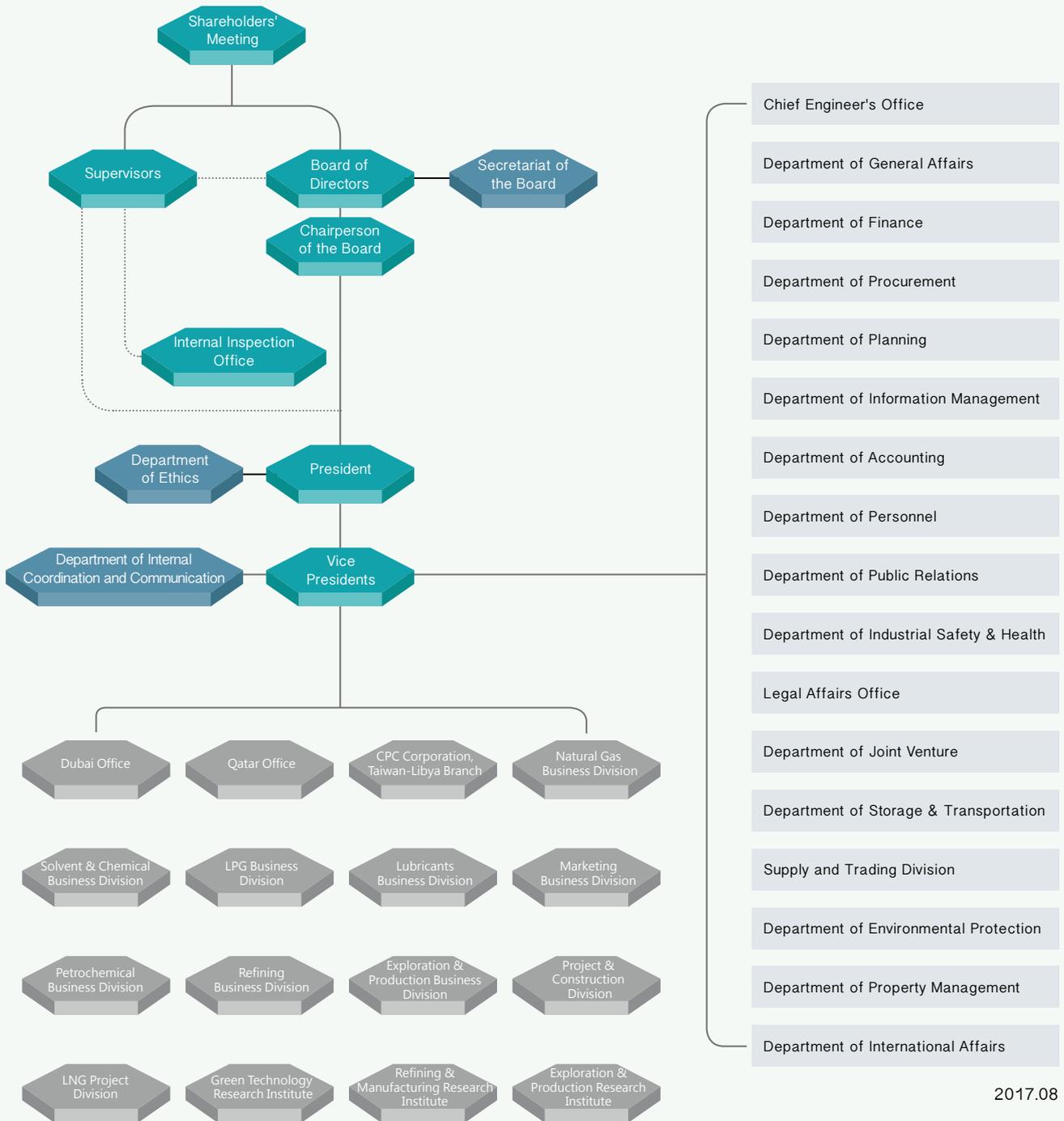
Director, LNG Project  
Division

Roung-Yuh Huang

Director, Project &  
Construction Division

Jack S.J. Wang

# ORGANIZATION CHART



# KEY MANAGERS



Jane Liao

CEO, Natural Gas  
Business Division

Peter Chan

CEO (Acting), Marketing  
Business Division

Yi-Fang Wu

CEO, Petrochemical  
Business Division

Chia-Shou Chiu

Vice President

Jen-Hung Huang

Vice President

Shun-Chin Lee

President



Chein Tai

Chairman

Ann S. C. Bih

Vice President

Shu-Chen Chen

Vice President

Jeng-Zen Fang

Vice President

Yao-Chiuan Chen

CEO, Refining  
Business Division

Michael Chang

CEO, Exploration &  
Production Business  
Division

# UPSTREAM OPERATIONS

EXPANSION OVERSEAS DRIVES STRATEGY:  
EXPLORATION AND M&A ARE DUAL PATHS  
TO PROGRESS

## EXPLORATION AND PRODUCTION: OVERSEAS IS KEY

Taiwan has only very limited energy resources of its own and depends on imports for almost all its fossil fuel needs. CPC has therefore focused on achieving more effective expansion of its upstream operations by acquiring and developing its own reserves – and ramping up production at sources abroad – to help stabilize the supply of oil and natural gas into the domestic market and so 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 promoting international cooperation in energy-related matters.

In order to improve its overall strategic positioning and stay in alignment with the corporate philosophy of 'active expansion, focused development', CPC has adopted exploration strategies aimed at gradually increasing its ratio of self-owned and self-controlled energy reserves within the full sourcing range. Achieving this means, in summary: expanded development of overseas resources while exploiting the indigenous ones to their maximum capacity; boosting 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.



### TAIWAN'S ONSHORE OIL & GAS: CONTINUING CONTRIBUTION

In 2017 CPC completed a 2D seismic survey of the Pingtung Plain, covering an area of 113 sq. km in the northern section while geological surveys and reconditioning of two wells extended over 70 sq. km elsewhere. Production from 27 wells in southern and southwest Taiwan yielded 266 million cubic meters of natural gas and 5,407 kiloliters of condensate.

In a new development, certain areas that have geothermal energy potential are being assessed while discussions with Taipower on cooperation in geothermal exploration as well as power generation are now in progress.

### TAIWAN'S OFFSHORE SEARCH: ONGOING ASSESSMENT

CPC is cooperating with Husky Energy of Canada in the exploration of deep-water blocks in the Tainan Basin; this arrangement allows CPC to both acquire deep-water exploration technology and to mitigate its risk. Husky has completed the 3D seismic survey and will continue its explanation of the data processing results as well as those of the evaluation of the geophysical data; on that will be based the decision as to whether or not enter the next phase of exploration.

### EXPLORATION IN THE TAIWAN STRAIT AND EAST / SOUTH CHINA SEA

CPC has completed its drilling program in the Taichao contract block and has decided to abandon the well as electronic logging showed no trace of oil or gas. Any future cooperative strategy for this contract area will depend on the results of further exploratory drilling.

CPC has also started 2D seismic surveys and data processing after signing a contract with China National Offshore Oil Corporation (CNOOC) and France's TOTAL for joint exploration in the Taiwan Strait's deep-water area.

### OVERSEAS EXPLORATION AND PRODUCTION: FURTHER DEVELOPMENT

By the end of 2017, CPC was engaged with international oil companies in joint exploration of 17 fields in 7 countries, involving the operation of 1,000 producing wells. In the same period, the yield obtained by CPC as its share of the output of 13 producing fields in Ecuador, Indonesia, Niger and the USA amounted to just over 4.5

# 2017

## Natural gas production

# 266

Million  
cubic meters

## Condensate production

# 5,407

kiloliters

million barrels of crude oil and 137 million cubic meters of natural gas. This output consisted of both conventional and tight oil and gas: lifting those large volumes of high-quality hydrocarbons entailed the deployment of ultra-low pressure enhanced oil recovery (EOR) methods and similar technologies.

In Chad, where CPC is the operator of three oilfields, 2017 saw the company acquire the license to formally enter into the development and production phase. The program is being accelerated in order to activate production by end-2019 and so achieve the twin goals of boosting the company's self-controlled oil and natural gas resources as well as making Taiwan's energy supply still more stable.

## SEEKING OPPORTUNITIES FOR COOPERATION OVERSEAS

It is likely that over the next 10 years Taiwan's existing onshore oil and gas fields will become successively exhausted, and this constitutes a call for action to avoid a crisis. CPC is therefore putting a lot of continuous effort into both domestic and foreign exploration and production as well as going after suitable merger and acquisition (M&A) opportunities.

In particular, and in compliance with both the government's New Southbound Policy and the international trend towards clean energy, CPC is engaged in both purchase and M&A opportunities with natural gas fields in ASEAN territory and south Asia. The company's wider exploration initiative encompasses fields in Southeast Asia, Australia, the Middle East (especially Iran), Central and South America and offshore areas of West Africa. CPC's interest in non-conventional fields is mainly concentrated on M&A of American shale formations and purchasing newly-developed sites. The core objective inherent in acquiring more oil and gas fields through purchase and M&A is to initially augment and later replace, when they run out, Taiwan's very limited indigenous hydrocarbon resources.

## LOGICAL AGGREGATION OF SELF-OWNED OIL AND GAS ASSETS

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 international oil and gas business: it is now consistently engaged in upstream international cooperation and M&A activity centered on exploration and boosting its self-controlled oil and gas reserves. The company will endeavor to acquire fields with good production potential, above all those with low risk, and to sign contract rights in currently-producing locations.

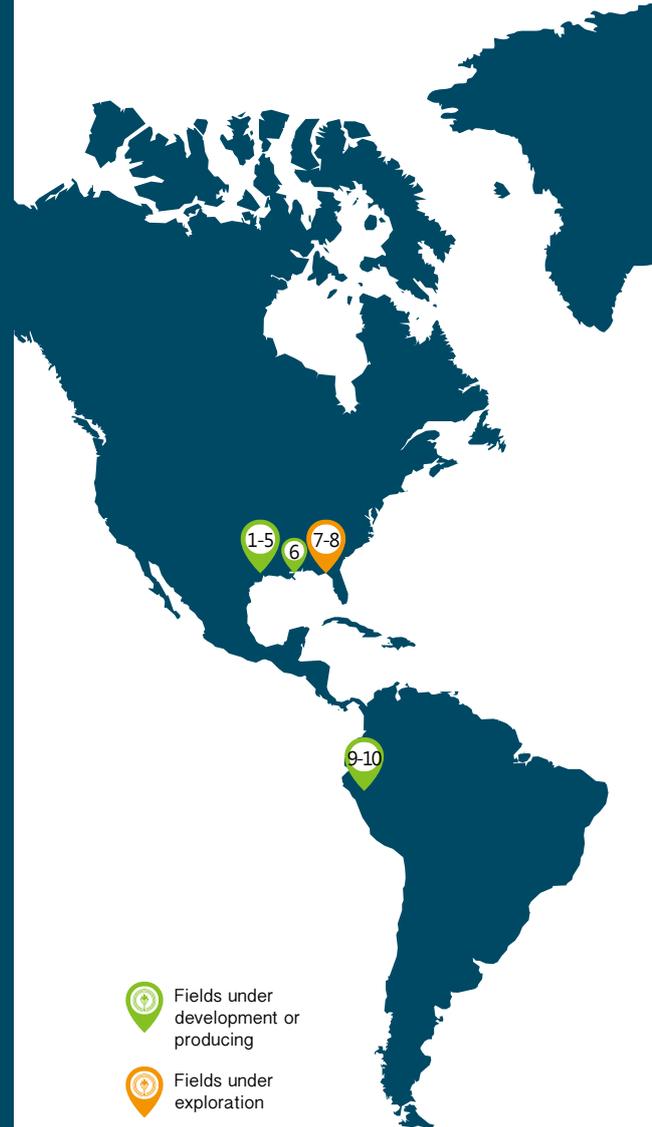
In parallel with this, there are initiatives to both develop diversity in the company's scope of business and to be a player in the fast-growing green energy industry.

## CPC'S EXPLORATION AND PRODUCTION PERFORMANCE OVER THE PAST THREE YEARS

Unit: In Millions of New Taiwan Dollars

Year	2015	2016	2017
Operating revenue	9,947	10,350	6,509
Operating costs	8,597	11,439	6,353
Earnings	1,350	(1,089)	156
Pre-tax profit	1,205	(6,749)	(10,362)
Operating revenue as a share of company's total revenue*	1.18%	1.35%	0.72%

\* Total revenue: NT\$844 billion in 2015, NT\$764 billion in 2016, NT\$897 billion in 2017



-  Fields under development or producing
-  Fields under exploration

### US- (Louisiana/Texas boundary)

-  **1 Big Horn** OPIC (11.2%)
  -  **2 Danube** OPIC (10%)
  -  **3 Yellowstone** OPIC (10%)
  -  **4 NW Bearhead Creek** OPIC (10%)
  -  **5 East Skinner Lakes** OPIC (10%)
- Operator : Indigo Minerals

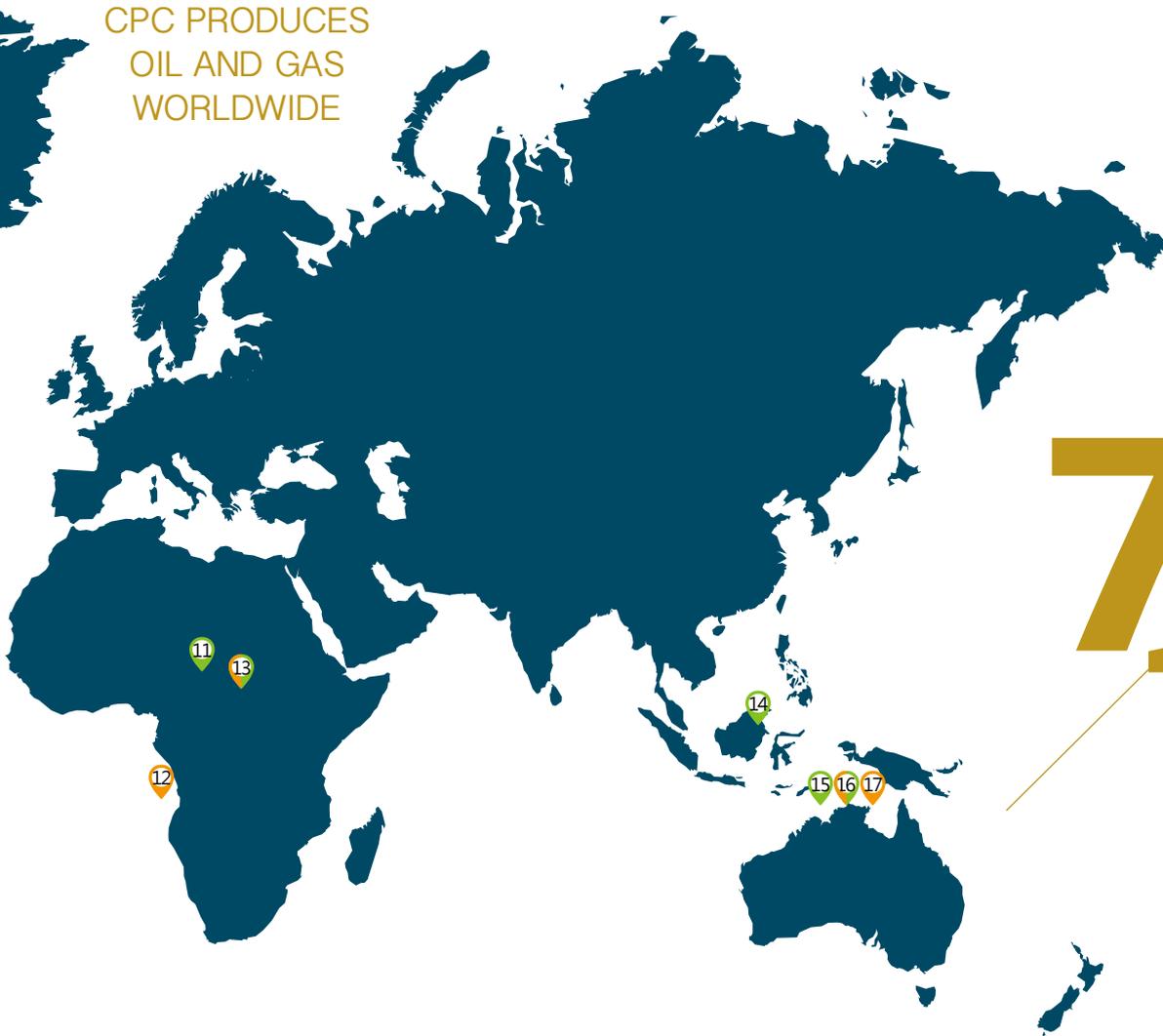
### US-Texas

-  **6 Maresh** OPIC (30%)
- Operator : TTEnergy

### US-Texas

-  **7 Lazy M5** OPIC (25%)
  -  **8 San Jac** OPIC (25%)
- Operator : GeoPetra

CPC PRODUCES  
OIL AND GAS  
WORLDWIDE



countries

7  
17

fields

#### Ecuador

- 9 Block-16 OPIC (31%)  
Operator : Repsol

#### Ecuador

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

#### Niger

- 11 Agadem EEA OPIC (20%)  
Operator : CNPCNP

#### Congo

- 12 Haute Mer A OPIC (20%)  
Operator : CNOOC Congo SA

#### Chad

- 13 Chad Oryx  
Operator : OPIC AFRICA (35%)

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

#### Indonesia

- 14 Sanga Sanga OPIC (16.67%)  
Operator : VICO

#### Australia

- 15 Prelude gas field OPIC (5%)  
Operator : SHELL

#### Australia

- 16 Ichthys gas field OPIC (2.625%)  
Operator : INPEX

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

#### Australia

- 17 AC/P21 OPIC (30%)  
Operator : ENI

# DOWNSTREAM OPERATIONS

ENSURING STABILITY IN SUPPLY:  
INNOVATION AND INVESTMENT BOOST  
QUALITY AND QUANTITY

## IMPORTING & REFINING

CPC aims to ensure the stability of its supply both by purchasing crude oil under long-term contracts and by utilizing vendors dispersed around the world. In 2017 its crude imports amounted to 140.65 million barrels: imports from the Middle East accounted for 56%, Africa 20.92%, Southeast Asia 2.74%; the remaining 20.34% came from other locations. In recent years, increasingly stringent domestic environmental standards have mandated that low-sulfur crude makes up a certain percentage of total imports.

To facilitate its handling of these vitally-important shipments, the company has set up large tanker offloading pontoons just offshore its refineries – at Shalun near Taoyuan in the north of Taiwan and Dalinpu near Kaohsiung in the south. In addition, purpose-built oil tanker wharves have been constructed at Kaohsiung, Taichung and Shen'ao ports.

## SHOULDERING RESPONSIBILITY – MEETING THE DEMAND FOR REFINED PRODUCTS

CPC's two operating oil refineries at Taoyuan and Dalin currently have a combined daily refining capacity of 500,000 barrels. In order to honor a commitment made to the government some years back to relocate the Kaohsiung refinery complex – which had a daily capacity of 200,000 barrels and an annual capacity of 50,000 tons for storing refined products and chemicals – it was shut down at the end of 2015. In order to avoid disrupting the supply of refined products on to the domestic market, its operations are being progressively transferred to the Dalin Refinery – which was already undergoing capacity expansion to meet rising internal demand for refined products. The job of filling the petrochemical raw material supply gap consequent to the Kaohsiung refinery closure has been transferred to a naphtha cracker in CPC's Linyuan petrochemicals complex.

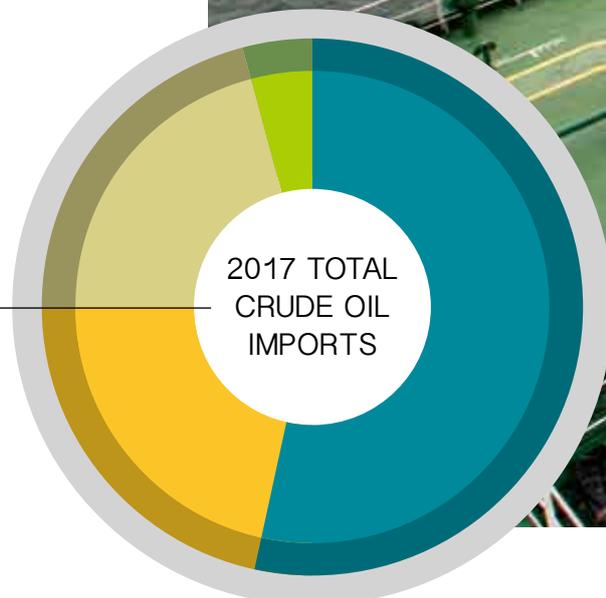
Southeast Asia 2.74%

Other Locations 20.34%

**140.65** million barrels

Middle East 56%

Africa 20.92%





The Dalin Refinery was originally established as a part of the Kaohsiung complex but in 1996 was hived off as an independent operation. Its daily capacity is 300,000 barrels, with both incoming crude and outgoing refined products handled by four offshore mooring and unloading buoys and dedicated port facilities.

The Taoyuan Refinery started up in 1976. Following renovations and the addition of a second distillation plant, it now has a daily refining capacity of 200,000 barrels.

In 2017 CPC's total output of refined petroleum products amounted to (in million kiloliters): gasoline 9.753; aviation fuel 1.918; diesel 5.761; fuel oil 3.041. Liquefied petroleum gas (LPG) production totaled 377,000 metric tons.

### **REFINING TECHNOLOGY UPGRADED TO ENHANCE QUALITY AND QUANTITY**

In response to Taiwan's ever more demanding environmental and quality of life standards, coupled with the government's increasingly strict enforcement of the environmental protection regulations enacted to improve air quality and reduce haze, CPC has in recent years moved to both improve the quality of its products and raise their production value. Refining and production facilities have undergone design and process upgrades to enable the supply of higher-grade products – such as desulfurized gasoline and diesel – to Taiwan's internal market. At the same time, those upgrades have raised the level of production efficiency across the whole range of refining processes.

Additionally, CPC's refinery facilities are in compliance with the Environmental Protection Administration's (EPA) 2011 directive setting parameters for the sulfur and aromatics content of gasoline and diesel fuel. The EPA measure required that diesel fuel's sulfur content be reduced to 10ppmw or less, its aromatic hydrocarbon content to 35vol% or less and that the olefin content in gasoline be 18vol% or less. The aforementioned facilities consist of a 30,000-barrel-per-day cracked gasoline hydro-desulfurization plant at the Taoyuan Refinery, completed in 2008; a 20,000-barrel-per-day cracked gasoline hydro-desulfurization plant at the Dalin Refinery, completed in 2009; and a similar 40,000-barrel-per-day plant for diesel at the Dalin Refinery, completed in 2010. The 18,000-barrel-per-day cracked gasoline quality improvement plant at the Kaohsiung Refinery was moved to the Dalin site in 2011.

In 2006 CPC began construction of an 80,000-barrel-per-day residual fluid catalytic cracking (RFCC) facility at the Dalin refinery to upgrade its refining infrastructure and heavy oil recovery rate. That plant began mass production in 2013. At the same location, construction of a 14,000-barrel-per-day alkylation plant – designed to boost gasoline quality and to take advantage of the plentiful supply of crude butane feedstock

from the refinery's heavy fuel oil conversion facility – began in 2008 and was completed in 2013 with the onset of mass production. With the aim of eliminating acidic fumes from the alkylation process and reducing other harmful emissions, CPC has built an extraction plant that began producing a daily output of 250 tons of high-grade sulfur in mid-2014.

In March 2017 CPC initiated its fully-funded plan for revamping the No. 3 residue hydro-desulfurization (RDS) plant at the Dalin Refinery. The scheme is aimed at boosting capacity for refining high-sulfur crude oil, thereby reducing procurement costs and reinforcing both the quality and stability of supply of the feedstock for its residual oil conversion facility. The plan's overall scope includes updating and restarting the existing residual oil hydrogenation and desulfurizing site within the Taoyuan refinery, plus construction of a 70,000-barrel-per-day desulfurization plant. But the immediate goal was to get both buy-in from local residents and approval by the competent authorities.

Due to the aforementioned closure of the Kaohsiung Refinery in late 2015, CPC is in the throes of installing an additional processing plant at its Dalin site to ensure an uninterrupted supply of raw materials to Taiwan's petrochemical industry. The plans call for the construction of a crude distillation unit (CDU) with a daily refining capacity of 150,000 barrels; a 50,000-barrel condensate fractionation unit (CFU) and hydro-desulfurization plants for both diesel (40,000 barrels) and kerosene (30,000 barrels) – all of which were due for completion in November 2017. After that, the Dalin complex's No. 9 CDU plant – which has been in operation for 40 years and has a daily refining capacity of 100,000 barrels – would be shut down. CPC's overall daily crude oil refining capacity will eventually be raised to 600,000 barrels when the Dalin site's throughput reaches 400,000 barrels a day.

CPC is involved in a joint venture with a Japanese firm to build and operate an 180,000-ton-per-year isononanol (INA) plant as well as a 144,000-ton-per-year methyl tert-butyl ether (MTBE) facility. Construction is scheduled to begin in July 2018 and production to start up at the end of 2021. The project's rationale is to boost the utility and commercial worth of the mixed C4 hydrocarbons produced by the heavy fuel oil conversion plant that turns out high-value petrochemical materials.

External sales of key refined products in 2017 amounted to approximately 3.012 million kiloliters. They were sold mainly to South Korea, Malaysia, Indonesia, the Philippines, Singapore, the United Arab Emirates, the Sultanate of Oman, Angola, Papua New Guinea and Hong Kong and other destinations. CPC will continue developing these and other export markets in the future as a means of helping to optimize the company's overall manufacturing efficiency and return on investment.

## CPC PETROCHEMICALS: THE WHERE AND HOW OF PRODUCTION

CPC's principal petrochemicals production sites are its Linyuan Petrochemicals Complex - run by the Petrochemicals Business Division - as well as the Taoyuan and Dalin refineries operating under its 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 produce ethylene, propylene and butadiene products, while its aromatics extraction facility produces benzene, toluene and xylene. CPC's current annual production capacity for petrochemical raw materials comprises 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.

2017 Total annual revenue from petrochemical products

NT\$ **92.53** billion

## PIONEERING THE PETROCHEMICALS INDUSTRY: COMMITTED TO INNOVATIVE DEVELOPMENT

CPC's long-term investment in upstream petrochemicals manufacturing has helped drive the industry's development and also support and sustain Taiwan's economic miracle. In recent years, the company has put greater effort into updating equipment and expanding production capacity so as to eliminate any possibility of a shortfall in the supply of raw materials to downstream users. 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 Third Naphtha Cracker 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 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 new processes, low-energy consumption technologies and economies of scale to provide the downstream part 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 in its efforts to overcome the challenge of industrial transformation.



## MARKETING CPC PETROLEUM PRODUCTS KEEPING TAIWAN ON THE MOVE:

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 2017 sales of those products in Taiwan totaled 20.694 million kiloliters in volume and generated revenue of approximately NT\$369 billion – the latter sum a significant increase over 2016. Automotive gasoline accounted for the largest share at approximately 51.6%, followed by diesel at about 23.6%, fuel oil at about 16.9% and aviation fuel at around 7.9%.

Taiwan's internal market for refined petroleum products is divided chiefly between CPC and the Formosa Plastics Group and competition between the two has grown 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 2,490 sites operating in Taiwan at the end of 2017, 610 were directly run by CPC, 5 were jointly run by CPC and other parties, and 1,371 were privately-owned CPC franchises. These 1,986 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 79.1%, fuel oil 95.1% and aviation fuel 57.3%, the overall market share being 80.4%.

In 2017 total domestic sales of  
petroleum products was

**20.694** million kiloliters

Total sales revenue

NT\$ **369** billion



- Gasoline  
51.6%
- Diesel fuel  
23.6%
- Fuel oil  
16.9%
- Aviation fuel  
7.9%



## CPC FUELS KEEP THINGS MOVING ALL AROUND TAIWAN

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

As of end-2017 CPC operated 14 product distribution centers, located country-wide at Keelung, Shimen, Hsinchu, Taichung, Taichung Harbor, Wangtian, Minxiang, Tainan, Fengde, Qiaotou, Suao, Hualien, Magong, Kinmen and Matsu. These depots supplied filling stations in their surrounding areas with a total of 23,339,000 kiloliters of product over the course of the year. Three chemical analysis centers in Keelung, Taichung and Kaohsiung, plus seven testing laboratories, were charged with testing products for quality control and altogether handled 29,583 samples during the year.

## CPC GAS STATIONS ARE SUCCESSFUL MULTI- SERVICE OPERATIONS

Maintaining market leadership requires maximizing customer satisfaction, so CPC has set as the keynote of its gas station operations a standard of service that differentiates them from their competitors. All CPC directly-operated filling stations throughout Taiwan provide all-round, high-level service – washrooms are updated and kept clean; staff employ a customer-experience management approach, actively promoting the VIP card system and applying proven customer relations management principles. Faced with the need to reduce operating costs and resolve manpower-shortage issues, CPC has taken the lead in introducing self-service fueling using credit cards; and also requires all filling stations under its flag to increase revenue from



non-core areas by providing a diversity of services and strengthening horizontal sales alliances by, for example, selling produce from local farms.

Gas station managers oversee the provision of ancillary services such as car wash, quick maintenance, convenience stores and sales of high-quality automotive accessory products. A growing number of sites now feature a battery exchange station for electric scooters. Sales of CPC-branded goods grew in 2017: sales of intake valve cleaning fluid for motorcycles, cars and diesel trucks reached 1,130,000 bottles, while sales of See Clean, an

environmentally-friendly laundry detergent, reached 440,000 units. Further, sales of CPC-branded mooncake gift boxes for the Mid-Autumn Festival reached a record high of 97,000 units. The revenue generated by car washing and quick maintenance services also reached a record high in 2017. Overall gross profit from multi-service gas stations exceeded NT\$1.17 billion and the consistent growth in their use demonstrates that the consumer now sees them as a useful and valuable retail channel.

When it comes to customer satisfaction, the 0800-036-188 customer service hotline – and the more recently added “1912” CPC service line – have expanded the scope of CPC’s services and enabled a quicker response to customers’ problems across the spectrum.

### CPC CONSTRUCTS GREEN-FRIENDLY BUILDINGS IN ITS PUSH TOWARDS SUSTAINABILITY

Within the global trend towards environmental protection there is now an emphasis on constructing buildings in a way that serves the cause of sustainability. Variously termed ‘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 February 2018, 37 sites have received ‘green building’ certification.

### DISTRIBUTION OF CPC GAS STATIONS WITH ‘GREEN BUILDING’ CERTIFICATION:





## **NATURAL GAS SUPPLY CPC ENSURES TAIWAN'S VITAL NATURAL GAS SUPPLY**

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 for natural gas from independent power producers as well as urban 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 plant in northern Taiwan is now under way.

## **CPC IS BUILDING RELIABILITY INTO NATURAL GAS SUPPLY**

Taiwan's aforementioned second LNG receiving terminal, sited close to Taichung's harbor and with an annual capacity of 3.0 million tons, became fully operational in 2009. It was designed to supply natural gas to Taiwan Power Company's (Taipower) Datan Power Station as well as industrial firms and household users in northern and central Taiwan. This project entailed building three 160,000-kiloliter LNG storage tanks, gasification and gas supply facilities and a 135-kilometer, 36-inch sea/land long-distance transportation pipeline from Taichung Harbor through the Tongxiao distribution center to the Datan power plant. The current Taichung LNG Terminal Phase II Investment Project calls for the construction of three additional 160,000-kiloliter above-ground storage tanks and 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 2018/2019, the project will boost the annual capacity of the Taichung terminal to over 5.0 million tons and ensure a stable, dependable supply of gas during the winter monsoon period as well as greater storage capacity in terms of the number of days' supply on hand.

In addition, in the context of the government's non-nuclear homeland and greenhouse gas reduction policies, the MOEA's Bureau of Energy plans to reach the goal of 50% of total electricity generated from natural gas in or by 2025. In preparing for this, CPC plans to lease West 11 and 12 terminals

2017 Natural gas transmission and distribution system comprised of

**2,149** kilometers of terrestrial trunk pipeline

**8** supply centers **44** distribution stations



from Port of Taichung and to build a second pier in Taichung Port, in order to enhance the Taichung terminal's LNG unloading capacity and hence gas supply stability. After the project is completed in 2022, the annual capacity of the Taichung terminal will be boosted by another 1.0 million tons.

#### TOWARDS A NATIONWIDE NATURAL GAS PIPELINE NETWORK

CPC has constructed a natural gas transmission and distribution system in western Taiwan comprised of approximately 2,149 kilometers of terrestrial trunk pipeline, extending from Pingtung in the south to Keelung in the north, which includes eight supply centers and 44 distribution stations. 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 Yongan to Tongxiao and a 500-kilometer terrestrial pipeline onwards from Tongxiao to Taoyuan, creating a circular network in Taiwan. In addition, after the 36-inch undersea gas pipeline from the Taichung LNG plant to Datan 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.

In the context of Taiwan's new energy policy that calls for gradually phasing out nuclear power and building a low-carbon environment partly run (20%) on renewable energy, Taipower is planning the addition of another 4 natural gas-fired generators to its Datan Power Plant. In a parallel development noted above, CPC is now planning construction of a third LNG receiving

terminal, located in the Guantang Industrial Area in northern Taiwan, to supply both the expanded fuel uptake of the Datan plant and growing demand from residential, industrial, and other energy users in the region. Apart from the LNG plant itself, the project will involve constructing a dedicated LNG pier and building facilities for handling the import of 3.0 million tons of LNG each year. The new works will include four 160,000-kiloliter LNG storage tanks as well as vaporization and distribution plants that will be connected to the existing natural gas distribution system. The total investment entailed will amount to NT\$60.08 billion.

The third LNG receiving terminal project formally commenced in 2016, with full operation scheduled by 2023. Its capacity may later be expanded up to 6.0 million tons of LNG annually to meet higher demand. With its three LNG receiving terminals located in the north, center and south of the island, CPC stands to reap economies of scale that will lower both the costs and risks of importing natural gas in the future. The existing figure-8 undersea and terrestrial pipeline system will enable mutual support by its components in transporting natural gas around Taiwan and raise the level of both operational safety and stability of supply.

#### CPC'S DIVERSIFICATION OF ITS NATURAL GAS SOURCES MAKES FOR A STABLE SUPPLY

CPC has devoted much effort to diversifying its liquefied natural gas (LNG) sources to ensure a reliably stable supply of natural gas for Taiwan. This has entailed signing multiple LNG import contracts for procurement around the globe – including the Middle East, Southeast Asia, Northeast Asia, Australia, North America, Africa and Europe as well as other areas.

In addition to those long-term LNG purchase contracts, CPC acquires yet more supplies through medium/short-term (spot) contracts. In 2017, CPC imported most of its LNG from Indonesia, Malaysia, Qatar, Papua New Guinea and Australia, with some coming from Russia as well.

Total domestic sales of natural gas in 2017

**22** billion cubic meters

**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 IN LPG: MASTERING THE MARKET AND FORGING EXCELLENCE IN DISTRIBUTION

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 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 a good corporate citizen and be seen to fulfill its CSR commitments, an obligation not shared by all of the players in the market.

### SOLVENTS & CHEMICALS CPC TAKES AN INNOVATIVE APPROACH TO AN ESTABLISHED MARKET

CPC holds a dominant market share position in Taiwan's solvents and chemicals sector: around 80% in solvents, 35% in toluene, 45% in xylene, 60% in methanol, 50% in asphalt and 45% in sulfur.

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

### CPC LUBRICANTS: MARKET LEADER AT HOME, EXPANDING IN ASIA-PACIFIC

CPC is the leader in Taiwan's automobile lubricants market with its duo of brands 'CPC' and 'Mirage' appealing to both consumer and professional users - a position supported by strong, well-defined and diversified sales channels. Those include more than 30 contracted distributors, the 600-plus CPC directly-operated gas stations 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 its community and corporate customers.

The LBD has established an automated precision blending system in Chiayi that took more than three years from the start in 2011 to construct - at a cost of NT\$400 million - and which is unique in Taiwan. 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 the 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 in northern, central and southern Taiwan, which works as a distinct competitive advantage in making sales. In current developments, CPC has as of early 2018 embarked on the two-phase construction of bonded storage and blending facilities for base oils and additives at Taichung Port to strengthen its supply capacity and 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 diversified international trade in lubricant materials and on external 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. Commercial operation is scheduled to begin in 2019 and when full production is reached it will become the LBD's second-ranked manufacturing base.

CPC's LBD will continue to uphold its core competences 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 products, technical consultancy and customer satisfaction. Looking to the future, the LBD's vision encompasses maintaining its lead over the competition in the home market while significantly expanding its presence in Asia-Pacific and other overseas markets to make the lubricant brands 'CPC' and 'Mirage' become well-known worldwide.

# INDUSTRIAL SAFETY & HEALTH

## CPC LAYS EMPHASIS ON WORKPLACE SAFETY TO CONTROL RISK



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, in order to maintain continuity in its operations, protect its employees from harm and safeguard lives and property in the communities surrounding the company's plants. Apart from compliance with Taiwan's relevant laws and regulations, CPC has also drafted – and strictly enforces – its own workplace safety and accident-prevention protocols. These are modeled on those of the advanced countries of the EU, the USA and Japan and have been suitably adapted to reflect local conditions and operational characteristics.

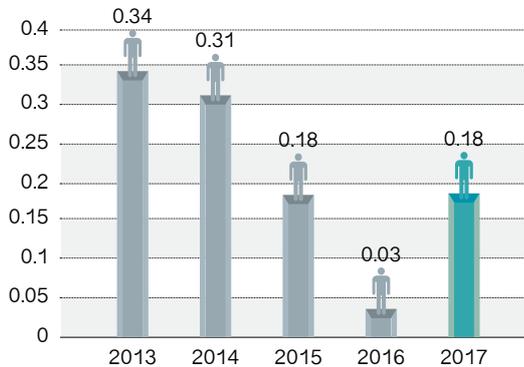
### CPC SAFETY DISCIPLINES GET FIRST PRIORITY

Industrial safety is the foundation of corporate development. To achieve its goal of '100% industrial safety, zero% accidents' CPC is constantly active in strengthening its workplace safety culture through implementation of a policy based on some basic and well-tried disciplines – such as thorough inspection, concern for employee well-being, responsive healthcare, risk management and systematized operations – in which employee buy-in and continuous improvement are the 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 often been a recipient of the annual Excellence in Promotion of Occupational Safety and Health awards from Taiwan's Ministry of Labor.

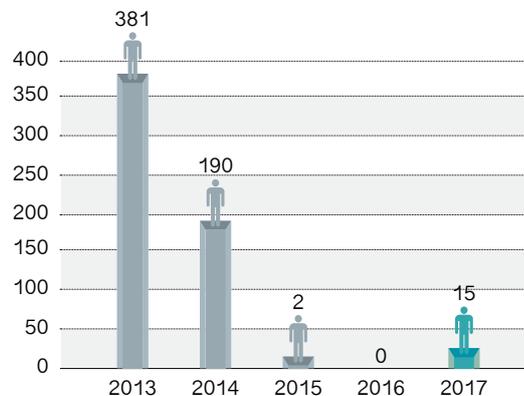


## CPC'S OCCUPATIONAL ACCIDENT STATISTICS FOR THE PAST FIVE YEARS

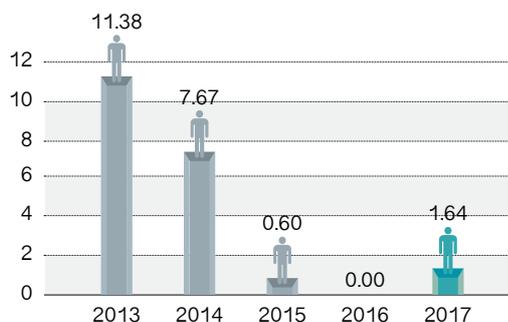
Frequency of Disabling Injury



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 team spirit among both employees and external vendors in the interest of creating a safe and comfortable working environment.

- Implementation of the Taiwan Occupational Safety and Health Management System (TOSHMS) together with a continuous process of improving the working and operational environment.

- 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 occupational safety laws, conducting periodic reviews of industrial safety and health regulations as well as continuous review and revision of standard operating procedures.
- Strengthening industrial health management protocols, scheduling employee health checkups (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.
- Reinforcement of the functions of the Safety Information Center, arranging for study material to be available on loan and installation of a system for handling online requests for industrial safety data.
- 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. In 2017, CPC held a total of 309 disaster prevention drills, 7 emergency response drills without warning and 4 large-scale emergency drills.

# POLLUTION PREVENTION AND ENVIRONMENTAL PROTECTION

## CPC AIMS FOR ENERGY CONSERVATION AND A CLEANER ENVIRONMENT

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 upheld the principle of sustainability in its corporate development. In doing so the company strictly adheres to generally-accepted environmental protection policies, is active in pollution prevention and exercises strong control over its resource usage. Additionally, it utilizes low-pollution production processes and the latest pollution-control facilities; it adheres to EIA commitments, has established a comprehensive environmental protection monitoring system and conducts education and training programs on environmental issues. In recent years the corporation has more systematically engaged in CO2 emission inventory and reduction endeavors and in all of its new investment projects the best available control technology (BACT) and equipment for that purpose is installed to reduce pollution that may be caused by production and storage processes. On top of all that, CPC has further deepened its commitment to ecologically beneficial measures that include improving the quality of its petroleum products, reducing the PM25 element in air pollution and supporting the circular economy principle.

CPC has invested more than NT\$50 billion since 1989 in its environmental protection efforts, chiefly by implementing a policy based on strict compliance with laws and regulations,

adopting international standards, pollution prevention, energy saving, waste reduction and ongoing process improvement. Other important aspects have been full engagement by employees, CSR outreach and aiming for sustainability in its corporate development.

### COMPARISON OF CPC REFINERY ENVIRONMENTAL QUALITY STANDARDS AND NATIONAL STANDARDS

Effluent \*is the monthly average

Item	Year	2017 Levels	Current National Standards Effluent	Current National Standards Ocean Effluent
Chemical oxygen demand COD ( ppm )		< 80	100	280
Oil ( ppm )		< 5	10	20
Suspended solids (ppm)		< 20	30	100
Phenol (ppm)		<0.1	1.0	1.0

Stack exhaust

Item	Year	2017 Levels	Current National Standards
Sulfur oxides (SOx) (ppm)	Gas fuel	< 90	100
	Liquid fuel		300
Nitrogen oxides (NOx) (ppm)	Gas fuel	< 130	150
	Liquid fuel		250
Total suspended particles (TSP) (mg/ Nm3)	Determined by the volume of gas emissions	<25	<100



## 2017 ENVIRONMENTAL FOOTPRINT

### Material investment

Water usage	33.612	Million kiloliters
Crude oil	21.666	Million kiloliters
Fuel oil	0.202	Million kiloliters
Fuel gas	1,534.765	Million cubic meters
Natural gas	705.446	Million cubic meters
Gasoline additives (MTBE)	0.523	Million kiloliters
Purchased electricity	1,850,596	Thousand kWh

### Material emissions

Gas emissions	CO <sub>2</sub>	7,694,519	Tons
	NO <sub>x</sub>	3,152	Tons
	SO <sub>x</sub>	1,063	Tons
	TSP	270	Tons
	VOC	4,730	Tons
	COD	453	Tons
Wastewater		11.353	Million cubic meters
Waste		55,306	Tons

### Refinery / petrochemical output

Diesel	5.873	Million kiloliters
Fuel oil	3.092	Million kiloliters
Vehicle fuel	9.754	Million kiloliters
Jet fuel	2.047	Million kiloliters
Liquefied petroleum gas	346,000	Tons
Ethylene	0.974	Million kiloliters
Propene	901,000	Tons
Butadiene	0.148	Million kiloliters

Since 1995, all of the company's business units have been required to compile ISO 14001 environmental management system programs and 20 of them had received official certification by the end of 2017. Following global practice, a cross-corporation environmental accounting system to track the effectiveness of the company's environmentally-friendly measures was set up as far back as 2004.

Taiwan's own Greenhouse Gas Reduction and Management Act was formally promulgated on July 1, 2015. Its goal is the reduction of nationwide annual greenhouse gas (GHG) emissions to no more than 50% of the year 2005 level by 2050. Following the Paris COP 21 Agreement becoming effective on November 4 2016, CPC has vigorously expanded its carbon reduction plan, committing the entire company to GHG emissions reduction and setting carbon dioxide emissions reduction targets and time-lines for its existing plants. 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 fact, since company-wide GHG emissions reduction has been in effect as described above, as of end-2017 there had been a saving of 2.936 million tons.

Moreover, in recent years the company has initiated energy-saving projects that deploy the latest technology to effect real improvement in the energy usage efficiency level at all of its workplaces. From 2005 through 2017 cumulative energy efficiencies of 828,000 kiloliters of oil equivalent (KLOE) were achieved, equating to a reduction of 2.467 million tons of CO<sub>2</sub> emissions. In that context and in line with the Energy Conservation Action Plan for Government Agencies and Schools promulgated by the Executive Yuan and which targets holding consumption as measured by the EUI below the given baseline until end-2019, CPC has



implemented electricity conservation in its office premises. Going further, among other measures the company has mandated the replacement of all conventional lighting systems by LED units before end-2019.

### **CPC HAS RAISED THE QUALITY OF ITS PRODUCTS TO HELP ENVIRONMENTAL SUSTAINABILITY**

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 Taiwan's air quality. 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. With the same motive, all CPC gas station fuel pumps have been retrofitted with vapor recovery nozzles and the company's distribution depot fuel-filling areas with similar equipment. The consequent gasoline recovery now amounts to more than 3,200 kiloliters per year, 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 achieved comparability with, 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; it continues to embrace the new paradigm for ecologically-friendly petroleum products set by the standards of the world's most advanced countries in their pursuit of ever higher product quality. Similarly in the wider energy field, the company will promote energy resource integration, upgrade its natural gas storage and transport capacity to facilitate greater use of low-carbon energy and lend stronger support to the application of R&D-based green energy technologies – incidentally creating a green 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 Chuhuangkeng in Miaoli County was certified as an environmental education site in August 2017. It is the only oil production educational site in Taiwan and it functions as a high-level environmental education venue for the general public, special interest groups, schools and government agencies. The Exhibition Hall has reinvigorated Chuhuangkeng, 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 approved on January 22, 2018 and began to be used after its inauguration on June 8.

CPC cares about its home country and is passionate about protecting its 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 waste recycling – all in the pursuit of sustainability in its operations and the sharing of good health and prosperity with the national community.



### **CPC CLEANS UP: GROUNDWATER AND SOIL REMEDIATION**

Since the promulgation of the Soil and Groundwater Pollution Remediation Act by the administration of President Chen Shui-Bian in 2000, the EPA has several times announced the Soil and Groundwater Pollution Remediation Act Enforcement Rules, subsidiary legislation and related control standards. Many CPC plant locations have been listed as pollution response sites, as pollution control sites or pollution remediation sites. 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 4 listed response sites, 23 listed control sites, and 5 listed remediation sites while remediation has been completed at 25 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 oil cargoes until operations were suspended in 1996. The Environmental Protection Agency (EPA) listed it as a soil control site on December 23, 2015 and the control plan subsequently

proposed by the company was approved by the Agency on November 4, 2016. Over 105,000 tons of gravel have been lifted from the site and stored outside at two locations to await remediation. The greater part has now been fully cleared and some has been returned to the site; the work of remediation goes on and the company aims to finish it as quickly as possible so that the previously imposed controls can be lifted.

CPC's Kaohsiung Refinery ceased working at the end of November 2015. As it was built a long time ago and operated for many years, almost all of the soil and groundwater across its total area have been listed as contaminated sites. The company is dismantling structures above ground - including workshops, process plant, pipelines and related facilities - and also removing pipelines from two meters beneath the ground. 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 flow of groundwater from upstream to downstream will be incorporated into the process. The overall remediation process will take 17 years and the plans call for the work to be carried out across separate areas in discrete phases.



# R&D AND INFORMATION MANAGEMENT

## R&D DRIVES TIMELY INNOVATION - A SOLID FOUNDATION FOR CORPORATE DEVELOPMENT

CPC has always attached great importance to research and development (R&D) as being fundamental to corporate innovation and sustainability in 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 and Material Testing & Certification Center in Kaohsiung. These facilities are responsible for all research in their respective domains, with the Taipei office-based Planning Department responsible for overall R&D operations 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. The Material Testing & Certification Center's work is centered on proving the commercial potential mainly of materials derived from the hydrocarbons handled and processed by CPC in its various businesses.

CPC's research and development fees amounted to approximately NT\$1.925 billion in 2017 and the results of that work are as follows:

### EXPLORATION AND DEVELOPMENT

- In compiling the overall outlook for oil and gas reserves, we integrated the results of research including seismic survey interpretation, well survey data, seismic characteristics and abductive inference. In the process we discovered no less than 3 different subjects in the 2D seismic survey area that were suitable for exploration.
- Research into, and planning of, the use of hydraulic fracturing in constructing the structural sand protection in Fengshan, as a means of resolving the sand issues while also increasing productivity.

- Proposed the exploration of three Pliocene / Pleistocene sites with production potential, being close to 3 billion cubic meters of both unconventional and conventional biogas reservoirs in the Sinshih area.
- Completed an assessment report on the Qingshui private geothermal energy BOT project and updated the underground temperature and fissure models of the Qingshui geothermal area.
- Completed the geothermal heat acquisition tests for abandoned and sealed domestic wells. Also completed were the temperature cycle tests for those oil pipes with insulation coating that have been installed along the same axis in single wells.

### REFINING AND PETROCHEMICALS

- Developments in new production processes: these include the joint production of dicyclopentadiene and methylcyclopentane; research on the use of recycled



diesel catalysts in second stage hydrogenation; tert-Butyl alcohol dehydration and production process analysis; and planning production procedures for the diluent cyclopentane.

- Established pollution remediation technologies: these include the use of mass spectrometry for the identification, analysis and applications of gasoline products; the use of soil gas in gas stations for the verification of pollution potential; and the use of geophysical survey technologies to complete the ground resistance tests of a site and determine the distribution of underground pollutants.
- Completed testing of the following applications: the actual vehicle emissions and pollution effect of ethanol gasoline; the performance of heavy diesel engines; and the performance of diesel additives in mitigating environmental pollution.
- Completed the monitoring of multiple parameters for water quality in wells in a number of industrial plants; carried out underground pollution remediation and inspection services; monitored airborne volatile organic compounds (VOC) and sulfides; reviewed wastewater treatment and recycling plans as well as health hazard assessments.
- Completed an assessment of the impact on natural gas pipelines of sporadic currents emanating from the Taipei MRT system; and assisted the inspection of joint pipelines between the now-closed Kaohsiung Refinery and the Dalin Refinery.
- Completed a review of gasoline and diesel production processes; carried out research and formulated technical services related to the optimization of petrochemicals production processes; resolved onsite issues and raised the level of operating efficiency so as to meet energy conservation targets.
- Completed the following: primary gasoline hydrogenation catalyst toxicity tracking at the Linyuan Petrochemicals Plant; plans for recycling styrene derived from the pyrolysis gasoline of the Petrochemical Business Division; performance testing of the R4101S hydrogenation catalyst in the fourth naphtha cracker at the Linyuan plant; and the analysis report on the source materials of hydrocarbon resin.
- Completed the technology transfer of new lubricant formulas and manufacturing techniques for motor oil, motorcycle engine oil, high-grade circulation oil and Super Duty Marilube Oil.
- Developed new CPC-branded lubricant products such as CPC Circulation Oil R100, CPC General Purpose Oil 15 and 5(II), CPC Wire Drawing Mill Oil NTM100, CPC Calcium Sulfonate Complex Grease No. 2, CPC Super Duty Marilube Oil CF15W40, Precision Machine Cutting Oil, CPC Marilube Oil CO250, and CPC Multi-Purpose Gear Lubricant 85W90.



## GREEN ENERGY RESEARCH AND DEVELOPMENT

- Established green energy-related technologies: including well temperature measurement for geothermal energy sites; transesterification for the production of biodiesel and triacetin; biomass plasticizer composition; key techniques for water soluble high-reflective heat insulating coating; key technical principles for ecological water-soluble, stone-like coating; a two-stage vacuum process for producing perovskite solar cells; a platform to quickly screen antioxidant capacity, seawater nitrogen and phosphorus detection.
- Completed installation of the 499kWp solar energy pilot system at the Linyuan plant and subsequently sold electricity to the TPC grid. We also completed the installation of solar photovoltaic systems at 44 CPC gas stations managed by the Kaohsiung Business Division; total installed capacity is 1411.7kWp.
- Using perovskite absorber film produced in both vacuum and non-vacuum processes, we completed a perovskite solar cell module with six units connected in series.
- Ecological biomass materials developed from vegetable oil were used for surfaces in a children's playground and then adapted for similar use at Gushan Elementary School in Kaohsiung City.
- Developed modified siloxane polymer materials to overcome corrosion in an insulated environment.
- Completed the sintering of lithium titanium oxide (LTO) material at the energy storage testing workshop in Chiayi and produced a total of 370kg of LTO substances.
- The light emitting diodes (LED) used in explosion prevention, emergency escape path guidelines

and emergency lighting have passed the Industrial Technology Research Institute's (ITRI) formal inspection of the mechanical, electrical and explosion prevention characteristics of electrical equipment. These outdoor-use LED lighting products have been installed in multiple business operations.

- We have established five types of antioxidation analysis methods - including the clearance of 1,1-Benzophenone-2-DPPH free radicals; evaluation of chelating effects on ferrous ions; evaluation of restorative power; capacity for clearing superoxide anion; total polyphenol content – together with a type of functional analysis and evaluation of whitening effects.
- Initiated trial mass production of non-crystalline carbon materials, which has produced a monthly total of 800 kilograms of green cokes.
- Conducted trial mass production of heavy oil upgrading to refined pitch and completed process design – specifically, a duct and instrumentation process diagram, with detailing of pipelines plus equipment and instrument specifications.

## INFORMATION MANAGEMENT

### CPC PREPARES FOR THE FUTURE: ONGOING OVERHAUL AND UPDATE OF ITS IT SYSTEMS

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.

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 computing in 2015. Owing to the consequent enhancement of computer performance and reduced operation time, since then all customer accounts can be settled 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 consistent adoption of cloud technology along with implementing staged virtualization of servers 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. The consistent adoption of cloud technology implementing staged virtualization of servers has significantly improved business efficiency and resulted in considerable cost reduction, as well as consolidating hardware and software resources and employing broadband networks providing digital services.

In order to enhance network quality and service reliability, CPC implements a diversified information service program. Based on the existing transmission system and network-enabled environment, CPC's system combines mobile communications technology and services and is paving the way for a mobile e-commerce operating environment. Furthermore, in response to the Executive Yuan's Internet Protocol Upgrade Promotion Program that mandates switching our existing fiber backbone network protocol to IPv6, CPC has already completed its upgrades in accordance with the prescribed timetable, thus meeting the needs of the next-generation network.

CPC has also continued with improving the information systems needed for key tasks, and is using information technology to improve data processing procedures. We are developing an integrated e-commerce system for selling petroleum products, electronic coupon issue, better filling station POS and multifaceted marketing networks. Further, we have established a petrochemical refining information system that integrates our production scheduling system with crude oil accounts; and we have established an exploration and production information system that integrates exploration and geographical data for management decision-making.

Developing CPC's information systems must factor in the 21st century's accelerating convergence of computerization, digitization and globalization. That will require effort being focused chiefly on corporate resource planning systems, customer relations management, corporate intelligence, knowledge management and information and communications infrastructure. In that respect we will adhere to the government's policy promoting deployment of Government Configuration Base (GCB), Open Data, IPv6 network adoption and upgrading and the use of the no-cost Open Office suite of applications (such as Open Document Format or ODF). With respect to systems, CPC looks to shortened settlement time and using Ainformation technology to boost production performance. As for services: we will rely on improved customer relations management (CRM) applications to help deliver high-level satisfaction to external customers; and use our information management system to supply real-time, transparent service management options to internal customers. With corporate intelligence, we are applying knowledge management principles to consolidate our corporate intellectual capital and popularizing a decision-making system that encourages widespread reference to information applications. With information and communications infrastructure, we are integrating our network services, enhancing mobile and e-commerce workability, strengthening Critical Infrastructure Information Protection (CIIP) and continuing to implement online and network security measures. In the field of management, we are reinforcing the organization of information in order to boost management performance, implementing integration of IT resources on an open platform and generally continuing to upgrade the company's IT know-how, processes and paradigms in order to boost overall corporate performance.

# HUMAN RESOURCES

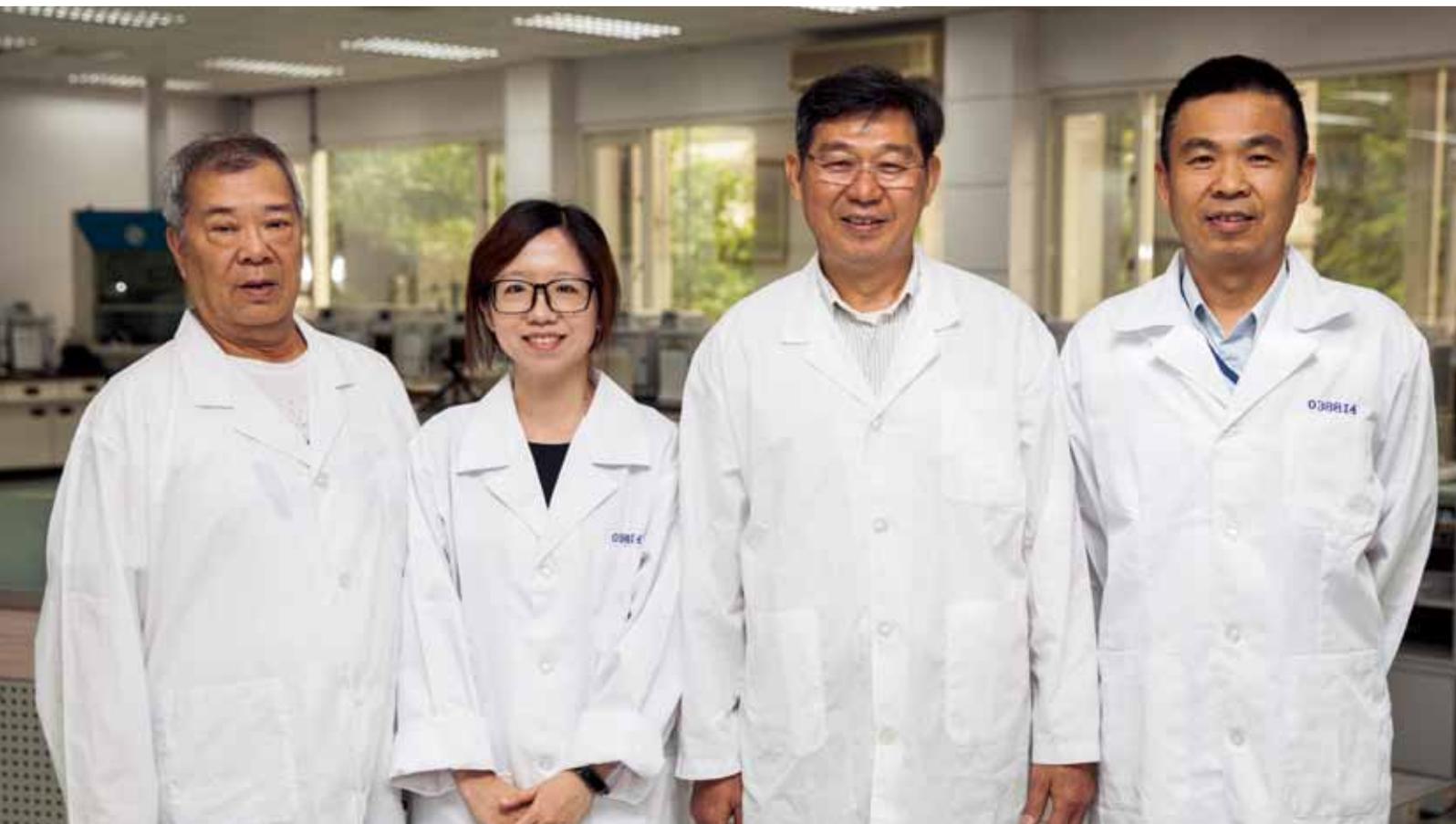
## PASSING THE TORCH: CONTINUITY OF LEADERSHIP IN CORPORATE DEVELOPMENT

CPC aims to fully develop the potential of its current (end-May 2018) 16,076 employees through long-term training and career guidance, while at the same time making both incentives and benefits more attractive. Managerial talent is selectively assessed with the aim of ensuring continuity in corporate development and leadership by talented people of outstanding ability.

### ENHANCING PROFESSIONAL KNOWLEDGE – OPTIMIZING HUMAN CAPITAL CAPABILITIES

In terms of human resource utilization, CPC has in recent years engaged in organizational and process re-engineering and also formulated employee rotation policies in order to use its manpower more effectively. It has also recruited young professionals to inject new blood into the corporate body and provide a smooth transfer of technical and operational know-how and competitive skills in preparation for a wave of retirements.

Beyond using professional qualifications and personal traits in the selection of executive personnel, CPC also uses management and leadership development training to help candidates achieve their full potential and to accomplish its corporate growth targets. At the same time, the company is strengthening on-the-job training at all levels, and has integrated existing training systems in the establishment of the CPC Corporate University. This offers beginner, intermediate and advanced courses in exploration, refining, marketing and engineering - the four key areas which comprise CPC's core competencies. By systematically enhancing employees' professional skills and helping them develop a broader range of talents, the CPC Corporate University also helps to optimize manpower utilization. CPC 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 disciplines. In line with its corporate transformation needs, the company is also strengthening secondary-skill training. Beyond this, employees are selectively sent abroad for higher education, research and internships as well as to participate in seminars on a range of topics relevant to the needs of the business.

As the number of people leaving or retiring from CPC in recent years has grown, new employees have needed comprehensive guidance and training to ensure a smooth transfer of responsibilities. On-the-job training is now combined with formal training courses; 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 promotion requirements have been shortened for outstanding managers, lowering the age distribution in management echelons and thus motivating 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, lasting from several weeks to a year for younger employees, 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 professional knowledge and workplace information they need without ever having to step into a classroom.

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

### A QUALITY WORKPLACE – LIFTING MORALE

In terms of employee incentives and benefits, it is CPC policy to award bonuses based on 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 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, company restaurants, libraries, company stores and other welfare facilities, 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 children attending college and university; medical subsidies for employees and their dependents; wedding, funeral, and retirement subsidies; and interest-free emergency loans. The company also chips in to support the activities of interest groups dedicated to baseball, bridge, mountain climbing, swimming, painting, film appreciation and other pursuits, in order to provide physical and mental relaxation for employees and boost their morale at work – and hopefully, of course, their on-the-job performance as well.

# CPC'S AFFILIATES AND SUBSIDIARIES

## SEIZING NICHE OPPORTUNITIES – DRAWING A BLUEPRINT FOR THE FUTURE

CPC's strategy for joint-venture projects can be summarized as actively expanding into the upstream and downstream petrochemical sectors – particularly the high-value petrochemical industry – while exploring opportunities in renewable energy sources and overseas joint venture projects on the basis of its core competencies. In this the company seeks to combine external patented technologies with its own skills and feedstock sources to develop high value-added products that will achieve optimal returns on investment. As of end-2017, CPC had invested a total of NT\$21.5 billion in its 18 affiliates and subsidiaries, which in turn created consolidated investment income of NT\$1.478 billion that year.

CPC's 18 affiliates and subsidiaries can be divided into four main categories—petroleum products, petrochemicals, natural gas and transportation. Of the 18, 11 are based in Taiwan and 7 are foreign. The principal enterprises are introduced below:



**CHINA AMERICAN PETROCHEMICAL CO. LTD. (CAPCO)**

Established in 1976, CAPCO is the major supplier of purified terephthalic acid (PTA) to the polyester textile industry in Taiwan. Its plant is located in the West Terminal of Taichung Harbor in central Taiwan. CPC holds 38.57% of the company's equity, including preferred stock.

**DAI HAI PETROLEUM CORP. (DHP)**

Established in 1994, Dai Hai Petroleum Corp. 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 by means of its own receiving, storage and supply facilities, as well as a filling station in Ha Tay Province. CPC holds 35% of the equity.

**QATAR FUEL ADDITIVES COMPANY LIMITED (QAFAC)**

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

**FARAWAY MARITIME SHIPPING CO. (FMSC)**

Faraway Maritime Shipping Co. was jointly established in 1997 by CPC and its foreign partner Golar to build and operate the Matsu-class LNG carrier vessel Golar Mazo for transporting LNG from the Badak VI gas field offshore Indonesia to Taiwan. CPC holds 40% of the company's equity.

**CHUN PIN ENTERPRISE CO., LTD. (CPEC)**

Chun Pin Enterprise Co. was established in 1998 to set up and operate a storage and transportation center as part of the Phase II development of Taipei Harbor. It is engaged in the storage and transshipment of petroleum and petrochemical products. CPC holds 49% of the equity.

**KUOKUANG POWER CO., LTD. (KKPC)**

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

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

Established in 2006 by CPC's Japanese partners, NYK and Mitsui. NSHC has four ship-owning companies under its umbrella. It has built four LNG vessels shipping LNG to CPC from Qatar's RasGas II plant. CPC holds 45% of the company's equity.

**NIMIC SHIP MANAGEMENT CO., LTD. (NSMC)**

Established in 2006, NSMC is responsible for the operation and management of the four LNG vessels built by NSHC. CPC holds 45% of the company's equity.

**GLOBAL ENERGY MARITIME CO. (GEMCO)**

Established in 2011, GEMCO plans to build three VLCC vessels with a volume of 300,000 tons and one LR1 vessel with a volume of 80,000 tons for transporting crude oil. CPC holds 48% of the company's equity.

**ICHTHYS LNG PTY LTD (ILPL)**

ILPL was established in 2011 to supply natural gas from the Ichthys gas-condensate field offshore Western Australia to its plant in Darwin for production of LNG, LPG and condensate. CPC holds 2.625% of the company's equity and will be a foundation customer.

**TAIWAN-JAPAN OXO CHEMICAL INDUSTRIES INC. (TJOC)**

Established in 2015, TJOC's mission is to produce high value-added petrochemical derivatives such as isononyl alcohol (INA), butene trimer (BT) and MTBE. CPC holds 47% of the company's equity.

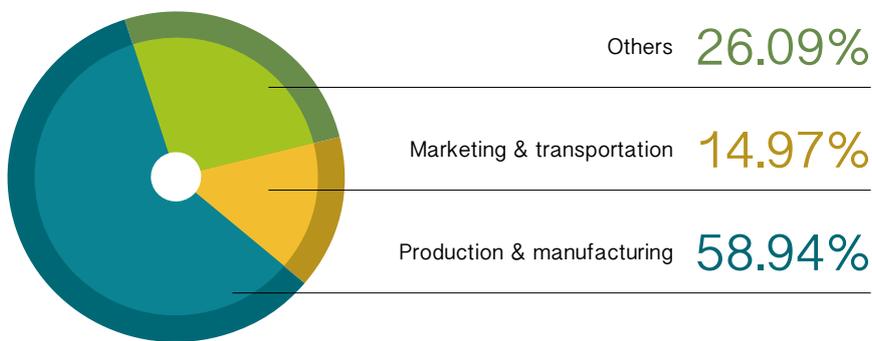
**MAXIHUB COMPANY LIMITED (MAXIHUB)**

Established in 2014, MAXIHUB plans to build a wharf, tank farm and lubricant blending factory in Dong Nai Province, Vietnam. The company was established to manufacture and process lubricating oil, and also to provide storage and warehouse services. CPC took a 40% equity position in the company in 2016.

# FINANCIAL STATEMENTS

The Exploration and Exploitation division's loss before tax in 2017 was mainly caused by the impairment loss recognized on the following sites: Prelude and Ichthys in Australia. Sales volume of the LNG business division increased compared to the same period of last year so that the profit increased. That the profit before tax in refining and marketing activities increased compared to the same period of last year was mainly driven by the stabilizing of international oil price, along with the refinery operation's significant improvement on production capacity and efficiency, resulting in higher profit margin and profit before tax.

The capital expenditure incurred in 2017 was NT\$20,964 million, a 4.75% increase from 2016. The breakdown of the expenditure was as follows:



The exchange rate between the NT dollar and the US dollar was 29.703:1 on December 31, 2017.

## STATEMENTS OF INCOME

FOR THE YEARS ENDED DECEMBER 31, 2017 AND 2016

(In Thousands of New Taiwan Dollars)

	2017	2016
<b>Operating Revenues</b>		
Sales	\$886,989,480	\$753,300,166
Other operating revenues	9,652,641	11,329,827
<b>Total operating revenues</b>	<u>896,642,121</u>	<u>764,629,993</u>
<b>Operating Costs and Expenses</b>		
Cost of goods sold	794,402,697	677,810,502
Exploration expenses	2,195,701	2,267,889
Oil and gas transmission and storage expenses	13,418,883	11,813,286
Other operating costs	16,404,888	13,009,038
<b>Total operating costs</b>	<u>826,422,169</u>	<u>704,900,715</u>
<b>Gross Profit(Loss)</b>	<u>70,219,952</u>	<u>59,729,278</u>
<b>Operating Expenses</b>	<u>19,508,901</u>	<u>20,302,019</u>
<b>Non-Operating Income and Gains</b>	<u>5,952,712</u>	<u>4,145,599</u>
<b>Non-Operating Expenses and Losses</b>	<u>8,121,702</u>	<u>8,142,151</u>
<b>INCOME (LOSS) BEFORE INCOME TAX</b>	<u>48,542,061</u>	<u>35,430,707</u>
<b>Income Tax Expense (Benefit)</b>	<u>8,230,498</u>	<u>6,054,234</u>
<b>NET INCOME (LOSS) FOR THE YEAR</b>	<u>\$40,311,563</u>	<u>\$29,376,473</u>

## BALANCE SHEETS

DECEMBER 31, 2017 AND 2016

(In Thousands of New Taiwan Dollars)

	2017	2016
<b>Assets</b>		
<b>Current Assets</b>		
Cash and cash equivalents	\$1,561,842	\$2,664,345
Financial assets at fair value through profit or loss-current	-	81
Derivative financial assets for hedging - current	4,098	7,641
Accounts receivable, net	45,838,735	40,219,094
Accounts receivables from related parties	287,234	315,224
Other receivables	8,013,772	7,625,636
Inventories	105,356,603	91,025,262
Prepayments	17,709,130	18,807,693
Other current assets	<u>690,430</u>	<u>1,691,560</u>
<b>Total Current Assets</b>	<u>179,461,844</u>	<u>162,356,536</u>
<b>Noncurrent Assets</b>		
Available-for-sale financial assets - noncurrent	531,446	649,023
Financial assets measured at cost - noncurrent	7,197,416	5,017,530
Investments accounted for using equity method	13,770,825	13,623,171
Property, plant and equipment	430,577,501	428,542,522
Investment properties	19,464,379	19,478,992
Intangible assets	149,613	151,817
Deferred tax assets	18,743,629	26,682,514
Oil and gas interest	61,999,568	72,024,076
Refundable deposits	282,146	200,146
Other long-term receivables	10,598,269	9,962,738
Long-term prepayments	2,044,633	2,094,220
Other noncurrent assets	<u>224,852</u>	<u>569,837</u>
<b>Total Noncurrent Assets</b>	<u>565,584,277</u>	<u>578,996,586</u>
<b>Total Assets</b>	<u>\$745,046,121</u>	<u>\$741,353,122</u>

## BALANCE SHEETS

DECEMBER 31, 2017 AND 2016

(In Thousands of New Taiwan Dollars)

	2017	2016
<b>Liabilities and Equity</b>		
<b>Current Liabilities</b>		
Short-term borrowings	\$25,466,128	\$26,668,394
Short-term notes and bills payable	77,359,190	98,709,540
Financial liabilities at fair value through profit or loss- current	97	-
Derivative financial liabilities for hedging- current	24,687	1,855
Accounts payable	40,139,715	40,442,484
Payable to constructors	4,573,551	4,401,430
Other payables	26,252,796	24,555,461
Advance receipts	17,641,998	16,365,971
Long-term borrowings, current portion	36,140,000	29,990,000
Other current liabilities	<u>8,743,319</u>	<u>8,448,542</u>
<b>Total Current Liabilities</b>	<u>236,341,481</u>	<u>249,583,677</u>
<b>Noncurrent Liabilities</b>		
Bonds payable	114,950,000	122,350,000
Long-term borrowings	11,640,000	25,580,000
Non-current provisions	25,818,464	26,724,739
Deferred tax liabilities	84,942,769	84,974,406
Post-employment benefits payable	4,537,706	4,041,232
Guarantee deposits received	1,251,177	1,307,528
Other non-current liabilities	<u>5,147,133</u>	<u>5,316,123</u>
<b>Total Noncurrent Liabilities</b>	<u>248,287,249</u>	<u>270,294,028</u>
<b>Total Liabilities</b>	<u>484,628,730</u>	<u>519,877,705</u>
<b>Equity</b>		
Share capital		
Common shares	130,100,000	130,100,000
Retained earnings		
Special earning reserve	127,636,720	127,712,480
Retained earnings (accumulated deficits)	<u>3,636,905</u>	<u>(35,917,414)</u>
Total retained earnings	<u>131,273,625</u>	<u>91,795,066</u>
Other equity	<u>(956,234)</u>	<u>(419,649)</u>
<b>Total Equity</b>	<u>260,417,391</u>	<u>221,475,417</u>
<b>Total Liabilities and Equity</b>	<u>\$745,046,121</u>	<u>\$741,353,122</u>

## CPC CORPORATION, TAIWAN

## STATEMENTS OF CASH FLOWS FOR THE YEARS ENDED DECEMBER 31, 2017 AND 2016

(In Thousands of New Taiwan Dollars)

	2017	2016
<b>Cash flows from operating activities:</b>		
<b>Net income before tax</b>	\$48,542,061	35,430,707
<b>Adjustments:</b>		
Non-cash adjustment items:		
Depreciation expense	18,597,377	19,759,245
Amortization expense	1,665,417	2,009,202
Provision for (Reversal of) bad debt expense	45,911	56,857
Net loss on financial assets or liabilities at fair value through profit or loss	267,690	126,254
Interest expense	3,056,608	3,510,135
Interest income	(372,561)	(324,476)
Dividend income	(811,600)	(451,706)
Share of loss of associates accounted for using equity method	(628,443)	(697,068)
Loss (gain) on disposal of property, plant and equipment	(115,545)	80,501
Reversal of write-down of inventories	(689,662)	(3,075,519)
Impairment loss recognized on non-financial assets	11,532,490	5,891,361
Loss (gain) on foreign exchange	(92,302)	111,510
Others	<u>(268,036)</u>	<u>(389,022)</u>
Total non-cash adjustment items	<u>32,187,344</u>	<u>26,607,274</u>
Changes in operating assets and liabilities:		
Accounts receivable	(5,653,578)	(2,514,520)
Other accounts receivable	(388,136)	(1,374,257)
Inventories	(13,641,678)	9,088,831
Prepaid expenses	1,098,563	1,816,167
Other current assets	1,002,972	71,603

	2017	2016
Accounts payable	(150,360)	14,309,972
Provision - non-current	(1,207,143)	(1,465,428)
Receipt in advance	1,276,028	8,097,639
Other current liabilities	1,641,323	3,091,594
Post-employment benefits payable	<u>(507,146)</u>	<u>(168,507)</u>
Total adjustments	<u>15,658,189</u>	<u>57,560,368</u>
Cash inflow generated from operations	64,200,250	92,991,075
Interest received	258,172	210,972
Interest paid	(2,787,206)	(3,488,066)
Income taxes paid	<u>(1,843)</u>	<u>(2,474)</u>
<b>Net cash flows provided by operating activities</b>	<u>61,669,373</u>	<u>89,711,507</u>
<b>Cash flows from investing activities:</b>		
Acquisition of financial assets measured at cost	(2,179,886)	(172,291)
Acquisition of investments accounted for using equity method	-	(1,482,500)
Decrease (increase) in prepayments for investments	341,872	(341,872)
Acquisition of property, plant and equipment	(20,791,811)	(19,275,553)
Proceeds from disposal of property, plant and equipment	435,097	32,197
Increase in refundable deposits	(164,799)	(89,121)
Decrease in refundable deposits	82,800	94,589
Acquisition of intangible assets	(106,921)	(147,413)
Increase in other long-term receivables	(521,143)	(3,298,170)
Decrease (increase) in other non-current assets	(495,380)	382,325
Dividends received from associates and others	1,110,132	1,075,075
Increase in oil and gas interests	<u>(3,044,334)</u>	<u>(5,787,812)</u>

	2017	2016
<b>Net cash flows used in investing activities</b>	<u>(25,334,373)</u>	<u>(29,010,546)</u>
<b>Cash flows from financing activities:</b>		
Increase in short-term borrowings	92,517,717	82,813,472
Decrease in short-term borrowings	(92,234,111)	(115,352,921)
Increase in short-term bills payable	279,080,623	214,328,705
Decrease in short-term bills payable	(300,430,973)	(211,362,812)
Issuance of bonds payable	14,800,000	-
Payments to bonds payable	(15,250,000)	(10,600,000)
Payments to long-term borrowings	(14,740,000)	(19,700,000)
Proceeds from guarantee deposits received	2,136,363	1,589,857
Refund of guarantee deposits received	(1,810,459)	(1,333,514)
Increase (decrease) in other non-current liabilities	(21,418)	124,862
Decrease in bank overdraft	<u>(1,485,245)</u>	<u>(812,624)</u>
<b>Net cash flows used in financing activities</b>	<u>(37,437,503)</u>	<u>(60,304,975)</u>
<b>Net increase (decrease) in cash and cash equivalents</b>	(1,102,503)	395,986
<b>Cash and cash equivalents at beginning of period</b>	<u>2,664,345</u>	<u>2,268,359</u>
<b>Cash and cash equivalents at end of period</b>	<u>\$1,561,842</u>	<u>2,664,345</u>

## CPC CORPORATION, TAIWAN

### NOTES TO FINANCIAL STATEMENTS FOR THE YEARS ENDED DECEMBER 31, 2017 AND 2016

(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 18, 2018.

#### (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, 2017:

New, Revised or Amended Standards and Interpretations	Effective date per IASB
Amendments to IFRS 10, IFRS 12 and IAS 28 "Investment Entities: Applying the Consolidation Exception"	January 1, 2016
Amendments to IFRS 11 "Accounting for Acquisitions of Interests in Joint Operations"	January 1, 2016
IFRS 14 "Regulatory Deferral Accounts"	January 1, 2016
Amendment to IAS 1 "Presentation of Financial Statements-Disclosure Initiative"	January 1, 2016
Amendments to IAS 16 and IAS 38 "Clarification of Acceptable Methods of Depreciation and Amortization"	January 1, 2016
Amendments to IAS 16 and IAS 41 "Agriculture: Bearer Plants"	January 1, 2016
Amendments to IAS 19 "Defined Benefit Plans: Employee Contributions"	July 1, 2014
Amendment to IAS 27 "Equity Method in Separate Financial Statements"	January 1, 2016
Amendments to IAS 36 "Impairment of Non-Financial assets- Recoverable Amount Disclosures for Non Financial Assets"	January 1, 2014
Amendments to IAS 39 "Financial Instruments-Novation of Derivatives and Continuation of Hedge Accounting"	January 1, 2014
Annual Improvements to IFRSs 2010-2012 Cycle and 2011-2013 Cycle	July 1, 2014
Annual Improvements to IFRSs 2012-2014 Cycle	January 1, 2016
IFRIC 21 "Levies"	January 1, 2014

The Company believes that the adoption of the above IFRSs would not have any material impact on its financial statements.

## (b) The impact of IFRSs 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, 2018 in accordance with Ruling No.1060025773 issued by the FSC on July 14, 2017.

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 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.

## (i) Classification-Financial assets

IFRS 9 contains a new classification and measurement approach for financial assets that reflects the business model in which assets are managed and their cash flow characteristics. 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 standard eliminates the existing 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 assets in the scope of the standard are never bifurcated. Instead, the hybrid financial instrument as a whole is assessed for classification. In addition, IAS 39 has an exception to the measurement requirements for investments in unquoted equity instruments that do not have a quoted market price in an active market (and derivatives on such an instrument) and for which fair value cannot therefore be measured reliable. Such financial instruments are measured at cost. IFRS 9 removes this exception, requiring all equity investments (and derivatives on them) to be measured at fair value.

Based on its assessment, the Company does not believe that the new classification requirements will have a material impact on its accounting for trade receivables, loans, investments in debt securities and investments in equity securities that are managed on a fair value basis. At December 31, 2017, the Company had equity investments classified as available-for-sale with a fair value of 531,446 thousand and financial assets measured at cost of 7,197,416 thousand that are held for long-term strategic purposes. At initial application of IFRS 9, the Company has designated these investments as measured at FVOCI. Consequently, all fair value gains and losses will be reported in other comprehensive income, no impairment losses would be recognized in profit or loss and no gains or losses will be reclassified to profit or loss on disposal. The Company estimated the application of IFRS 9's classification requirements on January 1, 2018 resulting in an increase of 414,287 thousand in the other equity.

(ii) Impairment-Financial assets and contract assets

IFRS 9 replaces the 'incurred loss' model in IAS 39 with a forward-looking 'expected credit loss' (ECL) model. This will require considerable judgment as to how changes in economic factors affect ECLs, which will be determined on a probability-weighted basis.

The new impairment model will apply to financial assets measured at amortized cost or FVOCI, except for investments in equity instruments, and to contract assets.

Under IFRS 9, loss allowances will be measured on either of the following bases:

- 12-month ECLs. These are ECLs that result from possible default events within the 12 months after the reporting date; and
- lifetime ECLs. These are ECLs that result from all possible default events over the expected life of a financial instrument.

Lifetime ECL measurement applies if the credit risk of a financial asset at the reporting date has increased significantly since initial recognition and 12-month ECL measurement applies if it has not. An entity may determine that a financial asset's credit risk has not increased significantly if the asset has low credit risk at the reporting date. However, lifetime ECL measurement always applies for trade receivables and contract assets without a significant financing component; an entity may choose to apply this policy also for trade receivables and contract assets with a significant financing component.

The Company believes that impairment losses are likely to increase and become more volatile for assets in the scope of the IFRS 9 impairment model. The Company estimates that the application of IFRS 9's impairment requirements on January 1, 2018 would not have any material impact on its financial statements.

(iii) Hedge accounting

When initially applying IFRS 9, the Company may choose as its accounting policy to continue to apply the hedge accounting requirements of IAS 39 instead of the requirements in IFRS 9.

IFRS 9 requires the Company to ensure that hedge accounting relationships are aligned with the Company's risk management objectives and strategy and to apply a more qualitative and forward-looking approach to assessing hedge effectiveness. IFRS 9 also introduces new requirements regarding rebalancing of hedge relationships and prohibiting voluntary discontinuation of hedge accounting. Under the new model, it is possible that more risk management strategies, particularly those involving hedging a risk component of a non-financial item, will be likely to qualify for hedge accounting. The Company does not currently undertake hedges of such risk components.

The Company uses forward foreign exchange contracts to hedge the variability in cash flows arising from changes in foreign exchange rates relating to foreign currency borrowings, receivables, sales and inventory purchases. The Company designates only the change in fair value of the spot element of the forward exchange contract as the hedging instrument in cash flow hedging relationships. Under IAS 39, the change in fair value of the forward element of the forward exchange contracts is recognized immediately in profit or loss. On adoption of IFRS 9, the Company has elected to separately account for the forward points as a cost of hedging. Consequently, the changes in forward points will be recognized in OCI and accumulated in a cost of hedging reserve as a separate component within equity and accounted for subsequently like gains and losses accumulated in the cash flow hedge reserve.

Under IAS 39, for all cash flow hedges, the amounts accumulated in the cash flow hedge reserve are reclassified to profit or loss as a reclassification adjustment in the same period as the hedged expected cash flows affect profit or loss. However, under IFRS 9, for cash flow hedges of foreign currency risk associated with forecast non-financial asset purchases, the amounts accumulated in the cash flow hedge reserve and the cost of hedging reserve will instead be included directly in the initial cost of the non-financial asset when it is recognized.

The types of hedge accounting relationships that the Company currently designates meet the requirements of IFRS 9 and are aligned with the entity's risk management strategy and objective.

(iv) Disclosures

IFRS 9 will require extensive new disclosures, in particular about hedge accounting, credit risk and expected credit losses. The Company's assessment included an analysis to identify data gaps against current processes and the Company plans to implement the system and controls changes that it believes will be necessary to capture the required data.

(v) Transition

Changes in accounting policies resulting from the adoption of IFRS 9 will generally be applied retrospectively, except as described below.

- The Company will take advantage of the exemption allowing it not to restate comparative information for prior periods with respect to classification and measurement (including impairment) changes. Differences in the carrying amounts of financial assets and financial liabilities resulting from the adoption of IFRS 9 generally will be recognized in retained earnings and reserves as at January 1, 2018.
- The new hedge accounting requirements should generally be applied prospectively.
- The following assessments have to be made on the basis of the facts and circumstances that exist 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.

## 2. 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 existing revenue recognition guidance, including IAS 18 "Revenue" and IAS 11 "Construction Contracts".

(i) 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. As a consequence, a lower proportion of the consideration will be allocated to the loyalty program, and therefore, less revenue is likely to be deferred.

## (ii) Transition

The Company plans to adopt IFRS 15 using the cumulative effect method. Therefore, the comparative information will not be restated. The cumulative effect of initially applying IFRS 15 will be recognized as an adjustment to the opening balance of retained earnings at 1 January 2018. The Company plans to use the practical expedient in paragraph C5(a) of IFRS 15, under which, for contracts that are completed at the date of the initial application ( i.e. 1 January 2018) will not be restated.

The Company estimates the adoption of IFRS 15 would not have any material impact on its financial statements.

## 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 intends to present a reconciliation between the opening and closing balances for liabilities with changes arising from financing activities.

## 3. 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 estimated the application of the amendments would not have any material impact on its 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 IASB, but not yet endorsed by the FSC:

New, Revised or Amended Standards and Interpretations	Effective date per IASB
Amendments to IFRS 10 and IAS 28 “Sale or Contribution of Assets Between an Investor and Its Associate or Joint Venture”	Effective date to be determined by IASB
IFRS 16 “Leases”	January 1, 2019
IFRS 17 “Insurance Contracts”	January 1, 2021
IFRIC 23 “Uncertainty over Income Tax Treatments”	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
Amendments to IAS 19 “Plan Amendment, Curtailment or Settlement”	January 1, 2019

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

Issuance / Release Dates	Standards or Interpretations	Content of amendment
January 13, 2016	IFRS 16 "Leases"	<p>The new standard of accounting for lease is amended as follows:</p> <ul style="list-style-type: none"> <li>• For a contract that is, or contains, a lease, the lessee shall recognize a right-of-use asset and a lease liability in the balance sheet. In the statement of profit or loss and other comprehensive income, a lessee shall present interest expense on the lease liability separately from the depreciation charge for the right of-use asset during the lease term.</li> <li>• A lessor classifies a lease as either a finance lease or an operating lease, and therefore, the accounting remains similar to IAS 17.</li> </ul>
June 7, 2017	IFRIC 23 "Uncertainty over Income Tax Treatments"	<ul style="list-style-type: none"> <li>• 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 and 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.</li> <li>• 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 or 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.</li> </ul>
October 12, 2017	Amendments to IAS 28 "Long-term interests in associates and joint ventures"	<ul style="list-style-type: none"> <li>• The amendment to IAS 28, which addresses equity-accounted loss absorption by long-term interests, will affect companies that finance such entities with preference shares or with loans for which repayment is not expected in the foreseeable future (referred to as long-term interests or 'LTI'). It also involves the dual application of IAS 28 and IFRS 9 Financial Instruments.</li> </ul>
December 12, 2017	Annual Improvements to IFRS Standards 2015-2017 Cycle <ul style="list-style-type: none"> <li>• IFRS 3 Business Combinations and IFRS 11 Joint Arrangements</li> <li>• IAS 12 Income Taxes</li> <li>• IAS 23 Borrowing Costs</li> </ul>	<p>Clarify how a Company accounts for increasing its interest in a joint operation that meets the definition of a business.</p> <ul style="list-style-type: none"> <li>• If a party maintain joint control, then the previously held interest is not remeasured.</li> <li>• If a party obtains control, then the transaction is a business combination achieved in stages and the acquiring party remeasures the previously held interest at fair value.</li> <li>• Clarify that all income tax consequences of dividends (including payments on financial instruments classified as equity) are recognized consistently with the transactions that generated the distributable profits-i.e. in profit or loss, OCI or equity.</li> <li>• Clarify that the general borrowings pool used to calculate eligible borrowing costs excludes only borrowings that specifically finance qualifying assets that are still under development or construction. Borrowings that were intended to specifically finance qualifying assets that are now ready for their intended use or sale – or any non-qualifying assets – are included in that general pool. As the costs of retrospective application might outweigh the benefits, the changes are applied prospectively to borrowing costs incurred on or after the date an entity adopts the amendments.</li> </ul>
February 7, 2018	Amendments to IAS 19 "Plan Amendment, Curtailment or Settlement"	<p>The amendments clarify that:</p> <ul style="list-style-type: none"> <li>• on amendment, curtailment or settlement of a defined benefit plan, a Company now uses updated actuarial assumptions to determine its current service cost and net interest for the remainder of the reporting period after the change to the plan; and</li> <li>• the effect of the asset ceiling is disregarded when calculating past service cost and the gain or loss on settlement. Any change in that effect is recognized in other comprehensive income.</li> </ul>

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

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

CPC is operated and managed by the Government of the Republic of China (ROC). CPC's accounts are maintained generally in accordance with the accounting laws and regulations governing state-owned enterprises. The Company's significant accounting policies conform to the Guidelines Governing the Preparation of Financial Reports by Securities Issuers, and the following International Financial Reporting Standards, International Accounting Standards (IASs), Interpretations of International Financial Reporting Standards (IFRIC), and Interpretations of IAS (SIC) (collectively, "IFRSs") endorsed by the Financial Supervisory Commission (FSC).

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, 2016 had already been completed.

The examinations of the Company's financial statements as of and for the year ended December 31, 2017 by these government agencies were not yet completed as of the auditor's report date. The financial statements were compiled in conformity with Guidelines Governing the Preparation of Financial Reports by Securities Issuers, IFRSs and related regulations.

##### **(a) Statement of compliance**

The financial statements have been prepared in accordance with the accounting laws and regulations governing state-owned enterprises, the Regulations Governing the Preparation of Financial Reports by Securities Issuers and 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:

- (i) Financial instruments measured at fair value through profit or loss are measured at fair value;
- (ii) Available-for-sale financial assets are measured at fair value;
- (iii) Hedging derivative financial instruments are measured at fair value;
- (iv) 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 equity securities of available-for-sale financial assets 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

Financial assets and financial liabilities are initially recognized when the Company becomes a party to the contractual provisions of the instruments.

## 1. Financial assets

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.

### (i) 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.

### (ii) 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.

### (iii) 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.

### (iv) 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.

## 2. 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.

## 3. 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.

## 4. 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 Recognition

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:

- (i) The Company has transferred to the buyer the significant risks and rewards of ownership of the goods;
- (ii) The Company retains neither continuing managerial involvement to the degree usually associated with ownership nor effective control over the goods sold;
- (iii) The amount of revenue can be measured reliably;
- (iv) It is probable that the economic benefits associated with the transaction will flow to the Company; and
- (v) 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.

(p) 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 rereasurement) under the defined benefit retirement benefit plans are determined using the projected unit credit method. Service cost (including current service cost) and net interest on the net defined benefit liability (asset) are recognized as employee benefits expense in the period they occur. 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.

#### (q) 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.

#### (r) Borrowing Costs

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

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

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

#### (s) Income taxes

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

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

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

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

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

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

(t) 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 consolidated 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.

(u) 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.

(v) 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.

(w) 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.

### 3. INVESTMENTS ACCOUNTED FOR USING THE EQUITY METHOD

December 31, 2017 and 2016

(In Thousands of New Taiwan Dollars)

	2017	2016
<b>Investments in associates</b>		
Unlisted companies		
▪ China American Petrochemical Co., Ltd. -CPC owned 38.64% equity	\$1,823,454	\$1,746,268
▪ Kuo Kuang Power Company Ltd. -CPC owned 45% equity	2,836,327	2,756,397
▪ Faraway Maritime Shipping Corp. -CPC owned 40% equity	1,963,226	2,000,159
▪ NiMiC Ship Holding Co., Ltd. -CPC owned 45% equity	2,852,494	2,515,223
▪ Taiwan Advanced Material Corporation -CPC owned 49% equity	252,720	541,729
▪ Chun Pin Enterprise Co., Ltd. -CPC owned 49% equity	382,566	379,615
▪ Global Energy Maritime Co., Ltd. -CPC owned 48% equity	2,441,196	2,438,851
▪ CPC Shell Lubricants Company Ltd. -CPC owned 49% equity	61,894	69,394
▪ Daihai Petrol Corporation. -CPC owned 35% equity	119,754	125,375
▪ NiMiC Ship Management Co., Ltd. -CPC owned 45% equity	51,034	48,280
▪ Kuokuang Petrochemical Technology Co., Ltd. -CPC owned 43% equity	20,151	20,073
▪ Taiwan-Japan Oxo Chemical Industries Inc. -CPC owned 47% equity	385,716	393,118
▪ Maxihub Company Limited -CPC owned 40% equity	<u>580,293</u>	<u>588,689</u>
	<u>\$13,770,825</u>	<u>\$13,623,171</u>

## 4. PROPERTY, PLANT AND EQUIPMENT

December 31, 2017 and 2016

(In Thousands of New Taiwan Dollars)

	2017	2016
Land and Land Improvements	\$309,725,091	\$302,607,289
Less: Accumulated depreciation and impairment on land and Land Improvements	16,501,471	15,391,377
Buildings	44,825,522	45,155,820
Less: Accumulated depreciation and impairment on buildings	28,743,445	28,683,381
Machinery and equipment	506,014,044	502,047,767
Less: Accumulated depreciation and impairment on machinery and equipment	414,301,445	416,050,574
Transportation equipment	25,618,337	22,250,095
Less: Accumulated depreciation and impairment on transportation equipment	19,129,376	18,255,066
Miscellaneous equipment	5,285,739	5,129,036
Less: Accumulated depreciation and impairment on miscellaneous equipment	4,456,802	4,441,207
Leasehold improvements	0	0
Less: Accumulated depreciation and impairment on leasehold improvements	0	0
Construction in progress	<u>22,241,307</u>	<u>34,174,120</u>
<b>Net Properties</b>	<b><u>\$430,577,501</u></b>	<b><u>\$428,542,522</u></b>

## 5. EMPLOYEE BENEFITS

### 1. Defined contribution plans

The Company allocates 6% of each employee's monthly wages to the labor pension personal account at the Bureau of Labor Insurance in accordance with the provisions of the Labor Pension Act.

The pension costs incurred from the contributions to the to the Bureau of the Labor Insurance amounted to 668,426 thousand and 695,264 thousand for the years ended December 31, 2017 and 2016, respectively.

### 2. Defined benefit plans

The defined benefit plan adopted by the Company in accordance with the Labor Standards Law is operated by the government. Benefits under the plans are based on employee's length of service and average monthly salaries of the last three months before retirement (for the length of service before the LSL was enacted) or six months before retirement (for the length of service after the LSL was enacted).

Personnel employed by the Company are referred to as either appointees or employees. The appointees' retirement fund (ARF), established under the guidelines of the Ministry of Economic Affairs, requires monthly contributions of amounts equal to 15% of monthly salaries and is administered by a pension plan committee. The ARF is deposited in the committee's name in a bank.

Based on an actuarial report, since the contribution surplus in plan assets exceeded the defined benefit obligation, the Company need not continue to contribute to the plan assets starting from July 2012. The employees' retirement fund (ERF) entails monthly contributions by the Company to a fund at amounts equal to a fixed percentage of 15% of salaries and wages. The ERF is administered by a monitoring committee and is deposited in the committee's name in the Bank of Taiwan. Based on an actuarial report, the Company should contribute to the ERF amounts equal to a fixed percentage of 2% of taxable payroll starting from July 2013. Before the end of each year, the Company assesses the balance in the pension fund. If the amount of the balance in the pension fund is inadequate to pay retirement benefits for employees who conform to retirement requirements in the next year, the Company is required to fund the difference in one appropriation that should be made before the end of March of the next year. The pension fund is managed by the Bureau of Labor Funds, Ministry of Labor ("the Bureau"); the Company has no right to influence the investment policy and strategy.

The Company awarded specific retired employees consolation benefits in accordance with corporate policies.

The Company adopted an insurance system called the Government Employee and School Staff Insurance ("GESSI"), which is a state-managed insurance plan. Under GESSI, an entity makes monthly contributions based on the employee's monthly insurance salary.

Reconciliation of defined benefit obligation at present value and plan asset at fair value are as follows:

	December 31, 2017	December 31, 2016
Present value of the defined benefit obligations	\$41,497,992	43,114,597
Fair value of plan assets	<u>(36,960,286)</u>	<u>(39,073,365)</u>
	4,537,706	4,041,232
The effect of the asset ceiling	-	-
Net defined benefit liabilities	<u>\$4,537,706</u>	<u>4,041,232</u>

## A Five-year Financial Summary

(In Thousands of New Taiwan Dollars)

	2017	2016	2015	2014	2013
Sales and other operating revenues	896,642,121	764,629,993	843,615,422	1,191,814,302	1,187,700,968
Profit (loss) before income tax	48,542,061	35,430,707	(1,402,323)	(33,754,588)	3,811,765
per dollar of sales and other operating revenues (NT\$)	0.054	0.046	(0.002)	(0.028)	0.003
Cash dividends	-	-	-	-	-
per dollar of capital (NT\$)	-	-	-	-	-
Owner's equity	260,417,391	221,475,417	192,157,075	193,597,425	227,104,799
per dollar of capital (NT\$)	2.00	1.70	1.48	1.49	1.75
General taxes and import duties	51,348,334	44,638,861	43,259,598	57,752,016	56,728,945
Commodity tax	74,288,029	74,581,051	72,054,757	70,639,775	69,049,020
Total taxes	125,636,363	119,219,912	115,314,355	128,391,791	125,777,965
Working capital (current assets less current liabilities)	(56,879,637)	(87,227,141)	(87,408,206)	(67,175,456)	(28,798,456)
Ratio of current assets to current liabilities	75.93%	64.93%	64.81%	79.37%	91.52%
Long-term Liabilities	126,590,000	147,930,000	177,920,000	194,920,000	194,820,000
Properties, plant, and equipment-gross	913,710,040	911,364,127	904,641,954	895,488,908	887,182,381
Properties, plant, and equipment-net	430,577,501	428,542,522	428,472,574	433,250,831	444,802,139
Exploration expenses (including all dry holes)	2,195,701	2,267,889	2,947,919	5,479,270	5,246,458
Total assets	745,046,121	741,353,122	741,965,890	833,704,503	878,932,667
Employed capital (Equity, long-term debt)	387,007,391	369,405,417	370,077,075	388,517,425	421,924,799
Employees on December 31	14,814	14,708	14,693	14,787	14,819
Sales and other operating revenues per employee	60,527	51,987	57,416	80,599	80,147

## A Five-year Financial Summary

	2017	2016	2015	2014	2013
Crude oil produced-total KL	193,474	182,265	169,797	189,138	84,437
daily average KL	530	499	465	518	231
Natural gas produced-total MCM	268,115	325,700	377,952	393,019	387,487
MCM per day	735	892	1,035	1,077	1,062
Wells drilled during the year	2	2	1	3	2
Crude oil processed-total KL	21,661,811	21,635,119	20,525,008	22,380,439	22,648,022
daily average KL	59,347	59,274	56,233	61,316	62,049
Natural gas sold-total MCM	21,967,834	20,042,777	18,950,917	17,621,331	16,565,221
MCM per day	60,186	54,912	51,920	48,278	45,384
Refined products sold-total KL	35,524,415	36,112,964	33,448,897	33,380,385	33,151,248
daily average KL	97,327	98,940	91,641	91,453	90,825
Petrochemicals sold-MT	4,016,126	4,253,360	4,351,223	4,566,296	3,867,979
daily average MT	11,003	11,653	11,921	12,510	10,597





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