

2019  
**Sustainability  
Report**







---

2019

# Sustainability Report

---





# CONTENTS

## Sustainable Governance and Commitment

From the Management	05
Vision and Mission	08
Our SDGs Contributions	09
Report Profile	14
2018 Winning Records	16

## CH1 Embracing Taiwan: An Inclusive CPC

1.1 Our CPC	18
1.2 Sustainable Management	24
1.3 Stakeholder Communication	26
1.4 Material Topics of Sustainability in 2018	33

## Special Column 1: Ecological and environmental conservation

### Special Column 1.1: CPC-The Green Dragon Creativity Summer Camp 43

### Special Column 1.2: Green CPC-Ecological Conservation 48

## CH2 Valuing Taiwan: A Responsible CPC

2.1 Response to National Policies	55
2.2 Response to Significant Events	61
2.3 Risk Management	68

## CH3 Prospering Taiwan: An Innovative CPC

3.1 Green R&D	74
3.2 Circular Economy	81
3.3 Products and Customers	84
3.4 Business Performance	88

## Special Column 2: Public Toilet Culture 89

## CH4 Engraining Taiwan: A Nurturing CPC

4.1 GHG Management	98
4.2 Energy and Resources Management	100
4.3 Risks and Opportunities From Climate Change	106
4.4 Effluents and Waste Management	110
4.5 Pollution Prevention	114

## CH5 Join hands in Taiwan: A Embracing CPC

5.1 Social Welfare	125
5.2 Promotion of Sports Development	128
5.3 Human Resources	130
5.4 Employee Development	133
5.5 Workplace Safety	136

## CH6 Goodwill Taiwan: A Transparent CPC

6.1 Corporate Governance	146
6.2 Ethical Management and Legal Compliance	150
6.3 Supply Chain Management	152
6.4 Membership of Associations and External Initiatives	155

## Appendix

Appendix 1 GRI-Standards Reference Table	157
Appendix 2 Statement of Third-Party Certification	162







## Sustainable Governance and Commitment

### From the Management

Over the years, we have been constantly seeking “economic, environmental, and social” successes. While ensuring an adequate supply of oil and gas in Taiwan, driving the development of industries in relation to petrochemistry, and contributing the best to the public and public finance, we uphold our aim of corporate social responsibility (CSR) and spare no effort to engage in energy conservation and emissions reduction, environmental protection, and green energy development, in order to achieve sustainable development.

In 2018, in the face of quality control defects of unleaded gasoline #95 and the oil leakage of the Huxi Oil Depot, apart from compensating the affected and reviewing these incidents to demonstrate our responsible attitude, we took corrective and preventive actions and implemented optimization programs through the concerted efforts of employees and with the support of stakeholders. In economic performance, our 2018 revenue was NT\$1.0346 trillion, 15% more than that of 2017 and with a financial contribution amounting to NT\$132.3 billion. Apart from returning to the “mega dollar club”, we created an income before tax of up to NT\$43.8 billion. In sustainable development, we uphold our founding aim and make constant efforts to achieve the following:

#### Green Energy Development

To keep pace with the global green energy trends and in response to the government’s energy policy, we have engaged in green energy development and deployment in recent years. In addition to investing in the research and development of biorefineries, hydrogen energy, and fuel cells, we have erected a PV system in some complexes, gas stations, and oil supply centers; promoted the transformation traditional gas stations into smart green energy filling stations; and plan to build 1,000 charging points within three years. In addition, we have signed a memorandum of understanding (MOU) with the Taiwan Power Company (TPC) on the “Renze-Tuchang Geothermal Site Survey and Geothermal Generation Development Project” in Yilan County to mark the onset of geothermal survey and geothermal generation in Taiwan and open a new chapter in renewable energy development and the energy sustainability of CPC Corporation, Taiwan.

#### Environmental Harmony Facilitation

To achieve environmental sustainability, we conserve and improve energy, reduce GHGs, and have built an environmental audit system. While promoting economic development, we spare no effort to practice energy conservation, emissions reduction, and environmental protection with equal emphasis. We have further established internal management systems to govern energy and resources utilization, waste management, GHG reduction, and pollution prevention, and we review them regularly. Furthermore, we promote energy linkage with nearby enterprises to raise energy utilization efficiency, reduce resources consumption, and lower regional pollutant emissions to effectively mitigate environmental impacts, improve environmental quality, and co-prosper with local communities.



## Climate Change Adaption

To mitigate climate change impacts, we proactively plan climate change adaptation to enhance self-resilience. Apart from enrolling in the “Climate Change Adaptation Strategies and Guidance Program for the Energy Sector” of the Bureau of Energy, we signed up to the climate change questionnaire project of the international Carbon Disclosure Program (CDP) in 2015. In addition, we inventory and address climate risks and opportunities in terms of the transformation risk (policy, regulations, and market) and the physical risk (immediate and long-term) with respect to the questionnaire contents. In 2018, we received a B grade for our management based on the questionnaire results. In addition to connecting with the world, the promotion demonstrates the effectiveness of our efforts.

## Friendly and Safe Workplace

To provide a friendly and safe work environment for employees, apart from constantly implementing various occupational health and safety (OHS) management systems, we ensure workplace safety for employees through employee training, disaster prevention drills, and audits. In addition, with respect for human rights and gender equality as the cornerstone, we offer sound remuneration and benefits and maintain unimpeded labor-management communication to build a friendly workplace. Furthermore, we provide employees with opportunities for career development through professional training, job rotation, promotion, and second specialty training.

## CSR Fulfilment

To practice “taking from society, paying back to society”, we are committed to promoting energy conservation, emissions reduction, and environmental and ecological protection. We also help local development, care for vulnerable groups, finance baseball teams in remote areas, support national athletes, and promote top-tier sports development. Furthermore, we maintain sound interaction with local groups and communities and organize various charitable events. With such, we aim to create social harmony in terms of “community welfare”, “care for vulnerable groups”, “charity activities”, and “energy education and publicization”.

## Sustainable Management

To achieve sustainable management, we promote topics in relation to sustainable management through the “Sustainable Management Committee” with respect to the UN Sustainable Development Goals (SDGs). In addition, through channels such as social media, the sustainable report, and the corporate website, we disclose information in relation to sustainable development to strengthen effective communication with stakeholders. In 2018, we were awarded the Corporate Sustainability Report Award TOP50-Plantimum Award and the Climate Leader Award in the Best Performance in Specific Categories at the Taiwan Corporate Sustainability Awards organized by the Taiwan Institute for Sustainable Energy. In addition, we were awarded the

Excellence of Sustainability by the British Standards Institution (BSI). All these are external recognition of our efforts and achievements.

The 2019 Sustainability Report is our eleventh issue. Apart from constantly demonstrating our achievements that concern stakeholders in the economic, environmental, and social categories, we disclose how we connect with and address the SDGs. In addition, we have specifically selected three special columns, including the Ecological Conservation Around CPC Complexes, such as the Guantang Industrial Park (Port), that details the implementation of green co-existence; the Green Dragon Creativity Summer Camp that emphasizes “environmental education”, “care for the vulnerable”, “youth empowerment”, and “creative learning”; and Public Toilet Culture that highlights events of urban civilization and the thoughtfulness of CPC. We hope that stakeholders can further understand our concerns, efforts, and determination in the pursuit of sustainable development.



Chairperson

Dr. Jerry J. R. Ou

Jia Ruey Ou.

President

Lee, Shun-Chin

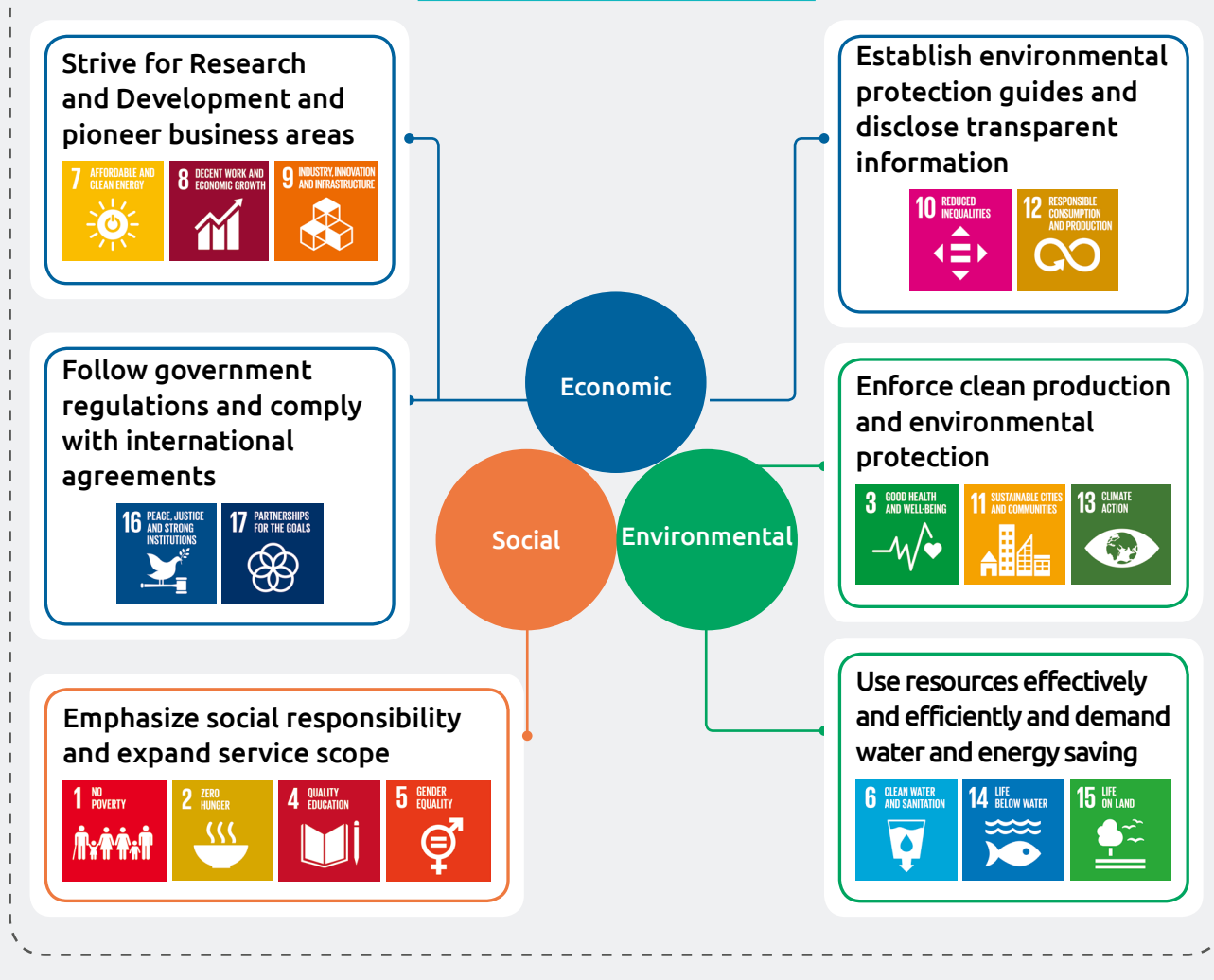
Lee, Shun-chin



## Vision and Mission



## Our SDGs and Core Values



## Our SDGs Contributions

SDG	Significance to Us	Our Contributions	Corresponding Section	Page
<b>SDG 1</b> NO POVERTY	Apart from helping the vulnerable in Taiwan, we promote community development in overseas mining sites, hoping to make contribution to eradicating poverty and protecting the underclass	<ul style="list-style-type: none"> <li>Promote cultural educations in communities to help local residents</li> <li>Sponsor baseball teams with baseball equipment in remote areas of Taiwan</li> <li>Donate regeneration computers and sponsor students of elementary schools in remote areas</li> </ul>	2.1 Response to National Policies 5.1 Social Welfare 5.2 Promotion of Sports Development	55 125 128
<b>SDG 2</b> ZERO HUNGER	We hope to improve the infrastructure of least-developed countries, end hunger, and raise rural productivity	<ul style="list-style-type: none"> <li>Donate water wells in the mining areas of least-developed countries to improve local water quality and thereby provide opportunities for agricultural improvement</li> </ul>	2.1 Response to National Policies	55
<b>SDG 3</b> GOOD HEALTH AND WELL-BEING	Ensuring the health and safety of employees and their family members is our responsibility	<ul style="list-style-type: none"> <li>Provide well-planned health examinations and dependent education allowances for the peaceful and healthy growth of employees</li> </ul>	5.5 Workplace Safety	136
<b>SDG 4</b> Education Quality	By combining education and daily life, we hope to communicate the need for environmental sustainability to children, youth, and the general public	<ul style="list-style-type: none"> <li>Our summer camps have trained 1,100 instructors and served over 20,000 elementary school students over the year</li> </ul>	Special Column 1.1: CPC-The Green Dragon Creativity Summer Camp	43



SDG	Significance to Us	Our Contributions	Corresponding Section	Page
<b>SDG 4</b> Education Quality		<ul style="list-style-type: none"> <li>Both the Kaohsiung Refinery Plant and the Taiwan Oil Field Exhibition Hall are certified environmental education sites</li> </ul>	Special Column 1.2: Green CPC-Ecological Conservation	48
<b>SDG 5</b> Gender Equality	At CPC, men and women are treated equally, and only competency and talent matter	<ul style="list-style-type: none"> <li>Two of the five vice presidents are female</li> <li>Up to 22% of officers are female</li> </ul>	6.1 Corporate Governance	146
<b>SDG 6</b> Clean Water and Sanitation	We value water resources management; therefore, we constantly implement various water conservation measures and enhance water efficiency	<ul style="list-style-type: none"> <li>Increased water recovery rate by 0.03% compared to 2017</li> </ul>	4.2 Energy and Resources Management 4.4 Effluents and Waste Management	100 110
<b>SDG 7</b> Affordable Energy	It is our duty to maintain a steady energy supply at a steady price, and to build PV systems at gas stations as well	<ul style="list-style-type: none"> <li>Supply stable and affordable oil and gas to the public</li> <li>Build PV systems at 172 gas stations</li> </ul>	2.1 Response to National Policies 3.1 Green R&D	55 74
<b>SDG 8</b> Employment and Economic Growth	We maintain excellent operational performance and provide employees with a sound work environment	<ul style="list-style-type: none"> <li>A total of 15,704 employees</li> <li>Hired 279 people (including work-study students) with disabilities, accounting for 4.46% of all employees, in excess of the required quota</li> <li>Organized 3,359 training courses for 119,946 persons, with an average length of 61 hours/person</li> </ul>	1.1 Our CPC 3.4 Business Performance	18 88

SDG	Significance to Us	Our Contributions	Corresponding Section	Page
<b>SDG 8</b> Employment and Economic Growth		<ul style="list-style-type: none"> <li>100% return to work and retention rates after parental leave of both male and female employees</li> </ul>	5.5 Workplace Safety	136
<b>SDG 9</b> Industry, Innovation, and Infrastructure	Through constant R&D and innovation, we enhance corporate competitiveness. Through the circular economy and the efficient enhancement of energy and resources, we enable sustainable development. Through adaptation and management, we increase resilience	<ul style="list-style-type: none"> <li>Green-building Gas stations: 50</li> <li>Inventoried climate change risk facilities including four gas supply centers and four petroleum supply centers</li> </ul>	3.1 Green R&D 3.2 Circular Economy 4.2 Energy and Resources Management 4.3 Risks and Opportunities From Climate Change	74 81 100 106
<b>SDG 10</b> Reduced Inequalities	Ensuring equality in opportunity and eradicating inequalities are our unchanged commitment	<ul style="list-style-type: none"> <li>Same entry-level pay for men and women, and promotions regardless of age, gender, and race</li> <li>The 2018 women-to-men salary ratio was 1:1.0672, with just a slight difference</li> </ul>	5.3 Human Resources	130
<b>SDG 11</b> Sustainable Cities and Communities	We have gas stations all across the country. As public spaces with the highest occupancy, they must be safe, inclusive, and user-friendly, particularly to women, children, and the disabled	<ul style="list-style-type: none"> <li>There are 592 accessible public toilets in 615 branch gas stations; and nearly all of them are equipped with bidet toilet seats</li> <li>50 gas stations are certified green buildings</li> <li>Build gas stations in rural areas</li> </ul>	2.1 Response to National Policies 3.1 Green R&D Special Column 2: Public Toilet Culture	55 74 89



SDG	Significance to Us	Our Contributions	Corresponding Section	Page	SDG	Significance to Us	Our Contributions	Corresponding Section	Page
SDG 12 Responsible Consumption and Production	We make production more efficient through R&D and innovation. We also maintain effective energy and resources use and waste management to ensure production management	<ul style="list-style-type: none"> <li>Acquired 21 patents, published 253 papers, and applied 49 perspective research outcomes</li> <li>Announced the results of sustainable management periodically</li> </ul>	CH3 Prospering Taiwan: An Innovative CPC CH4 Engraining Taiwan: A Nurturing CPC	73 93	SDG 15 Life On Land	Promoting ecosystem sustainability is a corporate responsibility. It is our duty to maintain biodiversity.	<ul style="list-style-type: none"> <li>We constantly implement ecological education in the Kaohsiung Refinery Plant and the Guantang Industrial Park</li> <li>We continuously implement decontamination, protection, and ecological restoration in the six contaminated sites delisted by the Environmental Protection Administration (EPA) in 2018</li> </ul>	Special Column 1.2: Green CPC-Ecological Conservation 4.5 Pollution Prevention	48 114
SDG 13 Climate Action	Facing the risks and opportunities from climate change and addressing them through mitigation and adaption	<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 23 energy supply complexes within three years</li> </ul>	2.3 Risk Management 4.1 GHG Management 4.2 Energy and Resources Management 4.3 Risks and Opportunities From Climate Change	68 98 100 106	SDG 16 Peace and Justice	We practice ethical corporate management and establish management mechanisms to minimize corruption.	<ul style="list-style-type: none"> <li>Rated AAA (twn) by Fitch Ratings for the thirteen consecutive years</li> <li>Further education for directors and supervisors (BOD) of up to 145 hours in 2018</li> </ul>	CH6 Goodwill Taiwan: A Transparent CPC	145
SDG 14 Life Below Water	As some of our sales locations our natural gas terminals sit by the sea are located near the seaside, we spare no effort to engage marine conservation and pollution control	<ul style="list-style-type: none"> <li>We will perform continual undersea ecological monitoring to minimize environmental impacts</li> <li>We will continue to provide cold drainage for residents living around the Yongan Plant to enhance aquaculture efficiency</li> </ul>	2.2 Response to Significant Events 3.2 Circular Economy	61 81	SDG 17 Partnerships For the Goals	Enhance Policy Coherence for True Development	<ul style="list-style-type: none"> <li>In response to global energy conservation and emissions reduction and national policies, we have raised the proportion of natural gas use and developed green energy</li> <li>Participate in the CDP questionnaire</li> </ul>	2.1 Response to National Policies 3.1 Green R&D 4.3 Risks and Opportunities From Climate Change 6.4 Membership of Associations and External Initiatives	55 74 106 155



## Report Profile

We, CPC Corporation, Taiwan, began publishing the sustainability report in 2007, and the 2019 Sustainability Report is the eleventh issue. We have also established a “CSR” section on our corporate website for the public to download our sustainability reports, and for us to disclose our goals, strategies, and achievements in promoting sustainable development, and address the CSR topics that concern the public.

### Scope of Report and Reporting Period

The report period is from January 1, 2018 to December 31, 2018. For information integrity and trend comparison, information for some content includes historical data. The last version was published in June 2018. Compared to the last report, this report contains no re-edited information, and the scopes of both reports are similar. This report provides information regarding the activities of CPC and its 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 at <https://www.cpc.com.tw/> for details.

### 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 Principles  
(AA1000AP)

The UN Global Compact

ISO 26000 Guidance  
on Social Responsibility

The UN Sustainable  
Development Goals (SDGs)



## Report Quality Control Workflow

**Report Editing:** Established the “2019 Sustainability Report Editing Panel”, with the Vice President as the convener, the Department of Planning (DoP) as the executive secretary, and members from all business divisions, research units, and staffing offices.

**Report Content Review:** After consolidating and editing, the DoP sent the first draft to panel members to review the contents in relation to their functions and duties. After third-party external verification, the DoP revised the draft with respect to the verification comments before finalization. Lastly, the DoP submitted the Report for approval according to the administrative procedure prior to publication.

**Report External Validation and Assurance:** This Report has been verified and assured by the British Standards Institution (BSI), and Ernst & Young to comply with the

- ◆ “Core” option of the GRI Standards
- ◆ AA1000AS (with 2018 addendum) Type 1
- ◆ ISAE 3000 assurance

## 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

If you have questions or comments regarding this Report, please contact us:

Mr. Wu, Wei-Ching, Department of Planning, CPC Corporation, Taiwan

No. 3, Songren Road, Sinyi District, Taipei City, Taiwan 11010 (R.O.C.)

Phone: (02) 8725-8253

Fax: (02) 8759-9018

E-mail: [207519@cpc.com.tw](mailto:207519@cpc.com.tw)

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

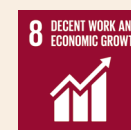


## 2018 Winning Records

- 🏆 Reader's Digest's Trusted Brand Platinum Award for 18 consecutive years.
- 🏆 No.1 "Consumer's Ideal Brand", gas station category, Management Magazine, for 14 consecutive years.
- 🏆 Awarded BSI's Corporate Sustainability Excellence Award.
- 🏆 Rated AAA (tw) by Fitch Ratings for thirteen consecutive years.
- 🏆 Rated "B" grade in the CDP Scores.
- 🏆 Awarded the TCSA Corporate Sustainability Report Award TOP50-Plantimum Award and the Climate Leader Award.
- 🏆 The 15th National Innovation Awards—Enterprise Innovation Award
- 🏆 The 18th Public Construction Golden Quality Awards by Public Construction Commission:  
One Excellence Award and one Honorable Mention for facility construction.
- 🏆 2018 Public Construction Excellence Awards by State-Owned Enterprises Commission:  
Two awards for facility construction
- 🏆 Taiwan International Ports Corporation(TIPC) Golden Vessel Award
- 🏆 MOE-SA "Sports Facilitator Award" and Golden Award in sponsorship.
- 🏆 The Kaohsiung Refinery Plant acquired environmental education site certification.
- 🏆 Completed 50 green-building gas stations, including 11 diamond grade stations.
- 🏆 Awarded the silver award by TTQS (for training organization).

## CH1 Embracing Taiwan: An Inclusive CPC

SDGs





With a history of 73 years, our products and services have become part of Taiwan's daily life in line with the social progress and economic growth. As a leading energy importer in Taiwan, to maintain the steady supply and safety of petroleum products, keep in line with national policies, fulfill stakeholders' demands, and proactively communicate with the public are our missions and business strategy.

The 2019 Sustainability Report aims to report our results in sustainable management in 2018. Apart from disclosing the nine types of channels for stakeholder communication, we have re-defined sustainability topics in different aspects this year. In addition, with more comprehensive, more common, and more practical questionnaire items, we identified 18 topics that concern stakeholders the most in 2018. Then, we introduce to the public our business policy and achievements with concise and easy to read contents. Through constant communication with all stakeholder groups, we hope to optimize our sustainable management and to further develop a business model, in order to achieve social inclusion and co-prosperity.

## 1.1 Our CPC

The year 2019 marks the 73rd year of operations of CPC. Our main scope of business covers the import and export, exploration, development, refining, storage, and transportation and sales of oil and gas, as well as the production and supply of petrochemical materials. Through top-down integration, we are an integrated energy company with business facilities distributed throughout Taiwan.

### Company Basic Data

Company Name	CPC Corporation, Taiwan	Chairperson	Jerry Ou
Establishment Date	June 1, 1946	President	Shun-chin Lee
Ownership	State-owned Enterprise (MOEA 100%)	Number of Employees (Dec 31, 2018)	15,704 People (including contract employees)
Authorized Capital	NT\$130.1 billion.	Headquarters Address:	No. 2, Tso-Nan Road, Nan-Tzu District, Kaohsiung City, Taiwan 81126 (R.O.C)
Revenue (2018)	1.0346Trillion (self-edited numberCPA-certified amount)	Credit Rating	AAA (twn) by Fitch Ratings

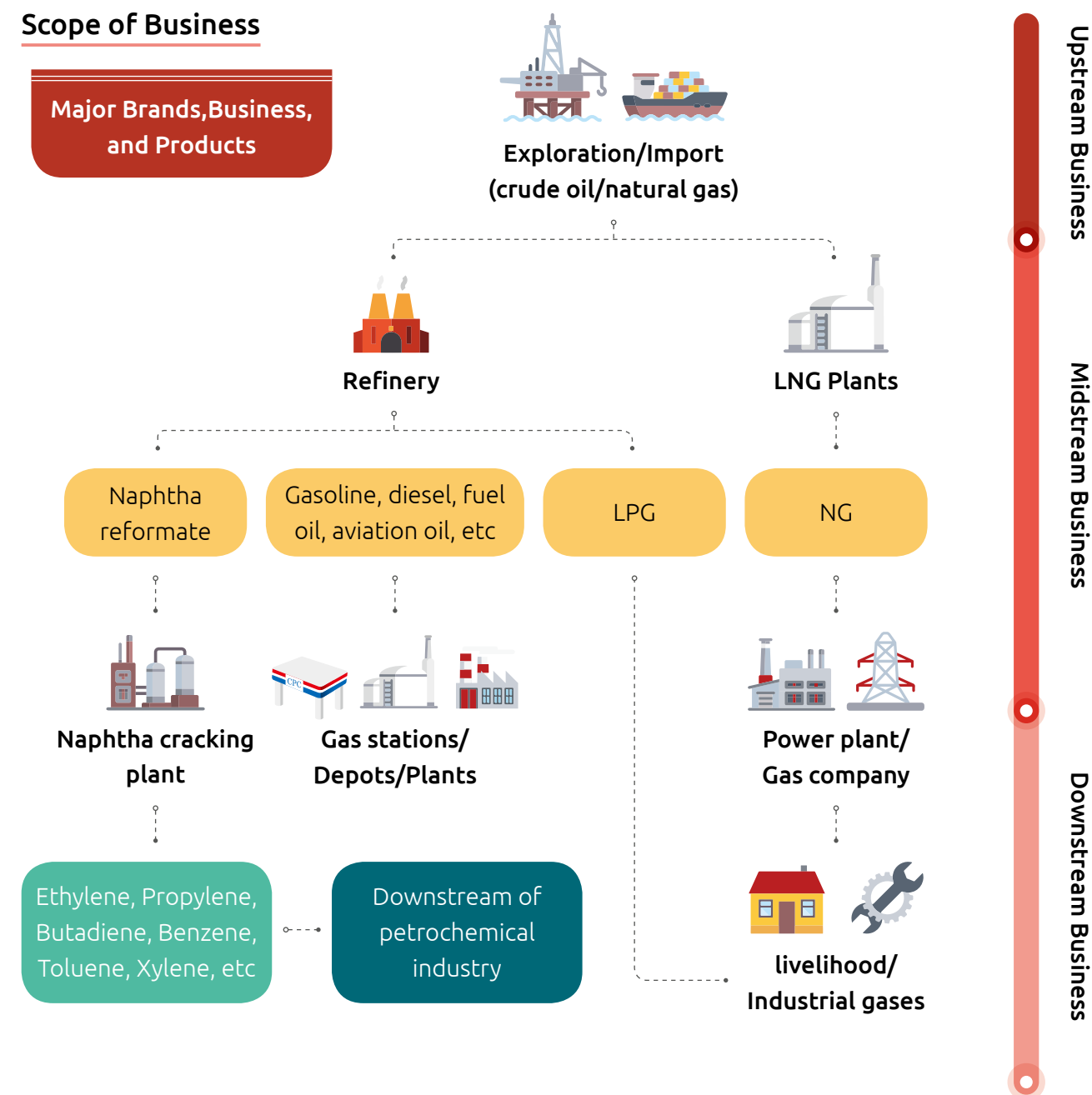
## Organization

Currently, we have 19 staffing units and 17 first-line direct business units. For details regarding the organization system, please refer to our [website](#).



CPC Website

## Scope of Business



### CPC's joint product chain

The scope of business includes the exploration, development, import, refining, transportation and sales of petroleum and natural gas, as well as the production and supply of petrochemical raw materials, serving as a comprehensive energy company with the vertical integration of upstream and downstream business.



## CPC services have become part of daily life.



### Mom's cooking

Natural Gas/  
Liquefied Petroleum  
Gas



### Laundry

See Clean Detergent



### Break on a trip

Combinative Stores  
Cup&Go Café  
Excellent Public  
Toilets



### Brother's electric motorcycle

Charging and Battery  
Replacement Services



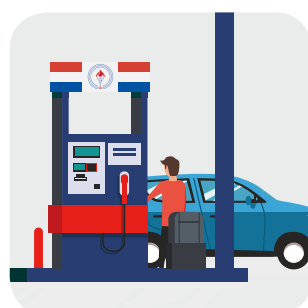
### Essentials of Life (clothes, plastic products, fertilizers, etc.)

Petrochemical  
Feedstock



### Sister's essential

Biotech Skincare  
Products



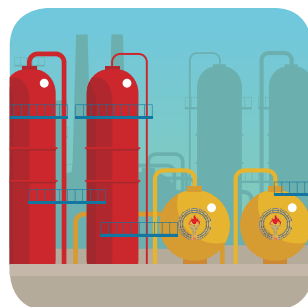
### Outing

Gas Stations



### Papa's beloved car

Quick Service and Tire  
Centers  
CPC Racing SM Motor Oil  
Carwash



### Life with clean and sufficient energy

Natural Gas Supply



### Grandma's Favorites

Festival Gift Sets  
Agricultural Products

## Major Domestic Locations



2 refineries (in Taoyuan and Dalin)



1 petrochemical Complex 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 gasoline supply centers



1,984 gas stations  
(Including joining station)

## Headquarters

Refining  
Business  
Division

Green  
Technology  
Research  
Institute

Project &  
Construction  
Division

Dalin Refinery

Lubricants  
Business Division

Petrochemical Business Division  
(Linyuan Petrochemical Complex)

Marketing  
Business Division

LPG Business  
Division

Natural Gas  
Business Division

Shen'ao Harbor  
Supply and  
Transportation  
Service Center

Taoyuan Refinery

Exploration &  
Development  
Research Institute

Exploration  
& Production  
Business Division

Taichung LNG  
Receiving Terminal

LNG Engineering  
Center

Taichung  
Laboratory

Personnel Training  
Center

Solvent & Chemical  
Business Division

Refining &  
Manufacturing  
Research Institute

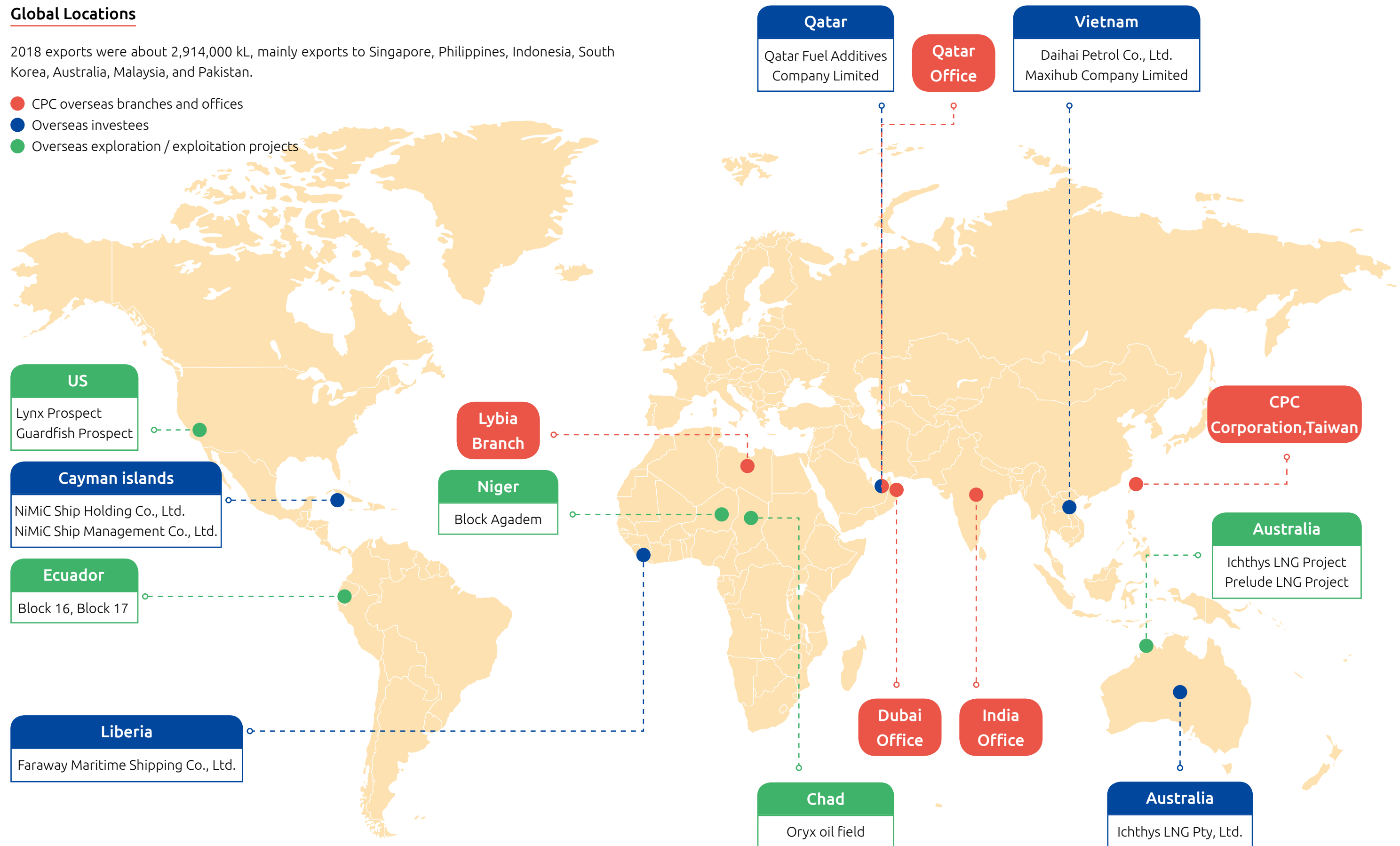
Yong-an LNG Receiving Terminal



## Global Locations

2018 exports were about 2,914,000 kL, mainly exports to Singapore, Philippines, Indonesia, South Korea, Australia, Malaysia, and Pakistan.

- CPC overseas branches and offices
- Overseas investees
- Overseas exploration / exploitation projects





## 1.2 Sustainable Management

Given the mission to maintain the steady supply and safety of petroleum products, sustainable development is a material topic to us. In consideration of the changes in the macro environment at home and abroad, we propose the following six policies for sustainable management.

### Sustainability Management Policies

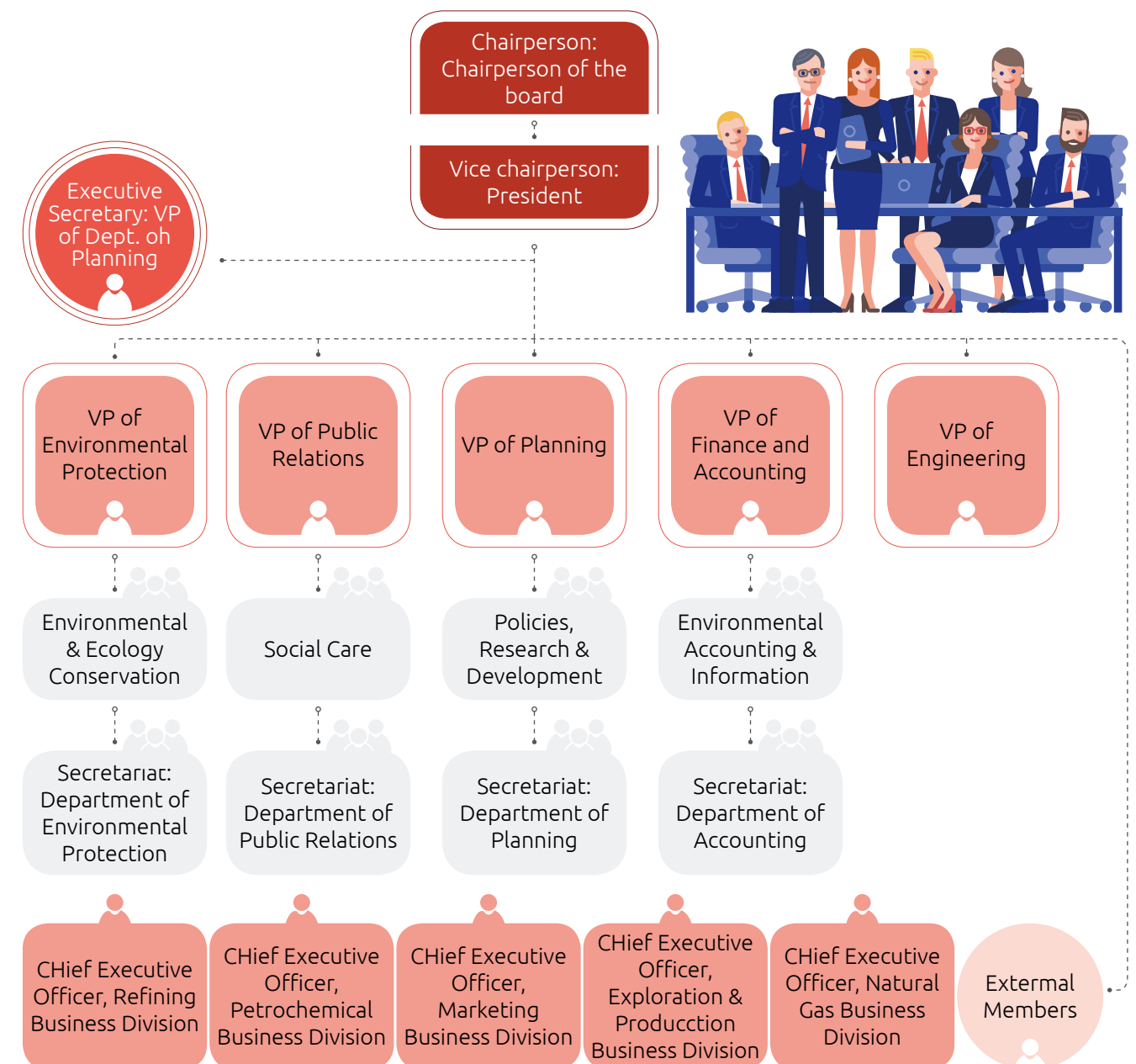
Significance of Sustainability to CPC and its Connection to the Overall Business Environment and CPC Operations

Follow government regulations and comply with international agreements	
Legal compliance is a basic requirement for all departments of CPC. We also proactively promote domestic and international conventions on environmental protection to broaden management horizons and adapt to the globalization trends in a timely manner.	CH2 Valuing Taiwan: A Responsible CPC CH6 Goodwill Taiwan: A Transparent CPC
Enforce clean production and environmental protection	
Optimize pollution prevention and make continual improvement with the environmental management system (EMS); implement waste reduction and source improvement; dispose of waste properly; analyze product lifecycles; and implement total clean production for ecological and environmental maintenance.	CH 4 Engraining Taiwan: A Nurturing CPC
Use resources effectively and efficiently, and demand water and energy saving	
Use resources efficiently and save water and energy effectively; maximize profit with the least cost; and reduce pollutant emissions (GHG reduction).	CH 4 Engraining Taiwan: A Nurturing CPC
Emphasize on social responsibility and expand service scope	
Fulfill corporate environmental responsibility and promote social and cultural improvement; expand the scope of service to meet the demand of business partners to create profit and enhance competitiveness together.	CH 3 Prospering Taiwan: An Innovative CPC CH 5 Embracing Taiwan: An Inclusive CPC
Establish environmental protection guides and disclose transparent information	
Establish environmental efficiency indicators, produce and publish statistics regularly, and enhance business transparency.	CH 4 Engraining Taiwan: A Nurturing CPC CH6 Goodwill Taiwan: A Transparent CPC
Strive for Research and Development and pioneering business areas	
Create opportunities for domain and new growth momentum cultivation through R&D and innovation in response to the rise of green energy, green materials, and green technologies.	CH 3 Prospering Taiwan: An Innovative CPC

### Sustainable Management Committee

Apart from establishing the Sustainable Management Committee in 2005, we divided sustainable management into four domains: "Environmental and Ecological Conservation", "Social Care", "Policy and R&D" and "Environmental Accounting and Information".

The Committee is chaired by the Chairman, with the president as the Vice Committee Chairperson, the VP. of Planning as the executive Secretary, and other VPs and the CEOs of the five business divisions as Committee Members. In 2008, we began to hire scholars and experts as Committee Members. The Committee held three meetings in 2018. Apart from making related proposals, it reports to the Board on a regular basis. The last report to Board was presented by the president at the 683rd Board Meeting.





1.3 Stakeholder Communication

Identification of Stakeholders

Stakeholders are concerned with our operations and services. Therefore, fulfilling their expectations, protecting their rights and interests, and keeping our commitments are our prime missions. Through the discussion of all unit directors, making 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: dependency, responsibility, tension, influence, and diverse perspectives, we identified nine stakeholder groups: shareholder (MOEA), the government,

legislators, employees, customers, partners, communities, non-profit organizations (NPOs) and non-governmental organizations (NGOs), and the media.

Stakeholder Communication

We have eight business divisions and hundreds of sales locations involving various topics. Therefore, we have arranged a range of communication channels for different stakeholder groups as shown below:



Stakeholders	Significance to Us	2018 Topic of Concern	Engagement	Communication Frequency	Our Response
Shareholder (MOEA)	We are a state-owned enterprises (SOE) wholly owned by the Ministry of Economic Affairs (MOEA). As the MOEA represents Taiwan, our integrity and sustainable management represent our commitment and mission for Taiwan	<ul style="list-style-type: none"> <li>Emergency Events Prevention and Handling</li> <li>Effluents and Waste Management</li> <li>Ethical Corporate Management and Legal Compliance</li> </ul>	1. CSR questionnaire 2. Annual General Meeting (AGM) of Shareholders and Provisional Meetings of Shareholders (currently acted on behalf by Board Meetings) 3. Public policy meetings 4. Exchange of official documents	1. CSR Questionnaire; Once a year 2. Board Meetings: At least 12 times a year 3. Other Meetings: At least 12 times a year	Apart from being rated AAA (tw) by Fitch Ratings for 13 consecutive years, we accept the Corporate Governance Evaluation organized by the State-owned Enterprise Commission, MOEA
Partners	Our partners include contractors and suppliers. Together we create value and stabilize the energy supply in Taiwan to build a sustainable value chain	<ul style="list-style-type: none"> <li>Emergency Events Prevention and Handling</li> <li>Ethical Corporate Management and Regulations</li> <li>R&amp;D and Innovation</li> </ul>	1. CSR questionnaire 2. Establishment of related management systems 3. Contractor meetings 4. Supplier meetings	1. CSR Questionnaire; Once a year 2. Other Meetings: At least 12 times a year (regular or irregular)	We constantly communicate with suppliers and contractors and request they comply with the related laws and regulations. We also offer training in the related professional skills for contractors to ensure construction safety
Legislators	We proactively communicate with legislators to understand the opinions and needs of the public, in order to fulfill their expectations while implementing targeted programs and projects	<ul style="list-style-type: none"> <li>Customer Rights and Interests and Product Safety</li> <li>Energy and Resources Consumption</li> <li>GHG Management</li> <li>Workplace Health and Safety</li> </ul>	1. CSR questionnaire 2. Targeted reports 3. Onsite inspection 4. Coordination meetings 5. Personal visits 6. Exchange of official documents 7. Various communication meetings	1. CSR Questionnaire; Once a year 2. Other Meetings: At least 12 times a year	We communicate various topics with legislators through various meetings, such as the Third LNG Terminal Project



Stakeholders	Significance to Us	2018 Topic of Concern	Engagement	Communication Frequency	Our Response
Communities	In addition to gas stations, we have 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>· Emergency Events Prevention and Handling</li> </ul>	<ol style="list-style-type: none"> <li>1. CSR questionnaire;</li> <li>2. Community public relations activities;</li> <li>3. Community communication meetings;</li> <li>4. Charitable events.</li> </ol>	<ol style="list-style-type: none"> <li>1. CSR Questionnaire: Once a year.</li> <li>2. Other Meetings: At least 12 times a year. (regular or irregular)</li> </ol>	Apart from managing GHGs, energy and resources, wastewater and effluents, and waste, we propose emissions reduction. In 2018, we amended our Waste Management SOP for better waste disposal to maintain community living quality.
NPOs/NGOs	Engagement with NPOs/NGOs enables us to understand opportunities for continual improvement. Therefore, we proactively exchange with related groups to achieve social inclusiveness.	<ul style="list-style-type: none"> <li>· Emergency Events Prevention and Handling</li> <li>· Climate Change Adaptation</li> <li>· Effluents and Waste Management</li> </ul>	<ol style="list-style-type: none"> <li>1. CSR questionnaire;</li> <li>2. Participation in external groups;</li> <li>3. Participation in seminars held by environmental protection groups;</li> <li>4. Invitation of environmental protection groups to organize seminars.</li> </ol>	<ol style="list-style-type: none"> <li>1. CSR Questionnaire: Once a year.</li> <li>2. Other Meetings: At least 12 times a year. (regular or irregular)</li> </ol>	We proactively communicated with different stakeholder groups and invited the public and related teams to participate in related meetings, such as the Third LNG Terminal EIA Project and conservation.
Customers	Customers have always been our major concern. 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>· R&amp;D and Innovation</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. Price, product, and service disclosures on the corporate website;</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: Once a year.</li> <li>3. Price, Product, and Service Disclosures on the Corporate Website: Subject to the nature of products and services.</li> <li>4. Customer Service Hotline: At least 100,000 calls a year.</li> <li>5. Various Types of Contact: At least 12 times a year.</li> </ol>	To understand customer needs and opinions, we constantly conduct satisfaction surveys for the reference of continual improvement. For example, after the quality defect incident of the unleaded gasoline #95, we proactively disclosed information to the public and made improvements.
Government	As an SOE, government policies are indispensable to our operations. Therefore, it is our duty to cooperate with government policies and promote economic development together with the government.	<ul style="list-style-type: none"> <li>· Emergency Events Prevention and Handling</li> <li>· GHG Management</li> <li>· Effluents and Waste Management</li> </ul>	<ol style="list-style-type: none"> <li>1. CSR questionnaire;</li> <li>2. Charitable events;</li> <li>3. Visits and sponsorship (donation);</li> <li>4. Participation in charitable events and infrastructure construction;</li> <li>5. Exchange of official documents;</li> <li>6. Various types of communication meetings.</li> </ol>	<ol style="list-style-type: none"> <li>1. CSR Questionnaire: Once a year.</li> <li>2. Other Meetings: At least 12 times a year.</li> </ol>	We proactively address public policies, such as energy transition. In addition to contributing NT\$132.3 billion to the government through taxes in 2018, we spare no effort to demonstrate our international influence to improve friendly interaction worldwide.



Stakeholders	Significance to Us	2018 Topic of Concern	Engagement	Communication Frequency	Our Response
Employees	Employees are an important asset to us. Therefore, we spare no effort to build a well-equipped and friendly workplace and introduce competitive workforce policies. By providing employees with all-round development, we guarantee their work and life.	<ul style="list-style-type: none"> <li>Workplace Health and Safety</li> <li>Emergency Events Prevention and Handling</li> <li>Employee Recruitment and Retention</li> </ul>	<ol style="list-style-type: none"> <li>CSR questionnaire</li> <li>CPC Employee Grievance Regulations</li> <li>BoD employee representatives</li> <li>Employee section on the corporate website and grievance hotline</li> <li>Labor-management meetings</li> <li>Chairperson and President emails</li> <li>CPC Monthly</li> </ol>	<ol style="list-style-type: none"> <li>CSR Questionnaire: Once a year</li> <li>Employee Grievances: As necessary</li> <li>Board Meetings: Once a month</li> <li>Other Meetings: At least 12 times a year (regular or irregular)</li> </ol>	To enhance employee competitiveness, we spent NT\$128 million in 2018 to organize 3,358 training courses. Apart from recognition from the Workforce Development Administration of the Ministry of Labor, we were awarded a silver medal as a training organization.
The Media	The media is our best partner for external communication. We maintain sound interaction with the media and provide them with information, hoping that they will disseminate our management philosophy and missions to the public.	<ul style="list-style-type: none"> <li>Effluents and Waste Management</li> <li>Ecological and Environmental Conservation</li> <li>Emergency Events Prevention and Handling</li> </ul>	<ol style="list-style-type: none"> <li>CSR questionnaire</li> <li>Concurrent response with press releases</li> <li>Press conferences</li> </ol>	<ol style="list-style-type: none"> <li>CSR Questionnaire: Once a year</li> <li>Other Meetings: At least 30 times a year (regular or irregular)</li> </ol>	We always communicate all events with the public proactively. In the face of unfavorable events, we still address and review them with “honesty and courage”. We maintain cooperation with the media, so that we timely disclose information, respond to, or give explanation regarding these events.

### Communication and Grievance Channels

#### Employee Grievances

Upholding ethics and integrity, we handle employee grievances concurrently and properly and give employees positive responses to maintain their legal rights and interests. We have also established the Employee Grievance Regulations. 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. We have 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. In 2018, two Committee Meetings were held. In addition, to protect gender equality in employment and prevent sexual harassment, we have established an independent Sexual Discrimination Grievance Mediation Committee.

#### Communication Channels for External Stakeholders

To maintain active communication, we make concurrent responses to comments outside of the organization through the media, corporate website, labor union, related meetings, and CPC Monthly.

1912 Customer Service Hotline

Supervisor's Mailbox

Service Mailbox (sales responsible units, Chairperson, President, and government ethics unit)

In 2018, we received a total of 240,243 cases, including 235,658 customer enquiries, 2,552 customer suggestions, 1,079 customer comments, 171 customer complaints, and 783 other cases (including affirmation and recognition). The Customer Service Center and Customer Service Office resolved 96.5% of these cases, and 3.5% (8,422 cases) were referred to related responsible units to reply to customers. It takes 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 2018, there were 62 overdue cases, with an overdue rate of 0.03%. All 171 consumer disputes (customer complaints) were resolved in time.

Labor-management Meeting

We hold a labor-management meeting at least once quarterly. In 2018, we held 24 labor-meetings across the company and at the headquarters, hoping to maintain sound interaction with employees, in order to achieve labor-management harmony. The minutes of each labor-management meeting are disclosed on the corporate website. Proposals discussed at labor-management meetings in 2018 are categorized as follows:

- 1 Coordination of labor-management relations and promotion of labor-management cooperation.
- 2 Labor conditions.
- 3 Work environment.
- 4 Others.

Daily Public Opinion Analysis and Response

For the Chairperson, President, Spokesperson, and Vice Presidents to effectively acknowledge and efficiently capture on the daily the media reports regarding the Company every day we hold the public opinion meeting at 08:30 every day for the Department of Public Relations (DPR) to report the summary of related reports on the media and social media to these roles, in order to take the following actions:

Immediate a Response	1. Immediate responses should be made to reports with significant mistakes or media reports that may confuse the pubic and lead to criticism or arguments that are urgent to the daily life of the public, in order to prevent a negative effect on the Company’s market presence. 2. Immediate responses should also be made to newspaper reports on important issues that may lead to exclusive reports that catch public attention, media reporters’ enquiries of directors or the Spokesperson, and legislators’ interpellation or press conferences.
Data Collection for Responses	1. Data should be collected as preparation for the responses to public opinions that do not require immediate responses but may develop into a media issue. 2. Data should be collected for the sand table of issues with unclear situations.

Based on the method of response, an emergency meeting should be held with the Chief of the responsible unit to discuss and prepare the response materials and determine the rationale of and the method of response to an issue. These materials will include the press release and the explanation presented by the Spokesperson and at the press conferences. Others will include contacting the case reporter to clarify or explain the issue, even inviting reporters for an onsite interview. For media reports in relation to the Company or events that bewilder the public, we make immediate responses through the press and over our corporate website to address the issue or explain our position based on the principles of honesty and voluntary improvement, in order to prevent an issue from further development and thereby minimize the resulting damage.

1.4 Material Topics of Sustainability in 2018



Gathering of Sustainability Topics

After identifying nine stakeholder groups as mentioned above, it is necessary for us to seek comprehensively and define topics in relation of the environment, economics, society, and governance, in order to understand the aspects that concern stakeholder groups and analyze the opportunities and challenges underlying our sustainable management. To focus on the sustainability topics gathered more accurately, we have reviewed the “sustainability topics” of the last year, integrated various aspects, analyzed their implications and definitions, made reference to the international trends of the petrochemical industry, and eventually concluded 18 sustainability topics after adjustments. Adjustments are made as follows:



2018 Sustainability Topics	2017 Themes	Adjustment
Sustainable Governance		
Economic Performance	Procurement Practices	As procurement practices are merely an aspect of the economic/financial category, we have expanded the scope of procurement practices
	Market Position	As governance may include internal management and external market value and status in the business, we have thus expanded the scope of market presence
Corporate Governance	Anti-corruption, anti-competitive behavior, environmental compliance, social compliance, and economic compliance.	The legal compliance of different categories has been combined into one topic
Ethical Management and Legal Compliance		
Indirect Economic Impact	Indirect Economic Impact	Unadjusted
R&D and Innovation	-	This topic has been added in consideration of the industrial trends and our technology investment and development
Environmental Education		
Energy Consumption	Materials and Energy	Materials and energy have been combined into one topic
Water Resources Management	Water	Topic title adjustment
GHG Management	Emissions	Topic title adjustment
Effluents and Waste Management	Effluents and Waste	Topic title adjustment
Ecological and Environmental Education	Biodiversity	“Environmental Education” has been chosen as the title for a broader coverage
Climate Change Response	Fossil Fuel Substitution	Title adjustment in consideration of industrial and global trends
Culture and Society		
Employee Recruitment and Retention	Labor-Management Relations, Training, and Education	Combined employee recruitment and training
Employee Benefits, Diversity, and Equality	Labor-management Relations, Diversity and Equal Opportunity, Non-discrimination, Freedom of Association and Collective Bargaining, Child Labor, Security Practices, Rights of Indigenous Peoples, Human Rights	Combined topics in relation to employee rights and interests
Workplace Health and Safety	Occupational Health and Safety and Forced/ Compulsory Labor	Combined workplace safety and employee health topics
Customer Rights and Product Safety	Customer Health and Safety, Marketing and Labeling, Customer Privacy	Combined topics in relation to products and services
Social Inclusiveness	Local Communities	Topic title adjustment

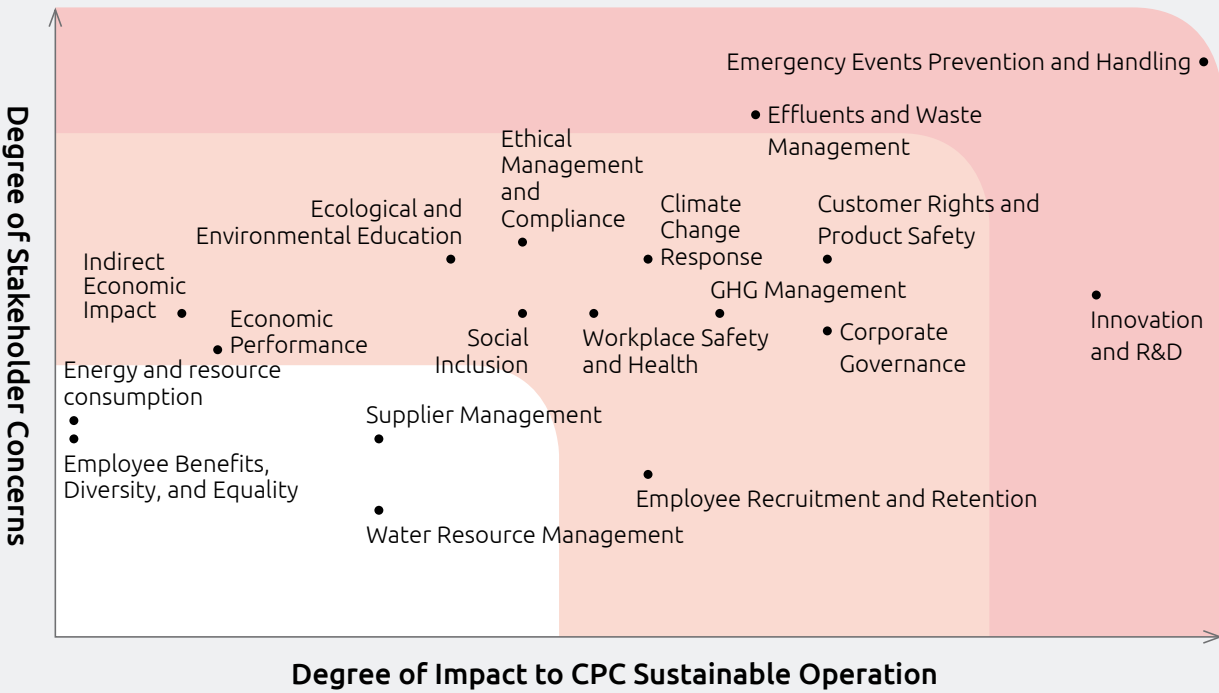
2018 Sustainability Topics	2017 Themes	Adjustment
Integrated		
Supplier Management	Supplier Social Assessment, Supplier Environmental Assessment	Combined supplier environmental and social assessments
Emergency Events Prevention and Handling	Emergency Events Prevention, Involuntary Placement, Asset Integrity, and Safety Drills	Combined topics in relation to emergency event handling

Note: As an SOE under government direction and legislature supervision, the public policy is our highest guiding principle. Therefore, we removed the “public policy” topic in 2017 from the process of material topic identification.

### Prioritization of Sustainability Topics

To identify the materiality of sustainability topics, we have prioritized them in two constructs: “impact on CPC’s sustainable management” and “stakeholder concern”. We measured these two constructs by means of a questionnaire, with each topic scored from one to five points. 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.

The score of the impact on CPC’s sustainable management is the average score of all valid responses of department chiefs. The stakeholder concern is measured in different stakeholder groups with the questionnaire. In the 2018 questionnaire, all 31 responses from department chiefs were valid. Of the 620 questionnaires distributed to stakeholders, 545 responses were valid. The number of responses in both constructs is higher than that of 2017. In particular, the valid responses from stakeholders increased by 25%, suggesting that the Sustainability Report concerns stakeholders more and more every year.



### Determination, Review, and Validation of Material Topics in 2018

After careful identification, material topics in 2018 centralized on the right upper part of the matrix, suggesting that these topics concerned stakeholders more and have greater impact on our

sustainable management. Prioritization and Boundaries of Material Topics.

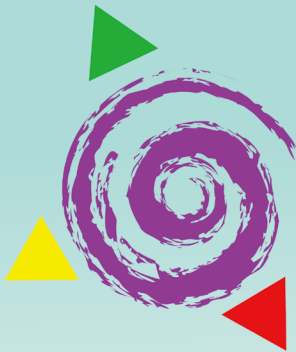
Aspect	Material Topics	Within Organization	Outside Organization	Corresponding		
				Sections	GRI Specific Topics	page
Integrated	Emergency Events Prevention and Handling	CPC	NPOs/NGOs, the Media, Customers	2.2 Response to Significant Events	-	61
				2.3 Risk Management		68
Governance	R&D and Innovation	CPC	Partners, Customers	3.1 Green R&D	-	74



Aspect	Material Topics	Within Organization	Outside Organization	Corresponding		
				Sections	GRI Specific Topics	page
Environmental	Effluents and Waste Management	CPC	Shareholder, the Government, Communities, NPOs/NGOs, the Media	4.4 Wastewater Treatment and Waste management	GRI 306	110
Social	Customer Rights and Product Safety	CPC	Communities, Partners, Customers, the Media, and Legislators	2.2 Response to Significant Events 3.3 Products and Customers	GRI 416 GRI 418	61 84
Governance	Corporate Goverance	CPC	Shareholder, the Government, Legislators, Employees, Customers, Partners, Communities	1.3 Stakeholder Communication 6.1 Governance	-	26 146
Environmental	Climate Change Response	CPC	The Government, Communities, NPOs/NGOs	4.3 Risk and Opportunities From Climate Change	-	106
Environmental	GHG Management	CPC	Shareholder, the Government, Legislators, NPOs/NGOs, the Media	4.1 GHG Management 4.5 Pollution Prevention	GRI 305	98 114
Governance	Ethical Management and Legal Compliance	CPC	Shareholder, the Government, Legislators, the Media, Partners, Customers	6.2 Ethical Management and Legal Compliance	GRI 205 GRI 307 GRI 419	150
Social	Workplace Health and Safety	CPC	The Government, Employees, Legislators, Customers	5.3 Human Resources 5.5 Workplace Safety	GRI 403	130 136
Environmental	Ecological and Environmental Education	CPC	The Government, Legislators, Communities, NPOs/NGOs, the Media	Special Column 1.2: Green CPC- Ecological Conservation 2.2 Response to Significant Events 3.2 Circular Economy	GRI 304	48 61 81
Social	Social Inclusion	CPC	Legislators, Communities	Special Column 1.1: CPC-The Green Dragon Creativity Camp 3.3 Products and Customers 5.1 Social Welfare	-	43 84 125

Note: See Appendix 1 GRI Standards Content Index for details of corresponding indicators.

Prioritization	Material Topics	Significance to Us
1	Emergency Events Prevention and Handling	Topics critical to social stability and critical to emergency address are most important to us.
2	R&D and Innovation	We proactively develop green energy, green materials, and green technologies toward sustainability management and transformation.
3	Effluents and Waste Management	Contributing to the Earth and reducing waste are our responsibilities.
4	Customer Rights and Product Safety	We create quality and stable products and services to benefit nationwide consumers.
5	Corporate Governance	Open and transparent management and steady growth are the obligations of SOE.
6	Climate Change Response	We spare no effort to adapt to impacts from climate change and mitigate global warming.
7	GHG Management	We enhance energy efficiency and reduce energy consumption to aim for carbon reduction.
8	Ethical Management and Legal Compliance	Ethical management is the only way to win public trust and pursue sustainable management.
9	Workplace Health and Safety	Care for employees and their health is what ensures riskless operations.
10	Ecological and Environmental Education	Economic development and environmental protection are bonded to each other. Co-existence with ecosystems is what enables sustainable management. We are committed to nature maintenance and environment education.
11	Social Inclusion	We take from society and must repay society. Therefore, we contribute to local communities and society.

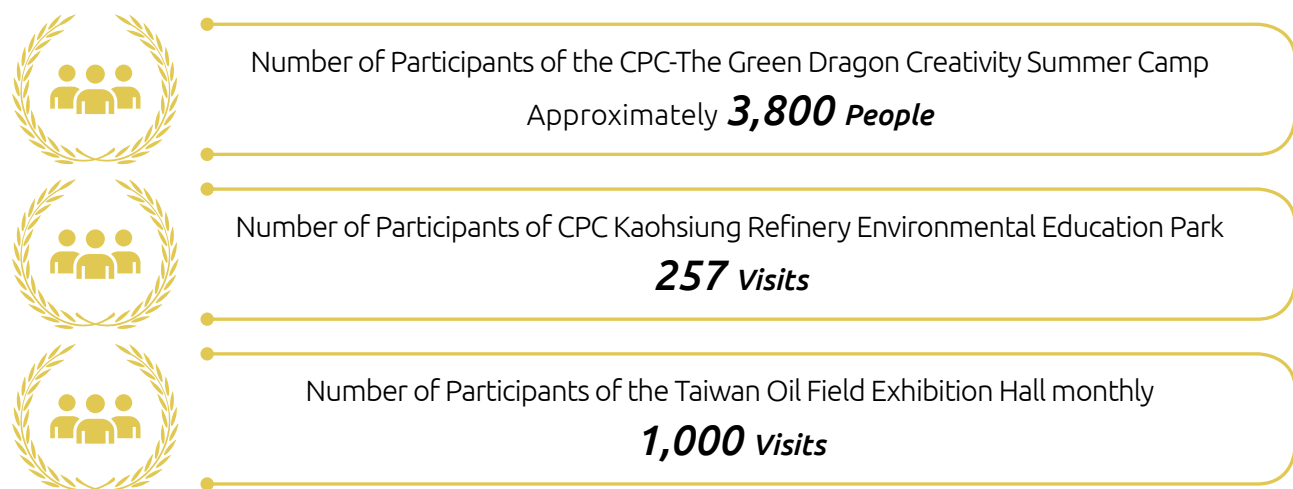


# Special Column 1: Ecological and environmental conservation

SDGs







# Management Approach

## Policy Commitment

- Adhering to green co-existence, we spare no effort to maintain and implement ecological conservation and environmental education, 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.
- Long-term ➡
- Promote Environmental Education: Maintain intertidal habitats and promote ecological conservation and education in collaboration with local governments; establish environmental education parks, such as the Guantang Industrial Park (Port) and Baiyu Coast.
  - Achieve a sustainable environment and ecology through ecological conservation in collaboration with local communities.

## Specific Actions

- We began organizing the “Green Dragon Creativity Summer Camp” on an annual basis in 2013. To date, we have trained 1,100 instructors and served over 20,000 elementary school students.
- We have established the “CPC Kaohsiung Refinery Environmental Education Park”, with three employees passing the environmental education personnel qualification. We also constantly invest in park maintenance. The “Taiwan Oil Field Exhibition Hall” constantly organizes environmental education activities to revitalize Chuhuankeng.
- We have established the “Guantang Industrial Park (Port) Ecological Conservation Committee” to plan local ecological conservation. The Committee also performs full range big data monitoring and plans improvement measures. Apart from gathering and analyzing EIA monitoring data, the Committee has set up a website for public access and interaction.

## 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.

Adhering to green co-existence, apart from maintaining ecological conservation and environmental beautification around complexes, we hope to disseminate to the public the spirit of environmental education, energy sustainability, and ecological sustainability to ensure the sustainable development of society, nature, and business.

## Environmental Education From Childhood

To start sustainability education with “humankind”, we publish CPC Monthly. Internally, we also publish a range of keynote articles to communicate our core values. We organize the Green Dragon Creativity Summer Camp to provide youth with guidance for lesson planning and equip children with knowledge in relation to energy and the environment. We also simulate their ideas to resolve future problems.

Inside the CPC Building, we have established the CPC Petroleum Discovery Museum to introduce to the public knowledge of petroleum and daily life. Due to the rapid changes and quick technology advancements in recent years, we remodeled the museum in 2018, and it was re-opened in May 2019. To constantly disseminate our achievements and share with others our experience in environmental protection, we opened the “CPC Kaohsiung Refinery Environmental Education Park” in June 2018, hoping to enforce environmental sustainability education to children, the youth, and the public, in order to do good for society and contribute to the Earth.

# Special Column 1.1: CPC-The Green Dragon Creativity Summer Camp

## About Green Dragon Creativity Summer Camp

As the leader of Taiwan’s energy industry and petrochemical industry, we spare no effort to constantly promote the development of Taiwan’s fundamental industries and economy. We understand that the growth and prosperity of an enterprise are the results of the concerted efforts and support of social groups. Therefore, aside from constantly developing the core business, we spare no effort to contribute to local communities and fulfil our corporate social responsibilities. Building an energy education camp has thus been our focus over the past few years. In 2013, we began 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.

Based on the four pillars of “environmental education”, “care for the vulnerable”, “youth empowerment”, and “creative learning”, the “Green Dragon Creativity Summer Camp” enables children to enjoy themselves at the summer camp and accumulate and share their experience. This is a very brave attempt. At the “Green Dragon Creativity Summer Camp”, we have pioneered the instructor training system. By recruiting and training college and university youth across Taiwan, we have trained over 1,100 youth instructors to guide over 20,000 elementary school students to experience the summer camp activities.

In the process, we see the enthusiasm and spirit of how youth combine self-oriented learning with social service. We also see how old and young children develop dependency and affection in the camp. In fact, they are gifts to one another in life. The smile of little children is the gift for instructors, while the contribution of instructors is the gift for us. By participating in and promoting the camp, young children, college and university youth, ourselves, local communities, schools, and even parents are given more opportunities to reach an understanding and bond more closely together emotionally. This is the spirit of common good.

#### Four Core Values

##### Energy education for children with core competence

By blending petrochemical, science, and environmental protection knowledge to camp activities, we take children to our business offices and refineries for them to understand the production process of petroleum and the correlation between petrochemical products and the daily life, in order to implement energy education and develop the correct energy conservation concepts in children with our core competence.



#### Sustainable Education Value Chain



#### 2018 Green Dragon Creativity Summer Camp

The 2018 summer camp began on the first week of the summer break. It started with the “five-day and four-night” youth instructor training. We recruited 195 college and university students and trained them in two sessions. From learning the knowledge of the summer camp courses, building team understanding, drilling interaction with students, and handling unexpected situations, trained instructors help them develop various abilities progressively before they are able to accompany elementary school students to enjoy a summer camp across Taiwan. Every day of these five-day training camps challenged the extremes of the enthusiastic youth. To give students a solid, safe, and joyful summer camp, many instructors continued drilling and could not get enough sleep.

From 8 am to 8 pm every day, college and university students turned from total strangers to friends. In the training courses, they learned about energy and petrochemical products. Through group recreation and understanding, they built teamwork. Many instructors were first-time trainees. Although some were expectant and worried at the same time, and others were passionate and creative, they did the same thing in the emotional hour on the last evening: cheering up one another with tears and laughter at the same time. They also felt sad about this transient encounter in a gorgeous summer.



Documentary of the 2018 Green Dragon



*“Everyone has their own leadership style. We discussed and exchanged opinions. We finally trusted one another and overcame every challenge together.” At the end of the camp, an instructor said in the sharing session, “As I review the ‘hope’ in the form I filled in at the arrival, apart from knowing more partners and friends, I adjusted my role in the team, examined myself, explored myself, and made self-progress. Although the training was quite tough and courses were tightly arranged, I learned a lot from them. Everything is worth it, and I’m glad to be there.”*



The professional training and group activities made the camp activities more edutaining. In the training and while leading students, many youth instructors explored themselves and developed self-value at the same time. We believe that this will be a big help for them to face future challenges.



The Green Dragon Summer Camp 2018 includes two categories: neighboring teams and overnight teams. According to the daytime statistics, up to 3,800 students joined the camp. Information of the 2018 Green Dragon Summer Camp:

Team	2018 Event Time	Number of Participants	Description
Neighboring Team	Session I: Jul 23-26 Session II: Jul 30-Aug 2	A total of 3,560 grade 4-6 elementary school students from neighboring areas.	The Neighboring Team activity was held from Monday to Thursday (without staying overnight) by partner schools in different areas.
Overnight Team	Session III: Aug 6-9 Session IV: Aug 13-16	Grade 4-6 vulnerable elementary school students from remote areas. 60 students/session, totaling 240 students.	The Overnight Team activity was held from Monday to Thursday by the training facilities of the CPC Department of Human Resources.

“Playing happily and learning happily” is the main aim of about 3,800 elementary school students across Taiwan participating in the summer camp. In the company of 195 intensively trained college and university students, they enjoyed four creative days and learned super-valuable knowledge. Apart from learning environmental education topics in relation to petroleum and green energy, they made blue bottles, hand warmers, hydrogen guns, and waste material robots; and participated in reflection and discussion activities like media literacy and emotional education. These educative and maker-spirit activities successfully caught the attention of students and brought them a different summer camp experience. For example, in the waste material robot contest, students attempted to balance the robot and dash forward through trial and error. Although arguments were inevitable in the process, when the robot reached the finish line successfully, the screams, ecstasy, the hugs, and the sense of achievement revealed from the eyes of students were priceless.



*“Children like hands-on lab courses. However, they became very excited and agitated when they wanted to see the results sooner,” said an instructor. When children are excited, agitated, and a bit wilder, maintaining “safe learning” will be one of the most important principles of the course. I thought making robots was difficult. To my surprise, they were more creative and learned faster than I thought!” Although youth instructors came from different areas of specialization, backgrounds, and disciplines, their love for children and enthusiasm were fully fed back to themselves. “He who teaches, learns”, and all courses...all courses were filled with creativity and passion.*

*“Patience is what I acquired most, then teamwork.”  
 “To me, CPC merely meant gas stations. Now, I have found out more interesting things about it.”  
 “I also want to be an on-duty officer. It’s cool.”  
 “I will surely come again next year!”*

From the ice-breaking activity, activity guidance, to course collaboration, apart from being the instructors of students in the four-day camp, instructors were also their best company. On the last day of the camp, their reluctance to leave was reflected in their actions. Before the camp ended, students wrote down their sentimental quotes: “Thank you for teaching me the truth of “who dares win”, “hope to see you next year”, “I want to be a fan of you”, etc. Some took pictures with one another, some burst into tears, leaving the beautiful, unforgettable memories with one another. This picture of large hands and small hands together is indubitably the most unique and most touching scene of the Green Dragon Creativity Summer Camp.



The four main themes: “creativity and imagination”, “green energy”, “care for the vulnerable”, and “media literacy” of the 2018 Green Dragon Creativity Summer Camp are explained as follows:

By enabling children to understand the role of the media in information absorption and accumulation, we aim to equip children with the ability to interpret and analyze the media.

By blending the green energy theme with a summer camp, we aim to allow children to acquire knowledge in relation to energy, realize problems in relation to the environment, and equip them with the ability to figure our possible solutions.

media literacy

green energy

Green Dragon Creativity Summer Camp

creativity and imagination

care for the vulnerable

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 creativity and imagination building courses.

By encouraging children to care for communities in real action, we aim to inspire them to find solutions to end poverty as future pillars of society.



## Special Column 1.2: Green CPC-Ecological Conservation

### CPC Kaohsiung Refinery Environmental Education Park

After shutting down the Kaohsiung Refinery, we planned to remediate and deregulate the contaminated areas with soil and water conservation and remediation technologies. During remediation, we applied for establishment of an environmental education facility on the site, hoping to enhance its function through transformation and revitalization. We got the EPA's environmental education facility certification in January 2018 and started park operations in June 2018. Through this park, we hope to share the achievements in soil restoration with the public, and enhance communication with local residents, so that the park can become one of our platforms for external communication.



CPC Kaohsiung Refinery  
Environmental Education Park  
Introduction and Visit Registration

#### A 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.



#### B 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.



#### C Never-Ending

Introduce the interrelationship between the petrochemical industry and daily life and the influence of fossil fuel on climate change. Then, visit the refinery museum to see the refinery and petrochemical relics.



The park is the only one oil refinery in Taiwan which gets environmental education facility certification. Based on courses covering the history of economic development and environmental protection movement, the ecosystem of Mt. Banping in the park, and the correlation between the petrochemical industry and our daily life, the park has designed three adult lesson plans. In 2018, the park offered nine environmental education courses with 257 participants. In the future, we will develop more lesson plans for all ages especially for children in order to make more correct environmental protection concepts be engrained. Let the park become a model of environmental sustainability by enterprises.

Our future of curriculum planning for children:

1. Develop lesson plans for elementary school students based on existing lesson plans.
2. Co-develop lesson plans with elementary and junior high schools near the park.



Overlooking the Kaohsiung Refinery

Cracker in Kaohsiung Refinery



## Taiwan Oil Field Exhibition Hall

Chuhuangkeng oil field in Miaoli County has the one of world's oldest oil well which still in production. The special geological landscapes, historical Japanese style buildings, and Hakka culture all are Taiwan's unique and valuable assets. CPC Corporation, Taiwan hopes to spread the contribution of Chuhuangkeng to the development of Taiwan and local areas, and changes the local environment with residents, for further recognizing the significance of Chuhuangkeng. CPC has revitalized the oil field as a Hall and Park to display and show how CPC reduces environmental and social impacts in the exploration and production process. The certification courses include "Oil Treasure Hunt", "Where's Oil and Gas", "Exploration



Taiwan Oil Fields  
Exhibition Hall Tour  
Registration

and Production of Oil and Gas", "Story of Chuhuangkeng Oil Field", and "The Past and Present of Chuhuangkeng" to provide quality environmental education field for the public and revitalize "Chuhuangkeng Oil Field".

In 2018, monthly average about 1,000 people visited the Taiwan Oil Field Exhibition Hall (Cooperating with the central and local government on "cultural value-added, industrial reproduction" to build the Exhibition Hall and Cultural Park. After renovation from September 1, 2018, the Hall reopened on June 15, 2019. A complete record of Taiwan's oil and gas exploration history and evolution with interactive practices induce visitors to understand that energy acquisition is not easy, leading visitors to cognize energy saving both with appreciate the preservation significance of relics and assimilate into the different environmental education learning and experience.





## Guantang Industrial Park (Port) Ecological Conservation

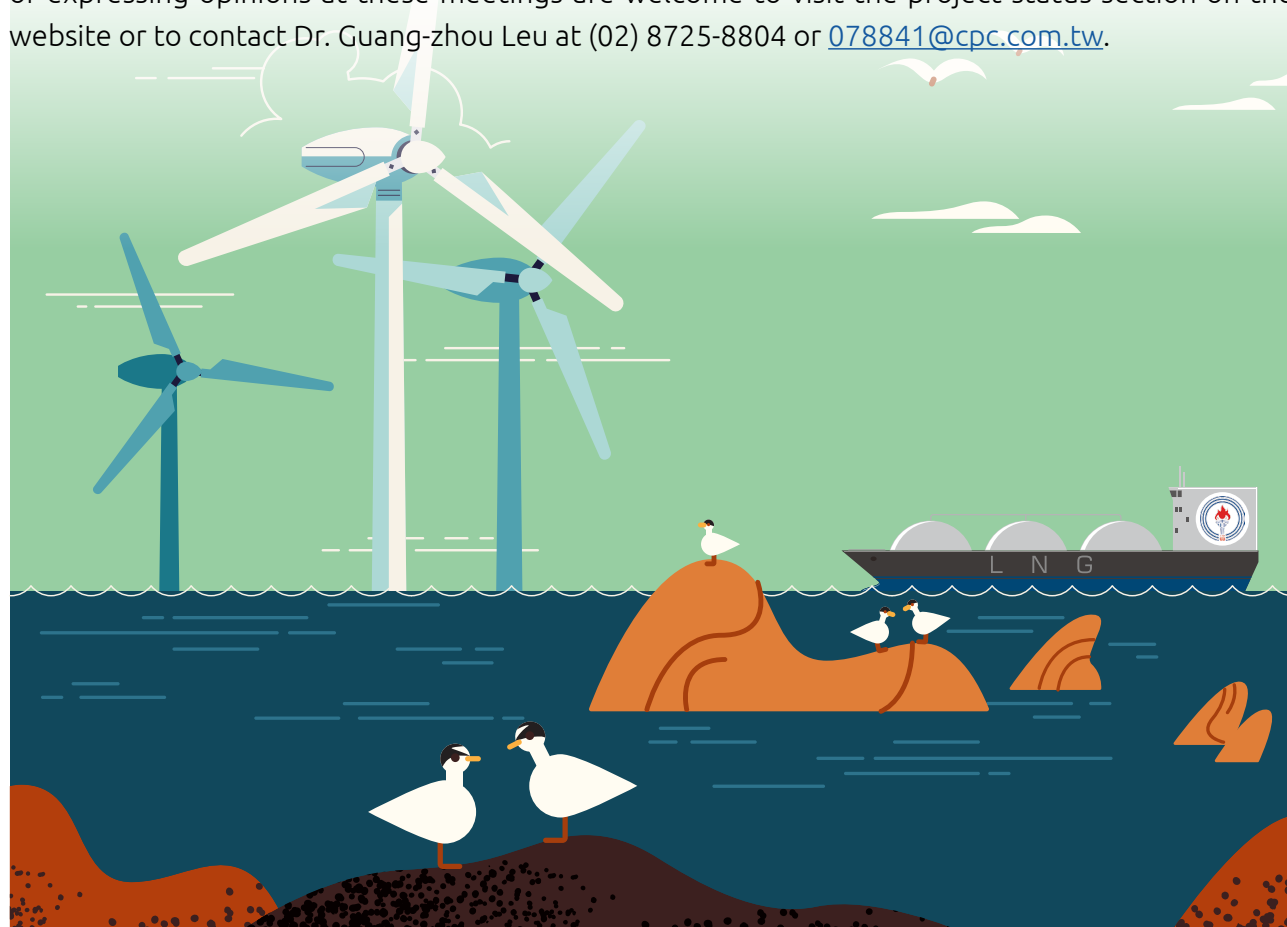
To further optimize ecological conservation and encourage community participation of the Third LNG Terminal, we formed the "Guantang Industrial Park (Port) Ecological Conservation Committee" (please refer to Section 2.2 for information regarding Committee status) in November, 2018 with experts and scholars, private groups, and competent authorities. Its mission is to verify the planning of ecological conservation measures and supervise and evaluate their implementation and achievements, and recommend improvement strategies. Apart from constantly monitoring local fauna and flora, such as macroalgae, zoobenthos, gastropods, fish, and birds, we proposed relevant maintenance strategies and actions, hoping to achieve marine ecological conservation and community sustainable development.

Investigations and data have shown that the little tern (*Sternula albifrons*), a protected species, is found in Guantang Industrial Park. Therefore, we commissioned the Chinese Wild Bird Federation (CWBF) to plan and design a little tern habitat building. After a number of onsite inspections, CWBF focused on the reproduction habitats for the little tern. It also hopes that these habitats can become elements for environmental education and guided tours. Currently, the dredging site north of the Zhuwei Fishing Harbor has been selected for the project, which has been completed by April 2019.

We will hold meetings to review the project status from time to time. Those interested in hearing or expressing opinions at these meetings are welcome to visit the project status section on the website or to contact Dr. Guang-zhou Leu at (02) 8725-8804 or [078841@cpc.com.tw](mailto:078841@cpc.com.tw).



"Guantang Industrial Park (Port) Ecological Conservation Committee" Status Section



# CH2 Valuing Taiwan: A Responsible CPC

## Chapter Summary

Undertaking a stable oil and gas supply in Taiwan, we optimize natural gas infrastructure, including terminal and pipeline construction at full stretch in response to the 2025 electricity portfolio announced by the government, in order to ensure a stable natural gas supply. To clear the doubts in the public, the process and solution of the three major incidents (Third LNG Terminal EIA, quality defect of the unleaded gasoline #95, and oil leakage of Huxi and Green Island) are as follows.

## SDGs



## Reader Priorities

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





## Management Approach

### Policy 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.
- 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; 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 ( responsibility and resources )

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 education and organization learning activities for risk management, assessments, and professional technologies on a regular basis.
3. Establish the “Emergency Response Team Operating Regulations” and emergency response plans.
4. Annual onsite audits by the Audit Office.

### Measurement Mechanisms

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

## 2.1 Response to National Policies

### 2.1.1 Energy Portfolio Transition : Stabilizing Oil and Gas Supply

It has been 73 years since CPC was established. Over the decades we have supported national policies to stabilize the oil and gas supply. Apart from actively decentralizing the sources of oil and gas import to secure Taiwan's energy supply, we help the government to stabilize the consumer commodity price and set up gas stations in remote areas and offshore islands regardless of losses, in order to supply the public with reliable and affordable oil and gas.

Given the escalation of extreme weather events and climate disasters across the globe, and the ongoing increase in the scale and frequency of resultant disasters, governments are aggressively implementing various energy policies to mitigate climate change and reduce GHG emissions. As natural gas is composed primarily of methane (CH<sub>4</sub>), one carbon bonded alkane, less air pollutants such as SO<sub>x</sub> and TSP will be produced after burning. Compared to coal, natural gas has a higher burning efficiency and heating value and produces less CO<sub>2</sub> than coal in burning, making it an important form of energy to reduce vigorous climate change. Therefore, natural gas has been pinned hopes against climate change. To reduce GHG emissions, the government promotes energy transition by increasing natural gas use with a new electricity portfolio to boost gas power generation to 50%, reduce coal fire power generation to 30%, and raise renewable energy power generation to 20%.

As an island country, Taiwan depends highly on energy imports due to low energy self-sufficiency, as witnessed by natural gas imports accounting for 98%. As Taiwan's leading natural gas importer and supplier, we undertake stabilizing the natural gas supply. To ensure the security and safety of the fuel supply for daily life and power generation, apart from improving our natural gas facilities and enhancing pipeline transportation capacity, we diversify natural gas sources.



Currently, we have two natural gas terminals, one in Yongan, Kaohsiung, and one in Taichung Port. After comprehensive consideration of the storage tank capacity, number of wharfs, gasification capacity, pipeline transportation capacity, and marine climate, the operating capacity of these two terminals is 11 million tons/year at Yongan and 5.5 million tons/year at Taichung Port, totaling 16.5 million tons/year. To ensure a stable market supply through flexible dispatch, we plan to establish a complete transportation and distribution network between Pingtung and Keelung in western Taiwan, with an onshore trunk line of 2,165 km assigned to eight gas supply centers and 47 gas distribution stations. A ring network is the target of transportation pipeline planning. The total length of the onshore trunk line between Yongan and Taoyuan is about 500 km. Along with the 36-inch offshore pipeline totaling 237.7 km long between Yongan and Tongxiao, the transportation ring of central and southern Taiwan is formed. In addition, after the 36-inch offshore pipeline totaling 135 km between Taichung and Datan joins operations, another transportation ring is formed in central and northern Taiwan. The ring network for natural gas transportation in western Taiwan will then be completed to enhance gas supply stability.

However, to increase natural gas use to keep pace with the international trend and government policy, it is necessary to build another natural gas terminal in addition to the Yongan and Taichung terminals, whose operability or pipeline transportation capacity have reached their caps, to fulfill the new natural gas demands in northern Taiwan. In addition to a CPC investment project, the Third LNG Terminal Project is one of the keys to the success of Taiwan's energy transition and the key to a stable natural gas supply. In the construction process, we will maintain constant communication with all parts of society to accelerate project construction. Please refer to Section 2.2 for details regarding the Third LNG Terminal Project.

**Basic Data of CPC Natural Gas Terminals**

Item	Yongan Plant	Taichung Plant	Total
Storage Tank (10,000kL)	69 (10*3+13*3)	48 (16*3)	117
Number of Unloading Berth	2	1	3
Gasification Facility (tons/hour)	2,220	1,200	3,420
Planned Operation Capacity (10,000tons/year)	750	450	1,200
Maximum Operation Capacity (10,000tons/year)	1,100	550	1,650

\*data until the end of 2018

In addition, based on the growth of natural gas demand estimated by the government, we found the need to constantly raise the supply capacity and optimize infrastructure. Therefore, we are actively planning and promoting the expansion and new construction of Natural Gas infrastructure, in order to strengthen infrastructure and optimize the transportation network to cope with the need of the overall growth and ensure the safe and stable supply of natural gas in the future, and to meet the amendment to increase the storage tank capacity and security stockpiles of the Natural Gas Enterprise Act.

- 1 36-inch Onshore Transportation Pipeline Between the Taichung Plant and Tongxiao Station: Disperse the risk of single output from the Taichung Plant and reduce the risk of gas transportation to northern Taiwan from the Yongan Plant in southern Taiwan.
- 2 Taichung Plant Expansion Project Phase II (including a second berth): Build three storage tanks and one berth.
- 3 Taichung Plant Expansion Project Phase III: Build two storage tanks, one gasification facility, and one sea water system.
- 4 Third LNG Terminal Project: Supply natural gas to the combined cycle generation sets of the Datan Plant of Taiwan Power Company
- 5 Yongan Plant Tank Expansion Project: Three underground storage tanks will be completed.
- 6 Taichung Plant Outer Terminal Expansion Project: Build two berths, three storage tanks, and gasification facilities.

In the future, LNG terminals in southern, central, and northern Taiwan will supply gas regionally to reduce the cost and risk of gas transportation. In addition, with the inter-transportation and redundancy of gas over the existing onshore and offshore pipelines, we can enhance the safety and stability of gas supply and synergize the overall gas transmission network.

Although the Industrial Development Bureau (IDB) has promoted the "natural gas for boilers" policy, as it is difficult to build pipelines in some industrial zones, natural gas supply is unavailable in some areas without pipelines. To increase natural gas use, in consideration of end-users in areas without pipelines, and with reference to the experience of LNG operations overseas, we planned the "Taichung Plant LNG Filling Facility Construction Project". After project completion, users can transport LNG to satellite LNG stations with tankers to unload and gasify LNG before supplying it to local civilian users and industrial users through local networks.

In LNG procurement planning, we make frequent contact and cooperate with global natural gas suppliers to ensure a stable natural gas supply. Our import sources cover the Middle East, Southeast Asia, Australia, Russia, North America, Africa, and Europe, and we have 37 valid master agreements, so that we can purchase LNG in a short time to support emergency demand increase. By the end of 2018, we have purchased LNG from up to 16 countries (only 19 countries in the world export LNG) across the world to decentralize procurement sources, in order to reduce the risk of supply disruption. In 2018, we signed a supply purchase agreement (SPA) with Cheniere, the largest US LNG exporter, to supply us with 2 million tons of LNG a year for a term of 25 years as of 2021.



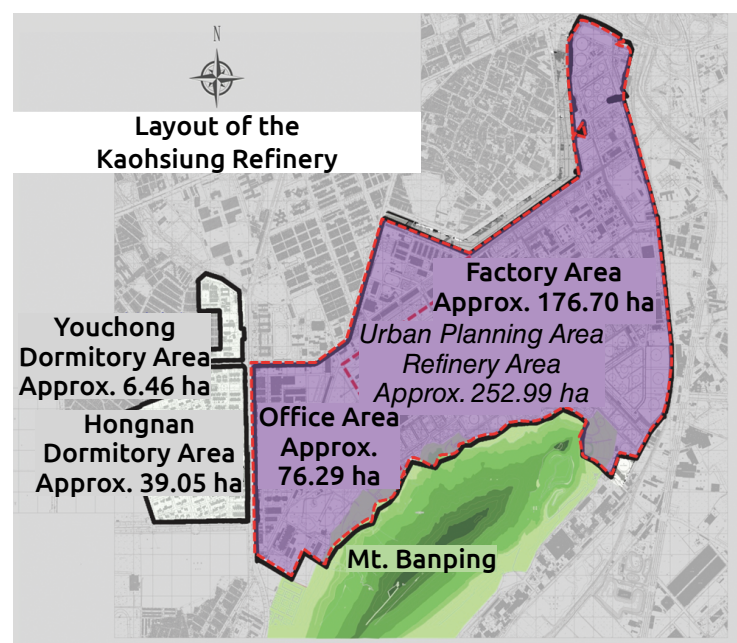
In terms of national energy policy, Taiwan is developing towards a low-carbon energy and low carbon society. As LNG meets the low-carbon and clean energy requirements, it will play a decisive role in our sustainable energy policy. As Taiwan's leading oil and gas supplier, it is our responsibility to cooperate with the government's new energy policy to plan the natural gas storage facility expansion project, keep constant track of natural gas, and diversify natural gas use, in order to ensure a steady natural gas supply in Taiwan, stabilize the power supply, and significantly reduce carbon emissions for the sustainable development of Taiwan.

## 2.1.2 Revitalization and Management of Land Property

Currently, we have land across Taiwan. When the urban area expands as the macro environment changes, we hope to revitalize and reasonably use idle or lowly developed land property to cope with government policies, urban development needs, and social expectations, in order to maximize property benefits and pursue the effective use and sustainable development of resources.

For example, in response to national development policies and in consideration of the advantages for commercial and MICE industry development of the Chengkung Complex due to its proximity to the Kaohsiung Exhibition Center and the Kaohsiung Software Technology Park, we can develop this site into a forward-looking base with a quality waterfront urban leisure environment and MICE functions and combine it with the trend of waterfront leisure and tourism development by land development permission. It is hoped that after passing the local government review, we can proceed with business solicitation through superficies creation, in order to attract quality investment teams to turn the site into an all-round economic and trade park, create job opportunities, and drive the urban transformation of Kaohsiung City.

Earlier, we acquired land mostly for industrial use. As time and space have changed, local governments often wish to change the land use of such property into high-value land through urban planning, in order to promote local economic development. However, as it may take years and even decades to complete a general review of urban planning, it is thus impossible to change the land use of such property within a short time for immediate development. Take the Kaohsiung Refinery for example. The area of the "Factory Area" before its shutdown was about 176.7 hectares, and the area was listed as contaminated land. Therefore, development is only possible after soil remediation is completed. The area of the "Office Area" outside of the factory area is about 76.29 hectares, and this area is an uncontaminated administrative area.



To accelerate land transformation and reuse after shutdown the refinery, meet the needs of Taiwan's overall R&D industries, and promote urban regeneration, we will release land in the original office area and factory area by batch based on the market demand after land use change through urban planning for the development of related R&D industries, the circular economy, new material applications, high-value product innovation, and technologies to create value for resources recycling and to build an integrated industry platform for resources and the environment.

In response to the government's cultural asset inventory, we have established the "Guidelines for Cultural Assets Inventory" to initiate a cultural assets inventory in the Kaohsiung refinery in coordination with the competent authorities of the central and local governments. In consideration of economic development, environmental protection, and cultural preservation, we will follow the government policy and the related laws and regulations and engage in constant communication with stakeholders regarding the land use planning and utilization the Kaohsiung Refinery in the future, in order to seek the perfect solution to balance conflicts to promote the transformation and development of the Kaohsiung Refinery.

## 2.1.3 Our International Influence

### Cultural Exchange

We purchase most oil and gas from Arabian allies. They are our long-term suppliers and important trading partners. Therefore, it is our mission to promote Sino-Arabian economic and cultural exchange, bilateral trade development, economic cooperation, cultural exchange, and the understanding of people in both countries. The industry and the academia thus co-founded the "Sino-Arabian Cultural and Economic Association" (SACEA) in 1975, hoping to become the platform for exchange between the government and Arabian countries through people-to-people diplomacy. Since the SACEA was established, the CPC Chairperson has been chairing the Association concurrently. With our international influence, we hope to improve friendly international interaction, promote friendship with allies, and fulfill CSR.



Sino-Arabian Cultural  
and Economic  
Association Website

Apart from publishing a special issue every year, the SACEA regularly publishes the Sino-Arabian Association Bulletin. It is the only journal in Taiwan to report on the Middle East situations and Sino-Arabian relations. The SACEA also organizes related seminars, which are important media for researchers and the public to discuss Middle East issues. The Sino-Arabian Night organized by the SACEA and co-organized by the Ministry of Foreign Affairs and ourselves in September, 2018 was an annual event for our Arabian allies. As a long-time sole coordinator between the government and Arabia, Arabia and the private sector, and the private sector and the government, we have been constantly promoting economic and cultural exchange and cooperation with the Arabian world and befriending people speaking a different language and having a different culture. Apart from bonding different ethnic groups more closely, we further enhance and optimize Sino-Arabian trade and economic relations and cultural exchange.



## Earth Citizen's CSR

To diversify oil and gas sources, raise our own energy ratio, and expand international business and markets, we engage in hydrocarbon exploration or investment in the USA, Australia, Ecuador, Niger and Chad etc. Even in foreign countries, we adhere to our CSR and proactively maintain friendly relations with local and nearby communities, hoping to ensure co-existence, the common good, and co-prosperity with local citizens through various neighboring or philanthropic activities.

Take hydrocarbon exploration in Chad for example. While exploration sites are often located in remote areas, below-average living conditions are very common in non-developed countries. During the drilling, a water well (short-term or permanent) must be dug on the exploration well site with simple filtration system to supply drinking water and for drilling construction water. Compared to the water wells of local residents, the quality of water from our water wells is usually better to use. Without forgetting the good neighbor policy, we often build more pipelines to local communities near the exploration well site to share with locals our better-quality water. We also visit nearby communities and schools in the company of locals to donate stationery, footballs, school bags, medical supplies, or help them dig water wells. At the same time, we maintain communication with local residents, in order to become a good neighbor and a friend of local communities. In addition, we will offer new job opportunities and reasonable wages to local communities in an investment or business project. Take Africa for example, we and the related contractors offer job opportunities to over 1,000 people in total.



During the drilling of the Benoy-4 well in Chad in April 2018, we and the contractor donated manual pump wells to the local Kiagor tribe.



CPC staff also visited local communities in Chad and donated stationery and confectionaries to locals.

Furthermore, most of our business partners practice CSR. Take Ecuador as an example, our Ecuadorian partnership is very concerned with the communities and ethnic groups living near the oil field area. Through the Fundación Repsol Ecuador, the partnership constantly and inclusively offers small loans, training and education programs, and health programs to develop the communities of Kichwa indigenous peoples and early settlers and to establish sound relations with them. The partnership also signed the "Friendly, Respect, and Mutual Support Agreement" with the Waorani Nation of Ecuador (NAWE), and collaborates with FARO, a

social group, to ensure exploitation activity transparency. Repsol Ecuador is also a member of the Ecuadorian Consortium for Social Responsibility (CERES) dedicated to promoting the sustainable development of Ecuador. Our Australian partnership is committed to contributing to local social groups by sponsoring locations including Darwin, Northern Territory, Kimberley and Perth. In 2018, it sponsored the training and education program, youth health and benefits program, local economic support program, and social groups of 37 indigenous groups.

## 2.2 Response to Significant Events

### 2.2.1 Response to Significant Events-Third LNG Terminal EIA

#### Project Causes

In response to the government energy policy to lower the greenhouse effect and reduce air pollution, we built the Third LNG Terminal to supply the natural gas required by the Datan Power Plant. To conserve the algal reef ecosystem, we adopted the "Avoidance Alternative Solution" after further screening and assessment. Apart from significantly reducing the scale of development (from 232 hectares to 23 hectares), we have planned friendly habitat conservation.



Third LNG Terminal Section

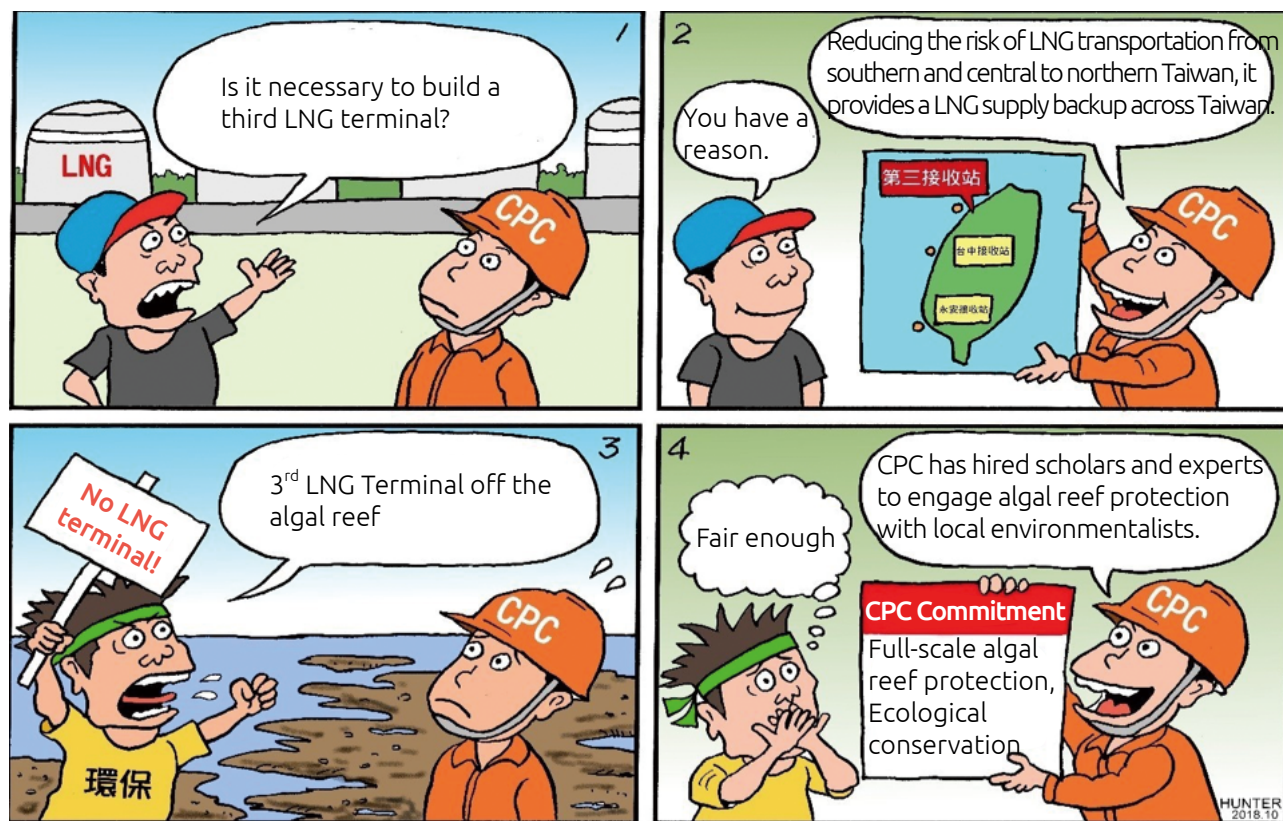
Focusing on the investigation, monitoring, and conservation of the intertidal algal ecosystem along the coast, this ecological conservation action promotes ecological conservation within and around the industrial park and industrial port together with marine data monitoring and marine conservation along the coast. To achieve environmental protection and community sustainable development, we establish partnerships with experts, scholars, and social groups and constantly promote algal reef ecosystem conservation to maintain the integrity of the structure and function of the algal reef ecosystem in Datan, Taoyuan.

#### Communication Meetings with Locals

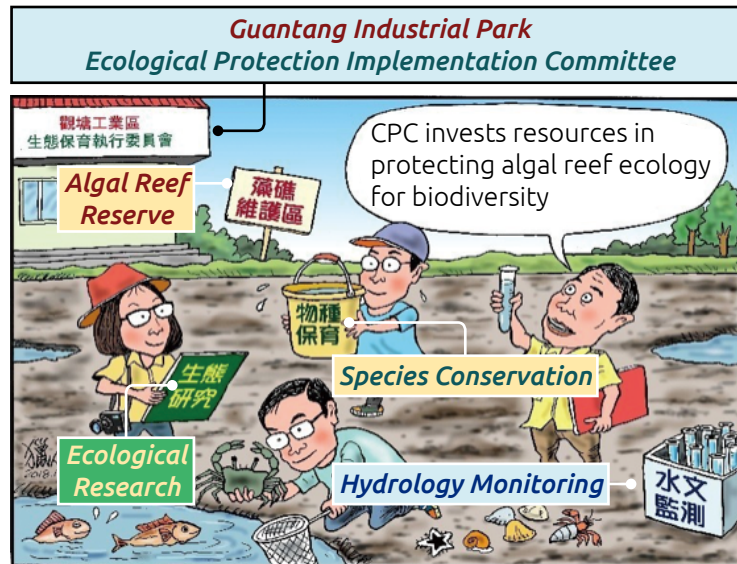


Guanying Township, Taoyuan





To optimize ecological conservation and enhance community participation, we established the "Guantang Industrial Park (Port) Ecological Conservation Committee" in 2018 together with experts and scholars, private groups, and competent authorities to verify the planning of ecological conservation measures and supervise and evaluate their implementation and achievements, and recommend improvement strategies. We are responsible for forming the "Ecological Conservation Working Team" to implement the related measures.



## Incident Review and Aftermath Handling

### Guantang Ecological Conservation Program

#### Key Conservation Areas (within the industrial park and the industrial port)

- Planning marine resources maintenance and monitoring, algal reef habitat monitoring, algal reef ecosystem research and monitoring (including water quality), and the conservation and research of the *Polycyathus chaishanensis* (lit. Chaishan polycyathus coral). In addition to research, we prohibit capture.



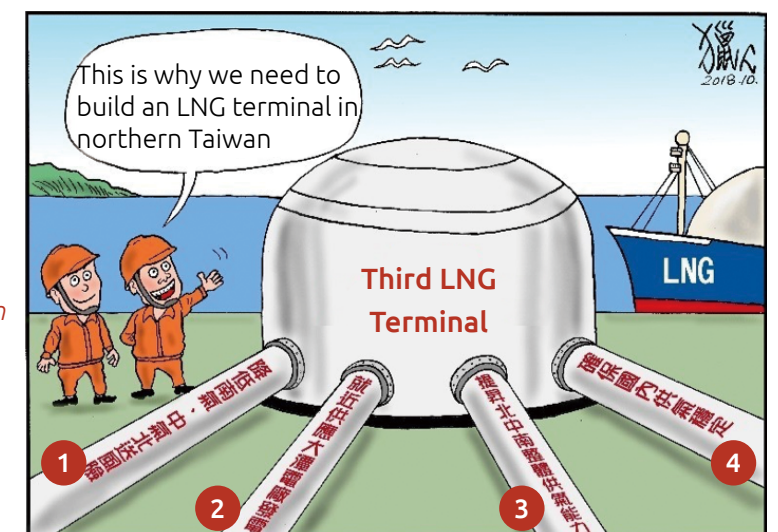
#### Key Conservation Areas (within the industrial park and the industrial port)

#### Education Promotion Areas (Guanxin Algal Reef Wildlife Reserve and Baiyu Coast, including the surrounding windbreaks/shelterbelts)

- Periodic ocean garbage cleanup and seabed fishing net cleanup to maintain the natural habitat.
- By establishing an environmental education park, we maintain intertidal habitats and engage in algal reef ecological research and monitoring (including water quality) to reduce damage to the natural environment caused by human interference.
- Adopt Baiyu and Guanxin algal reef coasts, with a focus on improving the coastal garbage and pollution problems, building windbreaks/shelterbelts, building habitats for biodiversity, and leisure and recreation.

In marine conservation, apart from ocean garbage cleanup and seabed fishing net cleanup, we study the feasibility of establishing a fishery culture area to promote fishery conservation. We will also avoid key conservation areas and fishing during the mating season (May to July) of the scalloped hammerhead (*Sphyrna lewini*) in collaboration with local fishermen's association and fishermen's organizations. We will also specify the functions of ecological reefs and actions planned in the key conservation areas and education promotion areas to reach an understanding for the sustainable development of fisheries.

Community participation is crucial to the success of ecological conservation. We will assist in training and offer equipment and resources according to the planning of the Taoyuan City Department of Environmental Protection in collaboration with local communities and conservation groups; monitor and report the 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) to help improve and protect the coral reef ecology and environment against man-induced pollution and damage. Apart from capacity building, we will establish the 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.



- 1 Disperse the risk of LNG transportation from southern and central to northern Taiwan
- 2 Proximate LNG supply to the Datan Power Plant
- 3 Strengthen LNG supply in all parts of Taiwan
- 4 Ensure stable domestic LNG supply

## 2.2.2 Response to Significant Events-Quality Defect of Unleaded Gasoline #95

### Causes

To ensure oil product quality, we perform the quality control inspection on products before shipping and after storing them in gas stations. On October 16, 2018, we found in the copper strip test that the unleaded gasoline #95 supplied by the Taoyuan Refinery to three gas stations (Hengshan, Daxi, and Chunri Road) exceeded the standard. After confirming the nonconformity and tracing the cause, we immediately held a press conference to explain the incident to the public and formed the compensation team to take care of consumer enquiries, adjudication, and claims, in order to show our social responsibility.

In addition to the full inspection on both branch and franchised gas stations within the affected areas (Keelung, Taipei, Taoyuan, Hsinchu, and Miaoli), we suspended the operations of the affected gas stations and recalled and replaced all unleaded gasoline #95 in these areas.

### Causes of Nonconformity of the Unleaded Gasoline #95

Before shipping oil products and after storing them in gas stations, we take samples for tests. We failed to find the problem immediately in this incident because we split samples in the sampling process before shipping, giving chances for highly volatile substances to evaporate more easily. When sampling from the gas station, we tightly closed the sample container without splitting it and directly shipped it to the laboratory for tests. As the affected contents of the product are highly volatile, we were unable to detect them at the outgoing quality control (OQC) inspection until the product reaches the gas station. However, the sampling method in both stages complies with the national standard (CNS1217). Although the Taoyuan Refinery gathered samples meet the national standard, to prevent the same incident from recurrence, we will adjust the sampling method of the OQC inspection in line with the method we use at the gas station.

### Incident Review and Aftermath Handling

To prevent similar events from recurrence, we enhance the quality control of oil products through short-, medium-, and long-term improvement plans to tighten control with the following measures:

- 1 Enhance the quality control of finished oil products: In addition to the copper strip test, we add the silver strip test.
- 2 Optimize sampling methods: In addition to tightly closed containers, we abandon the split procedure and take individual samples for the copper strip test (CNS1217) to prevent light-mass substances from evaporation.
- 3 Enhance source management: We perform the Doctor's test on all blending materials to ensure only materials better than the standard are blended to the product. We also enter the results of the Doctor's test to the UPS system for daily tracking.



As an SOE, we adhere to the management philosophy of "Quality, Service, and Social Contribution" in place of the profit orientation. In the future, we will continue to optimize the quality of oil products, in order to provide consumers with products and services of the best quality.

### "Claim for Victims of Unqualified Unleaded Gasoline #95" Section

Customers who purchased unqualified unleaded gasoline #95 in the copper plate test from the announced 159 gas stations between October 1, 2018 and October 21, 2018 (some October 22 or October 23) may claim from the designated 112 CPC gas stations or the direct sales counter of the nine CPC business offices across Taiwan between November 1, 2018 and June 2019 in accordance with the Directions for Claim Management. Customers claim for liquid sensor failure shall also submit the Vehicle Service Claim Form for professional verification prior to determining the claim. Customer having problems with the claim may visit the claim section of our corporate website or call our 24-hour free helpline at 1912. In 2018, we accepted 266,007 claims, with an amount totaling NT\$827,590,000.

#### Related links:

- [Claim Section](#)
- [Directions for Claim Management](#)
- [List of the 159 gas stations with unqualified oil products](#)
- [Claim application locations](#)
- [Oil Fee Claim Form](#)
- [Vehicle Service Claim Application Form](#)



Claim Section

## 2.2.3 Response to Significant Events-Oil Leakage in Huxi and Green Island

During July 2018, oil leakage broke out at our oil depot in Huxi Township of Penghu County and the gas station sump in Green Island Township of Taitung County to contaminate soil and groundwater, disturbing the public and society and affecting the rights and interests of stakeholders. Both incidents are thus our operational mistakes. Apart from a thorough investigation of the causes, reviewing the hardware and software equipment and mechanisms and the reporting processes, and compensating for the damage of local residents, we resolved the incidents by eliminating their recurrence. The incidents, our immediate responses, and subsequent reviews are as follows:

### ■ Huxi Oil Supply Center (Huxi Oil Depot) Leakage

#### Causes

After the open-tank cleansing and inspection in June 2017, a liquid level drop was noted during oil feeding. The preliminary check suggested that it should be the result of oil gas leakage due



to imperfect sealing of the sealer, resulting in oil disappearance off the record. After inspections, grooves were made to remove the FRP from the bottom plate on August 7, then it was determined that the plate was corroded and leaking oil and he maintenance was started. However, the site personnel did not report to the supervisor, resulting in the subsequent handling errors. Until May 2018, we found that the accumulated amount of maintenance investment and oil account were abnormal, and conducted the investigation for subsequent remedy. The incident occurred due to the personnel's failure to make immediate report of oil disappearance but adoption of the "keep observation" policy when a liquid level drop was noted, resulting in impact expansion.



Huxi Oil Depot Leakage  
Incident Inspection Data

### Incident Review and Aftermath Handling

After the incident review, problems are categorized in five points:

- Failure to exact oil tank inspection and repair.
- Failure to perform safety check before feeding oil.
- Failure to make proper response.
- Failure to make immediate report.
- Inaccurate book-keeping of oil accounts.

- 1 After the incident broke out, we immediately formed an emergency response team to take the following actions:
- 2 Performed the leakage test on all oil tanks and pipelines in the depot, no nonconformity was found, and no leakage or spill was detected in of the related equipment.  
Completed the underground insulation wall in the depot and completed the construction
- 3 of the 110m long groundwater pollution aeration interception facility at 9m below ground in October 2018 to prevent groundwater pollution from expansion. The system is in operation constantly.

The Huxi Oil Depot was announced a groundwater pollution remediation site by EPA on December 10, 2018. We will implement pollution remediation according to the Soil and Groundwater Pollution Remediation Act.

In the "Huxi Oil Depot HS-16 Oil Tank Leakage Review and Improvement Report", we proposed nine improvement plans covering the optimization of operations, systems, and technologies.

#### **Operations**

1. Audit depot oil accounts: Establish an audit team to audit the oil account of all oil supply centers.
2. Implement risk control on soil and groundwater pollution at all oil supply centers: Create files based on the risk level of potential oil pollution in the operations areas for control.
3. Storage and transportation training: Enhance the storage and transportation skills of onsite employees.



#### **Systems**

1. Improve open-tank inspection.
2. Remove coatings during the open-tank inspection to facilitate non-destructive inspections.
3. Exact current accounting operations and add "oil feeding after passing the open-tank inspection".

#### **Technology**

1. Install the oil account automatic articulation system to automatically compare oil tank storage and send warnings for anomalies.
2. Enhance the machinery integrity (MI) system to control storage tank maintenance and management.
3. Integrate the automatic oil system and account system to replace manual registration with automatic closing.

### **Gas station Leakage on Green Island**

#### **Causes**

In early July 2018, a probable nozzle failure was reported at a gas station on the Green Island, and oil account shortages continued thereafter. A further inspection on July 13 confirmed that cracks are noted on the PPR pipe connecting the storage tank pump of unleaded gasoline #95 to the sump under the fuel dispenser. When the dispenser activates, the pressure of the submersible pump causes unleaded gasoline #95 to leak from the said cracks. In addition, as the sump under the dispenser failed to demonstrate its anti-leakage function in a fuel leakage, oil leaked and contaminated the underground environment.

### Incident Review and Aftermath Handling

- 1 When the incident broke out, we immediately tracked down and stopped the leakage source, replaced fuel dispenser piping and the sump, and continued soil gas release.
- 2 We also excavated the contaminated soil and provided local communities with alternative water sources. On August 10, 2018, we completed the written report to the Taitung County Environmental Protection Bureau.
- 3 EPA announced on December 25, 2018 that the said gas station is a groundwater remediation site. On January 31, 2019, EPA held the soil and groundwater pollution investigation and assessment review meeting of the said gas station with the Taitung County Environmental Protection Bureau.
- 4 We will submit the Underground Environment Investigation Report and Pollution Remediation Plan according to the "Soil and Groundwater Pollution Remediation Act". Remediation is expected to be completed by the end of 2021.

To prevent similar incidents from recurrence, after reviewing and inventorying related SOPs, we have proposed six optimization plans in terms of management, equipment, and technology to reduce operational risks. The six optimization plans include:

1. Implement full inspection of the piping and anti-leakage of fuel dispensers.
2. Enhance routine oil account and equipment management.
3. Establish an oil account monitoring and management mechanism.
4. Establish work instructions.
5. Organize professional training activities.
6. Define the measurement accuracy of the oil tank monitoring system.

### Response to Significant Events

Concluding all significant events in 2018, apart from facing them, making quick response, and communicating with affected stakeholders proactively, we reviewed the negligence of the related personnel and the defects in the related processes, mechanisms, and equipment, and proposed appropriate punishment and optimization/improvement plans. In the future, we will strengthen internal risk management and the internal audit system, implement SOPs, adhere to the "quality first" management philosophy, and insist on the core value of environmental protection, in order to keep society away from worries.

## 2.3 Risk Management

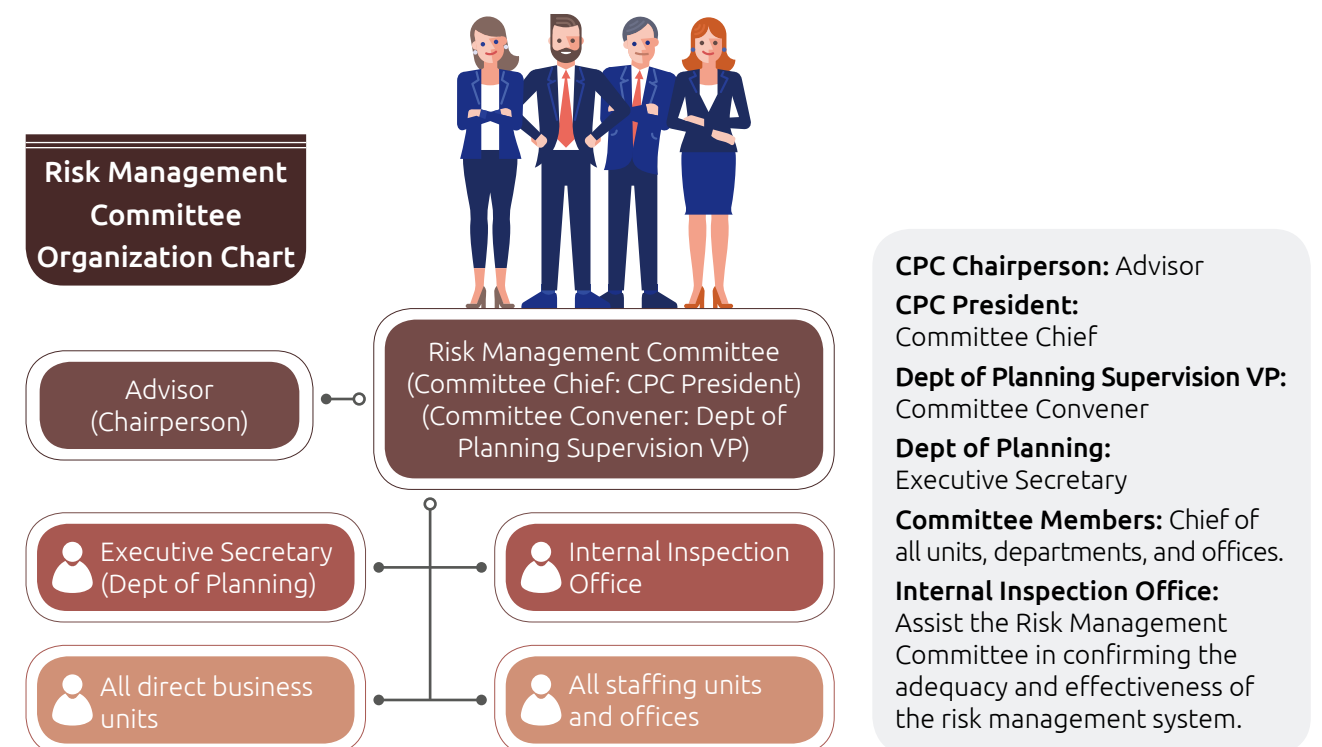
### 2.3.1 Risk Management Policy

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.



### Risk Management Committee

In March 1998, we established the "Risk Management Committee" which holds a committee meeting every year. Its missions include reviewing the risk items and risk profiles proposed by all units, screen important overall risk items, coordinate and supervise the risk management of individual units, perform rolling review of risk change factors according to current events, take timely precautionary actions and management, and integrate related resources.



### Operation of Risk Management

#### Bottom-up risk management:

Each unit has a risk management team chaired by the unit chief to promote risk management, prevent 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 keep track on 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; notify the responsible units to make corrections and control and implement constant risk management, in order to reduce operational risks.



### 2.3.2 Major risk items and countermeasures

Risk management is a cycle of continual improvement. Through risk identification, risk analysis, risk assessment, and risk handling, the effectiveness of improvement is verified through communication and discussion and supervision and review before re-assessing the risk level. If the residual risk falls below the risk tolerance line, countermeasures are proven effective, and the threat of risk has been reduced to a level acceptable by us.

In 2018 we identified seven risk items. After taking corrective actions and continuous monitoring, the residual risk value of these seven risks is below our risk tolerance line.

Risk Identification	Countermeasures
Construction or operation risk due to failure to implement the OHS SOP (including contractors).	<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. 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	<ol style="list-style-type: none"> <li>1. Accelerate new employee recruitment and enhance core professional training.</li> <li>2. Organize technology exchange and learning with external experts and across departments and discussion activities with retirees.</li> <li>3. Establish SOPs and other documents to enrich knowledge documents.</li> <li>4. Retain a certain proportion of planning and operational management workforce of core business.</li> </ol>
Stable supply and safety of oil and gas	<ol style="list-style-type: none"> <li>1. Disperse 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 Terminal Project.</li> <li>3. Invest in new onshore pipeline projects between Taichung and Tongxiao to build backup gas transportation pipelines.</li> </ol>
Leakage of long-distance oil and gas pipelines	<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 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> </ol>

Risk Identification	Countermeasures
System halt and unplanned boiler halt	<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> </ol>
Oil price fluctuation risk	<ol style="list-style-type: none"> <li>1. Hold oil price hedging strategy meetings periodically, determine the price difference trend between the selling price of export oil products and the crude oil cost based on the international economic trend, and discuss and establish hedging strategies.</li> <li>2. Keep constant track on oil price trends, 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 based on the operational condition and timely strive for the opportunity to review the floating oil price mechanism from the government.</li> </ol>
Offshore pipeline risk due to constant seabed collapse	<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> </ol>

Note: We have also identified the potential risks and opportunities brought by climate change. Please refer to section 4.3 Risk and opportunities from climate change related counter measures.





# CH3

## Prospering Taiwan: An Innovative CPC

### Chapter Summary

In response to the global economic changes in recent years, the government's energy policy and 5+2 Industrial Innovation Plan, apart from proactively developing green energy, green materials, and green technologies, we have implemented the "Domestic and Overseas Oil Mine Potential Assessment and Research", hoping to become the initiator of Taiwan's green energy development to bring new opportunities to Taiwan's economic development and lay the foundation for sustainable management.

### SDGs



### Reader Priorities

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



## Management Approach

### Policy Commitment

#### R&D and Innovation

1. Develop green energy core technology; develop green products; generate corporate revenue, and lead CPC to a high-value, low-carbon, eco-friendly, and energy-efficient green industry to set the foundation for sustainable development.
2. "Commercialize new products and industrialize new technologies" based on the R&D for "carbon reduction, energy conservation, and clean energy", with a focus on green energy, green materials, and green technology.

#### Customer Rights and Product Safety

1. Implement management activities to maintain customer rights and interests and ensure product safety based on the concepts "total participation, quality improvement, and customer satisfaction", in order to provide products and services of the best quality.
2. 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

#### R&D and Innovation

- Short-term ➡ Enhance the added value of fossil energy.
- Long-term ➡ 1. Address climate change challenges to diversify sustainable supply of green energy.
2. Realize smart green energy and energy transition.

#### Customer Rights and Product Safety

- Short-term ➡ Customer Experience Management (CEM) is continuously implemented by all CPC gas stations.
- 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

#### R&D and Innovation

1. Sign a memorandum of understanding (MOU) "Jen Tse Tu-Chang Geothermal Area Exploration and Power Generation Development and Operation in Yilan County" with TPC to explore geothermal sources.
2. Build the PV system at 172 gas stations and EV charging/battery replacement sites at 160 gas stations across Taiwan and Penghu.
3. Completed R&D projects and R&D achievement.

#### Customer Rights and Product Safety

1. Inspect and monitor product quality every year.
2. Hold regular meetings to review products and services and revise related procedures and operations as necessary.
3. Perform customer satisfaction survey and extend CEM to 125 gas stations.

### Measurement Mechanisms

#### R&D and Innovation

Research reports, year-end assessment meetings, performance evaluation as evaluation mechanisms

#### Customer Rights and Product Safety

Internal evaluation mechanisms include the customer complaint resolution rate, the customer satisfaction survey, and the performance evaluation. We also commission the Industrial Technology Research Institute to implement the "Petroleum Product Quality Inspection and Management" program on behalf of the Bureau of Energy to ensure compliance with the national standard by spot checks.

## 3.1 Green R&D

In response to the global economic and climate changes, the government's energy policy and 5+2 Industrial Innovation Plan, apart from offering technical services for production and sales department, the R&D unit increases investments in forward-looking R&D projects every year, including "green energy, green materials, and green technologies" based on the R&D for "carbon reduction, energy conservation, and clean energy". The R&D unit also engages in "Domestic and Overseas Oil Mine Potential Assessment and Research", hoping to develop green energy core technology and new products to "commercialize new products and industrialize new technologies", in order to expand the existing scope of business. We also actively develop energy diversity and geothermal resources; build smart green energy stations; develop battery cell materials and promote green bonds, hoping to become the initiator of Taiwan's green energy industry development to lead CPC to a high-value, low-carbon, eco-friendly, and energy-efficient green industry and set the foundation for sustainable development.



### Input

Investment budget (NT\$100 mn) 21.72  
Workforce investment 639

### R&D Themes and Outcomes

#### Green Energy



##### ■ Biomass Refining Process:

Apart from producing green diesel by hydrogenating bio-fat, we import engines and related parts and components for testing in collaboration with the Automotive Research & Testing Center (ARTC), in order to promote our biodiesel in the market.

##### ■ Hydrogen Energy and Fuel Cells:

To develop a safe and high-efficiency environment for distributed hydrogen energy supply for distributed generation systems, we actively engage in the R&D of hydrogen-focused distributed power supply. In technology verification, we use fuel gases with rich hydrogen content in the refinery for the 15kW low-temperature fuel cell system. We have completed the test of the medium- and low-temperature proton exchange membrane fuel cell (PEMFC) generation system. In addition, we have initiated a co-development project with Taiwan's company to build a 5kW-grade high-temperature solid oxide fuel cell system.

##### ■ Photovoltaic (PV) System:

By the end of 2018, we completed the PV systems in 172 CPC PV gas stations, CPC in the future, we will equip all oil supply centers, the Taiyuan Refinery, and natural gas plants with PV systems and establish operation and maintenance SOPs for self-sufficient operations and maintenance.

#### Green Materials



##### ■ Development of Heavy-crude-converted Refined Carbon and Trial Mass Production Through In-depth Processing:

The trial run of amorphous carbon has been completed. Two more production lines will be planned to increase annual capacity to 10 tons. In 2018, we also purchased calcination and grinding equipment to further process amorphous carbon for manufacturing higher-level carbon materials. Capacity of the current trial mass-production is 15 tons/year for "battery anode amorphous carbon materials".

##### ■ Lithium-titanate Battery Anode Material Development:

We have expanded the lithium-titanate material process and started business discussions with domestic and overseas companies. After confirming the testing results, we will manufacture storage equipment that can store 50W/h for use in smart green gas station at Tainan Cianfong Road. We have also developed the application of lithium-titanate module in UPS and will develop the lithium-titanate battery for use on electric buses, with a charging capability of 10 minutes to run 100 km.

##### ■ Development of Multifunctional Eco-Friendly Coating:

It is a high-performance energy-efficient and eco-friendly water-based imitation stone coating material. In addition to decorating building exterior walls, it helps reduce building temperature, with performance complying with inspection standards, and factory trial run was a success. Currently, it is being used experimentally on the roofs of the pre-fabricated housing at Gushan Elementary School and the Hamasen bus station kiosk in Kaohsiung.

**Output**

<b>R&amp;D contribution (NT\$100 mn)</b>	34.27	<b>Application of outcomes from forward-looking R&amp;D</b>	49
<b>Acquired patents</b>	21		
<b>Published papers</b>	253		

**R&D Themes and Outcomes****Green Technology**

- We proactively engage in the R&D of items and materials in other areas, including separation processes and utility research, the technologies, implementation, and applications of forward-looking carbon materials, and the development of specialty chemicals and application technologies.
- In the development and application of environmental cleanup and pollution remediation technologies, we have completed:
  - Utility model patent for "oil slick recovery equipment".
  - Feasibility assessment of power generation with exhaust from oil loading and proposal of the optimal oil loading exhaust handling strategy: "-40°C Condensate + Pressure Swing Absorption (PSA) + Power Generation".
  - Cracking fraction residuals of waste solvents with microwaves.
  - Onsite application of chemical oxidation technology at Xinguang Community.
- Apart from successfully obtaining 3 purified rice bran enzymes by purifying esterase and lipase in rice brans, we have built a polyol quick test platform for screening strains with polyol production potential.

**Assessment and Research of Domestic and Overseas Oil Mine Potential**

- Completed the pressure, volume, and temperature (PVT) analysis of the Benoy-1 Reentry well in the Republic of Chad, and the capacity properties and instantaneous pressure analysis of the Mouroumar-3, Benoy-4, and Mbaikoro-2 wells.
- Completed the commissioned technical service of the OPIC Africa's company Chad Branch.
- Completed the integrated research of the large-area geological framework and petroleum system in the Mexican Gulf to facilitate future bidding on prospective resources in the area.
- Completed the economic assessment of the F-structure gas field development and estimated the prospective resources and contingent resources around the gas field.
- Estimated the total onshore natural gas contingent resources in Donzijing, Guanziling, and Zhonglun based on the interpretation of the domestic onshore well data and the follow-up of the six discovery layers of oil and gas.

**Geothermal Resources Exploration**

To promote energy diversification in Taiwan, we signed the "Jen Tse Tu-Chang Geothermal Area Exploration and Power Generation Development and Operation in Yilan County" MOU with TPC in March 2018, and held the "Jen Tse Geothermal Well 3 Drilling Ceremony" in November 2018 as a new milestone for geothermal energy exploration and power generation, in order to embark on renewable energy development and to pursue sustainable development.

Our "Geothermal Technology Team", a task force formed by employees from different departments and offices, engages in the administration, survey, and engineering work in relation to geothermal resources exploration. The goal is to drill and discover geothermal resources worthy of commercialization for power generation and constantly assess other areas, hoping to maintain the lifespan of geothermal resources for over two decades through sound production management.

**Assessment of Economic, Environmental, and Social Impacts****Economic**

Prior to drilling, we estimated the possibility of the cost with income breaking even based on the wholesale purchase rate of geothermal power before project initiation. Our goal is to commercialize geothermal resources for power generation and to maintain the lifespan of geothermal resources for over two decades through sound production management, in order to promote green energy development in Taiwan.

**Environmental**

First, we established the geothermal concept model in Tu-Chang, Yilan, determined the location with the highest geothermal potential, and assessed the best well location for geothermal development. Then, we outsourced environmental monitoring before and during the drilling in Jen Tse, Yilan, to understand the influence of the geothermal well on local ecosystems and hydrological systems and reduce the related impacts, hoping to minimize its environmental impact through internal and external supervision.

**Social**

To reduce the influence on local communities, we reached a drilling agreement with the local tribe (L.muan) based on The Indigenous Peoples Basic Law. During the drilling, we will maintain constant communication and good relations with local communities and will further contribute resources to them in the future.



### Future Planning and Expected Benefits

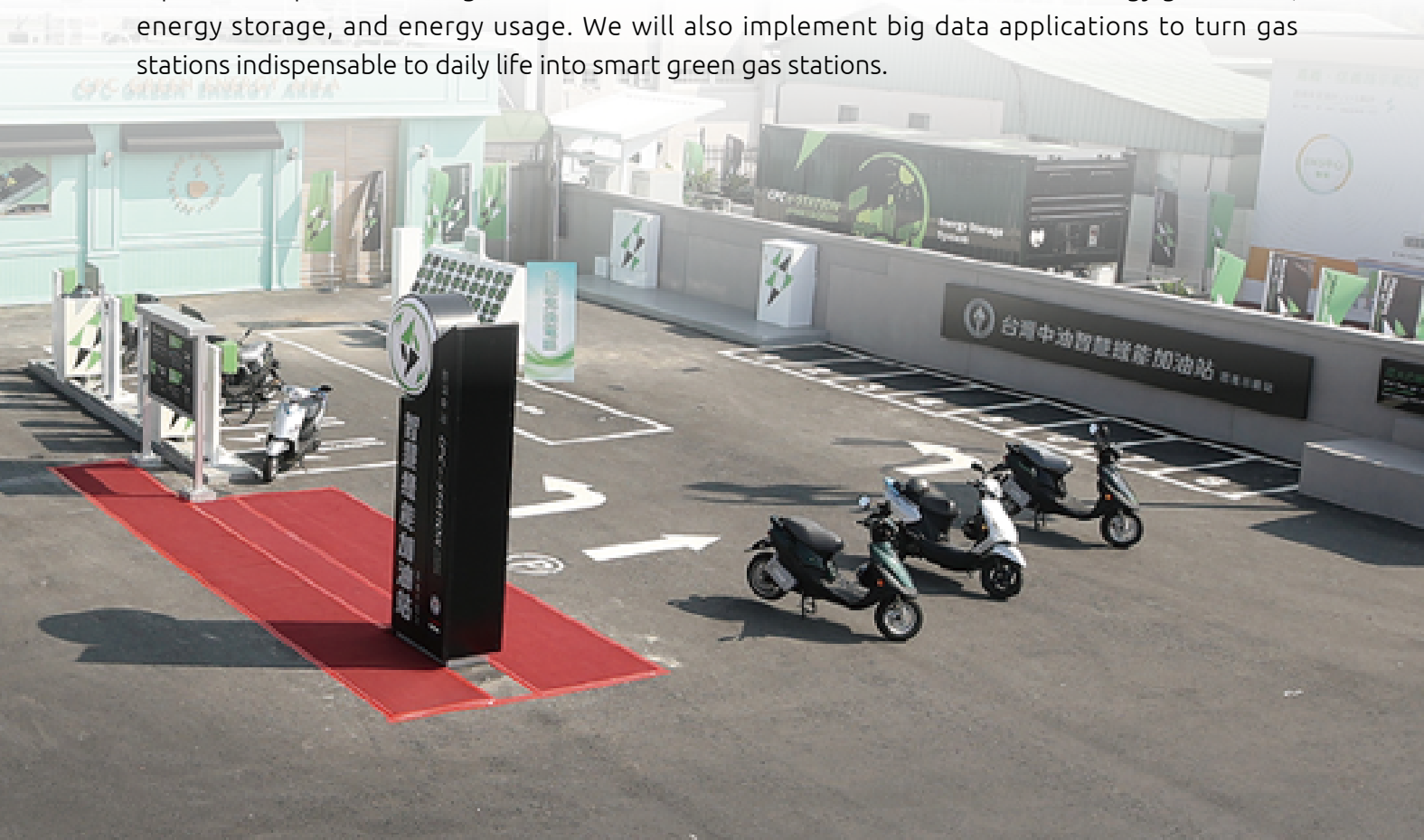
Six geothermal wells will be drilled between June 2018 and June 2021, i.e. two each year, in Jen Tse and Tu-Chang, Yilan, hoping to explore geothermal resources to generate at least 8 MW installed capacity in the area. The Jen Tse 3 well will be completed in March 2019, and the capacity test will begin in April. The drilling of the Jen Tse 4 well will begin in April 2019 and will be completed in June 2019. Based on the subsequent drilling exploration results, drilling will begin in locations with higher geothermal potential in Phases II and III, hoping to supply stable electricity generated by geothermal energy to citizens in Yilan.

To contribute to local communities during drilling, we will hire L.muan's people to join the drilling team and will equip local youth with related technical competencies. We will also drill a well at the Taipingshan Working Station of the Forestry Bureau to supply drinking water to the drilling team, units near the Taipingshan Working Station, and Datong Junior High School in Yilan Country.

In response to the government's target of 2MW installed capacity for geothermal power generation by 2025, we will start geothermal studies in Mt. Datun in 2019. After completing all three phases of exploration in Jen Tse and Tu-Chang, Yilan, we will continue with the drilling in Mt. Datun in 2021, hoping to confirm the power generation capacity of the geothermal resources in the volcano area of Mt. Datun.

### Smart Green Gas Stations

In response to the government's policy to encourage green energy development, energy conservation, and carbon reduction, we will install PV systems and EV charging/battery replacement points at CPC gas stations across Taiwan based on three themes: energy generation, energy storage, and energy usage. We will also implement big data applications to turn gas stations indispensable to daily life into smart green gas stations.



So far, we have installed PV systems in 172 CPC gas stations. After 25 more to be completed in 2019, there will be 197 PV gas stations with a daily generation capacity of about 17,000 kWh to reduce carbon emission by about 9.418 tons each day. Please visit our [website](#)<sup>1</sup> for information regarding daily power generation, cumulative power generation, and cumulative carbon reduction. The cumulative power generation of 138 PV gas stations is 4.782 million kWh. Apart from self-consumption, electricity is mainly sold to TPC. Apart from energy conservation, PV gas stations improve the operational performance of gas stations. In the future, we will continue to install PV systems at other gas stations and operating platforms and integrate PV and energy storage equipment and operation and maintenance with information systems to achieve optimal performance. In addition, between 2018 and 2022, we will complete 1,000 EV charging/battery replacement sites. In 2018, we already installed 160 sites across Taiwan and in Penghu as planned. The goal for 2019 will be 216 sites.

The "Smart Green Gas Station at Chiayi Xinyi Station", the Phase I smart green energy station, and "Smart Green Gas Station at Tainan Cianfong Road", the first smart green energy station with multiple power supply and energy storage systems, will start operations in January and February 2019 respectively. The "Smart Green Gas Station at Chiayi Xinyi Station" is characterized a new four-in-one business model: quick battery replacement or 15-minute quick charge; electricity supply in addition to petroleum; a circular economy model using PV system and energy storage, and leisure and recreation. The Smart Green Gas Station at Tainan Cianfong Road" is designed upon the community microgrid planning supplying electricity with the PV system and other forms of energy to achieve energy conservation through peak cuts with storage systems using vanadium redox batteries (VRB) and lithium titanate batteries. By transforming gas stations into green energy centers, we hope to demonstrate our influence to spread the momentum of green energy to other industries.

Note 1: As it is necessary to import the data of all PV gas stations to the system and adjust related equipment, we will only disclose the data of some gas stations in this report. Data of all PV gas stations will be disclosed in the future.

### Long-Life Soft Carbon Anode Materials

In 2018, the global consumption of carbon anode materials exceeded 150,000 tons, including about 70,000 tons of power batteries, with an annual growth up to 10%. As a key technology in EV development, the battery determines the performance and maximum trip of an EV, and its price accounts for a comparatively larger part of the entire EV cost. Therefore, a battery with quick charge ability and a long life span



will mean a big help to EV development. With years of experience in green energy development, we will duplicate this experience in EV battery development through a small-scale field test. After safety validation, we will promote the related technologies to automakers and sign an MOU with TDK of Japan and Tangeng Advanced Vehicles Co., Ltd. to accelerate battery promotion to applications in Taiwan's EV industry. In addition, this will demonstrate our determination in green energy battery development and improve our presence in the international market.

In material development, we will make high-quality soft carbon materials of different specifications with heavy crude to optimize the properties of soft carbon, achieve cost control, and acquire proprietary key technology patents. Therefore, in December 2018 we were awarded the Enterprise Innovation Award at the [15<sup>th</sup> National Innovation Awards](#). CPC constantly optimizes its technology and helps promote EV industry development.

Technical Advantages of Software Carbon Materials:

Develop a series of soft carbon materials with higher capacity than those from Japanese competitors.

Develop soft carbon materials supporting 12-minute quick charge with a minimum 7-year life span, in contrast to artificial graphite anode materials without quick charge capabilities.

### Green Bonds

To promote green financial development in Taiwan and to encourage industries to invest in sustainable development, we were qualified to issue green bonds in the green plan category under "GHG Reduction" in 2017 and issued Taiwan's first green bond from the manufacturing industry. Our 10-year green bond received heated feedback from the financial market. The tender amount was 5.6 times of the required amount at NT\$2 billion, with reopening at an awarded sum of NT\$2.8 billion completed in the same year. The amount raised has been allocated to the "Taichung LNG Terminal Phase II Investment Project" of the Natural Gas Business Division at NT\$1.3 billion, and the "The third LNG Receiving Terminal Investment Project" at NT\$1.5 billion.



CPC Green Bond QR  
Code and Link



## 3.2 Circular Economy

### Cold Energy Reuse: A Good Neighbor of Local Communities

When we import natural gas, the supplier will first compress it into liquefied natural gas (LNG) by lowering the temperature to 162°C below zero. After LNG is delivered to Taiwan, temperature exchange with seawater takes place to gasify LNG before it is ready for use by consumers. As a great deal of cold energy will be released during gasification, apart from using it to generate electricity and for on-site air-conditioning we supply released cold energy to Air Liquide Far Eastern and Blue Ocean Gas and offer free "diamond water" to local fishermen to benefit local aquafarms, in order to create a win-win for local industries and citizens.

#### Air Liquefaction:

After liquefying gas through chilling, liquefied air is separated into liquid nitrogen (LN<sub>2</sub>), liquid oxygen (LO<sub>2</sub>), and liquid argon (LAR) through distillation. Compared to the traditional process, this can reduce electricity consumption significantly. In 2018, the Taichung Plant and Yongan Plant supplied cold energy to Blue Ocean Gas and Air Liquide Far Eastern for cooling air, making a profit of about NT\$120 million.

#### Cold Energy and Pressure Energy Generation of Yongan Plant:

After recovery from LNG with propane, ultralow temperature energy is gasified by pressurization to push the expansion engine to drive the generator to generate electricity at about 1,800 kWh to supply part of the plant's electricity consumption and gasify LNG at about 90 tons/hour. By combining with pressure energy power generation, the plant saved up to 35.52 million kWh of purchased electricity.

#### Cold Energy Chiller System:

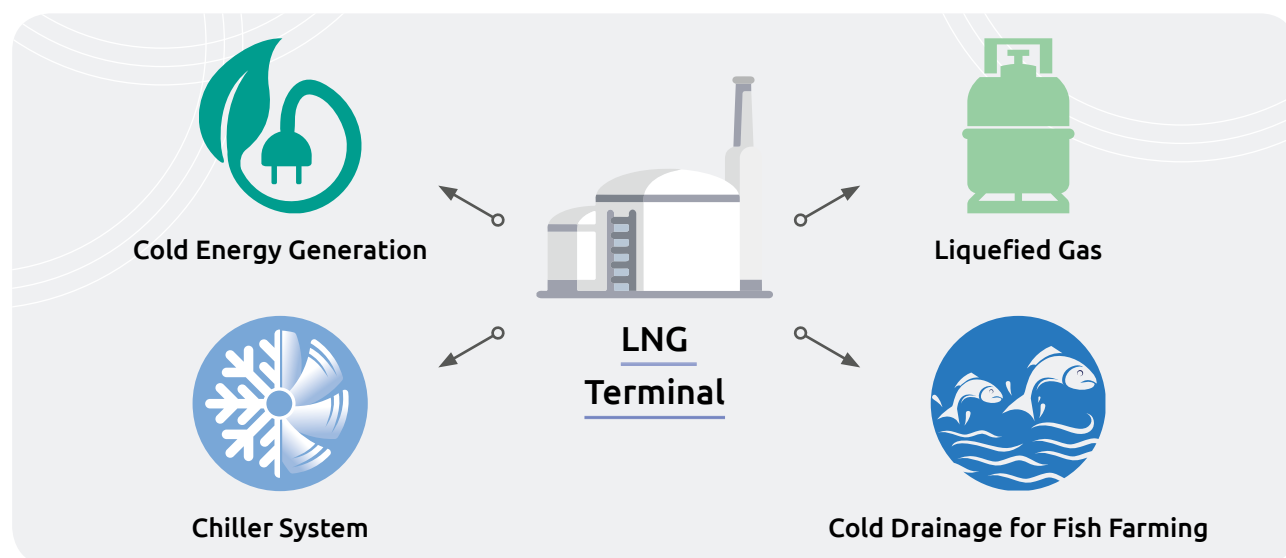
Apart from power generation, we can generate low-temperature chilled water to air-condition the entire plant and the chilled water required by other equipment with the heat exchange of the ultralow temperature LNG process and the reflow of high-temperature chilled water from the chiller. As this can save electricity consumption and operational and maintenance costs, the cold energy chiller system saved 4.78 kWh of electricity in 2018, amounting to about NT\$12 million.

#### Cold Drainage (Diamond Water) from the Yongan Plant:

The Plant supplies free cold water discharged from the LNG process to local aquafarms through underground box culverts. Apart from the ease of access, aquafarm owners do not need to worry about the possibility of barnacles clogging the intake or typhoons damaging the pipelines. Clean and low-temperature cold drainage is filtered and cleansed three times before being discharged 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 maintain, repair, or restore pumping equipment. Therefore, they call the water "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, the circular economy, and befriending neighbors of enterprises. In addition, the Yongan LNG Cold Discharge Water Aquaculture Test Farm of the Fisheries Agency, Council of Agriculture, was unveiled in 2018 to promote fisheries transformation with innovative aquaculture technologies, in order to boost marine economic growth.

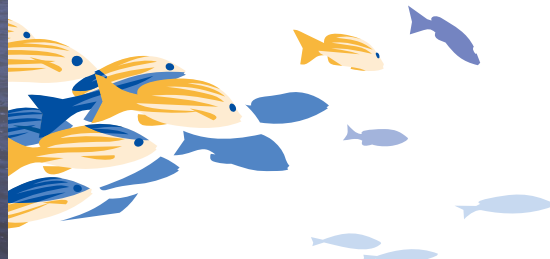


#### Advantages of "Diamond Water"

- Cleaned to enhance fish survival rate.
- Cleaned to reduce fish diseases and medication and thereby improve fish product quality.
- Stable water supply to reduce water changing and pumping.
- Save electricity bills and maintenance fees of the previous pumping motors.

#### Tips

Natural gas is liquefied when cooled to  $-162^{\circ}\text{C}$ . Its volume also reduces to 1/600 to facilitate long-distance sea transport. At the destination, we can gasify LNG. In this process, using a huge amount of seawater for heat exchange will be the most economical method. It takes about 20 tons of seawater at  $25^{\circ}\text{C}$  to warm up each ton of LNG. The temperature of the used seawater will drop to about  $15^{\circ}\text{C}$ . As it is lower than the intake temperature, it is called "cold drainage".



### Energy-resource Integration: Co-prosperity With Industries

The Dalin Refinery is our biggest oil refining base. By integrating with the Kaohsiung Linhai Industrial Park, it will form an energy-resource chain with local industries to supply nitrogen, steam, fuel gas, hydrogen, caustic soda, and fuel oil. In the integration process, this can enhance energy efficiency, reduce energy consumption, and lower pollution and emissions within the park to effectively reduce environmental impacts and improve environmental quality. Therefore, this is a perfect "good neighbor" policy.

**Nitrogen Integration:** At the Dalin Refinery, we use nitrogen to raise pressure, facilities sealing up and purge out. Major supplied nitrogen come from oxygen the China Steel Corporation.

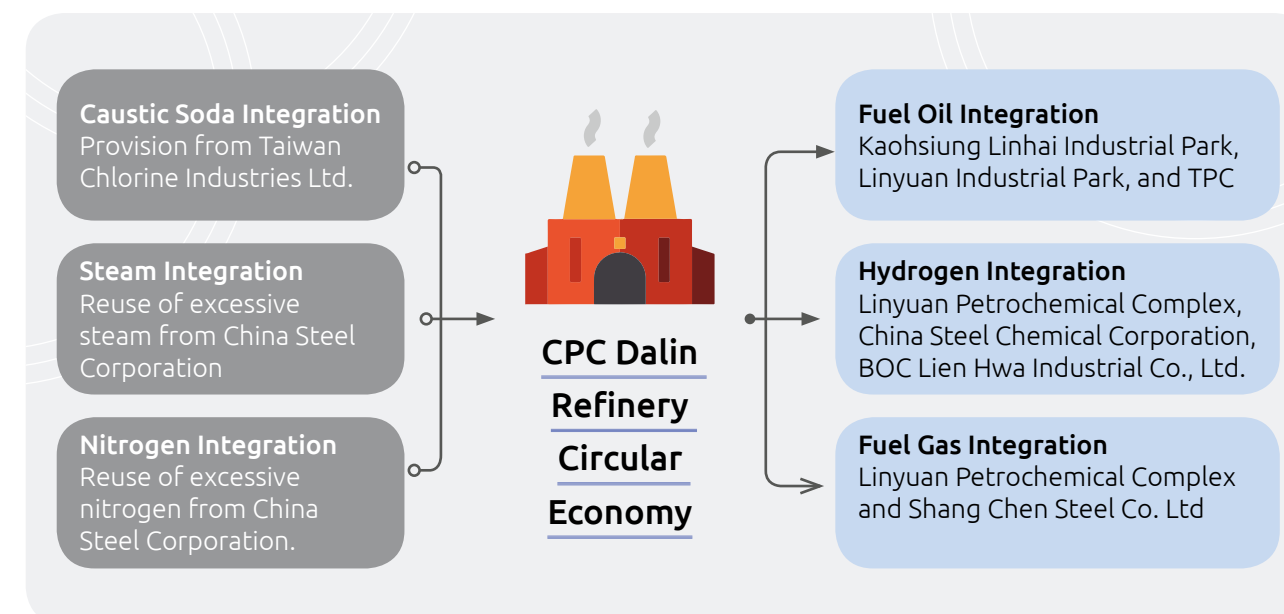
**Steam Integration:** By integrating with the Kaohsiung Linhai Industrial Park, the Dalin Refinery can use the excess steam from the China Steel Corporation to reduce  $\text{CO}_2$  emissions.

**Fuel Gas Integration:** The Dalin Refinery can supply surplus fuel gas from the refining process to Shang Chen Steel Co. Ltd. and Linyuan Petrochemical Complex.

**Hydrogen Integration:** The Dalin Refinery can supply the hydrogen it produces to the China Steel Chemical Corporation, and BOC Lien Hwa Industrial Co., Ltd., and even to Linyuan Petrochemical Complex.

**Caustic Soda Integration:** The Dalin Refinery uses caustic soda in the major process or pollution control equipment. The refinery used to transport caustic soda with tankers. Currently, some of the caustic soda is transported via the pipelines of Taiwan Chlorine Industries Ltd. to reduce the fuel costs from tanker transport, transportation costs, and transport management risk.

**Fuel Oil Integration:** The 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.



## 3.3 Products and Customers

### Safety and Quality of Products and Services

Given our management philosophy: “quality, service, and social contribution”, the influence of product safety on customers is always our prime concern. Apart from ensuring compliance with CNS standards and all applicable laws and regulations, we implement quality management with respect to the ISO 9001 international standards and disclose the information and safety data sheets of all products and services on the corporate website for the reference of stakeholders. In addition, we state the precautions on the packaging of individual products as warnings for consumers. Therefore, there was no report of non-compliance with the health and safety of products and services in 2018.

### 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 reviewed existing operational mechanisms, enhanced the security maintenance of information systems, and strengthened the training and education of employees in “privacy protection” and “information security” to ensure the retention and protection of the customer’s personal information. Therefore, there was no report of customer privacy invasion or leakage or theft of personal information in 2018. Please visit our corporate website for more about our information protection policy.

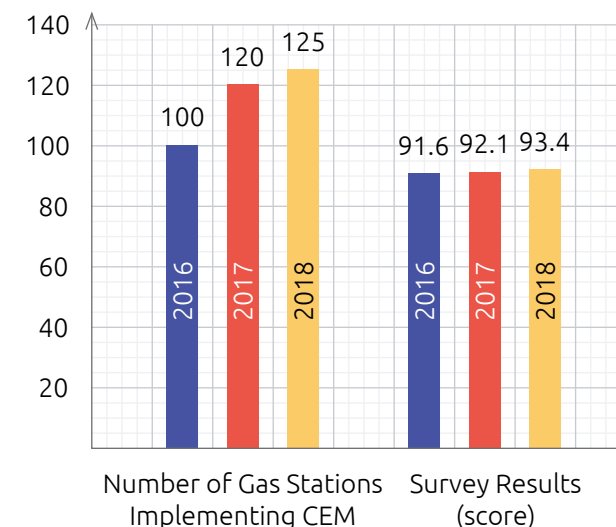
### Customer Satisfaction

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

Year		2016	2017	2018
Branch Gas station		93.1	95.2	97.3
Natural Gas Supply Service		98.8	97.5	96.9
Product Sales Service	Solvent Business	90.7	91.6	91.8
	Lubricant Business	93.4	94.3	95.2
Gas station Customer Satisfaction Survey (MOEA) <sup>1</sup>		93.1	96.2	97.3

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.

Except for the “Natural Gas Supply Service”, customer satisfaction with other services and products has risen for three consecutive years. The frequent construction projects of gas transportation equipment and doubts about the environmental impact of major investment projects of natural gas storage facilities accounted for the falling customer satisfaction of “Natural Gas Supply Service”. We have requested the related construction departments to complete construction faster without affecting industrial safety to reduce the impact on the public and to enhance communication with the public.



### Customer Experience Management (CEM)

Apart from making continual improvements in the quality of gas station services, we spare no effort to focus on consumer experience and opinions. Therefore, we implement CEM survey customer satisfaction with the overall service, the service attitude, the filling service, and the environment of gas station, in order to understand the customer’s feedback of our gas station services, to make progress, focus review and improvement, and optimize service quality.

### Business Diversification

Committed to leading and innovating gas station services, apart from actively transforming gas stations into “Smart Green Gas Stations”, we began business diversification to include car maintenance and carwash, product sales, horizontal alliances, and business platforms, in order to increase the service value of gas stations, provide customers with one-stop value-added services, and make gas stations friendlier, more convenient, and more elaborate. We also actively develop own-brand products, such as CPC Racing SM Motor Oil, CPC Super Concentrated Intake Valve Cleaner, See Clean Detergents, Cup & Go Café, and CPCBio (click the links below for more information about our services and products).



“Service Diversification”  
QR Code and Link



“CPCBio”  
QR Code and Link



#### Car Maintenance and Carwash:

We have 72 quick maintenance and tire centers across Taiwan to provide car owners with periodic maintenance and tire services to maintain car quality and safety and protect driving safety for drivers. In 2018, there were 280 gas stations offering carwash service.





### CPC Combinative Stores and Convenience Stores:

To fulfill the shopping demands of drivers and for them to fill the needs of their trip while filling up on petrol, we have established 126 combinative stores and convenience stores to sell general merchandise, festival gift sets and agricultural products, and own-brand product See Clean Detergents. We also run the Cup & Go Café.

Menu TIME TO DRINK COFFEE MENU CUP & GO 單品咖啡 SINGLE ORIGIN		
品項		S / M
熱美式	HOT AMERICANO	35 / 45
冰美式	ICED AMERICANO	/ 45
熱拿鐵	HOT LATTE	45 / 55
冰拿鐵	ICED LATTE	/ 55

festival gift sets and agricultural products, and own-brand product See Clean Detergents. We also run the Cup & Go Café.

In June 2018, we launched our first Cup & Go Café at the Fulin Gas Station in Taipei, selling high-quality Arabica coffee imported from Antigua Guatemala at an affordable price for car owners to buy coffee conveniently while filling up on petrol to refresh themselves.

### Horizontal Alliances and Commercial Platform:

To maximize the effectiveness of gas station functionality, we actively launch cooperation with other industries, such as multimedia ads, collection services, and electric motorcycle battery exchange.

#### See Clean Detergents



#### Biotech Skincare Products



#### Green Tech Products



### CPCBio:

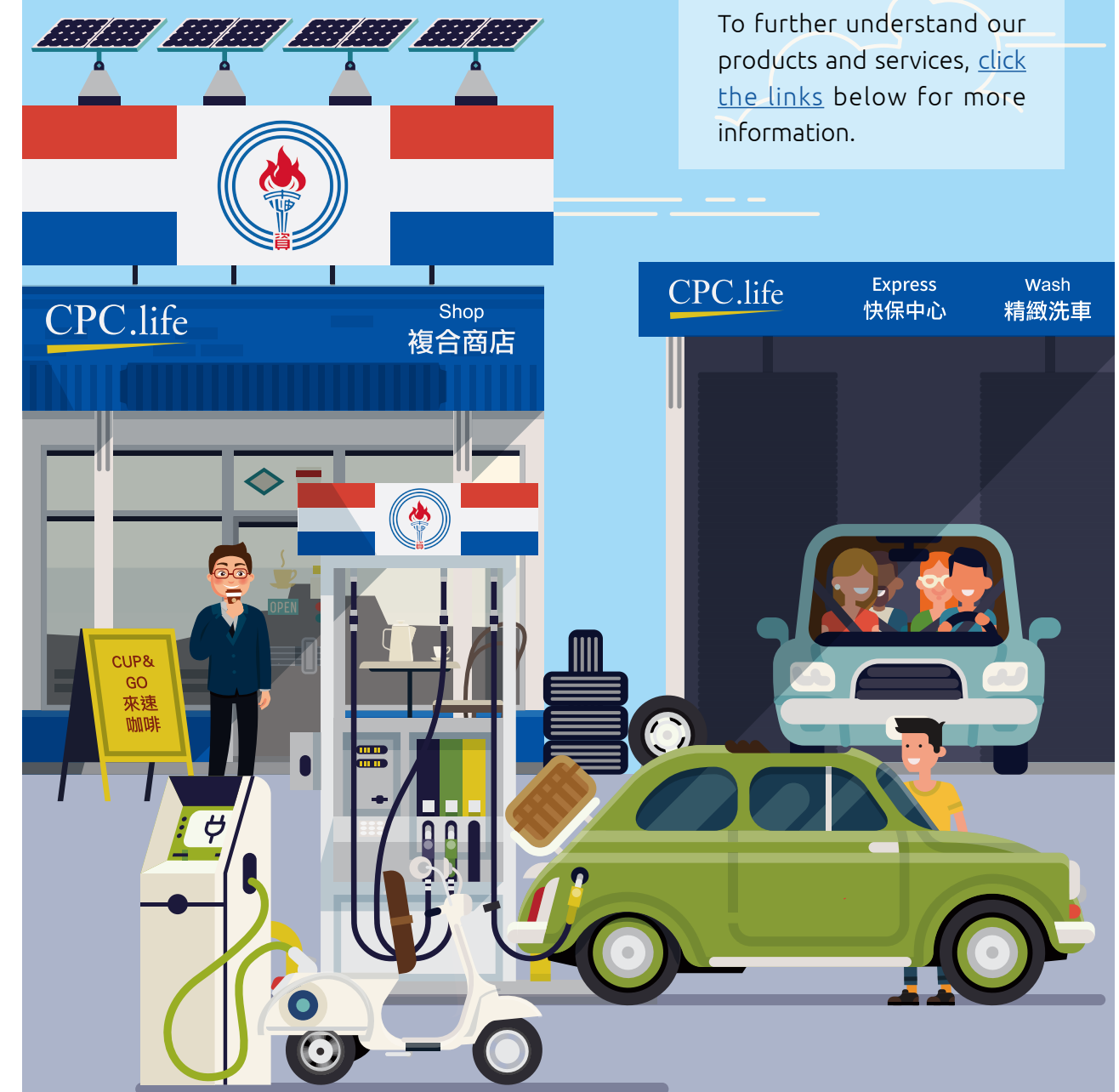
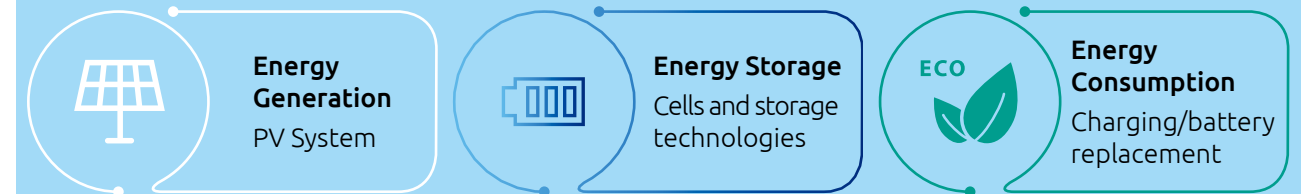
Adhering to “care, products, brand, perfection, and quality”, CPCBio hopes to bring quality assurance and health to Taiwanese society, including biotech skincare products and biotech cleaning agents sold at designated gas stations.



In November 2018, we participated in the “2018 Taiwan Healthcare Expo” to promote a range of CPC biotech products. We also hope to contribute to the beauty, health, cleanliness, and green life of people in Taiwan. In the future, we will organize related exhibitions from time to time, and citizens are welcome to join us. Please visit our website from time to time for more information.



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



### 3.4 Business Performance

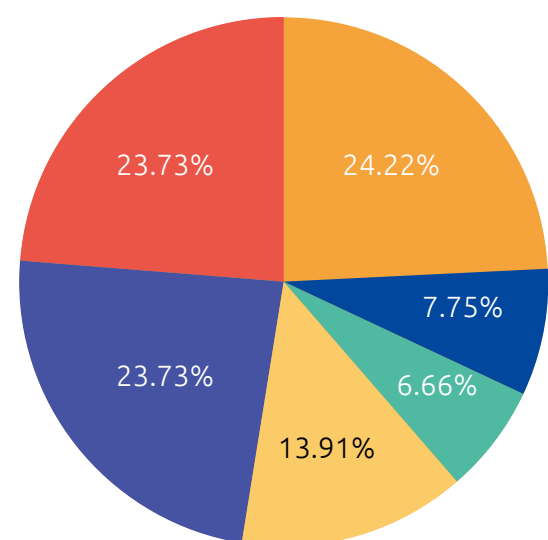
National economic development has been our mission since we were established. In 2018, our revenue rose to NT\$1.0346 trillion, up 15% from the last year, with a financial contribution to Taiwan of NT\$132.3 billion. Please refer to the [2018 CPC Annual Report](#) for more financial information.

(NT\$100 mn)

Item		Year		
		2016	2017	2018
Direct Economic Value	Revenue	7,646	8,966	10,346
Economic Value-Distributed	Operating Costs Expenses	7,252	8,459	9,889
	Employee Wages and Benefits	256	222	226
	Payment to Providers of Capital Investors	35	31	41
	Payments to Government Contribution to Public Finance	1,196	1,261	1,323
	Community Investment	3.6	3.95	3.85
Others	Net Income Before Tax	354	485	438
	Net Income	294	403	343
	Total Assets	7,414	7,450	7,695

#### Ratio of Major Products \* in 2018 Revenue

\* Note1: Including multilateral trade.

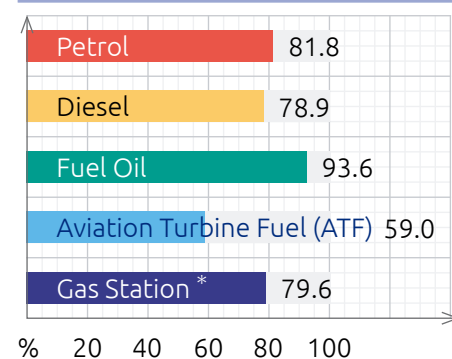


● Natural Gas Finished Product    ● Fuel Oil  
● Gasoline    ● Olefins  
● Diesel    ● Others

#### Production and Sales of Products

Type	Unit	Quantity
Crude Refining Volume	(10,000 kL)	2,221
Oil Products Total Sales (including petrochemical products and multilateral trade)	(10,000 kL)	3,466
Natural Gas Sales	(100 mn m <sup>3</sup> )	222

#### Market Share of Products and Services



\* Note 2: Including branch, franchised, and collaborative gas stations.



### Special Column 2: Public Toilet Culture

Speaking of CPC, the gas station will certainly be the first thing that comes to the mind of most people, then “public toilet” will probably be the next. Regardless of the completion of new public transport systems such as the THSR and MRT, or the convenience stores that have sprung forth like mushrooms over the last few decades, our gas stations have been and will always be the relay stations of citizens traveling across Taiwan during major folk festivals.

According to the World Toilet Organization (WTO), a UN-accredited NPO, every person is entitled to use clean toilets, females will overlook sanitation after prolonged use of messy toilets in their puberty, and the right to use toilets of people with disabilities is almost globally ignored.

According to a WTO survey, about one billion people in the world are still deprived from covered and indoor toileting environments, and over three billion people do not have clean toilets to use. Therefore, they hope to eliminate diseases caused by environments of poor sanitation, eradicate poverty, and end backwardness. As early as in 2003, when CPC was chaired by Jin-cai Guo, we began to implement the “Public Toilet Re-Engineering Program”. A neat and tidy public toilet represents the major part of the service quality of our gas stations. Therefore, we must do the best in every detail. “Clean, dry, and odorless” are basic requirements of the public toilet. Employees are required to check all public toilets hourly to achieve hotel-grade toilet management. In addition to there being neither dirt nor mud, toilet paper and sanitary napkins for women must be in place, and a comfortable toileting space greened with potted plants is maintained for customers to feel absolutely relaxed while toileting.



The Dazhi Gas Station was 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 will not need to participate in the evaluation from December 2018 to November 2021.



The spacious and independent public toilets at the Suao Gas Station are horticultural and always full on holidays.

Upholding the spirit of “quality, service, and social contribution”, we have made continual improvement over the years to maintain brand image and service competitiveness. For example, we have organized the “Public Toilet Culture Forum”, “Neat and Tidy Week”, and the “Chairman Leads’ Toilet Cleanup”. In Taiwan, we have about 2,000 gas stations, including branches and franchises, making the public toilet the first impression and icon of gas stations.

Since 2017, we have installed 592 accessible





gas stations to reduce odor and user contact and further reduce bacterial infection. Along with the remodeling of old public toilets and equipment with toilet seat covers, we invested a total of about NT\$160 million in 2018. While maintaining the rights and benefits of customers and offering top-quality services, we never forget sustainability concepts including urban greening, water conservation, and waste reduction.

For example, we installed special ceramic wall boards that are dirt resistant, mold resistant, easy to clean, antibacterial, and deodorizing using nano-photocatalysis in the Dazhi gas Station to make overall environmental maintenance easier.

Winning numerous outstanding gas station citations, the Suao Gas Station located at the start of Provincial Highway No. 9 (Suao-Hualien Highway), servicing public, tourists and truck drivers for years, has more than 20 parking spaces for saloons and public toilets occupying an area of over 50 m<sup>2</sup>, which are always full in tourist seasons. For these reasons, we have spared no effort to keep the public toilets at Suao Gas Station neat and tidy at all times. In addition to the CPC



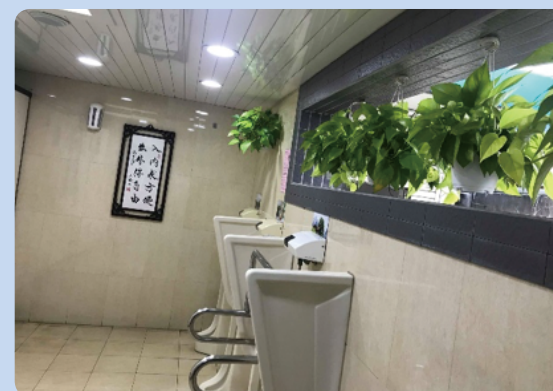
Current station manager Hong-xiang Jian added, he checks each urinal bowl, the wall surface, and each basin hands on every morning. It is his first thing in his daily routine to ensure best services for customers.

toilets in 615 branch (including collaborative) gas stations across Taiwan, progressively installed electronic bidets in gas stations, and posted slogans in response to the government's flushing toilet paper policy. We have even installed sensor waste bins in some

standard requiring half-hourly inspections and cleanup, the gas station voluntarily makes continual improvement to the station. For example, between late 2017 and early 2018, Suao Gas Station built roof windows and open wall windows for planting to facilitate ventilation for effective deodorization. From tiles, wall surfaces, to door surfaces, employees of the Suao Gas Station never give up on each corner. According to present station manager Hong-xiang Jian, examining the urinal bowl, the wall surface, and the basics is the very first thing in his daily routine, in order to put customers first.

In addition to branch gas stations, many franchised gas stations voluntarily request guidance from our local offices and invest in public toilet remodeling. For example, the Guaihua Gas Station in Kaohsiung installed ventilators and air-conditioning to remove odor and keep customers cool in hot summers while toileting. It also decorated the basins with ornamental plants to catch the customers' attention. Creating benefits with quality and service is the representation of our core spirit.

After decades of improvement and promotion, every CPC gas station participates in the public toilet evaluation/review organized by the local or central government every year. Whether it is cleanliness, service, hardware, special comfort, or accessible facilities, each is the target of investment and competition of every gas station. In the 2018 local evaluations/reviews, 416 out of 615 CPC gas stations earned a distinction and 109 of them a credit, and over 85% branch stations were awarded. In the central government evaluations/reviews, 61 gas stations were awarded the distinction medal by the EPA.



The Suao Gas Station built windows in the wall and puts plants there for ventilation, deodorization, and soul healing.



The Suao Gas Station built windows in the wall and puts plants there for ventilation, deodorization, and soul healing.



# CH4

## Engraining Taiwan: A Nurturing CPC

### Chapter Summary

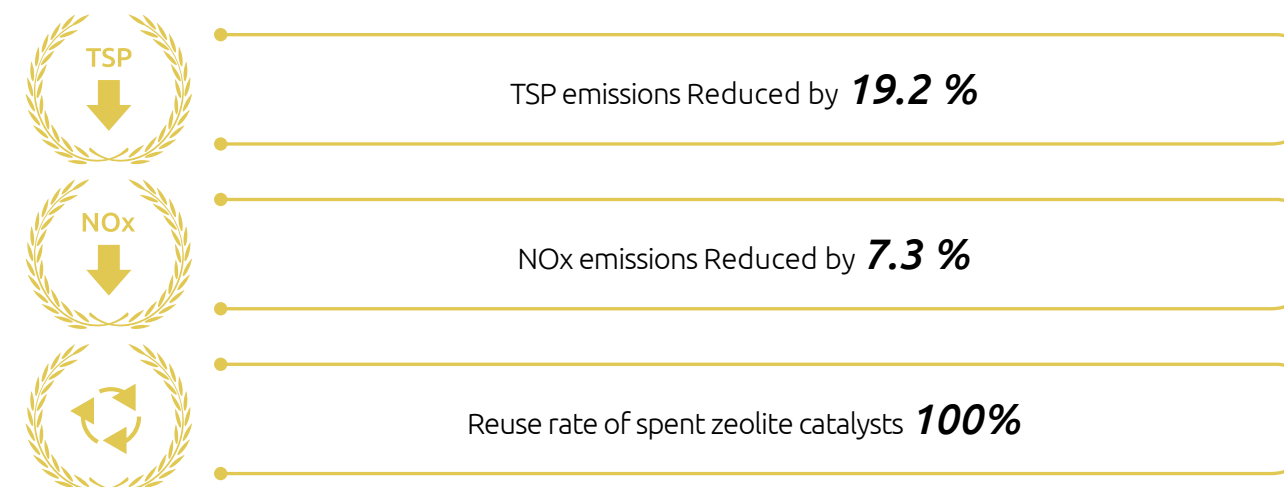
Environmental protection has always been a key topic to us, and GHG reduction is our long-standing target. Apart from setting up the environmental protection audit information management system to achieve environmental compliance, the environmental protection patrol team performs in-depth audits on the environmental control performance of each unit, and every plant proactively audits its own environmental protection performance. As a result, environmental protection fines have been reducing over the past three years.

### SDGs



### Reader Priorities

- |                      |              |
|----------------------|--------------|
| ■ Shareholder (MOEA) | ■ Government |
| □ Partners           | □ Employees  |
| ■ Legislators        | ■ Media      |
| ■ Communities        | ■ NPOs/NGOs  |
| □ Customers          |              |



## Management Approach

### Policy Commitment

1. Capture global carbon reduction trends, enhance green economic competitiveness, and establish GHG reduction target in response to national policies.
2. Capture the Risks and Opportunities from climate change and reduce operational impacts as chances for development.
3. Start effluent prevention with the source control of process wastewater and enhance effluent recycling and reuse with high-performance equipment.
4. Quantity reduction, volume reduction, and size reduction are the basic principles for waste management.

### Goals

- Short-term ➡
1. Achieve the annual GHG reduction target.
  2. Inventoried the climate risk facilities of 23 energy complexes.
  3. Enhance source management of upstream workshops, improve the quality of effluents, and increase effluent reclamation.
  4. Acquire the permit to dispose of hazardous industrial waste when incinerating hazardous industrial waste from the refinery and the petrochemical plant.
- Long-term ➡
1. Set medium- and long-term GHG reduction targets: Reduce by 20% of the 2005 emissions by 2030 for the medium run and reduce by 50% of the 2005 emissions by 2050 as specified in the "Greenhouse Gas Reduction and Management Act" for the long run. Our target is to reduce by 30% of the 2005 emissions by 2030.
  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.
  4. Upgrade wastewater treatment equipment and reclaim effluents for reuse and build a waste soil ex-site treatment organization.



Specific Actions

1. Implement stage one GHG control of at the energy and manufacturing sectors based on the corporate strategy, implement process improvement projects and energy management products to continuously reduce GHG emissions.
2. Periodically inventory climate risks and opportunities, such as establishing the risk management organization, and assess such risks and opportunities with the resources of the climate change mitigation platform in the energy sector.
3. Participate in the “Climate Change Adaptation Strategy and Guidance for the Energy Sector” program of the Bureau of Energy.
4. Review and revise the waste management SOP to ensure the compliance of waste disposal practices.

Measurement Mechanisms

Set annual targets for energy conservation, carbon reduction, and waste reduction, and follow up and review them at least two to four times a year.

Environmental protection policy

Pollution prevention

Energy conservation and waste reduction

Environmental sustainability

Recognizing 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.

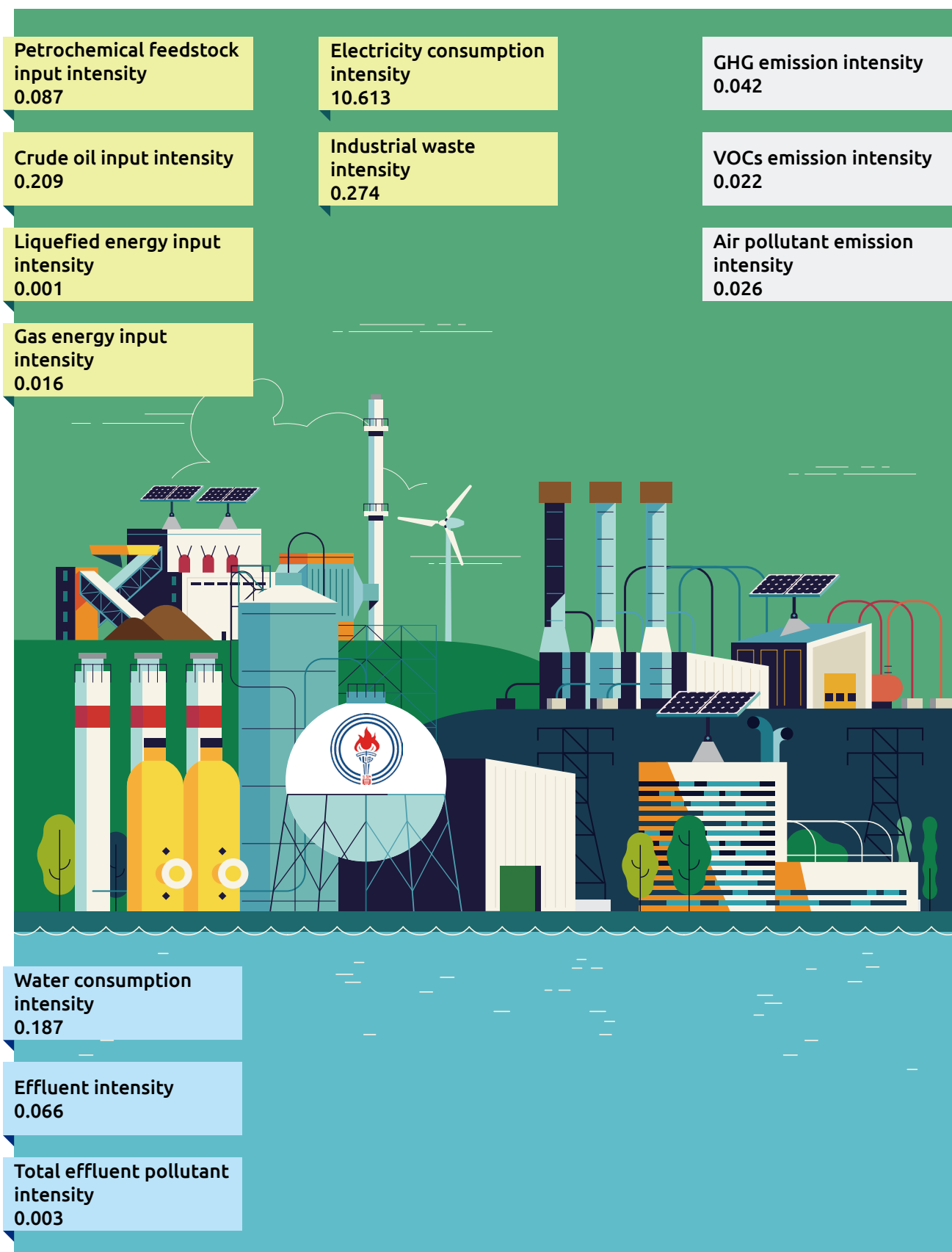
(expressed in NT\$ ten thousands)

Environmental protection expenses	2016	2017	2018
Company operating cost <sup>1</sup>	177,483	155,274	300,896
Supplier and customer cost <sup>2</sup>	1,971	1,386	3,171
Management activity cost <sup>3</sup>	24,594	20,184	29,496
R&D cost <sup>4</sup>	28,036	28,307	10,868
Social activity cost <sup>5</sup>	13,632	11,103	15,915
Loss and compensation cost <sup>6</sup>	98	3,022	2,010
Fees and taxes <sup>7</sup>	287,148	310,347	439,047
<b>Total</b>	<b>532,962</b>	<b>529,623</b>	<b>801,403</b>

- Note 1: Expenditure on pollution prevention expenditure, 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, government-defined air pollution, soil pollution, water pollution and other fees.
- Note 4: Expenditure on products researched and developed for environmental protection and expenditure on research to reduce environmental impacts at the product sales stage, and expenditure on environmental impact assessment.
- Note 5: Expenditure on nature conservation, afforestation, landscaping and other environmental improvements, and 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



Indicator	2016	2017	2018
<b>1. Petrochemical feedstock input intensity</b> petrochemical feedstock input (kL) <sup>1</sup> /petrochemical output (kL) <sup>1</sup>	0.068	0.089	0.087
<b>2. Crude oil input intensity</b> crude oil input (kL)/equivalent distillation capacity(EDC) for refinery (kL) <sup>2</sup>	0.201	0.201	0.209
<b>3. Liquefied energy input intensity</b> liquidized energy input (kL) <sup>3</sup> /(EDC for refinery + petrochemical output) (kL)	0.002	0.001	0.001
<b>4. Gas energy input intensity</b> gasified energy input (km <sup>3</sup> ) <sup>4</sup> /(EDC for refinery + petrochemical output) (kL)	0.016	0.015	0.016
<b>5. Water consumption intensity</b> Water consumption (km <sup>3</sup> )/(EDC for refinery + petrochemical output) (kL)	0.194	0.199	0.187
<b>6. Electricity consumption intensity</b> Electricity consumption (kWh)/(EDC for refinery + petrochemical production) (kL)	10.432	10.955	10.613
<b>7. GHG emission intensity</b> tonnes of carbon dioxide equivalent (tCO <sub>2</sub> e)/(EDC for refinery + petrochemical production) (kL)	0.044	0.044	0.042 <sup>5</sup>
<b>8. Industrial waste intensity</b> waste (kg)/(EDC for refinery + petrochemical output) (kL)	0.340	0.332	0.274
<b>9. Effluent intensity</b> effluents (t)/ (EDC for refinery + petrochemical output) (kL)	0.070	0.067	0.066
<b>10. Total effluent pollutant intensity</b> total effluent pollutants (kg) <sup>6</sup> /(EDC for refinery + petrochemical output) (kL)	0.003	0.004	0.003
<b>11. VOCs emission intensity</b> VOCs emissions (kg)/(EDC for refinery + petrochemical output) (kL)	0.027	0.028	0.022
<b>12. Air pollutant emission intensity</b> air pollutant emissions (kg) <sup>7</sup> / (EDC for refinery + petrochemical output) (kL)	0.027	0.026	0.026

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

Note 2: EDC: Standardized total amount equivalent 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: The initial estimated value is 0.042 Third party verification is to be completed by the end of August.

Note 6: Total effluent pollutants = total amount of (COD+SS+Oil) in effluents.

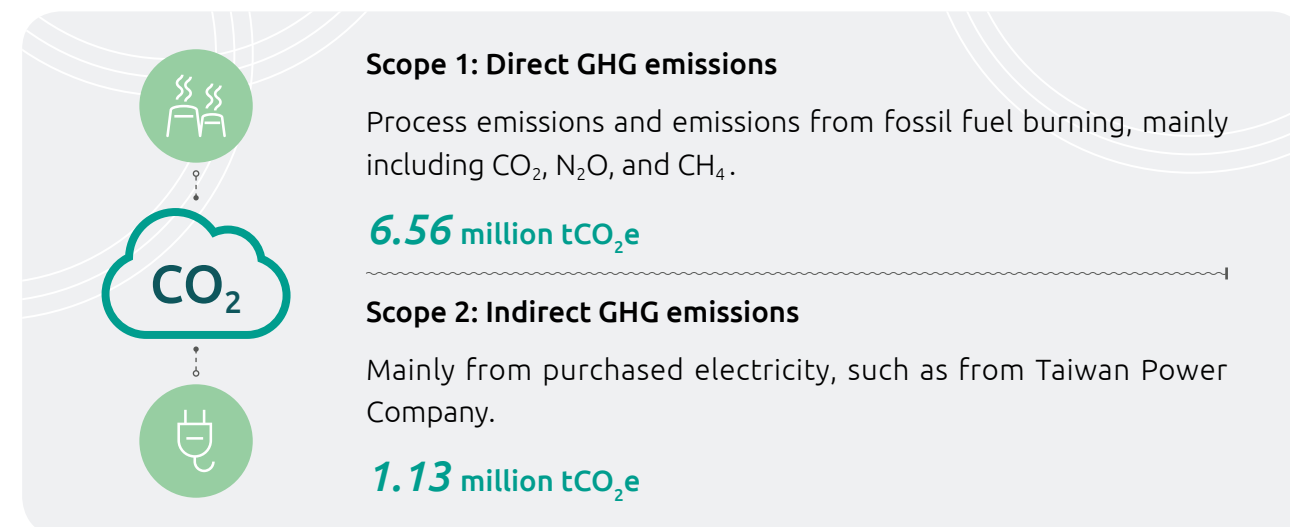
Note 7: Air pollutant emissions = total amount of (SOx + NOx + TSP).



## 4.1 GHG Management

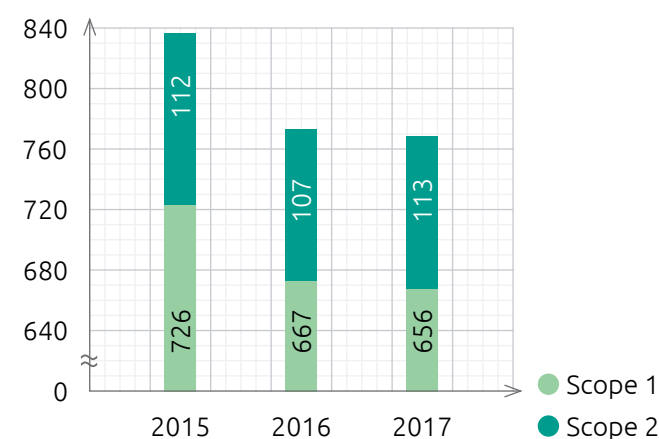
In response to the national long-term GHG reduction goal, we implemented the ISO 14064-1 GHG inventory system in 2004 to inventory the GHG emissions of the related units. Results approved by third-party verification are used to set the GHG reduction targets and implement GHG management programs, in order to reduce GHG emissions each year. In addition, we register the GHG inventory results on the “National Greenhouse Gases 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. Compared to that of 2016, the total emissions of scopes I and II in 2017 was 50,000 tCO<sub>2</sub>e less. The 2018 GHG emissions will be announced after every unit completes third-party verification in July 2019.



**Total amount of CPC GHG emissions in recent years**

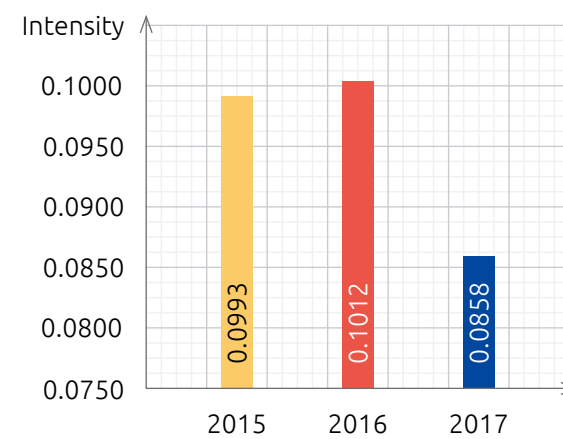
(Unit: ten thousands tons)



Note: The boundary of GHG inventory covered 21 units, including all refineries and Linyuan Petrochemical Complex.

**GHG emissions intensity**

(Unit: tons/NT\$ hundred millions)



Note: GHG intensity = Annual GHG Emissions / Annual Revenue.

In recent years, we have been reducing GHG emissions through process improvement and equipment upgrading and renewal. Every year we follow up and review the GHG emissions of each plant and related management approaches. Between 2005 and 2018, the accumulative reduction was 856,000 kiloliters of oil equivalent (KLOE), approximating to 2.549 million tCO<sub>2</sub>e, and the unit energy consumption of each major production plant also reduced.

**Major Energy Conservation Measures and Performance in 2005-2018**

Major Energy Conservation Measures	Reduction (KLOE)	Performance (NT\$ ten thousands)	tCO <sub>2</sub> e (tons)
Process Equipment Renewal	250,089	353,587	760,412
Equipment Repair/Improvement	136,238	199,057	413,137
Waste Heat and Fuel Gas Recovery	234,067	379,554	719,837
Operation Improvement	87,768	237,594	267,402
Other Improvements in Energy Management	147,349	221,023	388,633
<b>Total</b>	<b>855,510</b>	<b>1,390,815</b>	<b>2,549,421</b>

In addition, we implemented the “Refinery Performance Enhancement Program”. In the “GHG Emission Control Action Plan” (phase I) for the energy and manufacturing sectors, we proposed the “Refinery Performance Enhancement Program” and “Petrochemical Plant Performance Enhancement Program” respectively. Currently, the expected GHG reduction of phase I (2018-2020) is 105,500 tCO<sub>2</sub>e and 51,000 tCO<sub>2</sub>e respectively.

**Energy Sector Phase I Action Plan**

Program	Duration	Expected benefits	Outcomes
Low-Carbon Energy (Natural Gas) Supply Boost Program	2018-2020	Expected 2020 natural gas handling is 16.50 million tons	2018 natural gas handling was 16 million tons
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 discharge algae culture technology	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 2. The culture technology has been patented

Program	Duration	Expected benefits	Outcomes
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	The 2018 expected carbon reduction of refineries was 27,300 tCO <sub>2</sub> e

#### Manufacturing Sector Phase I Action Plan

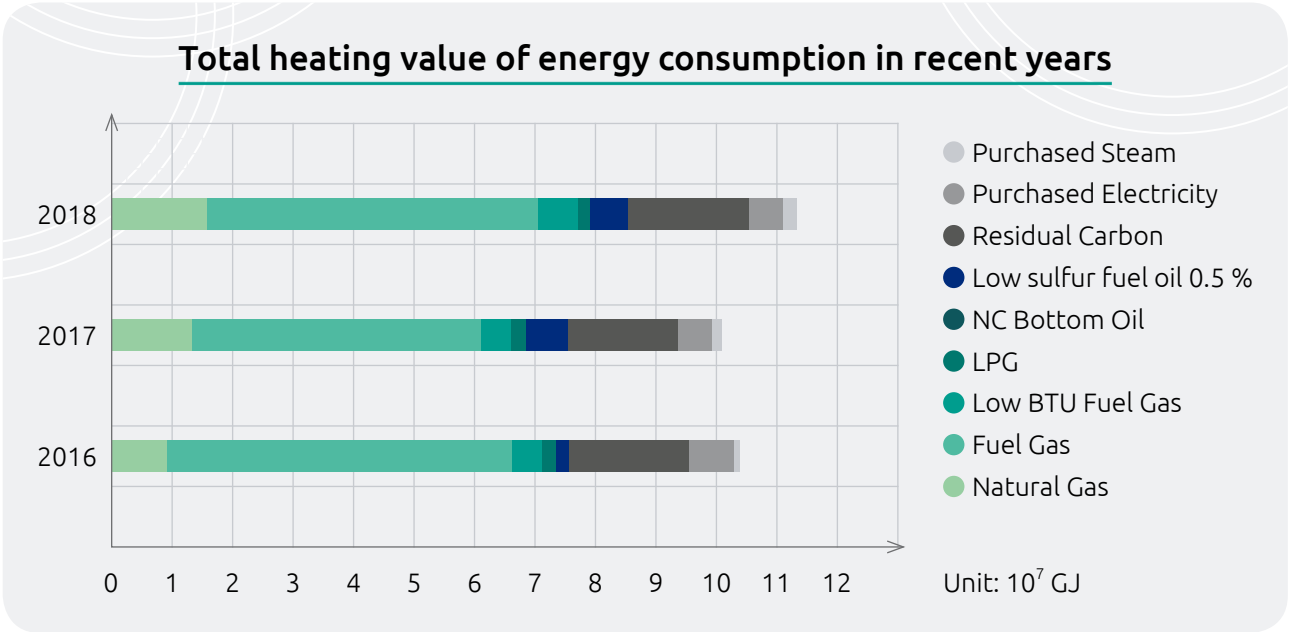
Program	Duration	Expected benefits	Outcomes
Promote fuel replacement with natural gas for the manufacturing sector	2018-2020	Guidance for 10 fuel-consuming manufacturers to replace fuel with natural gas each year	Guided 28 fuel-consuming manufacturers to replace fuel with natural gas in 2018
Petrochemical 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	The 2018 energy efficiency enhancement of petrochemical plants was 0.62% (approx. reduction of 13,700 tCO <sub>2</sub> e)

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 carbon reduction performance follow-up meetings, we keep track on implementation to exact carbon reduction in the energy and manufacturing sectors. With respect to the “Regulations for Setting Energy Conservation Targets and Implementation Plants of Energy Users” promulgated by the Bureau of Energy on August 1<sup>st</sup>, 2014, we constantly implement plant and factory energy conservation by replacing energy-efficient lighting to save over 1% of electricity on average every year.

## 4.2 Energy and Resources Management

### 4.2.1 Energy consumption

We consume electricity, natural gas, steam, fuel gas, petroleum gas, and fuel oils. The total 2018 energy consumption was 11.29x10<sup>7</sup> GJ, with the highest heating value from fuel gas. In addition, the 2018 renewal energy output of our gas station PV systems totaled 4.782 million kWh (mainly sold to Taiwan Power Company). The 2018 output of own production was about 180.379 million kL, with energy intensity at 0.626 GJ/kL, about 4.3% higher than that of 2017 at 0.6 GJ/kL. As shown in the data, after energy conservation and carbon reduction programs are implemented, the unit product energy consumption has been stabilized.



#### Refinery energy consumption

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

Year		2016	2017	2018
Direct energy consumption	Natural gas	0.92	1.30	1.63
	Fuel gas	5.68	4.85	5.56
	Low BTU fuel gas	0.52	0.53	0.51
	LPG	0.15	0.16	0.20
	NC bottom oil	-	-	-
	Low sulfur fuel oil 0.5 %	0.49	0.74	0.62
	Carbon residue	2.00	1.80	2.02
	Total heating value	9.76	9.38	10.54
Indirect energy consumption	Purchased electricity	0.55	0.56	0.56
	Purchased steam	0.05	0.10	0.19
	Total heating value purchased	0.60	0.65	0.75
Gross heating value		10.36	10.03	11.29

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 860 Kkcal/MWH (9) purchased steam of 724Kkcal/TON



## 4.2.2 Water consumption

Water supply in Taiwan has been unstable in recent years as a result of extreme climate change. When engaging in production activities, therefore, we spare no effort to save water, reclaim water for reuse, and discharge effluents properly. Water for Dalin Refinery is purchased from Fengshan Reservoir and its groundwater wells (Daliao Water Supply Station). Water for Linyuan Petrochemical Complex is purchased from Fengshan Reservoir. Water for Taoyuan Refinery is purchased from Shimen Reservoir and its groundwater wells. As all water consumption plans are assessed and

2016			
	Groundwater (well water)	Runoff (tap water irrigation system water)	Total
<b>Dalin Refinery</b>	0	12,953	12,953
<b>Taoyuan Refinery</b>	625	5,927	6,552
<b>Linyuan Petrochemical Complex</b>	0	12,719	12,719
<b>Total</b>	<b>625</b>	<b>31,599</b>	<b>32,224</b>

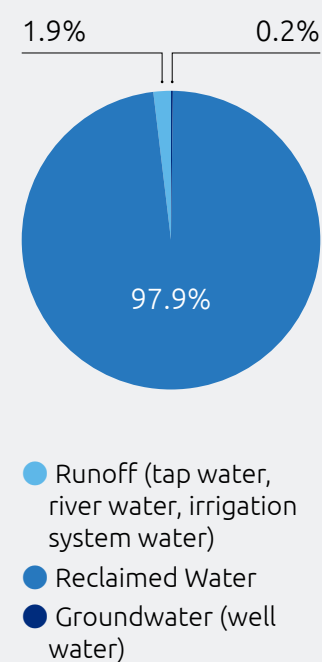
approved by the Taiwan Water Corporation and the Water Resources Agency in advance for water supply influence, water used in our production activities will not cause significant influence on water supply. Water for Kaohsiung Refinery mainly comes from Daliao Water Supply Station. We perform related tests biannually by means of dual verification (by ourselves and by a third-party unit) to measure and monitor commissions independent and impartial units to conduct double verification every six months to analyze the elevation change trend of the measurement and monitoring points. The monitoring reports of 2015 to 2018 show that no significant subsidence is noted around the Daliao Water Supply Station.

Unit: thousands tons

2017			2018		
Groundwater (well water)	Runoff (tap water irrigation system water)	Total	Groundwater (well water)	Runoff (tap water irrigation system water)	Total
0	13,355	13,355	1,406	11,984	13,390
816	6,221	7,037	665	5,898	6,563
0	13,066	13,066	0	13,466	13,466
<b>816</b>	<b>32,642</b>	<b>33,458</b>	<b>2,071</b>	<b>31,348</b>	<b>33,419</b>

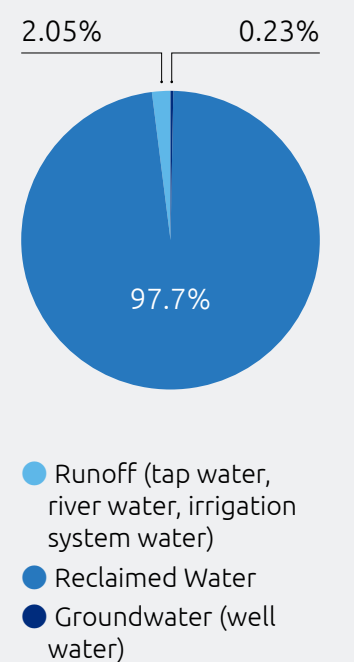
Plant	(expressed in thousand tons)		Year		
			2016	2017	2018
Dalin Refinery	Total water demand		631,843	669,343	639,930
	Runoff (tap water, river water, irrigation system water)	Consumption	12,953	13,355	11,984
		Proportion	2.05%	2.00%	1.87%
	Groundwater (well water)	Consumption	0	0	1,406
		Proportion	0	0	0.22%
	Reclaimed Water	Stormwater	69	114	90
		Process Wastewater (Reclaimed volume of effluent reclamation equipment)	0	305	986
		Others (including cooling water circulation, condensate reclamation, acidic water reclamation, and backwash water reclamation)	618,821	655,569	625,464
		Total reclamation	618,890	655,988	626,540
		Proportion	97.95%	98.00%	97.91%

### Water consumption in Dalin refinery in 2018



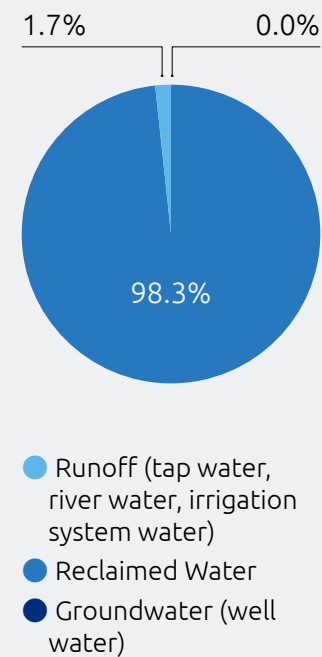
Plant	(expressed in thousand tons)		Year		
			2016	2017	2018
Taoyuan Refinery	Total water demand		294,729	281,732	288,106
	Runoff (tap water, river water, irrigation system water)	Consumption	5,927	6,221	5,898
		Proportion	2.01%	2.21%	2.05%
	Groundwater (well water)	Consumption	625	816	665
		Proportion	0.21%	0.29%	0.23%
	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)	288,177	274,695	281,544
		Total reclamation	288,177	274,695	281,544
		Proportion	97.78%	97.50%	97.72%

### Water consumption in Taoyuan refinery in 2018



Plant	(expressed in thousand tons)		Year		
			2016	2017	2018
Linyuan Petrochemical Complex	Total water demand		830,276	766,852	815,568
	Runoff (tap water, river water, irrigation system water)	Consumption	12,719	13,066	13,466
		Proportion	1.53%	1.70%	1.65%
	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)	871	731	774
		Others (including cooling water circulation, condensate reclamation, acidic water reclamation, and backwash water reclamation)	816,687	753,054	801,328
		Total reclamation	817,558	753,786	802,102
		Proportion	98.47%	98.30%	98.35%

#### Water consumption in Linyuan petrochemical in 2018



### 4.2.3 Water 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. In 2018, the reclaimed water consumption of all facilities was 0.03% higher than that of 2017. In addition, we actively implement process water reclamation and reuse and a range of water conservation and effluent reclamation and reuse measures.

#### Water conservation and effluent reclamation and reuse measures of our facilities

Program	Description
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

#### Water conservation and effluent reclamation and reuse measures of our facilities

Program	Description
Improve boiler water quality	Produce water with pure/ultrapure water equipment to increase water intake and reduce effluent in cycle. Treat raw water with electrodialysis 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 improve intake water quality
Improve water for fire-fighting	Stagnant water for fire-fighting is prone to deteriorate. Flushing water surface with backwash water for fire-fighting 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. Reclaim condensate to the water tower with solenoid valves, reclaim low-pressure steam with the de-aerating feed tank to recover heat energy and reclaim condensate
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

	Unit	Dalin Refinery	Taoyuan Refinery	Linyuan Petrochemical Complex	Total
2016	Raw Water Replenished (in thousand tons) (A)	12,953	6,552	12,719	32,224
	Reclaimed Water Volume (in thousand tons) (B)	618,890	288,177	817,558	1,724,625
	Water Reclamation Rate (B ÷ [A+B])	97.95%	97.78%	98.47%	98.17%
2017	Raw Water Replenished (in thousand tons) (A)	13,355	7,037	13,066	33,458
	Reclaimed Water Volume (in thousand tons) (B)	655,988	274,695	753,786	1,684,469
	Water Reclamation Rate (B ÷ [A+B])	98.00%	97.50%	98.30%	98.05%
2018	Raw Water Replenished (in thousand tons) (A)	13,390	6,562	13,466	33,418
	Reclaimed Water Volume (in thousand tons) (B)	626,540	281,544	802,102	1,710,186
	Water Reclamation Rate (B ÷ [A+B])	97.91%	97.72%	98.35%	98.08%

Note: 1. Raw Water Replenished: Surface water and groundwater.

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



In addition, Kaohsiung Linhai Reclaimed Water Treatment Plant will be completed in 2021 and start water supply in 2022. Dalin Refinery will purchase 10,000 tons of reclaimed water from the plant on a daily basis.

### 4.3 Risks and Opportunities From Climate Change

In 2015, the “Paris Agreement” and Taiwan’s “Greenhouse Gas Reduction and Management Act” were enacted, suggesting that climate change has been an ongoing concern to Taiwan and the whole world. Climate change also brings direct or indirect effects to our oil supply and cost, energy demand change, and potential loss from investment; and direct impacts to energy supply facilities, such as the refining, transportation, distribution, and storage facilities of oil, and the infrastructure for transportation, receiving, and distribution of natural gas. Responsible for stabilizing domestic energy supply, it is our duty to ensure climate risk management to provide citizens with an environment for living and working in peace.

With respect to the CDP climate change questionnaire, we inventory our climate risks and opportunities in terms of transformational risks (policy, laws and regulations, and market) and physical risks (acute and chronic). Since 2015, we signed up to the climate change questionnaire project of the CDP and received a D for disclosure in 2015/16, C in 2017, and was promoted a big step forward to B in 2018.

#### Climate change risks

	Aspect	Item	Impact on CPC	Countermeasures
Transformational risks	Policies and laws	Cap and trade	Limit GHG emissions of our production facilities to increase operating costs	Aggressive carbon reduction and industrial upgrading
		Government’s subsidization of electric motorcycle procurement	Government’ s active assistance for EV industry development will lead to a sales and revenue reduction of oil products	Actively transform gas stations into green energy station by setting up charging and battery replacement points and investing in battery materials R&D
	Market	Rise of global environmental protection awareness.	Replacement of boiler fuel from fuel oil with natural gas to reduction of fuel oil sales channels	Raise the export sales of fuel oil
Physical risks	Acute	Heavy rainfall events	Flooding events due to untimely drainage	Increase pressure water pumps
		Droughts	Loss from output reduction or boiler shutdown as a result of water rationing	1. Increase intermediate tank capacity 2. Monitor dynamic water consumption change
	Chronic	Sea level rise	Affect waterfront storage and transportation facilities	Relocate to new port areas higher than the sea level

#### Climate Change Opportunities

Aspect	Item	Impact on CPC	Countermeasures
Energy and resources integration	Promote regional energy-resources integration, such as 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	1. Purchase steam, nitrogen, and caustic soda from China Steel Corporation to reduce energy consumption 2. Sell fuel gas, nitrogen, and fuel oil, and enhance resource efficiency
Market	High-value petrochemical products	Turn process by-product oils into high-value materials	Turn specific contents of process by-product oils into high-value and daily life materials

Apart from implementing various energy conservation and carbon reduction measures and reducing GHG emissions, we plan climate adaptation and enhance self-resilience to reduce the impact of climate change.

#### Implementation strategy of climate change adaptation



##### Establishment of an energy conservation organization

✓ We began to promote energy conservation and carbon reduction measures in 2005 and hold effectiveness follow-up meetings biannually 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 convened by the deputy director of the Department of Environmental Protection and Ecological Conservation, with members from personnel in relation to utility, technology, and environmental protection of the Refining Business Division and Petrochemical Business Division, and the related research staff off the Refining & Manufacturing Research Institute and the Green Technology Research Institute. The team holds working team meetings at the plant regularly and is responsibility 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.

**Exchange with international organizations**

- ✓ Participate in the Norway - Taiwan Joint Business Council Meeting and the United Nations Framework Convention on Climate Change (UNFCCC).

**Green energy and green building**

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

**Mitigation****Enhance energy efficiency**

- ✓ Enhance the adjustment of refining and manufacturing structure and equipment renewal. 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; and control unit energy and resource consumption.

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

- ✓ Expand the storage and transportation facilities of Yongan and Taichung Port and invest in the Third LNG Terminal project.

**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 Corporation.
- ✓ LNG 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****Adaptation management**

- ✓ Green Energy Research Institute expands 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**

We sign 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 23 energy supply complexes within our refineries, natural gas terminals, gas supply centers, and oil supply centers within three years; and proposed adaption strategies for identified high-risk facilities to make improvement.

**List of Units for Risk Assessment****Natural Gas Processing Plant**

1. Taichung Natural Gas Processing Plant
2. Yongan Natural Gas Processing Plant

**Refinery**

3. Dalin Refinery
4. Taoyuan Refinery

**Oil Supply Center**

5. Keelung Oil Supply Center
6. Shimen Oil Supply Center
7. Wangtian Oil Supply Center
8. Taichung Oil Supply Center
9. Taichung Port Oil Supply Center
10. Hualien Oil Supply Center
11. Suao Oil Supply Center
12. Tainan Oil Supply Center
13. Fengde Oil Supply Center
14. Qiaotou Oil Supply Center
15. Minxiong Oil Supply Center

**Gas Supply Center**

16. Taipei Gas Supply Center
17. Taoyuan Gas Supply Center
18. Hsinchu Gas Supply Center
19. Miaoli Gas Supply Center
20. Taichung Gas Supply Center
21. Chiayi Gas Supply Center
22. Tainan Gas Supply Center
23. Kaohsiung Gas Supply Center

In 2018 we inventoried 1,611 operational facilities in four gas supply centers and four oil supply centers, with 38 identified as high-risk facilities. We will complete adaptation measures in 2019 to reduce risks.

Establish the Climate Change Adaptation organization

Define the range of Climate Change Adaptation

Create a list for architectures & facilities

Use system build-in disaster potentials map to analyse the weak point and risks of facilities.

Create the related parameters for architectures & facilities (such as, Coordinates, ground height, facility height, wind resistance design, sewer design, waterproof facility design, repair time, and so on.)

Obtain the Risk Matrix for refineries (5X5)

According to the risk adaption principles to propose strategies



## 4.4 Effluents and Waste Management

### 4.4.1 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 2018, soil conditioner was added to the domestic water-based waste mud generated by three onshore drillings (Xinying No. 8 well, Chuhaungkeng Mine No. 124 well, and Chuhaungkeng Mine No. 138 well) remove moisture to below 80%. After passing the dissolution test, it was commissioned to qualified disposal agents for landfill. The disposing volume was 761.07 tons, 236.95 tons, and 216.25 tons respectively. The total volume of water-based waste mud was 1,214.27 tons.

#### Volume and Method of Waste Disposal of Refineries and Petrochemical Plants in 2018

Type	Method	Volume (ton)	Ratio (%)	Waste (ton)	Ratio (%)
<b>Hazardous Waste</b>	Solidification	715.739	0.783	2,097.588	2.295
	Waste	44.660	0.049		
	Incineration	1,336.489	1.462		
	Offshore Treatment	0.700	0.001		
<b>Non-Hazardous Waste</b>	Chemical Treatment	3,393.570	3.712	89,313.421	97.705
	Non-Hazardous Waste	4.200	0.005		
	Physical Treatment	6,989.694	7.646		
	Recycling	53,791.320	58.846		
	Landfill	6,704.111	7.334		
	Incineration	17,892.826	19.574		
	Off-Site Effluent Treatment Facilities	4.180	0.005		
	Thermal Treatment (except for incineration)	533.520	0.584		
<b>Total</b>		<b>91,411.009</b>	<b>100.000</b>		

If waste has a market value or if government agencies announce that it should be recycled and reused, we will make every effort to promote the recovery and reuse of waste. In 2018, the residue fluid catalytic cracking (RFCC) spent zeolite catalyst was the main recycled and reused material, with a 100% reuse rate.

### 4.4.2 Management of hazardous 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 one 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.

In addition, all relevant units participate in the nationwide toxic chemical substance joint prevention organization in accordance with Article 38 the "Toxic Chemical Substances Control Act" and Article 7 of its Enforcement Rules. In addition, we complete the stage 1 registration of a total of 154 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.



The 2018 emergency response drill of toxic chemical disasters of Linyuan Petrochemical Complex.



### 4.4.3 Effluents management

We treat wastewater of all major production facilities is 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

- ✓ Implement water pollution preventive measures planning, and apply for approval of bypass and dilution to environmental protection authorities.
- ✓ Implement contingency measures and report to competent authorities for waster body contamination due to negligence.
- ✓ Enhance source management of upstream workshops, improve the quality of effluents, and increase effluent reclamation.
- ✓ Enhance patrol, inspection, and emergency response drill of storage tanks and transportation equipment.
- ✓ Encourage employees to obtain related licenses and certificates and participate in professional training.
- ✓ 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 2018, the effluent monitoring values of all production facilities met the effluent standards, and the total wastewater volume was lower than that of 2017. 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.

Test Item	Effluent Standard or Control Standard	2016	2017	2018
SS (mg/l)	100	15.65	13.8	12
COD(mg/l)	280	73.08	78.6	45.4
Oil (mg/l)	20	2	2.8	<1
Phenol (mg/l)	1.0	0.0279	0.02	0.005
Discharge (tons)	-	4,176,576	3,612,464	3,415,819

Note: Wastewater (discharge): Refer to the water containing pollutants produced in the process of manufacture, operation, naturel resource cultivation, or contained in the work environment.

#### (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.

Test Item	Effluent Standard or Control Standard	2016	2017	2018
SS (mg/l)	30	11	17.01	11.20
COD(mg/l)	100	27.225	20.87	19.88
Oil (mg/l)	10	1.6	2.44	8.40
Phenol (mg/l)	1.0	0.004625	<0.1	0.00485
Discharge (tons)	-	2,388,364	2,596,899	3,041,824

#### (3) Linyuan Petrochemical Complex

After primary treatment, wastewater from Linyuan Petrochemical Complex (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.

Test Item	Effluent Standard or Control Standard	2016	2017	2018
SS (mg/l)	100	6.9	4.45	5.3
COD(mg/l)	280	55	44.4	60.45
Oil (mg/l)	20	<1.0	<0.1	1.55
Phenol (mg/l)	1.0	0.011	<0.01	<0.01
Discharge (tons)	-	2,652,007	2,516,167	3,007,259

### 4.4.4 Mining formation with water production

Most domestic oil and gas mining areas are natural gas wells. When mining natural gas, condensate oil (naphtha; C<sub>5</sub>-C<sub>20</sub>) and formation water also produce. After three phase separation of oil, gas, and water, the formation associated water production will be affected by the difference in salt



content (Cl-, 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: First, after concentration, it is reinjected into the reservoir via the water production reduction well, and the injection of the water production to the reservoir can help to extract additional oil; second, after the water is treated by the treatment plant and passes the water quality inspection, it will be discharged to the river. In 2018, the total output of water production in the formation was 26,476 kL.

Region	Tiezhanshan Mine, and Jinshui Area and Qingcaohu Area of Jinqing Mine	Chuhuangkeng Mine
Treatment method	Reinjection into the formation through disposal well	Effluent
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 regulation	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
2018 Processing Volume (percentage)	13,678 kL (51.66%)	12,798 kL (48.34%)

## 4.5 Pollution Prevention

### 4.5.1 Emissions and management air pollutants

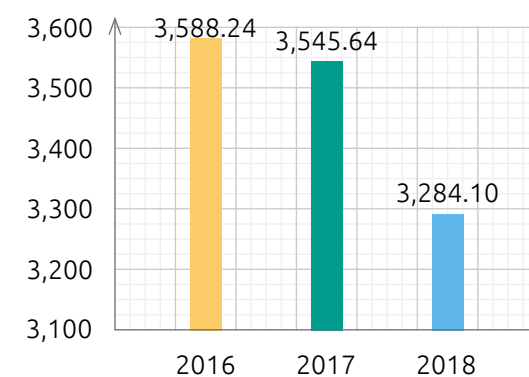
Nitrogen oxides (NOx), sulfur oxides (SOx), volatile organic compounds (VOCs), and total suspended particulates (TSP) are the major air pollutants emitted from our production facilities. They are emitted via stacks, flares, storage tanks, equipment components, and loading operation. With respect to the contents specified in the "stationary pollution source operating permit", each production facility operates and maintains stationary pollution source control facilities and perform periodic inspections. In addition, production facilities analyze and track inspection results to ensure the legal compliance of gases emitted from the facility and minimize air pollutants to reduce environmental impacts.

Type	Headquarters/Complex	Unit	2016	2017	2018
NOx	Refineries	tons	3,588.24	3,545.64	3,284.10
SOx	Refineries	tons	1,649.14	1,081.83	1,080.87
VOCs	Refineries	tons	2,079.54	2,167.73	2,200.88
TSP	Refineries	tons	223.69	269.701	217.86

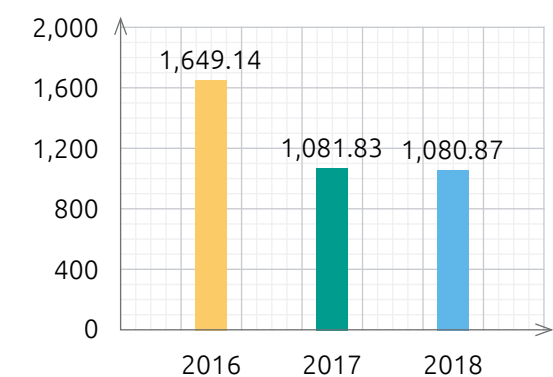
Note1: Refineries include Kaohsiung Refinery, Dalin Refinery, Taoyuan Refinery, and Linyuan Petrochemical Complex.

Note2: Volumes in 2016 and 2017 are approved volumes, and the volume of 2018 is the reported volume.

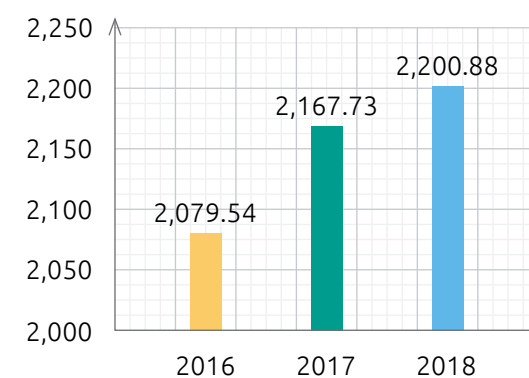
**NOx** (Unit: Ton)



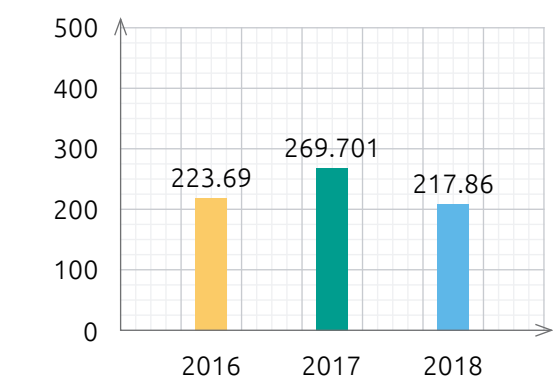
**SOx** (Unit: Ton)



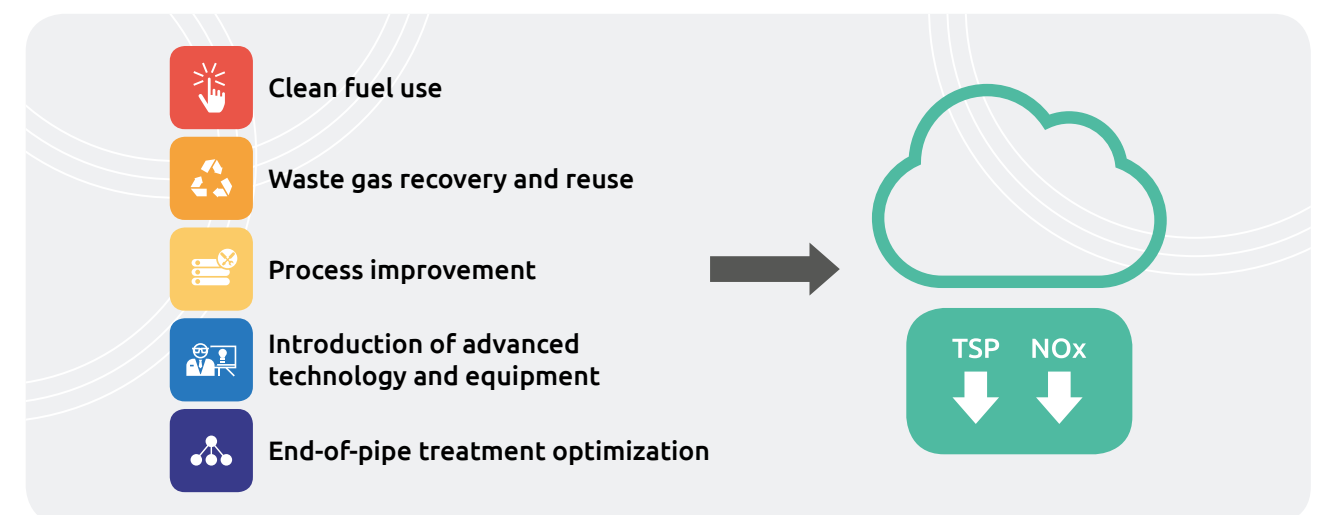
**VOCs** (Unit: Ton)



**TSP** (Unit: Ton)



Air quality has been a rising public concern in recent years. To effectively reduce air pollutant emissions, we have spared no effort to make improvements in all aspects, including clean fuel use, waste gas recovery and reuse, process improvement, the introduction of advanced technology and equipment, and end-of-pipe treatment optimization, to progressively reduce pollution emissions. Through the improvement in different aspects, we reduce NOx and SOx emissions every year, including NOx at 7.3% lower than that of 2017 and TSP at 19.2% lower than that of 2017. These results suggest that our improvements have effectively reduced air pollutant emissions.



## Air pollution control plans

We implement various air pollution control plans in response to the government policy. These plans include the oil and gas recovery equipment, improvement of air pollution control equipment, boiler catalyst renewal, replacement of fuel oil with gas fuel, equipment component renewal, and boiler renewal. Items completed in 2018 include:

### Taoyuan Refinery

SCR catalyst renewal at the Catalytic Reforming Unit II.

### Linyuan Petrochemical Complex

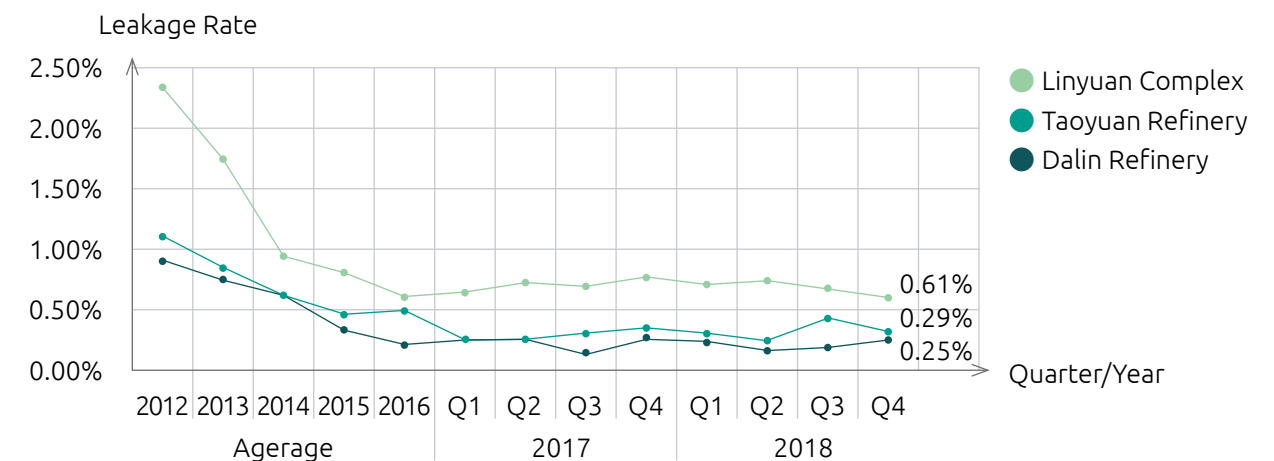
Change of boiler operation to the full gas burning mode. Renewal of anti-leakage components of the storage tank area of the Storage and Transformation Unit and the Aromatics Extraction Unit VI of Aromatics Section III.

We plan air pollution improvement projects in response to the government policy. Since 1989, we have invested over NT\$50 billion in reduction pollution and emissions. From 2017 to 2024, we will implement 41 air pollution improvement projects. After reporting to MOEA, 30 key projects will be included in the Air Pollution Control Action Plan. Air pollution reduction of refineries

- Clean fuel use:** Use fuel gas (clean fuel) for new processing units; increase gaseous fuel usage in existing units, including NG, hydrogen, LPG and fuel gas.
- Process improvement:** Improve combustion technology and enhance combustion efficiency through different practices; and adjust process parameters and operate with the optimal control parameters.
- Waste gas recovery:** Reduce process waste gas discharged to the flare; and recover waste gas after pressurization through the flare gas recovery system (FGRS).
- Installation of air pollution control equipment, such as the dust collector for capturing TSP; flue-gas desulfurization (FDG) for SO<sub>x</sub>; the low nitrogen burner (LGN) and the selective catalytic reduction (SCR) system for NO<sub>x</sub>; and oil and gas recovery for VOCs.

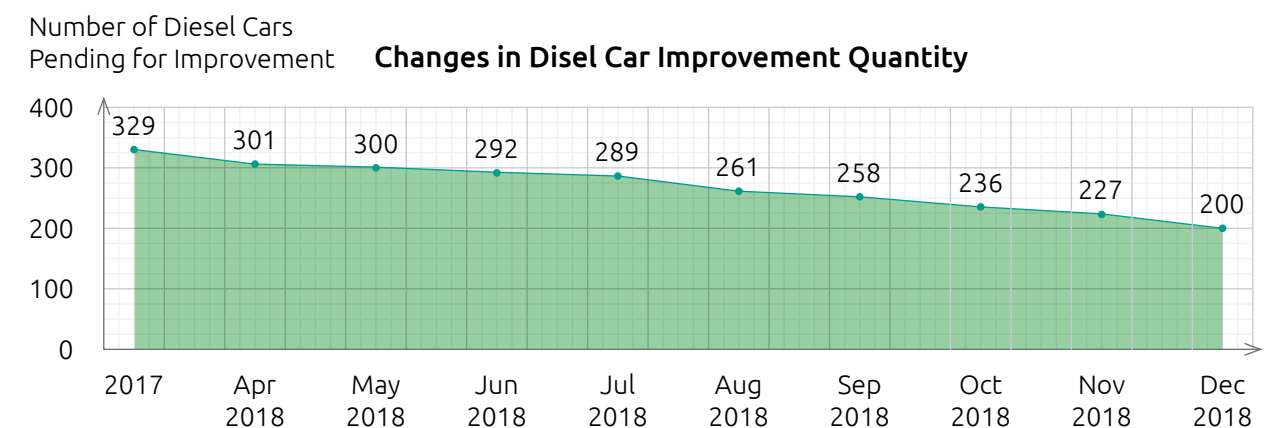
## Management and reduction of VOCs

Evaporation from equipment components is amongst the most different to control sources of VOCs. To effectively control and reduce VOCs 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 0.6%, and we are working toward our target at below 0.3%.



## Diesel Car PM<sub>2.5</sub> Emissions Reduction Program

In response to the national pollution reduction policy and to practice CSR, we have implemented the PM<sub>2.5</sub> emissions reduction working program for self-owned diesel cars and those owned by contractors. By December 2018, we have improved 129 self-owned diesel cars. In contractor diesel car control, we request contractors to comply with the standards of phases IV and V or higher in the contract.



## Cap reduction planning for Kaohsiung and Pingtung

On June 30, 2015 EPA implemented the "Air Pollutants Cap and Trade Program for Kaohsiung and Pingtung" to allocate reduction responsibilities to individual emission sources through cap control. The four types of pollutants controlled under the program include NO<sub>x</sub>, SO<sub>x</sub>, VOCs, and TSP. Phase I of the program lasted for three years, from the date of promulgation to June 30th, 2018. The designated reduction target of individual pollutant types of existing stationary pollution sources is 5% of the "cap".

Based on different control numbers, we were assigned with eight controlled units, including Kaohsiung Refinery (closed at the end of 2015), Dalin Refinery, Linyuan Petrochemical Complex,



Pollutant	Annual Cap (kg)	Target Year Emissions (kg)	Phase I Emissions in the Last 4 Quarters (kg)
Kaohsiung Refinery			
TSP	310,552	295,024	1,904
SOx	1,731,565	1,644,987	0
NOx	2,103,808	1,998,618	0
VOCs	737,171	700,312	56,443
Dalin Refinery			
TSP	205,557	195,279	100,196
SOx	1,697,857	1,612,964	546,985
NOx	3,022,994	2,871,844	1,137,132
VOCs	795,121	755,365	517,694
Wucailin Storage and Transportation Section			
VOCs	323,551	307,373	56,830
Guanyin Storage and Transportation Section			
VOCs	700,148	665,141	505,681
Linyuan Petrochemical Complex			
TSP	401,002	389,502	45,848
SOx	3,398,040	3,228,138	226,517
NOx	4,040,989	3,838,940	1,152,830
VOCs	1,537,517	1,460,641	675,483
Cianjhen Storage and Transportation Office <sup>1</sup>			
NOx	9,308	8,843	11,245
VOCs	110,037	104,535	79,392
Ciaotou Oil Supply Center <sup>2</sup>			
VOCs	148,496	141,071	158,332
Yongan LNG Refinery			
NOx	11,405	10,835	8,306
VOCs	9,334	8,867	4,384

Note: Cianjhen Storage and Transportation Office (NOx) and Ciaotou Oil Supply Center (VOCs) exceeded the target year emissions, and countermeasures have been taken as follows:

Note1: Cianjhen Storage and Transportation Office: We applied for a change of the Stationary Pollution Source Operating Permit based on the Air Pollution Control Act and acquired a quota to offset additional emissions to meet the phase I control requirements.

Note2: Ciaotou Oil Supply Center To achieve the phase I reduction target, Ciaotou Oil Supply Center applied to EPB for facility coefficient determination (oil and gas recovery equipment reduction efficiency) for a more reasonable VOC report quantity and achieve the phase I control target.

Yongan Natural Gas Refinery, Ciaotou Oil Supply Center, Cianjhen Storage and Transportation Office, and Guanyin and Wucailin oil depots of Dalin Refinery. We were required to assess and capture the condition of refining, manufacturing, transportation, storage, and air pollution over the years to apply for a “cap” to competent authorities.The “cap” will be the basis for calculating designated air pollution level in the future. Currently, we have acquired the “cap” for all eight controlled units and have started the related reduction programs to meeting with the cap reduction requirements.

### 4.5.2 Remediation of soil and groundwater contamination site

Currently, we have proposed remediation plans for the sites that have been regulated or announced for regulations. We have also performed soil and groundwater pollution investigations and improvements. In 2018, six regulated sites have been deregulated, and a total of 30 sites were delisted from control by the end of 2018.

Sites deregulated in 2018: 6		Date of deregulation
1	Luzhu Station/Taoyuan City	1/23/2018
2	Wanli Station/Tainan City	4/3/2018
3	Kaohsiung Port Terminal/Kaohsiung City	4/12/2018
4	Jiesho Station/Taoyuan City	6/4/2018
5	Wucailin Waste Landfill of Dalin Refinery/Kaohsiung City	6/20/2018
6	Guandongqiao Station/Hsinchu City	7/30/2018



#### 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 scholars and experts.
- Unregulated

✓ Enhance the monitoring function of groundwater monitoring wells, oil and gas monitoring wells, and gas station pipe leak detection system.  
✓ 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.

## Key remediation items

No.	Site	Progress
1	7 lots at Lingya district	After the 1989 oil leakage incident, we continue with slick recovery and contamination removal, and implement continual remediation with bioremediation. By April 30 <sup>th</sup> , 2019, the overall remediation progress was 82.6%.
2	CBD2 (south)	<p>Washing with clear water is the main remediation method at present, supported by bioremediation and in-situ chemical oxidation. Site remediation is in progress. By April 30, 2019, the overall remediation progress was 96%.</p> <p><b>1. Washing</b> 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.</p>  <p><b>2. Bioremediation</b> 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.</p>  <p><b>3. In-situ chemical oxidation</b> 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</p>

No.	Site	Progress
2	CBD2 (south)	<p>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 (redox).</p> <p><b>4. Ex-situ processing</b> When other methods are ineffective to treat highly contaminated soil or highly concentrated contaminated soil (sludge), we outsource treatment to qualified contractors.</p> 
3	Xinguang Community	The regulated site covers a residential area, private property, and general roads, public property. In the private property, while residents have not established a single window and reached a consensus on compensation allocation, onsite remediation has not started. In the public property, we perform soil monitoring and inject chemicals to reduce pollution regularly. By April, 30 <sup>th</sup> 2019, the overall remediation progress was 22.3%.
4	Chengkung Complex	The complex was deregulated through five zones. Zone 1 was deregulated on December 26 <sup>th</sup> , 2017, Zone 2 was announced for deregulation on January 31 <sup>st</sup> , 2018, and Zone 3 was deregulated on March 2 <sup>nd</sup> , 2018. Zone 4 passed EPB's onsite inspection on January 18 <sup>th</sup> , 2019, pending for deregulation along with Zone 5. EPB completed sampling from 20 points in Zone 5 on March 18 <sup>th</sup> -19 <sup>th</sup> , and the samples of two points failed the test. We will continue subsequent improvements after receiving the official documents. By April 25 <sup>th</sup> , 2019, the overall remediation progress was 89.65%. The deregulation of Zone 5 is expected on July 2019.
5	Kaohsiung Terminal Center	Originally, we rented the site of the Kaohsiung Terminal Center for loading and unloading oil. We shut down the operation in 1996. EPA announced the site as a soil pollution control site in 2015. Based on the approved plan, we classified soil on Cianjhen Dumping Site for treatment, filled back the site with clean earth (29,625 tons) to the Kaohsiung Intercontinental Container Terminal, and transported contaminated earth (50,998 tons) to recycling facilities for treatment, totaling 80,623 tons. In addition, we implemented bioremediation on the contaminated earth (24,475 tons) dumped at the south gate of Kaohsiung Refinery. After remediation was completed in April 2018, the site was deregulated.



In addition, when there are conflicts between soil remediation and cultural asset conservation, we handle such conflicts as follows:

**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).

**Laws and Regulations:** If the land number of the preservation site is not approved by EPB (i.e. still under regulation), the following shall be approved by EPA prior to implementation: (1) subsequent “construction of new or additional, alteration, renovation, or demolition of buildings or facilities” (Article 17, Soil and Groundwater Pollution Remediation Act) shall be approved by EPA; and (2) “excavation, backfill, temporary storage, and transport of soil or groundwater extraction” (Article 19, Soil and Groundwater Pollution Remediation Act).

**Fund and the Period:** 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.



## CH5 Join hands in Taiwan: A Embracing CPC

### Chapter Summary

Adhering to the “taking from society, contributing to society” spirit, apart from promoting energy conservation, emissions reduction, and environmental and ecological protection, we spare no effort to help local development, care for vulnerable groups, support elite athlete cultivation, maintain sound interaction with local groups and communities, and organize various charitable events. In addition to economic development and environmental protection, we aim to create social harmony in terms of “community welfare”, “care for vulnerable groups”, “charity activities”, and “energy education and publicization”.

### SDGs



### Reader Priorities

- |   |  |
|---|--|
| <input type="checkbox"/> Shareholder (MOEA)     | <input checked="" type="checkbox"/> Government |
| <input type="checkbox"/> Partners               | <input checked="" type="checkbox"/> Employees  |
| <input checked="" type="checkbox"/> Legislators | <input type="checkbox"/> Media                 |
| <input checked="" type="checkbox"/> Communities | <input type="checkbox"/> NPOs/NGOs             |
| <input checked="" type="checkbox"/> Customers   |  |



Engagement in social projects

**NTD385 million**Percentage of people with disabilities (including work-study students)  
in total employees **4.46 %**

Average training length per employee

**61 hours**

Return to work and retention rates after parental leave

**100 %**

## Management Approach

### Policy Commitment

#### Social Inclusiveness

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

#### Workplace Health and Safety

Achieve “100% safety and zero accident” through employees and contractors safety, risk management, and healthcare.

### Goals

#### Social Inclusiveness

- 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.
- 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.

### Goals

#### Workplace Health and Safety

- Short-term ➔ 1. Continue to implement CNS15506 and introduce ISO 45001 in the future to enhance professional skill training for contractors.  
2. Strengthen the learning, reporting, and investigation of accidents, periodically check if recommendations are exactly implemented.  
3. Strengthen the employee health protection system.
- 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. Develop the assessment technology for risk base inspection (RBI).

### Specific Actions

#### Social Inclusiveness

Organize various social projects, such as the “Earth Day with CPC, Forest Life in Taiwan” seedling donation, “2018 Care for the Ocean, Clean the Earth” beach cleanup, the “2018 Care Forever, Clean Earth Together”; and sponsor Taiwan elite athletes.

#### Workplace Health and Safety

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

#### Social Inclusiveness

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.

#### Workplace Health and Safety

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

## 5.1 Social Welfare

As a top-tier enterprise in Taiwan, we are also an everyday-life partner to the public. Contributing local people and local communities is thus prime concern. Apart from implement environmental and ecological protection and pollution prevention around the complex or a mine, we proactively



communicate and maintain two-way exchange with local communities to create a more harmonious commune life with them. When organizing charitable activities, we invite local residents to join us, in order to contribute to society and create sustainable value with us.

### 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 petrol stations, we are a great partner to communities. Branch gas stations are even the hub for us to demonstrate local influence. In 2018, branch gas stations organized the following charitable activities:

#### “Earth Day with CPC, Forest Life in Taiwan” seedling donation

On April 22, 2018, all 100 branched gas stations across Taiwan encourage citizens to redeem tree seedlings with uniform invoices (receipts) or waste batteries.

**Donated 20,000 seedlings in coordination with Earth Day promotion.**



#### Sales collaboration of agricultural products

**Sold 220 tons of agricultural products in 2018.**

· In recent years, we have been proactively discussing collaborative sales with local farmers' associations and local agricultural authorities.



- Sales collaboration through all 100 branched gas stations across Taiwan.
- Sold a total of 150 tons of onions, 18 tons of garlics, 4.7 tons of litchi, 18 tons of slope bananas, 18.3 tons of pineapples, and 20 tons of white cabbage (Brassica oleracea).
- Constant collaboration in selling peasant products and local specialties through CPC compound stores.



#### “Light Up Society with CPC” charitable event

- Event time: June 1-July 31, 2018
- Co-organizers: Syinlu Social Welfare Foundation Hongdao Senior Citizens' Welfare Foundation Child Welfare League Foundation During the event time, we linked up with 1,685 CPC gas stations across Taiwan to convert points accumulated by members from filling into charity for members to choose the recipients of donation, in order to give the most substantial assistance to those in need of help.



★ Accumulated 330,597 donations ★ Contributed 396,848,566 points  
★ Converted into a total of NT\$3.96 million.

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

#### “2018 Care for the Ocean, Clean the Earth” beach cleanup, the “2018 Care Forever, Clean Earth Together” mountain cleanup and hiking.



- We began organizing joint mountain cleanup and beach cleanup activities since 2013. Over the past six years, past and present chairpersons and presidents participated in these activities in person to realize the charity commitment of enterprises.
- Nearly 700 people attended the beach cleanup of Guantang, Taoyuan.
- Nearly 3,000 people participated in the mountain cleanup and hiking activities in Taipei, Taichung, Kaohsiung, and Hualien.

**Nearly 700 people participated in beach cleanup  
nearly 3,000 people participated in mountain cleanup and hiking**





### Regeneration computer donation

Promote social welfare, shorten the urban-rural digital divide, regenerate computers, and promote e-learning.

**Donated 361 regeneration computers in 2018**



### Sponsored elementary school students in remote areas, initiate green energy maker education



- On November 30, 2018, we participated in the "2018 Maker Party", Taiwan's largest parent-child DIY innovation platform.
- Theme area: Smart Green Energy Station
- Sponsored 60 students of Shueili Elementary School in Nantou to join the event in Taipei.

**Engrain green energy education from children: Smart petrol stations in the creative ideas of children**

## 5.2 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 Directors for Sponsoring and Cultivating Elite Athletes" in 2002.

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.

**Sponsored 11 individuals and six schools with a total of NTD 3.46 million in 2018 in the following sports:**

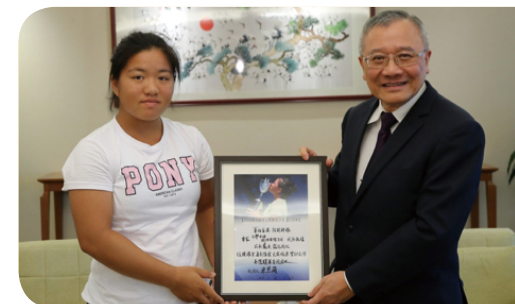
**Individual:** triathlon, table tennis, tennis, javelin, and badminton

**School:** baseball, hockey, and basketball

Fuji Elementary School in Gongguan Township, Miaoli County, sits near our Chuhuangkeng Mine. The school has a total of 116 students, and 20 of them are members of the school baseball team formed in 2015. With undesirable venues and equipment, they took the county champion in 2016 and later the champion of the lower year category, Jhu-luo Shan International Junior Baseball Tournament, in 2017.



To spread love to remote areas, we sponsored Fuji Elementary School to promote baseball, hoping to develop more sports talents for Taiwan and remind every child to find own talent and put themselves in the right place, in order to shine over the world.



In January 2018, we presented a certificate of appreciation tennis player En-shuo Liang, champion of the Women's Singles and Doubles of the Australian Open.

As their mother is a CPC employee and a member of our badminton team, badminton players Chia-hsin Lee, mixed doubles champion of the 2017 Summer Univesiade, and Chia-hao Lee have a special feeling for CPC and feel extremely proud on receiving our rewards, with which Chia-hsin Lee could participate in competitions across the world and focus on practicing to accumulate credits and power to champion the 2017 Summer Univesiade.



▲ We are awarded the "Golden Award" in sponsorship at the 2018 Sports Activist Awards.

In view of the importance of social sustainability and talent development, we support and sponsor all types of athletes and win the recognition of the athletics world upon the spirit of "the most powerful support of Taiwan's glory". In September 2018, the Ministry of Education (MOE) awarded us with the "Golden Award" in sponsorship at the "2018 Sports Activist Awards" to encourage us to help and support Taiwanese athletes to continue to shine over the international stage.



## 5.3 Human Resources

### 5.3.1 Employment

We have established well-defined employment regulations 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. In 2018, 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.

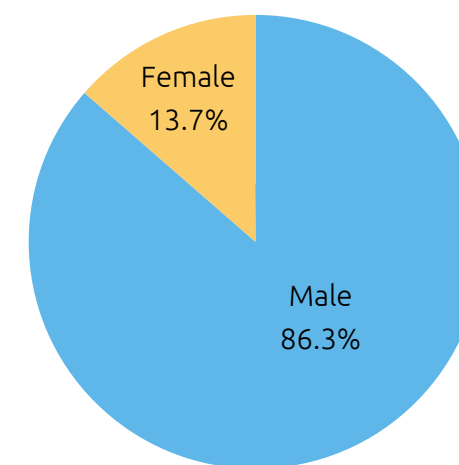
By the end of 2018, we have a total of 15,704 employees, including 15,633 direct laborers and 71 indirect laborers. Compared to the total number of 14,806 employees in 2017, there were 898 employees more in 2018 as a result of the amendment to the Labor Standards Act which postpones the retirement age by five years. As the number of retirees began to increase in 2013, we have been increasing workforce in recent years to mitigate workforce ageing and succession gap and address the “one fixed day off and one flexible rest day” policy in the amendment. At the end of 2018, the number of employees increased.

Type		Direct workers	Research staff	Support personnel	Management staff
Below 30	Male	1,335	50	194	104
	Female	190	14	80	179
30-50	Male	3,661	163	553	347
	Female	316	24	107	336
Over 50	Male	5,425	185	800	695
	Female	281	24	115	455
Total		11,208	460	1,849	2,116
Total		15,633			

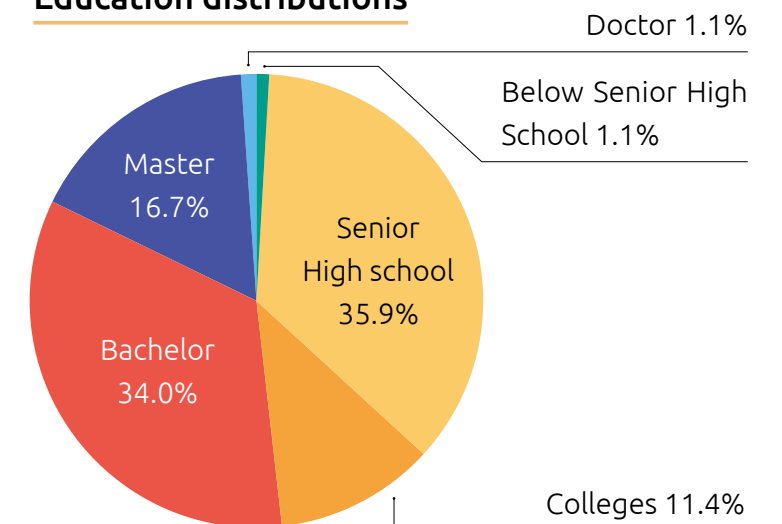
Note: All above figures do not include 71 indirect laborers (including 34 males and 37 females).

CPC is a petrochemical company, and most employees are recruited from the natural science and engineering disciplines in, which males are more than females. Therefore, the male-to-female ratio is higher, i.e. 86.3% are male employees and 13.7% are female employees. In workforce arrangement, however, we abide by the International Bill of Human Rights and domestic laws and regulations to ensure equal treatment and non-discrimination over gender. In education distribution employees graduated from senior high schools, colleges, and universities, accounting for 81.2% of total employees, and 16.7% of the employees hold master's degree.

Employee sex ratio in 2018



Education distributions



New employee recruitment is the foundation for enterprises to maintain energetic and innovative. We recruit new employees annually and recruited 1,623 new employees in 2018, accounting for 10.33% of total employees (i.e. the employment rate). In 2018, 766 employees resigned or retired with a turnover rate of 4.87%. Employees have high organizational cohesion and organizational commitment. Most of the employees work in CPC until their retirement.

Type		New employees	Employment rate	Exit employees	Turnover rate
Below 30	Male	820	5.22%	43	0.27%
	Female	173	1.10%	4	0.03%
30-50	Male	514	3.27%	42	0.27%
	Female	97	0.61%	2	0.01%
Over 50	Male	19	0.12%	629	4.01%
	Female	0	0.00%	46	0.29%
Total		1,623	10.33%	766	4.87%

By the end of 2018, the number of employees, including work-study students, totaled 17,821 persons. The number of employees with disabilities required for obligatory organizations is 517, and the actual number of employees (including work-study students) with disabilities hired was 796, with additional employment of 279 employees with disabilities. The total number of employees (including work-study students) with disabilities accounted for 4.46% of total employees. The number of employees (including work-study students) with disabilities hired by our gas stations accounted for 10.21% of all total employees of gas stations, which is way higher than the mandatory 3%.

### Range of benefits from our gas stations for work-study students

We provide complete training and education for work-study students, emphasizing training development and skill training. We also offer them various employment assistance. In addition to the mandatory requirements, our Employee Welfare Committee (EWC) provides them with NTD 1 million casualty insurance and fuel discounts.

### A friend in afar is a member of CPC.

"Welcome!" "What? There are African work-study students at CPC gas stations?" Passionate about Taiwanese culture, three Malawian students pursue higher education in Taiwan and became work-study students at our Dazhi Gas Station coincidentally. We welcome them joining us and allow them to feel the passion and friendliness of Taiwan.



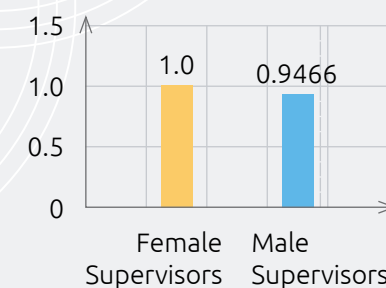
We speak Mandarin fluently and serve customers with sincerity. Besides being impressed by them, customers befriend with them. Employees of Dazhi gas Station call them the "walking attraction" of the gas station.

In gender equality for employment, CPC is the first company in Taiwan hiring female pumping staffs 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 led 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 increases year by year, and even in folds in the past five years. Apart from one female director and one female supervisor in the board of directors, we hired the first female vice president in SOE and petrochemical industry in 2016, the second in 2018, and two out of five vice presidents are female, ahead of all SOEs. In addition, 22% of chief officers are female, exceeding the 19.5% female chief officers of local governments in Taiwan, the target basic value for sustainable development.

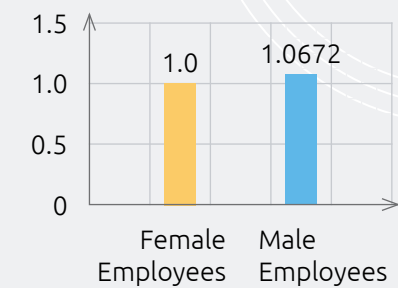
## 5.3.2 Equal remuneration and benefits

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 off Performance Rewards of State-Owned Enterprises of the Ministry of Economic Affairs". The basic wage for female and male employees at same position and grade is equal. The average annual salary ratio of female-to-male supervisors is 1:0.9466, and the average annual salary ratio of female-to-male employees is 1:1.0672. Gender equality is a focal point of our 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.

Average annual salary ratio of female-to-male supervisors



Average annual salary ratio of female-to-male employees



## 5.4 Employee development

### 5.4.1 Competitive human resources policy

To develop human resources, strengthen professional skills, and coordinate with the promotion and transfer system, we implement the selection, training, and employment to address our long-term development and to establish a well-planned human resources development framework. 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 employees with qualified work attitude and concepts. 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, foreign language education, and job transfer training. The training expense in 2018 amounted to about NTD 128 million, and we organized 3,358 training courses with 103,085 participants. In 2018, the Workforce Development Agency, Ministry of Labor, awarded the training institute with the "Training Organization Silver Medal" in the Workforce Development Quality Management System Evaluation to recognize our efforts in workforce development.



### Management workforce development framework

Training Type	Workforce Type	Supervisors			Junior Management
		Senior Management	Officers	Professional	
Management Competence 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

### 5.4.2 Well-established workforce development system

To help employees understand and get ready for their job, we plan related training courses (including probation or internship) to evaluate their performance. The followings are 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 off new employees.

**2 Months 2-6:** Introduction of the business of the service unit, professional competencies in relation to the 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 the 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.

In addition, we should set the job targets and training focus based on the company'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". In 2018, the average training length is 61 hours, eight hours more than that of 2017.

### Statistics on 2018 Training Courses

Type	Courses	Ratio	Participants					
			Male	Ratio	Female	Ratio	Total	Ratio
Supervisor training	37	1.1%	1,092	1.1%	227	0.2%	1,319	1.3%
Professional training	2,357	70.2%	54,003	52.4%	10,214	9.9%	64,217	62.3%
Second specialty training	100	3.0%	3,179	3.1%	855	0.8%	4,034	3.9%
Self-motivation training	12	0.4%	337	0.3%	146	0.1%	483	0.5%
Internal instructor training	4	0.1%	166	0.2%	82	0.1%	248	0.2%
Other training	607	18.1%	20,577	20.0%	6,980	6.8%	27,557	26.7%
Orientation training	225	6.7%	4,286	4.2%	831	0.8%	5,117	5.0%
Skill qualification training	16	0.5%	93	0.1%	16	0.02%	109	0.1%
<b>Total</b>	<b>3,358</b>	<b>100%</b>	<b>83,734</b>	<b>81.2%</b>	<b>19,351</b>	<b>18.8%</b>	<b>103,085</b>	<b>100%</b>

### Statistics on 2018 Employee Education and Training (by rank)

	Participants	Training Hours	Average Training Hours/Employee
Supervisors	1,018	57,273	56
Non-supervisors	14,750	904,862	61
<b>Total</b>	<b>15,768</b>	<b>962,135</b>	<b>61</b>

### Statistics on 2018 Employee Education and Training (by gender)

	Participants	Training Hours	Average Training Hours/Employee
Female	2,165	147,386	68
Male	13,603	814,749	60
<b>Total</b>	<b>15,768</b>	<b>962,135</b>	<b>61</b>

## 5.5 Workplace Safety

### 5.5.1 Unimpeded labor-management communication

We abide by international labor conventions and Taiwan’s Labor Union Act and ensure the freedom of association and participation in labor 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 of 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”. By the end of 2018, a total of 15,640 employees participated in the union, commanding at 99.59% of total employees (15,704). There was no report of violation of the freedom of association and collective bargaining during the reporting period. Currently, we have not launched collective bargaining with the Taiwan Petroleum Workers’ Association (TPWA). Both parties are working for a better solution than the Labor Standards Law.

#### Number of labor-management meetings and outline of proposals

In 2018 we held 24 labor-management meetings across the company and with headquarters. We maintained sound interaction with employees, in order to achieve labor-management harmony. The minutes of each labor-management meeting are disclosed on our corporate website. Proposals discussed at labor-management meetings in 2018 are categorized as follows:

- 1

Coordinating labor-management relations for labor-management cooperation.
- 2

Labor condition
- 3

Work environment
- 4

Other discussions

### 5.5.2 A friendly happy workplace

#### Friendly workplace

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 TPWA to organize various types of welfare business and recreational activities. To promote employee welfare, we establish branch committees in different locations. In addition to the mandatory National Health Insurance, Civil Servant and Teacher 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.

Besides setting up local welfare facilities such as clinics, employee canteens, libraries, and tuck shops; and sports facilities such as various ballgame venues and gymnasiums, every business unit supports club activities such as ballgames, chess, hiking/mountaineering, swimming, calligraphy, and movie appreciation to help employees balance work and relaxation and boost morale.

In addition, EWC offers benefits including, children’s grants and scholarships, medical allowance for dependents, wedding allowance, death and disability condolence funds, and retirement allowance. To take care of young new employees, exact general equality in employment, and encourage birth, we have amended the employee loan regulations to cover marriage and birth, in addition to children’s higher education and emergency assistance. Local EWC branches also offer preferential nursery services by signing contracts with kindergartens and disclose information of established or contracted kindergartens on the intranet for the reference of employees.



#### Employee Welfare Committee (EWC)

Based on the “CPC Employee Welfare Committee Establishment and Management Mechanisms”, we have established the Employee Welfare Committee (EWC) under the supervision of MOL, including the approval of the annual budget, the final account, and working plans.

EWC benefits	
Type	Item
Allowance	Wedding allowance (employees)
Allowance	Birth allowance (employees or spouses)
Insurance	Group insurance
Allowance	Allowance for self-financed health examinations (employees)
Grants and scholarships	EWC children’s education allowance
Others	Rationed liquefied gas purchase (either LPG or LNG)



## Parental leave

We support employees to take parental leave and process applications according to the Act for Gender Equality in Employment. In 2018, there were 354 employees, including 284 male employees and 70 female employees, were entitled to parental leave, and a total of 63 employees (18%), including 23 male employees (8%) and 40 female employees (57%), took parental leave. The return to work rate of both male and female employees was 100%; and the retention rate of both male and female employees was also 100%.

### 2018 Parental Leave Statistics

Return to work rate			
	Total number of employees that did return to work after parental leave	Total number of employees due to return to work after taking parental leave	Return to work rate
Female	26	26	100%
Male	12	12	100%
Retention rate			
	Total number of employees due to return to work after taking parental leave	Total number of employees retained 12 months after returning to work following a period of parental leave	Retention rate
Female	23	23	100%
Male	8	8	100%

## 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 and 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 co-organize 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 with the ROC Retired Petrochemical Workers' Association.

## 5.5.3 A safe work environment

### Sexual harassment prevention

To provide female employees with a friendly work environment, apart from setting up quality certified lactation rooms, we arrange gender mainstreaming training and education courses 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 courses 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. In 2018, there were four grievances on sexual harassment, and four review meetings were held to discuss the cases.

#### Directions for Sexual Harassment Prevention and Settlement

- **Grievance helpline:** 02-8725-8422
- **Grievance fax:** 02-8789-9405
- **Mail:** 21F, No. 3, Songren Road, Xinyi District, Taipei, Taiwan 110
- **Email:** [807664@cpc.com.tw](mailto:807664@cpc.com.tw)

• **Undertaker:**  
Ms. Yeh,  
Department of  
Human Resources



### Occupational health and safety

We hold the labor-management meeting monthly to discuss issues in relation to the work environment, labor condition, and occupational health and safety with labor representatives. Responsible units suggest solutions or report the progress of improvement to labor representatives at the meeting. All issues discussed at the meeting are followed up until resolutions are made. These resolutions are also considered as official labor-management agreements. Both parties are engaging in collective bargaining to include OHS and related labor rights.

In 2018, we received 25 OHS tickets from the competent authorities, and the total amount of fines was NT\$2.95 million. We constantly implement various plans to improve workplace safety, contractor safety management, and OHS. We also educate all units to implement such improvements and keep track on non-compliance until corrective action are completed.

#### Occupational Safety and Health Act

Hold four OHS Committee meetings a year.

In 2018, labor representatives made **11** proposals, accounting for **68.75%** of all proposals.



In addition, we have 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 representatives from different units as members. Nine members, or 35%, are labor representatives. The regulations of the committee are superior to that of the regulatory requirements.

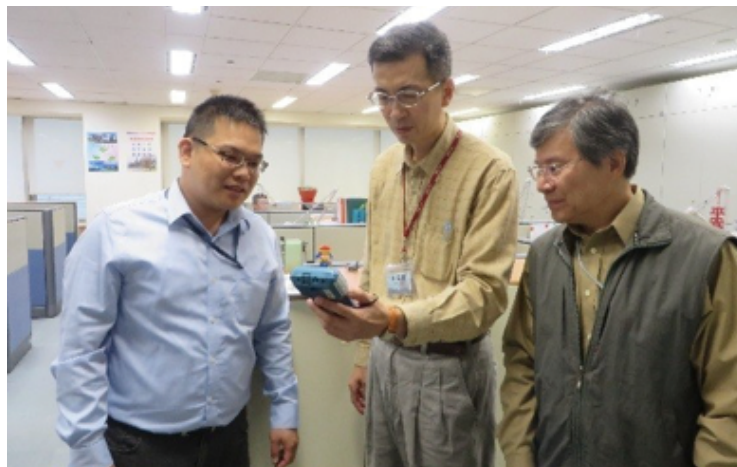
### Employee health management

We arrange health examinations for employees every year to maintain their health. In 2018, 13,103 employees took the general health examination and 2,529 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 2018, 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 below the permissible exposure limits. We will constantly keep track on employee health. In 2018, there was no report of occupational disease of any kind.

To further the statistical analysis capacity of health management, we analyze employee examination results every year and list the top six anomalies. In 2018, they were body weight, total cholesterol, chest X-ray, low density lipoproteins, waist measurement, and triglycerides. We also arranged health talks and health promotion activities based on these anomalies to promote employee health.

▼ CPC regularly inspects the environment and measures air hazards of the interior workplace



▶ Health Talk: CPR in Practice



▶ Health Talk: Aerobic Exercise

### Occupational safety identification

In 2002, we introduced the risk-management-based OHSAS 18001. To build a quality safety culture, we implemented the Taiwan Occupational Safety and Health Management System (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 the "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. 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 2018, 34 units have implemented and passed the certification of TOSHMS.

We identify unit-specific risk and draw up related countermeasures. We also draw up various emergency response drilling plans and implement emergency response drills regularly to improve the ability to accident response and disaster prevention.

#### OHSAS 18001 and TOSHMS

In 2018, we implemented 310 disaster prevention drills (including four expanded emergency response drills).

Headquarters implemented eight unannounced emergency response drills on each unit.



▶ Emergency response drills

### Accident investigation and analysis

We form the Accident Case Study Working Team to collect information of industrial safety accidents to analyze their root causes and accident types. The team has also published the Industrial Safety Case Studies as a learning resource of accident investigation to improve employees' accident investigative skills and thereby enhance overall safety performance.

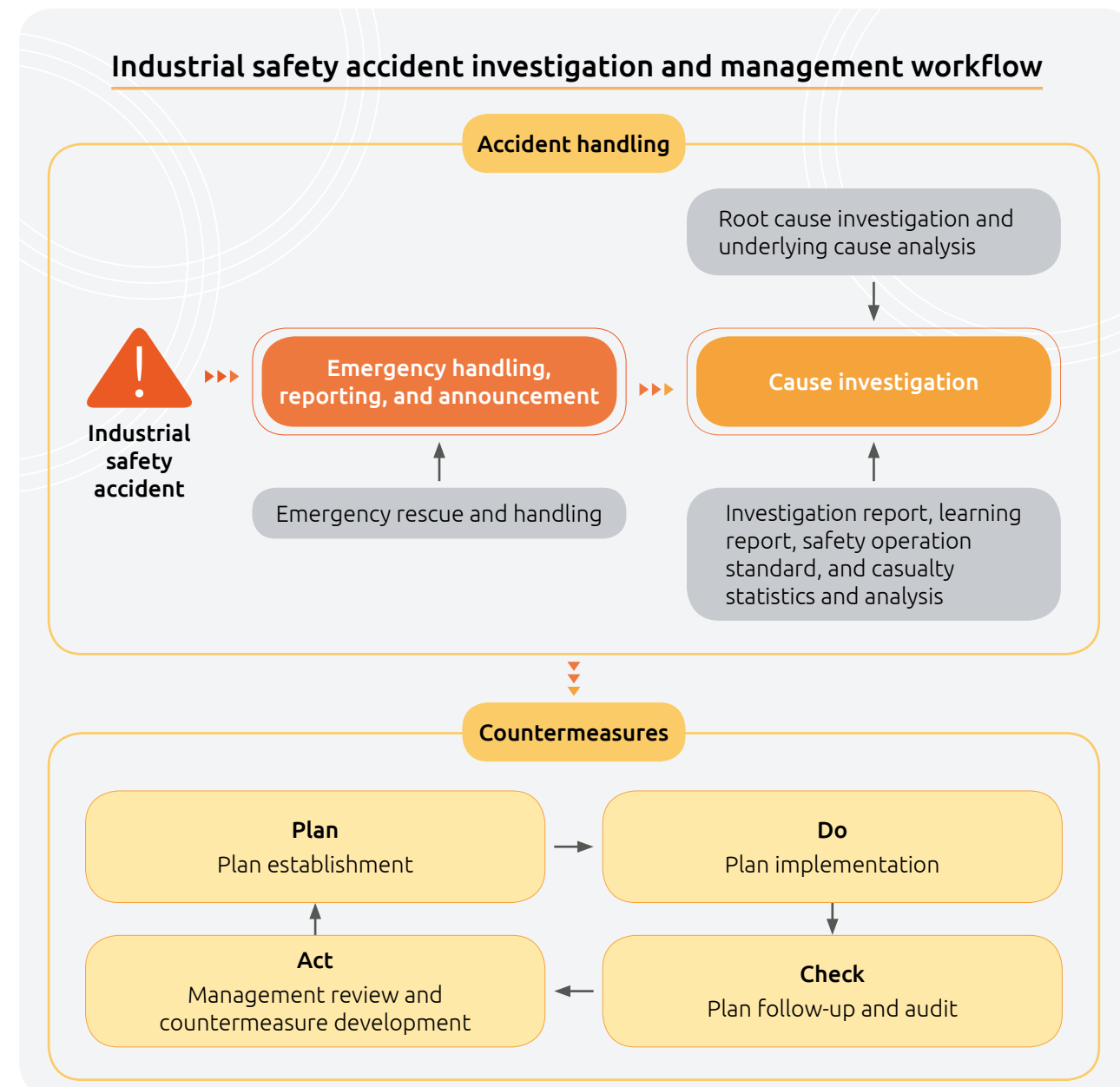


In addition, we have established the “Principles for the Investigation and Management of Industrial Safety Accidents” to define the process of investigation, report writing, statistics, and follow-up. We have also designed “Hazards and Emergency Report System” in the intranet to timely capture the related information of accidents.

Our OHS performance has been superior (i.e. FSI is below the industry average) to that of competitors. The 2018 OHS performance was also below the control value, except for FR (0.59) which was higher than the control value (0.43). After reviewing and analyzing the causes of accidents in detail, we implemented corrective actions in terms of system and implementation and requested related units to propose action plans to improve industrial safety. We have also initiated a general review to prevent the recurrence of similar accidents.

Note: The control value is the average value during the last five years, which deducting the highest and the lowest value.

### Industrial safety accident investigation and management workflow



### OHS management performance

	Male	Female	Total
Absentee rate (AR)	94.25		94.25
Disabling injury frequency rate (FR)	0.07	0.24	0.09
Disabling injury severity rate (SR)	0.17	0.73	0.24
Line-of-duty deaths	0	0	0

#### Description:

##### ■ Calculations, including full-time and temporary employees.

- Absentee rate(A.R.)=(Days of absence in total(includes personal leave,sick leave and compensation leave for injuries at work))/(Working days in total) = 23,467.75/249 = 94.25
- Disabling injury frequency rate(F.R.) = (Amount of disabling frequency × 10<sup>6</sup>)/(Working days in total)
  - = (male) 2 × 10<sup>6</sup>/29,542,291.2 = 0.07
  - = (female) 1 × 10<sup>6</sup>/4,084,129.8 = 0.24
  - = (total) 3 × 10<sup>6</sup>/33,626,421=0.09
- Disabling injury severity rate(S.R.) = (Total amount of disabling injury severity × 10<sup>6</sup>)/(Working days in total)
  - = (male) 5 × 10<sup>6</sup>/29,542,291.2 = 0.17
  - = (female) 3 × 10<sup>6</sup>/4,084,129.8 = 0.73
  - = (total) 8 × 10<sup>6</sup>/33,626,421=0.24

- 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.





# CH6

## Goodwill Taiwan: A Transparent CPC

### Chapter Summary

Governance, ethics and integrity are the cornerstones of sustainable management and our main principles of operations and development. They are the backbone of our healthy and prosperous development.

### SDGs



### Reader Priorities

- |                      |              |
|----------------------|--------------|
| ■ Shareholder (MOEA) | ■ Government |
| ■ Partners           | ■ Employees  |
| ■ Legislators        | ■ Media      |
| ■ Communities        | □ NPOs/NGOs  |
| ■ Customers          |              |



Fitch Ratings for thirteen consecutive years

**AAA(twn)**



Total length of further education of directors and supervisors in 2018

**145 hours**



Integrity awareness education

**41 sessions**

## Management Approach

### Policy Commitment

1. Establish an effective governance system, strengthen board competencies, demonstrate supervisor functions, protect the rights and interests of shareholders, enhance information transparency, and protect the rights and interests of stakeholders.
2. To implement governance across the company, we have established the "[Corporate Governance Practical 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 the "Integrity and Ethics Principles for Employees of the Ministry of Economic Affairs". In addition, we implement business activities based on integrity and ethics. Prohibit any and all forms of bribery, corruption, extortion and embezzlement.



Corporate  
Governance Zone

### Goals

- Short-term ➡ 1. Prevent corruption and pursue of the highest standards of integrity.  
2. No significant violation of social, environmental, and economic compliance.
- Long-term ➡ Establish the internal control system based on the "Regulations Governing Establishment of Internal Control Systems by Public Companies" and arrange related training and education and anticorruption publicization activities from time to time.

### Specific Actions

1. Arrange directors and supervisors to perform onsite inspection of each unit and investee.
2. Hold three "Sustainable Management Promotion Committee" meetings for the chairperson and president to supervise, urge, and promote sustainable development on behalf of the board of directors.
3. In addition to setting up a governance section and business bulletin section on the corporate website, we disclose financial and non-financial information, such as the annual report and the sustainability report.
4. Implement the internal control and internal audit systems.



### 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 2018, State-owned Enterprise Commission, MOEA commissioned National Taipei University of Technology to evaluate our corporate governance.

## 6.1 Corporate Governance

Rated AAA (tw) by Fitch Ratings for thirteen consecutive years.



'AAA' ratings denote the lowest expectation of default risk. They are assigned only in cases of exceptionally strong capacity for payment of financial commitments. This capacity is highly unlikely to be adversely affected by foreseeable events

Note: The modifiers "+" or "-" may be appended to a rating to denote relative status within major rating categories.

### 6.1.1 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 for a term of two years (32nd board from June 12, 2017 to June 11, 2019). The chairperson and the president are executive directors, and there are two independent directors. Please refer to the 2018 annual report for information regarding the major education, experience, and salary structure of directors and supervisors.

Board Operation in 2018

Number of directors (including independent directors)		13
Independent directors	Seats	2
	Ratio	15.38%
Female directors	Seats	1
	Ratio	7.7%
Average age		61.6
Average directorship		17.4 months
Number of board meetings in 2018		12
Director attendance rate in 2018		93%
MOEA stake		100%

### Board operation

Apart from hearing and approving the report on the major strategy and status of operations from different departments, the board of directors reviews the progress of operational strategies and assesses business performance to maintain corporate growth and align with market demands. The minutes of the monthly board meetings are disclosed on our corporate [website](#).

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. In 2018, these teams completed the discussion of 34 related proposals.

### Further education of directors and supervisors

All directors and supervisors are the best of their kinds in terms of expertise, field experience, and ethical conduct. Apart from the expertise and field experience in relation to our scope of business, they either graduated from or are professors of related disciplines and provide guidance and consultation services for operations, technology, and financial management, and take charge of the company's strategy making, operations, and supervision. In 2018, directors and supervisors attended further education for 145 hours, covering environmental education, business administration, tax management, risk management, and information security.

### 6.1.2 Board performance assessment

MOEA establishes the "Directions For Selection of Directors, Supervisors, and other Important Posts of State Owned Enterprise and Private Enterprises Administered by MOEA and its Organizations" to improve the selection, management, and evaluation of directors, supervisors, and other important posts of SOEs and private enterprises under its administration.

In addition, to implement governance, improve board functions, and set performance indicators to enhance board operational efficiency, we have specifically established the "CPC Directors for Performance Assessment of the Board of Directors" according to the ["Corporate Governance Practical Principles for TWSE/TPEx Listed Companies"](#). After closing the account each year, we assess board performance based on the procedures and indicators specified in the Directions. The assessment report will be submitted to the board and disclosed on our corporate website. In the future, we will outsource assessment to the unit designated by the board of directors.

### Governance evaluation by State-owned Enterprise Commission, MOEA

In 2018, MOEA commissioned National Taipei University of Technology to evaluate our governance performance by means of documentary review and onsite inspection (including interviews with the chairperson, independent directors, labor directors, supervisors, chief auditor, CFO, and CAO).

#### Credits

- 1 Environmental protection performance: Completed the climate risk assessment report of eight gas/oil supply centers in 2018.
- 2 Operations and governance performance: The percentage of female employees rises every year; a higher percentage of female senior officers than female employees—22% (totaling 20 female senior officers) vs. 14%; two female CEOs in the eight major business units; the second female VP in 2018 after the first ever female CEO of SOEs in 2016, with a female VP performance up to 40%.
- 3 Social inclusiveness performance: Perceivable performance in economic, environmental, and social categories, covering aspects including “community welfare”, “care for vulnerable groups”, “charitable activities”, and “energy education and publicization”.

#### Recommendations

- 1 In board operations, balance the right of speech of directors and discussion efficiency at the same time, and ad important proposals shall be approved by the board.
- 2 The materiality of all stakeholders shall be considered in significant violations of internal controls, such as oil leakage and gas explosions.
- 3 Enhance the connection between audit results and employee performance evaluation; raise the risk awareness of BU workers, particularly for BUs with more levels, the risk alertness of base-level employees should be strengthened to prevent industrial safety events and environmental protection.
- 4 Substantially plan the technical staff cultivation and know-how succession of medium- and base-level employees for BUs to raise the awareness of discipline and punishment of workers.



### 6.1.3 Board and stakeholder bargaining

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.

#### Significant bargaining events approved by the board of directors in 2018

- Approval of lending the Chengkung Complex in Kaohsiung City administered by the Refining Business Division to the Kaohsiung City Government for use as car parking and greenery for a term of three years.
- Approval of the compensation for landlords for the contamination of the leased land in the rear of Kaohsiung Port wharfs 18-20 administered by Port of Kaohsiung, Taiwan International Ports Corporation.
- Approval of the release of the one-time condolence pay as requested by the Penghu County Government to soothe the severe anxiety and disturbance of residents around the Magong Marketing Center, Chianan Business Office, Marketing Business Division, after the “Huxi Oil Depot Tank 16 Leakage Incident”.
- Approval of the indemnification for TPC for the “August 15 Blackout”.
- Approval of the compensation for the NHI premium of all residents registered at Huxi Township based on the resolution made by the 5th pollution dispute adjudication committee meeting of the Penghu County Government, after the “Huxi Oil Depot Tank 16 Leakage Incident” within the jurisdiction of the Marketing Business Division.

### 6.1.4 Avoidance of conflicts of interest

We have prescribed in the “Corporate Governance Practical Principles” and the “Rules of Procedure for Meetings of Board of Directors”: A director having a conflict of interest (COI), either with himself or the corporate investor(s) he represents, shall specify the material contents regarding the COI. When a COI will cause threats to the organizational interest, this director shall sidestep from the discussion and voting and their processes of the related proposal, nor shall he represent other directors to exercise such rights.

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 2018, there were three COI proposals. Please refer to the 2018 Annual Report for details.



## 6.2 Ethical Management and Legal Compliance

### 6.2.1 Ethical Management

We have established the “[CPC Code of Ethical Conduct](#)” with respect to the “Guidelines for the Adoption of Codes of Ethical Conduct for TWSE/GTSM Listed Companies” to regulate employees (including board members, management, and general employees) to develop a healthy corporate culture for sustainable ethical management and win trust from stakeholders. To enforce ethical management, we have established an effective accounting system. When auditing financial statements, accountants will assess our internal control system with respect to the “Regulations Governing Auditing and Attestation of Financial Statements by Certified Public Accountants” and the “Generally Accepted Auditing Standards, GAAS”.

In business transaction, to ensure the ethical management of tenderers, we check if a tenderer is rejected from tendering over the Government Procurement Information System (GPIS) prior to tender opening and request tenderers to submit tax data for the reference. In addition, we have specified penalties in all procurement contracts to request suppliers to indemnify our damages from exact contract performance.

### 6.2.2 Anticorruption

In anticorruption work, we begin with corruption prevention. By establishing business reform and anticorruption measures, 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. The units with a government ethics department are included in the corruption risk assessment. In 2018, 11 units implemented corruption risk assessment and reported 25 probable “corruption risk events”. Among these 25 probable “corruption risk events”, there was no “high corruption risk event”; 14 (56%) were “low corruption risk events”, such as falsification of travel expenses and violation of the “Ethics Guidelines for Civil Servants”; and 11 (44%) “medium corruption risk events”, such as inexact labor service supervision, contractor’s falsification of project claims, and report of involvement in tender collusion of employees. We have taken actions, such as administrative responsibility investigations, administrative punishment, or legal actions, for these offences or allegations.

In 2018, our employees were involved with nine government ethics events. After the investigation of the government ethics department, employees with confirmed negligence were requested to take their administrative responsibility and were referred to the prosecution for suspicion of crime. The government ethics department will compile law-breaking cases and regulation-breaking cases as examples for awareness education of employees, in order to strengthen the prevention and awareness of corruption. In 2018, there was no report of significant corruption, tender collusion, or undue advantages.

### Major anticorruption actions and performance in 2018

We arrange different types of anticorruption awareness education for employees in different units. Every year, the government ethics department of each unit organizes anticorruption training and education through various channels, such as assemblies, training, and publicity materials, to constantly promote anticorruption across the unit.

In 2018, we organized 41 awareness education activities to spread anticorruption to 5,000 employees through keynote speeches, online quizzes, and seminars. We also invited district prosecutors to give talks on anticorruption through interesting and diversified approaches to motivate employees to attend related activities and enrich their legal literacy and anticorruption knowledge. Every year we and all units also hold the “anticorruption meeting” convened by government officials with chiefs of all units as committee members to discuss issues in relation to anticorruption to enhance overall anticorruption effectiveness.



### Corruption reporting channels

- **CPC Government Ethics Unit**  
Mailbox: Taipei Xinyi P.O. Box 128-36.  
Phone: (02) 8725-8478  
Fax: (02) 8789-9007
- **MOEA Procurement Audit Unit**  
Address: No. 15, Fuzhou Street, Taipei City  
Phone: (02) 2397-1592  
Fax: (02) 2397-1593
- **Central Government Procurement Audit Unit, Public Construction Committee, Executive Yuan**  
Address: 9F, No. 3, Songren Road, Xinyi District, Taipei City  
Phone: (02) 8789-7548  
Fax: (02) 8789-7554
- **Agency Against Corruption, Ministry of Justice**  
Free reporting line: 0800-286-586  
Mailbox: Academia Historica P. O. Box 153, Taiwan 10099.  
Fax: (02) 2381-1234  
Email: [gechief-p@mail.moj.gov.tw](mailto:gechief-p@mail.moj.gov.tw)  
Report center: No. 166, Boai Road, Zhongzheng District, Taipei City.
- **Investigation Bureau, Ministry of Justice and stations** (<https://www.mjib.gov.tw/EditPage/?PageID=68997624-8ae6-4d5d-955c-dd97c5ca1f87>)

### 6.2.3 Internal audit system

We respect the professionalism and independence of the Audit Office and internal auditors and give them full delegation to perform targeted audits based on the following audit framework:



Audit Mechanism	
Internal audit	<ul style="list-style-type: none"> <li>Establish an audit office under the board of directors to draw up the internal audit program for the next year based on the results of operational risk assessment.</li> <li>Examine and review the defects in the internal audit system and measure the effectiveness and efficiency of operations.</li> <li>Make recommendations for the improvement of internal control vulnerabilities to the management and keep track on such vulnerabilities until corrections are completed.</li> </ul>
External supervision	<ul style="list-style-type: none"> <li>CPA certification and FSC examinations every year.</li> <li>Accept supervision of the State-owned Enterprise Commission, MOEA, and the National Audit Office, Control Yuan</li> </ul>

## 6.3 Supply chain management

In the face of the increasingly harsher environmental and social challenges across the globe, supply chain management (SCM) has naturally become a crucial topic for sustainable management. With the Government Procurement Act as SCM principle, we implement procurement projects based on equality, impartiality, and transparency. We also comply with labor, environmental, and human rights requirements and propose improvement plans for violation.

#### Policy and objectives of supplier management

- Achieve co-existence and co-prosperity and develop long-term partnership with suppliers.
- Compliance with our quality, delivery, and price requirements
- Management through ISO management systems

#### New supplier selection criteria

- In addition to the Government Procurement Act, supplier shall abide by the Fair Trade Act, the Environmental Protection Act, the Labor Standards Act, and the Occupational Health and Safety Act. Suppliers are requested to propose improvements for violation.
- 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

- ✓ Establish long-term strategic partnership with suppliers and discuss material supply mechanisms with suppliers periodically.
- ✓ 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 suppliers’ personnel 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.

Except for the procurement amount of crude oil and natural gas (NT\$100 mn)

Type		2016	2017	2018
Labor service procurement (undertaking and service)	Domestic	178	149	266
	Overseas	1	2	2
	Subtotal	179	151	268
Proper procurement (feedstocks)	Domestic	104	113	117
	Overseas	40	15	26
	Subtotal	144	128	143
Construction procurement (buildings and equipment)	Domestic	39	24	306
	Overseas	0	0	78
	Subtotal	39	24	384
Total		362	303	795

#### 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. We procure crude oil according to the Government Procurement Law and CPC's internal SOPs and regulations.

Every month we establish the procurement plan based on the crude oil demand for refining and manufacture in the next three months and complete crude oil procurement for the third month of the plan. When crude oil procurement is required, we will send the tender invitation to CPC's pre-qualified suppliers. After collecting all offers, we will calculate the value of each crude and consider the shipment schedule, then we finalize the procurement after price negotiation.



### Management method

To prevent the performance delay of suppliers from affecting our production-marketing planning, and even impacting domestic gasoline and diesel supply to threaten our reputation and Taiwan’s energy security, we have established related regulations for avoiding this situation. Besides, in order to ensure suppliers are not involved with violation of human rights and international and local regulations, we have also included the related clause into the contract.

### Supplier evaluation

Apart from requesting suppliers to meet our standards, we investigate their background and history of performance. We accept only suppliers that can fulfill performance as scheduled to ensure Taiwan’s energy safety.

New suppliers: Submit documents for review to ensure compliance with our requirements and standards.

Existing suppliers: Review at least once a year. Suppliers violating our regulations will be removed from the qualified supplier list, and suppliers with higher transaction risk will be listed into the tender suspension list.

### Quality management of crude oil

When suppliers recommend new oil types, we will assess and examine the quality of their crude oil according to the internal SOPs and hire external units to assist with the examinations to ensure the quality of crude oil complies with our requirements. In addition, we will retain samples for future verification and tracking of oil quality.

### Structure of crude oil procurement source structure by country and by region

In 2018, we imported most crude oil from the Middle East, accounting for about 60%, and other sources included Africa and America.

### Natural gas procurement

We purchase LNG to fulfill the domestic natural gas demand and for resales. While neither opening tendering nor selective tendering is appropriate due to the characteristics of buyers, processes, and supply sources or actual needs, restricted tendering is adopted.

We purchase LNG mainly through medium- and long-term contracts and in the support of short-term spot procurement. Our procurement sources cover 16 countries (of the total of 19) in the Middle East, Southeast Asia, Australia, Russia, North America, Africa, and Europe. Therefore, we have sources across the globe to disperse gas sources.



## 6.4 Membership of Associations and External Initiatives

### 6.4.1 External initiatives

In response to the new energy age, we co-published the Energy for the Next Generation-Shaping Taiwan’s Energy Transition report under the Low Carbon Initiative (LCI) in collaboration with the European Chamber of Commerce Taiwan (ECCT) to urge enterprises to continuously implement new energy development. We also establish reasonable and feasible policies with the government sector and combine the energy of academia-industry research to fulfil CSR and to work for the vision of “sustainable Taiwan”.



### 6.4.2 Membership in external organizations

In addition to internal management, we engage in exchange and cooperation by participating in organizations at home and abroad to develop multilateral relations, exchange commercial experience and market information, and connect with the industrial trends at home and abroad. We also actively participate in over 50 industry associations and societies. Some of them are listed below by initiative issues and by organization nature:

Type	Organization	Type	Organization
Industrial exchange and development	World Energy Council Taiwan	Governance	The Institute of Internal Auditors-Chinese Taipei
	International Group of Liquefied Natural Gas Importers (GIIGNL)	Sustainable management	Taiwan Institute for Climate Change and Sustainable Energy
	Chinese International Economic Cooperation Association (CIECA)		Center for Corporate Sustainability,
	Petrochemical Industry Association of Taiwan		World Business Council For Sustainable Development Taiwan
	Taiwan Biotechnology Industry Alliance		Taiwan Association of Soil and Groundwater Environmental Protection
Industrial exchange and development Technology innovation	National Association of Corrosion Engineers (NACE)	Industrial safety management	US National Safety Council
	Chinese Society of Structural Engineers		Industrial Safety and Health Association of the ROC
	The Corrosion Engineering Association of the Republic of China		Taiwan Safety Council



## Appendix 1 GRI-Standards Reference Table

### General Disclosures Cross Reference

Category/Topic	No.	GRI Indicator	Corresponding Section	Page
<b>GRI 102 Organizational profile</b>				
Core	102-1	Name of the organization	1.1 Our CPC	18
Core	102-2	Activities, brands, products, and services	1.1 Our CPC	18
Core	102-3	Location of headquarters	1.1 Our CPC	18
Core	102-4	Location of operations	1.1 Our CPC	18
Core	102-5	Ownership and legal form	1.1 Our CPC	18
Core	102-6	Markets served	1.1 Our CPC	18
Core	102-7	Scale of the organization	1.1 Our CPC	18
Core	102-8	Information on employees and other workers	5.3 Human Resources	130
Core	102-9	Supply chain	6.3 Supply chain management	152
Core	102-10	Significant changes to the organization and its supply chain	2.2 Response to Significant Events Third LNG Terminal	61
Core	102-11	Precautionary Principle or approach	2.3 Risk Management	68
Core	102-12	External initiatives	4.3 Risks and Opportunities From Climate Change	106
Core	102-13	Membership of associations	6.4 Membership of associations and external initiatives	155
<b>GRI 102 Strategies</b>				
Core	102-14	Statement from senior decision-maker	From the Management	05
<b>GRI 102 Ethics and integrity</b>				
Core	102-16	Values, principles, standards, and norms of behavior	Goodwill Taiwan: A Transparent CPC	144
<b>GRI 102 Governance</b>				
Core	102-18	Governance structure	6.1 Corporate Governance	146
<b>GRI 102 Stakeholder Communication</b>				
Core	102-40	List of stakeholder groups	1.3 Stakeholder Communication	26



Category/Topic	No.	GRI Indicator	Corresponding Section	Page
Core	102-41	Collective bargaining agreements	5.5 Workplace Safety	136
Core	102-42	Identifying and selecting stakeholders	1.3 Stakeholder Communication	26
Core	102-43	Approach to stakeholder engagement	1.3 Stakeholder Communication	26
Core	102-44	Key topics and concerns raised	1.3 Stakeholder Communication	26
GRI 102 Reporting practice				
Core	102-45	Entities included in the consolidated financial statements	3.4 Business Performance	88
Core	102-46	Defining report content and topic boundaries	Report Profile 1.4 Material Topics of Sustainability in 2018	14 33
Core	102-47	List of material topics	1.4 Material Topics of Sustainability in 2018	33
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 2018	33
Core	102-50	Reporting period	Report Profile	14
Core	102-51	Date of most recent report	Report Profile	14
Core	102-52	Reporting cycle	Report Profile	14
Core	102-53	Contact point for questions regarding the report	Report Profile	14
Core	102-54	Claims of reporting in accordance with the GRI Standards	Report Profile Appendix 1 GRI content index	14 157
Core	102-55	GRI content index	Appendix 1 GRI content index	157
Core	102-56	External assurance	Appendix 2 Third-party assurance certification	162

Material Topics-GRI Standards Cross Reference

Category/Topic	No.	GRI Indicator	Corresponding Section	Page
Economic				
Anticorruption	103-1 103-2 103-3	Management Approach	Goodwill Taiwan: A Transparent CPC	144

Category/Topic	No.	GRI Indicator	Corresponding Section	Page
Anticorruption	205-3	Confirmed incidents of corruption and actions taken	6.2 Ethical Management and Legal Compliance	150
Environmental				
Biodiversity	103-1 103-2 103-3	Management Approach	Green CPC-Ecological Conservation	48
	304-2	Significant impacts of activities, products, and services on biodiversity	2.2 Response to Significant Events 4.5 Pollution Prevention Green CPC-Ecological Conservation	61 114 48
Emissions	103-1 103-2 103-3	Management Approach	Engraining Taiwan: A Nurturing CPC	92
	305-1	Direct (Scope 1) GHG emissions	4.1 GHG Management	98
	305-2	Energy indirect (Scope 2) GHG emissions	4.1 GHG Management	98
	305-4	GHG emissions intensity	4.1 GHG Management	98
	305-5	Reduction of GHG emissions	4.1 GHG Management	98
Emissions	305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	4.1 GHG Management	98
Effluents and Waste	103-1 103-2 103-3	Management Approach	4.4 Effluents and Waste Management	110
	306-1	Water discharge by quality and destination	4.4 Effluents and Waste Management	110
	306-2	Waste by type and disposal method	4.4 Effluents and Waste Management	110
	306-3	Significant spills	2.2 Response to Significant Events	61
Social				
Occupational health and safety	103-1 103-2 103-3	Management Approach	Join hands in Taiwan: Embracing CPC	123
	403-1	Workers representation in formal joint management-worker health and safety committees	5.5 Workplace Safety	136
	403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	5.5 Workplace Safety	136

Category/Topic	No.	GRI Indicator	Corresponding Section	Page
Occupational health and safety	403-3	Workers with high incidence or high risk of diseases related to their occupation	5.5 Workplace Safety	136
Customer Health and Safety	103-1 103-2 103-3	Management Approach	Join hands in Taiwan: A Embracing CPC	123
	416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	2.2 Response to Significant Events	61

Material topics of non-GRI topic-specific disclosures

Prevention of emergency events	103-1 103-2 103-3	Management Approach	Valuing Taiwan: CPC’s Responsibility	53
R&D and Innovation			Join hands in Taiwan:A Embracing CPC	123
Governance			Goodwill Taiwan: A Transparent CPC	145
Climate Change Response			Join hands in Taiwan: A Embracing CPC	123
Social Inclusiveness			Join hands in Taiwan:A Embracing CPC	123

Non-material topic GRI Standards cross reference

Category/Topic	No.	GRI Indicator	Corresponding Section	Page
Economic Performance	201-1	Direct economic value generated and distributed	3.4 Business Performance	88
	201-3	Defined benefit plan obligations and other retirement plans	5.5 Workplace Safety	136
Indirect Economic Impact	203-1	Infrastructure investments and services supported	Join hands in Taiwan: A Embracing CPC	123
Energy	302-1	Energy consumption within the organization	4.2 Energy and Resources Management	100
	302-2	Energy consumption outside of the organization	4.2 Energy and Resources Management	100
	302-3	Energy intensity	4.2 Energy and Resources Management	100

Category/Topic	No.	GRI Indicator	Corresponding Section	Page
Water	303-1	Water withdrawal by source	4.2 Energy and Resources Management	100
	303-3	Water recycled and reused	4.2 Energy and Resources Management	100
Environmental compliance	307-1	Non-compliance with environmental laws and regulations	Environment Protect Policy	94
Employment	401-1	New employee hires and employee turnover	5.3 Human Resources	130
	401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	5.3 Human Resources	130
	401-3	Parental leave	5.5 Workplace Safety	136
Training and education	404-1	Average hours of training per year per employee	5.4 Employee development	133
Diversity and Equal Opportunity	405-1	Diversity of governance bodies and employees	5.3 Human Resources	130
	405-2	Ratio of basic salary and remuneration of women to men	5.3 Human Resources	130
Marketing and Labeling	417-1	Requirements for product and service information and labeling	3.3 Products and customers	84
Customer privacy	418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	3.3 Products and customers	84
Socioeconomic compliance	419-1	Non-compliance with laws and regulations in the social and economic area	6.2 Ethical Management and Legal Compliance	150



## Appendix 2 Statement of Third-Party Certification

(pending for verification completion)

### INDEPENDENT ASSURANCE OPINION STATEMENT

#### CPC Corporation, Taiwan 2019 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 2019 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 2019 Sustainability Report provides a fair view of the CPC Corporation, Taiwan CSR programmes and performances during 2018. 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 2018 economic, social and environmental performance indicators are fairly represented. The CSR performance indicators 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: the 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 34 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. The participation of stakeholders has been initiated in developing and achieving an accountable and strategic response to sustainability. The reporting systems are being developed to deliver the required information. 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: the 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  
2019-05-28




AA1000  
Licensed Assurance Provider  
000-4

Taiwan Headquarters: 5th Floor, No. 39, Ji-Hu Rd., Nei-Hu Dist., Taipei 114, Taiwan, R.O.C.

BSI Taiwan is a subsidiary of British Standards Institution.





#### 安永聯合會計師事務所

11012 台北市基隆路一段333號9樓  
9F, No. 333, Sec. 1, Keelung Road  
Taipei City, Taiwan, R.O.C.  
Tel: 886 2 2757 8888  
Fax: 886 2 2757 6050  
www.ey.com/taiwan

### 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 2018 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2018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政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

西元二〇一九年六月二十一日





附件一：

編號	章節	內文標題	標的資訊	適用基準
1	第四章	空氣汙染物排放及管理	2018 年氮氧化物(NOx)申報量為 3,284.10 公噸。	2018 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	第四章	空氣汙染物排放及管理	2018 年粒狀物質(TSP)申報量為 217.86 公噸。	2018 年度粒狀物質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	第五章	完整的員工聘僱情況	一級高階女性主管占比達 22%。	2018 年 12 月 31 日一級主管女性人數除以一級主管總人數之比率。
4	第五章	具競爭力的人力政策	自辦訓練共辦理 3,358 班。	2018 年度自辦訓練總班次。
5	第五章	友善的幸福職場	2018 年育嬰留職停薪之復職率，男、女性皆為 100%。	2018 年度育嬰留職停薪實際復職人數除以育嬰留職停薪原應復職人數之比率。