



2020

# Sustainability Report



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2020

# Sustainability Report



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# CH1

## CPC's Mission and Vision

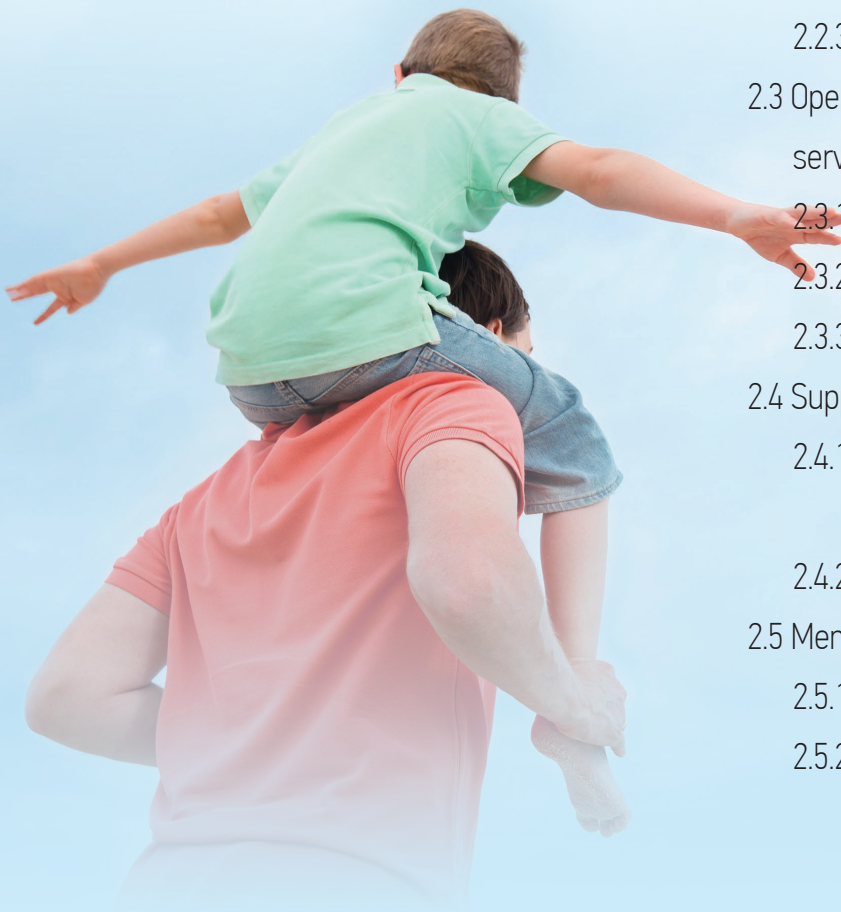
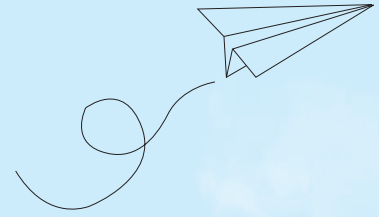
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## Message from the management

Over the years, CPC has been committed to pursuing a win-win situation for the economy, the environment and society, and providing a stable supply of oil and gas for the domestic market. Injecting momentum into economic development, bringing convenience to people's livelihood and contributing to national finances; and continuing to contribute to environmental protection and ecological conservation. Moreover, we make every effort to expand low-carbon energy supply, devote ourselves to greenhouse gas reduction, green energy research and development, and build diversified energy supply facilities to create an environmental education field for maintaining the ecology of our operating location. At the same time, CPC continues to invest in social care, helping the disadvantaged and sending love to remote areas. We hope that we can take root for the next generation of energy education and share prosperity with our community.

In 2019, as the energy industry continues to face the challenges of restructuring and transformation, CPC will continue to uphold its win-win philosophy and persistence with the joint efforts of all employees and the support of all stakeholders, we have got multiple achievements in five aspects and received recognition from many parties. In terms of image, the company was named No.1 of Management Magazine's "Consumer's Ideal Brand" (gas station category) for the 15 consecutive years and Reader's Digest's "Trusted Brand Platinum" for 19 consecutive years and won four major awards in the 16th "National Brand Yushan Award". Also, we ranked among the top 20 "Best Employers 2019" of "Chemical and Petrochemical Category" by 1111 Job Bank; in human resources development, we won the Ministry of Labor's "National Talent Development Award". In the area of sustainable management and stakeholder communication, we were awarded BSI's "Corporate Sustainability Excellence Award" and the 2019 TCSA's "Taiwan Corporate Sustainability Award". Furthermore, we got an international award such as "Asia Corporate Excellence & Sustainability Awards" (ACES), towards sustainable development.

### ▣ Workplace Safety

Employees are the company's most valuable assets, and occupational safety is a prerequisite for business operation. In order to effectively reduce the risk of occupational safety and health, CPC has implemented the "Taiwan Occupational Safety and Health Management System" (TOSHMS) for many years and continues to internal and external auditing, hazard identification, risk assessment, and risk control procedures are in place to effectively prevent occupational hazards. By the end of 2020, the CNS 45001 conversion certification will be completed. At the same time, we plan to introduce new

technologies (AR/VR/MR) for equipment risk detection and employee and contractor safety training. This will strengthen the overall safety management network.

### ■ Low-Carbon Energy

With the trend of "low-carbon, clean-up, and energy-efficient" energy consumption, the international energy industry has been restructured and transformed, while the domestic industry is also facing the challenge of carbon emissions. In order to expand the use of low-carbon energy, CPC is actively promoting major energy infrastructures, including the construction of the third LNG Receiving Terminal and the expansion of Taichung LNG Plant Phase 2 storage tank and port to increase the capacity of natural gas transportation and storage in Taiwan. Furthermore, we plan to transport natural gas to remote areas by tanker trucks and diversify LNG import sources to spread the risk and enhance the country's security of low carbon energy supply.

### ■ Green energy transformation

In line with the global trend of green energy, the government's industrial innovation plan, and the need for enterprises to upgrade and transform their operations. CPC invests in forward-looking research and development, with "energy creation, energy conservation, energy storage, and carbon reduction" as the main theme, and "green energy, green materials, and green technology" as the key elements. Our area of research includes the assessment of the potential of domestic and overseas mines, the development and application of renewable energy, environmental cleanup, and pollution remediation technologies. Besides, we are actively accelerating efficiency gains through trial mass production and diversified applications to inject new vitality into our R&D and innovation energy. It has become an engine to drive industrial restructuring and upgrading.

### ■ Environmental Harmony

CPC has set GHG reduction targets in accordance with national policy. We started introducing various process improvements and energy conservation measures since 2015. In 2019, we continually reduced greenhouse gas emissions and energy consumption. We are committed to reducing pollution through our facilities and management practices, and to preventing and managing pollutants and mitigating environmental impacts under stringent environmental regulations. In recent years, CPC has been committed to maintaining the ecology of the locations where they operate and working on the ecological restoration of

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the fishing ports of Guantang, Datan, and Zhuwei. While promoting low-carbon energy infrastructure, we do not forget about ecological conservation to achieve co-existence and co-prosperity with the environment.

## ■ Social Responsibility

Building on the foundation of Environmental Protection, CPC continues to provide quality oil and gas products and services to create a convenient and barrier-free fueling environment for consumers. We also care for disadvantaged groups, assist in local development, and maintain good interaction with local groups and residents in pursuit of community integration. We have also established Environmental Education Parks in Kaohsiung and Miaoli, and organized activities such as Green Dragon Creativity Summer Camp to promote sustainable development to people of all ages. Moreover, we further support the development of the national elite movement for corporate social responsibility (CSR) as our self-expectation.

Over the years, CPC has been committed to employee health care, gender equality, personnel training, talent cultivation for implementing corporate governance, and internal auditing. We make efforts to the further development of risk management and forward-looking strategic planning. CPC continues to issue sustainability reports to promote communication with stakeholders through transparent and open disclosure of information. To achieve a win-win situation for the economy, environment, and society, we will continue to strengthen our core business development based on environmental protection, and develop green technologies to accumulate growth momentum and realize the sustainable vision of co-existence with the environment and harmony with society. CPC, as an enterprise that keeps pace with the times, protects Taiwan with everyone, creating and sharing a better future.

Chairperson  
**Dr. Jerry J. R. Ou**

*Jia Duoy Ou.*



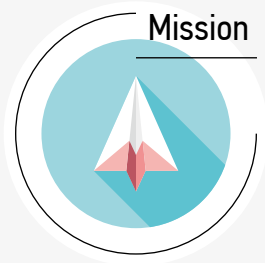
President  
**Lee, Shun-Chin**

*Lee, Shun-chin*





# CPC's sustainable vision



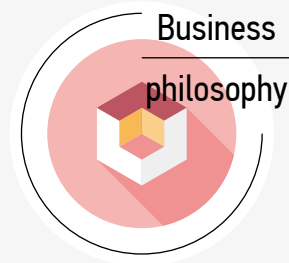
**Mission**

To provide our customers with supreme quality, reliable energy supplies and services as a key contribution to Taiwan's economic prosperity



**Vision**

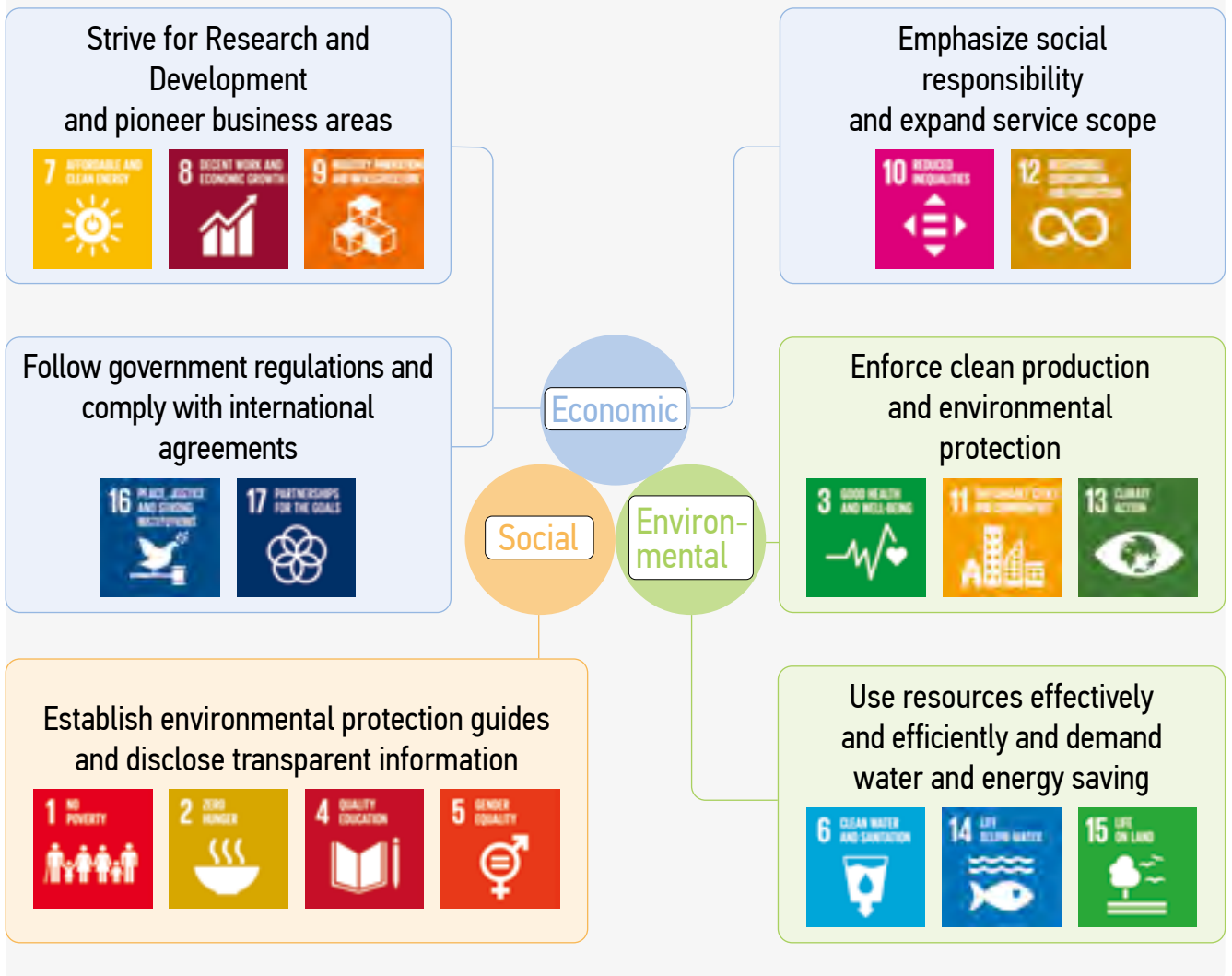
A safe, clean and internationally-competitive integrated energy enterprise







**Business philosophy**

Supreme Quality  
Best Service  
Greatest Contribution





## Our SDGs and Core Values


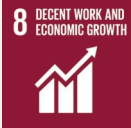




## SDGs and CPC





SDG	The Significance to Us	Our Contributions	Corresponding Section	Page
<b>SDG 1</b> Eliminate poverty 	CPC assists the underprivileged domestically and promotes community development in foreign mining sites; it is the organization's goal to eliminate poverty and under-development worldwide by exerting corporate influence	<ul style="list-style-type: none"> <li>■ CPC promotes cultural development, education and knowledge transfer in underdeveloped countries, and sponsors donation of household equipment for the sake of local residents</li> <li>■ Donated renewed computers to both local and abroad remote areas to help students learn</li> <li>■ Support is given to sports teams in remote areas so that children can acquire specialty in sports, thus turn their lives around.</li> </ul>	1.1 Our CPC 5.1 Social Welfare 5.3 Promotion of sports development	<a href="#">18</a> <a href="#">157</a> <a href="#">170</a>
<b>SDG 2</b> Zero hunger 	CPC helps improve infrastructure in less developed countries, in the hope of supplying drinkable water and improving productivity in agricultural areas	<ul style="list-style-type: none"> <li>■ Donate water wells in the mining areas of underdeveloped countries to improve local water quality and thereby provide opportunities for agricultural improvement.</li> </ul>	5.1 Social Welfare	<a href="#">157</a>
<b>SDG 3</b> Health and well-being 	It is CPC's responsibility to ensure employees' health and safety	<ul style="list-style-type: none"> <li>■ Employees are provided with complete health checkup and occupational safety protection</li> <li>■ CPC clinics have been established in Taoyuan, Miaoli, Kaohsiung and Taipei to serve employees and local community residents</li> </ul>	4.2 Workplace Safety 4.3 Friendly Workplace	<a href="#">123</a> <a href="#">128</a>
<b>SDG 4</b> Education quality 	CPC associates energy education with daily lives and conveys its sustainability philosophy through propaganda, exhibition, event, and environmental education. Through edutainment, message is conveyed to a broad variety of audience including children, young adults, and the general public	<ul style="list-style-type: none"> <li>■ Our summer camps have trained 1,200 instructors and served over 22,000 elementary school students over the year.</li> <li>■ CPC Kaohsiung Refinery Environmental Education Park and Taiwan Oil Field Exhibition Hall have been certified for Environmental Education Facilities and Venues</li> </ul>	5.2 Environmental Education	<a href="#">162</a>



SDG	The Significance to Us	Our Contributions	Corresponding Section	Page
<b>SDG 4</b> Education quality 	<p>CPC associates energy education with daily lives and conveys its sustainability philosophy through propaganda, exhibition, event, and environmental education. Through edutainment, message is conveyed to a broad variety of audience including children, young adults, and the general public</p>	<ul style="list-style-type: none"> <li>■ CPC engages regularly in Maker Party, an energy education program that teaches through handicraft and games, and sponsors participation by elementary school children</li> <li>■ CPC Petroleum Discovery Museum adopts digital and virtual reality technologies to enhance visitors' learning intent and effectiveness</li> <li>■ To hold energy industry essay scholarships continuously</li> </ul>	5.2 Environmental Education	<a href="#">162</a>
<b>SDG 5</b> Gender equality 	<p>CPC treats all males and females as equals; salary and promotion decisions are not distinguished by gender in any way</p>	<ul style="list-style-type: none"> <li>■ Females accounted for 14.25% of general staff and 21.05% of senior managers</li> <li>■ Female engineers are assigned at oil gas exploration wells, which is rare in the world</li> </ul>	4.1 Human Resources  Special Coverage - Female Oil Engineer in Chad	<a href="#">120</a>  <a href="#">152</a>
<b>SDG 6</b> Clean water and sanitation 	<p>CPC places great emphasis on water resource management and has implemented multiple measures to conserve water, improve water efficiency and contribute to preserving Earth's water resources</p>	<ul style="list-style-type: none"> <li>■ Between 2017 and 2019, all three plants had recycled more than 97.5% of the used water</li> </ul>	3.4 Energy and Resources Management	<a href="#">96</a>
<b>SDG 7</b> Affordable energy 	<p>CPC shoulders the responsibility to maintain stability of energy supply and pricing; the organization also promotes installation of solar power generators at gas stations and sponsors research and development of green energy</p>	<ul style="list-style-type: none"> <li>■ CPC ensures consistent supply of oil and gas to satisfy domestic demands, and strives to increase supply of natural gas, a low-carbon energy source, as a support to the nation's energy transformation efforts</li> <li>■ Solar panels have been installed on the rooftop of 193 gas stations, and a 499 KW station solar power generator has been established at Linyuan Petrochemical Plant for a total capacity of 8 MW</li> </ul>	1.1 Our CPC	<a href="#">18</a>

SDG	The Significance to Us	Our Contributions	Corresponding Section	Page
<b>SDG 7</b> Affordable energy 	CPC shoulders the responsibility to maintain stability of energy supply and pricing; the organization also promotes installation of solar power generators at gas stations and sponsors research and development of green energy	<ul style="list-style-type: none"> <li>■ The volume of natural gas processed in 2019 had reached the CPC's 2020 target of 16.5 million tonnes</li> </ul>	3.2 Green energy transformation and circular economy	<a href="#">79</a>
<b>SDG 8</b> Decent work and economic growth 	CPC offers appealing employment opportunities and a friendly work environment, and strives to maintain strong operating performance	<ul style="list-style-type: none"> <li>■ Employee count (permanent and contract) totaled 15,836</li> <li>■ 814 people with disability (including interns) were hired; they represented 4.62% of total employees and were 305 above the statutory quota</li> <li>■ 100% return to work and retention rates after parental leave of both male and female employees.</li> </ul>	4.1 Human Resources 4.3 Friendly Workplace	<a href="#">120</a> <a href="#">128</a>
<b>SDG 9</b> Industry, innovation and infrastructure 	CPC continually enforces circular economy, energy/resource efficiency enhancement and innovative R&D projects as means to enhance competitiveness, sustainability and resilience	<ul style="list-style-type: none"> <li>■ Ongoing enhancements are being made to natural gas transportation and storage facilities and pipeline capacity for improved gas supply and a robust gas supply network</li> <li>■ 57 gas stations were certified for green building, and 11 of which received diamond grade certification</li> <li>■ Inventoried climate change risk facilities including four gas supply centers and four petroleum supply centers.</li> </ul>	1.1 Our CPC 3.1 Risks and Opportunities from Climate Change	<a href="#">18</a> <a href="#">75</a>
<b>SDG 10</b> Reduced inequalities 	CPC ensures that every employee is entitled to equal recruitment, treatment and promotion opportunities, and has always persisted in it.	<ul style="list-style-type: none"> <li>■ Same entry pay for men and women, and promotions regardless of age, gender, and race.</li> <li>■ CPC encourages employee feedback and pays attention to employees' opinions; a total of 6 collective bargaining meetings and 24 labor-management meetings were convened in 2019</li> </ul>	1.3 Stakeholder Communication 4.1 Human Resources	<a href="#">26</a> <a href="#">120</a>



SDG	The Significance to Us	Our Contributions	Corresponding Section	Page
<b>SDG 11</b> Sustainable cities and communities 	CPC has gas stations all over Taiwan; being one of the most highly used public spaces, it is especially important that we offer safety, inclusiveness and convenience to women, children and people with disability	<ul style="list-style-type: none"> <li>■ CPC has gas stations established in offshore islands and remote areas</li> <li>■ 585 of CPC's 615 branches have accessible restrooms; 560 of which are fitted with bidet and some are equipped with baby changing facilities</li> <li>■ 57 gas stations were certified for green building</li> </ul>	2.3 Operating performance, products and services  3.1 Risks and Opportunities from Climate Change	<a href="#">55</a>   <a href="#">75</a>
<b>SDG 12</b> Responsible Consumption and Production 	CPC undertakes innovative R&D and environment-friendly and sustainable solutions to fulfill its duties as a responsible producer	<ul style="list-style-type: none"> <li>■ All products have complied with CNS</li> <li>■ Information and safety data sheet (SDS) of key products and services have been disclosed on CPC website</li> <li>■ Progress of sustainability efforts is disclosed on an ongoing basis</li> </ul>	2.3 Operating performance, products and services	<a href="#">55</a>
<b>SDG 13</b> Climate Action 	CPC responds to the risks and opportunities of climate change and addresses them through mitigation and adaption measures	<ul style="list-style-type: none"> <li>■ Set the 2030 milestone at reducing overall emissions by 30% of 2005 emissions.</li> <li>■ Complete climate risk facility inventory of 24 energy supply complexes within three years.</li> </ul>	3.1 Risks and Opportunities From Climate Change  3.3 GHG Management	<a href="#">75</a>   <a href="#">92</a>
<b>SDG 14</b> Life below water 	Some of CPC's operations take place near harbor areas; for this reason, the organization invests resources into marine conservation and adopts the duty and philosophy to reduce impact to the ecosystem	<ul style="list-style-type: none"> <li>■ Undersea ecological monitoring is being carried out at natural gas receiving terminals to minimize environmental impact</li> <li>■ We provide cold drainage for residents living around the Yongan Plant to enhance aquaculture efficiency.</li> </ul>	3.2 Green energy transformation and circular economy  3.6 Environmental protection and pollution prevention	<a href="#">79</a>   <a href="#">111</a>

SDG	The Significance to Us	Our Contributions	Corresponding Section	Page
<b>SDG 15</b> Life on land 	CPC is dedicated to preserving biodiversity at all operating sites, and embraces its responsibility and mission to facilitate sustainability of the ecosystem	<ul style="list-style-type: none"> <li>■ We constantly implement ecological and environmental education in the Kaohsiung Refinery Plant and the Guantang Industrial Park</li> <li>■ Pollution removal, protection and habitat restoration efforts are being carried out at various locations</li> </ul>	3.6 Environmental protection and pollution prevention 5.2 Environmental Education	<a href="#">111</a> <a href="#">162</a>
<b>SDG 16</b> Peace and justice institutions 	CPC upholds business integrity and has management systems in place to prevent fraud in consumers' best interest	<ul style="list-style-type: none"> <li>■ Rated AAA (tw) by Fitch Ratings for 14 consecutive years.</li> <li>■ Ethics departments have been established within certain units to perform integrity risk assessment on an ongoing basis</li> <li>■ Board performance was rated 85 in a self-assessment by directors and supervisors</li> <li>■ CPC undergoes MOEA's corporate governance evaluation on a yearly basis</li> </ul>	2.1 Corporate Governance 2.2 Ethical Management and Legal Compliance	<a href="#">47</a> <a href="#">52</a>
<b>SDG 17</b> Partnerships for the goals 	CPC supports the government's green energy policy and adopts a series of low-carbon transformation strategies and plans to connect with global sustainability practices	<ul style="list-style-type: none"> <li>■ CPC supports world's energy conservation and carbon emission reduction initiative and responds to climate change; the organization also supports national policies through ongoing expansion and enhancement of natural gas supply, and is actively involved in the research and development of green energy solutions</li> </ul>	1.1 Our CPC 3.2 Green energy transformation and circular economy	<a href="#">18</a> <a href="#">79</a>

## Report Profile

CPC Corporation (referred to as CPC throughout this report) values interaction and communication with stakeholders, and has been preparing sustainability reports voluntarily since 2007. This report marks the 12th issue; it discloses CPC's goals, strategies and accomplishments with respect to sustainability, and is intended to address CSR issues that are of concern to the general public.

### Scope of Report and Reporting Period

The report period is from January 1, 2019 to December 31, 2019. For information integrity and trend comparison, information for some content includes historical data. The last version was published in June 2019. Compared to the last report, this report contains no re-edited information, and the boundaries of both reports are similar. This report provides information regarding the activities of CPC headquarter and affiliates. Environmentally, the report boundaries mainly cover the performance of the Taoyuan Refinery Plant, Dalin Refinery Plant, and Linyuan Petrochemical Plant. For matters and data not disclosed in this report, please visit our [corporate website](https://www.cpc.com.tw/) (https://www.cpc.com.tw/).

### Normative References

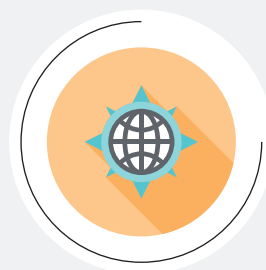
We have prepared this report in accordance with the GRI Sustainability Reporting Standards (GRI Standards) published by the Global Sustainability Standards Board (GSSB) and the following frameworks and initiatives:



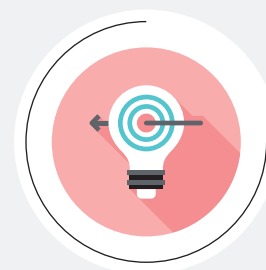
AA1000 Accountability  
Stakeholder  
Engagement Standard  
(AA1000SES)



The Global  
Compact's Ten  
Principles

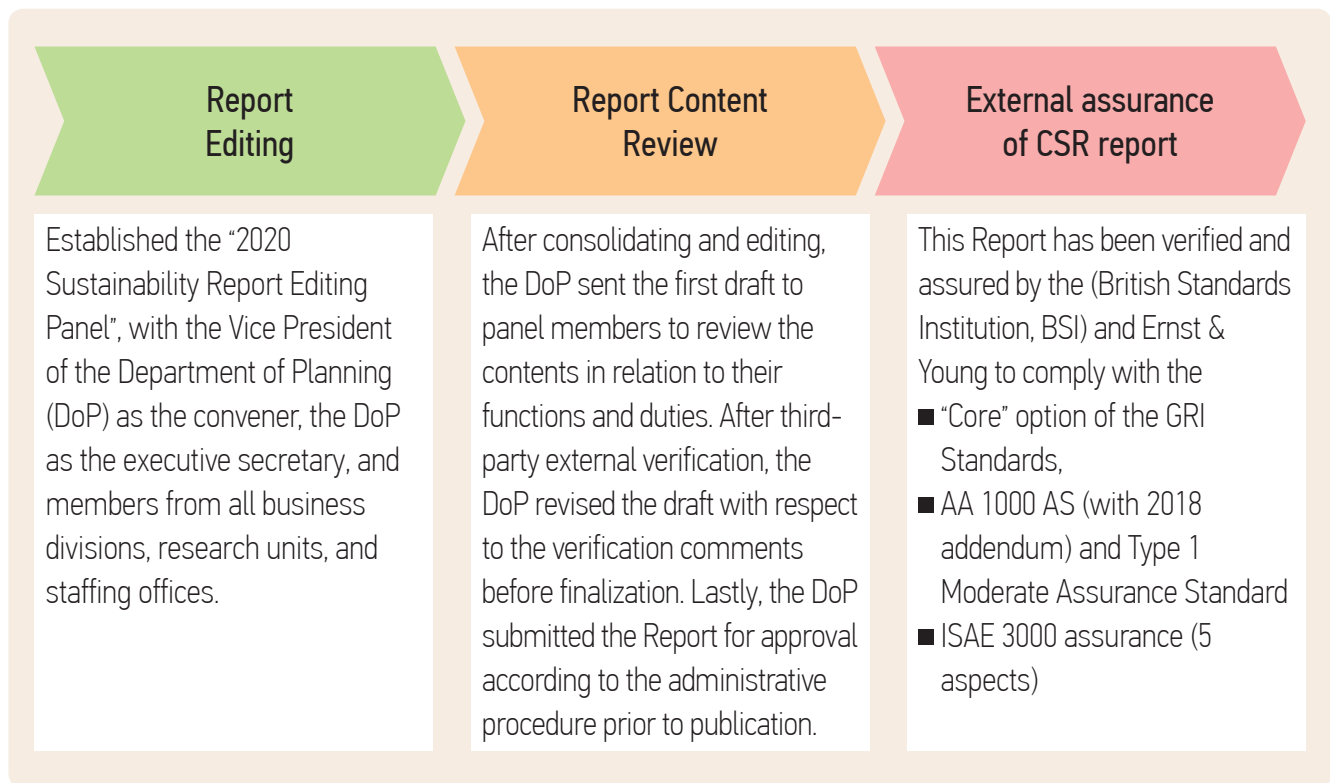


ISO 26000  
Guidance on Social  
Responsibility



The UN Sustainable  
Development Goals  
(SDGs)

## Report Quality Control Workflow



## Data Calculation Basis

All financial data contained in this Report is extracted from CPA-certified financial statements, and all values are expressed in New Taiwan Dollars. Some statistics are quoted from the open information of government agencies (e.g. EPA). ISO 14064-1, ISO14001, and OHSAS 18001 are certified by third-party certification bodies.

## Contact

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Website: <https://www.cpc.com.tw/>



[corporate website](#)



## 2019 WINNING RECORDS

-  Won "Taiwan Sustainable Enterprise Excellence Award," "Corporate Sustainability Report Awards - Platinum," "Gender Equality Award," "Climate Leadership Award," "Creativity and Communication," "Growth through Innovation Award" and "Circular Economy Leadership Award" from Taiwan Institute for Sustainable Energy
-  Won Asia Corporate Excellence & Sustainability Awards - "Asia's Most Influential Companies Award" and "Green Innovation Award"
-  Won National Brand Yushan Award - "Most Popular Brand Award" National First Prize for CPC gas stations, and National Brand Yushan Award - "Best Product Award" for "CPC 9000 Series Motor Oil" and "CPC High Performance Intake Valve Deposit Cleaner"
-  Won Reader's Digest "Trusted Brand Platinum Award" - Gas Station for 19 consecutive years and "Trusted Brand Gold Award" - Lubricant
-  No. 1 "Consumer's Ideal Brand," gas station category, Management Magazine, for 15 consecutive years.
-  Awarded BSI's Corporate Sustainability Excellence Award for 3 consecutive years
-  Ranked 394th among Fortune Global 500 in 2019
-  Topped state-owned companies in net income for 3 consecutive years
-  Rated AAA (twN) by Fitch Ratings for 14 consecutive years
-  Won "Intelligent Manufacturing and Big Data Analytics Contest" - "Corporate and Research Institution Division" - Project B First Prize.
-  Won 16th National Innovation Award - "Enterprise Innovation Award" for "Large-scale Local Algae Material Development"
-  Won Public Construction Golden Quality Award - "Infrastructure Construction Golden Quality Award" from Public Construction Commission, Executive Yuan, for the "Exploration and Production Business Division Natural Gas Thermal Value Stabilization System Turnkey Project" and "Port of Taichung Fuel Distribution Center Lubricant Tank Construction and Filling Project"
-  Dalin Refinery was awarded "Excellent Clean Air Zone Sponsor" by Environmental Protection Administration and Kaohsiung City Environmental Protection Bureau

## 2019 WINNING RECORDS

- 1 Ranked among the top 20 “Best Employers 2019” - “Chemical and Petrochemical Category” by 1111 Job Bank
- 1 MOE-SA “Sports Facilitator Award” and Golden Award in sponsorship for 2 consecutive years
- 1 Won 2019 “National Talent Development Awards” - Institution and Organization Category organized by Ministry of Labor
- 1 Won the 14th “Arts & Business Awards” - “Regular Award - Gold” organized by Ministry of Culture
- 1 Nominated for the “First National Corporate Environmental Protection Awards” organized by Environmental Protection Administration
- 1 The CPC website received Web Content Accessibility Guidelines 2.0 Level AA rating
- 1 193 solar power stations have been constructed, and 17 proprietary photovoltaic systems attained Renewable Energy Project certification
- 1 57 gas stations have been certified for green building, and 11 of which received diamond grade certification
- 1 Certified by government authority for Information Security Excellence
- 1 Certified for ISO27001 - Information Security Management, CNS15506 - Occupational Health and Safety Management System, OHSAS18001, ISO45001 (still transitioning), ISO14001 - Environmental Management System and ISO9001 - Quality Management System



# CH1

## CPC's Mission and Vision

### Chapter summary

CPC has been entrusted with the mission of sustaining energy supply within the nation. In addition to supporting the nation's green energy initiative and "5+2" industries project, the Company brings value and advanced technology to industries by contributing research capacity in "energy creation," "energy conservation," "energy storage" and "carbon reduction" fields. In the future, CPC will continue satisfying the public's demand for oil gas, and engage pro-actively in green energy transformations to support sustainability efforts of individuals, businesses, the society and the nation.

### Corresponding SDGs



### Reader Priorities

- Shareholder (MOEA)
- Partners
- Public representatives
- Communities
- Customers
- Government
- Employees
- Media
- NPOs/NGOs

CPC has been providing service in Taiwan for more than 70 years. As the economy and the society progressed, CPC remains committed to its focus of “Quality, Service and Contribution,” embraces its responsibility of ensuring stable energy supply, and maintains active interaction and communication with the general public.

This report discloses CPC's overall accomplishments in 2019; based on feedbacks collected from 9 categories of stakeholder, CPC is able to focus on material topics that are of significant concern and explain its methods and performance accordingly. CPC follows the government's low-carbon transformation policy and adopts a business philosophy that “gives back to the society.” Through this report, we hope to enhance communication with all stakeholders and adjust our practices in ways that improve the inclusiveness, equality and sustainability of our environment.

## 1.1 Our CPC

As a state-owned enterprise, CPC's business activities include the import, exploration, development, refinery, transportation, storage and sale of oil gas, and production and supply of petrochemical materials. From importing of petrochemical materials in the upstream to supply of consumer goods in the downstream, CPC has operations and sales offices deployed throughout Taiwan; being able to operate as a vertically integrated omnibus energy supplier not only places CPC at the heart of the nation's energy supply, but also makes it a critical member to the nation's economic growth and stability.

Company Basic Data	
Company Name	CPC Corporation, Taiwan
Establishment Date	June 1, 1946
Ownership	State-owned Enterprise (MOEA 100%)
Authorized Capital	NT\$130.1 billion.
Sales Volume (2019)	NT\$1,014.1 billion (audited)
Chairperson	Jerry Ou
President	Shun-chin Lee
Number of Employees (Dec 31, 2019)	15,836 Persons (including contract employees)
Headquarters Address	No. 2, Tso-Nan Road, Nan-Tzu District, Kaohsiung City, Taiwan 811 (R.O.C)
Credit Rating	AAA (tw) by Fitch Ratings

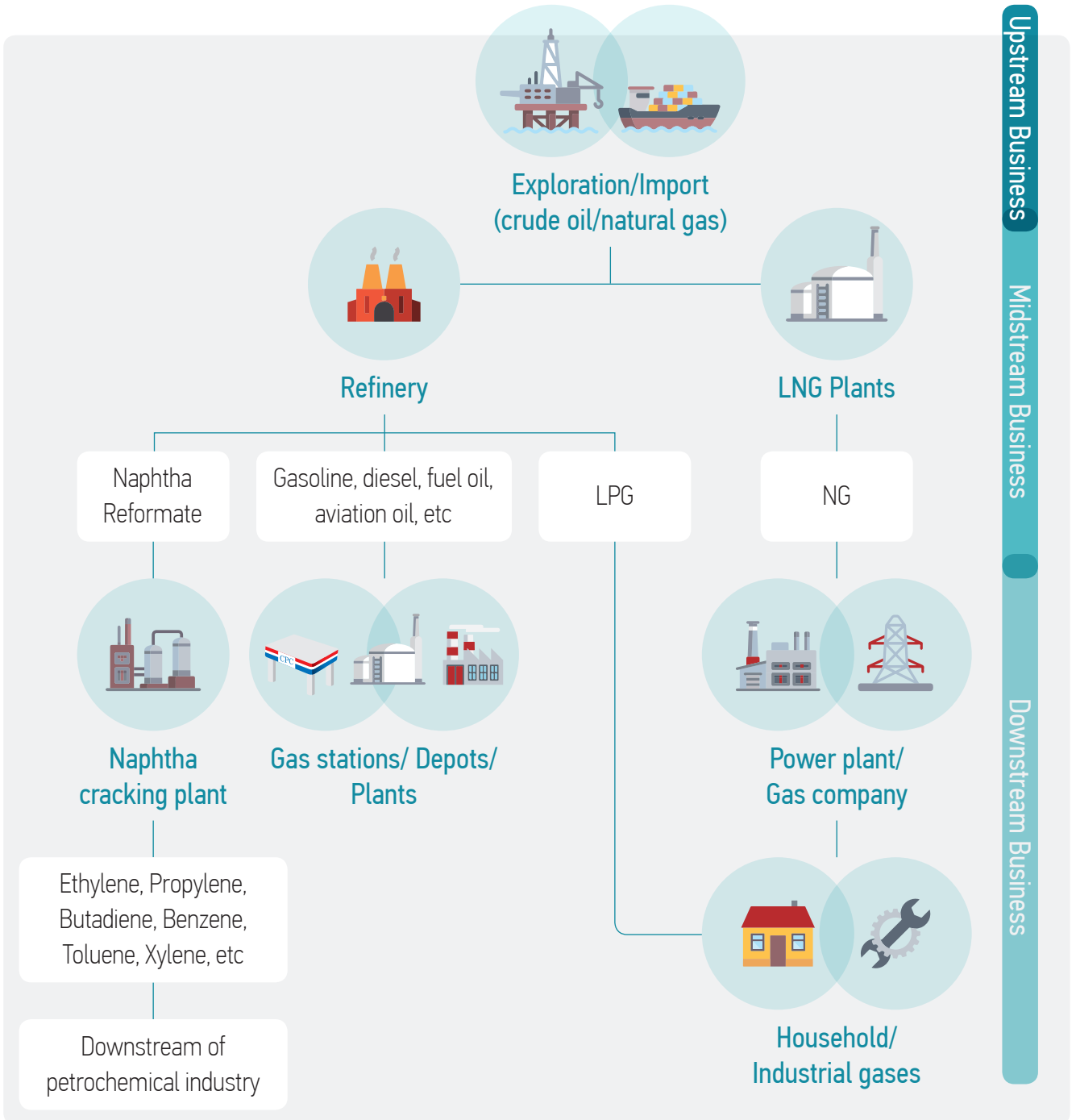
### □ CPC Organization System

Currently, we have 19 staffing units and 16 first-line direct report units. For details regarding the organization system, please refer to our website.



Scope of Business

Major Brands, Business, and Products



Other diverse products and services

Lifestyle products	Quality service	Mid-stream and upstream products
<ul style="list-style-type: none"> <li>· Biotech products</li> <li>· Festive gifts</li> <li>· Agricultural Products</li> <li>· Vehicle fuel</li> </ul>	<ul style="list-style-type: none"> <li>· Quick Service and Tire Centers</li> <li>· Carwash</li> <li>· Compound stores and excellent public toilets</li> <li>· Cup &amp; Go Drive-thru Coffee shop</li> <li>· Charging and Battery Replacement Points</li> </ul>	<ul style="list-style-type: none"> <li>· Refinery and supply of petrochemical feedstock</li> </ul>



*“The pillar to national economy;  
The foundation to energy security and prosperity.”*

## ■ Energy transformation and low-carbon future

Being an island nation, Taiwan is highly dependent on imported energy sources, and for more than 70 years, CPC has supported national policies, satisfied the needs of the domestic population and made energy security part of its responsibility. Today, CPC has created a strong foundation for the growth of domestic industries and the national economy. As the only LNG importer and supplier in Taiwan, CPC undertook several infrastructure projects in recent years from natural gas transportation and storage facility enhancement, pipeline capacity enhancement and diversification to natural gas transportation and storage expansion all for the purpose of building a robust gas supply network that not only assures the stability and safety of fuel supply, but also supports the government's shift toward low-carbon energy source and meets the rising demand for natural gas within the nation. Aside from construction of the third LNG Receiving Terminal, other projects including the onshore gas pipeline between Taichung Plant and Tongxiao Station, Taichung Plant Phase 2 storage tank and port expansion, Phase 3 gasification facilities and seawater system, Yongan Plant underground storage tank and Taichung Plant off-port expansion are scheduled to be completed from the end of 2020 to 2027.

CPC also advocates green upgrades and supports green innovation through technology, product and service. The Company prides itself for being the driving force behind the nation's energy, industry and low-carbon transformation. Backed by access to green energy, green material and green technology, CPC has focused its research efforts toward improving “energy creation,” “energy conservation,” “energy storage” and “carbon reduction” and supporting the nation's green energy initiatives as well as the “5+2” industries project. Through commercialization of our R&D accomplishments, CPC hopes to create value and contribute know-how to the benefit of the environment and the industry. Bio-ATF (aviation turbine fuel), hydrogenic energy, fuel cell, solar system integration, heavy oil conversion, fine carbon development and transesterification are some of the technologies that CPC is currently developing. CPC will continue satisfying the public's demand for oil, gas, and engage pro-actively in green energy transformations to support sustainability efforts of individuals, businesses, the society and the nation.

---

## Highlights of green energy transformation - 2019

- 💡 194 Gogoro GoStations, 22 charging stations and 2 smart green energy gas stations were established nationwide
- 💡 17 establishments with a total capacity of 535.80 KW were certified for Renewable Energy Project; 410 renewable energy certificates representing a total power capacity of 418,810 KWH were approved
- 💡 Yongan Plant continued supplying cold energy to local industries

For progress on energy research, please refer to section 3.2 Green energy transformation and circular economy.

## Major Domestic Locations

2 refineries (in Taoyuan and Dalin)

1 petrochemical plant in Linyuan

2 LNG Receiving Terminal (Yong-an and Taichung)

8 NG supply centers

4 NG service centers

1 transportation hub

9 oil product business offices

13 product distribution centers

1,989 gas stations  
(Including joining station)

3 Research Institute

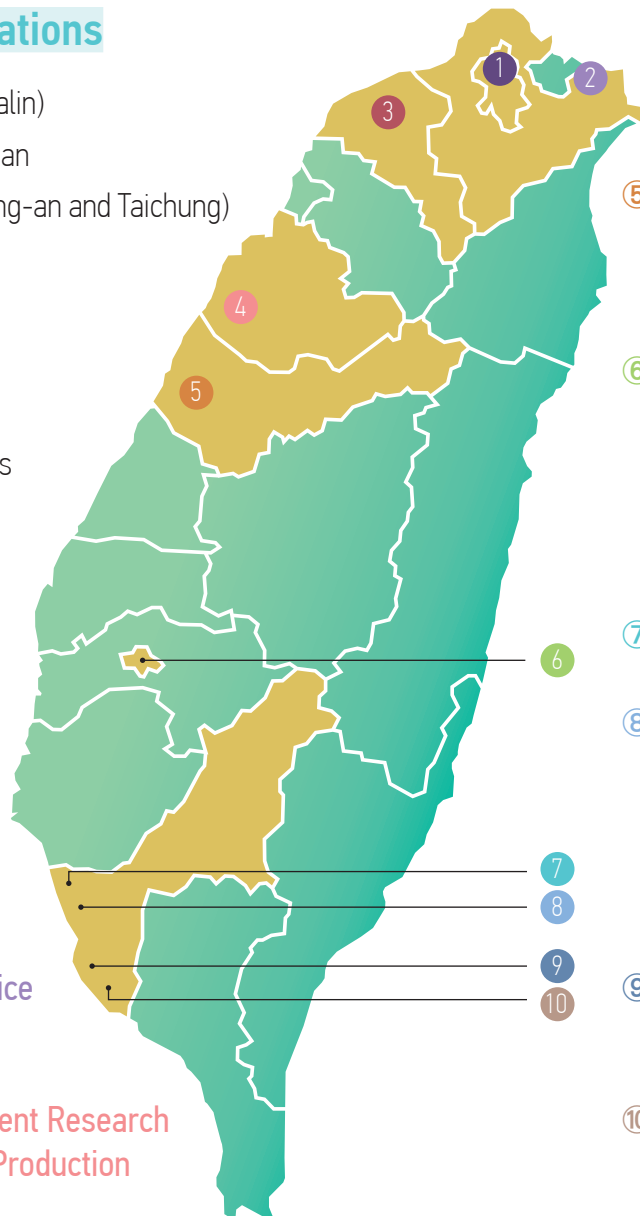
2 Laboratory

① Marketing Business Division, LPG Business Division, Natural Gas Business Division

② Shen'ao Harbor Supply and Transportation Service Center

③ Taoyuan Refinery

④ Exploration & Development Research Institute, Exploration & Production Business Division



⑤ Taichung LNG Receiving Terminal, LNG Engineering Center Taichung Laboratory

⑥ Human Resource Training Center, Solvent & Chemical Business Division, Refining & Manufacturing Research Institut

⑦ Yong-an LNG Receiving Terminal

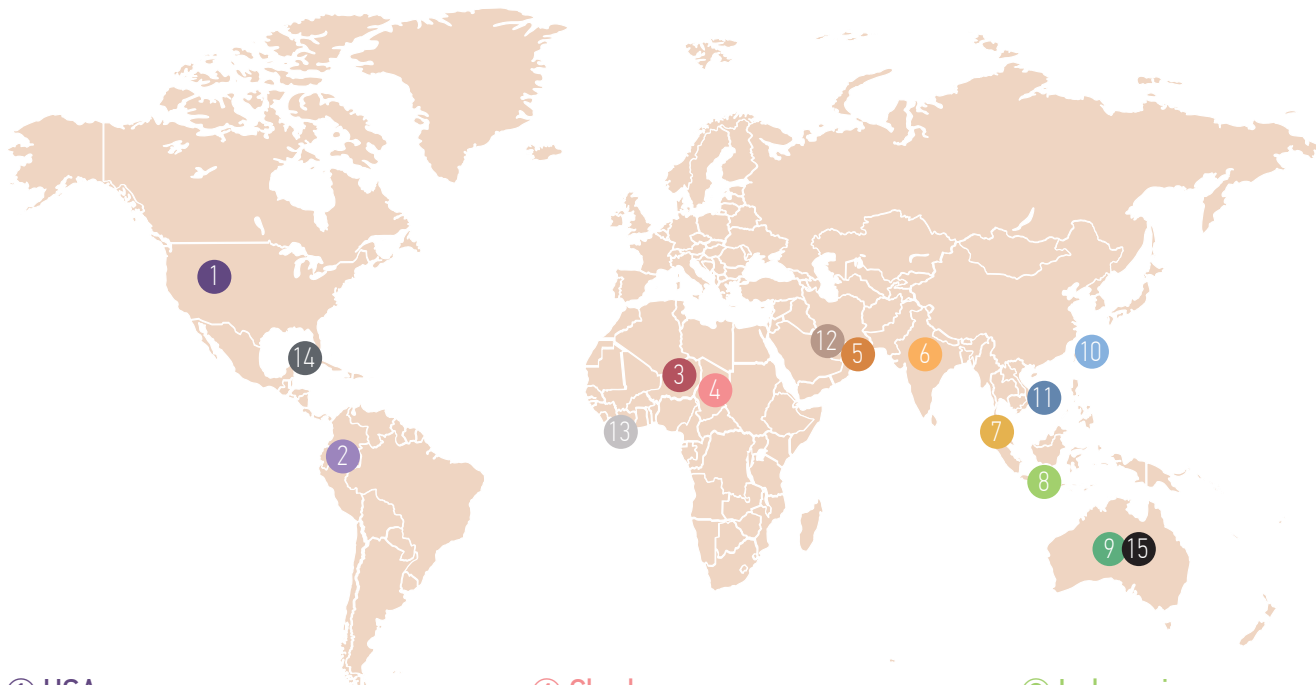
⑧ Headquarters, Refining Business Division, Green Technology Research Institute, Project & Construction Division

⑨ Dalin Refinery, Lubricants Business Division

⑩ Petrochemical Business Division (Linyuan Petrochemical Plant)

## Global operations

2019 exports were about 11.77 million kL, mainly to Singapore, the Philippines, Indonesia, South Korea, Australia, Malaysia, and Pakistan. CPC Global locations have wide spreaded to 15 countries and 4 continents.



### ① USA

Opicoil America, Inc., OAI  
Opicoil Houston, Inc., OHI

### ② Ecuador

Ecuador Branch, OPIC

### ③ Niger

OPIC Niger S.A.R.L.

### ④ Chad

OPIC Africa Corp.

### ⑤ Dubai

Dubai Office

### ⑥ India

India Office

### ⑦ Singapore

CPC International Trading Pte. Ltd.

### ⑧ Indonesia

Indonesia Branch, OPIC

### ⑨ Australia

OPIC Australia Pty. Limited  
OPIC LNG Holding Pty. Ltd.  
OPIC Ichthys Pty. Ltd.

## Investees

### ⑩ Taiwan

China American Petrochemical Co. Ltd. (CAPCO)  
CPC Shell Lubricants Company Ltd.  
Kuokuang Power Co., Ltd. (KKPC)  
Chun Pin Enterprise Co., Ltd. (CPEC)  
Global Energy Maritime Co. (GEMCO)  
Taiwan-Japan Oxo Chemical Industries Inc. (TJOC)  
Taiwan Stock Exchange Co., Ltd.

China Ship Building Co., Ltd. (CSBC)  
Overseas Investment & Development Co. (OIDC)

### ⑪ Vietnam

Dai Hai Petroleum Corp. (DHP)  
Maxihub Company Limited (MAXIHUB)

### ⑫ Qatar

Qatar Fuel Additives Company Limited (QAFAC)

### ⑬ Liberia

Faraway Maritime Shipping Co. (FMSC)

### ⑭ Cayman Islands

Nimic Ship Holding Co., Ltd. (NSHC)  
Nimic Ship Management Co., Ltd. (NSMC)

### ⑮ Australia

Ichthys LNG Pty Ltd. (ILPL)



## ■ Gas supply and care for the society

CPC plays an important role in people's lives, offering essential products and services including natural gas, LPG, gasoline, diesel, vehicle servicing, multi-purpose store, biotech product, laundry solution and petrochemical materials.

### Highlights

#### 💡 Fuel subsidy for low-income households

Natural gas and LPG are two common household fuels, and given that the nation depends almost entirely on import, CPC has implemented a Low-income Household Fuel Subsidy Policy to mitigate the effect of fuel price changes to low-income households. When international price increases cause the wholesale price of household fuel to increase above a certain amount, whether due to seasonality or otherwise, low-income households are entitled under the policy to apply for LPG subsidy to help relieve the additional financial burden. Natural gas users, on the other hand, are entitled to waiver of basic fees. For more details on the subsidy policy, please refer to section - [Fuel subsidy for low-income households](#).

#### 💡 Price stabilization system

CPC has been implementing a price stabilization system for oil and natural gas in line with the government's price stabilization policies since 2007. For gasoline and diesel, the system works by adjusting retail price of 92 Unleaded and Super Diesel using prescribed formula before converting them to pre-tax wholesale prices. These prices are then compared to current week's lowest pre-tax price observed in competing countries in Asia (namely Japan, South Korea, Hong Kong and Singapore), which serves as the upper limit for price adjustments. Furthermore, to lessen the financial burden and impact that price changes have on the general public, the MOEA announced a new set of oil price stabilization measures in 2018 that set three price thresholds for 95 Unleaded at NT\$30, NT\$32.5 and NT\$35 per liter. If retail price rises above the threshold, the government will absorb 25%, 50% and 75% of the excess, respectively. The same absorption rate applies to 92 Unleaded, 98 Unleaded and diesel on a per-liter basis. As for prevailing gas price stabilization mechanism, CPC's natural gas price fluctuation caps at 3% in a single month and 6% over 3 consecutive months. Adjustments above this cap must be reported to and approved by MOEA before taking effect.

In addition to the above, CPC has worked with the MOEA to stabilize prices on many occasions either by slowing or suspending rise of oil price, which helped reduce financial burden to the public and the industries. None of the subsidies was recovered afterwards even when oil prices fell back to the adjustable range, which is a strong indication of CPC's significant contribution to the domestic economy and its commitment to giving back to the society.



## 1.2 Sustainable Management

### Sustainability Management Policy

#### Legal Compliance and Abidance with International Conventions

>

Compliance with domestic and international regulations and support to home country policies are the fundamental requirements of CPC's operations. CPC actively participates in domestic and foreign environmental protection conventions and accepts them as the benchmark for all practices worldwide

> CH2

#### Low-carbon transformation and preservation of the ecosystem

>

CPC incorporates low-carbon energy source into its operations and is transitioning toward sustainable energy supply. Meanwhile, environmental management systems have been adopted to enforce pollution prevention, energy conservation, waste reduction and preservation of the ecosystem

> CH3

#### Efficient Resources Use and Effective Energy and Water Conservation

>

CPC is deeply invested into improving energy efficiency and water resource management. The Company is constantly looking for ways to maximize yield and reduce consumption of Earth's energy and resources at reasonable cost.

> CH3

#### Emphasis on corporate responsibility and care for social citizens

>

CPC promotes social inclusion as a role-model business. While it strives to expand the scope of service and increase profits, the Company is always looking to expand influence and create diverse values for stakeholders

> CH4  
CH5

#### Environmental Indicators and Information Transparency

>

Establish environmental efficiency indicators, produce and publish statistics regularly, and enhance business transparency.

> CH3

#### Green research and diverse opportunities

>

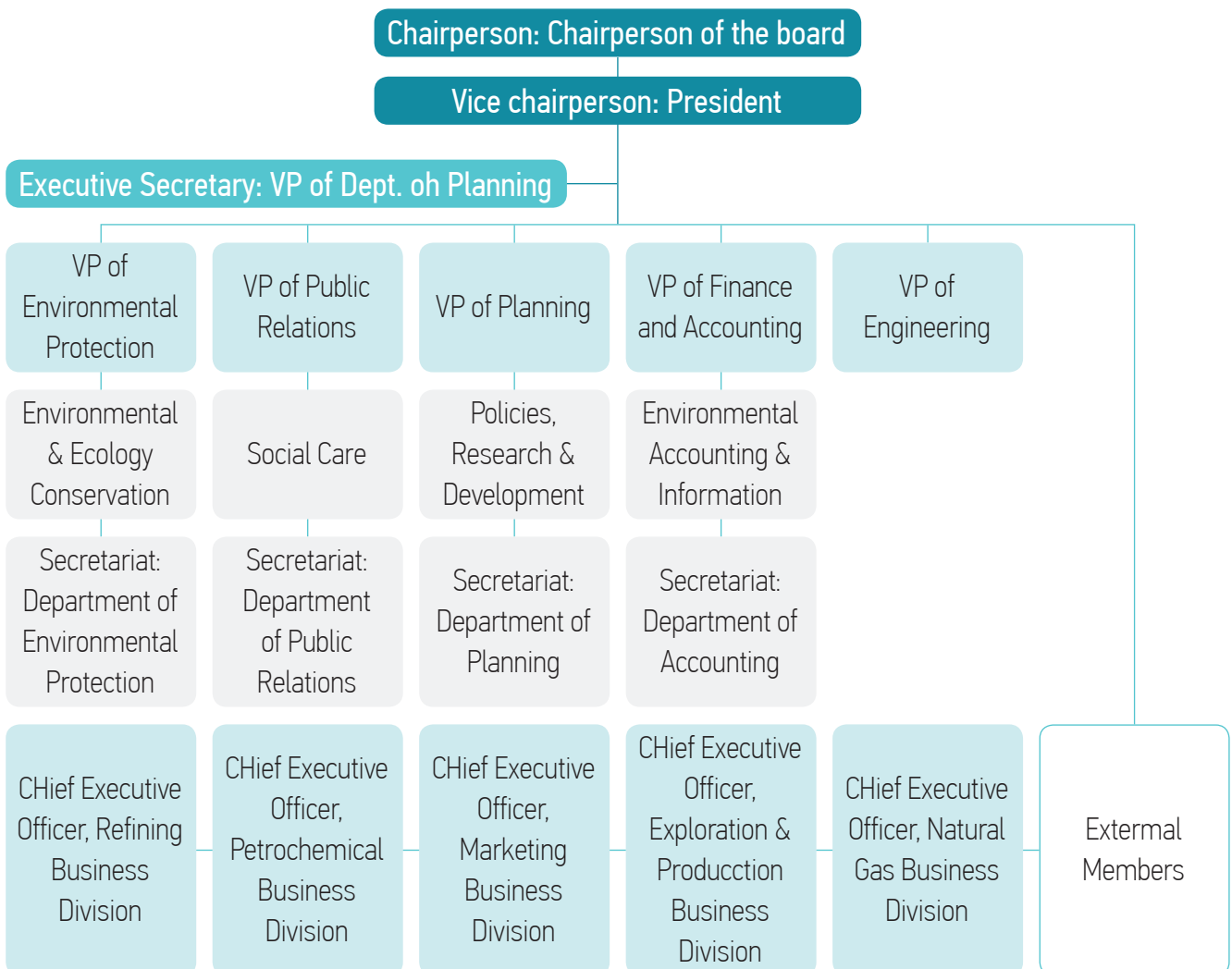
CPC views innovative R&D as the means to expand and capitalize on new growth opportunities, and therefore invests aggressively into the development of green energy sources, materials and technologies

> CH3

## Sustainable Operations Promotion Committee

CPC's "Sustainable Operations Promotion Committee" was assembled in 2005. The committee oversees sustainability in four major aspects: "Environmental Protection And Ecological Conservation," "Social Care," "Policy and R&D" and "Environmental Accounting and Information"; it pays constant attention to sustainability trends local and abroad, contributes expertise on both strategic and operational levels, and promotes sustainability of the organization as well as the society.

The Sustainable Operations Promotion Committee is chaired by the Chairperson, with the President as the Vice Committee Chair, the DoP VP as the Secretary, and other VPs and the CEOs of the five business divisions as Committee Members. The committee has been sourcing experts and scholars from outside the organization to serve as committee members since 2008. The Sustainable Operations Promotion Committee convened 3 meetings in 2019 to discuss various proposals, and made unscheduled reports to the board of directors. The Chairperson and President supervise the committee's sustainability efforts on behalf of the board.



## 1.3 Stakeholder Communication

### Identification of Stakeholders

As a state-owned enterprise, CPC exercises significant influence as an industry leader. Its products, services and operations are constantly under public scrutiny, therefore it is of utmost priority to meet expectations and address the interests of all its stakeholders. Through reference to the stakeholder groups identified by the energy industry at home and abroad, and referring to the attributes of stakeholders as specified in AA1000SES (Stakeholder Engagement Standards): dependency, responsibility, tension, influence, and diverse perspectives, we identified nine stakeholder groups: shareholder (MOEA), the government, public representatives, employees, customers, partners, communities, non-profit organizations (NPOs) and non-governmental organizations (NGOs), and the media.



### Stakeholder Communication

CPC operates 8 main business divisions and hundreds of sales offices. Below is a list of diverse communication methods and channels that CPC has adopted to engage different stakeholders:

Stakeholders	Significance to Us	2019 Topic of Concern	Communication channel	Communication Frequency	Outcomes
Shareholder (MOEA)	We are a state-owned enterprises (SOE) wholly owned by the Ministry of Economic Affairs (MOEA).	<ul style="list-style-type: none"> <li>Emergency Events Prevention and Handling</li> <li>Effluents and Waste Management</li> </ul>	<ol style="list-style-type: none"> <li>CSR questionnaire</li> <li>Shareholder meetings and extraordinary shareholder meetings (currently convened on behalf by the board of directors)</li> </ol>	<ol style="list-style-type: none"> <li>CSR Questionnaire: Once a year</li> <li>Board of directors meetings, at least 12 per year</li> </ol>	<ul style="list-style-type: none"> <li>CPC has been awarded “AAA(twn)” rating by Fitch Ratings for 14 consecutive years, and is subjected to corporate governance evaluation organized by State-owned Enterprise Commission, MOEA</li> </ul>



Stakeholders	Significance to Us	2019 Topic of Concern	Communication channel	Communication Frequency	Outcomes
Shareholder (MOEA)	Our integrity and sustainable management represent our commitment and mission for Taiwan.	<ul style="list-style-type: none"> <li>▪ Ethical Management and Legal Compliance</li> <li>▪ Governance</li> </ul>	<ol style="list-style-type: none"> <li>3 Public policy meetings</li> <li>4 Official correspondences</li> </ol>	<ol style="list-style-type: none"> <li>3 Others, at least 60 times a year</li> </ol>	<ul style="list-style-type: none"> <li>▪ A total of 17 board of directors meetings (including regular and extraordinary sessions) were convened in 2019; directors' attendance rate was calculated at 91%</li> </ul>
Partners	CPC and partners (including contractors and suppliers) create value and stabilize the energy supply in Taiwan to build a sustainable value chain.	<ul style="list-style-type: none"> <li>▪ Effluents and Waste Management</li> <li>▪ Customer Rights and Product Safety</li> <li>▪ Emergency Events Prevention and Handling</li> </ul>	<ol style="list-style-type: none"> <li>1 CSR questionnaire</li> <li>2 Establishment of management systems</li> <li>3 Contractors meeting</li> <li>4 Suppliers meeting</li> </ol>	<ol style="list-style-type: none"> <li>1 CSR Questionnaire: Once a year</li> <li>2 Others, at least 400 times a year (regular and unscheduled)</li> </ol>	<ul style="list-style-type: none"> <li>▪ Suppliers and contractors are engaged in ongoing communication.</li> <li>▪ A total of 30 suppliers completed the CSR self-assessment questionnaire in 2019</li> <li>▪ 363 disaster prevention/rescue drills were held during the year, including 4 escalated emergency response drills</li> </ul>
Public representatives	CPC engages public representatives in active communication in order to learn the opinions of local residents, so that projects and works can be carried out in conformity with the public's needs and expectations	<ul style="list-style-type: none"> <li>▪ Emergency Events Prevention and Handling</li> <li>▪ GHG Management</li> <li>▪ Social Inclusiveness</li> </ul>	<ol style="list-style-type: none"> <li>1 CSR questionnaire</li> <li>2 Project report</li> <li>3 On-site inspection</li> <li>4 Coordination meeting</li> <li>5 Personal visit</li> <li>6 Official correspondences</li> <li>7 Communication meetings of various form</li> </ol>	<ol style="list-style-type: none"> <li>1 CSR Questionnaire: Once a year</li> <li>2 Others, at least 400 times a year</li> </ol>	<ul style="list-style-type: none"> <li>▪ CPC communicates with public representatives through various meetings, and invites them to project meetings update them on the progress of various projects. This practice ensures smooth and unobstructed interaction with the stakeholder</li> </ul>

Stakeholders	Significance to Us	2019 Topic of Concern	Communication channel	Communication Frequency	Outcomes
Communities	In addition to gas stations, CPC has refineries and petrochemical plants. Therefore, to maintain good relations with local communities and maintain their living quality are our commitments.	<ul style="list-style-type: none"> <li>▪ Effluents and Waste Management</li> <li>▪ GHG Management</li> <li>▪ Social Inclusiveness</li> </ul>	<ol style="list-style-type: none"> <li>1 CSR questionnaire</li> <li>2 Neighborhood engagement event</li> <li>3 Community meeting</li> <li>4 Charity event</li> </ol>	<ol style="list-style-type: none"> <li>1 CSR Questionnaire: Once a year</li> <li>2 Others, at least 200 times a year (regular and unscheduled)</li> </ol>	<ul style="list-style-type: none"> <li>▪ CPC is dedicated to reducing environmental impact through pro-active energy and resource management and by cutting down waste and pollution. Furthermore, budgets are allocated into neighborhood engagement events for the purpose of building relationship with local communities.</li> <li>▪ A total of 6,138 neighborhood engagement events were subsidized in 2019</li> </ul>
NPOs/NGOs	CPC engages NPOs/NGOs in ongoing communication to identify areas of potential improvement and ways to achieve social inclusion	<ul style="list-style-type: none"> <li>▪ Ethical Management and Legal Compliance</li> <li>▪ Indirect Economic Impact</li> <li>▪ Ecological and Environmental Education</li> </ul>	<ol style="list-style-type: none"> <li>1 CSR questionnaire</li> <li>2 Participation in external associations</li> <li>3 Participation in conferences of environmental protection organizations</li> <li>4 Invitation to environmental protection organizations for hosting seminars</li> </ol>	<ol style="list-style-type: none"> <li>1 CSR Questionnaire: Once a year</li> <li>2 Others, at least 24 times a year</li> </ol>	<ul style="list-style-type: none"> <li>▪ CPC takes the initiative to reduce pollution and environmental impact. Information of all of its projects are made open and transparent, whereas arrangements are made to communicate, respond and resolve queries with concerned groups. For example, CPC worked with Wild Bird Society of Taoyuan in 2019 to begin habitat restoration for little terns</li> </ul>



Stakeholders	Significance to Us	2019 Topic of Concern	Communication channel	Communication Frequency	Outcomes
Customers	Based on the management philosophy "Quality, Service, and Contribution to Society," we engage with customers and pave way for sustainable management with an appropriate amount of profit	<ul style="list-style-type: none"> <li>▪ Customer Rights and Product Safety</li> <li>▪ Emergency Events Prevention and Handling</li> <li>▪ Effluents and Waste Management</li> </ul>	<ol style="list-style-type: none"> <li>1 CSR questionnaire</li> <li>2 Customer satisfaction survey</li> <li>3 Website disclosure of price, product and service</li> <li>4 1912 Customer Service Hotline</li> <li>5 Regular telephone and mail interviews and contacts</li> </ol>	<ol style="list-style-type: none"> <li>1 CSR Questionnaire: Once a year</li> <li>2 Customer satisfaction survey is conducted once a year</li> <li>3 Open disclosures are made depending on product and service nature</li> <li>4 More than 100,000 calls are received through customer service hotline per year</li> <li>5 Various Types of Contact: At least 1,000 times a year</li> </ol>	<ul style="list-style-type: none"> <li>▪ To understand customer needs and opinions, we constantly conduct satisfaction surveys and report the results at the review meeting for the reference of continual improvement</li> <li>▪ CPC's customer service center received a satisfaction rate of 99.3% in 2019</li> </ul>
Government	As a state-owned enterprise, CPC continues to support government policies and contribute to sustainability development in Taiwan	<ul style="list-style-type: none"> <li>▪ Effluents and Waste Management</li> <li>▪ Emergency Events Prevention and Handling</li> <li>▪ GHG Management</li> <li>▪ Climate Change Response</li> </ul>	<ol style="list-style-type: none"> <li>1 CSR questionnaire</li> <li>2 Charity event</li> <li>3 Visit and subsidy (donation)</li> <li>4 Participation in charity event and construction</li> <li>5 Official correspondences</li> <li>6 Communication meetings of various form</li> </ol>	<ol style="list-style-type: none"> <li>1 CSR Questionnaire: Once a year</li> <li>2 Others, at least 100 times a year</li> </ol>	<ul style="list-style-type: none"> <li>▪ CPC responds proactively to national policies such as energy transformation, and contributes its part to provide stable energy supply to the society's expectation. The Company contributed NT\$150.1 billion of tax revenue in 2019.</li> </ul>

Stakeholders	Significance to Us	2019 Topic of Concern	Communication channel	Communication Frequency	Outcomes
Employees	CPC views employees as the most important capital, and is constantly looking for ways to create a friendly workplace and introduce competitive human resource policies. Employees are offered comprehensive training and assurance to work-life balance	<ul style="list-style-type: none"> <li>▪ Workplace Health and Safety</li> <li>▪ Employee Recruitment and Retention</li> <li>▪ Employee Benefits, Diversity, and Equality</li> </ul>	<ol style="list-style-type: none"> <li>1 CSR questionnaire</li> <li>2 CPC Employee Grievance Policy</li> <li>3 Employee representative in the board of directors</li> <li>4 Dedicated webpage and complaint hotline</li> <li>5 Labor-management Meeting</li> <li>6 Chairperson's and President's mailbox</li> <li>7 CPC Monthly</li> </ol>	<ol style="list-style-type: none"> <li>1 CSR Questionnaire: Once a year</li> <li>2 Employees may raise complaints as needed</li> <li>3 Board meetings, held once per month</li> <li>4 Others, at least 30 times a year</li> </ol>	<ul style="list-style-type: none"> <li>▪ Approximately NT\$130 million of training budget were committed in 2019. CPC organized a total of 3,799 training sessions and received approximately 118,000 enrollments during the year, for which it was awarded National Talent Development Awards by the Ministry of Labor</li> <li>▪ A total of 6 labor-management collective bargaining meetings and 24 labor-management meetings were convened in 2019</li> </ul>
The Media	CPC sees media as an important partner for external communication, and strives to maintain relationship through information sharing, seminar etc. so that CPC's mission, philosophy and performance can be properly conveyed to the public	<ul style="list-style-type: none"> <li>▪ Emergency Events Prevention and Handling Effluents and Waste Management</li> <li>▪ R&amp;D and Innovation</li> </ul>	<ol style="list-style-type: none"> <li>1 CSR questionnaire</li> <li>2 Instant press release</li> <li>3 Press conference</li> </ol>	<ol style="list-style-type: none"> <li>1 CSR Questionnaire: Once a year</li> <li>2 Others, at least 500 times a year</li> </ol>	<ul style="list-style-type: none"> <li>▪ Through press conference and press release, we work with media partners to communicate with the general public</li> </ul>





## Communication and Grievance Channels

### ■ Employee Grievances

CPC addresses employees' grievances in an honest, open, immediate and direct manner, and implements a set of Employee Grievance Policy to protect employees' rights. Employees may raise grievances when there are objections to a reward or punishment decision; or when employee rights and interests are damaged due to inappropriate systems, regulations, or administrative measures; or when there is employee misconduct. CPC has established the Employee Grievance Handling Committee with seven to nine seats held by the Chief (VP) of related departments and offices, and the Chairperson and representatives of the labor union. 1 Employee Grievance Handling Committee meeting was convened to review 1 case in 2019, and the case has been properly resolved.

CPC has established a set of Sexual Harassment Prevention, Complaint and Discipline Guidelines in accordance with the government's "Act of Gender Equality in Employment," "Sexual Harassment Prevention Act," "Regulations for Establishing Measures of Prevention, Correction, Complaint and Punishment of Sexual Harassment at Workplace" and "Ministry of Economic Affairs Notes on Sexual Harassment Prevention, Complaint, Investigation and Discipline," and assembled a Sexual Harassment Complaint Review Committee to handle sexual harassment claims. In addition, dedicated webpage, hotline and personnel have also been arranged to receive and handle related complaints. On the arrival of new employees, we introduce them to the new work environment and arrange courses on sexual harassment prevention and introduce grievance mechanisms for them. Managers and staff of all levels are subjected to annual training on the topic of sexual harassment prevention and gender equality. Awareness promotion and prevention tasks are being performed on a routine basis. A total of 5 sexual harassment complaints were raised in 2019, all of which have been properly resolved.

### ■ Labor-management Meeting

According to rules, CPC is required to convene labor-management meetings at least once every 3 months; a total of 24 regular labor-management meetings (including company-wide and headquarter meetings) were held in 2019. Minutes of previous labor-management meetings have been disclosed on Intranet to facilitate transparent communication and harmonic work relationship. Proposals discussed at labor-management meetings in 2019 are categorized as follows:

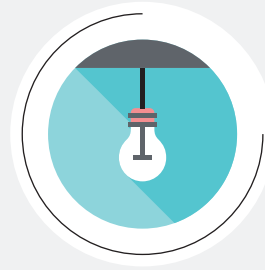
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Coordination of labor-management relations and promotion of labor-management cooperation



Labor conditions



Work environment



Others

CPC has not established any collective bargaining agreement with Taiwan Petroleum Workers' Union, but both parties are committed toward reaching consensus in all negotiations.

### Highlights of Labor-management Relation in 2019

- 💡 A total of 6 collective bargaining meetings and 2 collective bargaining discussions were held in 2019 to discuss 55 work-related articles in 9 chapters.

### Communication with External Stakeholders

CPC maintains communication with the outside world, and actively gathers and responds to queries or suggestions through corporate website, department website, CPC Monthly, meetings, events, the media and unions.



[Supervisor's Mailbox](#)



[Service Mailbox \(sales responsible units, Chairperson, President, and government ethics unit\)](#)

### Customer visit

As part of its service to customers, CPC pays regular and unscheduled visits to customers, and gathers and analyzes their suggestions and requirements in order to explore solutions. For the sale of oil products, CPC paid customers a total of 3,156 visits in 2019 and helped customers resolve 531 issues concerning product use.

## ▶ Customer complaint and suggestion




In 2019, we received a total of 227,236 cases, including 222,407 customer enquiries, 2,706 customer suggestions, 1,092 customer comments, 174 customer complaints, and 857 other cases (including affirmation and recognition). The Customer Service Center and Customer Service Office resolved 96.4% of these cases, and 3.6% (8,218 cases) were referred to related responsible units to reply to customers. It took about 3-6 workdays for the responsible unit to resolve a referred case. A case is deemed overdue when it remains unsolved after six workdays, and either a longer time is required or the customer is unreachable. In 2019, there were 37 overdue cases, with an overdue rate of 0.02%. All 174 consumer disputes (customer complaints) were resolved in time.

CPC conducts satisfaction survey on the quality of service delivered through the customer service center in order to learn how satisfied customers are with the responses and the ways their queries are handled. The 2019 survey showed a high satisfaction rate of 99.3%, which indicates that customers felt satisfied and reassured with CPC's methods and attention.

## ▶ Communication with local communities and partners

CPC engages the public in active communication, and has Neighborhood Engagement Guidelines and Neighborhood Engagement Review Committee in place to govern engagements of key production or operational sites with local city/county governments, government agencies, schools, organizations and community service offices. Review meetings are held on a monthly or ad-hoc basis to discuss local neighborhood engagement needs and ways to support the local economy and give back to the society.

### Highlights of 2019

-  **Regular meetings:** 12 review meetings and 5 ad-hoc meetings were convened in 2019
-  **Quarterly visits:** on-site visits were arranged once every three months to assist local units with their neighborhood engagement efforts.
-  **Annual tasks:** CPC hosts a 2-day neighborhood engagement task meeting at its Chiayi Human Resource Training Center each year to help employees develop skills that are relevant to their tasks. Plans and uses of the neighborhood engagement budget are discussed at the end of each meeting.

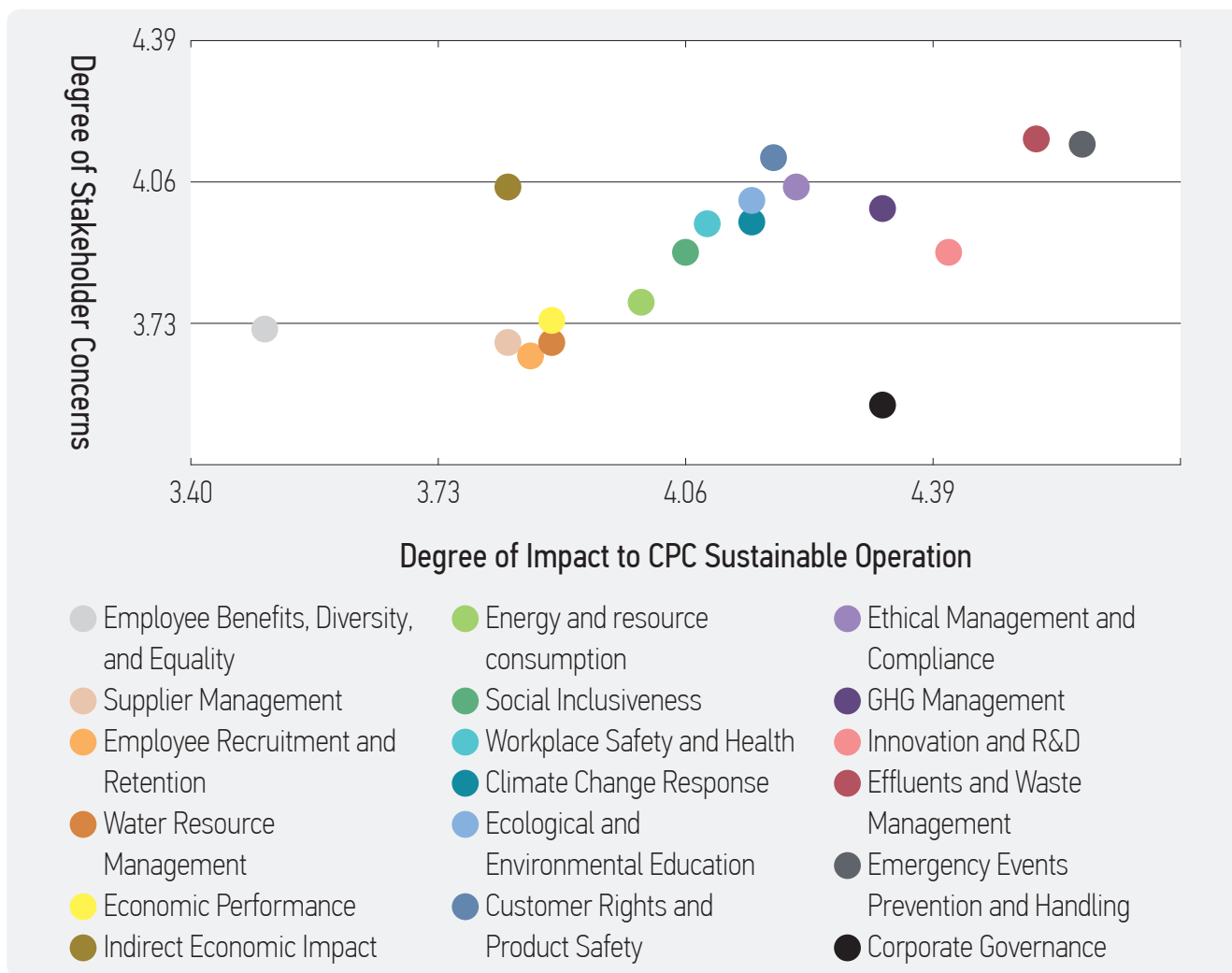
Driven by the spirit to “give back to the society,” CPC and local organizations, but also engages them in the development of sustainability culture through active communication and visits. For more details on social communication, please refer to Chapter 5 CPC and Social Co-prosperity.

## 1.4 Material Topics of Sustainability in 2019

CPC values and keeps track of stakeholders' suggestions regarding sustainability management. Through a well-established and systematic process for material topic identification, we identify topics that concern stakeholders more or with greater impact on sustainable management, which become the subject matter of the Sustainability Report. Process for Identification of Material Topics:



During the stakeholder identification process mentioned in Section 1.3 above, issues concerning global, national and industry trends are taken into consideration to create a “Stakeholder Concern Survey” with 20 questions covering environmental, social, economic and governance aspects, which is subsequently distributed to the 9 categories of stakeholders. Meanwhile, an “Internal Sustainability Impact Survey” comprising the same questions is distributed to gather senior managers' response. For both surveys, each topic is scored on a scale of one to five. A topic with the least impact on CPC's sustainable management or of the least stakeholder concern will be scored with one point, and a topic with the highest impact on CPC's sustainable management or of the highest concern will be scored with five points. The score of each topic should be different. A response will be considered invalid when the score of all topics is the same or only the score of one or two topics is different. A total of 397 stakeholder questionnaires were recovered in 2019, and 341 (86%) of which were valid responses; as for management questionnaires, all 34 responses recovered were valid. After thorough analysis and prioritization, we have analyzed our 2019 sustainability issues as follows. The further an issue is positioned in the top-right corner of the matrix, the higher its impact is on CPC and the higher concern it is to stakeholders.



After careful analysis, the top 12 issues were chosen as material topics to be communicated in this report. For each of the topics identified, CPC has disclosed its performance highlights, management approach and actions for the year to address stakeholders' concern. This year's material topics and impact boundaries are shown in the following table; refer to corresponding chapters for more information.

Aspect	Prioritization	Material Topic	Within Organization	Outside Organization	Corresponding Section	Corresponding GRI disclosure
Risk	1	Emergency Events Prevention and Handling	CPC	NPOs/NGOs, the media, customers	1.5	GRI 102-11
Environmental	2	Effluents and Waste Management	CPC	Shareholder, the Government, Communities, NPOs/NGOs, the Media	3.5	GRI 306

Aspect	Priori- tization	Material Topic	Within Organi- zation	Outside Organization	Corres- ponding Section	Corres- ponding GRI disclosure
Environ- mental	3	GHG Management	CPC	Shareholder, the Government, Public representatives, Legislators, NPOs/ NGOs, the Media	3.3	GRI 305
Governance	4	R&D and Innovation	CPC	Partners and Customers	3.2	-
Social	5	Customer Rights and Product Safety	CPC	Communities, Partners, Customers, the Media, and Public representatives	2.3	GRI 418
Governance	6	Ethical Management and Legal Compliance	CPC	Shareholder, the Government, Public representatives, the Media, Partners, Customers	2.2	GRI 205-3
Environ- mental	7	Ecological and Environmental Education	CPC	The Government, Public representatives, Communities, NPOs/ NGOs, the Media	3.6	GRI 304
Environ- mental	8	Climate Change Response	CPC	Shareholder, the Government, Communities, NPOs/ NGOs	3.1 3.2	-
Social	9	Workplace Health and Safety	CPC	The Government, Employees, Public representatives, Customers	4.2	GRI 403
Social	10	Social Inclusiveness	CPC	Public representatives, Communities	5.1	-
Governance	11	Indirect Economic Impact	CPC	Public representatives, Communities, NPOs/ NGOs, the Media	3.2	GRI 203
Governance	12	Corporate Governance	CPC	Shareholder, the Government, Public representatives, Employees, Customers, Partners, Communities	2.1	GRI 102

For details on corresponding indicators, please refer to Appendix 1. GRI Standards Index

## Material topics, ranking and implications

Priori- tization	Material Topic	Significance to Us
1	Emergency Events Prevention and Handling	It is CPC's goal to ensure stable supply to domestic oil and gas demands while enforcing sustainability management, and crisis handling is a key issue that the organization must overcome
2	Effluents and Waste Management	It is CPC's responsibility to reduce environmental impact and lessen wear and damage to land
3	GHG Management	Through action projects and plans, CPC involves itself in the fight against global warming
4	R&D and Innovation	CPC proactively develops green energy, green materials, and green technologies toward sustainability management and transformation
5	Customer Rights and Product Safety	Providing consumers with products and services of consistent quality is the fundamental value of all businesses, including CPC
6	Ethical Management and Legal Compliance	Honesty, integrity and openness are how CPC earns the trust of its stakeholders
7	Ecological and Environmental Education	As one of Earth's citizen, it is CPC's obligation to preserve balance of the natural environment and the ecosystem
8	Climate Change Response	CPC spares no effort in mitigating impact and preventing potential damage of climate change
9	Workplace Health and Safety	Assuring employees' health and safety and retaining human capital are part of CPC's sustainable foundation
10	Social Inclusiveness	CPC strengthens local relations by giving back to the local community, and operates with social inclusion in mind
11	Indirect Economic Impact	CPC exists to provide stable energy supply for Taiwan, and create both economic and non-economic values.
12	Corporate Governance	It is CPC's fundamental obligation as a state-owned enterprise to adopt pragmatic and transparent management practices

CPC has identified 12 material topics for this year; they cover all 11 material topics addressed in 2018 with the addition of “Indirect Economic Impact.”

## Difference between Material Topics Identified for 2019 and 2020

Topic ranking	2019	2020
	Name of topic	Name of topic
1	Emergency Events Prevention and Handling	Emergency Events Prevention and Handling
2	R&D and Innovation	Effluents and Waste Management
3	Effluents and Waste Management	GHG Management
4	Customer Rights and Product Safety	R&D and Innovation
5	Corporate Governance	Customer Rights and Product Safety
6	Climate Change Response	Ethical Management and Legal Compliance
7	GHG Management	Climate Change Response
8	Ethical Management and Legal Compliance	Workplace Health and Safety
9	Workplace Health and Safety	Social Inclusion
10	Ecological and Environmental Education	Ecological and Environmental Education
11	Social Inclusion	Indirect Economic Impact
12		Corporate Governance

## 1.5 Risk management Management Approach

### Emergency Events Prevention and Handling

#### Policy and commitment

- ✓ Apart from establishing the "Principles for Risk Management and Crisis Handling Practices," a risk management system, and an internal audit system, we activate the Crisis Response Team at crisis outbreak to maintain the effective operation of internal control to ensure steady business operations.

#### Goals | Short-term

Based on the risk management policy, each unit carries out their duties and functions with respect to its objectives and plans; implements routine operations; manages, prevents, and monitors risks and makes continual improvement; and establishes an effective emergency response and reporting system.

#### Goals | Medium/long-term

- 1 Arrange appropriate training and education on risk management or organizational learning for employees of all levels for them to understand their responsibilities, develop the ability to carry out risk management tasks, enforce the risk management mechanism, and reduce operational risk of the Company.
- 2 Equip employees with risk awareness and risk management ability; blend risk management into routine operations and decision operations; and improve corporate crisis handling capacity to achieve our medium- and long-term plans and sustainable management goals and protect the rights and interests of stakeholders.



## Specific Actions

- 1 Establish the Risk Management Committee and a risk management team for each unit to constantly operate the CPC risk management mechanism, and the enterprise risk management (ERM) system to systematically record, trace, and control the improvements of all types of risks occurring in CPC.
- 2 Organize training and internal learning activities for risk management, assessments, and professional technologies.
- 3 Establish the “Emergency Response Team Operating Regulations” and emergency response plans.
- 4 Annual onsite audit by the Internal Inspection Office.

## Measurement Mechanisms

- 1 Assess with the “Risk Matrix.”
- 2 Host Risk Management Committee meetings regularly to review the effectiveness of risk management of each unit.
- 3 The Internal Inspection Office plans and implements the annual onsite audit program to review the suitability and effectiveness of our risk management system.

We have established the “Principles for Risk Management and Crisis Handling Practices” and set four risk management policies as the guidelines of organizational risk management.

Reduce business risks for corporate sustainability

Adopt total risk management and enforce operating procedures

Improve risk management capacity and shape a risk management culture

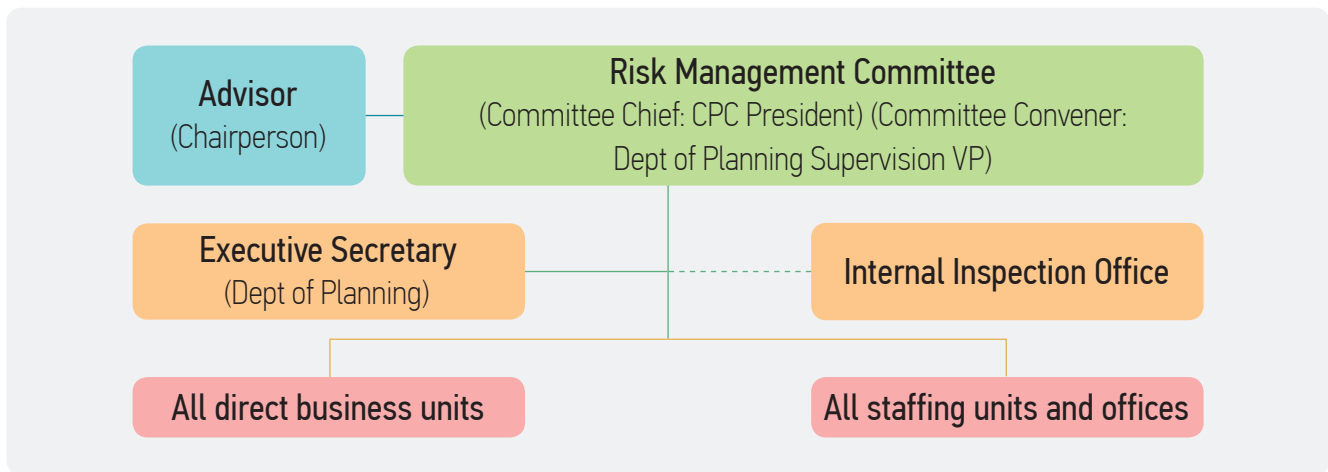
Enhance the communication with employees and stakeholders and enforce the risk management policy

## □ Risk Management Committee

In March 1998, we established the “Risk Management Committee” which holds a committee meeting annually. Its missions include reviewing the risk items and risk profiles proposed by all units, screening important overall risk items, coordinating and supervising the risk management of individual units, performing rolling review of risk change factors according to current events, taking timely precautionary actions, managing, and integrating related resources.



## Risk Management Committee Organization Chart



Risk management speech for senior executives



Risk management course

### Operation of risk management

#### Bottom-up risk management

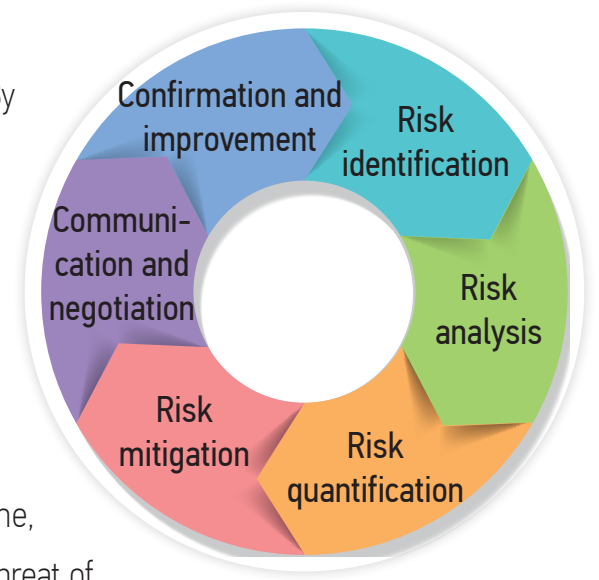
Each unit has a risk management team chaired by the unit chief to promote risk management, preventing and monitoring risk within the unit, and make continual improvement. The risk management teams propose the annual risk items and risk profiles. After reviewing such risk items and risk profiles, the Risk Management Committee adjusts major risk items and the risk level and notifies all units to make revisions and control accordingly. In response, the risk management teams propose risk solutions, review and monitor the status of improvement periodically, and report to the Risk Management Committee to follow up the effectiveness of handling.

#### Top-down risk management

The Risk Management Committee supervises the status of risk management of each unit and comprehensively assesses the influence of the risks of each unit in terms of financial losses, personnel casualties, loss from business disruption, company reputation, public opinions, violation of laws and regulations, and human resources to screen important overall risk items for further discussion; develop the organizational risk profile; and notify the responsible units to make corrections and control and implement constant risk management, in order to reduce operational risks.

**Risk management outcome**

Risk management is a cycle of ongoing improvements. By identifying, analyzing and quantifying risks, CPC is able to screen and prioritize risks relevant to business operations. Risks of greater significance are addressed appropriately to mitigate potential impact, and verify improvement outcome through communication, supervision and discussion. Risks are re-assessed after one whole cycle. Once the residual risk falls below the risk tolerance line, countermeasures are proven effective, indicating that the threat of risk has been reduced to an acceptable level.



In 2019 we identified ten risk items. After taking corrective actions and continuous monitoring, the residual risk value of these ten risks is below our risk tolerance line. After taking measures to make improvements, and keep monitoring the risk items, seven of which maintained the same or lowered; on the other had, one rose and two is below the risk tolerance line, and was unmanaged.

Identification of risks and opportunities	Risk category	Response measures and actions
Construction or operation risk due to failure to implement the OHS SOP (including contractors).	Operational management	<ol style="list-style-type: none"> <li>1 Enhance audits of the issuance of construction permits and the OHS SOP compliance of contractors.</li> <li>2 Trace incident to the cause of occurrence. Include the revision of the relevant SOPs and implementation of training and education as important evaluation items for promotion.</li> </ol>
Risk of talent and core technology succession gap and outsourcing overall risk	Operational management	<ol style="list-style-type: none"> <li>1 Accelerate new employee recruitment, enhance core professional training and implement mentorship to help employees develop diverse skills</li> <li>2 Organize technology exchange and learning with external experts and across departments and discussion activities with retirees.</li> <li>3 Maintain documentation of proper knowledge, including SOP</li> <li>4 Retain a certain proportion of planning and operational workforce of core business; outsource non-core business activities</li> <li>5 Share case studies of good knowledge management</li> </ol>

Identification of risks and opportunities	Risk category	Response measures and actions
Stable supply and safety of oil and gas	Operational management	<ol style="list-style-type: none"> <li>1 Diverse the supply sources of oil and natural gas, enhance safety stock control, and expand oil and gas exploration and acquire oil and gas fields in politically stable countries.</li> <li>2 Promote the third LNG Receiving Terminal Project; increase the number of available tanks to relieve strain on natural gas reserve</li> <li>3 Exercise management over the reliability of gas supply equipment and buildings, and establish SOP to ensure proper operation and maintenance</li> <li>4 Examine key points of supply. Develop plans for backup gas pipeline, provide dual-source gas supply for key customers and organize annual drills and training on incidental disruption of gas supply according to plan</li> </ol>
Leakage of long-distance oil and gas pipelines	Operational management	<ol style="list-style-type: none"> <li>1 Implement pipeline patrol and contact with the disaster response center, and plan pipeline post-disaster response plans.</li> <li>2 Implement pipeline patrol and pre-construction onsite inspection SOPs.</li> <li>3 Monitor and check oil delivery and receiving quantity through the pipeline monitoring system; and find abnormal points with cathodic protection (CP) system measurement, close internal potential survey (CIPS), and Intelligent PIG (IP) checks.</li> <li>4 Perform periodic check of alternative pipelines and equipment to keep them in good condition.</li> <li>5 Enhance pipeline monitoring through system, verify the volume of oil distributed and received, inspect pipelines, identify potential and suspicious points of failure and respond to abnormal signs immediately</li> <li>6 Monitor monthly inspection findings of the Pipeline Audit Team</li> </ol>
System halt and unplanned boiler halt	Operational management	<ol style="list-style-type: none"> <li>1 Organize training and education activities for engineers and related operating personnel.</li> <li>2 Pre-construction training and education and re-education after violation for contractors.</li> <li>3 Perform system overhaul and enhance maintenance quality to raise equipment reliability.</li> <li>4 Establish the commissioned refinery mechanism for crude oil and semi-finished oil products, and arrange oil tankers to transport oil products for emergency supply.</li> <li>5 Apply rigorous control over natural gas tank capacity so that inspections are completed according to timeline; conduct regular tracking on the inspection of storage tanks</li> </ol>



Identification of risks and opportunities	Risk category	Response measures and actions
Oil price fluctuation risk	Economic	<ol style="list-style-type: none"> <li>1 Hold oil price hedging strategy meetings periodically to analyze the difference trend between export oil products price and crude oil cost based on international economic trend, price discuss and establish hedging strategies.</li> <li>2 Constantly track oil price trends to enter the market at better timing, and lock on the profit of export oil products.</li> <li>3 Timely explain the oil price risk to the government and strive for the opportunity to review the floating oil price mechanism from the government.</li> <li>4 Establish an oil price stabilization reserve system that uses earnings generated from periods of oil price hike to cover losses from price fall or to absorb slow rises</li> </ol>
Offshore pipeline risk due to constant seabed collapse	Climate and the ecosystem	<ol style="list-style-type: none"> <li>1 Implement seabed collapse protection to stabilize seabed and prevent current washing to ensure the safety of offshore oil and gas pipelines; establish operation and maintenance SOPs; strengthen drills according to the related emergency response plans to ensure the safety of offshore transportation of oil and gas.</li> <li>2 Perform emergency repair according to the related SOPs to reduce damage and ensure constant monitoring and maintenance after an accident.</li> <li>3 Perform ongoing inspections and tests on equipment and plan new pipeline works</li> </ol>
Mishandling of crisis/incident	Operational management	<ol style="list-style-type: none"> <li>1 Establish CPC's spokesperson system and reporting system. Events such as emergency or unscheduled media visit shall be reported according to the "Disaster and Emergency Event Reporting Sheet"</li> <li>2 Enhance employees' alertness and ensure their familiarity with emergency reporting procedures and proper response to crisis</li> <li>3 Issue press release, statement and organize press conference to address public opinions in a timely manner</li> <li>4 Develop an inter-department reporting system using a variety of mechanisms such as the Intranet, internal communication system etc. to avoid delay in report</li> </ol>

Identification of risks and opportunities	Risk category	Response measures and actions
Risk of poor construction quality	Operational management	<ol style="list-style-type: none"> <li>1 Increase the frequency of random quality inspections. Promote employees' awareness and raise the intensity of unnotified audits. Utilize the construction quality audit mechanism Identify possible areas of weakness in construction projects using the construction quality audit mechanism and take corrections and preventions in a timely manner. Communicate with workers on site to establish actual requirements and provide useful reference for future designs.</li> <li>2 Enhance employees' quality awareness and tighten quality control; assign employees to public construction quality training or courses of similar nature</li> <li>3 11 meetings were organized in 2019 to convey quality in large-sum procurement and construction project</li> </ol>
Impacts of green energy transformation	Regulations	<ol style="list-style-type: none"> <li>1 Adjust the refinery and production model, make structural improvements and adopt advanced technologies</li> <li>2 Develop new technologies and products in sole capacity or by engaging external partners</li> <li>3 Install charging equipment in gas stations, daily equipment status examination by checklists, and respond systematically to customers' requirements and suggestions</li> <li>4 Increase refinery of reformat using existing production capacity; raise production of petrochemical products to accommodate adjustments in the oil production chain</li> <li>5 Construct units to effectively reduce pyrolysis gasoline</li> <li>6 Export gasoline in the form of semi-finished goods (with additives) to increase product value</li> <li>7 Convert oil or petrochemical products into high-value specialized chemicals, electrical supplies and low-carbon energy sources</li> </ol>

Note: We have also identified the potential risks and opportunities brought by climate change. Please refer to section 3.1 Risk and Opportunities from Climate Change for related counter measures.

# CH2

## Business Integrity and Precision Management

### Chapter summary

A robust corporate governance framework combined with policies can provide CPC a solid foundation needed to expand business. Furthermore, by applying the latest technology and management know-how into key business activities, CPC is able to improve operating efficiency, business performance and competitiveness over time to become a sustainable energy supplier with a global vision.

### Corresponding SDGs



### Reader Priorities

- Shareholder (MOEA)
- Partners
- Public representatives
- Communities
- Customers
- Government
- Employees
- Media
- NPOs/NGOs

## Chapter Highlights



Rated **AAA (tw)** by Fitch  
Ratings for 14 consecutive years



Self-evaluated **85**  
inside the board



Contributed **NT\$150.1**  
**billion** to government taxation



Over **90%**  
customer satisfaction



**229,000** transactions  
were completed using NFC mobile  
payment + CPC Pay

## Management Approach

### Corporate Governance, Ethical Management, and Legal Compliance

#### Policy and commitment

- ✓ CPC upholds integrity in all corporate activities, and enforces sound corporate governance by following "Corporate Governance Best Practice Principles," "Code of Ethical Conduct," "Rules of Procedure for Meetings of Board of Directors," "Act on Recusal of Public Servants Due to Conflicts of Interest" and "Integrity and Ethics Principles for Employees of the Ministry of Economic Affairs." Measures have been taken to enhance board and supervisor functions, improve information transparency and thereby protect stakeholders' interest.



[CPC website  
of Corporate  
Governance  
section](#)

#### Goals | Short-term

- 1 The primary goal is to avoid major violation against social, environmental or economic laws, while at the same time fulfill responsibilities to the society and to the government's policies.
- 2 Make honest and transparent disclosure of information according to laws or instructions of the authority; adhere to conducts of high ethical standard and avoid corruption.

#### Goals | Medium/long-term

Enhance the quality of internal control system based on the "Regulations Governing Establishment of Internal Control Systems by Public Companies" and arrange corresponding training and anticorruption courses activities from time to time.



### Specific Actions

- 1 Arrange directors and supervisors to perform onsite inspection of each unit and investee.
- 2 3 “Sustainable Operations Promotion Committee” meetings were convened to discuss relevant proposals; unscheduled reports were made to the board of directors.
- 3 In addition to setting up a governance section and business bulletin section on the corporate website, we regularly disclose financial and non-financial information, such as the annual report and the sustainability report.

### Measurement Mechanisms

- 1 Hold the board meeting every month, review and approve operational strategies, and assess management team performance.
- 2 Perform risk assessment in relation to internal control every year.
- 3 Submit the business status report and the performance review report to MOEA every month and report performance and related review reports to the Executive Yuan every year.
- 4 In 2019, CPC participated in the corporate governance evaluation that National Taipei University of Technology had organized at the request of State-owned Enterprise Commission, Ministry of Economic Affairs.

## 2.1 Corporate governance

CPC has been rated “AAA (tw)” by Fitch Ratings for 14 consecutive years

This credit rating indicates that the subject has exceptional capacity to repay financial commitments, and the likelihood of being affected negatively by a foreseeable event is extremely low

### 2.1.1 Functions of the board of directors

#### Composition

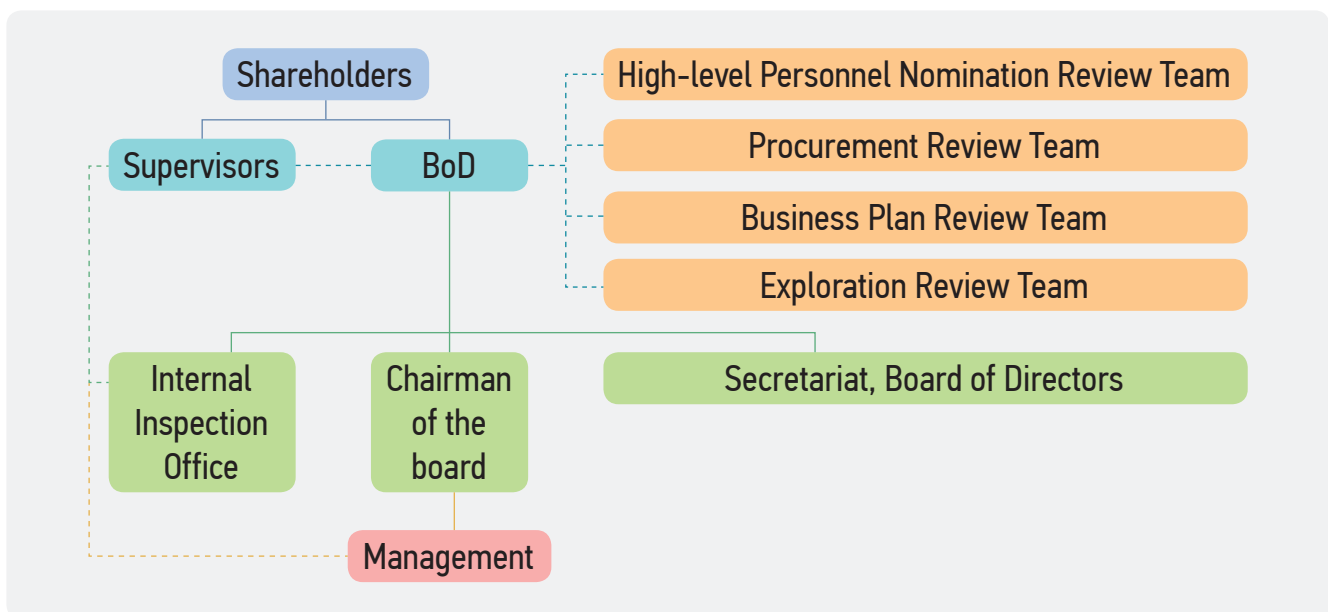
We are a wholly-owned SOE of MOEA. As the top management of the company, the board of directors exercises authority on behalf of the shareholder. There are 13 directors and 3 supervisors in the board, all are assigned by MOEA. The chairperson and the president are executive directors, and there are 2 independent directors. For details on directors' and supervisors' academic/career background, salary composition and education background, please refer to the 2019 annual report.

Information on CPC board of directors 2019			
Age	Composition of directors (including independent directors) and supervisors		
	Gender	Count	Percentage (%)
Aged 30~50 (inclusive)	Male	2	12.5%
	Female	2	12.5%
Aged 51 and above	Male	11	68.7%
	Female	1	6.3%
Average age <sup>1</sup>	59.2		
Average directorship <sup>1</sup>	30.5 months		
Meetings held (including extraordinary and regular board meetings)	17		
Director attendance rate	91%		

Note 1: The above data applies to the current (33rd) board of directors

## Board operation

Apart from hearing and approving the report on the major strategy and status of operations from different departments on a monthly basis, the board of directors reviews the progress of operational strategies and assesses business performance to maintain corporate growth. This practice not only aligns with market demands, but also conforms with international trends.





To fulfill the supervision duty, enhance proposal discussion efficiency, and improve proposal quality, we have established the “High-level Personnel Nomination Review Team,” “Procurement Review Team,” “Business Plan Review Team” and “Exploration Review Team” to review and discuss important strategic projects, exploration projects, and procurement projects before a board meeting and submit the review results to the board as reference of making decisions.

## 2.1.2 Corporate governance evaluation

CPC is dedicated to protecting stakeholders' interest and considers enhanced board structure and function to be essential for its CSR efforts, sustainability vision, and competitiveness as a global energy supplier. For this reason, CPC has implemented a set of “Directives for Performance Assessment of the Board of Directors” based on “Corporate Governance Best-Practice Principles for TWSE/TPEX Listed Companies” that introduces a self-assessment approach for evaluating board performance. Furthermore, individual directors are required to conduct self-assessments in line with “Notes on Appointment of Directors, Supervisors and Key Staff in State-owned Enterprises, Private Businesses and Non-profit Organizations by Ministry of Economic Affairs and Subordinates” and “Notes on Implementation of Independent Director System by Ministry of Economic Affairs and Subordinates” and set performance targets accordingly to enhance board efficiency. Indicators used in the assessment include: level of participation, decision quality, board composition, directors' ongoing education and internal control of the Company. The most recent assessment concluded a total score of 85, and directors had raised improvement suggestions on various aspects of business operation. Outcome of the assessment has been reported to the board of directors and published on the corporate governance section of CPC's website.

In addition to internal assessments, the State-owned Enterprise Commission, Ministry of Economic Affairs also conducts corporate governance evaluation regularly on CPC through document review and on-site visit. The 2019 corporate governance evaluation was carried out by National Taipei University of Technology, during which members of the board including: the Chairperson, independent directors, workers' director, and supervisors were interviewed individually while corporate governance and board practices were investigated in great depth. Outcome of the evaluation is as follows:

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## Corporate governance evaluation organized by State-owned Enterprise Commission, MOEA

### Strengths

- 1 **Employee rights:** The Chairperson shows initiative in promoting harmonic employment relation and values opinions raised by other directors, which helps improve the effectiveness of board meetings and the corporate governance system.
- 2 **E.P.S goals and response to UN's SDG:**
  - **E (Environment)** emphasizes on pollution prevention, energy conservation, waste reduction and sustainability of the environment - Having attained Management Level in the CDP (Carbon Disclosure Project) questionnaire is a strong indication that the Company possesses the proper governance framework, risk management tools and reduction actions to address climate change.
  - **P (People)** emphasizes on friendly workplace, customers' opinions and safety culture - Through mentorship, job rotation and by having retirees teach, audit and involve in meetings, the Company is able to share experience and transfer knowledge.
  - **S (Society)** emphasizes on creativity, communication, care for the underprivileged and social co-prosperity - CPC raises its social influence through engagements such as talent training, charity, sports promotion, and co-prosperity programs at African mining sites. CPC also engages Green Dragon Summer Camp as a means to educate children on the topic of sustainability.

All internal departments have been instructed to examine the suggestions raised in annual corporate governance evaluations, and are required to devise improvement measures to continually enhance the existing corporate governance system. Below is a summary of improvement measures that CPC had undertaken in 2019 based on suggestions of the 2018 corporate governance evaluation:

### Specific improvement highlights in 2019

#### Board meeting procedures that cater for speakers' rights and efficiency

- Not only do directors and supervisors take the initiative to express personal opinions during meetings, the chairperson would also ask attending directors and supervisors for their opinions on current topics
- Issues of high significance are generally resolved at board meetings and raised according to internal policies. In the event of emergency, standing director meetings or extraordinary director meetings can be held so that managers are given timely direction and authorization to proceed with subsequent actions
- To fulfill the supervision duty, enhance proposal discussion efficiency, and improve proposal quality, we have established the "Procurement Review Team", "Business Plan Review Team", and "Exploration Review Team" to review and discuss important strategic projects, exploration projects, and procurement projects before a board meeting and submit the review results to the board for the reference of making decisions

#### Enhanced internal control and internal audit

- CPC conducts on-site audits and uses meeting as an opportunity to convey issues concerning internal control and audit scoring. The 2019 on-site audit covered a total of 21 units

### Specific improvement highlights in 2019

#### Project audit

- Unfinished projects from 2018 were audited in 2019 with respect to their plans and execution
- Audit focuses are prioritized on a quarterly basis; details are published on the Internal Inspection Office webpage and distributed to each unit to serve as reminder
- The Internal Inspection Office would assign personnel to conduct training at various units involved with procurement, risk management, internal control and internal audit activities

#### Enhanced risk awareness among entry-level employees for reduction of work safety and pollution incidents

- Implementation of occupational safety and health management system has been certified
- Initiatives have been taken to implement production safety management systems
- Audits of random site and time are conducted each year to evaluate safety in various locations
- Each unit has been instructed to plan emergency drills on a yearly basis and execute accordingly
- For more details, please see section 4.2 Workplace Safety

#### Feasible training and knowledge transfer plans are made for mid-level, entry-level and technical staff in each business unit External training courses are arranged as needed for business activities

- Each department conducts long-term training and offers daily guidance on exiting and future business activities
- A core talent bank training program has been planned
- For more details, please see section 4.4 Talent Development

## 2.1.3 Board and stakeholder bargaining

### Material bargaining events approved by the board of directors in 2019

- 1 Passed the decision to partially lease out 9 plots of land including lot No. 189, Emei Section (i.e. partial sections of Nanmen Green), Taoyuan District, Taoyuan City that is currently under management of Taoyuan Refinery Plant, Refining Business Division, to Taoyuan City Government for use as green park and bike rental without compensation for 5 years.
- 2 Passed the decision to lease out 6 plots of land including lot No. 514, Shijia Section, Qianzhen District, Kaohsiung City that is currently under management of Refining Business Division to Kaohsiung City Government for use as green park without compensation for 5 years. Apart from providing recreational space and landscaping benefits for local citizens, this arrangement also achieves tax-saving and is deemed appropriate for land resources that could not be used otherwise.

We have established the “List of Matters Required for Board Reporting” to define the duties of the board of directors and handling departments. The results of implementation of board resolutions shall be reported to the board for approval of recordation. When there are difficulties in implementation or needs for adjustment of a board resolution, the handling department shall report to the board for approval prior to implementation.

We have also established the “Directions for Reporting Material Events to Directors and Supervisors” defining the types of reports, routine reports, accidental material events, and reporting processes.

Rules concerning directors' recusal from interest-conflicting motions have been outlined in CPC's “Corporate Governance Best Practice Principles” and “Rules of Procedure for Meetings of Board of Directors.” In addition, proposals in relation to related party trade or board members shall be remarked in the proposal to remind directors or COI avoidance. In 2019, there were five COI proposals. Please refer to the 2019 Annual Report for details.

## 2.2 Ethical Management and Legal Compliance

### 2.2.1 Ethical Management and Legal Compliance

CPC values the trust of its stakeholders, and has established the “CPC Code of Ethical Conduct” with respect to the “Guidelines for the Adoption of Codes of Ethical Conduct for TWSE/TPEX Listed Companies” to regulate employees (including board members, management, and general employees) to develop a healthy corporate culture for sustainable ethical management.

Compliance with government regulations is the fundamental requirement. CPC pays constant attention to government policies that may potentially affect its operation and operates in line with international conventions. The Company also has rules and procedures in place to guide employees accordingly. No violation of social or economic law was found in 2019.

### 2.2.2 Anticorruption

In anticorruption work, we begin with corruption prevention. By establishing business reform and anticorruption measures and the “Principles of Co-Supervision of Government Ethics Personnel” and the “Platform for Reporting Procurement Anomalies to Government Ethics Department,” we hope to prevent procurement corruption and ensure open, impartial, and transparent competitions. All units have a government ethics department that is included in the corruption risk assessment. In 2019, 10 units implemented corruption risk assessment and reported 33 probable “corruption risk events.” Among these 33 probable “corruption risk events,” 16 (48%) were “low corruption risk events,” such as falsification of travel expenses, improper use of corporate vehicle and violation of the “Ethics Guidelines



for Civil Servants”; and 17 (52%) were “medium corruption risk events,” such as non-performance by suppliers, non-compliant delivery by suppliers, and employees’ violation of concurrent employment and recusal rules; no “high corruption risk event” was found. We have taken actions, such as administrative responsibility investigations, recovery of funds, or legal actions for criminal offences.

### Major anticorruption actions and performance in 2019

Ethics departments of various units organize annual anti-corruption events, training, gathering and propaganda to promote employees’ awareness toward anti-corruption and related laws. These activities took the form of keynote speech, online quiz, and seminar. Apart from heads of ethics department, guest speakers such as district prosecutors, anti-corruption officer’s crime investigators were invited share their experience from the perspective of the justice system using real crime cases. This approach gave employees the incentive to participate and learn knowledge on laws, integrity and anti-corruption.



- 1 **Passed by board of directors** ✓ CPC Code of Ethical Conduct
- 2 **Public disclosure**
  - ✓ The Company upholds integrity principle and adheres to the highest ethical standards. No case of lobbying was recorded on file in 2019.
- 3 **A dedicated organization, the Department of Ethics, has been established to oversee integrity and anti-corruption** ✓ Ethics personnel accompanies to procurement activity
- 4 **Integrity incident and personnel risks are analyzed and assessed on a yearly basis**
- 5 **Integrity risk assessment report**

Correspondence issued by Department of Ethics of the headquarter

Risky events are assessed by ethics units (risk levels are rated low, medium or high)

Consolidation by Department of Ethics of the headquarter

Review by the president

Report to ethics department of the competent authority
- 6 **Dedicated phone lines, fax line, EMAIL and supervisor’s mailbox are made available to receive misconduct reports, whether named or anonymous**

## Corruption reporting channels

CPC has several channels in place to receive misconduct reports. In 2019, 18 of the reported cases were referred to law enforcement, 4 were prosecuted, 2 were deferred and 3 were awarded judgment. No significant act of corruption had occurred. Furthermore, violations are compiled into case studies and conveyed to employees on a regular basis.

Ethics department receives misconduct report

Initiate administrative investigation to gather facts and evidence and establish the violating act

Findings of the investigation are circulated to the head of unit and to ethics department of the competent authority

Impose administrative liability or refer to the justice system

### Highlight in 2019

💡 CPC held anticorruption educational promotion for 49 times in 2019 and has reached 4,985 people-times participating.

## 2.2.3 Internal audit system

CPC has created an Internal Inspection Office directly under the board of directors to support corporate governance and enhance the internal control/audit system. The Internal Inspection Office includes 1 chief auditor, 15 auditors and 1 audit assistant. We respect the professionalism and independence of the Internal Inspection Office and internal auditors and give them full delegation to perform targeted audits based on the following audit framework:



[Internal audit organization and policies](#)

### Internal audit

- The Internal Inspection Office reports directly to the board of directors, and devises internal audit plans for the following year based “Regulations Governing Establishment of Internal Control Systems by Public Companies” as well as the Company’s operational goals and risk assessment outcome.
- Examine and review the defects in the internal audit system and measure the effectiveness and efficiency of operations.
  - Conduct on-site audit and make recommendations for the improvement of internal control vulnerabilities to the management and keep track on such vulnerabilities until corrections are completed.

### External supervision

- CPA certification and FSC examinations every year.
  - Accept supervision of the State-owned Enterprise Commission, MOEA, and the National Audit Office, Control Yuan.





## 2.3 Operating performance, products and services

### Management Approach

#### Customer Rights and Product Safety

##### Policy and commitment

- ✓ Implement management activities to maintain customer rights and interests and ensure product safety based on the concepts "full participation, quality improvement, and customer satisfaction," in order to provide products and services of the best quality.
- ✓ Constantly discover customer needs and maintain customer rights and benefits and product safety to achieve continual improvement, prevent problems, reduce the defect rate, improve product quality, and enhance customer satisfaction.

##### Goals | Short-term

CEM program is being introduced to 125 direct branches each year

##### Goals | Medium/long-term

- 1 Avoid violation of regulations regarding products, services, customer privacy, and personal information.
- 2 Constantly enhance customer satisfaction and improve product quality.

##### Specific Actions

- 1 Continually inspect and monitor product quality.
- 2 Hold regular meetings to review products and services and revise related procedures and operations as necessary.
- 3 Perform customer satisfaction survey and apply CEM (Customer Experience Management).

##### Measurement Mechanisms

Internal evaluation mechanisms include the customer complaint resolution rate, the customer satisfaction survey, and the performance evaluation. The Bureau of Energy also commissions third parties to implement the "Petroleum Product Quality Inspection and Management" program to ensure compliance with the national standard by spot checks.

### 2.3.1 CPC's operational performance

CPC has been entrusted with the mission to stabilize oil and gas price for the growth of the national economy since the day it was founded. In 2019, CPC generated NT\$1,014.1 billion in revenues, topped state-owned companies in net income for three consecutive year and contributed NT\$150.1 billion of taxes to the national treasury. For more financial information mentioned in CPC's consolidated financial statements, please refer to CPC's 2019 annual report.

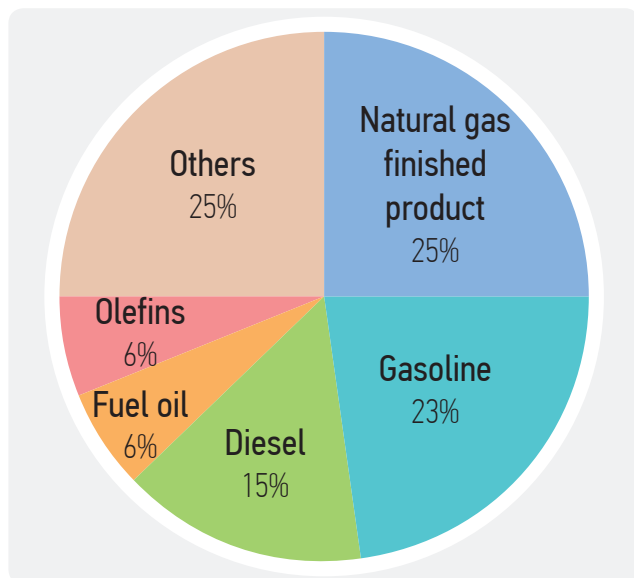
(NT\$100 mn)

	Item	Year		
		2017	2018	2019
Direct Economic Value	Revenue	8,966	10,346	10,141
Economic Value-Allocated	Operating Expense	8,459	9,903	9,779
	Employee Wages and Benefits	222	226	228
	Payment to Investors	31	41	278
	Financial contribution to governments of various countries and regions <sup>1,2</sup>	1,261	1,320	1,501
	Community Investment	3.95	3.85	4.5
Others	Net Income Before Tax	485	438	333
	Net Income	403	343	324
	Total Assets	7,450	7,695	8,019

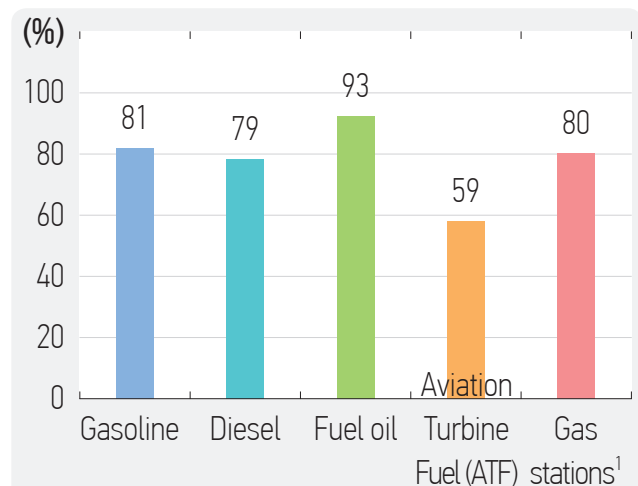
Note 1: CPC contributed NT\$126.1 billion (2017), NT\$132 billion (2018) and NT\$150.1 billion (2019) of tax revenue to the national treasury

Note 2: 2017 and 2018 figures were certified by the Legislative Yuan, whereas 2019 figures were audited

## Main products revenue weight in 2019



## Market Share of Products and Services



Note 1: Includes direct branch, franchised and collaborative gas stations

## Production and Sales of Products

Type	Unit	Quantity
Crude Refining Volume	(10,000kL)	2,376
Oil products total sales (including petrochemical products and multilateral trade)	(10,000kL)	3,431
Natural gas sales	(100mn m <sup>3</sup> )	217



## 2.3.2 Products and Customers

### Safety and quality of products and services

“Quality, service, and social contribution” are our management philosophy, as we value how product safety affects our customers. Apart from ensuring compliance with CNS standards and all applicable laws and regulations, we implement quality management with respect to the ISO 9001 international standard and disclose the information and safety data sheet of all products and services on the corporate website for the reference of stakeholders. In addition, we state the precautions in the package of individual products as warnings for consumers. There was no report of non-compliance with consumer health and safety involving our product or service in 2019.

### Customer privacy

In response to the implementation of the “Personal Information Protection Act,” apart from establishing the Customer Service Center Information Security and Personal Information Management SOP, we review existing operational mechanisms, enhance the security maintenance of information systems, and strengthen the training and education of employees in “privacy rights protection” and “information security” to ensure the retention and protection of the customer's personal information. There was no report of customer privacy invasion or leakage or theft of personal information in 2019. Please visit our corporate website for more details about our information protection policy.

### Customer Satisfaction

Aiming to serve society, we have established the “Satisfaction Survey SOP” to understand the needs and opinions of customers and provide them with complete services. We conduct surveys and make continual improvement based on the analysis results every year, in order to make continual improvement of service quality. If customer satisfaction is lower than expected, we request the related units to propose corrective and preventive actions and discuss at the management review meeting for the reference of continual improvement.

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### ▶ Product Sales Service

- By engaging customers in meetings, the Company is able to gather customers' opinions, learn the prevailing market conditions, and make flexible adjustments to marketing strategy in response
- Regular calls and visits are made to customers; data gathered from customer interviews and satisfaction surveys is analyzed to reflect customers' needs, which can be acted upon with proper solution and assistance
- CPC constructs a customer database and keeps track of customers' purchasing pattern in order to respond with an appropriate sales approach

Year		2017	2018	2019
Product Sales Service	Solvent Business	91.6	91.8	92.2
	Lubricant Business	94.3	95.2	95.8
	LPG	90.5	90.8	90.7
Gas station customer satisfaction survey (MOEA) <sup>1</sup>		96.2	97.3	98.8
Natural Gas Supply Service		97.5	96.9	96.9

Note 1: Every year MOEA outsources the customer satisfaction survey by interview or by phone of each business unit with customer-specific questionnaires, in order to find the causes of satisfaction and dissatisfaction.

Customer satisfaction of main services and products has risen for three consecutive years except for the "Natural Gas Supply Service," which stayed consistent in the last two years. Frequent renewal of gas transportation equipment had raised doubts among the public, for which the construction department has been instructed to enhance personnel training, place greater emphasis on safety and shorten the construction period to minimize impact to the public. We also strengthen our communication with the public to provide the best quality of service.

### Highlights of Customer Satisfaction - 2019

- 💡 The ministry of economic affairs conducted a CPC customer service center satisfaction investigation in 2019, and the result reached 99.1 percent.

## Customer Experience Management (CEM)

CPC focuses on consumer experience and opinions and makes continual improvement to the quality of gas station services. Therefore, we implement CEM survey customer satisfaction with the overall service, the service attitude, the filling service, and the filling environment, in order to understand the customer's feedback of our gas station services, and make progressive improvement to optimize service quality.

Year	Number of gas stations implementing CEM in the current year	Survey results
2019	125	93.4
2018	125	93.4
2017	120	92.1

## Business diversification

Committed to leading and innovating gas station services, apart from actively transforming gas stations into "CPC Smart & Green e-Station," we began business diversification to car maintenance and carwash, product sales, horizontal alliances, and business platform, while bringing more products under the proprietary brand, such as CPC Racing SN Motor Oil, Intake Valve Cleaning Solution, See Clean Laundry Detergent, Cup & Go etc. These efforts have been made to increase the service value of gas stations, provide customers with one-stop value-added services, and friendlier, more convenient, elaborate gas station.

### Carwash Express-convenient and professional vehicle cleaning service



CPC offers a broad range of carwash service from fully manual, machine-based manual, rim cleaning, waxing to frame wiping. Oil removal film and vehicle coating can be performed at additional charge. In 2019, carwash service was being provided across 284 gas stations.

### Car maintenance Express car maintenance-tyre changing and detailed diagnosis of vehicle health

Express car maintenance and tyre service facilities have been established in 70 of CPC's gas stations nationwide. They provide regular servicing and offer tyre replacement to assure drivers' safety on the road CPC prides itself for being a car doctor. All technicians on site have been certified for Class B



Vehicle Maintenance Technician. Furthermore, advanced equipment such as four-wheel positioning and Italian-made tyre changer have been installed to provide consumers with the best service quality.

### ■ CPC Compound Stores and Convenience Stores - A place for refreshment and short rest

To fulfill the shopping demand of drivers and for them to fill the needs of the trip while filling gasoline, we have established 131 compound stores and convenience stores to sell general merchandise, festival gift sets, agricultural products, own-brand products and Cup & Go.

In 2018, we launched our first coffee brand - Cup & Go at Fulin Gas station in Taipei, selling high-quality Arabica coffee imported from Antigua Guatemala at an affordable price while offering a place where drivers can take a short rest and regain mental clarity. This new establishment has impressed countless visitors to date. By January 2020, the concept was implemented in 11 additional stations to serve a greater number of consumers.



### ■ CPCBio cares for your health

Driven by "care, product, brand, perfection and quality," CPCBio offers a broad range of cosmetic solutions and cleaning supplies from essence, face mask to bathroom cleaning, dishwashing and laundry solutions. CPCBio products are sold at designated gas stations and are intended to provide consumers with quality range of household supply.



See Clean  
Bathroom  
Cleaning Solution



See Clean  
Dishwashing  
solution



See Clean  
Laundry  
Detergent



ZOEYEN  
Anti-Wrinkle  
Essence



GSH  
Bio-Cellulose  
Mask



## Horizontal alliances and commercial platform - Strategic partnership for broader range of convenience service

To maximize the effectiveness of gas station use and for the convenience of consumers, we actively cooperate with other industry participants for services such as payment collection and electric motorcycle battery exchange.

### Public Toilet Culture

CPC's nation-wide gas station network provides much relief to long-distance travelers especially during festive occasions. Not only do they provide fueling and places to rest and stretch, they also satisfy people's desperate need for bathroom break.

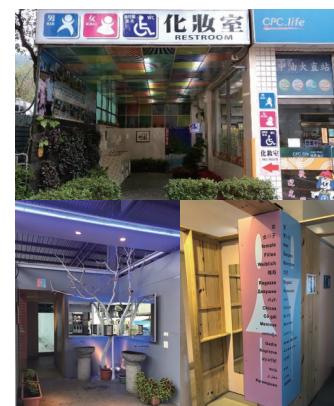
Out of consideration for consumers' convenience and comfort, CPC has made public restroom cleanliness a key aspect of internal performance evaluation, and even incorporated public toilet into its brand image. For many years, CPC has committed effort into improving the quality of its public toilets through events such as "Public Toilet Culture Forum," "Cleanliness Week" and toilet cleanup.

#### ▶ CPC Dazhi gas station

- ✓ Rated the No. 1 public toilet in Taipei City for ten consecutive years, and the Taipei City Government even awarded us the Public Toilet Excellence Certification. This means, Dazhi Gas station does not need to participate in the evaluation from December 2018 to November 2021.

#### ▶ CPC Guandu gas station

- ✓ The gas station carries a distinctive vibe with its multi-lingual signs, creative lighting, artistic decoration and exceptional cleanliness and service. It was awarded the "Public Restroom Award" in two categories, Commercial Location and Creativity by New Taipei City Department of Environmental Protection in 2019



### Highlights of gas station - 2019

**💡 In 2019, 455 of CPC's gas stations had public toilet quality rated Exceptional while another 100 stations were rated Excellent, totaled 90% of CPC's 615 gas stations**

## 2.3.3 Technology innovation

CPC is aware of new technologies including artificial intelligence (AI), big data, IoT and 5G and how they can be incorporated to create endless applications. For this reason, steps have been taken to adopt these technologies for the promotion and execution of various business activities.

## 5G application

CPC plans to adopt 5G technology for the following applications, subject to data security protections

<b>Disaster aid</b>	>	The technology can be used for emergency communication between departments, such as production, transportation, storage, tank trucks and vessels
<b>Pipeline monitoring</b>	>	Detection, monitoring and routine inspection of long-distance oil and gas pipeline, and pipeline anti-theft system
<b>IoT application</b>	>	Detection signaling
<b>Smart traffic and logistics</b>	>	Digital management of tank truck fleet and loading/unloading
<b>Real-time environment remote monitoring</b>	>	Contractor positioning system, which enables real-time monitoring of contractors' work activities and reduces unsafe practice

## AR/VR digital training

AR/VR can be incorporated into oil well platform and equipment training, which saves the time and cost of having to relocate trainees. The simulation also avoids risk of hazard in the event of error. Operator Training System (OTS) for the new No. 3 Naphtha Cracker has been designed using massive volume of data gathered from previous years. It trains employees by putting them in a simulation that is virtually indistinguishable from the actual environment.

## AI application

AI application assessment sheet

<b>Abnormality detection on key equipment</b>	>	By combining machine learning and data analysis with equipment inspection/maintenance, CPC is able to develop equipment failure prediction models and undertake precautionary measures to prevent production losses and work safety incidents.
<b>Contractor management application</b>	>	License plate recognition and vehicle tracking
<b>Electronic fence and access control</b>	>	These applications will first be implemented on critical infrastructures to facilitate prevention and tracking
<b>Alarm system</b>	>	With more rational and more effective design of the alarm system, CPC will be able to classify alarms by severity, gather historical data, analyze work site condition and manage alarm through automation



### Production analysis for cracking products

By simulating the cracking process, CPC is able to estimate how the changes in coil outlet temperature and different components of feedstocks affect production yield. This stimulation allows the production profit of crackers to be configured to achieve the optimization.

### Tank truck straying and collision alert

An advanced driver safety system can be installed to gather real-time data on whether the driver is exhibiting abnormal behavior on the road. The system will also record abnormal situation and position in real-time to ensure tank truck safety.

## Big data and IoT application

After observing governance practices and experiences of foreign petroleum and natural gas companies, CPC decided to adopt the technology for its oil field located in Chad in 2020. This new system uses complex algorithm to generate value from data gathered at oil layers, wells and facilities and presents them in ways that optimize production efficiency.

By preventing leakage increase of volatile organic compounds (VOCs), CPC is able to reduce chances of fire accident. Chiayi Plant of the Solvent Business Division adopted the VOCs AIoT solution. The system not only allows operators to remotely detect area and concentration of leakage using infrared beam, but also uses AI and big data functions to improve detection efficiency.

## Promotion of diverse payment tools

CPC has been supporting the government's goal to increase popularity of mobile payment to 90% in 2025. Following the introduction of NFC payment service to CPC's gas stations in 2018, CPC launched its proprietary payment tool called "CPC Pay" in 2019 with the support of its co-branded card issuer. This new payment tool allows virtualization of membership card, prepaid card and credit card information, which in turn enables membership points to be converted and used for mobile payment, thereby saving customers the hassle of carrying physical cards around. The CPC Pay App also offers useful features such as parking information, gas station inquiry, oil price inquiry and eTag fee inquiry to provide users the ultimate convenience. Third-party payment and electronic payment services are expected to be available at all CPC's gas stations in the second half of 2020.




Oil Price information and eTag



"CPC Pay" QR Code

### Highlights of CPC Pay - 2019

 By the end of 2019, **229,000** transactions were completed using NFC payment + CPC Pay in December, CPC Pay received **185,000** downloads and registration

## 2.4 Supply chain management

### 2.4.1 Supply chain management and assessment

As a state-owned enterprise, CPC's procurement activities are regulated by the Government Procurement Act and the Company is bound to exercise supply chain management in a fair, just and open manner. The Company treats all suppliers as key business partners and checks the tenderers for blacklist history using government database before tendering. Suppliers are also required to submit tax return as proof of integrity. Furthermore, it is essential for suppliers to comply with labor, environmental and human rights criteria; any violation discovered must be responded with an improvement plan and followed up accordingly.

#### Policy and objectives of supplier management

- ▶ Achieve co-existence and co-prosperity and develop long-term partnership with suppliers.
- ▶ Suppliers' product quality, delivery and pricing shall conform with requirements
- ▶ Supplier management is being carried out according to the Government Procurement Act

#### Participation criteria for new suppliers

- ▶ Compliance with Government Procurement Act and related rules: All of CPC's tender documents require tenderers to comply with fair trade principles, environmental protection laws, the Labor Standards Act and occupational safety and health regulations
- ▶ Suppliers shall hire people with disabilities and indigenous peoples according to the People with Disabilities Rights Protection Act, the Indigenous Peoples Employment Rights Protection Act, and the Government Procurement Act



## ■ Mechanisms for assessing supplier risks and impacts

### Risk prevention

- Discuss material supply mechanisms with suppliers periodically and establish long-term strategic partnership with suppliers
- Determine the safety stock based on the department-specific material preparation lead-time to ensure unobstructed supply chain operations

### Post-disaster damage control

- Immediately gather information regarding the employee safety, plant and equipment, feedstock supply, and finished product damage of suppliers after a disaster and submit the results to all staffing units to understand and take actions
- Hold emergency rationing meetings based on the status of damage, adjust supplier rations, and assess the possibility of backup supply of new suppliers as necessary

CPC values corporate sustainability. Not only has it imposed strict requirements for its own fulfillment of CSR and related commitments, the company also leads suppliers by example and instructs suppliers to achieve sustainability and co-existence and co-prosperity.

### Highlights of Supply chain management - 2019

- 💡 30 suppliers have finished the CSR self-evaluation sheet for their suppliers which included five aspects of the environment, labors, human rights, social shock, and product responsibility.

## 2.4.2 CPC procurements

### Procurement amount (excluding crude oil and natural gas)

CPC procures labor service, property and construction service in accordance with the Government Procurement Act. Procurement amount and weight (by locality) in the last three years are shown below:

(NT\$100 mn)

Type		2017	Ratio	2018	Ratio	2019	Ratio
Labor service procurement (undertaking and service)	Domestic	149	99%	266	99%	171	99%
	Overseas	2	1%	2	1%	2	1%
	Subtotal	151	100%	268	100%	173	100%
Property procurement (feedstocks)	Domestic	113	88%	117	82%	146	81%
	Overseas	15	12%	26	18%	35	19%
	Subtotal	128	100%	143	100%	181	100%

Type		2017	Ratio	2018	Ratio	2019	Ratio
Construction procurement (buildings and equipment)	Domestic	24	100%	306	80%	168	99%
	Overseas	0	0%	78	20%	1	1%
	Subtotal	24	100%	384	100%	169	100%
Total	Domestic	286	94%	689	87%	485	93%
	Overseas	17	6%	106	13%	38	7%
	Subtotal	303	100%	795	100%	523	100%

## Crude oil procurement

Over 90% of energy used in Taiwan is imported. Therefore, it is our responsibility to ensure energy security and our prime mission to maintain stable energy supply. A crude oil procurement policy has been established based on the Government Procurement Act and internal policies.

### ► Crude oil procurement source by country and by region

The Middle East region accounted for the highest percentage (51%) of CPC's crude oil import in 2019, while Africa and America made up the rest.



### Management method

Implement management guidelines to ensure that suppliers:

- 1 Are able to deliver in a timely manner without affecting CPC's production and sales plan
- 2 Are able to maintain consistent supply without compromising Taiwan's energy security or CPC's reputation
- 3 Are free of violation against human rights or international or local laws

### Evaluation system

Apart from requesting suppliers to meet our standards, we investigate their background and history of performance to ensure that they are able to make delivery in time. Only those that pass review may be accepted as qualified crude oil suppliers

- 1 **New suppliers:** Submit documents for review to ensure compliance with requirements and standards
- 2 **Existing suppliers:** Subject to regular review at least once a year. Suppliers' dealing with other suppliers are also reviewed during this process

### Quality management of crude oil

When suppliers suggest a new oil source, CPC will proceed with the following:

- 1 Assess and test oil quality according to internal procedures
- 2 Engage external parties to assist with the test, and thereby ensure that the quality of crude oil purchased complies with CPC's requirements
- 3 To retain the crude oil samples for future verification and tracking of oil quantity

## Liquefied natural gas (LNG) procurement

CPC imported liquefied natural gas (LNG) from a total of 16 countries in 2019 (21 exporting countries in the world), including the sources from Middle East, Southeast Asia, Australia, Russia, North America, Africa and Europe. It is CPC's strategy to diversify sources of LNG supply. CPC also has more than 40 Master Agreements that enable it to purchase LNG within a short-term period to meet unexpected gas demand.

### ► Procurement method

CPC complies with the Government Procurement Act and purchases LNG primarily under medium-term and long-term contracts, while complementing on short-term or spot basis, to ensure stable supply of natural gas for the nation.

## 2.5 Membership in external organizations

### 2.5.1 External initiatives

#### ■ Asia Corporate Excellence & Sustainability Awards

CPC invests pro-actively into research projects such as production improvement, green energy, environmental protection and biotechnology. The Company also supports the government's energy policies by increasing use of natural gas, undergoing energy transformation, promoting smart green gas stations, installing charging facilities, and exploring renewable energy sources such as thermal and solar power. This long-time commitment to sustainability and energy transformation was what enabled CPC to claim "Asia's Most Influential Companies Award" and "Green Innovation Award" of the Asia Corporate Excellence & Sustainability Awards during its first attempt at an international award



#### ■ UN Climate Change Conference (COP25)

CPC assigned representative to participate in the 25th UN Climate Change Conference (COP25) and is therefore informed on the latest trends in climate change, the positions of various nations, and status of ongoing negotiations. Carbon reduction commitments and climate resilience remained the focus of discussion this time round. CPC envisions itself as the climate protector and has acquired patents on several new production, green energy and environmental protection technologies to facilitate energy/carbon reduction and climate adaptation



### 2.5.2 Membership in external organizations

CPC participates in several local and foreign industrial organizations and associations. This engagement provides CPC with the opportunity to expand multilateral relations, exchange business experience and market information, connect with international industry trends, and ultimately maintain corporate competitiveness and global visibility. Below is a list of key external organizations that CPC is a part of and its existing role:



Type	Name of external organization	Form of participation
Industrial exchange and development	International Group of Liquefied Natural Gas Importers (GIGNL)	Member
	Chinese International Economic Cooperation Association (CIECA)	Class A membership; member representatives: 5
	Chinese Association for Energy Economics (CAEE)	Member; member representatives: 2
	Chinese Petroleum Institute	Member Director/ Managing Supervisor
	Petrochemical Industry Association of Taiwan	Member; member representatives: 6
	Taiwan Biotechnology Industry Alliance	Member; member representatives: 3
Technology innovation	National Association of Corrosion Engineers (NACE)	Member; member representatives: 13
	Chinese Society of Structural Engineers	Member; member representatives: 1 (Chairperson Jerry Ou)
	The Corrosion Engineering Association of the Republic of China	Member; member representatives: 1
Corporate Governance	The Institute of Internal Auditors-Chinese Taipei	Member; member representatives: 5
Sustainable management	Taiwan Institute for Climate Change and Sustainable Energy	Member; member representatives: 3
	Center for Corporate Sustainability	Member; directorship
	World Business Council For Sustainable Development Taiwan	Premium member; member representatives: 12
	Taiwan Association of Soil and Groundwater Environmental Protection	Member; member representatives: 3
Industrial safety management	Industrial Safety and Health Association of the ROC	Member
	Taiwan Safety Council	Member; member representatives: 3



# CH3

## CPC's Environmental and Sustainability Efforts

### Chapter summary

CPC has long devoted its attention to environmental protection. In addition to reducing energy consumption, GHG emission and environmental impact associated with business activities, the company has also been conducting relevant assessments as a way to respond and explore opportunities amidst the changing climate. Meanwhile, habitat preservation for little terns is being carried out near the Guantang area where the third LNG Receiving Terminal is located, and this effort signifies CPC's intent to simultaneously cater economic development and environmental protection.

### Corresponding SDGs



### Reader Priorities

- Shareholder (MOEA)
- Partners
- Public representatives
- Communities
- Customers
- Government
- Employees
- Media
- NPOs/NGOs



## Chapter Highlights



R&D contribution  
**NT\$3.858**  
billion



Photovoltaic (PV) generators have  
been installed on the rooftops of  
**193** gas stations



**410** renewable  
energy certificates  
have been acquired



Energy intensity  
reduced by  
**5.7%**



All three plants recycled more  
than **97.5%** of water  
between 2017 and 2019



VOCs emission  
reduced by  
**3.3%**



Cold drainage supported  
aquaculture for an annual  
value of **NT\$1.5~2 billion**

## Management Approach

### GHG management and response to climate change

#### Policy and commitment

- ✓ Grasp global carbon reduction trends, enhance green economic competitiveness, and establish GHG reduction goals in response to government policies.
- ✓ Keep track of emission through GHG inventory verification.

#### Goals | Short-term

- 1 Achieve the annual GHG reduction goal.
- 2 Inventoried the climate risk facilities of 24 energy complexes.

#### Goals | Medium/long-term

- 1 The Company has set its goals to reduce emission to 30% below the 2005 level by 2030, which conforms with the carbon reduction goal that Taiwan has committed to the world and goals set forth in the Greenhouse Gas Reduction and Management Act.
- 2 Complete the adaptation strategy and make improvement of facilities with high climate risks.
- 3 Encourage employees to obtain licenses and certificates in relation to environmental protection and participate in the related training and education activities.

## Specific Actions

- 1 Implement stage one GHG control of the energy and manufacturing sectors based on the corporate strategy. Several process improvement and energy management projects have been executed since 2005 to continuously reduce GHG emissions.
- 2 Increase the supply of low-carbon energy sources. The volume of natural gas processed in 2019 had reached the CPC's 2020 target of 16.5 million tonnes.
- 3 Promote energy measures and increase energy efficiency of oil refineries and petrochemical plants.
- 4 Offer guidance to fuel oil users for transitioning into natural gas.
- 5 Participate in the "Climate Change Adaptation Strategy and Guidance for the Energy Sector" program of the Bureau of Energy.

## Measurement Mechanisms

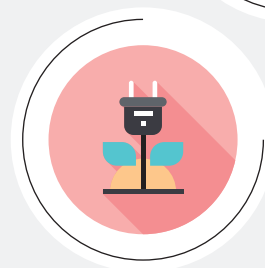
CPC sets annual energy conservation targets and convenes energy/carbon reduction meetings twice a year to keep track of its progress, thereby ensuring the effectiveness of its efforts.

### Environmental protection policy

CPC recognizes the need to maintain economic development and environmental protection at the same time; it is our responsibility to ensure environmental protection while promoting national economic development. Therefore, we actively engage in pollution prevention and environmental protection, aiming to reducing environmental impacts from business activities.



Pollution prevention



Energy conservation  
and waste reduction



Environmental  
sustainability



Unit: NTD ten thousand

Environmental protection expenses	2017	2018	2019
Company operating cost <sup>1</sup>	155,274	300,896	265,905
Supplier and customer cost <sup>2</sup>	1,386	3,171	2,424
Management activity cost <sup>3</sup>	20,184	29,496	25,282
R&D cost <sup>4</sup>	28,307	10,868	10,180
Social activity cost <sup>5</sup>	11,103	15,915	21,390
Loss and compensation cost <sup>6</sup>	3,022	2,010	283
Fees and taxes <sup>7</sup>	310,347	439,047	416,750
Total	529,623	801,403	742,214

Note 1: Expenditure on pollution prevention, global environmental protection, and resource recycling.

Note 2: Expenditure on green procurement, resource recovery and recycling, products and services from implementing environmental protection, and additional expenditures on packaging containers from reducing environmental impacts.

Note 3: Expenditure on environmental education and training, verification and certification, environmental monitoring and measurement, handling environmental impacts, insurance for environmental protection, air pollution, soil pollution, water pollution and other fees.

Note 4: Expenditure on environmental protection product research and development and expenditure on research to reduce environmental impacts on the products in the market, and expenditure on environmental impact assessment.

Note 5: Expenditure on nature conservation, afforestation, landscaping and other environmental improvements, expenditures on sponsoring community activities for environmental protection, environmental groups, announcements, environmental protection publicity, and other information.

Note 6: Expenditure on environmental issues, compensation, penalties and lawsuits, and maintenance of urban landscape and living environment quality.

Note 7: Fees regarding the air pollution, soil pollution, water pollution and other fees imposed by the government.

## Environmental performance indicators

Petrochemical feedstock  
input intensity

**0.089**

Gas energy  
input intensity

**0.015**

GHG emission  
intensity

**0.045**

Total effluent pollutant  
intensity

**0.003**

Crude oil  
input intensity

**0.207**

Water consumption  
intensity

**0.180**

Industrial waste  
intensity

**0.532**

VOC emission  
intensity

**0.019**

Liquefied energy  
input intensity

**0.001**

Electricity consumption  
intensity

**10.904**

Effluent  
intensity

**0.064**

Air pollutant emission  
intensity

**0.023**

Indicator	2017	2018	2019
<b>1 Petrochemical feedstock input intensity</b> petrochemical feedstock input (kL) <sup>1</sup> /petrochemical output (kL) <sup>1</sup>	0.089	0.087	0.089
<b>2 Crude oil input intensity</b> crude oil input (kL)/equivalent distillation capacity for refinery (kL) <sup>2</sup>	0.201	0.209	0.207
<b>3 Liquefied energy input intensity</b> liquidized energy input (kL) <sup>3</sup> /(equivalent distillation capacity for refinery + petrochemical output) (kL)	0.001	0.001	0.001
<b>4 Gas energy input intensity</b> gasified energy input (km <sup>3</sup> ) <sup>4</sup> /(equivalent distillation capacity for refinery + petrochemical output) (kL)	0.016	0.016	0.015
<b>5 Water consumption intensity</b> Water consumption (km <sup>3</sup> )/(equivalent distillation capacity for refinery + petrochemical output) (kL)	0.199	0.188	0.180
<b>6 Electricity consumption intensity</b> Electricity consumption (kWh)/(equivalent distillation capacity for refinery + petrochemical production) (kL)	10.94	10.613	10.904
<b>7 GHG emission intensity</b> tonnes of carbon dioxide equivalent (tCO <sub>2</sub> e)/(equivalent distillation capacity for refinery + petrochemical production) (kL)	0.045	0.047	0.045 <sup>7</sup>
<b>8 Industrial waste intensity</b> waste (kg)/(equivalent distillation capacity for refinery + petrochemical output) (kL)	0.326	0.272	0.532
<b>9 Effluent intensity</b> effluents (t)/(equivalent distillation capacity for refinery + petrochemical output) (kL)	0.067	0.066	0.064
<b>10 Total effluent pollutant intensity</b> total effluent pollutants (kg) <sup>5</sup> /(equivalent distillation capacity for refinery + petrochemical output) (kL)	0.004	0.003	0.003
<b>11 VOC emission intensity</b> VOC emissions (kg)/(equivalent distillation capacity for refinery + petrochemical output) (kL)	0.028	0.021	0.019
<b>12 Air pollutant emission intensity</b> air pollutant emissions (kg) <sup>6</sup> / (equivalent distillation capacity for refinery + petrochemical output) (kL)	0.026	0.026	0.023

Note 1: Petrochemical feedstock input=( naphtha+ reformat+ xylene mixture) input, petrochemical output is the output of ethylene, propane, butadiene and benzene converted into equivalent distillation capacity (EDC)

Note 2: EDC (Equivalent Distillation Capacity): Standardized amount for different refinery processes

Note 3: Liquefied energy input=(gasoline+ diesel+ fuel oil) input

Note 4: Gasified energy input=(NG+ fuel gas) input

Note 5: Total effluent pollutants=total amount of (COD+SS+Oil) in effluents

Note 6: Air pollutant emissions=total amount of (SO<sub>x</sub> + NO<sub>x</sub> + TSP)

Note 7: The initial estimated value is 0.045. Third party verification is to be completed by the end of August, 2020



## 3.1 Risks and Opportunities from Climate Change

CPC pays constant attention to the latest global trends and development as a response to climate change and related impact. Meanwhile, TCFD (Task Force on Climate-related Financial Disclosures), published by the Financial Stability Board (FSB) in June 2017, are progressively being incorporated into the management system and information disclosure.

Based on the climate risk and opportunity framework proposed by TCFD, CPC has identified transformation risk, physical risk and climate opportunities and made appropriate responses. CPC also takes part in "Climate Change Adaptation Strategy and Guidance Program for Energy Sector" of the Bureau of Energy, and proposes adaptation strategies to facilitate improvement of high-risk facilities identified.

Aspect		Item	Impact on CPC	Countermeasures
Physical risk	Instant	Heavy rainfall events	Slow drainage may cause flooding in plant premise, and affect equipment function and personnel activities	Set up pressured-water pumps
		Droughts	Production disruption due to output reduction or facility shutdown as a result of water rationing	<ol style="list-style-type: none"> <li>1 Increase the capacity of intermediate tank</li> <li>2 Monitor dynamic water consumption change</li> </ol>
	Long-term	Rising sea level	Affect waterfront storage and transportation facilities	Assess possibility to relocate facilities to new port areas above the sea level
Transformational risks	Policies and laws	Cap and trade on GHG emission	Limit GHG emissions of our production facilities to increase operating costs	<ol style="list-style-type: none"> <li>1 Increase energy efficiency</li> <li>2 Enforce GHG reduction measures</li> </ol>
		Prohibition selling of gasonline/diesel vehicles	The government may prohibit selling of gasonline/diesel vehicles in the future, and impact CPC's revenues	Actively transform gas stations into smart green gas station by installing battery charging and switching stations and investing on battery materials R&D
	Market	Transition of boiler fuel from oil to natural gas	Shift of boiler fuel from oil to natural gas or fuel gas; fuel oil consumption decreased	Enhance fuel oil export

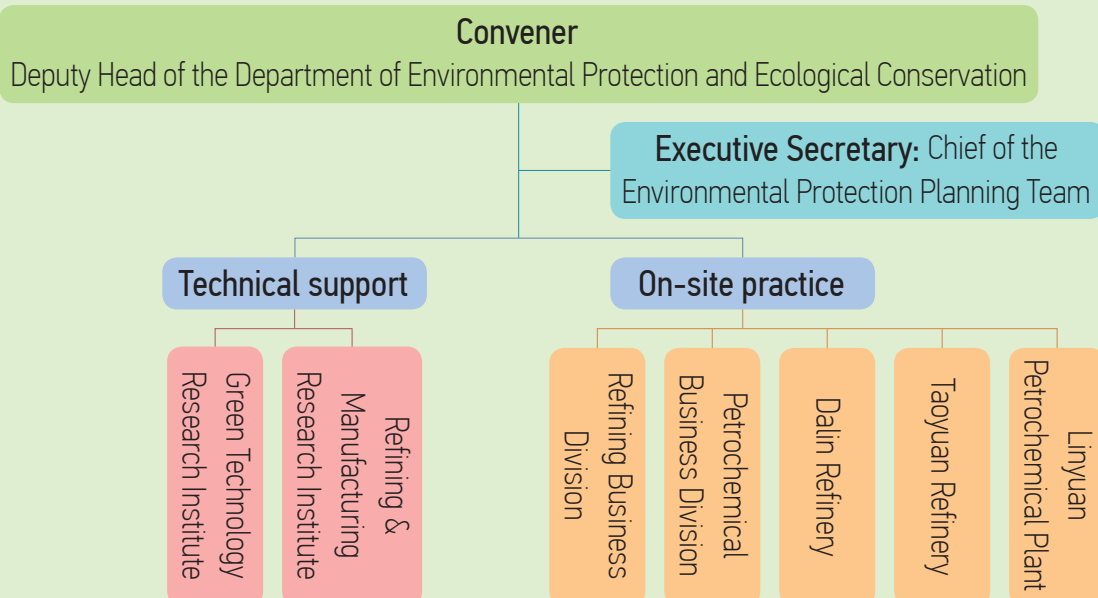
Aspect	Item	Effects on CPC	Countermeasures
Energy and resources integration	Promote regional energy-resources integration such as the use of nitrogen, steam, fuel gas, hydrogen, caustic soda, and fuel oil	Enhance energy and resource efficiency and reduce site pollution to effectively reduce environmental impact and improve environmental quality	<ol style="list-style-type: none"> <li>1 Purchase steam, nitrogen from China Steel Co. and caustic soda to reduce energy consumption</li> <li>2 Sell fuel gas, hydrogen, and fuel oil, and enhance resource efficiency</li> </ol>
Product, market and service	High-value petrochemical products	Make optimal use of oil by-products and turn low-value fuel into high-value materials	Turn viable contents of pyrolysis gasoline into materials for livelihood necessities

## Implementation strategy of climate change adaptation

### Management

#### Establishment of an energy conservation organization

We began to promote energy conservation and carbon reduction measures in 2005 and hold effectiveness follow-up meetings once every six months to review the effectiveness of the related measures. To facilitate all units to conserve energy and reduce carbon, we established the Energy Conservation and Carbon Reduction Team in 2019. The team holds working team meetings at the plant regularly and is responsible for the research and review of energy conservation and carbon reduction practices, introduction and implementation of energy conservation technologies, guidance of energy conservation and carbon reduction of plants and divisions, and compilation and experience sharing of energy conservation cases.



#### Awareness education

- ✓ Raise the energy conservation awareness in employees and practice workshop energy management .
- ✓ Implement automotive and motorcycle inspections and fuel saving education.

## Management

### Exchange with international organizations

- ✓ Participation in Norway Economic Cooperation Conference and ROC Business Council for Sustainable Development.
- ✓ Conferences of the Parties (COP): CPC participated in 14 COPs between 2003 and 2019, which enabled it to observe methods for assessing climate change impact and reducing carbon emission, and devise carbon reduction plans accordingly.

### Green energy and green building

- ✓ Promote PV gas stations and gas stations green-building certification.

## Mitigation

### Enhance energy efficiency

- ✓ Make structural enhancements and equipment renewals to the refinery process. Adopt the best available technology (BAT) to enhance energy efficiency and reduce environmental impact.
- ✓ Actively enhance the energy efficiency of refineries and petrochemical plants; set energy conservation and carbon reduction targets control unit energy and resource consumption.
- ✓ Introduce energy efficiency improvement measures such as heat recovery through heat pipe and heat exchanger network simulation.

### Enhance the transportation capacity of natural gas to increase low-carbon energy use

- ✓ Raise operating efficiency of natural gas storage and transportation facilities in Yongan and the Port of Taichung, and commence construction of the third LNG Receiving Terminal. Supply capacity is expected to be raised to more than 23.5 million tonnes by 2025.

### Regional energy and resource integration

- ✓ Promote waste heat recovery in collaboration with other companies in the industrial park, such as purchasing steam produced with furnace waste heat of China Steel Co.
- ✓ Use of natural gas and cold energy.

## Adaptation

### Adaptation management

- ✓ Assess climate risks and establish improvement plans for high-risk facilities, such as the production, transportation, storage, and industrial safety facilities of refineries, natural gas terminals, gas supply centers, and oil supply centers, in coordination with the "Climate Change Adaptation Strategy and Guidance Program for Energy Sector" of the Bureau of Energy.

## Research and development

### Green Energy Research Institute

- ✓ Expand the scope of industry-research cooperation to develop technologies in relation to renewal energy and green energy, such as solar energy, biomass energy, LED lighting, and biomaterials.

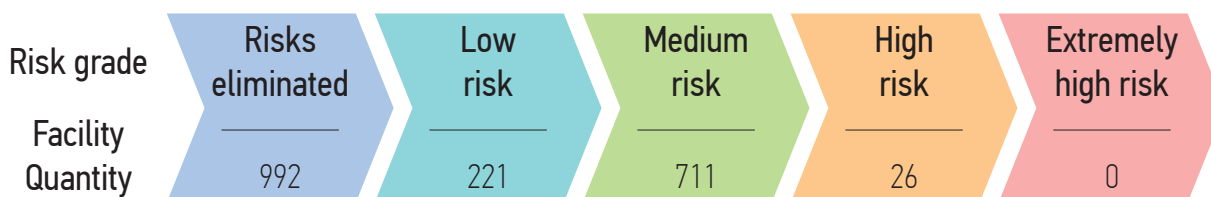
### Biofuel R&D

- ✓ Engage in the R&D of microalgae culture, biodiesel, and bio-ATF technologies.

## Management of climate change adaptation

CPC signed up to the "Climate Change Adaptation Strategy and Guidance Program for Energy Sector" of the Bureau of Energy. In 2018, we began to inventory a total of 24 energy supply complexes within our refineries, natural gas terminals, gas supply centers, and oil supply centers within three year, and proposed adaption strategies for identified high-risk facilities to make improvement.

A total of 9 plants completed climate risk assessment report in 2019, namely Dalin Refinery, Taichung LNG Terminal, Miaoli Gas Supply Center, Tainan Gas Supply Center, Keelung Fuel Distribution Center, Port of Taichung Fuel Distribution Center, Minxiong Fuel Distribution Center, Tainan Fuel Distribution Center and Qiaotou Fuel Distribution Center. These 9 plants surveyed a total of 1,950 facilities, and 26 of which were identified as high risk (prone to strong wind and flood). Experts from the Industrial Technology Research Institute were invited to help various departments of CPC develop improvement plans for high-risk facilities.



High risk	Response strategies
Strong wind	<ol style="list-style-type: none"> <li>1 Assess structural integrity of existing facilities and improve accordingly</li> <li>2 Implement backup systems so that operations can be sustained by switching to the alternative system in the event of damage</li> </ol>
Flood	<ol style="list-style-type: none"> <li>1 Assess structural settlement regularly and apply enhancements if tolerance is exceeded</li> <li>2 Elevate and make appropriate improvements to electrical equipment</li> </ol>







## 3.2 Green energy transformation and circular economy

### Management Approach

#### R&D and Innovation

##### Policy and commitment

- ✓ CPC actively promotes green upgrades and transformation and brings green innovation into products and services through advanced technology. Resources have been invested into projects such as energy conservation, carbon reduction, renewable energy, environmental protection, biotechnology, waste reduction and production efficiency enhancement to create circular economy benefits. It is CPC's goal to contribute innovative R&D in such a way that inspires transformation and upgrade of the entire industry, thereby bringing new opportunities to the organization and the industry as a whole.
- ✓ CPC's green energy, green material and green technology development efforts are geared toward "energy generation, energy conservation, energy storage and carbon reduction." Research outcomes are put into trial and mass production to achieve commercialization of new products and technologies."

##### Goals | Short-term

- 1 Enhance the added value of petrochemical energy
- 2 Achieve the annual GHG reduction goal

##### Goals | Medium/long-term

- 1 Address climate change challenges to diversify sustainable supply of green energy
- 2 Achieve smart green energy and energy transformation.

##### Specific Actions

- 1 Sign a memorandum of understanding (MOU) "Renze-Tuchang Geothermal Area Exploration and Power Generation Development and Operation in Yilan County" with TPC to explore geothermal sources
- 2 CPC installs solar power facilities at available spaces nationwide. A total capacity of 8MW has been installed at 200 sites to date, and CPC expects to install more than 10.5MW of capacity by the end of 2020. In the meantime, CPC is constructing large-surface, ground-mounted PV systems for a total capacity of 26.5MW, so that it meets the 10% contractual capacity requirement expected from a major power user
- 3 CPC successfully developed a new heavy-duty anticorrosion coating material that is environment-friendly, low in VOCs (50 g/L) and ISO 12944-compliant, which can be used in applications such as offshore wind power and vessel coating in the future.
- 4 Promote cold drainage algae farming

##### Measurement Mechanisms

Research reports, year-end assessment meetings, and performance evaluation as evaluation mechanism

## Indirect Economic Impact

### Policy and commitment

- ✓ While providing the nation with adequate and consistent supply of oil- and gas-based energy, CPC is well-aware of the importance to protect the environment, and has therefore committed ongoing efforts to improve product quality, promote the use of clean energy, and enforce energy/resource integration, recycling/reuse and innovative environmental protection measures at key production or operation sites. These efforts have also proven to be beneficial to local industries, employment and prosperity.

### Goals | Short-term

- 1 Energy and resource integration at Dalin Refinery
- 2 Recovery of cold energy at LNG plants

### Goals | Medium/long-term

- 1 Expand regional energy and resource integration
- 2 Offer guidance to fish farmers for using cold drainage in fish/algae farming
- 3 Continue assistance to local businesses create value through innovation

### Specific Actions

- 1 Promote energy and resource integration through Dalin Refinery
- 2 All LNG plants reuse cold energy. Where liquid gas is supplied as alternative energy, CPC also provides purified low-temperature cold drainage to local fish farmers free of charge, and thereby achieves circular economy.
- 3 Coordinate with Fisheries Administration in the development of cold water aquaculture of high economic value, and thereby promote the upgrade of the aquaculture industry
- 4 Support the development of algae farming technology

### Measurement Mechanisms

- 1 CPC's Neighborhood Engagement Review Committee convenes review meetings regularly once a month or on an ad-hoc basis to understand neighborhood engagement needs of various departments
- 2 Quarterly visits: On-site visits were arranged once every three months to assist local units with their neighborhood engagement efforts.
- 3 Annual tasks: CPC hosts a neighborhood engagement task meeting at its Chiayi Training Facility each year to help employees develop skills that are relevant to their tasks. Plans and uses of the neighborhood engagement budget are discussed at the end of each meeting.

## 3.2.1 Green energy transformation

To accommodate recent changes in the global economy and support the government's energy policies and the 5+2 industries project, CPC's research department has progressively expanded its research efforts into four main themes including: smart green energy, high value-adding materials, circular economy and



technical service, in addition to its basic responsibilities of providing technical service for production and marketing departments. CPC estimates having generated financial yield of NT\$3.858 billion in 2019 from the new products and technologies developed, which was 1.5 times the amount of R&D resources invested. Through green energy transformation, CPC hopes to bring sustainable practices into its operation.

	2017	2018	2019
Investment budget (NT\$100mn)	19.25	21.72	22.91
Proportion of R&D expenses in net income	0.26%	0.26%	0.23%
Financial benefits (in multiples of NT\$100 mn)	39.31	34.27	38.58
Acquired patents	31	21	16
Published papers	302	253	199
Application of outcomes from forward-looking R&D	31	49	48

## Green project R&D

### Assessment and research of domestic and overseas oil and gas potential

- ▶ Completed an assessment of hydrocarbon resource and its related risk of all CPC's mining sites in Chad. Completed reserve and production capacity evaluation for every structure in Oryx Oil Field
- ▶ Incorporated AI and big data technologies in performing the project "Well Logging and Seismic Image Analysis"
- ▶ Completed a post-drilling assessment for all oil fields in Niger. Collected all basic parameters of these fields and made an analysis of them. Conducted a comprehensive evaluation for the fields' development and made a suggestion for future development
- ▶ Completed an analysis about injection capacity test, an evaluation and identification of numerical simulation of geological model for the Wells C1, C2 and B1 in Tiezhenshan Field. Established a geological model and conducted a historical data fitting to evaluate the injection capacity and its expansion possibility, and offer a suggestion for future management

### Development and use of renewable energy

- 💡 Advanced CPC's exploration in geothermal energy in 2019. Completed two geothermal wildcat wells (Renze 3, 4) and established a preliminary 3D geological model and a fracture permeability distribution model for these two wells based on the wells' subsurface geology and test data. The results will be useful as reference for determining the new well sites

### Development and use of renewable energy

- 💡 Development of bio-jet fuel: CPC has been successful in producing bio-jet fuel from bio-oil. The product fully conforms with JET-A1 standards. Bio-jet fuel offers a number of advantages including low sulfur content, low density and low flashpoint that make it an ideal substance for mixing with fossil fuel. Bio-jet fuel not only improves fuel performance and reduces emission of SO<sub>x</sub>, it also serves as an alternative fuel on its own and adds value to jet fuel products.
- 💡 Hydrogenic energy and fuel cell: CPC has begun assembly and testing of a 5 kW solid oxide fuel cell (SOFC) power system by leveraging its proprietary gas reformer, the research capacity of local industries and reformer of the Green Technology Research Institute. The SOFC system is currently installed at Tainan Qianfeng Gas station, and test runs are being performed to validate the use of natural gas in distributed generation. The outcome will serve as reference to the establishment of smart green gas stations in the future
- 💡 Completed design and integration of solid oxide fuel cell (SOFC); 70 hours of preliminary performance test were conducted in 2019; power output was maintained at 2 kW throughout the operation period, whereas average power efficiency was measured at 35% (low thermal value)
- 💡 Ninety-five percent of the hydrogen produced from refineries are used as input materials for proton-exchange membrane fuel cells (PEMFC); through continuous discharge of anode exhaust gas, CPC completed three power generation tests to confirm that the PEMFC is capable of sustaining operation for three days
- 💡 PV system: With regards to the application and development of solar system integration technologies, CPC had installed rooftop PV generators at 193 gas stations by the end of 2019, and completed a 500 kW PV system at Linyuan Petrochemical Plant. With 8 MW of capacity installed, CPC expects to generate 9 million kWh of power per year, which saves 4,790 tonnes of carbon emission per year
- 💡 Completed a cloud-based solar power monitoring and alert system, implemented a 20-year operation plan and adopted visual representation for solar power data and related analyses
- 💡 Evaluated the use of non-pure hydrogen input in PEMFC application

## Development of new products and new technologies

- 💡 Developed the “CPC High Performance Intake Valve Deposit Cleaner” and “CPC 9000 Series Motor Oil,” both of which won the “National Brand Yushan Award”
- 💡 Conversion of heavy oil into fine carbon and mass production trial for in-depth processing: Using heavy oil of refineries as feedstock, CPC is able to convert heavy oil into amorphous carbon of higher value through in-depth processing, and use it as anode material for lithium battery. CPC expects to complete construction of continuous, automated processing facility for converting coke into soft carbon and commence mass production trial before the end of 2020; production capacity of this facility is estimated at 18 tonnes per year.
- 💡 Lithium-titanium oxide as anode material: CPC has developed proprietary procedures for the development of lithium-titanium oxide materials. Lithium-titanate battery made from such materials are tested to house a capacity of 160 mAh and above, and can be charged to 80% in 3 minutes and 90% in 10 minutes. CPC plans to expand production capacity to 1,000 tonnes per year by the end of 2022, which can be commercialized upon completion.
- 💡 Development of environment-friendly multi-functional coating: Solutions such as anticorrosion coating, low VOC coating, water-based heat insulation coating and environment-friendly anticorrosion coating have been developed in response to the rising environmental awareness. These coating solutions are been used in applications such as heat retention for geothermal power, anticorrosion treatment for pipelines and storage tanks, and heat insulation for buildings. The energy-saving thermal insulation coating was applied on a trial basis to pre-fabricated buildings at Kaohsiung Gushan Elementary School and dormitories and bus stops at Fengshan Administration Center, for which it has been well-recognized for its thermal insulation features.
- 💡 Established quality control standards for gamma oryzanol, rice bran ground (glucose ceramide) and rice bran polysaccharides, and packaging and storage conditions for functional materials



Lithium-titanate battery

### Development of new products and new technologies

- 💡 Cold drainage from Yongan LNG Plant was fed to red algae trial farm for a production capacity of 2 tonnes per year, for which CPC had won the 16th (2019) National Innovation Award - "Enterprise Innovation Award"
- 💡 Developed transesterification technology, which can be broadly applied to products such as biodiesel, biolubricant, and special chemicals
- 💡 Developed next-generation eddy-current testing technology, which penetrates FRP and is used to analyze defect, thickness and corrosion of oil tank bottom

### Development and application of environmental cleanup and pollution remediation technologies

- 💡 Assisted Environmental Protection Administration (EPA) in executing its program "Soil and Groundwater Pollution Tracing" and established the petro-forensics technology. It was applied by EPA and CPC to identifying the pollution source of gasoline in pollution sites and helped to determine who has to take responsibility for the pollution
- 💡 PH monitoring and analysis were performed on bottom ash collected from waste incinerators, which served as a reference for mixed waste incineration
- 💡 Membrane interface probing system was adopted to survey soil and groundwater pollution

### Development of renewable energy

In 2019, CPC spent NT\$115 million into renewable energy projects including PV technology and geothermal energy development. With respect to solar power, CPC had installed PV systems at 193 gas stations nationwide by the end of 2019 (21 stations were added in 2019) for a total capacity of 8 MW. Meanwhile, PV systems



PV system at Chiayi Technology Park



are being installed on rooftops of fuel distribution centers, refineries, petrochemical plants and office towers, and CPC has set goals to increase total capacity to more than 10.5MW by the end of 2020, and to 14.08MW between 2021 and 2024. In addition, CPC acquired certification for 17 Renewable Energy Projects and a total capacity of 535.80 kW in 2019, which accumulates to 410 renewable energy certificates and 418,810 kWh of capacity to date.

CPC has implemented a “Cloud-based Solar Power Monitoring, Alert, Maintenance and Management System” that not only integrates solar power data, but also presents analyses visually in the form of “CPC Solar Power Control Panel” that enables more intuitive observation of changes as well as more effective management and planning. Furthermore, CPC made its first attempt at selling solar power data in 2019, and was able to profit from the transaction.

As to geothermal exploration, CPC has completed drilling Wells Renze 3 and 4 in 2019. A new 3D model of fracture permeability distribution of Renze-Tuchang geothermal area was established based on latest geological data collected from the two new wells.

### ► Renewable Energy Development Act Task Force

CPC supports the government's 2025 nuclear-free policy and GHG reduction goals, and assembled a task force comprising representatives from different departments on May 15, 2019 as a response to the Renewable Energy Development Act amendments made in 2019. This task force represents CPC's attention to the issue of renewable energy and its initiative to promote high value-adding industrial activities.

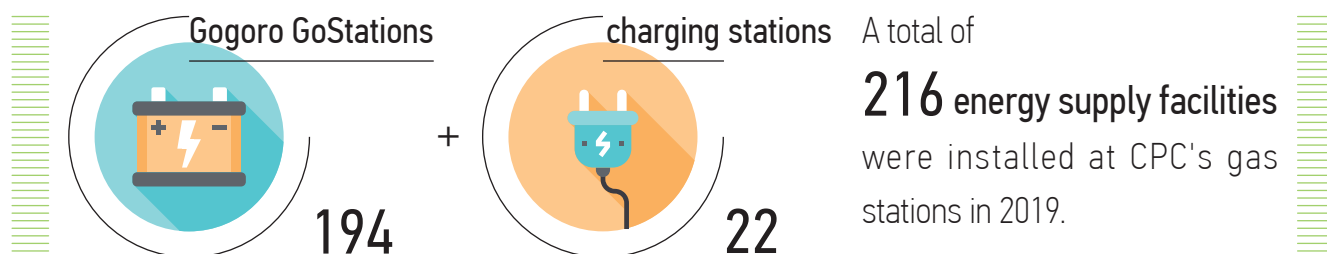
The task force addresses the following matters concerning renewable energy:

- 1 Solar power plans and strategies
- 2 Development plans and strategies for hydrogenic energy
- 3 R&D strategy for fuel cell and energy storage equipment
- 4 Geothermal development and strategy
- 5 Application for renewable energy certificate

## Smart green energy stations

In response to the government's policy to encourage green energy development, energy conservation, and carbon reduction, we will install the PV system and EV charging/battery replacement sites at CPC gas stations across Taiwan based on three themes: energy generation, energy storage, and

energy use. We will also implement big data applications to turn gas stations into smart green energy stations. By the end of 2019, CPC had constructed solar power facilities at 193 gas stations, which generated 10.068 million kWh of energy and saved 5,245.5 tonnes of carbon emission in total.



CPC plans to transform conventional gas stations into integrated smart, green energy platforms that “generate, conserve and utilize green energy.” Two gas stations located in Chiayi and Tainan were chosen as pilots for CPC's smart green gas station project; both pilot stations began operation in early 2019, and successful experiences would be replicated to other stations. The Chiayi pilot project (Xinyi Road Station) was configured to be self-sufficient on green energy, whereas the Tainan pilot (Qianfeng Road Station) was configured to run on multiple power sources. Both gas stations have been installed with energy storage systems such as rooftop solar panels, natural gas fuel cells, lithium-titanium oxide (LTO) batteries and vanadium redox batteries; together, they validate our research findings and help us explore ways to create smart cities and co-exist with nature.

Xinyi Road gas station in Chiayi uses solar energy to power its operations and the electric bike charging/battery replacement system. The station has received overwhelming praises since it opened, and due to the large number of vehicle owners who purposefully charge/replace batteries at this station, it occasionally drew power from the grid to meet the shortfall. Green energy percentage of the pilot stations on sunny days was calculated at 80.8% in 2019. (Green energy percentage =  $PV / (power\ grid + PV)$ )

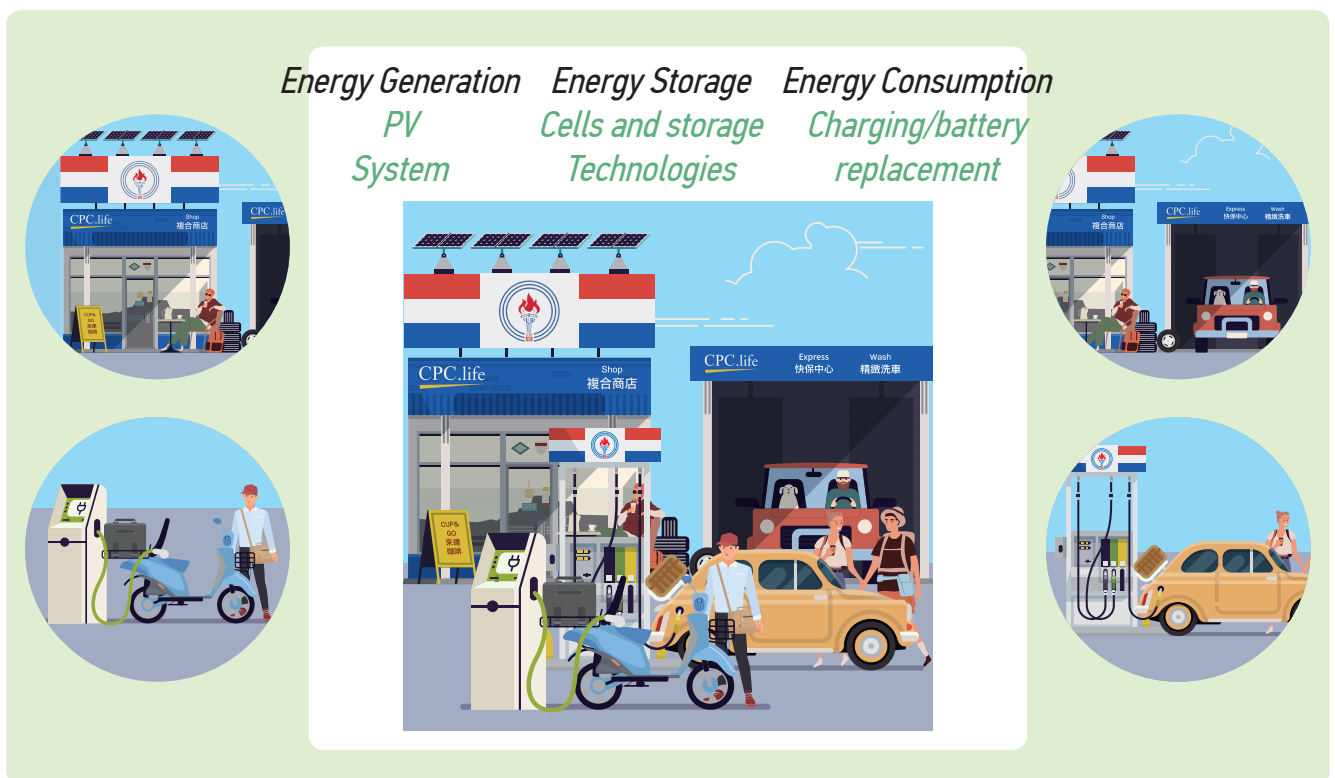
Qianfeng Road Smart Energy Pilot Station located in Tainan has been configured to run on multiple power supply systems at the same time, and since it opened, all the equipment has performed as they were initially designed to. Through data monitoring and power conditioning using the energy management system, we were able to validate results on the multiple power supply setup over the long term, so that power generated from various equipment can be allocated effectively to meet loads within



the gas station, and therefore reduce the amount of power drawn from grid. Judging by the percentage of power produced in-house, the pilot station is estimated to save approximately 20~25% energy.

Backed by proprietary research, CPC has materialized its vision of the future smart city and how people should coexist with the environment. By combining different energy generation, storage and utilization technologies and incorporating big data, CPC is able to come up with a proven business model for green gas stations and will be implementing it to other gas stations as part of its transformation. With this success, CPC hopes to become the energy source that powers a smart community and the key to achieving sustainability.

### Smart Green Gas Station and One-Stop Service



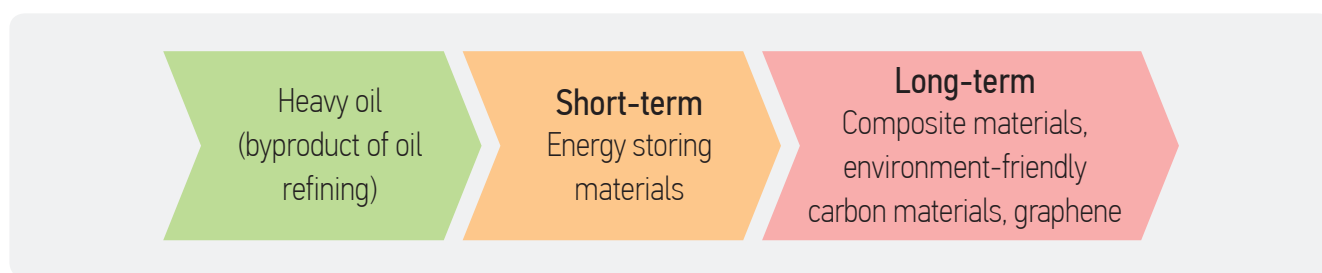
To further understand our products and services, click [here](#) to CPC website for more information.

### 3.2.2 Circular economy

CPC considers waste as resources that are not fully utilized, which is why the company persistently re-examines existing waste and tries to find new values through Reduce, Reuse, Recycle and Renew. By pursuing a zero-waste goal and ensuring reasonable and effective use of resources, CPC hopes to address the dilemma between economic development and environmental impact at the root cause.

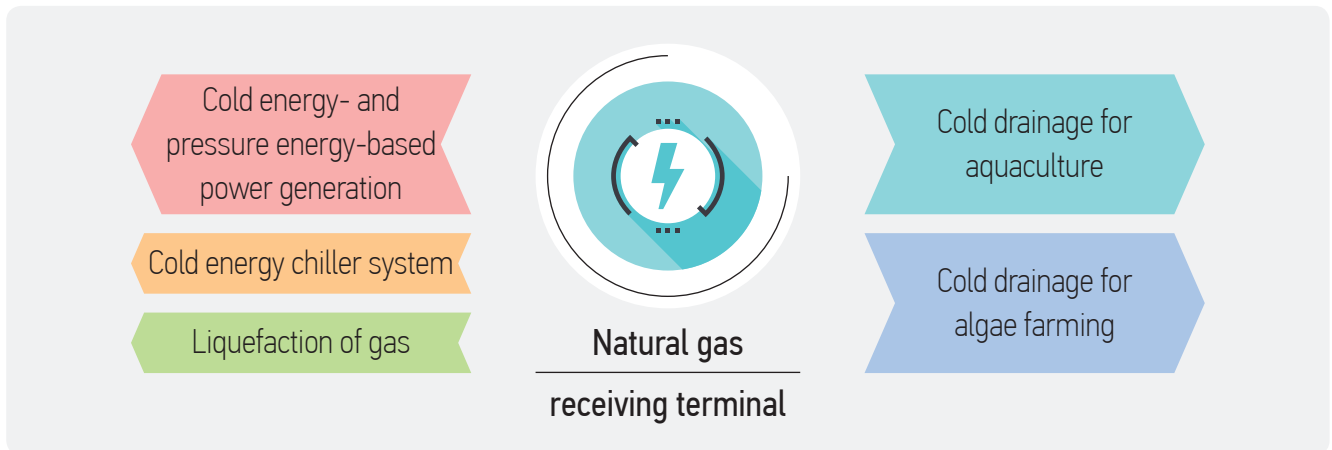
## High-value heavy oil derived products

Heavy oil is a byproduct of the oil refining process and used to be combusted as fuels. In light of the tightening emission standards on combustion equipment and rising environmental awareness, CPC continues to explore value-added uses of this byproduct and has successfully turned it into “anode material for lithium battery” in electric bikes, which offers a number of benefits including rapid charging/discharge, longevity, safety and higher cycles under rapid and normal charging. CPC also plans to turn heavy oil into asphalt over the medium and long term, which offers several high value-adding uses such as composite material, environment-friendly carbon materials, graphene and electronics.



## Use of cold energy

Natural gas has to be converted at its place of origin to a liquid state, comprising only 1/600 of its original gaseous volume, for storage and long distance transport. Liquefaction usually involves the gas being processed through multiple stages in a refrigerant compressor, which will gradually lower its temperature in this liquefaction process, 700Kcal of energy is required to produce 1kg of LNG; 500 Kcal of that is released as waste heat and the remaining 200Kcal becomes LNG cold energy. This cold energy has many commercial applications. These include air liquefaction and separation, power generation, air-conditioning systems, food industry processes and etc. CPC utilizes cold energy mainly to supply air liquefaction and separation services to other manufacturers and to generate power for the natural gas plant. CPC also supplies cold energy to Eastern Industrial Gases and Blue Ocean Industrial Gases for air liquefaction, and provides purified cold drainage of consistent temperature for algae farming (an ingredient for dietary supplement) and to local fish farmers for aquaculture activities, thereby producing mutual benefits with local businesses and residents. “Yongan Grouper Festival,” a festivity hosted by communities near Yongan Plant for several years is now a renowned local event.



### ► Cold energy- and pressure energy-based power generation

CPC uses propane to recover cold energy from the LNG gasification process, which can then be pressurized and gasified to drive the expander and power generator to generate electricity up to 1,800 kW per hour. Cold energy meets part of Yongan Plant's power requirements and saved approximately 31.64 kWh of purchased electricity in 2019, saving NT\$74.36 million.

### ► Cold energy chiller system

Apart from power generation, we can generate chiller water for equipment cooling and airconditioning for the entire plant by exchanging heat between ultralow temperature LNG and high-temperature liquid flowing back from the chiller. Doing so saves electricity and operational and maintenance cost, and the cold energy chiller system saved approximately 4 million kWh of electricity in 2019, which amounted to about NT\$9.4 million.

### ► Liquefaction of gas

Taichung LNG Refinery and Yongan LNG Refinery supply cold energy to Blue Ocean Industrial Gases and Eastern Industrial Gases, respectively, for air liquefaction. The cold energy reduces air temperature, turning it into liquid form, which is subsequently run through the rectifying tower to be separated into liquid nitrogen (LN<sub>2</sub>), liquid oxygen (LO<sub>2</sub>) and liquid argon (LAr). This process is 32% more power efficient than the conventional liquefaction method, and CPC was able to generate NT\$100 million of revenue from this in 2019.

### ► Cold drainage for aquaculture

The Plant supplies filtered, purified cold drainage of consistent temperature to local aquafarms free of charge through underground box culverts. Apart from the ease of access, aquafarm owners will not need to worry about barnacles that may clog the intake or typhoons that may damage the pipelines. Cold drainage is filtered and purified thrice before discharge to create a quality environment for the grouper, reduce the possibility of diseases, and thus enhance output. Aquafarm owners can also save expenses from electricity for pumping water and from maintain, repair, or replace pumping equipment. Therefore, they call the cold drainage “diamond water,” which is a treasure with both tangible and intangible benefits to aquafarm owners. In addition, the reuse of the discharged cold water serves as a good example of resources reuse, circular economy, and mutually beneficial engagement with the neighborhood. CPC help to create approximately NT\$1.5 billion ~ NT\$2 billion of production value in this respect.



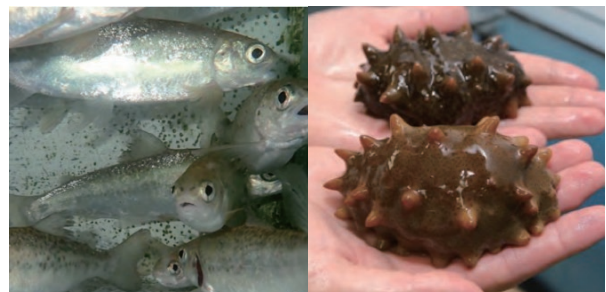
CPC is proud to have supported the development of grouper farming in Yongan, and feels satisfied seeing “Yongan Grouper Festival” become a renowned local event in its 20th year (2019) and Yongan fish farmers winning the “National Grouper Competition” time and time again.



The “Yongan Grouper Festival” has become a renowned local event.

### Cold water aquaculture

CPC coordinated with the Fisheries Agency to construct a “cold water aquaculture pilot plant” that was commenced operations in 2018. This establishment makes use of the cold drainage discharged from Yongan Plant, and introduces cold water aquaculture technologies along with high-value cold water species such as Atlantic salmon, halibut, Japanese sea cucumber and abalone. Cold water aquaculture is expected to be adopted at 100 hectares of fish farm nearby to produce 6,700 tonnes of seafood (equivalent to NT\$4.3 billion in value), and replace 20% of the current national import for cold water seafood products



### ► Cold drainage for algae farming

Utilizing cold drainage discharged from Yongan Plant, CPC constructed a large-scale algae farming pilot site along the drain to experiment farming of red algae (a type of algae), making it the first domestic attempt to grow algae onshore using cold drainage. The pilot site currently has a capacity to grow 2 tonnes of algae indoors, which provides foundation stock for the 10-tonne and 20-tonne outdoor pools. Access to cold drainage ensures that red algae, a species that thrives in the temperature range of 20~25, is able to grow in good quantities and quality in Taiwan.

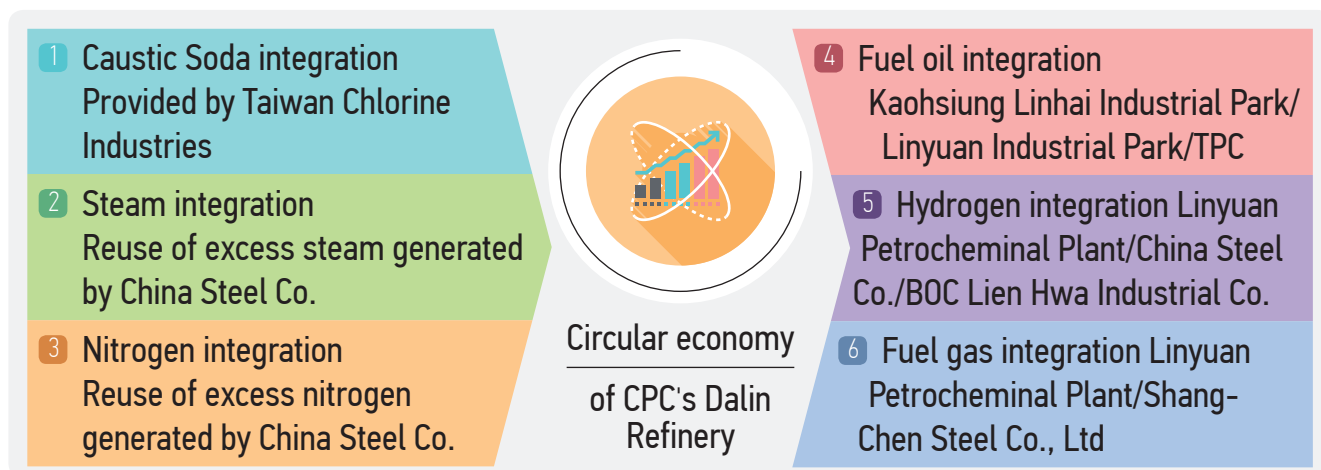


The site grows several algae species such as Japanese sea cucumber, grateloupia filicina, red grape algae, helminthocladia australis, black moss etc., and CPC won the 16th National Innovation Award - “Enterprise Innovation Award” for “Large-scale Local Algae Material Development” in 2019. Japanese sea cucumbers are currently being developed into products such as gift boxes, jelly, handmade noodles and ice blocks, while more valuable uses such as food, animal feed, healthcare etc. are being developed currently.

The pilot site produces 20 tonnes of red algae per year, which generates NT\$4 million in revenues at NT\$200 per kg in raw form, but more than NT\$80 million (20 times) if processed into food. Given that Taiwan imports approximately NT\$2 billion worth of algae per year for food and industrial use, CPC will continue offer guidance to help Yongan fish farmers with transition into red algae farming, which increases local economic activities and reduces dependency on imports at the same time.

## Energy and resources integration

Dalin Refinery is CPC's largest refinery base; it contributes to the energy/resource integration within Kaohsiung Linhai Industrial Park by supplying industrial gases such as steam and hydrogen to other businesses without them having to acquire or produce separately. This arrangement also allows excess gases such as steam to be utilized by businesses in need instead of being released into the atmosphere and cause wastage. Overall, it is an arrangement that reduces cost for the entire industrial park and relieves the environment of excess burden. In terms of fuel oil integration, Dalin Refinery can produce low-sulfur fuel oil for TPC, the Kaohsiung Linhai Industrial Park, and the Linyuan Industrial Park to reduce air pollution caused by fuel oil boiler emissions.

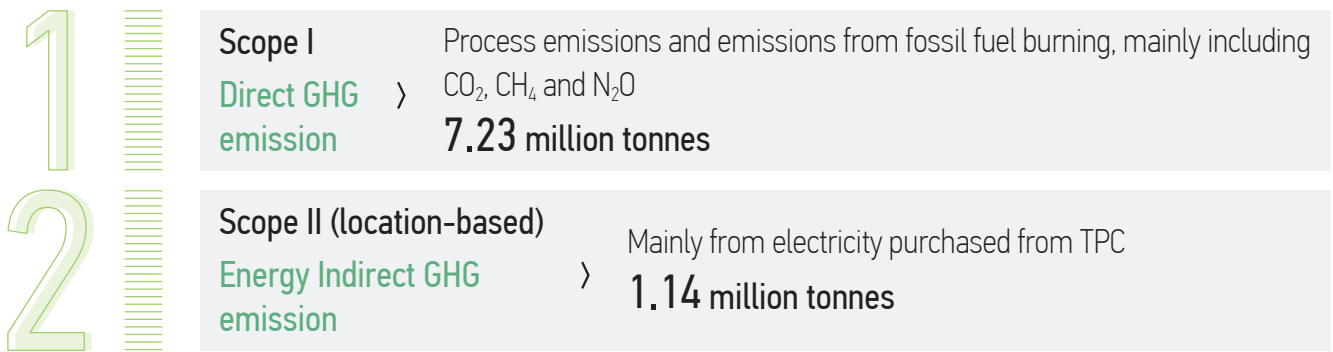


- 1 Caustic Soda integration:** Caustic Soda is mainly used in production procedures and neutralization at Dalin Refinery; it used to be transported using tank trucks and is now moved through pipelines to minimize fuel consumption, transportation cost, and management risks.
- 2 Steam integration:** By integrating with the Kaohsiung Linhai Industry Park, Dalin Refinery can use the excessive steam from China Steel Corporation to reduce CO<sub>2</sub> emissions.
- 3 Nitrogen integration:** At Dalin Refinery, we use nitrogen to make up pressure, seal up things, and blow off dirt. Nitrogen is mainly supplied by China Steel Co.
- 4 Fuel oil integration:** Dalin Refinery can produce low-sulfur fuel oil for TPC, the Kaohsiung Linhai Industrial Park, and the Linyuan Industrial Park to reduce air pollution caused by fuel oil boiler emissions.
- 5 Hydrogen integration:** Dalin Refinery can supply the hydrogen to China Steel Co., BOC Lien Hwa Industrial Co., Ltd., and even to Linyuan Petrochemical Plant.
- 6 Fuel gas integration:** Dalin Refinery can supply fuel gas from its refining process to Top Commercial Material Co., Ltd. and Linyuan Petrochemical Plant.

### 3.3 GHG Management

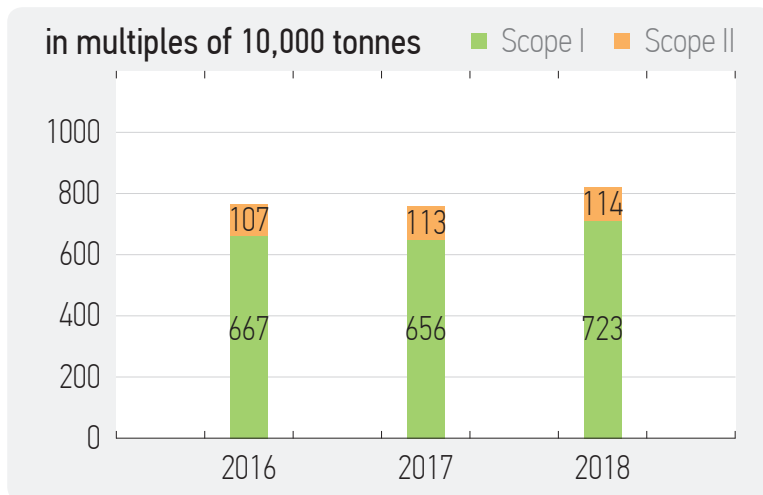
In response to the national long-term GHG reduction goal, we implemented the ISO 14064-1 GHG inventory system in 2004 to quantify the GHG emissions of production facilities. Results approved by third-party verification are used to set the GHG reduction goals and implement GHG management programs in order to reduce GHG emissions each year. In addition, we register the GHG inventory results on the "Taiwan GHG Emission Registry" and disclose them on the sustainability report to inform the public of our GHG emissions over the years.

GHGs are categorized into Scopes I, II, and III. Given the difficulty in quantification and verification, Scope III is not included in our emissions calculation. Total GHG emission in 2018 was 680,000 tonnes (CO<sub>2</sub>e) higher than that in 2017, but the GHG emission intensity has actually been reducing for two years since 2016. In terms of GHG intensity, the level in 2018 was 5.7% lower than 2017. GHG emission volume for 2019 is still pending for third-party validation by August 2020 before releasing to the public.



Note 1: CPC does not use biofuel

### CPC's total GHG emission in recent years

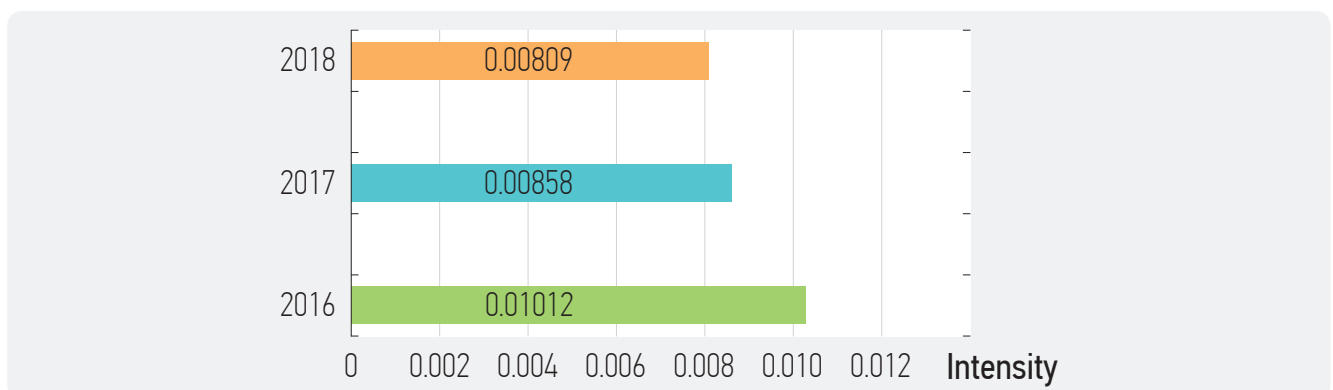


Note 1: 2005 is designated as the baseline year; GHG inventory is carried out using the operational control approach outlined in Section 4.1 of ISO 14064-1; the boundary of GHG inventory covers 21 units including all refineries and Linyuan Petrochemical Plant

Note 2: GHG emission volume for 2019 is still pending third-party validation by August 2020

Source: Based on GWP information cited on the National GHG Registration Platform, Environmental Protection Administration, for the respective years of survey.

### GHG emissions intensity



\*Note: GHG intensity = Annual GHG Emissions/Annual Revenue (kg/ NT\$)

CPC has long been exploring ways to save energy on production procedures, transportation and storage, and is committed to supporting the nation's claimed goals to reduce carbon to 20% below the 2005 baseline by 2030, and the goals stated in Greenhouse Gas Reduction and Management Act to reduce carbon to 50% below the 2005 baseline by 2050. Internally, CPC continues to enforce a GHG reduction plan that aims to reduce emission to 30% below the 2005 baseline by 2030.

With respect to energy and CO<sub>2</sub> reduction, CPC saved energy equivalent to 34,000 kL of oil and reduced 102,000 tonnes of CO<sub>2</sub> in equivalent terms. Cumulative volume of energy saved from 2005 to 2019 totaled an equivalent of 889,000 kL of oil, reducing 2.615 million tonnes of CO<sub>2</sub> in equivalent terms. Energy consumption had improved significantly across all major production units during this period.

### Major Energy Conservation Measures and Performance 2005-2019

Major Energy Conservation Measures	Reduction (KLOE)	Performance (NT\$ ten thousand)	CO <sub>2</sub> reduction (t)
Process Equipment Renewal	250,315	354,297	767,104
Equipment Repair/Improvement	137,821	203,038	420,382
Waste Heat and Fuel Gas Recovery	259,577	417,855	765,632
Operation Improvement	89,121	240,072	272,394
Other Improvements in Energy Management	152,376	228,564	389,325
Total	889,210	1,443,826	2,614,837

"Refinery Performance Enhancement Program" and "Petrochemical Plant Performance Enhancement Program" have been devised to support GHG Emission Control Action Plans (phase I) of CPC's energy and manufacturing departments, respectively. Phase I (2018-2020) GHG reduction for the two departments is estimated at 105,500 and 51,000 tonnes, respectively.



## CPC Energy Sector Phase I Action Plan

Program	Duration	Expected benefits	2019 outcome
Low-Carbon Energy (Natural Gas) Supply Boost Program	2018-2020	Natural gas loading/unloading capacity is estimated at 16.5 million tonnes in 2020.	Natural gas loading/unloading capacity totaled 16.5 million tonnes.
Macroalgae (Red Algae) Culture Technology Development Program	2018	A 20-tonne algae culture laboratory is built in Yongan Natural Gas Plant to develop the outdoor LNG cold drainage algae culture technology.	<ol style="list-style-type: none"> <li>1 Long-time outdoor culture of algae The average output of a 20-tonne pond is up to 1 kg/m<sup>2</sup>/week.</li> <li>2 Patent acquired for algae culture technology.</li> <li>3 Won the 16<sup>th</sup> National Innovation Awards—Enterprise Innovation Award.</li> </ol>
Refinery Performance Enhancement Program	2018-2020	Promote various energy conservation measures and enhance refinery energy efficiency, with expected carbon reduction of 105,500 tCO <sub>2</sub> e.	Carbon reduction measures implemented at refinery plants reduced carbon by 46,000 tonnes during the year, or 79,000 tonnes cumulatively.
Promote fuel replacement with natural gas for the manufacturing sector	2018-2020	Guidance for 10 fuel-consuming manufacturers to replace fuel with natural gas each year.	Helped 42 fuel oil users transition into natural gas; a cumulative total of 70 users have received counseling to date.
Petrochemical Plant Performance Enhancement	2018-2020	Implement energy conservation and improvement measures every year. Starting from 2014, the estimated energy efficiency raise is 2.3% (approx. reduction of 51,000 tCO <sub>2</sub> e) of an entire plant.	Energy efficiency enhancement of petrochemical plants was 0.82% (approx. reduction of 18,000 tCO <sub>2</sub> e). Energy efficiency of production plants have improved by 1.28% compared to the 2014 baseline.

We constantly implement plant energy consumption control through energy efficiency enhancement, energy and resource integration, and the use of low-carbon fuels and bioenergy. Through the biannual energy conservation and CO<sub>2</sub> reduction performance follow-up meetings, we keep track of our reduction progress. With respect to the “Regulations for Setting Energy Conservation Targets and Implementation Plants of Energy Users” promulgated by the Bureau of Energy, we constantly improve plant and factory energy conservation by replacing energy-efficient lighting to save over 1% of electricity on average every year.

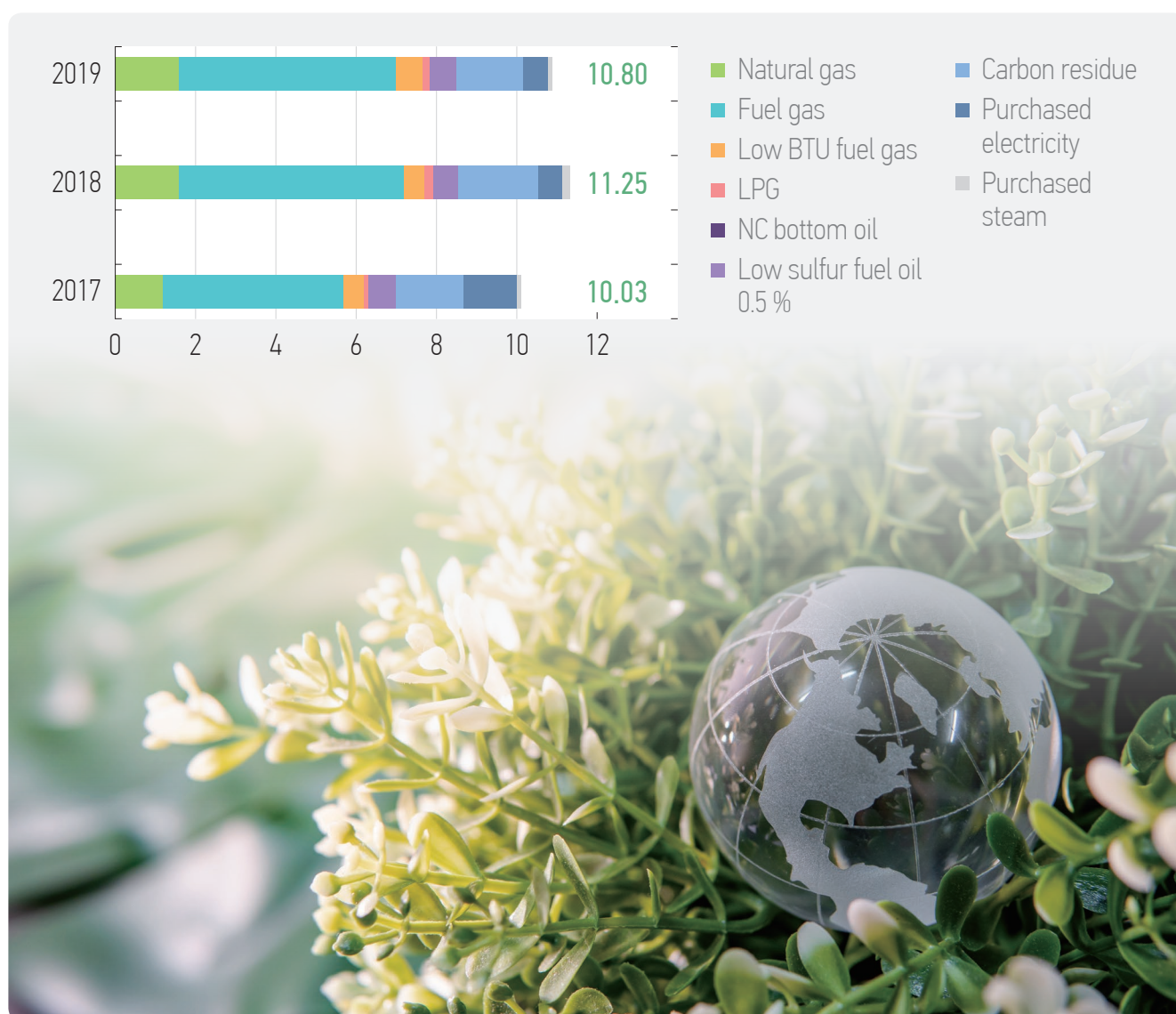
## 3.4 Energy and Resources Management

### 3.4.1 Energy consumption

We consume electricity, natural gas, steam, fuel gas, petroleum gas, and fuel oils. The total 2019 energy consumption was 108 million GJ, with the highest heating value from fuel gas. In addition, the 2019 renewal energy output of our PV systems totaled 10.068 million kWh and were sold to TPC. The 2019 output production was about 183.596 million kL, with energy intensity at 0.588 GJ/kL, about 6.07% lower than that of 2018 at 0.626 GJ/kL. After energy conservation and carbon reduction programs are implemented, the unit product energy consumption was stabilized.

\*Total energy intensity = total energy consumption/volume of products produced

#### Total thermal value of energy sources used at the three plants



## Use of energy source (heating value) by the three plants in 2017 ~ 2019

Unit: 10 million GJ (GJ=10<sup>9</sup>J)

Year		2017	2018	2019
Direct energy consumption	Natural gas	1.30	1.63	1.62
	Fuel gas	4.85	5.56	5.40
	Low BTU fuel gas	0.53	0.51	0.63
	LPG	0.16	0.20	0.15
	Low sulfur fuel oil 0.5 %	0.74	0.62	0.62
	Carbon residue	1.80	2.02	1.69
	<b>Total heating value</b>	9.38	10.50	10.10
Indirect energy consumption	Purchased electricity	0.56	0.56	0.60
	Purchased steam	0.10	0.20	0.10
	<b>Total heating value purchased</b>	0.65	0.75	0.70
<b>Gross heating value</b>		10.03	11.25	10.80

Note 1: Energy Consumption = Fuel Usage \* Unit Heating Value

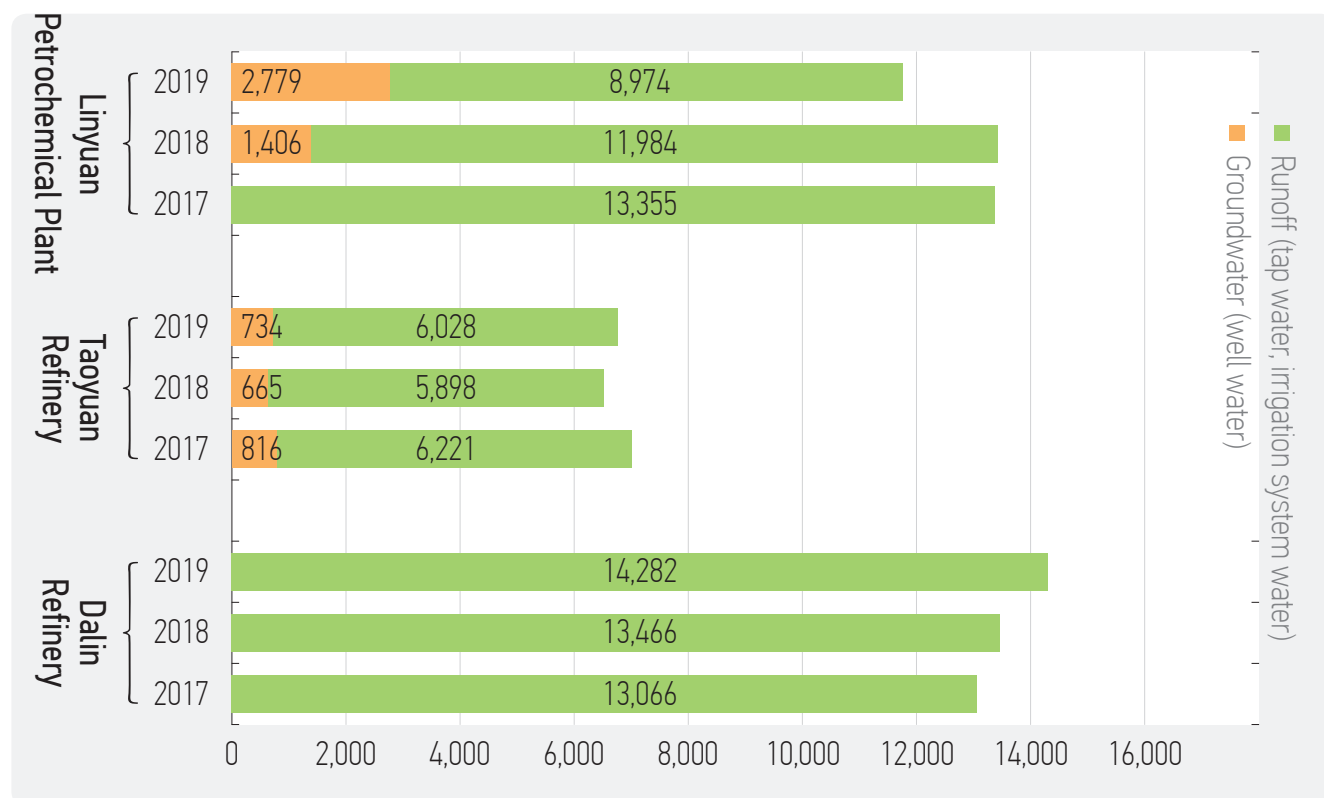
Note 2: The unit heating value is: (1) natural gas of 8,900 Kkcal/KS, (2) fuel gas of 9,000 Kkcal/KS, (3) low BTU fuel gas of 6,000 Kkcal/KS, (4) LPG of 6,635 Kkcal/KL (5) NC bottom oil of 9,700 Kkcal/KL, (6) low sulfur fuel oil (0.5%) of 9,200 Kkcal/KL, (7) Carbon residue of 9,580 Kkcal/TON, (8) purchased electricity of 2,180 Kkcal/MWH for 2017 and 860Kkcal/MWH for 2018-2019, and (9) purchased steam of 724Kkcal/TON

### 3.4.2 Water consumption

Water conservation and emergency response measures for water shortfall are two important issues especially given the extreme climate changes. We actively implement process water reclamation and reuse and a range of water conservation and effluent reclamation and reuse measures. Water for Dalin Refinery and Linyuan Petrochemical Plant is purchased from Fengshan Reservoir. Water for Taoyuan Refinery is purchased from Shimen Reservoir. As all water consumption plans are assessed and approved by the Taiwan Water Corporation and the Water Resources Agency in advance for water supply influence, water used in our production activities will not cause significant influence to the water supply.



## Water usage by plants in the last 3 years

(Unit: 1000 m<sup>3</sup>)

Plant	(expressed in m <sup>3</sup> )		Year		
			2017	2018	2019
Dalin Refinery	Total volume		669,343,388	639,930,353	603,958,428
	Runoff (tap water, river water, irrigation system water)	Consumption	13,354,959	11,984,186	8,973,939
		Proportion	2.00%	1.87%	1.49%
	Groundwater (well water)	Consumption	0	1,405,957	2,778,785
		Proportion	0.00%	0.22%	0.46%
	Reclaimed Water	Stormwater		114,325	90,350
Process Wastewater (Reclaimed volume of effluent reclamation equipment)		305,269	985,963	1,182,166	
Others (including cooling water circulation, condensate reclamation, acidic water reclamation, and backwash water reclamation)		655,568,835	625,463,897	590,988,037	
Total volume		655,988,429	626,540,210	592,205,704	
Proportion		98.00%	97.91%	98.05%	



Plant	(expressed in m <sup>3</sup> )		Year			
			2017	2018	2019	
Taoyuan Refinery	Total volume		281,732,204	288,106,337	295,905,327	
	Runoff (tap water, river water, irrigation system water)	Consumption	6,220,896	5,897,648	734,240	
		Proportion	2.21%	2.05%	0.25%	
	Groundwater (well water)	Consumption	815,811	664,515	6,028,370	
		Proportion	0.29%	0.23%	2.04%	
	Reclaimed Water	Stormwater		0	0	0
		Process Wastewater (Reclaimed volume of effluent reclamation equipment)		0	0	0
		Others (including cooling water circulation, condensate reclamation, acidic water reclamation, and backwash water reclamation)		274,695,497	281,544,174	289,142,717
		Total volume		274,695,497	281,544,174	289,142,717
		Proportion		97.50%	97.72%	97.71%

Plant	(expressed in m <sup>3</sup> )		Year			
			2017	2018	2019	
Linyuan Petrochemical Plant	Total volume		766,852,087	815,568,249	787,199,506	
	Runoff (tap water, river water, irrigation system water)	Consumption	13,066,143	13,465,992	14,282,055	
		Proportion	1.70%	1.65%	1.81%	
	Groundwater (well water)	Consumption	0	0	0	
		Proportion	0	0	0	
	Reclaimed Water	Stormwater		0	0	0
		Process Wastewater (Reclaimed volume of effluent reclamation equipment)		731,448	774,188	924,151
		Others (including cooling water circulation, condensate reclamation, acidic water reclamation, and backwash water reclamation)		753,054,496	801,328,069	771,993,330
		Total volume		753,785,944	802,102,257	772,917,481
		Proportion		98.30%	98.35%	98.19%

### 3.4.3 Water Resources Management

To adapt to the potential water shortages and the risk of water consumption charge in the future, and to cherish natural resources, we are committed to reclaim and reuse wastewater and effluents discharged from our facilities to achieve water conservation and maximize water reuse through the following measures. Between 2017 and 2019, all three plants had reclaimed more than 96% of the water consumed.

#### ■ Water conservation and effluent reclamation and reuse measures of CPC facilities:

##### Reduce cooling water loss

- ✓ Renew water trays and honeycomb water deflectors to lower cooling water lost in evaporation from 0.1% to 0.003% to reduce cooling water refill.

##### Improve boiler water quality

- ✓ Produce water with pure/ultrapure water equipment to increase water intake and reduce effluent in cycle.
- ✓ Treat raw water with electro dialysis reversal (EDR) equipment to reduce water conductivity and total hardness, in order to increase the water intake of ion-exchange resin and thereby reduce boiler water consumption by improving intake water quality.

##### Improve water for firefighting

- ✓ Stagnant water for firefighting is prone to deteriorate. Flushing water surface with backwash water for firefighting to inhibit algae growth can maintain water quality for a longer time.

##### Save process water

- ✓ Install condensate monitoring and diversion equipment to keep track on condensate quality at all times to prevent condensate from contamination and non-reusability.
- ✓ Solenoid valves are used to recycle water and replenish water towers.
- ✓ Deaerating tanks are used to recycle low-pressure steam, which enables recovery of heat and condensed water.

##### Reclaim and reuse effluents

- ✓ Process wastewater after treatment is transported to the park wastewater treatment plant. Some effluents can be reclaimed and reused in sludge dehydrators or incinerator wet scrubbers.
- ✓ After sedimentation and sediment removal and sand filtration, some effluents from sewage can be used in washing gutters and oil tanks.

## Water conservation progress

Year		Dalin Refinery	Taoyuan Refinery	Linyuan Petrochemical Plant
2017	Raw Water Replenished (in 10 thousand tons) (A)	1,335.5	703.70	1,306.60
	Reclaimed Water Volume (in 10 thousand tons) (B)	35,598.80	27,469.50	75,378.60
	Water Reclamation Rate (%) (B ÷ [A+B])	96.38%	97.50%	98.30%
2018	Raw Water Replenished (in 10 thousand tons) (A)	1,339.00	656.20	1,346.60
	Reclaimed Water Volume (in 10 thousand tons) (B)	62,654.00	28,154.40	80,210.20
	Water Reclamation Rate (%) (B ÷ [A+B])	97.91%	97.72%	98.35%
2019	Raw Water Replenished (in 10 thousand tons) (A)	1,175.3	676.3	1,428.2
	Reclaimed Water Volume (in 10 thousand tons) (B)	59,220.6	28,914.3	77,291.7
	Water Reclamation Rate (%) (B ÷ [A+B])	98.05%	97.71%	98.19%

Note 1: Water reclamation rate (%) is calculated as  $(B \div [A+B])$ , where A represents the volume of raw water replenished (in multiples of 10,000 tonnes) and B represents the volume of water reclaimed (in multiples of 10,000 tonnes).

Note 2: Water Reclamation Rate: Harvested stormwater, reclaimed process wastewater, reclaimed cooling water, reclaimed condensate, reclaimed acidic water, and reclaimed backwash water.

## 3.5 Pollution Prevention Management Approach

### Effluents and Waste Management

#### Policy and commitment

- ✓ Start effluent prevention with the source control of process wastewater and enhance effluent recycling and reuse with high-performance equipment. Ensure that effluents are compliant with environmental protection laws.
- ✓ Quantity reduction, volume reduction, and size reduction are the basic principles for waste management. Follow these principles
- ✓ CPC has been adopting the ISO 14001 - Environmental Management System since 1996; a total of 22 units had passed certification at the end of 2019
- ✓ Implement robust environment monitoring systems according to the commitments made in the environmental assessment

#### Goals | Short-term

- 1 Enhance source management of upstream workshops, improve the quality of effluents, and increase effluent reclamation.
- 2 Acquire the permit to dispose of hazardous industrial waste when incinerating hazardous industrial waste from the refinery and the petrochemical plant.

**Goals | Medium/long-term**

- 1 Encourage employees to obtain licenses and certificates in relation to environmental protection and participate in the related training and education activities
- 2 Upgrade wastewater treatment equipment, promote recycling and reuse of wastewater, establish an off-site soil treatment facility with the goal of turning soil into resource, and adopt a circular economy focus

**Specific Actions**

- 1 Undertake air pollution improvement measures in support of government policies such as the "Kaohsiung-Pingtung Total Air Pollutant Control Program" and the "Air Pollution Prevention Action Plan"
- 2 Assemble an Environment Audit Team and maintain audit records on the environment audit system for progress tracking until rectified
- 3 Review and revise the waste management SOP to ensure the compliance of waste disposal practices.

**Measurement Mechanisms**

Convene environmental protection meetings and waste taskforce meetings on a regular basis; conduct rolling reviews of current progress to ensure proper execution

## 3.5.1 Emissions and management of air pollutants

Nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), volatile organic compounds (VOCs), and total suspended particulates (TSP) are the major air pollutants emitted from our production facilities. They are emitted via stacks, flares, storage tanks, equipment components, and loading operation. NO<sub>x</sub> emission in 2019 was 7.7% lower compared to 2018, VOCs emission in 2019 was 4.5% lower compared to 2018, and TSP emission in 2019 was 0.1% higher compared to 2018; these figures indicate that improvement measures were effective at reducing various forms of emission. However, SO<sub>x</sub> emission in 2019 was 10.08% higher than 2018 due to absence of annual servicing for Dalin Refinery, a residual oil cracking (ROC) plant in 2019 and higher days of operation compared to 2018.

### CPC emission volume by pollutants in the last 3 years

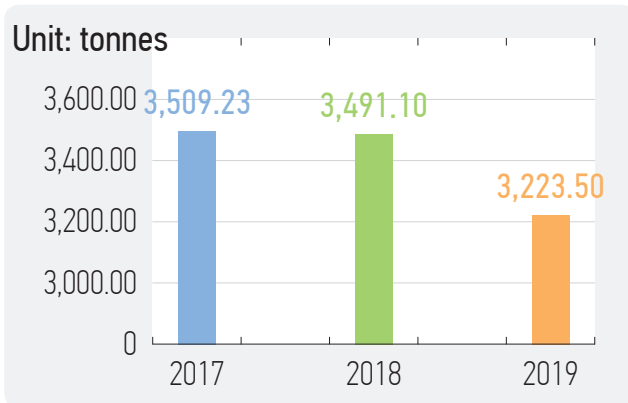
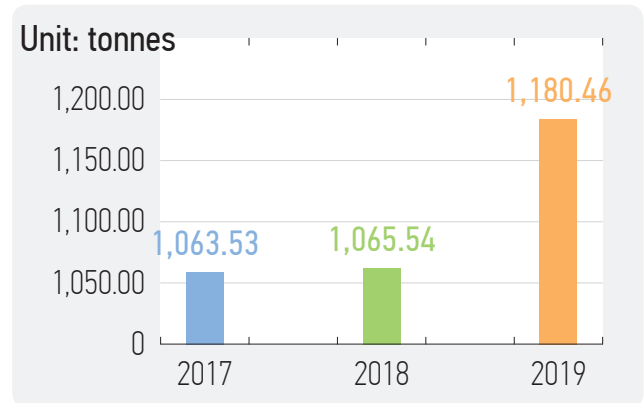
Unit: tonnes

Type	Headquarter/plant	2017	2018	2019
NO <sub>x</sub>	Refineries	3,509.23	3,491.10	3,223.50
SO <sub>x</sub>	Refineries	1,063.53	1,065.54	1,180.46
VOCs	Refineries	2,154.22	2,226.03	2,125.90
TSP	Refineries	264.66	216.67	216.90

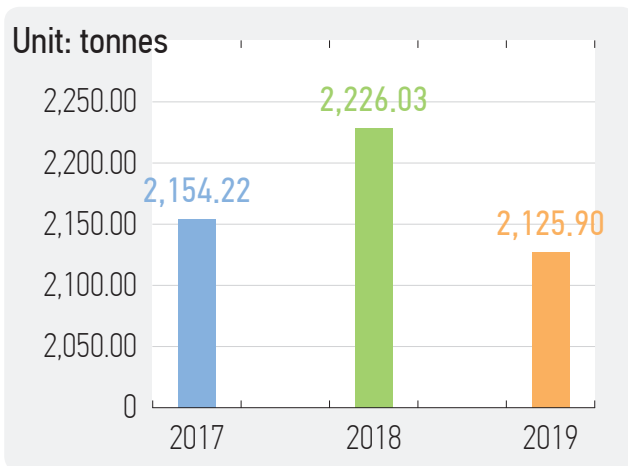
Note 1: Refineries/petrochemical plants include Dalin Refinery, Taoyuan Refinery and Linyuan Petrochemical Plant

Note 2: Volumes in 2017 and 2018 are approved volumes, and the volume of 2019 is the reported volume pending approval from the authority.

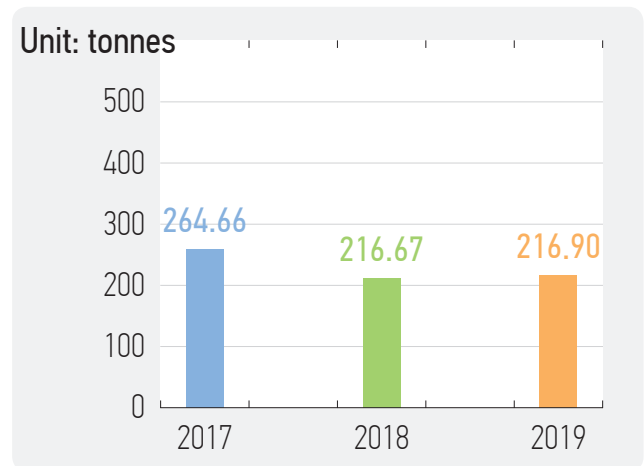


NO<sub>x</sub>SO<sub>x</sub>

## VOCs



## TSP



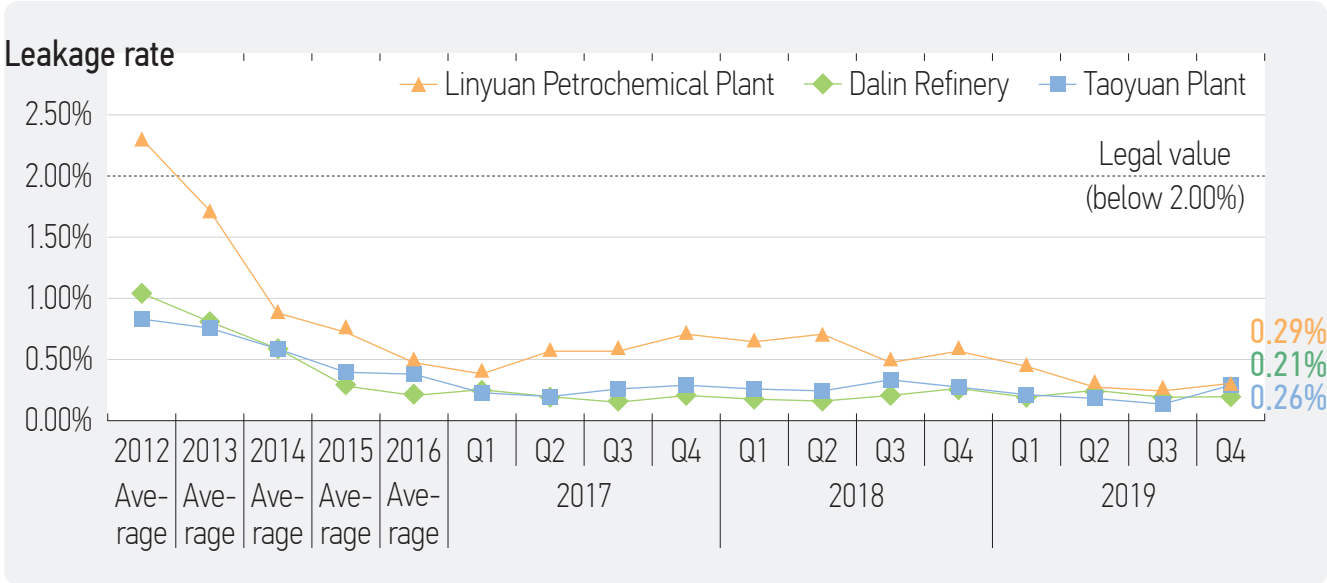
CPC has been promoting independent testing of equipment components since 2011 and has highly risen the proportion of independent testing in 2019, promoting building a list of high-leakage risk equipment components, and list them as key targets for independent testing. We will further increase our efforts to test and inspect equipment and components for VOC emission. Each unit will be required to examine current practices regularly for conformity with the operating permit, and convene monthly equipment/component improvement team meetings to facilitate inter-department communication, so that improvement measures can be taken accordingly to reduce the number of environmental violations in the future.

We initiate air pollution improvement projects in response to the government policy. Since 1989, we have invested over NT\$50 billion in reducing pollution and emissions. The Executive Yuan proposed an "Air Pollution Prevention Action Plan" at the end of 2017 that encompasses a total of 15 strategies. To support the above policy, CPC has made plans for 22 air pollution improvement measures to be carried out between 2017 and 2022 for the purpose of reducing air pollutants. Below is a summary description of such measures:

Improvement plans	Improvement measures	Description
Air pollution improvement plan for refineries and petrochemical plants	Incorporation of advanced procedures and equipment (BACT) into the production process	<ul style="list-style-type: none"> <li>✓ By introducing advanced procedure integration and control systems, CPC is able to improve the stability of its operations</li> <li>✓ Use of optimal and feasible control technologies and low-leakage equipment currently available</li> </ul>
	Use of clean fuel	<ul style="list-style-type: none"> <li>✓ Transition into gas fuel for existing and new boiler equipment to significantly reduce emission of pollutants and burden to the environment</li> </ul>
	Process improvement	<ul style="list-style-type: none"> <li>✓ Adjust operation and program of existing equipment for optimal performance</li> <li>✓ Improve combustion technology for higher combustion efficiency</li> </ul>
	Installation of air pollution control equipment	<ul style="list-style-type: none"> <li>✓ TSP: Install static electricity- or bag-based dust collector</li> <li>✓ SO<sub>x</sub>: Install fume gas desulfurization (FGD) equipment</li> <li>✓ NO<sub>x</sub>: Adopt selective catalytic reduction (SCR) or low NO<sub>x</sub> burner (LNB)</li> <li>✓ VOCs: Progressively transition into low-leakage components and adopt oil and gas recovery equipment</li> </ul>
	Waste gas recovery and reuse	<ul style="list-style-type: none"> <li>✓ Install Flare Gas Recovery System (FGRS) at refineries and petrochemical plants, so that exhaust generated from plant operations can be recovered and reused in the production process</li> </ul>
Diesel vehicle PM <sub>2.5</sub> emission improvement plan	Proprietary diesel vehicle	<ul style="list-style-type: none"> <li>✓ Full replacement of phase 1 and phase 2 proprietary diesel vehicles and installation of particulate filters on phase 3 proprietary diesel vehicles by the end of 2019</li> </ul>
	Contractors' diesel vehicles	<ul style="list-style-type: none"> <li>✓ Require contractors to use only diesel vehicles that conform with emission standards phase IV, V, and above when performing the contracted work, and to include this requirement in all new contracts</li> </ul>

## VOCs emission management and improvement

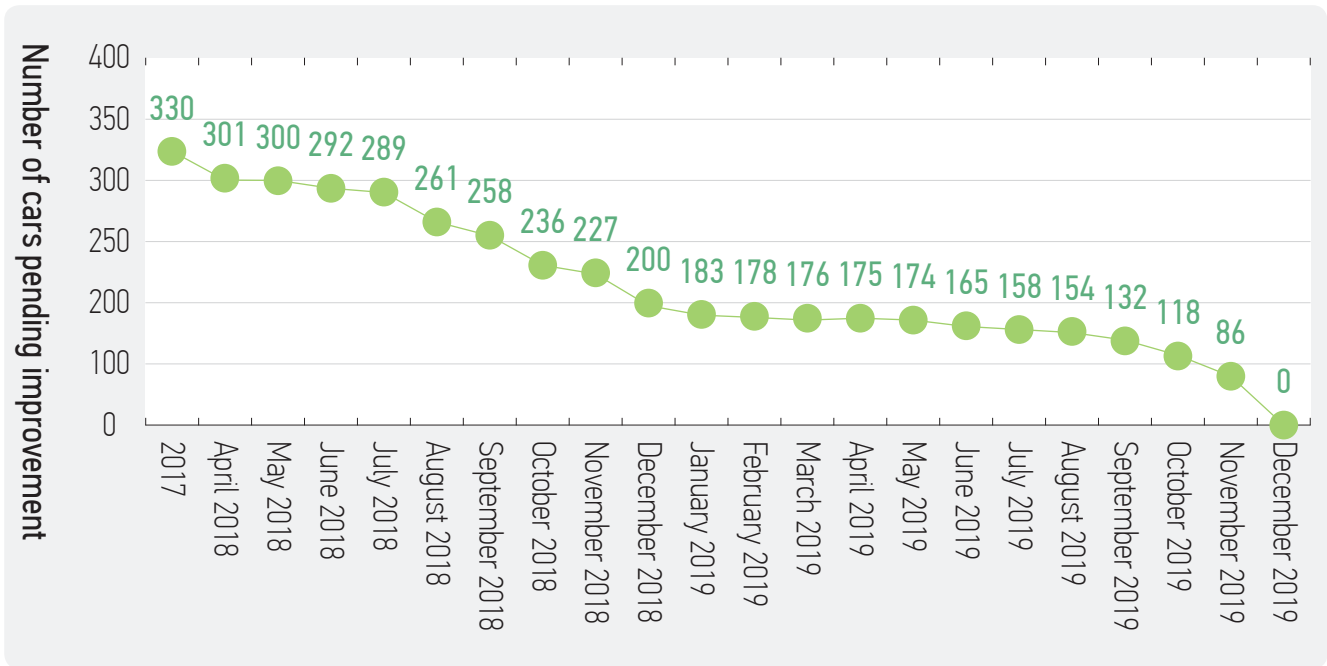
Evaporation from equipment components is amongst the most difficult to control sources of VOCs. To effectively control and reduce VOC emissions, we established the "Equipment Component Improvement Team" in 2013. It holds quarterly meetings to review the improvement measures of each plant. After incessant efforts over the years, VOC leakage of equipment components of three production facilities has been controlled within 0.3%, and we are working towards our target of less than 0.3%.



## Diesel Car PM2.5 Emissions Reduction Program

In response to the national pollution reduction policy and to practice CSR, we have implemented the PM2.5 emissions reduction working program for self-owned diesel cars and those owned by contractors. By December 2019, we improved 330 self-owned diesel cars. As for contractor diesel cars, we request contractors to comply with the standards of phases IV and V or higher in the contract.

### No. of diesel vehicles with improvements made



## 3.5.2 Effluents management

We treat wastewater of all major production facilities properly with in-house treatment facilities prior to discharge. We also test wastewater quality periodically to ensure no significant environmental impacts. Our effluents management approaches are as follows:

### Effluents management approaches

- 1 Implement water pollution preventive measures planning, and apply for approval of bypass and dilution to environmental protection authorities
- 2 Implement contingency measures and report to competent authorities for waster body contamination due to negligence
- 3 Enhance source management of upstream workshops, improve the quality of effluents, and increase effluent reclamation
- 4 Enhance patrol, inspection, and emergency response drill of storage tanks and transportation equipment
- 5 Encourage employees to obtain related licenses and certificates and participate in professional training
- 6 Upgrade wastewater treatment equipment and recycle wastewater

We have planned well-established effluent pollution control measures to prevent process wastewater from causing environmental impacts. Petroleum organic compounds are the major pollutants contained in our effluents. The effluent monitoring targets include suspended solid (SS) chemical oxygen demand (COD), oil, and phenol. In 2019, the effluent monitoring values of all production facilities met the effluent standards, and the total wastewater volume was 113,400 tonnes or 1.17% lower than that of 2018. Remedial actions were taken to clear damaged pipeline of residual oil, remove contaminated soil, stop residents from using groundwater and use water supplied by CPC for irrigation instead, and subsidize installation of fresh water equipment for access to drinking water. Overall, residents' use of water was unaffected. Meanwhile, additional pressure monitoring system, inspection points and anticorrosion test points were introduced and pipelines were actively replaced to prevent recurrence. Wastewater pollution prevention by facility:

### 1 Dalin Refinery

Wastewater from Dalin Refinery (special wastewater, wastewater containing oil, wastewater containing mineral salts, and sewage) is transported to treatment at the secondary wastewater treatment site through the oil-water separator before being released through the ocean drainage pipes of the central wastewater treatment plant at the Kaohsiung Linhai Industrial Park.



Tests	Effluent Standard (EPB) or Control Standard (Science Park)	2017	2018	2019
SS (mg/L)	100	13.8	12	10.5
COD (mg/L)	280	78.6	45.4	39.8
Oil (mg/L)	20	2.8	<1	1.1
Phenol (mg/L)	1.0	0.02	0.005	<0.05
Discharge (tonne)	-	3,893,530	3,651,524	3,321,491

Note: Water discharge data for 2017, 2018 and 2019 was revised following the authority's review.

## 2 Taoyuan Refinery

Wastewater from Taoyuan Refinery (special wastewater, wastewater containing oil, wastewater containing mineral salts, and sewage) is transported to treatment at the wastewater treatment site before releasing to the Nankang River, provided that the volume must not exceed the river's assimilative capacity. In addition, as the quality of treated wastewater complies with the national effluent standards and is even better than the quality, there is only mild impact on the river.

Tests	Effluent Standard (EPB) or Control Standard (Science Park)	2017	2018	2019
SS (mg/L)	30	17.01	11.20	10.27
COD (mg/L)	100	20.87	19.88	21.40
Oil (mg/L)	10	2.44	8.40	4.37
Phenol (mg/L)	1.0	<0.1	0.00485	0.0049
Discharge (tonne)	-	2,596,899	3,041,824	2,969,641

## 3 Linyuan Petrochemical Plant

After primary treatment, wastewater from Linyuan Petrochemical Plant (special wastewater, wastewater containing oil, wastewater containing mineral salts, and sewage) is transported to secondary (biological) treatment. After meeting the control standards, secondary treated wastewater will be released through the ocean drainage pipes of the central wastewater treatment plant at the Kaohsiung Linhai Industrial Park. After primary treatment, some wastewater is transported to secondary treatment and tertiary treatment and sent back to the complex for reuse after it meets the effluent standards.

Tests	Effluent Standard (EPB) or Control Standard (Science Park)	2017	2018	2019
SS (mg/L)	100	4.45	5.3	9.25
COD (mg/L)	280	44.4	60.45	38.5
Oil (mg/L)	20	<0.1	1.55	<0.1
Phenol (mg/L)	1.0	<0.01	<0.01	<0.01
Discharge (tonne)	-	2,516,167	3,007,259	3,296,109

## Mining formation with water production

Most domestic oil and gas mining areas are natural gas wells. When mining natural gas, condensate oil (naphtha; C5-C20) and formation water are also produced. After three phase separation of oil, gas, and water, the formation associated water production will be affected by the difference in salt content (Cl<sup>-</sup>, about 3,800-11,000 ppm) in different mining areas. Although salt is not included in the effluent control standard, it may cause soil salinization. Therefore, there are two treatment methods for water production:

1

First, after concentration, it is reinjected into the reservoir via the water production reduction well, which helps extract additional oil.

2

Second, after the water is treated by the treatment plant and passes the water quality inspection, it will be discharged to the river. In 2019, the total output of water production in the formation was 21,452 KL.

Region	Tiezhanshan Mine, Jinshui Area, and Qingcaohu Area of Jinqing Mine	Chuhuangkeng Mine
Treatment method	Reinjection into the formation through disposal wells	Discharge after treatment
Description	Before oil reinjection into the formation, the oil slick is recovered by oil-water separation and before reinjection into the underground reservoir. The specifications of disposal wells mainly refer to the relevant regulations of the second class of injection wells of the United States federal regulations	Oil is first separated and recovered by an oil-water separator (API) and discharged until it meets the release standard using an air pressurization floater and a biological treatment system
Volume treated in 2019 (%)	7,627 kL (35.6%)	13,825 kL (64.4%)



### 3.5.3 Waste management

Apart from general refuse, our production activities generate waste including catalysts, sludge, and sediments. We dispose of different types of waste according to their nature. Apart from incinerating household waste at local incineration plants through the local cleaning unit and qualified contractors, we recycle the precious metals contained in waste catalysts and bury sludge and sediments after incineration in-house. Overall, we dispose of solid waste properly by type, such as recycling, bidding and selling, barrel burial, incineration, direct landfill, oil and gas recovery, and direct disposal. Drilling mud is a common waste of the oil and gas industry. Its components often include various types of oils and chemical treatment agents. Improper disposal will thus affect water bodies and ecology. In 2019, soil conditioner was added to the domestic water-based waste mud generated by seven onshore drillings (5 at Chuhaungkeng Mine including Well No. 134 and Geothermal Wells No. 3 and No. 4 at Rezhe, Yilan) to remove moisture to below 80%. After passing the dissolution test, it was commissioned to qualified disposal agents for landfill. Disposal volume for the two locations were 376.16 tonnes and 2,029.33 tonnes, respectively. The total volume of water-based waste mud was 2,405.49 tonnes.

Since waste has a market value and that the government agencies announce that it should be recycled and reused, we will make every effort to promote the recovery and reuse of waste. Zeolite catalyst (mainly consists of aluminium oxide ( $\text{Al}_2\text{O}_3$ ) and silicon dioxide ( $\text{SiO}_2$ )) is the main form of waste reused at refineries and petrochemical plants in 2019, and 100% of which was reused. Based on the reuse purposes outlined in Ministry of Economic Affairs Regulations Governing Reuse of Industrial Waste, CPC transports zeolite catalyst waste to the appropriate institutions where it is made into concrete (floor) tiles, Jersey barriers, curbstone materials, fire-retardant materials, blast-furnace cement, slag and hollow bricks.



## Volume and Method of Waste Disposal of Refineries and Petrochemical Plants in 2019

Type	Method	Volume disposed (tonnes)	Percentage (%)	Waste (tonnes)	Percentage (%)
Hazardous waste	Solidification	608.742	0.545	2,510.563	2.247
	Physical Treatment	29.160	0.026		
	Incineration	1,872.661	1.676		
Non-Hazardous Waste	Chemical Treatment	791.390	0.078	109,229.630	97.753
	Physical Treatment	3,436.789	3.076		
	Recycling	80,016.419	71.609		
	Landfill	5217.414	4.669		
	Incineration	18,990.868	16.996		
	Thermal Treatment (except for incineration)	776.75	0.695		
Total		111,740,193	100.000	111,740,193	100.000

### 3.5.4 Treatment of toxic substances

We operate categories I and III toxic chemical substances as proclaimed by EPA. As all of reach the benchmark of large operation volume, submit the related contingency plans to competent authorities to apply for approval for recordation. Every contingency plan shall include the emergency response task force, the command system, the reporting mechanism, and the emergency disaster prevention equipment. Two unannounced tests and overall drill shall be implemented for every contingency plan each year, and drills in collaboration with the emergency response drills of local environmental protection units shall be implemented to ensure preparedness for toxic disaster prevention.

All relevant units participate in the nationwide toxic chemical substance joint prevention organization in accordance with Paragraph 4, Article 16 of the "Toxic and Concerned Chemical Substances Control Act" and Article 7 of its Enforcement Rules. In addition, we complete the stage 1 registration of a total of 144 existing chemicals according to the "Regulations of New and Existing Chemical Substances Registration." Furthermore, we voluntarily complete the Chemical Commodity Importation Pre-Confirmation in coordination with the "Import Management in Chemical Substance Registration" promoted by EPA.





Emergency response drill 2019 on toxic substance at Taoyuan Refinery

## 3.6 Environmental protection and pollution prevention Management Approach

### Ecological and Environmental Education

#### Policy and commitment

- ✓ Adhering to green co-existence, we spare no effort to maintain and implement ecological conservation, hoping to maintain the sustainable development of society, nature, and business
- ✓ Community participation is important to the success of ecological conservation. Therefore, we proactively link communities, experts and scholars, and government units to establish ecological conservation partnerships, in order to enforce ecological and environmental conservation

#### Goals | Short-term

Constant environmental and ecological monitoring

#### Goals | Medium/long-term

- 1 Promote Environmental Education: Maintain intertidal habitats and promote ecological conservation and education in collaboration with local governments; and establish environmental parks, such as the Guantang Industrial Park (Port) and Bayu Coast
- 2 Achieve a sustainable environment and ecology through ecological conservation in collaboration with local communities

#### Specific Actions

- 1 “Guantang Industrial Park (Port) Ecological Conservation Committee” was assembled to verify the planning of ecological conservation measures and supervise and evaluate their implementation and achievements, and recommend improvement strategies
- 2 Completed habitat restoration for little terns (a rare and valuable species)
- 3 Conducted regular monitoring, testing and reporting of water quality at coastal areas and estuaries near Baiyu and Guantang, which helped protect algal reefs from pollution and manmade damage

#### Measurement Mechanisms

The Ecological Conservation Working Team promotes and implements measurement, produces reports or makes enquiries periodically, and performs rolling reviews to ensure the effectiveness of implementation

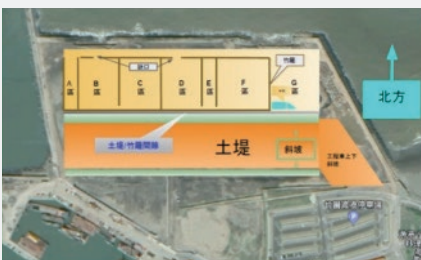
### 3.6.1 Ecological preservation

In response to the government's energy transformation policy to minimize greenhouse effect and reduce air pollution, we have built the third LNG Receiving Terminal to supply natural gas required by TPC's Datan Power Plant. However, there remains dispute over how the LNG terminal may pose a threat to algal reef, coral (*polycyathus chaishanensis*) and little terns (a rare and valuable species). Motivated by a green, co-existing philosophy, CPC assembled its "Guantang Industrial Park (Port) Ecosystem Preservation Committee" and tasked the committee with the mission of conducting ecological survey, monitoring and preservation. Through this committee, CPC hopes to contribute to the preservation of ocean environment and sustainability of the community. The committee held a total of 6 meetings by the end of 2019, and after careful evaluation, the committee decided to adopt an "Avoidance Solution" that not only reduces the development area by a significant extent (from 232 hectares to 23 hectares), but also commits to protect the natural habitat and preserve biodiversity.

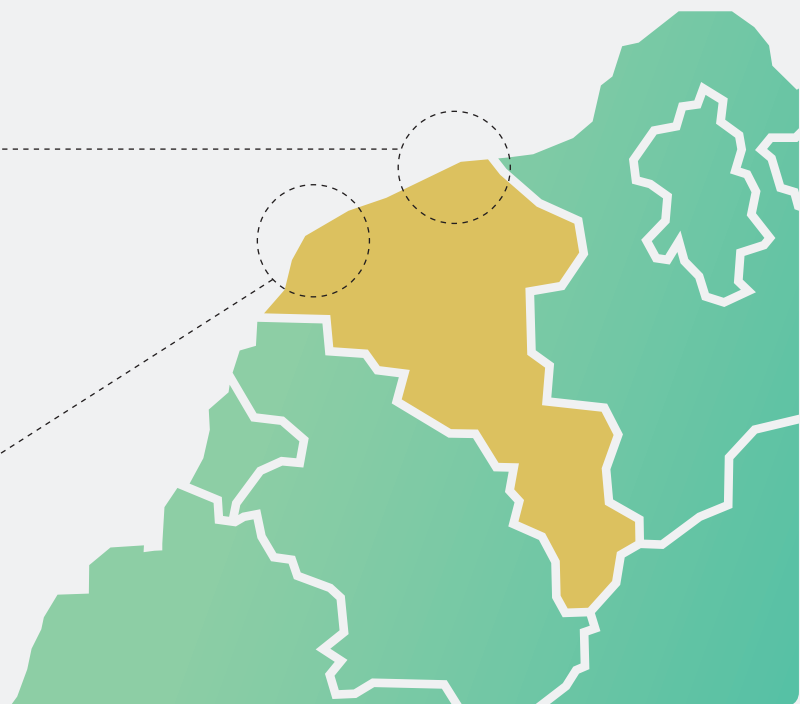
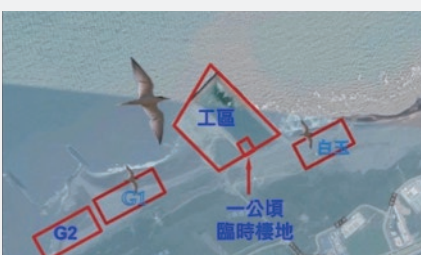
#### ■ Habitat restoration for little terns





Guantang Industrial Park is situated in close proximity to the habitat of little terns (a rare and valuable species). Since 2019, CPC has been cooperating with Taoyuan City Wild Bird Association to plan and design the construction of habitat for little terns, and by April 2019, habitats had been constructed at Datan, Guantang, and Zhuwei Fishing Ports. One of the keys to successful habitat restoration was the placement of "dummy birds" at sand beach and shingle beach, which little terns mistook as live birds and nested near them.

#### Zhuwei Fishing Port



#### Guantang



			
<p>Excavation of habitat for little terns</p>	<p>Cleanup at Datan Algal Reef coast area G1</p>	<p>Completed bamboo fences</p>	<p>Chick inside shelter</p>
<p><b>One hectare of flat surface free of disturbance and harassment with access to 100 square meters of fresh water was created as temporary habitat. Simple signage was placed around the habitat.</b></p>	<p><b>Completed cleanup at Datan Algal Reef coast area G1 and Baiyu Coast</b></p>	<p><b>Completed excavation of Beiti Reclaimed Land at Zhuwei Fishing Harbor to be used as habitat for little terns, and established bamboo fences.</b></p>	<p><b>Completed perimeter marketing for the two locations, published announcements that wild animals are not to be disturbed at the habitat, and placed 10 dummy birds and 10 shelters at each location.</b></p>

Observation of little tern breeding program 2019:

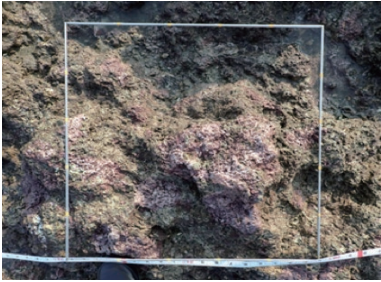
<p><b>1</b></p>	<p><b>Zhuwei Fishing Port</b> As many as 178 little terns were observed in a single observation; hatchability was observed at <b>84 %</b></p>	<p><b>2</b></p>	<p><b>Guantang and Baiyu coastal areas</b> As many as 134 little terns were observed in a single observation; hatchability was observed at <b>48 %</b></p>
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Note: Hatchability for little terns averaged 17-33% in previous years in Taoyuan.

**■ Preservation of algal reef**

Guantang Industrial Park operates in close proximity to algal reef, a bio-diverse habitat, and coral, an endangered species. Impact to algal reef is deemed limited after adopting the Avoidance Solution. In an attempt to preserve the algal reef, CPC cooperated with Taoyuan City Department of Environmental Protection and worked with local communities and conservation groups to arrange training and equipment for the monitoring and reporting of water quality in the Baiyu and Guantang coastal area and at the estuary of nearby rivers (Dachu River, Guanyin River, Xiaofanki River, Xinwu River, and Shezi River) as well as ecological survey and background data building, which help improve and protect the coral

reef ecology and environment against man-induced pollution and damage. CPC will also be creating Baiyu Coastal Environmental Education Park to promote environmental education and ecotourism in collaboration with local communities, colleges and universities, the Taoyuan City Government, and the Guanyin District Office. We will also offer operational guidance for local communities and groups to achieve a win-win for ecological conservation and economic development.



### Ecological survey for algal reefs

- 1 14 macroalgae and 20 crustose coralline algae have been observed
- 2 Diversity of crustose coralline algae was the highest at Guanxin Algal Reef Reserve, and somewhat lower at Baiyu Algal Reserve

◀ Algal reef algal species survey sample box



### Ecological survey at intertidal zone and maritime space

- 1 88 species of benthic organisms were observed in 2019
- 2 A total of 2,442 shellfish, 1,332 crabs, 1,178 hermit crabs, and 1,782 balanus were observed
- 3 Guanxin Algal Reef Reserve exhibited consistent ecological attributes with little variation

◀ Ecological survey at intertidal zone (Gymnothorax)



### Coral (*polycyathus chaishanensis*) survey

Length of live coral clusters observed were measured between 2 cm and 38 cm; they covered 10.5 cm<sup>2</sup> to 875 cm<sup>2</sup> of algal reef surface, and the size of coral clusters varied significantly

◀ Coral (*polycyathus chaishanensis*) cluster



## 3.6.2 Remediation of soil and groundwater contamination site

CPC surveys soil and groundwater pollution and makes improvements according to the law. A total of 6 sites were deregulated in 2019, and by the end of 2019, CPC had 36 sites deregulated while 33 sites were still under regulation. CPC expects to have another 6 sites deregulated in 2020.

	Sites deregulated in 2019: 6	Date deregulated
1	Ling Station - Guangting/Kaohsiung City	2019/1/30
2	Ling Station - Gongyibei/Kaohsiung City	2019/1/30
3	Chenggong Plant Zone 4/Kaohsiung City	2019/4/12
4	Ling Station - Temoa Ernan/Kaohsiung City	2019/9/18
5	Ling Station - Lot No. 291/Kaohsiung City	2019/11/22
6	Ling Station - Lot No. 273/Kaohsiung City	2019/11/22

### ■ Countermeasures for polluted site

#### Regulated

- ✓ Request related units to propose contingency, control and remediation plans. Investigate and remedy the contaminated sites in accordance with the supervision and requirements of competent authorities and improvement plans reviewed and approved by scholars and experts.

#### Unregulated

- ✓ Enhance the monitoring function of groundwater monitoring wells, oil and gas monitoring wells, and gas station leak detection pipe
- ✓ Request all units to follow the "Soil and Groundwater Pollution Prevention and Improvement SOP"; and immediately establish pollution improvement plans, plan budgets, and actively implement pollution reduction after detecting soil and groundwater contamination within the jurisdiction

## ■ CPC's countermeasures

### Technology

- › Perform underground enclosure (steel sheet pile, air curtain and other methods) along the perimeters of conservation and continue pollution control/remediation in collaboration with in-situ methods (chemical injection, gas injection and ventilation)

### Laws and regulations

- › Storage locations that do not pass EPA's inspection will be subject to the following treatment:
  - 1 Article 17 of the Soil and Groundwater Pollution Remediation Act - any subsequent construction, expansion, modification, repair or demolition of building will have to be approved by Environmental Protection Administration before proceeding
  - 2 Article 19 of the Soil and Groundwater Pollution Remediation Act - any work that involves removal, back-fill, temporary storage or transportation of soil or groundwater extraction will have to be approved by Environmental Protection Administration before proceeding

### Budget and duration

- › Given the difficulty of remediation and the fund for enclosure measures, the entire remediation cost will at least be doubled. In addition, expenses for document preparation and applications and preparation time are required for the future use of the regulated site or the removal, temporary storage, and transportation of soil and groundwater

## ■ Description of remediation method

### Washing

Include two procedures: hydraulic sorting and wastewater treatment. In hydraulic sorting, soil bump breaking, sedimentation, up flow sorting, and hydro-cyclone procedures are implemented to facilitate particulate separation. It has higher processing capacity and better processing results.



## Bioremediation

As microorganisms decompose hydrocarbon compounds to get energy and the carbon source for metabolism and growth, bioremediation makes use of this process to convert some pollutants into CO<sub>2</sub> and H<sub>2</sub>O.



### Innovative practice - phytoremediation

CPC is currently conducting an experiment to plant vetiver grass on exposed soil at two of its regulated sites. This plant has high tolerance for toxic metals such as aluminium, manganese, lead and mercury and the ability to absorb them. By exploiting this special property, CPC hopes to remove heavy metals from soil and effectively reduce oil concentration in oil-polluted soil.

This method is still in the experimental stage, and is expected to take 3 to 5 years to validate results



## In-situ chemical oxidation

Chemical oxidation can be achieved either in situ or ex situ. Given the rapid chemical reaction, in-situ chemical oxidation is more efficient and more competitive in processing time. In chemical oxidation, oxidants are added to damage pollutants or convert them into non-toxic or lowly toxic substances by means of oxidation reduction.

## Ex-situ processing

When other methods are ineffective to treat highly contaminated soil or highly concentrated contaminated soil (sludge), we outsource treatment to qualified contractors.



# CH4

## Friendly Workplace and Knowledge Transfer

### Chapter summary

Talents are the foundation to sustainable business management and the key to competitive advantage, which is why CPC considers employees to be the most important capital. Not only does CPC invest resources continuously into training, also places great emphasis on workplace safety and is dedicated to creating a safe and friendly work environment where employees may grow and contribute to the Company's competitiveness.

### Corresponding SDGs



### Reader Priorities

- Shareholder (MOEA)
- Partners
- Public representatives
- Communities
- Customers
- Government
- Employees
- Media
- NPOs/NGOs



## Chapter Highlights



Return to work and retention rates after parental leave: **100%**



Average years of service at retirement: **39.6 years**



Employee training budget: **NT\$130 million**



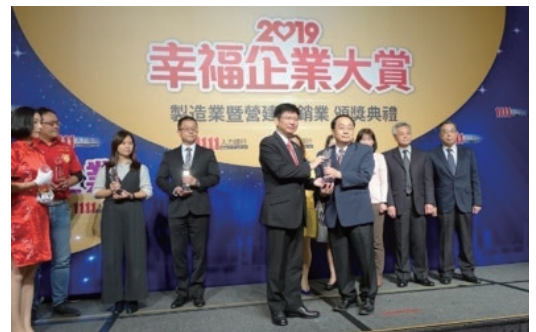
Average training hours per employee: **61 hours**



Health promotion events and seminars: **194 sessions**

## Won “Best Employers 2019”

CPC has been recognized for its relentless pursuit to creating a quality work environment and was ranked among the top 20 “Best Employers 2019” - “Chemical and Petrochemical Category” in an online vote organized by 1111 Job Bank. According to the survey, corporate policies (compensation, promotion and welfare) and interpersonal relationship (workplace atmosphere and colleague engagement) were the keys to CPC's accomplishment.



CPC was awarded the honor not only for its long-term commitment to building an ideal work environment, but also for rewarding employees based on corporate performance and employees' individual contribution and performance. Clinics, canteens, sports facilities and childcare services have been arranged at multiple departments, and an employee welfare committee is available to address welfare issues, organize recreational and entertainment activities, and arrange group insurance and children's scholarship for the protection of employees' work-life quality. Employees averaged 39.6 years of service upon retirement in 2019, which is representative of CPC's commitment and accomplishment in creating a friendly workplace. In the future, CPC will continue creating a friendly, safe, stable, fair and trusted workplace that appeals to all job seekers.

## Won 2019 “National Talent Development Awards”

“National Talent Development Awards” is an official award created by the Ministry of Labor for the purpose of improving talent development and encouraging good human resource practices within the nation. The award is structured based on world-recognized human resource review indicators, and emphasizes on development of “all-round talent.” The review and scoring criteria covers a number of aspects including “talent development system,” “performance association” and “innovation and benefit,” and is held on such a scale that makes it the most prestigious human resources award in the nation.

In 2019, CPC was able to stand out among 126 contending businesses to win the Organizational Award of “National Talent Development Awards,” making it the only state-owned enterprise in history to win this award. In the future, CPC will continue creating a talent development and training platform that conforms with its goals and the market's needs. By establishing a learning organization and utilizing new technologies, CPC hopes to engage the industry and the academia on the basis of professional knowledge and skills, explore possible improvements and innovation to training quality and coordinate with industry, government and research counterparts to make CPC the talent training benchmark in the energy and petrochemical industry.

### 4.1 Human Resources

CPC has established well-defined employment policies in accordance with Regulations on Recruitment for Subordinates of Ministry of Economic Affairs to open, equal and fair recruitment, and has never hired child labor. In addition, to provide vulnerable groups with more job opportunities, we give extra credits to people with disabilities and indigenous peoples. Based on the principle of equal pay for equal work, we ensure equal remuneration for employees regardless of race, belief, religion, political party, place of origin, place of birth, gender, sexual orientation, marriage, appearance, physical and mental disabilities, or past union membership. We also ensure the freedom of association of employees and encourage them to join clubs. As we also conduct business with suppliers and contractors abiding by the above principles, no report regarding gender discrimination or racism has been reported over the years. During the year, there was no human right violation or discrimination case for newly hired employees. Nor is there any human rights impact on our company operation. In 2019, there was no report on violation of human rights, non-compliance with non-discrimination, or impact on business activities as a result of human rights.

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CPC had a total of 15,836 employees in 2019 (including direct workers, research staff, support personnel, management staff and contract personnel, but excluding interns). We are an oil company, and most employees are recruited from the natural science and engineering disciplines, which have more males than females. Therefore, the male-to-female ratio is higher, i.e. 85.75% are male employees and 14.25% are female employees. In workforce arrangement, however, CPC abides by the International Bill of Human Rights and domestic laws and regulations to ensure equal treatment and non-discrimination over gender. In education distributions, most employees graduated from senior high schools, colleges, and universities, accounting for 80.28% of total employees, and 17.67% hold a master's degree. In 2019, new recruits with doctoral degree were assigned civil servant grade 7-5 with average salary of NT\$62,000; new recruits with college degree were assigned civil servant grade 2-1 with average salary of NT\$38,000; new recruits with senior/vocational high school education were assigned worker grade 4-1 with an average salary of NT\$24,000. No salary adjustment was made for directors, supervisors, managers and non-managerial staff in 2019.

## CPC employees by employment contract - 2019

### Gender and age distribution of full-time employees

Unit: persons

		Contract employees	Direct workers	Research staff	Support personnel	Management staff
Below 30	Male	0	1,537	46	210	123
	Female	0	224	14	83	193
30-50	Male	12	4,002	168	595	368
	Female	24	368	21	128	377
Over 50	Male	21	4,973	163	729	631
	Female	14	260	27	98	427
Total		71	11,364	439	1,843	2,119

## Academic background of CPC employees - 2019

Unit: persons

Below senior high school	Senior high school	College	University	Masters Degree	Doctoral Degree
152	5,162	1,704	5,847	2,798	173

## Workplace distribution for CPC employees - 2019

Unit: persons

Taiwan			Singapore	Libya	Dubai	Qatar	Others
Northern Taiwan	Central Taiwan	Southern Taiwan					
6,485	2,493	6,811	22	5	4	4	12

New recruits are one of the best ways for businesses to maintain energy and creativity. In 2019, CPC hired 1,091 new recruits that accounted for 6.89% of total employees (i.e. employment rate); a total of 985 employees left the organization during the year (204 resigned and 781 retired), representing an exit rate of 6.22%. CPC employees are highly loyal and identify strongly to the values of the organization, and most employees are committed to serving long-term until retirement. The Company has been actively sourcing new recruits in recent years; its employees average 18.8 years of service overall, and 39.6 years of service upon retirement in 2019.

### CPC new recruits/resignations - 2019

		New employees (persons)	Employment rate (%)	Exit employees (persons)	Exit rate (%)
Below 30	Male	298	1.88%	71	0.45%
	Female	53	0.33%	16	0.10%
30-50	Male	588	3.71%	99	0.63%
	Female	142	0.90%	21	0.13%
Over 50	Male	7	0.04%	708	4.47%
	Female	3	0.02%	70	0.44%
Total		1,091	6.89%	985	6.22%

CPC was obligated to hire a total of 509 persons with disability (including interns) in 2019, and exceeded the quota by 305 people in hiring 814 people with disabilities. According to “Indigenous Peoples Employment Rights Protection Act,” CPC is required to hire 1 person of indigenous background per 100 employees, or 1/3 in aboriginal areas, when recruiting workers for the 4 non-technical roles: “security,” “gardening,” “reception” and “sundry affairs.” CPC was obligated to hire 1 employee of indigenous background under the above requirement but recruited 2 instead, which was 1 more than the quota. CPC also hired 44 people of indigenous background outside the above requirement for a total of 46.

Persons with disability (persons)	As a percentage of total employees (including interns) (%)	Indigenous people (persons)	As a percentage of total employees (%)
814	4.62%	46	0.29%

Note: “Total employees” carries different meaning when calculating the percentage of employees with disability and employees of indigenous background. When calculating employees with disability, total employees refers to those who are covered by insurance; when calculating people of indigenous background, total employees refers to the actual employee size.



## 4.2 Workplace Safety Management Approach

### Workplace Health and Safety

#### Policy and commitment

- ✓ Achieving “100% industrial safety and zero accident” through employees and contractors safety, risk management, and healthcare.

#### Goals | Short-term

- 1 Continue the enforcement of systematic management practices on contractor safety and health performance assessment, and enhance professional skill training for contractors
- 2 Enforce work safety and health training and continue implementation of safety and health certification, credit and on-job training system
- 3 Continue the execution of work safety protections and emergency response drill

#### Goals | Medium/long-term

- 1 Sustain the pursuit of 100% safety and zero accident.
- 2 Improve the professional skills in the non-destructive inspection of equipment and pipelines and effectively prevent equipment deterioration and unplanned unit shutdown
- 3 Apply the Process Safety Management (PSM) standards to other production aspects for total systematic management

#### Specific Actions

Organize safety courses periodically, which focus on enhance supervisors and employees' competency, in order to improve the effectiveness and efficiency of Taiwan Occupational Safety and Health Management System (TOSHMS)

#### Measurement Mechanisms

Implement internal and external audits regularly every year and hold the TOSHMS management review meeting to review audited defects and the audit results

CPC has established the “Occupational Health and Safety Committee” to implement work safety, accident prevention, workplace improvement, and employee health maintenance. The committee has 26 seats, including the president as the committee chair and 25 representatives from different units as members. 9 seats (35%) are allocated to workers' representatives, which is more favorable than what the laws require. The Occupational Health and Safety Committee convenes 4 meetings each year; worker representatives raised 12 proposals in 2019, which accounted for 92.3% of all discussions. All issues



discussed were highly relevant to the workplace and employees' interest; from additional manpower, equipment installation and improvement, uniform material, employee training, skill certification to adjustment of performance evaluation standards, all requests were taken seriously by committee members and relevant departments were assigned to address the issues raised.

CPC adopted Taiwan Occupational Safety and Health Management System (TOSHMS) in 2008 as a means to reduce work safety incident. By establishing procedures such as hazard identification, risk assessment and risk control, the organization aims to effectively prevent occupational hazards. In addition, we conduct internal and external audits every year and hold the TOSHMS management review meeting to review audited defects and the audit results to ensure OHS compliance. By 2019, 34 units have implemented and passed the certification of TOSHMS, and the Company expects to obtain certification for its conversion to ISO 45001 before the end of 2020.

CPC is aware of the dangers involved in certain work activities such as oil tank cleaning and oil exploration, etc. For this reason, CPC complies strictly with the Occupational Safety and Health Act and related laws, and has assembled separate audit teams for refinery, oil exploration, marketing and construction activities, whose responsibilities are to perform safety and health audits on-site on a monthly basis. Each unit is also responsible for performing daily inspections and enforcing risk-based audit within their work sites.

Improvements such as enhanced contractor inspection, contractor hazard awareness, employee safety and health training and protection measures have since been implemented. We constantly implement various plans to improve workplace safety, contractor management, and OHS. We also educate all units to implement such improvements and keep track on non-compliance until workplace safety is well improved.



## Occupational safety and risk identification

In 2002, CPC introduced the risk-management-based OHSAS 18001. To build a quality safety culture, we implemented TOSHMS in 2008 to capture the hazard factors in various jobs through systematic management. To ensure risk assessment consistency of all units, we have established the “Hazard Identification and Risk Assessment SOP” to identify the risk of every type of business. We have also established “Duty and Job Inventory” for further risk identification based on the inventory results to complete the “Hazard Identification and Risk Assessment Sheet.” For high-risk jobs, we immediately review the integrity of existing protective measures and make improvements as soon as possible in terms of system, equipment, and implementation to reduce risk in the work environment.

We identify unit-specific risk and draw up related countermeasures. We also draw up various emergency response drill plans and implement emergency response drills regularly to improve the ability to accident response and disaster prevention. In 2019, a total of 363 emergency response drills were completed across plants, including 4 coordinated drills involving the Lubricants Business Division, natural gas processing plants of the Exploration and Production Department, Taoyuan Refinery of the Refining Business Division and Taichung Plant of the Natural Gas Business Division. Through these drills, employees are trained the proper response, knowledge and skills needed to minimize losses and environmental impact in the event of disaster.

- ▶ In 2019, a total of 363 emergency response drills were completed across plants, including 4 coordinated drills
- ▶ 7 headquarter-to-unit emergency response drills without warning.

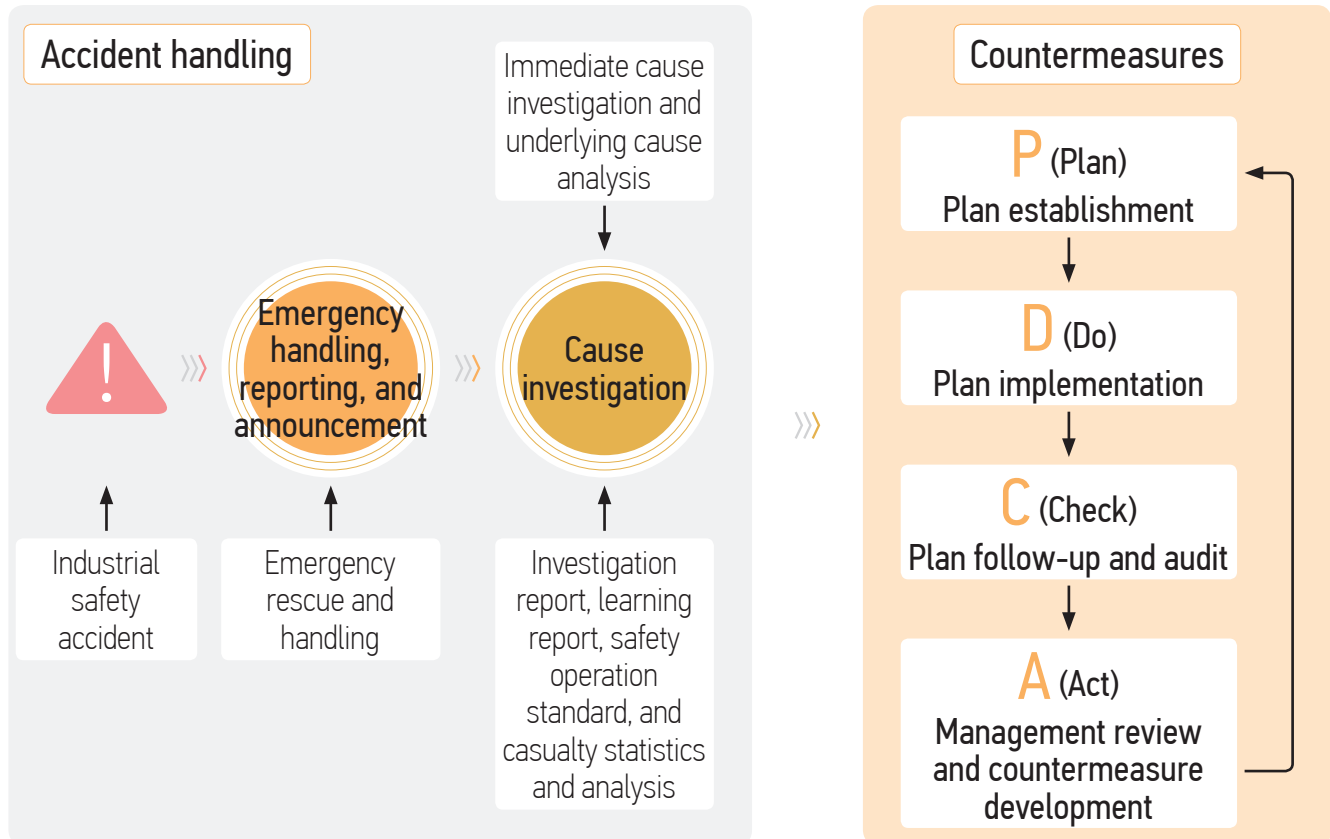


## Industrial safety accident investigation and management workflow

We form Accident Case Study Working Team to gather information of all industrial safety accidents of the company and at home and abroad to investigate their causes and accident types. The team has also published the Industrial Safety Case Studies as a learning resource of accident investigation to improve the accident analytical power of employees and thereby enhance overall industrial safety performance.

We have established the “Principles for the Investigation and Management of Industrial Safety Accidents” to define the reporting process, investigation, report writing, statistics production, and follow-up of accidents. We have also designed the online “Hazards and Emergency Report Form” on the intranet to timely capture the actuality of accidents occurred in all units.

### Industrial safety accident investigation and management workflow



Plant	Gender	Occupational injury		Absentee rate (AR)		Disabling injury frequency rate (FR)		Disabling injury severity rate (SR)	
		Injury count	Death count	Total absent days	Total work days	Total disabling injuries	Total work hours	Total days lost to injury	Total work hours
Whole company	Female	0	1	30,433.88	250	1	4,297,724	6,000	4,297,724
	Male	2	0			2	29,587,102	61	29,587,102
Total		2	1	0.77%		3	33,884,826	6,061	33,884,826
Work injury description		Jamming, contact with hazardous substance, fall							





Description:

- ◆ Calculations, including full-time and temporary employees.
  - Absentee rate (A.R.) = (Absent days (include personal leave, sick leave, and work injury leave)) / (Total work days x employee count)
  - Disabling injury frequency rate (F.R.) = (Total disabling injuries × 10<sup>6</sup>) / (Total work hours)
  - Disabling injury severity rate (S.R.) = (Total days lost to injury × 10<sup>6</sup>) / (Total work hours)
  - Average days charged for disabling injuries (ADCDI) = (Disabling injury severity rate (S.R.)) / (Disabling injury frequency rate (F.R.))
- ◆ AR is based on absenteeism due to the loss of the ability to work, without limitation to work-related injuries or diseases. It also excludes the approved holidays or leave, such as folk festivals, training, maternity/paternity leave, and compassion leave. Absenteeism includes personal leave, sick leave, and compensation leave for injuries at work.
- ◆ The number of days lost from the inability to work of employees due to work-related injuries or diseases.
- ◆ Work-related diseases shall be determined based on the diagnosis of occupational specialists of a hospital.
- ◆ Disabling injuries do not include minor injuries, i.e. injuries healed on the same day and employees can return to work in the next day.
- ◆ Total lost days include the sum of the lost days of four types of disabling injuries: death, permanent total disabilities, permanent partial disabilities, and temporary total disabilities.
- ◆ Both deaths and permanent total disabilities are calculated at 6,000 days.

\*Explanation to errors:

On page 110 of the 2019 sustainability report, A.R. was wrongly printed as 94.25%, and has been corrected as follows: Absentee rate (AR) = (Total absent days including sickness leave, special sickness leave, work injury and sickness leave, menstruation leave and hospitalization leave) / total work days x employee count = 23,467.75 / 249 x 15,704 = 0.60%

## Employee health care

We arrange health examinations for employees every year to maintain their health. In 2019, 14,660 employees took the general health examination and 2,676 the special health examination for employees engaging in work with noise, dust, organic solvents, specialty chemicals, ionized radiation, and abnormal pressures.

To prevent employees from exposing to various work-related hazard factors, we have established the Work Environment Monitoring Plan and implement work environment monitoring for the reference of improvement, in order to prevent hazards. In 2019, we performed work environment monitoring on 32 chemical hazard factors (organic solvents, specialty chemicals, dust, and CO<sub>2</sub>) and two physical hazard factors (noise exposure and wet-bulb globe temperature (WBGT) index). The monitoring results are within the permissible exposure limits.

To further the statistical analysis capacity of health management, we analyze employee examination results every year and list the top six anomalies. In 2019, they were body weight, total cholesterol, chest X-ray, low density lipoproteins, fasting blood sugar and triglycerides. We also arranged health talks and health promotion activities based on these anomalies to guide employees' health management efforts.

### Health seminar and health promotion events

CPC arranges seminars of various themes that provide employees with the proper knowledge needed to maintain and manage health at work. Activities such as



smoking cessation class, reducing body fat class, fitness class, aerobic program and hiking have been arranged to help employees develop healthy habits. A total of 194 health promotion seminars and events were organized in 2019.

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## 4.3 Friendly Workplace

We abide by the international labor conventions and Taiwan's Labor Union Act to ensure the freedom of association and participation in trade unions of employees. Employees are also entitled to collective bargaining according to the related laws and regulations. Mechanisms for communicating with the labor union include: board participation of labor directors, the periodic labor-management meeting held by each business unit, irregular collective bargaining meetings, and business expansion meetings with the labor union chairperson as a guest. In addition, we organize labor-management relations review meetings every year to promote labor-management communication and arrange communication among the host of official and unofficial activities, vice presidents, and union representatives to exchange opinions. The PR director and deputy director also visit the labor union from time to time to hear the opinions of union members. We invite union representatives to attend OHS meetings, complaint adjudication meetings, reward/punishment meetings, procurement review meetings. Both parties also form EWC and the "Labor Pension Review Supervisory Committee." Should any major incident occur, the Chairperson and President would issue a joint statement to comfort employees and boost morale. CPC is currently negotiating

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with Taiwan Petroleum Workers' Union for the establishment of collective bargaining agreement. The employer and employees have been engaging each other to draft a collectively bargaining agreement since 2019, and have convened 6 negotiation meetings to date. It is the organization's goal to maintain harmonic employment relations and explore solutions that work in favor of business development and employee welfare.

## Employee welfare

Apart from building a friendly work environment, we release a range of bonuses based on the overall performance of business units and the contribution and performance of individual employees. We also contribute the welfare fund according to the "Employee Welfare Fund Act" and co-establish EWC with Taiwan Petroleum Workers' Union (TPWU) to organize various types of welfare business and recreational activities. The above measures apply to all full-time and contract employees of CPC. To promote employee welfare, we establish branch committees in different locations. In addition to the mandatory National Health Insurance, Government Employee and School Staff Insurance, and Labor Insurance, we purchase additional group insurance, overseas travel insurance (business trips), and accident insurance for employees. We also provide employees with injury, disability, and death condolence funds to protect the work and life security of employees.

### *Welfare facilities*



clinics



employee  
canteens



libraries



tuck shops

### *Club activities*



ballgames



chess



hiking/  
mountaineering



swimming



calligraphy



movie  
appreciation

In addition, CPC takes care of young new employees and retirees, exacts general equality in employment and encourage birth. We have amended the employee loan policy to provide benefits such as children's scholarship, children's college education loan, employee and dependents medical subsidy, wedding/funeral/retirement subsidy and interest-free loan for emergencies. Local EWC branches also offer preferential childcare services by signing contracts with kindergartens and disclosing information of established or contracted kindergartens on the intranet for the reference of employees. There is no difference between welfare of managerial and non-managerial employees.

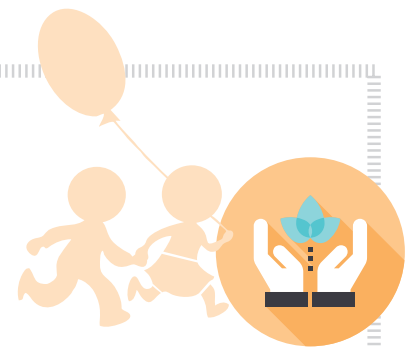
### ▶ Childcare facilities and measures

#### 1 For production units:

The Company currently operates two proprietary childcare facilities, namely CPC Corporation Employee Welfare Committee Private Childcare Facility for Kaohsiung Refineries and CPC Employee Welfare Committee Miaoli Branch Private Childcare Facility for Miaoli County. Production units outside the above areas contract highly rated local childcare institutions with the help of local EWC branches, and offer service to employees at preferential rate. At the end of 2019, a total of 151 children from various departments were placed under childcare.

#### 2 Taipei CPC Building:

CPC has been contracting Taipei Child Welfare Center, a top-performing childcare institution, for childcare service since 2009. The childcare center is situated in a mere 7 minutes walk from CPC Building, and is intended to provide employees with the most professional and convenient childcare service.



### ▶ Clinic

CPC has family clinics established at Taipei CPC Building, Taoyuan Refinery, Exploration and Production Department Miaoli Branch and Kaohsiung Refinery to provide employees with reliable and accessible medical service. Services provided at these clinics include general healthcare for adults and children; some would even offer health checkup and vaccination, and has been a major support to employees' physical and mental health.

These clinics not only serve CPC employees, but also provide outpatient service to the general public, and have been well-recognized within the neighborhood for their outstanding service quality, transparent pricing and contribution to community health.

## Pension and compensation

Matters regarding retirement of dispatched employees and contract-based employees are subject to the "Regulations Governing the Pension, Compensation, and Severance Pay of Employees of State-



Owned Enterprises Administered by the Ministry of Economic Affairs” and the related civil service laws and regulations. The employment of full-time employees and contract-based employees is subject to the “Labor Standards Act” and the “Labor Pension Act.” In addition, we have established the “Employee (dispatched and contract-based employees) Pension Fund Management Committee” and “Labor Pension Fund Supervisory Committee.” The Employee (dispatched and contract-based employees) Pension Fund Management Committee is responsible for the planning, custody, use of the pension fund, and the disbursement of pension, compensation, and severance pay. The Labor Pension Fund Supervisory Committee is responsible for the audit of amount of pension fund contributions and disbursements and the supervision of matters in relation to the pension fund. Every year we assist ROC Retired Petrochemical Workers' Association in organizing events, such as “Happy New Year with Peace and Health,” “Happy and Healthy Later Life” and “Mid-Autumn Festival Reunion,” for retired employees and their dependents.

## **Employee performance, evaluation, and promotion**

“Managers and Workers Performance Evaluation Guidelines” have been established to ensure that CPC employees' performance is properly reflected during evaluation in a manner that inspires greater performance in the future. For vice presidents and tier-1 units, performance criteria, targets, score weights and scoring methods are approved by the board of directors before proceeding; for tier-2 units and below, performance criteria, targets and scoring methods have also been established and managers, operators and non-managerial staff are rated according to target accomplishment and actual performance.

CPC conducts annual reviews and allocates bonus according to “Notes on Worker Performance Review and Bonus Allocation.” Employees with performance rated “A” will have pay grade increased by one level and receive one additional month of salary as bonus; if no further increase of pay grade is possible, an additional month of salary will be paid instead. Employees with performance rated “B” will have pay grade increased by one level and receive one half-month of additional salary as bonus; if no further increase of pay grade is possible, an additional month of salary will be paid instead. Employees with performance rated “C” will remain in the current pay grade and no performance bonus is paid. Employees with performance rated “D” will be dismissed or disqualified.

	Count (persons)	As a percentage to total employees subject to evaluation (%)
Contract employees	4,106	27.72%
Permanent employees	10,705	72.28%
Male	12,756	86.13%
Female	2,055	13.87%

As an SOE, employees are salaried and rewarded according to the “Directions for Management of Personnel Wages of State-Owned Enterprises of the Ministry of Economic Affairs” and the “Directions for Release of Performance Rewards of State-Owned Enterprises of the Ministry of Economic Affairs.” Relative annual salary ratio between females and males was 1:0.98 for managers and 1:1.01 for non-managers. Gender equality is a focus of CPC's human resources policy. We eliminate workplace gender discrimination and abide by Taiwan's Act of Gender Equality in Employment to create a friendly and equal work environment. The entry pay for female and male employees is the same, suggesting that there is no unequal remuneration at CPC. This result is representative of CPC's effort in the enforcement of gender equality.

## Gender equality

In gender equality for employment, we were the first in Taiwan to hire female petrol butlers back in 1973. As the first mover in the industry, we were ahead of the government's gender equality in employment policy. Apart from raising customer satisfaction with gas stations and oil supply, we have started the trend of female employment in other industries. Besides setting an example for society, we significantly enhance women employment. From exploration, refining, the manufacture of petrochemical products and solvents, to gas station services, the number of female workers has increased continuously. In addition to having two female directors and one female supervisor on its board, CPC made history in Taiwan's heavy petrochemical industry by hiring the first female vice president as a state-owned enterprise in 2016, which was followed by a second female vice president in 2018. In 2019, CPC led state-owned enterprises in gender equality, with 1 out of 5 vice presidents being female.

To provide female employees with a friendly work environment, apart from setting up quality certified lactation rooms, we arrange gender mainstreaming training and education classes where publicity films on the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) are



broadcast for employees to understand common workplace discrimination and thereby to enhance their awareness of human rights. On the arrival of new employees, we introduce them to the new work environment and arrange classes on sexual harassment prevention and grievance mechanisms for them. We also enhance the publicity and prevention of sexual harassment at all times and arrange training and education on sexual harassment prevention for supervisors and employees. CPC has also implemented Sexual Harassment Prevention, Complaint and Discipline Guidelines, Sexual Harassment Prevention webpage, sexual harassment complaint hotline and assembled a Sexual Harassment Complaint Review Committee to handle sexual harassment complaints and protect employees' interest. A total of 5 sexual harassment complaints were raised in 2019, all of which have been properly resolved.

#### ► Directions for Sexual Harassment Prevention and Settlement

Grievance helpline | 02-8725-8422      Grievance fax | 02-8789-9405

Mailing Address | 21F, No. 3, Songren Road, Xinyi District, Taipei, Taiwan 110.

Email | 807664@cpc.com.tw

Undertaker | Ms. Yeh, Department of Human Resources



## Parental leave

We support employees to take parental leave and process applications according to the Act for Gender Equality in Employment. CPC had a total of 69 employees on extended unpaid parental leave in 2019, of which 23 were male and 46 were female. Return to work rate for employees on extended unpaid parental leave was 100% for males and females, whereas retention rate of employees returning from extended unpaid parental was 100% for males and females.

	Return to work rate			Retention rate		
	No. of employees due to be reinstated (persons)	No. of employees actually reinstated (persons)	Return to work rate (%)	No. of employees actually reinstated (persons)	Total number of employees retained 12 months after returning to work following a period of parental leave (persons)	Retention rate (%)
Female	22	22	100%	26	26	100%
Male	15	15	100%	12	12	100%

Note: Includes employees who had applied for maternity leave or paternity leave in 2019

## 4.4 Talent Development

CPC has implemented a robust training framework that aims to equip the workforce with the proper knowledge and skills. Meanwhile, a rational promotion system is available to ensure that employees are selected, trained and recruited to support CPC's growth. We survey and research the professional competencies of individual core, professional duty for the reference of internal promotion and job rotation and recruitment interviews, in order to select personnel with qualified work attitude and concepts. Furthermore, management associate training and on-job management training are arranged for managers and staff of all grades to enhance management capacity. In addition, we encourage employees to take national skill qualification tests, facilitate employees to acquire licenses and certifications in relation to health, safety, and environmental protection (HSE). We have also established directions for further education to encourage employees to engage in lifelong learning, second specialty training, further education after work (in-house and outsourced), foreign language education, and job transfer training. The 2019 training expense amounted to about NT\$130 million, and we organized 3,799 training classes with 117,681 participants.

### Employee training budget invested

(including internal and external training, Taiwan and overseas branches, excluding subsidiaries)

Training indicators	Unit of calculation	2017	2018	2019
Total employee training expense	in multiples of NT\$ 100mn	1.27	1.28	1.30
Total hours of employee training	Hours	775,804	962,135	941,312
Total employee training expense/total revenue	Percentage	0.01%	0.01%	0.01%
Total employee training expense/total employees	NTD/person	6,045	6,933	8,209

In addition, we should set the job targets and training focus based on CPC's vision, development direction, and annual training policy and with reference to the development of major business, the professional competencies required by employees and their future development trends, in order to draw up training plans for "supervisor training," "professional training," "second specialty training," and "other training." Training hours per employee averaged 61 in 2019, which was the same as 2018.

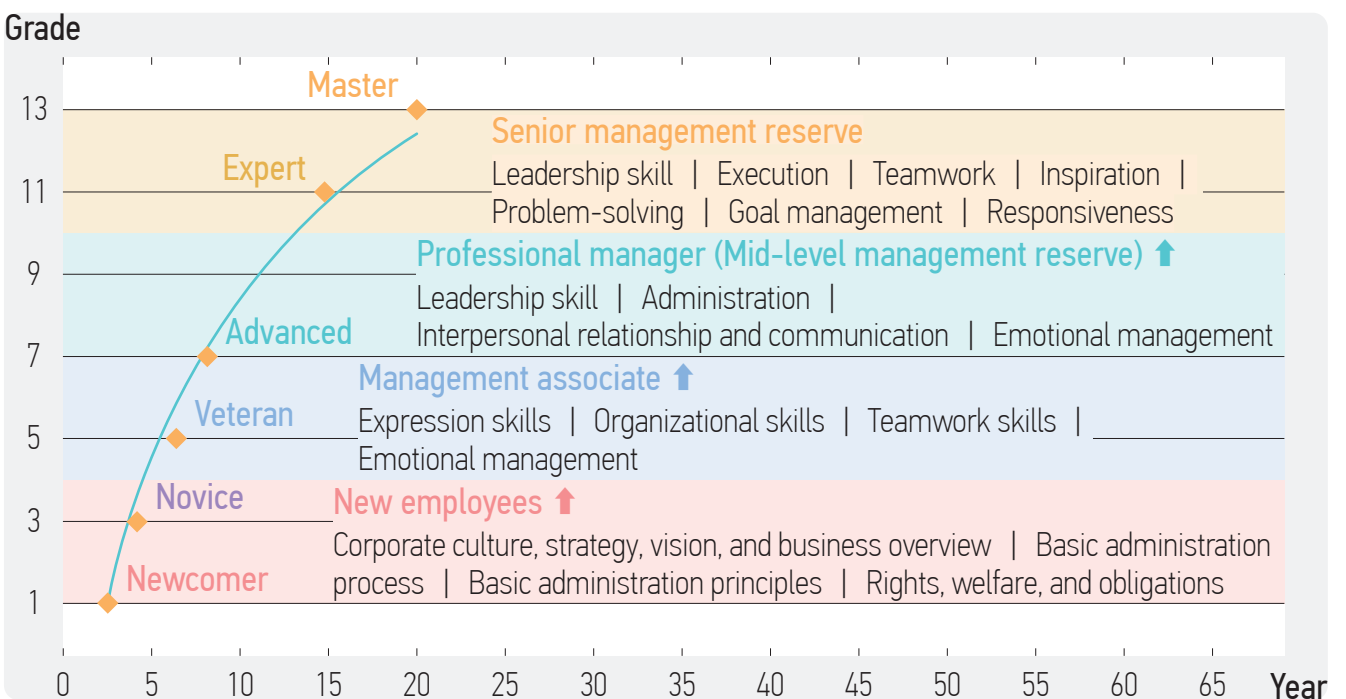


### Management skill training by employee grade

Training Type	Workforce Type	Supervisors		Professional	Junior Management
		Senior Management	Officers		Onsite leaders and manager and assistant manager of gas stations
Management skill training	Management associates	Organizational management practical training	Leadership ability and strategic planning training	Management concepts and routine management practical training	Job instruction, job improvement, and job relations
	On-the-job	Operations, management, and development strategies and team leadership effectiveness management	Management ability development and training	Management ability development and training	Implemented by unit supervisors or the human resources department as necessary

### Management role talent development framework

◆ Grade — Logarithm (grade)



## Orientation

For new employees to understand and to help get ready for their job, we plan related training (including probation or internship) and evaluate their performance. Two training stages:

# 1

General education for month 1: HSE, fire prevention, information security, gender equality, human resources, business overview, and ethics and integrity. Fundamental professional training: Required fundamental professional training based on the job type and service unit of new employees.

# 2

Months 2-6: Introduction of the business of the service unit, professional competencies in relation to the upcoming duty, advanced training and training on the required licenses and certificates, field training, and the evaluation of learning attitude, conduct, and competency. Probation at related business units or in the field based on the nature and needs of job.

A mentor will be assigned to new employees assigned to a service department and probation at related business units or in the field. Apart from mentoring them throughout probation or internship, a mentor shall plan a training schedule and training content and help them arrange relating matters. Supervisors shall keep track on the training performance of new employees from time to time.

## CPC training classes - 2019

Training Type	Training classes (classes)	Percent-age (%)	Enrollments					
			Male	Percent-age (%)	Female	Percent-age (%)	Total	Percent-age (%)
Supervisor training	31	0.82%	945	0.98%	202	0.94%	1,147	0.97%
Professional training	2,633	69.31%	60,483	62.93%	10,804	50.07%	71,287	60.58%
Second specialty training	117	3.08%	3,175	3.30%	820	3.80%	3,995	3.39%
Self-motivation training	9	0.24%	323	0.34%	158	0.73%	481	0.41%
Internal instructor training	4	0.11%	155	0.16%	58	0.27%	213	0.18%



Training Type	Training classes (classes)	Percent-age (%)	Enrollments					
			Male	Percent-age (%)	Female	Percent-age (%)	Total	Percent-age (%)
Other training	774	20.37%	27,969	29.10%	8,932	41.40%	36,901	31.36%
Orientation training	217	5.71%	3,041	3.16%	598	2.77%	3,639	3.09%
Skill qualification training	14	0.37%	14	0.01%	4	0.02%	18	0.02%
Total	3,799	100.00%	96,105	100.00%	21,576	100.00%	117,681	100.00%

### Statistics on 2019 Employee Education and Training (by grade)

	Count (persons)	Training hours (hours)	Average training hours per person (hours/person)
Supervisors	3,286	145,859	44
Non-supervisors	12,120	795,453	66
Total	15,406	941,312	61

### Statistics on 2019 Employee Education and Training (by gender)

	Count (persons)	Training hours (hours)	Average training hours per person (hours/person)
Female	2,205	150,346	68
Male	13,201	790,966	60
Total	15,406	941,312	61

## Human Resource Training Center

CPC has established a Human Resource Training Center that organizes seminars and training classes to support CPC's business development and national growth. The department trains employees on a wide range of expertise from refinery, excavation, engineering, marketing, administration to environment safety, and offers vertical advancement (entry-level, mid-level and advanced level) as well as horizontal advancement (across different fields of expertise) paths to help employees develop the skills needed for their career. Since the new building was commissioned in 2014, number of classes have increased significantly from 334 in 2014 to 591 in 2019, whereas class enrollments have also grown from 13,450 in 2014 to 26,881 in 2019. CPC reached a new milestone in August 2019 when it held its 10,000th class.

Year	Total classes (classes)	Total participants (persons)	Total hours (hours)
2019	591	26,881	9,789
2018	539	22,339	10,178
2017	474	20,705	9,545
2016	423	19,626	8,105
2015	384	16,094	8,072
2014	334	13,450	7,865

## Project description

In order to grow, train, and promote talents in line with the organization's needs, we have developed a comprehensive management talent development framework that introduces an integrated approach on personnel selection, training and assignment. Management associate classes are organized for talents of different grades.



Group classes for professional managers

## Project result

Classes organized in 2019 by the Department of Administration, CPC University, and participants are summarized below:

- 1 Senior management reserve: 2 classes; 60 participants; approximately 111 hours per class
- 2 Professional managers: 3 classes; 106 participants; approximately 76 hours per class
- 3 Management associates: 5 classes; 175 participants; approximately 58 hours per class
- 4 Entry-level management reserve (production management): 4 classes; 188 participants; approximately 25 hours per class
- 5 Entry-level management reserve (service and marketing): 3 classes; 106 participants; approximately 27 hours per class
- 6 Professional training for assistants: 1 class; 39 participants; approximately 22 hours per class
- 7 New recruits: 2 classes; 331 participants; approximately 57 hours per class

## Project description

E Library was created in 2018 as enforcement to CPC's policy of helping employees learning. Knowledge and experience of senior employees are taught through pre-recorded classes and retained in the form of digital materials, thereby enabling accumulation and transfer of knowledge and experience within CPC.



## Project result

- 1 Digital learning materials make inventory count, selection, relocation and modification relatively easy, which facilitates transfer of knowledge within the organization. Nearly 80 retirees and experts from various departments were mobilized to identify more than 800 core topics.
- 2 E Library was accessed by 12,105 users for a total of 42,749 hours in 2019.
- 3 The forum section is deemed to have served its purpose of facilitating communication, as a total of 189 articles were posted and 716 replies were received in 2019.

## Project description



“CPC Seminar” is an education program introduced by CPC's Human Resource Training Center in 2018; since then, the program has continually expanded and improved in terms of target audience, purpose and execution.

## Project result

A total of 8 seminars had been held under the program by the end of 2019, covering a wide variety of topics from business administration, charity, environmental protection, healthy lifestyle, interpersonal communication and cultures of Taiwan. Speakers including Hsin-Ling Shen, film director Chueh-Ming Mai, Minister Audrey Tang and Tun-Tsu Tan were invited to host seminars in 2019, which received a total of 1,290 enrollments and 330 online views.

### ■ Talent training highlight project 1: Mid-level and senior manager skill map

1

To facilitate training and development of senior managers, the vice president of Department of Human Resource hosts a series of senior management capacity meetings with the help of consultant companies, during which participants engage in focus group discussions and use card tools to explore core skills and management models that meet the organization's expectations. These meetings have proven beneficial to employees who are looking to take their skills to the next level.

### ■ Talent training highlight project 2: Diverse training classes for petrochemical talents, and the nation's only gas station air quality testing class

2

CPC has spared no efforts creating proper training facilities and organizing air quality tester classes for the purpose of improving air quality in Taiwan and complying with EPA's “Gas Station Gasoline Vapor Recovery Facility Management Regulations.” Being the only certified training institution in Taiwan in this field, CPC helps train gasoline vapor recovery testing personnel for the nation that are well-equipped with theoretical knowledge and practical experience. Currently, all refueling nozzles have been equipped with gas vapor recovery device, which contributes significantly to improving air quality near gas stations.

2

CPC organizes training classes for certifications such as class B petrochemical, class B chemical engineering and class C chemical engineering to help the nation grow its reserve of petrochemical talents; furthermore, it provides a workshop environment where industrial high school and university chemical science students are able to build up practical experience in preparation for their future career, and where existing workers can build up the petrochemical knowledge and skills needed for career advancement. These classes are structured with the ultimate goal of helping participants obtain technician certificate, and have contributed tremendously to their ongoing education and career development.

### ■ Talent training highlight project 3: Industry-academia collaboration

3

CPC supports the government's policies on industry-academia collaboration and southbound expansion policy, and contributes its effort to training entry-level employees for the petrochemical industry. Through a combination of theoretical and practical teaching, students are able to learn through experience and practice, and thereby develop the skills needed for their future career. By building up a reserve of overseas talents, CPC provides real support to businesses that intend to invest into Southeast Asia.

#### Senior high and vocational schools

The industry-academia collaboration began with Linyuan Senior High School, an institution that has educated countless number of the nation's prominent contributors but unable to attract new students in recent years due to its remote location. In light of this challenge, CPC communicated with the school and students on many occasions to come up with an industry-collaboration program that not only helps Linyuan Senior High School attract local students, but also enables CPC to recruit top-performing employees locally. Top-performing students are offered scholarship; those from medium and low-income households or underprivileged families may even have living expenses subsidized at NT\$3,000 per person, per month for one year.





Students of the first phase of the industry-collaboration program have graduated since 2017; 41 of whom were employed by CPC through open recruitment.

3

### Universities and colleges

Through memorandums of understanding, CPC organized 5 classes for a total of 238 students from National Dong Hwa University, National Chung Cheng University, National Chiayi University and Kun Shan University in 2019. Students were offered practical learning opportunities and shown various operations of CPC, which helped build up and improve the qualities needed to pursue a promising career in Southeast Asia. Students from Indonesia, Thailand, Malaysia, The Philippines and Mongolia were able to learn, observe and exchange with others through this class; in return, they connect CPC to vast reserve of talents overseas.

To further expand the recruitment channel, CPC has implemented a set of “University Scholarship Guidelines” and invited universities to recommend junior students going into the senior year for the scholarship program. Candidates that pass the open exam are entitled to summer internship at CPC. Those who pass review upon completion of the 1-month internship are granted scholarship in exchange for 2 years of service at CPC after graduation.

### Social value and impacts

An industry-collaboration program has the potential to benefit schools, students and local communities. Youths from disadvantaged families, for example, are able to accumulate practical experience, learn useful knowledge about petrochemicals and expand global vision through the class. The program also supports government policies as it introduces Southeast Asian language as an advantage for career development.

CPC was the first state-owned enterprise to introduce industry-academia collaboration, and the model it chose was to work with students of “Petrochemical Class” of Linyuan Senior High School. The program plays an important role in students' studies, and its success at helping people grow has inspired many businesses from Ren Da Industrial Park and other senior high schools to follow.

CPC values talent development, and takes pro-active steps to give back to the society and exert social influence by training industry talents that have the ability to pass on knowledge.

# Special Coverage



**History of Oilmen  
in Taiwan**



**CPC's Move into  
Africa**



**Female Oil  
Engineers in Chad**





## Special coverage – History of oilmen in Taiwan

Incorporated more than 70 years ago, CPC plays a vital role in Taiwan's oil exploration and production history, which dates back more than a hundred years. The Chuhuangkeng, situated between Houlong River and Longchuan Mountain at Kaigong, Gongguan Township, Miaoli County, has been gifted with rich oil deposits as the distinctive geological attributes make oil and gas easy to gather. It marks the first discovery of oil in Taiwan and is one of the oldest oil and gas fields in the world that is currently in production. The oil field has seen much of Taiwan's history, from Qing Dynasty to Japanese colonial rule period and is now managed by CPC.

### The origin of oil well establishment

In 1817, Lin-Fang Wu from Southern China discovered droplets of oil floating in rivers near Chuhuangkeng, Miaoli, that could burn for extended period of time. People at the time did not know what the substance was and mistook it for “oil containing sulfur,” and therefore named the place Chuhuangkeng. It marked the first sighting of oil in Taiwan. In 1877, Governor Ri-Chang Ting of Fujian appointed King-Sing Tong to oversee oil drilling in Taiwan, and had once invited American technicians to introduce mechanical process for the drilling. However, for reasons concerning geological characteristics, equipment, workers and living conditions, the contract was not renewed upon expiry. The succeeding governor, Ming-Chuan Liu, did establish a Coal and Oil Department within the administration, but the five existing wells had yielded so little that the department was later removed in 1891.



1952 - Chief of China Mission (Dr. Schenck) and Chief of Far East Mission from Mutual Security Agency en route to opening ceremony of Chuhuangkeng well No. A2 in a inclined trail car

In 1897, the Japanese government allowed state-owned and private enterprises to register ownership of oil fields for more aggressive production of this precious substance. By the end of World War II in 1945, Chuhuangkeng had produced approximately 184 million liters of oil. Oil reservoir in shallow layers depleted at one time, for which the Japanese producer was required to drill deeper using a different approach. It was a time when oil was starting to become an important and valuable commodity.

After the war, CPC imported heavy equipment with the help of the U.S. government to continue oil drilling. In 1959, CPC acquired two drilling rigs capable of reaching 4,500 meters in depth, and successfully constructed well No. 106 in 1962 as its decade-long effort training geologists and geophysics. This accomplishment proved that there is abundant reservoir of natural gas in Chuhuangkeng formation.

### Life of Oilmen

Chuhuangkeng had light rails deployed throughout the mining site to move supplies to/from Nanliao, Beiliao and between oil wells. Dormitories, workshops, derricks and resting areas light up after dark to create an illusion of a populated city.

Oil and gas drilling activities multiplied around the world after World War II, and the new administration of Taiwan, too, saw Chuhuangkeng as an important part of the nation's development. It was during this time that the domestic oil industry made successive breakthroughs in terms of capacity, technology and talents. To cater for employees' needs, CPC had kindergarten, elementary school and junior high school set up so that oil workers could focus on their duties. In addition to an employee canteen, other necessities such as infirmary, commissary and grocery were also available, whereas theatrical performances, outdoor movie and entertainment shows were arranged during leisure time. By this time Chuhuangkeng had grown from a small village to a crowded, self-sustaining cluster. It even became a popular tourist attraction during the 1960s, and for many people, it was famous as "Little Hong Kong."



First Graduates of Chuhuangkeng Childcare Center in **1952**

Night View at Chuhuangkeng Beiliao Field in the **1960s**



Chuhuangkeng Became a Popular Tourist Attraction in the **1960s**

Chief Officer of Taiwan Petroleum Exploration Department (Mr. Te-Mei Wu) instructed Geology and Drilling and Production Knowledge in the **1960s**

## Life of Oil Field and Oilmen

Almost a hundred wells were drilled at Chuhuangkeng, whether by successively government or by CPC, over several decades, and while oil reservoirs had depleted, natural gas is still being produced to this date, although at a diminishing return. Furthermore, advancements in modern machinery and technology have replaced much of the labor, and the prosperous days of Chuhuangkeng now exist only in memories.

- ▶ In 1963, Typhoon Gloria Destroyed the Road in front of the Field Dinning Hall, Residents Cleaned up the Fallen Rocks



## Withstanding Taiwan's Glory

Taiwan made significant economic progress after the 1960s as it took part in the global markets. Given the increasing level of job specialization among local industries, CPC made several strategic adjustments and transformations, and was able to prevail with the support of its employees. Today, CPC continues to create jobs and support the nation's economic and industrial development, lighting up everywhere of Taiwan.



Being the pillar of the nation's energy supply, CPC places quality and service at the top of its priority, and has created countless jobs and supported the growth of the nation's industries to date. In a period of rising awareness toward low-carbon transformation, innovation and green energy, CPC remains active in its exploration efforts and continues to support growth of the nation's economy and industries. While supporting industrial activities, CPC has adopted new focuses including environmental education, land revitalization and culture rebuild to preserve the memories of people who came before.

Chuhuangkeng may pass its prime days, but still has many interesting stories to tell. It is important that we remember how oilmen had contributed to the foundation of Taiwan's economic strength, which is why CPC had gone to great extent to preserve the legends and memories of oilmen as part of its history.



Zhongshan North Road Gas station in the 1960s



The First Naphtha Cracking Facility at Kaohsiung



Statue of Oilmen at Taiwan Oil Field Exhibition Hall, Miaoli

In 2019, CPC renovated and re-opened Taiwan Oil Field Exhibition Hall located in Miaoli. The site preserves many of the old buildings and tracks to present a glimpse of Chuhuangkeng at its prime. Through digital image and historical artifacts, the exhibition hall not only tells stories of oil and gas drilling in Taiwan, but also reminds us of the treasures we inherit from nature and how they should be used properly to ensure the sustainability of our next generation.

- ▶ For more stories on oilmen and Chuhuangkeng, please visit Taiwan Oil Field Exhibition Hall (No. 363, Kaigong, Gongguan Township, Miaoli County). For details of Taiwan Oil Field Exhibition Hall, please see section 5.2 Environmental Education of this report.



## Special coverage - CPC's Move into Africa

Taiwan is highly dependent on import for energy supply, and in an attempt to secure energy supply, CPC has been cooperating with the government of Chad since 2003 to explore potential oil and gas fields. Having weathered through chaos including severance of diplomatic relations, war and terrorist attack, CPC was finally able to discover several oil fields with commercial potential in 2011. In 2017, the President of Chad issued production concession permit for the Oryx oilfield, for 25-years period. CPC produced its first barrel of oil from Chad in early 2020, which was a monumental milestone to CPC's 40-year investment and exploration efforts overseas. It signifies CPC's technological competence from survey, drilling, exploration to production, and marks the start of a new chapter in CPC's history.

### CPC's expedition at the heart of Africa

Oil gas exploration is a high-risk business; not only are projects costly to set up, a merely 25% to 30% of exploration projects end up successful on average, but failures are measured in hundreds of millions of dollars. Even if exploration efforts do yield preliminary discovery results and are able to progress into the production stage, the project will still face other tough challenges. In addition to technical aspects such as site survey, drilling, environmental impact assessment and oil pipe installation, developers also have to deal with management issues such as procurement, outsourcing and cross-border pipeline connections that put them in a constant race against time.



Daily safety meetings on site

CPC's involvement in exploration and development activities of Chad comprises two major parts: 1. construction planning, tender invitation, procurement, outsourcing and communication with employees



in Taiwan, and 2. arrange round-the-clock shift for the well engineering team at the southern Chad. Remote communication equipment and time zone management are essential to improve the efficiency of scheduled tasks, and every mission from technical team's meeting with oil department officials of Chad to select local experts for tender review, which are challenges for CPC.

Safety, environmental protection and working quality are three ultimate principles for CPC. The company hosts daily safety meetings and requires all workers and contractors to adhere to the highest HSE standards of the local government.

Whether being in Taiwan or in Chad, CPC employees coordinate closely with each other to overcome the difficulties, and thereby secure access to oil production that would otherwise be unavailable to Taiwan. This mission is shared by all oil workers from young to old at CPC. To fulfill this sacred mission, they willingly fly 10 thousand kilometers into the heart of Africa where civil war and diseases such as malaria and typhoid fever possibly await them. After more than a decade of persistent effort, their adventurous spirit overcame all odds to create new opportunities for CPC and Taiwan.

## Perseverance in the desert

CPC's drilling well site in Chad is located at southern Chad, 500 km away from the capital. It is often that vehicles break down during the trip to well site, and it takes a whole day to repair. Water supply, food, and sanitation of the local area are undesirable to the point that it takes months for Taiwanese to adapt. Security is a serious concern within the country. CPC team is required to hire armed security guards to protect themselves from danger. Even when presented with such a harsh environment, CPC has no shortage of experts and technicians from various fields volunteering to undertake such an extreme challenge in desert, and CPC is proud to carry this spirit as part of its culture.



Work commencement rituals were held according to Taiwanese customs to pray for workers' safety



Container dormitory at well site; simple and difficult like barracks

Well-drilling works have to be monitored and controlled continuously 24 hours, and container dormitories are created on-site to accommodate workers. CPC employees are often required to communicate with local drill workers with vastly different cultural background to ensure work progression. Despite the irregular work hours, the harsh living conditions and presence of work stress among other challenges, CPC employees are able to withstand them through persistence and perseverance, but homesick need to be overcome.

In order to adapt to the wild land where supplies are short and dangers are abound, CPC employees have to do everything on their own and learn skills in addition to their geology or geophysics expertise, and through which they were able to develop deeper understanding into the meaning of culture and life. The workers stationed in Chad are compared to soldiers fighting CPC's battles in the frontline, where victory is the only goal. In order to produce Taiwan's first barrel of oil in Chad, they work together, support and encourage each other, and ultimately light up CPC's eternal torch.

## Passion that runs across continents

The Exploration & Production Research Institute located in Miaoli serves as CPC's knowledge center for a wide variety of topics from geology, geophysics, drilling to oil production. The institute houses a team of professional researchers and advanced instrument; it provides support to colleagues in Chad by conducting professional studies and analyses, or by analyzing rocks or oil samples collected from site. Every packet of data symbolizes a perfect coordination between CPC employees and their passion to contribute to the production of oil resources.

At N'Djamena, the capital city of Chad where life is not as tough as onsite in oil field, workers still depend on each other and they welcome locals into the big family. Work activities commence at dawn each day, and begin with discussions about the progress of key construction projects and response to





Excitement of obtaining underground oil sample at midnight

emergency events. In the afternoon, workers join Taiwan headquarters in a conference call to report current day's progress. The crew has staffs that specialize in different duties from finance, engineering, exploration to drilling. At leisure hours, CPC employees gather others for enjoying meal, sports, watching movies and weekly "Chad Days" when they dress up in traditional local clothing and enjoy local delicacies.

New production facilities and dormitories at Oryx oilfield are scheduled to be completed in 2020, meaning that CPC employees no longer have to live inside quarters made from containers and will have a more comfortable living area to compensate their harsh working environment. Each one of CPC's overseas employees is an adventurous soul; they bring passion into their work and invest emotionally into the local lifestyle, creating value for Taiwan and CPC during their days in Africa.

## Care for African communities and bonding of Taiwan-Chad relations

In addition to oil survey and production, CPC also places great emphasis on engaging tribal neighbors nearby. The Company communicates with local government authorities, visits tribal chiefs and invests significant amount of resources into local communities on a regular basis. Voluntary medical service, construction of groundwater wells and schools, and donation of stationery supply and soccer balls to children are some of the neighborhood engagement efforts that CPC has committed locally. The company even introduced a "Friday Chad Day," during which employees are instructed to wear traditional Chad clothing to work. Overall, CPC maintains good relationship with local communities and residents in Chad, and managed to create a multi-cultural oasis in the middle of the desert.

*CPC's activities help generate tax revenues and create job opportunities in Chad; the complexity of survey techniques and engineering solutions used on-site give CPC engineers a perfect opportunity to learn through practice. Furthermore, ongoing engagement with local neighborhoods, communities and tribes have strengthened the bond between the people of Taiwan and Chad, and demonstrated the diligent qualities of the Taiwanese people. As CPC extracts Taiwan's first barrel of oil, it brings Taiwan's distinctive values into Africa and contributes to UN sustainable development goals as a Taiwanese state-owned enterprise.*

- For more information about CPC's neighborhood and community engagement efforts in Chad, please see section 5.1 Social Welfare in this report.

## Special Coverage - Female Oil Engineers in Chad

It is hard to imagine that a group of people would travel half way around the world to the inland nation of Chad in Africa, and then march 500 km away from the capital city (N'Djamena) to the southern oilfield and collaborate local villagers and authorities amidst risk of malaria and typhoid fever in a substance-deprived environment all for the purpose of producing Taiwan's first barrel of oil in Chad.

Recruiting employees for such as difficult environment has been a challenging task, but CPC is fortunate to have not only one, but several outstanding female engineers who, despite having their own family and children, are willing to embrace the challenge. Their courage to dream, fulfill and accomplish have made them the rare beauties at the barren land of Chad.

*“Even having invested enormous amounts through China National Petroleum Corporation, Sinopec Group and CNOOC Ltd. and assigned massive number of employees in Chad, Chinese companies would at best deploy female accounts or female admin. staff here, and never a female engineer at well site. Female engineers are rarely seen on-site at oil wells anywhere in the world, except for CPC,” said Yu-Kuo Chen, Technical Vice President of OPIC Africa Corporation at the time.*

### Female oil workers and their pursuit for their dreams



#### Case #1: Shih-Min Wu, well site geologist

“Why would your employer send a young lady like you to Chad?” Shih-Min Wu was assigned to Chad in 2015 as a geophysics surveyor, whose responsibilities are to gather and interpret seismic data in exploration area. This assignment came as a surprise to all workers of world-renowned oil companies stationed in Chad at that time.

*As CPC is about to begin producing its first barrel of oil in Chad, Shih-Min Wu said: “I am really proud to have participated in the preliminary survey of the Oryx oilfield in Chad.”*

### ■ Case #2: Hui-Ling Chang, drilling engineer

“Oil drilling is a costly operation and charged by an hourly rate. It is common for oil drillers (contractors) to slack off while the supervisor (OPIC Africa Corporation) is resting, that is why CPC would conduct unnotified visits midnight on the drilling platform from time to time, and we did catch them not doing work on several occasions.

There were critical moments when we had to stay round-the-clock on the drilling platform or near derricks to supervise and coordinate work activities, and identify areas that require improvement.



*Drilling work takes place round-the-clock and has to be monitored at all times, but Hui-Ling Chang never complained, and the only challenge she found difficult was the thought of her child.*

Hui-Ling Chang has the deepest gratitude for her husband and family, because it was their contribution and support in raising child that enabled her to pursue career as an oil engineer in a foreign country.



### ■ Case #3: Hsiang-Yu Wang, oil engineer

I used to work in oil refinery and production for downstream industries in Taiwan. In Chad, I was granted my wish of working in the upstream, the oil production field. While searching for the most appropriate pour point depressant for crude oil, I am constantly expected to draft procurement contracts and communicate with international suppliers in English. When supervising construction activities, I often have to ask experts about the proper methods and procedures of surface engineering, and may sometimes be required to negotiate with local villagers about lack of compensation for their land. These work activities are unheard of in Taiwan, but I learned a lot being a part of it.

*Attempting to expand professional experience in Chad where supply is short and diseases are abounding does present cultural shock and new challenges, but Hsiang-Yu Wang overcame them with her thirst for knowledge as an engineer.*

#### ■ Case #4: Chi-Hui Chiu, production engineer

Layer 1 oil and gas testing at well BENOY-1 did not show positive results as planned in 2019, said Chi-Hui Chiu. “The workover had completed without problem, but we did not know why there was no oil emerged from layer 1. We did not know what was going on beneath the surface and everyone was frustrated and under tremendous stress.”

Then they tested second layer, Chi-Hui Chiu and other well engineers had not slept well for days, and fortunately they were able to extract oil from second layer in mid-July, meaning that well BENOY-1 is completed and may progress into the production stage.



*During her expatriation in Chad, Chi-Hui Chiu learned and observed as she made decisions, overcame the 24-hour continuous stress and managed to complete the well within the given time. She and her colleagues have opened up a new chapter in CPC's history.*

Apart from those mentioned above, other outstanding female CPC employees included Nian-Chi Chin and Yi-Hui Hsu, both of whom had been assigned to Chad, and Shih-Chi Fu, former deputy head of Exploration & Production Research Institute who proposed the position for CPC's first well in Chad. CPC is fortunate to have the support of these individuals, whose courage to pursue dreams, undertake responsibilities and challenge the impossible in field site in Chad has moved CPC forward at this critical juncture in time.

# CH5

## CPC and Social Co-prosperity

### Chapter summary

CPC has service locations deployed throughout the nation, making it an ideal neighbor and partner to local residents. CPC builds on top of this advantage by maintaining productive interaction with local communities and organizations and contributing back to the neighborhood. Motivated by the spirit of “giving back to the society,” CPC fulfills its social responsibilities through actions such as charity, environmental education and sports sponsorship.

### Corresponding SDGs



### Reader Priorities

- Shareholder (MOEA)
- Partners
- Public representatives
- Communities
- Customers
- Government
- Employees
- Media
- NPOs/NGOs

## Chapter Highlights



Regional education and care for underprivileged:

**NT\$ 370 million**



Green Dragon Creativity Summer Camp

participants: **2,120**



CPC Petroleum Discovery Museum visitor count:

**37,565**



CPC Kaohsiung Refinery

Environmental Education

Park visitor count: **1,409**



Taiwan Oil Field

Exhibition Hall visitor

count: **48,047**



Sponsorship to sports

talents: **7 individuals**

and **10 schools**



Donation of renewed

computers:

**346 pieces**

## Management Approach

### Social Inclusiveness

#### Policy and commitment

- ✓ In addition to economic development and environmental protection, CPC aim to create social harmony in terms of "community welfare," "care for vulnerable groups," "charity activities" and "energy education and publicization."

#### Goals | Short-term

- 1 Develop friendly understanding with local governments and sponsor infrastructure projects that can be felt by the public.
- 2 Constantly promote neighboring work and assist in local development to sustain neighborly work.
- 3 Care for vulnerable groups and spread love to remote areas; engrain energy education and promote ecological conservation; cultivate elite athletes; and fulfill CSR.

#### Goals | Medium/long-term

- 1 Maintain friendly understanding with communities around complexes and mines, sustain care for the vulnerable, and prosper with local residents.
- 2 Combine green operations, cultural and creative industries, and community co-prosperity to build a brand-new image of CPC green energy.

### Specific Actions

Several social campaigns were organized, including “CPC Plantation” - a seedling giveaway and “2019 Earth Cleanup and Persistence Support” - a winter mountain cleanup hiking event and donation for Taiwanese athletes

### Measurement Mechanisms

Hold the Neighboring Work Review Committee meeting once a month to review the annual working plan, charitable activities, and proposals, and follow up and evaluate performance in neighboring work.

## 5.1 Social Welfare

After decades of commitment in Taiwan, CPC has become an essential part of people's life. The organization adopts a philosophy that aims to “give back to the society,” and does so by maintaining active interaction with local organizations and residents. Apart from implement environmental and ecological protection and pollution prevention around the complex or a mine, CPC proactively communicates and maintains two-way exchange with local communities to create a more harmonious commune life with them. CPC has been contributing to charity for decades; through these efforts, the Company hopes rally more support from the public to start a cycle of decency that creates sustainable values.

### Three policies for social inclusiveness

Care for vulnerable groups and let the sunshine of love shine over every corner.

Green society to achieve the sustainable development of land through real actions.

Promote energy education to light up the cultural dreams of locals with knowledge.

With nearly 2,000 branch and franchised gas stations, we are a great partner and a strong influencer to communities. In 2019, branch gas stations organized the following charitable activities:

### ☐ “CPC Plantation” - seedling giveaway

- 1 Seedlings were given out at 100 direct gas stations nationwide on April 22, 2019
- 2 Redemption:
  - ✓ Seedlings can be redeemed by presenting one receipt of current day's gas purchase of any amount at designated station
  - ✓ Collect 5 current receipts of any amount    ✓ Collect 5 waste batteries



*Donated 20,000 seedlings in response to Earth Day.*



### ☐ Sales collaboration of agricultural products

- 1 Starting from 2019, agricultural products are purchased then donated to underprivileged organizations
- 2 4 purchases of agricultural product were made in 2019, including: 80 tonnes of guava in April, 3 tonnes of pomelo and 1.8 tonnes of red bean in September, and 12 tonnes of banana in November

*Sold 96.8 tonnes of agricultural products in 2019*

In addition to the social involvement of gas stations, employees also contribute to society with existing resources:

### ☐ Blood donation

- 1 CPC has been advocating blood donation since 2013, and continues to address the shortage in blood supply by supporting local blood centers' call for “blood donation as a life-saving act.”
- 2 In 2019, CPC had 14 units and 8,553 employees responding to the initiative from all over the nation.



*3.983 million c. c. of blood was donated during the year, adding to a cumulative total of 13.9165 million c.c.*



## Local charity donations

- 1 CPC does not have any plant or mining facility situated in aboriginal areas, but still supports activities of indigenous peoples nonetheless. In 2019, 51 subsidies (donations) totaling NT\$2.973 million were made. CPC also subsidized events such as local educational/cultural activity, emergency aid, low-income household support, elder welfare, welfare for persons with disability, local festivity, local sports/entertainment, residents gathering etc. as part of its neighborhood engagement initiative. In 2019, the Company subsidized 6,138 events for a total of NT\$ 370 million.
- 2 CPC has been working with World Vision Taiwan since 2010 to rally employees into donating NT\$1,000 per month to disadvantaged children within the nation. A sum of NT\$2.436 million was donated in 2019 to finance the tuition of 203 children



*Local charity donations amounted to approximately NT\$370 million*

## "2019 Earth Cleanup and Persistence Support" - winter mountain cleanup hike

- 1 CPC has been organizing mountain cleanup events on a yearly basis since 2013, and the 2019 event marked the 7<sup>th</sup> consecutive year and 11th overall
- 2 On November 23, employees were mobilized to a mountain cleanup hike simultaneously in Taipei, Taichung, Kaohsiung and Hualien, and the event received support of nearly 3000 people from employees' family members, business partners and community residents. Together, they spread environmental protection and sustainability awareness within the community.



*Nearly 3,000 people were mobilized to mountain cleanup and hiking*

## Renewed computer donation

- 1 Reducing the urban-suburban digital divide and promoting use of digital learning companion
- ✓ As a support for the Ministry of Education's "Digital Application Promotion Project in Remote Areas" and "Digital Learning Companion Program," CPC donated renewed computers to the list of sponsored institutions so that university students may engage children and guide them through their studies online, thereby improve learning motive and interest among children in remote areas.



- 2 Renewed computers were shipped overseas for the first time to Africa and Central America
- ✓ With the help of International Volunteer Group at National Tsing Hua University, renewed computers were shipped overseas for the first time to Tanzania (Africa), Kenya (Africa) and Belize (Central America) with the hope of turning the education system around

### 346 renewed computers were donated to underprivileged students from Tanzania, Kenya, Belize, and Taiwan

*Su, a member of International Volunteer Group at National Tsing Hua University, said that although the government of Kenya is committed to promoting computer-based education, only the capital has the resources to purchase actual computers, whereas teachers of schools in remote locations simply draw pictures of computers on the blackboard and teach students to imagine using them. As volunteers arrived at their destination with renewed computers sourced from various donors, they felt reassured about their mission of conveying love and hope, and were glad to give children the means to learn more knowledge. "The volunteer group thanks CPC for its support in shipping equipment to Africa. We look forward to seeing the seed of hope grow some day."*

### ■ Supporting Taipei Happy Mount and creating art-friendly public restrooms

- 1 CPC purchased artworks created by residents of Taipei Happy Mount and placed them inside accessible restrooms as a charitable and artistic gesture
- 2 On August 27, Yilan Marketing Center of the Eastern Businesses Department, Oil Product Marketing Division, invited residents of Taipei Happy Mount to a meet-the-audience event and a tour to various services offered at gas station (such as car wash, smart store etc.), during which they were given the opportunity to experience payment for their own purchases. By exposing the residents to diverse living experience, CPC hopes to help people with mental disability blend with the general public.



## International influence

### 1 Voluntary medical service in Chad and helped 2 girls seek medical assistance in Taiwan

CPC carries out overseas investment and oil exploration programs through a subsidiary called "Overseas Petroleum & Investment Co."(OPIC). In 2019, representatives from CPC and OPIC Africa Corporation paid visit to the village where two of the girls had previously sought medical assistance in Taiwan. The visitors were welcomed by villagers young and old upon arrival, who waved the OPIC flag and greeted them cheering "OPIC GO! GO! GO!"



*“The voluntary medical service conducted by the Taiwan Root Medical Peace Corps in 2016 left the Chad people impressed with Taiwan’s medical expertise, and many people were truly thankful to Taiwan and OPIC for the arrangement. The immigration officers would even treat members of the voluntary medical group with greater respect, knowing that they have accompanied OPIC Africa Corporation to the visit,” said Hsiang-Chen Lin, Vice President of OPIC Africa Corporation at the time.*

In 2016, CPC led Taiwan Root Medical Peace Corps, a voluntary medical service team comprising 26 professional medical staff and volunteers, to perform voluntary medical service at Benoy and Bebalem, two areas that are close to the Company’s oil field in Chad, Africa. Two of the girls were found to have suffered from severe cleft lip/palate and severe burn injury on the fingers that could only be treated with surgery. An arrangement was then made to have the patients, family members and interpreters visit Taiwan for treatment, which CPC agreed to cover transportation, food and accommodation expenses whereas the treatment was arranged by the Taiwan Root Medical Peace Corps with Chang Gung Memorial Hospital and paid for by the Noordhoff Craniofacial Foundation. Through this gesture, CPC fulfilled its commitment to narrow the medical divide for the underprivileged, and helped raise Taiwan’s visibility in the world. The terms “OPIC” and “Taiwan” have since been imprinted in many people’s minds in Chad.



For more details on the CPC’s voluntary medical service tour to Chad in 2016, please refer to special coverage - Voluntary Medical Service by CPC in the 2017 sustainability report



## 2 School and water well construction near oil field

CPC has donated stationery to top-performing students in schools near southern oil field on many occasions. Donations were also made to schools to help local students study. In July 2019, representatives from OPIC Africa Corporation revisited the school, it had founded to donate stationery supplies and soccer balls. They were greeted by the principal, the tribal chief, students and hundreds of villagers and were invited to a soccer game at the school yard. The principal even taught students the French way of saying “Thank you, OPIC!”



*Min Chang, CEO of CPC's Exploration and Production Department, said that "CPC's investment efforts in Chad is all about co-prosperity and giving back to the society. Not only do we donate resources to build schools, we also help nearby villages create wells, hoping that access to fresh water would improve their living conditions."*

OPIC's African office continues to drill water wells for villages near the oil field. "OPIC expects to construct 5 water wells for the most water-deprived villages this year. There are even some remotely located villages that have no access to water wells at all, and villagers have to walk miles to draw water from other villages each day," said Hsiang-Cheng Lin, Vice President of OPIC at the time. "Helping the most resource-deprived villages is the least CPC can do as part of its mining operation here."



[CPC Monthly - special coverage on neighborhood engagement in Chad](#)[URL](#)



For more details, please see:  
[Special coverage - CPC's Move into Africa](#)  
[Special Coverage - Female Oil Engineer in Chad](#)

## 5.2 Environmental Education

### 5.2.1 Green Dragon Creativity Summer Camp

As the leader of Taiwan's energy and petrochemical industries, CPC recognizes the vital role it plays in energy transformation of the current era, and actively promotes energy education to prepare the next generation for the challenges ahead. Since 2013, CPC has been organizing summer camps named the "Green Dragon Creativity Summer Camp," hoping to educate children about the importance of environmental sustainability. By offering more resources and inspiration to children, we equip children with a bond between petrochemical industry and daily life.

## Four Core Values

“Green Dragon Creativity Summer Camp” is inspired by four core values: “environmental education,” “care for the underprivileged,” “youth empowerment” and “creative learning.” In order to give more children the opportunity participate in summer camp and accumulate and pass on the knowledge they learn, CPC made a bold attempt by incorporating a counselor training system into “Green Dragon Creativity Summer Camp,” which recruits and trains college students from all corners of the nation. Over 7 years, nearly 1,200 college youths took on the role of counselor and guided more than 22,000 elementary students through summer camp activities, bringing joyful summer memory to children from remote areas and disadvantaged families. The summer camp also educates participants on green energy, so that they may learn and grow to become pioneers of the next energy movement.



## Opening the door to the future

The 2019 “Green Dragon Creativity Summer Camp” continued the foundation of previous summer camps and introduced new transformations with more pro-active and feasible actions and plans that further enhanced the brand image of “Green Dragon Creativity Summer Camp.” The spirit of “Opening door to the future” was incorporated into this year’s event to expand value of the summer camp while at the same time demonstrate CPC’s creative energy and improve corporate image.



Opening ceremony for Green Dragon Creativity Summer Camp, during which two large custom-made spheres were passed among participants, to symbolize knowledge transfer



Incorporate CPC's sustainability spirit into summer camp design



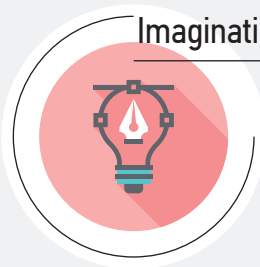
Emphasize on developing creative capacity of future talents, and enhance awareness toward environmental and human culture issues



Direct CPC's core capacity toward energy education

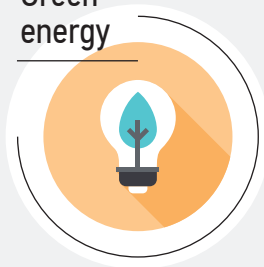
## Main theme of the 2019 summer camp

### Creation Imagination



In the face of the unpredictable and rapidly changing society and environment, it is necessary to cultivate imaginative and creative talents for the future through care for the surrounding environment as well as creativity and imagination building classes.

### Green energy



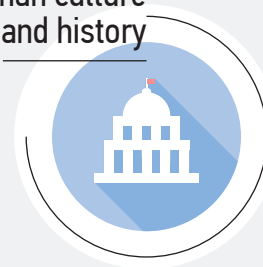
By incorporating a green energy theme into the summer camp, we aim to equip children with knowledge on energy technology, enable them to apply what they learn in daily life, help them realize problems in relation to the environment, and guide them toward exploring possible solutions.

### Teamwork and compassion



Children were organized to complete a series of challenges through teamwork, during which they were encouraged to turn compassion into active care. The activity emphasizes on the importance of working with others toward achieving mutual benefit.

### Human culture and history



The summer camp began with the teaching of local culture. It directed children's attention to the important role of the petrochemical industry in Taiwan's economic development, as well as its historical connections with local communities. By inspiring care for local cultures, children will learn to cherish or even make use of local culture to their advantage.

## Improved yields

44 training counselors and 2,120 children jointly contributed to the success of 2019 Green Dragon Creativity Summer Camp.

- 1 By training university students into counselors, the program provides them the opportunity to engage in various activities that care for the society. Through professional training and group activities, the summer camp achieved its goal of bringing games into education, which ensured stronger understanding of the petrochemical industry and energy issues.
- 2 Children from neighborhood engagement areas, remote locations and disadvantaged families were offered complimentary admission to the summer camp as part of the Company's CSR efforts. Doing so not only enhances the effect of neighborhood engagement, promotes community relations and directs care to the underprivileged, but also improves CPC's corporate and brand image.
- 3 With plant premise and professional knowledge, we develop the imagination and creativity of future pillars of society through friendly summer camp activities, and guide children toward building problem-solving capabilities that may prove useful in their future lives and careers. We hope that the next generation can become green citizens and value energy and the Earth more in the future.
- 4 Some participants of the 2013 summer camp have grown up into college/university students. CPC plans to track down these people and invite them to take part as counselors, so that they may relive their fun memories and contribute to educating the new generation about energy and sustainability.



## 5.2.2 Maker Party

The word "Maker" involves turning thoughts into action, which plays an important part in future innovations. The old ways of school teaching that focused on thoughts instead of practice no longer suffices today as businesses now compete on creativity and innovations. Changing the conventional approach is the key to building competitiveness for the future.

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CPC made its first appearance in Maker Party in 2018, and after receiving favorable responses for its “CPC Smart Green Gas station,” the Company returned to the exhibition in 2019 with a digital interactive presentation of “CPC Energy Lab.” This project targeted elementary school students, preschool children and workers of the education sector as the main audience; it enforced the concept of “Maker Party” to “learn through practice and games” and adopted a fun approach to deliver knowledge on energy, petrochemicals in life, natural gas transportation and how the Yongan natural gas plant uses cold drainage for circular economy.

### ▶ Three main themes of CPC's “Maker Party” project

#### 1 Detector of petrochemicals in life:

By establishing connections between petrochemicals and the things around us, the game explains how petrochemicals have become an irreplaceable part in life. The experience is packaged in a story, and users are given an interactive tour through the CPC Energy Lab.

#### 2 Journey of natural gas:

Through a maze challenge, players are educated on how natural gas is turned from liquid form on vessel into the usable form at household, as well as the importance of clean energy

#### 3 Circular economy:

Using real example, this module explains how circular economy is made possible at CPC, and how a small extra step would go a long way of turning cold drainage into viable resources for aquaculture. It uses games to explain the importance and wonders of circular economy.



Children of selected elementary schools were invited to participate in the event free of charge. In addition to the exhibits, CPC also arranged an exclusive handicraft class for making electric oil drilling rig models. The class gave children a basic understanding of powering motor with battery, along with simple knowledge on oil and gas gathering. It is an excellent example of “learning through practice and games.”

## 5.2.3 Environmental education location & document preservation

### CPC Petroleum Discovery Museum

CPC Petroleum Discovery Museum (formerly known as Petroleum Exhibition Museum), opened on May 29, 2019, provides free guided tour to the general public on an appointment basis. The museum has approximately 1,332 m<sup>2</sup> of exhibition space; the first floor takes visitors





thousand meters below ground and introduces them to oil deposits as well as the many ways that people have been using oil for centuries. As scientific knowledge advanced, people were able to develop more sophisticated drilling and refinery methods that completely changed our modern lifestyle. The second floor is presented in the form of a bright, warm oil city, where visitors are free to move between gas station, home, street, supermarket and laboratory to discover the many uses of oil, the search for new energy sources and CPC's history. The special exhibition hall showcases the latest energy issues around the world, and features creative exhibits on topics such as green energy development, climate



change, environmental protection and sustainability. The first special exhibition carried the theme "GO GREEN! The Smart Green Lifestyle," which invited visitors to a tour through smart green gas stations and how it brings clean, low-carbon energy into our lives! Use of digital interactive media, the museum creates an environment where participants may learn and explore oil and green energy-related knowledge through immersive experience.



[CPC Petroleum  
Discovery  
Museum URL](#)

### ► Becoming an oil explorer

With a puzzle card in hand, the visitors follow "Ollie" the mascot to complete 7 challenges hidden throughout the museum, and earn points to become oil explorers.



### ► From earth to city

This part of the exhibition is divided into 12 separate yet connected spaces, where visitors are free to move between different areas such as earth layer, refinery, gas station, street, home, supermarket, laboratory etc. to explore oil in its crude form and the many uses.



### ► Journey of oil presented through digital technology

See engineer turn into Mario the plumber and oil into glass marbles through this mechanical theater that tells the story of Taiwan's first oil well! Using interactive technology, this exhibition educates visitors on scientific knowledge and history through immersive experience of games, arts and culture.



## CPC Kaohsiung Refinery Environmental Education Park

After shutting down the Kaohsiung Refinery, we remediated and restored the contaminated areas with soil and water conservation and remediation technologies, hoping to revitalize the site through land transformation. To constantly enhance the site's function, we passed the EPA's environmental education facility certification in 2018. Informative materials have been designed for adults and children to address issues concerning environmental protection, preservation of nature, public hazard prevention and the refinery culture. A total of 1,409 visitors had participated our park's courses in 2019.

CPC Kaohsiung Refinery Environmental Education Park is the only oil refinery-related facility to pass EPA's environmental education facility certification. The park offers classes to educate visitors on environmental issues such as: the history of economic development and environmental movements, the ecology of Mount Banping, and the significance of petrochemicals in our lives. Using the 3 approved informative materials as the guideline, 2 modified versions have been created for elementary school students and are being taught on trial basis.

### Informative material for adults



#### Curriculum 1 "Petroleum, Economy, and the Environment"

Explore the interrelation between "economic development" and "environmental protection" through the park development history and introduce the remediation and transformation for revitalization after the refinery was shut down.



#### Curriculum 2 "Between Height and Thickness"

Explore "environmental justice" and "environmental sustainability" with the environmental difference between the southeast and the northwest of Mt. Banping, and experience the beauty of nature through a field trip to Mt. Banping.



#### Curriculum 3 "Never-Ending"

Introduce the interrelationship between the petrochemical industry and daily life and the influence of petroleum on climate change. Then, visit the refinery museum for an introduction of the refinery process, history of the petrochemical industry and artifacts.

### Informative materials for children

#### Informative materials for children



Grade 1 ~ 3  
"Love the Earth from treasuring oil resource"



Grade 4-6  
"The fragrance of soil in childhood"

## Taiwan Oil Field Exhibition Hall

Located in the Chuhuangkeng area of Kaigong, Gongguan Township, Miaoli County, this place marks the first sighting of oil in Taiwan. Taiwan Oil Field Exhibition Hall first acquired certification for environmental education facility certification in 2017 and was re-opened in June 2019. The exhibition hall is divided into seven exhibit areas, including one that takes visitors on a VR tour back into Chuhuangkeng in the 1960s, one that introduces how oil is drilled and gathered through interactive multimedia, and one that details CPC's history in oil exploration. In addition to being an edutainment and recreational place for the public, the exhibition hall also houses remnants of the Chuhuangkeng area. The exhibition received 48,047 visits by the end of December.



[Taiwan Oil Field Exhibition Hall Introduction and tour](#)



Oil Fields in Taiwan and Chuhuangkeng



Oil/Gas Formation and Exploration



Oil/Gas Production and Processing



Oil and Gas Pipelines



Offshore and Overseas Exploration



Sustainable Development



Local Images of Chuhuangkeng

*Memories of Chuhuangkeng at its prime may be distant, but have not faded with time. Through the exhibition hall, these stories are once again presented to pay tribute to the greatest asset in the nation's oil and gas history. Through stories of the local people, the exhibition hall enables visitors to understand and rediscover the oil field that had played a significant role in the nation's energy supply.*

It was CPC's intent to design environmental education classes with local features; as a result, Taiwan Oil Field Exhibition Hall, the inclined trail car and oil exploration equipment on the two sides, and the cluster of Japanese style buildings were all registered as environmental education facilities. Through guided tours, visitors are given a comprehensive explanation of the historical site, the culture associated

with it and the oil exploration process. 28 sessions of the above event were held in 2019, which received a total of 1,343 enrollments.

For more details, please see Special Coverage - Oilfields, oilmen, and Taiwan

## Document preservation

Kaohsiung Refinery was first taken over from the Japanese government in 1945 and subsequently closed down in 2015. For 70 years, it bore witness to various challenges in Taiwan's economic development. Although the refinery no longer bears any production activity after closure, its historical significance is undeniable as the building is constructed over several stages.



Main office corridor and arched doors

Currently, CPC's Hongnan Class D Semidetached Dormitory (formerly used as dormitory for class D officers of the fuel workshop by Japan's 6<sup>th</sup> Navy) has been designated municipal heritage, whereas CPC's Hongnan Dormitory Cluster (formerly the fuel workshop of Japan's 6<sup>th</sup> Navy) has been designated cultural heritage. In addition to being proof of history, these buildings also have countless stories to tell.

CPC will ensure proper maintenance and utilization of the cultural heritage according to policy, and may make arrangements to reuse them as needed in accordance with the Cultural Heritage Preservation Act. In which case, CPC will seek to revitalize Kaohsiung Refinery in such a way that brings new opportunities and breathes new life into the cultural heritage.

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## 5.3 Promotion of sports development

To promote sports development in Taiwan, cultivate elite athletes, and fulfill CSR, we established the "Elite Athlete Sponsorship Consultation Committee" and established the "CPC Directives for Sponsoring and Cultivating Elite Athletes" in 2002.

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In 2017, we amended the “CPC Directives for Sponsoring and Cultivating Elite Athletes” to expand the scope of sponsorship to the athletics team of public and private schools of all levels and renamed the document “CPC Directives for Sponsoring Top-Tier Sports Development.” In consideration of the deprivation of sports talent development of students as a result of the long-time shortage of stable resource support of athletics teams of schools in remote areas, we amended the Directives to include sponsorship for athletics teams of schools in remote areas for students in remote areas to demonstrate their sports talent through proper sports education and find self-assurance and the sense of achievement, and provide them an opportunity to change their life.

CPC awarded a total of 7 individuals and 10 schools in 2019.

### **CPC Awarded Elite Athletes and School Team Lists**

**Badminton** | Chia-Hsin Li, Chia-Hao Li, Hsiao-Cheng Chen

**Table tennis** | Yun-Ju Lin, Pi-Chun Lu

**Golf** | Hui-Wen Chiu

**Figure skating** | Hsiao-Chun Lin

**Basketball** | Miaoli County Mingren Junior High School, Miaoli County Dalun Junior High School

**Weightlifting** | Tainan Municipal Danei Junior High School

**Judo** | National Taitung University Affiliated Physical Education Senior High School

**Hockey** | Changhua County Pinghe Elementary School

**Archery** | Taichung Municipal Szu Chen Junior High School

**Baseball** | Hsinchu County Kuan Hsi Junior High School, Miaoli County Fu-Ji Elementary School

**Women's softball** | New Taipei Municipal Dan Feng Senior High School

**Soccer** | Kaohsiung Municipal Rueisiang High School



### ► Table tennis player worthy of Tokyo Olympics - Yun-Ju Lin

From Yilan, Yun-Ju Lin has taken a path to success that is vastly different from traditional athletes, one that relies on relentless practice, self-guided learning and the ability to remain calm and cool-headed during games. Lin currently ranks 6<sup>th</sup> in the world (February 2020).

CPC is well-aware of the loneliness associated with the path of practice, and therefore has been sponsoring athletes anonymously to keep them focused on their training. Yun-Ju Lin is one of the athletes that CPC has been sponsoring on a long-term basis. For three years in a row, Lin has been selected CPC Elite Sponsored Athlete; he will be competing in table tennis during the 2021 Tokyo Olympics, and we look forward to his victory.



Yun-Ju Lin (center) has been selected CPC Elite Sponsored Athlete for 3 straight years

Yun-Ju Lin (left) was the champion in Men's Singles in the 2019 Oman Open

During the 48<sup>th</sup> (2019) California Cup Field Hockey tournament, the hockey team of Ping He Elementary School from Changhua County won champion in the U12 Mixed division, making it the team's third consecutive championship in this tournament



CPC acknowledges the importance of talent development in a sustainable society, which is why the Company supports whole-heartedly to the government's sports policies and sponsors local communities, schools and organizations in sport events and competition. CPC prides itself for being the "strongest support for Taiwanese athletes," and in addition to sponsoring top performers, the Company also extends support to sports talents and events in remote areas.

In 2019, CPC received Sports Activist Awards in the Sponsorship Category - Gold Class from the Sports Administration, Ministry of Education, for the second time. With this affirmation, CPC will continue supporting Taiwanese athletes with their competition throughout the world.



▲ CPC received Sports Activist Awards in the Sponsorship Category - Gold Class in 2019. Chairperson Jerry Ou (right) received trophy on behalf of CPC from Vice President Chien-Jen (left)



Furthermore, having recognized the importance of nurturing national athletes, CPC decided to create its own professional soccer team and has assembled a “CPC Men's Soccer Team Preparation Task Force” in March 2019 to oversee the preparation. The team will be registered under the name “CPC Soccer Team” with Kaohsiung being its home court, and will train at the fields of CPC's Kaohsiung dormitory. The team will first compete in Taiwan Second Division Football League, and work its way up to Taiwan Football Premier League to contribute to the development of Taiwan's soccer sport.



# Appendix

GRI content index

Statement of Third-Party  
Certification

CPA Assurance Report







# Appendix 1 GRI content index

## General Disclosures Cross Reference

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Core	102-2	Activities, brands, products, and services	1.1 Our CPC	<a href="#">18</a>
Core	102-3	Location of headquarters	1.1 Our CPC	<a href="#">18</a>
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Core	102-5	Ownership and legal form	1.1 Our CPC	<a href="#">18</a>
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Core	102-8	Information on employees and other workers	4.1 Human Resources	<a href="#">120</a>
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<b>GRI 102 Governance</b>				
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Core	102-41	Collective bargaining agreements	4.3 Friendly Workplace	<a href="#">128</a>
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Core	102-46	Defining report content and topic boundaries	Report Profile 1.4 Material Topics of Sustainability in 2019	<a href="#">13</a> <a href="#">34</a>
Core	102-47	List of material topics	1.4 Material Topics of Sustainability in 2019	<a href="#">34</a>
Core	102-48	Restatements of information	There was no restatement of information in this report.	-
Core	102-49	Changes in reporting	1.4 Material Topics of Sustainability in 2019	<a href="#">34</a>
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## GRI Specific topic cross reference

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## Non-material topic GRI Standards cross reference

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## Appendix 2 Statement of Third-Party Certification



### INDEPENDENT ASSURANCE OPINION STATEMENT

#### CPC Corporation, Taiwan 2020 Sustainability Report

The British Standards Institution is independent to CPC Corporation, Taiwan (hereafter referred to as CPC Corporation, Taiwan in this statement) and has no financial interest in the operation of CPC Corporation, Taiwan other than for the assessment and assurance of this report.

This independent assurance opinion statement has been prepared for CPC Corporation, Taiwan only for the purposes of assuring its statements relating to its corporate sustainability (CSR), more particularly described in the Scope below. It was not prepared for any other purpose. The British Standards Institution will not, in providing this independent assurance opinion statement, accept or assume responsibility (legal or otherwise) or accept liability for or in connection with any other purpose for which it may be used, or to any person by whom the independent assurance opinion statement may be read.

This independent assurance opinion statement is prepared on the basis of review by the British Standards Institution of information presented to it by CPC Corporation, Taiwan. The review does not extend beyond such information and is solely based on it. In performing such review, the British Standards Institution has assumed that all such information is complete and accurate.

Any queries that may arise by virtue of this independent assurance opinion statement or matters relating to it should be addressed to CPC Corporation, Taiwan only.

#### Scope

The scope of engagement agreed upon with CPC Corporation, Taiwan includes the followings:

1. The assurance scope is consistent with the description of CPC Corporation, Taiwan 2020 Sustainability Report.
2. The evaluation of the nature and extent of the CPC Corporation, Taiwan's adherence to all AA1000 AccountAbility Principles in this report as conducted in accordance with type 1 of AA1000AS (2008) with 2018 Addendum assurance engagement and therefore, the information/data disclosed in the report is not verified through the verification process.

This statement was prepared in English and translated into Chinese for reference only.

#### Opinion Statement

We conclude that CPC Corporation, Taiwan 2020 Sustainability Report provides a fair view of the CPC Corporation, Taiwan CSR programmes and performances during 2019. The CSR report subject to assurance is free from material misstatement based upon testing within the limitations of the scope of the assurance, the information and data provided by the CPC Corporation, Taiwan and the sample taken. We believe that 2019 economic, social and environmental performance information are fairly represented. The CSR performance information disclosed in the report demonstrate CPC Corporation, Taiwan's efforts recognized by its stakeholders.

Our work was carried out by a team of CSR report assurers in accordance with the AA1000 Assurance Standard (2008) with 2018 Addendum. We planned and performed this part of our work to obtain the necessary information and explanations we considered to provide sufficient evidence that CPC Corporation, Taiwan's description of their approach to AA1000 Assurance Standard with 2018 Addendum and their self-declaration of 'in accordance' with the GRI Standards: Core option were fairly stated.

#### Methodology

Our work was designed to gather evidence on which to base our conclusion. We undertook the following activities:

- review of issues raised by external parties that could be relevant to CPC Corporation, Taiwan's policies to provide a check on the appropriateness of statements made in the report.
- discussion with managers on approach to stakeholder engagement. However, we had no direct contact with external stakeholders.
- Interview with 32 staffs involved in sustainability management, report preparation and provision of report information were carried out.
- review of key organizational developments.
- review of the findings of internal audits.
- review of supporting evidence for claims made in the reports.
- an assessment of the organization's reporting and management processes concerning this reporting against the principles of Inclusivity, Materiality, Responsiveness and Impact as described in the AA1000 AccountAbility Principles (2018).

## Conclusions

A detailed review against the Inclusivity, Materiality, Responsiveness and Impact of AA1000 AccountAbility Principles (2018) and the GRI Standards is set out below:

### Inclusivity

This report has reflected a fact that CPC Corporation, Taiwan has continually sought the engagement of its stakeholders and established material sustainability topics, as the participation of stakeholders has been conducted in developing and achieving an accountable and strategic response to sustainability. There are fair reporting and disclosures for economic, social and environmental information in this report, so that appropriate planning and target-setting can be supported. In our professional opinion the report covers CPC Corporation, Taiwan's inclusivity issues.

### Materiality

CPC Corporation, Taiwan publishes sustainability information that enables its stakeholders to make informed judgements about the organization's management and performance. In our professional opinion the report covers CPC Corporation, Taiwan's material issues.

### Responsiveness

CPC Corporation, Taiwan has implemented the practice to respond to the expectations and perceptions of its stakeholders. An Ethical Policy for CPC Corporation, Taiwan is developed and provides the opportunity to further enhance CPC Corporation, Taiwan's responsiveness to stakeholder concerns. Issues that stakeholder concern about have been responded timely. In our professional opinion the report covers CPC Corporation, Taiwan's responsiveness issues.

### Impact

CPC Corporation, Taiwan has Identified and fairly represented impacts that were measured and disclosed in probably balanced and effective way. CPC Corporation, Taiwan has established processes to monitor, measure, evaluate and manage impacts that lead to more effective decision-making and results-based management within an organization. In our professional opinion the report covers CPC Corporation, Taiwan's impact issues.

### GRI Sustainability Reporting Standards (GRI Standards)

CPC Corporation, Taiwan provided us with their self-declaration of 'in accordance' with the GRI Standards: Core option (For each material topic covered by a topic-specific GRI Standard, comply with all reporting requirements for at least one topic-specific disclosure). Based on our review, we confirm that social responsibility and sustainable development disclosures with reference to the GRI Standards' disclosures are reported, partially reported or omitted. In our professional opinion the self-declaration covers CPC Corporation, Taiwan's social responsibility and sustainability topics.

### Assurance level

The moderate level assurance provided is in accordance with AA1000 Assurance Standard (2008) with 2018 addendum in our review, as defined by the scope and methodology described in this statement.

### Responsibility

This CSR report is the responsibility of CPC Corporation, Taiwan's chairman as declared in his responsibility letter. Our responsibility is to provide an independent assurance opinion statement to stakeholders giving our professional opinion based on the scope and methodology described.

### Competency and Independence

The assurance team was composed of Lead Auditors experienced in relevant sector, and trained in a range of sustainability, environmental and social standards including AA1000 AS, ISO14001, OHSAS18001, ISO14064 and ISO 9001. BSI is a leading global standards and assessment body founded in 1901. The assurance is carried out in line with the BSI Fair Trading Code of Practice.

For and on behalf of BSI:



Peter Pu, Managing Director BSI Taiwan



Statement No: SRA-TW-2019003  
2020-05-20

...making excellence a habit.™

## Appendix 3 CPA Assurance Report



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### 會計師獨立確信報告

台灣中油股份有限公司 公鑒

#### 一、確信範圍

本事務所接受台灣中油股份有限公司（以下簡稱台灣中油）之委任，對 2019 年度企業社會責任報告書中所選定之永續績效資訊進行有限確信並出具報告。

有關台灣中油所選定之標的資訊及其適用基準，詳附件一。

#### 管理階層責任

台灣中油管理階層應依據適當之基準編製 2019 年度企業社會責任報告書，包括參考全球永續性報告協會 (Global Reporting Initiatives, GRI) 所發布之 GRI 準則 (GRI Standards)，並應設計、執行及維護與報告編製相關之內部控制，以蒐集並揭露報告書內容。

#### 本事務所責任

本事務所係依照財團法人中華民國會計研究發展基金會所發布之確信準則公報第一號「非屬歷史性財務資訊查核或核閱之確信案件」之要求規劃並執行有限確信工作。

#### 二、確信工作

有限確信案件中執行程序之性質及時間與適用於合理確信案件不同，其範圍亦較小，所取得之確信程度明顯低於合理確信案件。為取得有限確信，本事務所於決定確信程序之性質及範圍時曾考量台灣中油內部控制之有效性，但目的並非對台灣中油內部控制之有效性表示意見。

為作成有限確信之結論，本事務所已執行下列工作：

- 與台灣中油之管理階層及員工進行訪談，以瞭解台灣中油履行企業社會責任之整體情況，以及報導流程；
- 透過訪談、檢查相關文件，以瞭解台灣中油之主要利害關係人及利害關係人之期望與需求、雙方具體之溝通管道，以及台灣中油如何回應該等期望與需求；





- 針對報告中所選定之永續績效資訊進行分析性程序；蒐集並評估其他支持證據資料及所取得之管理階層聲明；如必要時，則抽選樣本進行測試；
- 閱讀台灣中油之企業社會責任報告書，確認其與本事務所取得關於企業社會責任整體履行情況之瞭解一致。

### 三、 先天限制

因企業社會責任報告中所包含之非財務資訊受到衡量不確定性之影響，選擇不同的衡量方式，可能導致績效衡量上之重大差異，且由於確信工作係採抽樣方式進行，且任何內部控制均受有先天限制，故未必能查出所有業已存在之重大不實表達，無論是導因於舞弊或錯誤。

### 四、 品質管制與獨立性

本事務所遵循審計準則公報第四十六號會計師事務所之品質管制之規範，建立並維護完備之品質管制制度，包含遵循職業道德規範、專業準則及所適用法令相關之書面政策及程序。本所亦遵循會計師職業道德規範中有關獨立性及其他道德規範之規定，該規範之基本原則為正直、公正客觀、專業能力及盡專業上應有之注意、保密及專業態度。

### 五、 結論

依據本事務所執行之程序及所獲取之證據，未發現台灣中油所選定之永續績效資訊有未依照適用基準編製而須作重大修正之情事。

安永聯合會計師事務所

會計師：涂嘉玲



西元二〇二〇年六月二十三日



附件一：

編號	章節	內文標題	標的資訊	適用基準
1	第三章	空氣污染排放與管理	2019 年氮氧化物(NOx)申報量為 3,223.50 公噸。	2019 年度氮氧化物公司申報至行政院環境保護署列管污染源資料查詢系統之資料。
2	第三章	空氣污染排放與管理	2019 年硫氧化物(SOx)申報量為 1,180.46 公噸。	2019 年度硫氧化物公司申報至行政院環境保護署列管污染源資料查詢系統之資料。
3	第三章	空氣污染排放與管理	2019 年揮發性有機化合物(VOCs)申報量為 2,125.90 公噸。	2019 年度揮發性有機化合物公司申報至行政院環境保護署列管污染源資料查詢系統之資料。
4	第三章	廢污水管理	2019 年大林煉油廠 SS 排放水質為 10.5 mg/L	2019 年度第三方檢測報告。
5	第四章	人力資源	台灣中油 2019 年已進用身心障礙人員 (含工讀生) 814 人。	身心障礙者權益保障法第 38 條規定之勞保、公保人數比例。





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台灣中油股份有限公司  
CPC Corporation, Taiwan