

台塑企業
FORMOSA PLASTICS GROUP



2018 Formosa Petrochemical Corporation
CSR Report Corporate Social Responsibility Report

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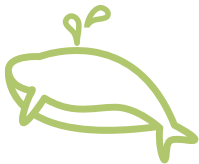
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Report Overview

This is the fifth report published by Formosa Petrochemical Corporation (FPCC). The period involved in information disclosure herein is from January 1, 2018 to December 31, 2018. The boundary is Taiwan, relevant information that exceeds this scope will be footnoted in the report, and four-year data are provided in principle. Please download previous reports at the CSR Website.

Overview of issuance

Issue Date of First Version: December 2015

Issue Date of Previous Version: June 2018

Issue Date of Current Version: May 2019

Issue Date of Next Version: May 2020

Report Boundaries and Scope

This report mainly discloses information on FPCC. Affiliates of FPCC include Formosa Oil, Formosa Petrochemical Transportation Corp., FPCC USA, Formosa Dredging Corporation, and Formosa Petrochemical Marine Company Limited, among others. The level of impacts from individual affiliates, however, are minimal. As such, this report features primarily data of FPCC. Hence, the boundary has not changed compared with the previous year.

Foundation for Data Calculation

The scope of information disclosed in this report includes financial, environmental, and social performance. The data in this report were compiled by the President's Office with materials provided by individual units, which were then collected and organized by the report composing group. Related data have been reviewed and confirmed by the CSR core group of FPCC to honor the integrity and transparency disclosure principles for this report.



Editing Principles

This report adopts the GRI Standards Core Option as the main framework, and covers the sustainable performance of FPCC in three major aspects, namely economic, environmental, and social. This report referenced the Oil and Gas Sector Disclosures and the four major principles of the AA1000 AccountAbility Principle Standard, namely materiality, inclusiveness, responsiveness, and impact, to demonstrate FPCC's commitment to sustainability in its business operations.

This report discloses information and considers sustainability issues based on the Corporate Social Responsibility Best Practice Principles for TWSE/GTSM Listed Companies of Taiwan, ISO 26000 Guidance on social responsibility, and UN Global Compact.

Third Party Verification

In order to ensure the transparency and credibility of information disclosure, related information and data disclosed in this report have gone through the independent verification performed by the British Standards Institution (BSI), a third party international certification institution, based on GRI Standards AA1000 AS:2008, and the verification statement is included in this report.

Contact information

Feel free to contact us through the following channels if you have any questions or suggestions concerning this report:

Formosa Petrochemical Corporation

- ✉ Contact information: President's Office
- ✉ Contact Person: Miss Lan
- ✉ E-mail: csr01@fpcc.com.tw
- ✉ Tel: +886-2-27122211 Ext.: 6255
- ✉ Address: Room 377, 4F, No. 201 Rear Building, Dunhua N. Rd., Taipei City
- ✉ Website: <http://fpcc-csr.eorz.net/index.php>

Message from the Chairman

Leading Local Development

The petrochemical industry is the force driving civilization forward. Becoming a company trusted by stakeholders is the core of FPCC's vision and sustainable development. The Company's sustainable development is based on the spirit of its founders, and focuses on four strategies, which are leading the industry, circular economy, forming a culture of safety and health, and local development. In this sustainable value model, we expect to not only drive our own growth, but also create value to fulfill our commitments to stakeholders. FPCC continued to work towards the Sustainable Development Goals (SDGs) in 2018, and began incorporating the SDGs into its core strategy for business operations three years ago. We hope to lay out the blueprint for FPCC's sustainable development through long-term development goals. We continued to implement measures in response to the 8 SDGs we identified last year to be highly related to oil refinery and petrochemical industries.

As the leader of the petrochemical industry, FPCC is gradually transforming through energy and ecological aspects. Current strategies and goals with circular economy at the core have been implemented for numerous years. To thoroughly achieve these goals, we not only invested in the latest process technologies, but also have the best management systems and determined employees throughout the group. Furthermore, we have consistently invested in technological developments in response to the arrival of Industry 4.0. We implemented AI in process improvement, integrated economic, environmental, and risk management to enhance our competitiveness, and also drive industrial upgrade, creating a new paradigm for industrial transformation. In particular, Mailiao Port was recognized by the European Sea Ports Organization in September 2018, and successfully obtained the EcoPorts Certification, becoming the first industrial port in Asia to obtain this recognition. This is one of our results in environmental protection.

The culture of labor safety is an unchanging core value of FPCC. We strengthened the accountability of employees in operational safety, and implemented management operations at each level, building employees safety responsibility through education, training, and emergency response activities, deeply embedding concepts of self-management in employees' hearts to strengthen safety protection. Furthermore, we hope to exert our influence and require upstream and downstream suppliers to also take labor safety seriously, working together to create safer work environments.

Strict corporate governance is the foundation of FPCC's sustainable development. Ethical corporate practices are the source of our governance as we seek to achieve information transparency and better communication with stakeholders. We ranked in the top 20% in the 2017 Corporate Governance Evaluation of Taiwan Stock Exchange Corporation. Each year we face severe challenges in the external environment, but we continued to improve our business and have not only won the trust of our investors, but also allowed shareholders to gain a reasonable return on investment. While we pursue continuous growth of the company, we are also working together with customers and suppliers towards common goals and ideals. We strive to provide more stable and better product and service quality to build long-term partnerships with mutual trust, maximizing the power of corporate social responsibility.

Talent is key to maintaining core competitiveness, and employees are our partners on the path towards sustainable growth. We provide competitive salaries, complete career development, and strive to cultivate and discover talent, creating a happy workplace environment where employees and their families can feel at ease. Furthermore, enterprises can only exist in a stable society. Hence, we are grateful and strive to provide assistance and care in social issues, giving back and caring for communities while supporting local development. We actively engage in industry-academia collaboration to drive the development of upstream and downstream industries, striking root in Taiwan so that Taiwan will flourish as we connect with one another.



Looking towards the future, climate change and energy issues will still be the key to oil refinery and petrochemical industries achieving sustainable development. Circular economy, artificial intelligence, and big data applications will be important tools for the Company's future growth. We are fully aware that we must continue to invest resources into sustainable development to face a wider range of stakeholders; only then can we maintain our commitment and generate results that will win the trust of our stakeholders such as customers, society, shareholders, and employees. This is necessary for the Company to achieve sustainable development. Furthermore, we will follow international sustainability trends and learn about related issues, in hopes of guiding the petrochemical industry to create a friendly environment, mutual prosperity in a happy society, and a booming economy.



Formosa Petrochemical Corporation

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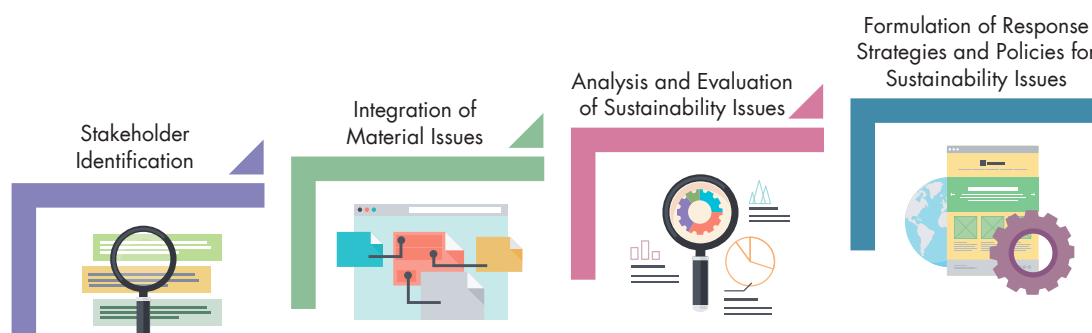
Chairman
2019

Stakeholder Engagement

FPCC attaches great importance to communicating and exchanging opinions with different stakeholders. We are fully aware that communication with stakeholders is key to making continuous improvement and achieving long-term development. To achieve efficient communication and engagement, FPCC periodically analyzes stakeholders and collects related responses and recommendations through different channels, including them into the Company's business plan.


Identification Method

The Company comprehensively evaluates global sustainability trends and FPCC's business development goals, analyzes major issues in governance, economy, environment, and society, and collects sustainability issues that stakeholders are concerned about through different communication channels. After discussions between internal and external experts on sustainability trends and impact analysis, and referencing the AA1000 Stakeholder Engagement Standard, the stakeholder communication process was established based on five principles, namely dependence, level of concern, influence, responsibility, and diverse perspective.












Stakeholder Communication and Engagement

FPCC's 8 main stakeholders were jointly identified by departments with the CSR Task Force. By analyzing the issues stakeholders are concerned about, departments were selected to gain a better understanding and communicate with their corresponding stakeholders. FPCC has designated departments responsible for communicating with, listening to the opinions of, and responding to the needs of different stakeholders.

Stakeholders	Meaning to FPCC	Responsible Department	Communication channel and frequency	Main Points of Communication	Response and Engagement
 Employees	Employees are the foundation for creating competitive advantages of FPCC. Solidarity among employees is enhanced through sound educational training and a friendly working environment.	President's Office	<ul style="list-style-type: none"> Employee-employer coordination meetings (once/2 months) Welfare Committee (Once/2 months) Opinion box/email (as needed) Release letter (As needed) 	<ul style="list-style-type: none"> Public safety risk management Employee profile and benefits 	<ul style="list-style-type: none"> 44 public safety training sessions; 1,392 training participants 91% completion of proposals at employer-employee meetings 100% completion of Welfare Committee proposals

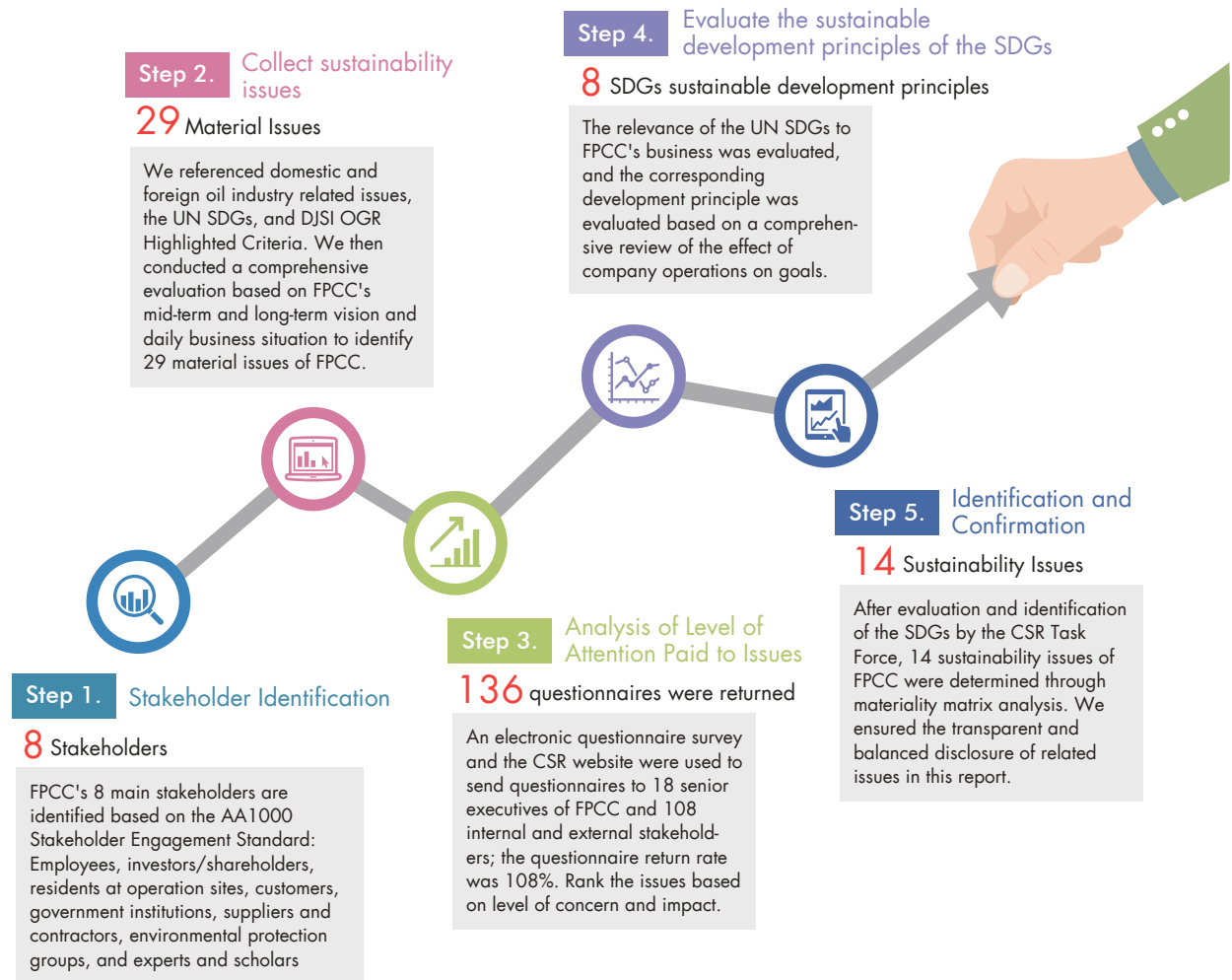


Stakeholders	Meaning to FPCC	Responsible Department	Communication channel and frequency	Main Points of Communication	Response and Engagement
 Investors/ shareholders	<p>Investors/shareholders are important supporters of FPCC's continued operations. To gain the favor of investors, our business philosophy is to implement ethical corporate practices and sustainable governance principles.</p>	President's Office	<ul style="list-style-type: none"> Shareholder meetings (once) Investor seminars (at least 4 times/year) Email/phone number (any time) 	<ul style="list-style-type: none"> Corporate governance Economic performance 	<ul style="list-style-type: none"> Invitation to investor seminars 5 times
 Residents at the operation site	<p>Maintaining good interactions with residents at operation sites is a key point of FPCC's operations. When formulating annual strategies and goals, this is a factor considered in evaluations for operations planning, so as to realize the vision of becoming like family to residents at plants.</p>	Regional Management Department	<ul style="list-style-type: none"> Email/phone number (any time) 	<ul style="list-style-type: none"> Local community development and communication 	<ul style="list-style-type: none"> Emphasis on the health of local residents Promotion in coordination with government knowledge of the environment
 Customers	<p>Providing customers with high value products is a key point of FPCC's operations. We are devoted to becoming a trustworthy business partner of our customers that grows together with them.</p>	Operation units under each business department	<ul style="list-style-type: none"> Satisfaction survey (twice/year) Email/phone number (any time) Meeting (once/month) 	<ul style="list-style-type: none"> Product quality and transportation method 	<ul style="list-style-type: none"> 2018 customer satisfaction survey results slightly improved compared to the previous year
 Government agencies	<p>Apart from abiding by applicable laws and regulations, FPCC also engages in two-way communication with the government, and provides its own industry experience to jointly promote sustainable industrial development.</p>	President's Office	<ul style="list-style-type: none"> Meeting (at least 4 times/year) Email/official letter (as needed) 	<ul style="list-style-type: none"> Industrial and public safety Emergency response and drills 	<ul style="list-style-type: none"> There were no process safety incidents in 2018. 219 emergency response operations were executed
 Suppliers and Contractors	<p>Suppliers and contractors provide high quality products and services, and mutual trust strengthens FPCC's relationship with its supply chain</p>	Safety and Health Management Office of each business department	<ul style="list-style-type: none"> Meeting (As needed) Contractor audit (as needed) Email/phone number (any time) 	<ul style="list-style-type: none"> Public safety risk management 	<ul style="list-style-type: none"> The number of contractors that attended educational events reached 3,601
 Environmental Protection Organizations	<p>Due to industry characteristics, FPCC takes environmental protection issues very seriously. We exchange opinions with environmental protection groups and jointly work towards environmental sustainability.</p>	President's Office	<ul style="list-style-type: none"> Email/phone number (any time) Meeting (once/quarter) 	<ul style="list-style-type: none"> Water resource management 	<ul style="list-style-type: none"> Unit product water consumption decreased 1.6% compared to the previous year Effective water quality monitoring of automatically connected facilities reaches at least 99% every quarter

Stakeholders	Meaning to FPCC	Responsible Department	Communication channel and frequency	Main Points of Communication	Response and Engagement
 Experts and scholars	We value the advice provided on the sustainability issue in academic theories and put the theories into practice to enhance the competitive advantages of industries in Taiwan as a whole.	President's Office	<ul style="list-style-type: none"> Email (any time) Meeting (once/quarter) 	 Environmental assessment	 We engage in industry-academia collaboration with National Taiwan University and Academia Sinica

Material Issue Analysis Process

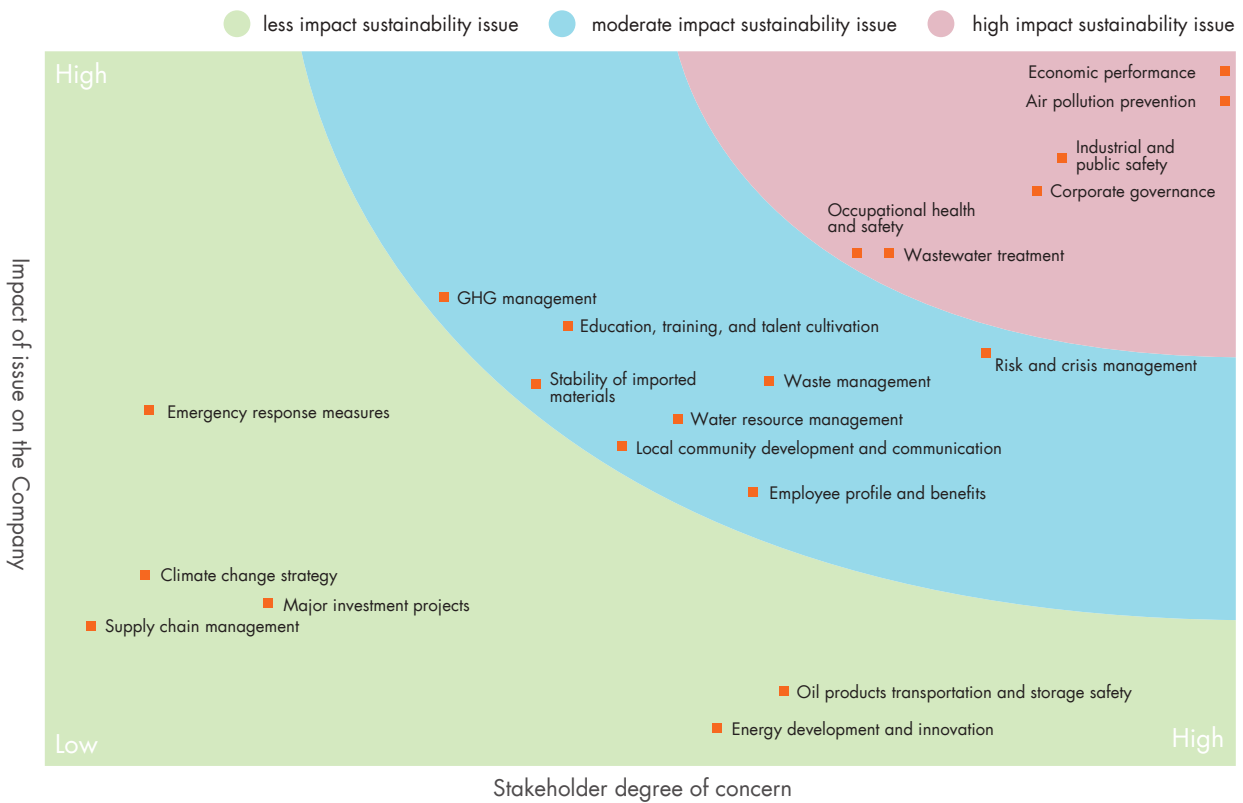
FPCC analyzes issues of concern to stakeholders through the materiality analysis process, and ranks issues based on level of concern to effectively respond to the issues that stakeholders are most concerned about.





Materiality Analysis Matrix

FPCC identified 29 material issues prioritized by stakeholders through the materiality analysis matrix. After discussions between each department and the CSR Task Force, 14 sustainability issues with moderate and high levels of influence were used as the foundation for preparing this report, and their management method and performance results are disclosed in this report so that information disclosure meets the expectations of stakeholders.



Sustainability Issues and Boundaries

The report boundaries and scope correspond to the sustainability issues defined internally and externally and material issues related to GRI Standards. This report fully discloses sustainability issues to ensure the completeness and transparency of information disclosures.

Facets of issues	Sustainability Issue	GRI Standards indicators	Corresponding chapter
	Corporate governance	GRI102-18~102-39	1.1
Economy	Economic performance	GRI 201-1~201-3	1.2 1.3 4.2
	Stability of imported materials	GRI 103-1~103-3	1.4
	Risk and crisis management	GRI103-1~103-3	1.3
	Air pollution prevention	GRI OG6	2.3
Environment	GHG management	GRI 302-1~302-4 GRI 305-1~305-7	2.2
	Water resource management	GRI 303-1~303-3 GRI OG6	2.4
	Wastewater treatment	GRI 306-1~306-5 GRI OG8	2.4
	Waste management	GRI 306-1~306-5 GRI OG5	2.4
	Industrial and public safety	GRI OG13	3.1 3.2
Society	Employee profile and benefits	GRI 401-1~401-3	4.1 4.2
	Education, training, and talent cultivation	GRI 404-1~404-3	4.2
	Occupational health and safety	GRI 403-1~403-3	3.2 4.2
	Local community development and communication	GRI 413-1~413-2 GRI OG10	2.3 4.3



	Boundary							
	Internal (FPCC)	External						
		Investors/ shareholders	Residents at the operation site	Customers	Government agencies	Suppliers and Contractors	Environmental Protection Organizations	Experts and scholars
	✓	✓		✓	✓	✓	✓	✓
	✓	✓				✓		✓
	✓	✓		✓		✓		
	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓		✓				
	✓		✓			✓		
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	✓	✓	✓	✓	✓	✓	✓	✓
	✓				✓			✓
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	✓	✓	✓	✓	✓	✓	✓	✓
	✓		✓					

Meaning and impact of sustainability issue on FPCC

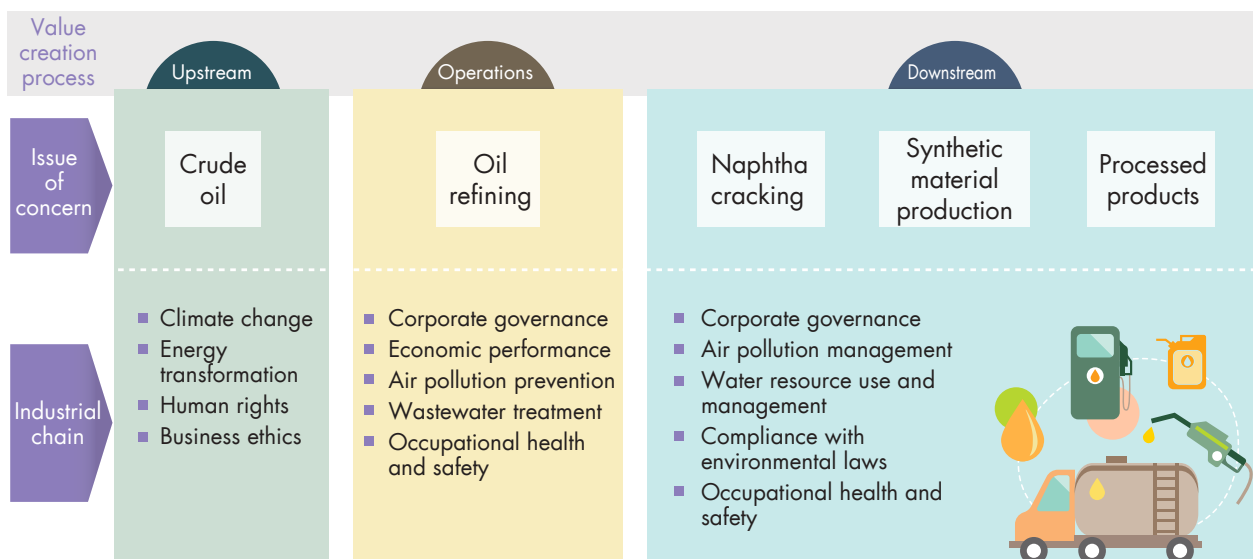
Sustainability Issue	Meaning and impact on FPCC	Issue changes compared to 2017
Corporate governance	Uphold the Company's business philosophy by complying with laws and the Company's Articles of Incorporation, and establish an internal control system to reduce the impact on operations.	<p>Moderate impact sustainability issue → High impact sustainability issue</p> <p>Comprehensive corporate governance is an important foundation for FPCC's sustainable development and stakeholders. Our business philosophy is achieved through a sound Board of Directors, transparent finances, managers with integrity, and internal auditing.</p>
Economic performance	We examined whether if corporate governance affairs were in compliance, achieved stable growth, and gave consideration to the interests of various parties to maximize value and reduce the impact on operations and society.	<p>Moderate impact sustainability issue → High impact sustainability issue</p> <p>We maximize influence through stable economic growth and further achieve the sustainable development of FPCC.</p>
Stability of imported materials	Raw materials used by FPCC include crude oil, naphtha, and coal. All of these raw materials rely on imports and are deeply affected by geopolitics, any inappropriate response will have a negative impact on the economy.	<p>Low impact sustainability issue → Moderate impact sustainability issue</p> <p>The stability of imported materials is an important issue to the development of FPCC. We evaluate external factors such as regional conflict, war, disasters, and political struggle to ensure stable raw materials supply.</p>
Risk and crisis management	FPCC formulates risk assessment methods and management processes in response to international trends, so as to lower the impact of social and environmental changes on its operations.	<p>New issue (Moderate sustainability issue)</p> <p>The assessment of financial and non-financial risks in operations has become an inevitable trend. We lower the impact of risks on operations through risk identification.</p>
Air pollution prevention	Reduce the impact on the environment and shoulder our corporate social responsibility to local residents, mutually prospering with communities to achieve corporate sustainability goals.	<p>Unchanged (High impact sustainability issue)</p>
GHG management	Environmental protection is included as a consideration of operations, use multiple perspectives to outline the Company's overall business policy, ensure the correctness of GHG emissions, and implement numerous process optimization and energy management plans to continue lowering GHG emissions and environmental impact.	<p>Unchanged (Moderate impact sustainability issue)</p> <p>Energy management and carbon issues were adjusted to GHG management.</p>



Sustainability Issue	Meaning and impact on FPCC	Issue changes compared to 2017
Water resource management		Unchanged (Moderate impact sustainability issue)
Wastewater treatment	Manage water resources from the source and set standards above regulatory requirements to minimize the environmental impact of operations.	Moderate impact sustainability issue → High impact sustainability issue In order to effectively use water resources, we lower the demand for water and increase the efficiency of water use to meet stakeholders' expectations.
Waste management		Unchanged (Moderate impact sustainability issue)
Industrial and public safety	We implement international specifications and technologies, and manage processes, equipment, and personnel based on their risk level, lowering the risks at operation sites and social impact.	Unchanged (High impact sustainability issue)
Employee profile and benefits	We attract talent through employee benefits that are better than regulatory requirements, increasing employee loyalty and our changes of retaining outstanding talent, while lowering social impact.	Unchanged (Moderate impact sustainability issue)
Education, training, and talent cultivation	Employees are the foundation for creating competitive advantages of FPCC. Talent with potential in FPCC is developed through education and training, and provide the ability to lead industrial transformation. Their identification with FPCC and retention will lower the impact on our operations and society.	New issue (Moderate sustainability issue) FPCC is actively cultivating AI talent in response to industry changes and transformation, so as to enhance its competitiveness in the industry.
Occupational health and safety	We comply with requirements of the Occupational Safety and Health Act and systematically manage health management plans, creating a high quality workplace culture to lower the impact on operations.	Unchanged (High impact sustainability issue)
Local community development and communication	Lower the impact of operation sites on local communities, and utilize resources of the Chang Gung medical system for health promotion and health education of local residents, developing communities to jointly achieve sustainable development.	Unchanged (Moderate impact sustainability issue)

FPCC's Industrial Value Chain

FPCC is a raw material provider for Taiwan's petrochemical industry. Our operational risks affect the value chain of the entire petrochemical industry. Therefore, we verified our value creation process through the identification and assessment of our industrial chain, and learned about the most important issues in each stage of the value chain through communication with upstream and downstream industries. We gained an overall understanding of the industry from a macro perspective to evaluate the future direction of our operations and formulate related action plans.



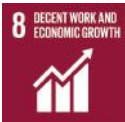











FPCC's SDGs

As a leading industry that is closely connected to the economy, FPCC sets out from its core business on the path towards sustainable development, closely follows international trends in sustainability issues, and comprehensively reviewed the connection between its sustainability practices and the 17 SDGs of the UN, actively responding to targets of each SDG. SDGs are integrated with FPCC's sustainability issues for a comprehensive evaluation, sequentially incorporating the SDGs into the decision-making process for sustainability issues, laying out the blueprint for FPCC's sustainability. The Company identified 8 SDGs to provide the framework for the sustainability blueprint. After a comprehensive evaluation of global sustainability trends, industry issues, and sustainability issues, the SDGs are prioritized and incorporated into the sustainability strategies and policies of business plans.









Identification and Prioritizing	UN SDGs		Sustainability Issue	Sustainability Measures of FPCC in 2018	Goal achievement	FPCC's long-term vision
	Goal	Target				
Tier 1 Core-linked goals		7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.	<ul style="list-style-type: none"> Economic performance GHG management 	<ul style="list-style-type: none"> 1,410 improvement cases in total Cumulative investment amount of NT\$5.71 billion 		Expand the provision of sustainable energy worldwide through the improvement of energy efficiency.
		8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors.	<ul style="list-style-type: none"> Economic performance Industrial and public safety Occupational health and safety 	<ul style="list-style-type: none"> Maintain 35% or above of high-level managerial positions held by local residents Frequency of disabling injuries 0 		Promote local employment development, improve work environment safety, and lead the industry towards higher added value.
		12.2 By 2030, achieve the sustainable management and efficient use of natural resources. 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.	<ul style="list-style-type: none"> Waste management 	<ul style="list-style-type: none"> Continue to implement waste reduction measures 		Implement reuse projects for waste that is buried to significantly reduce the amount of waste generated.

Identification and Prioritizing	UN SDGs		Sustainability Issue	Sustainability Measures of FPCC in 2018	Goal achievement	FPCC's long-term vision
	Goal	Target				
Tier 2 Middle layer linked goals		3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being	<ul style="list-style-type: none"> Employee profile and benefits Occupational health and safety Local community development and communication 	<ul style="list-style-type: none"> Set up 23 i health physical fitness instruments for employees to manage their own health. 		Implement local healthcare and occupational health management, collect big data, and actively provide employees with individual health education and tracking.
		6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally by x%.	<ul style="list-style-type: none"> Water resource management Wastewater treatment 	<ul style="list-style-type: none"> Obtain environmental impact assessment and design documents for desalination plant. Rain water storage rate of 97.6% 		Increase water usage and properly carry out wastewater treatment to protect water ecological systems
		13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.	<ul style="list-style-type: none"> GHG management Air pollution prevention 	<ul style="list-style-type: none"> Reduce GHG emissions by 3% compared to the previous year 		Reduce the impact on climate change through the control and reduction of GHG emissions, and implement energy conservation and carbon reduction measures in coordination with the Greenhouse Gas Reduction and Management Act.



Identification and Prioritizing	UN SDGs		Sustainability Issue	Sustainability Measures of FPCC in 2018	Goal achievement	FPCC's long-term vision
	Goal	Target				
Tier 3 Outer layer linked goals		14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.	<ul style="list-style-type: none"> Local community development and communication 	<ul style="list-style-type: none"> Pass the EcoPorts Certification and obtain a certificate 		Reduce the impact of land waste on the ocean to protect marine ecology
		15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.	<ul style="list-style-type: none"> Local community development and communication 	<ul style="list-style-type: none"> Conduct local species surveys for at least 10 consecutive years to fulfill our responsibility to species conservation at operation sites 		Reduce actions that damage natural habitats to protect ecological resources and species on land



1

Leading
Industrial
Development





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Chapter Summary

FPCC stably operated at full capacity throughout 2018 and implemented management while strictly abiding by labor safety and environmental protection principles. We implement strict cost control measures to ensure our profitability, and continue to make steady profits throughout the year, despite the effects of large oil price fluctuations. We continued to uphold steadiness in corporate governance, risk management, and supply chains relationship management, as we continue to make steady progress.

Stakeholders: Investors/shareholders, customers, government agencies, environmental protection groups, suppliers and contractors, experts and scholars, local residents, and employees

Sustainability Issue: Corporate governance, economic performance, stability of imported materials, and risk and crisis management

Sustainable Development Goals (SDGs)



Strategy

- Sustainable development – Developing higher value products in search of momentum to drive the next generation forward
- Steady operation – Robust corporate governance
- Protect the Rights and Interests of Shareholders – Information transparency, stable return on equity






Targets in 2018	2018 Performance	Targets in 2019	Mid-term and Long-term Goals
Sustainable development			
<ul style="list-style-type: none"> ■ Carry out the HSBC joint venture. ■ Carry out the HHCR joint venture. ■ Carry out the Louisiana State investment project. ■ Carry out the UV LED investment project. 	<ul style="list-style-type: none"> ■ Formal operation has already begun and new specification products will be tested according to the production and sales plan. ■ Actively expanding facilities. ■ A total of US\$220 million was remitted for the Louisiana State investment project in 2018, and environmental impact assessment is currently being carried out. ■ Establishment of a subsidiary was completed for the UV LED investment project, and various production and sales plans are currently being formulated. 	<ul style="list-style-type: none"> ■ Enter the steady production phase. ■ Continue to carry out factory construction and a test run will be carried out in 2019. ■ Continue to implement the Louisiana State investment project. ■ Continue to implement the UV LED investment project and complete joint venture. 	<ul style="list-style-type: none"> ■ To achieve sustainable development, besides ensuring the competitiveness of the Company's current products and further developing high value petrochemical products, we are also searching for new investment and development opportunities.

Targets in 2018	2018 Performance	Targets in 2019	Mid-term and Long-term Goals
Steady operation			
<ul style="list-style-type: none"> ■ Held at least 6 Board of Directors meetings with an average attendance rate of at least 80%. ■ Top 20% in the Corporate Governance Review. ■ Completed the internal audit plan approved by the Board of Directors, and effectively improved deficiencies. ■ Evaluate the effectiveness of the internal control system. 	<ul style="list-style-type: none"> ■ Held 6 Board of Directors meetings with an average attendance rate of 87%. ■ Maintain Top 20% in the Fourth Corporate Governance Review. ■ All 52 audit plans approved by the Board of Directors were completed, and all deficiencies found were improved. ■ Completed an assessment of the effectiveness of the internal control system, verified the effectiveness of internal controls and issued a statement. 	<ul style="list-style-type: none"> ■ Held at least 6 Board of Directors meetings with an average attendance rate of at least 80%. ■ Top 20% in the Corporate Governance Review. ■ Completed the internal audit plan approved by the Board of Directors, and effectively improved deficiencies. ■ Evaluate the effectiveness of the internal control system. 	<ul style="list-style-type: none"> ■ Ensure corporate governance operations strictly comply with regulatory requirements and achieve the purpose of steady operation.
Protect the rights and interests of shareholders			
<ul style="list-style-type: none"> ■ Strengthen disclosures in Chinese and English on the official website. ■ We fulfilled our obligation of information disclosure and were not fined for any violation of this obligation. ■ Participated in at least 4 investor seminars, at least once each quarter. ■ Stable return on equity. 	<ul style="list-style-type: none"> ■ Added the disclosure of the human rights policy, employee compensation and salary adjustment mechanism, and implementation of ethical corporate management education. ■ We were not fined for any violations of our reporting obligation in 2018. ■ Attended five sessions on 3/21, 5/24, 6/29, 7/30, and 12/5. ■ A yield of 3.99% is higher than the interest rate of 1.04% for one-year term deposits. 	<ul style="list-style-type: none"> ■ Strengthen information disclosure and compile English version annual reports for shareholder meetings. ■ We fulfilled our obligation of information disclosure and were not fined for any violation of this obligation. ■ Participated in at least 4 investor seminars, at least once each quarter. ■ Stable return on equity. 	<ul style="list-style-type: none"> ■ Material information of the Company is immediately disclosed and transparent in accordance with regulatory requirements, and the Company's dividend policy is stably executed to protect shareholders' rights and interests.

1.1 Corporate Governance

management approach (MA)

GRI Standards corresponding: Governance

-  Sustainability Issue: Corporate Governance
-  Our commitment and responsibilities: The Board of Directors is FPCC's highest governance unit, and upholds the Company's business philosophy by complying with laws and the Company's Articles of Incorporation. The internal control system was established to ensure that corporate governance tasks are carried out according to regulations. We also ensure that stakeholders can immediately access material information of the Company.
-  Our goals: Ensure corporate governance operations strictly comply with regulatory requirements; material information of the Company is immediately disclosed and transparent in accordance with regulatory requirements; the Board of Directors, functional committees, and the Company's internal controls are effectively executed.

Organizational Structure, Ethical Corporate Management

Company Overview

Formosa Petrochemical Corporation (FPCC) was founded in 1992 and deals mainly with the production and sales of oil products and fundamental petrochemical materials. It was the first private oil refining business in Taiwan to produce and sell various oil products such as gasoline and diesel. Its naphtha crackers, on the other hand, produce fundamental petrochemical materials such as ethylene, propylene, and butadiene, with a throughput scale topping the domestic list. In addition, there are the qualified heat and power combined co-generation system to supply various public utility fluids such as steam and power at its facilities in the Formosa Plastics Group Mailiao Industrial Park.



Formosa Petrochemical Corporation



Date of Establishment
April 6, 1992



Listing Date
December 26, 2003



Total Capital Assets
NT\$95,259,596,520



Number of employees
in 2018
5,285



2018 Consolidated Revenue
NT\$767,550,210,000



Credit rating
Taiwan Ratings: twAA;
Standard & Poor's A-



Business
office

Headquarters: No. 1-1, Formosa Plastics Group Industrial Zone, Zhongxing Village, Mailiao Township, Yunlin County
Taipei Office: 4F, No. 201, Formosa Building, Dunhua N. Rd., Songshan Dist., Taipei City

Note: (As of Monday, December 31, 2018)



FPCC is a member of the Formosa Plastics Group Identification System. The corporate identification system features a stylized chain as its common symbol, indicating the horizontal and longitudinal connections, assistance and cooperation, harmony and smooth fusion among all members, and is symbolic of the consistency, sustainability, and continuous development power of the Formosa Plastics Group.

Business Philosophy

The Formosa Plastics Group has now developed into a comprehensive industrial group, and is active in a variety of fields. The momentum that drives the organization to constantly expand itself, grow, and become strong is exactly the underlying spirit that its two founders, Mr. Yung-Ching Wang and Mr. Yung-Tsai Wang, have emphasized and lived up to: hard work, being down-to-earth, aiming at perfection, sustainable management, and giving back to society.

Hard Work and Being Down-to-earth

Diligence is demonstrated in applying intelligence, and simplicity is a down-to-earth attitude at work. Improvements are sought in honor of the spirit to get to the bottom of everything and every effort is made to seek reasonable management.

Aiming at Perfection

In a rapidly changing external environment, enterprises have to get better and better in rationalizing their operation and management and realize innovation and development by making breakthroughs in the midst of continuous improvements.

Giving Back to Society

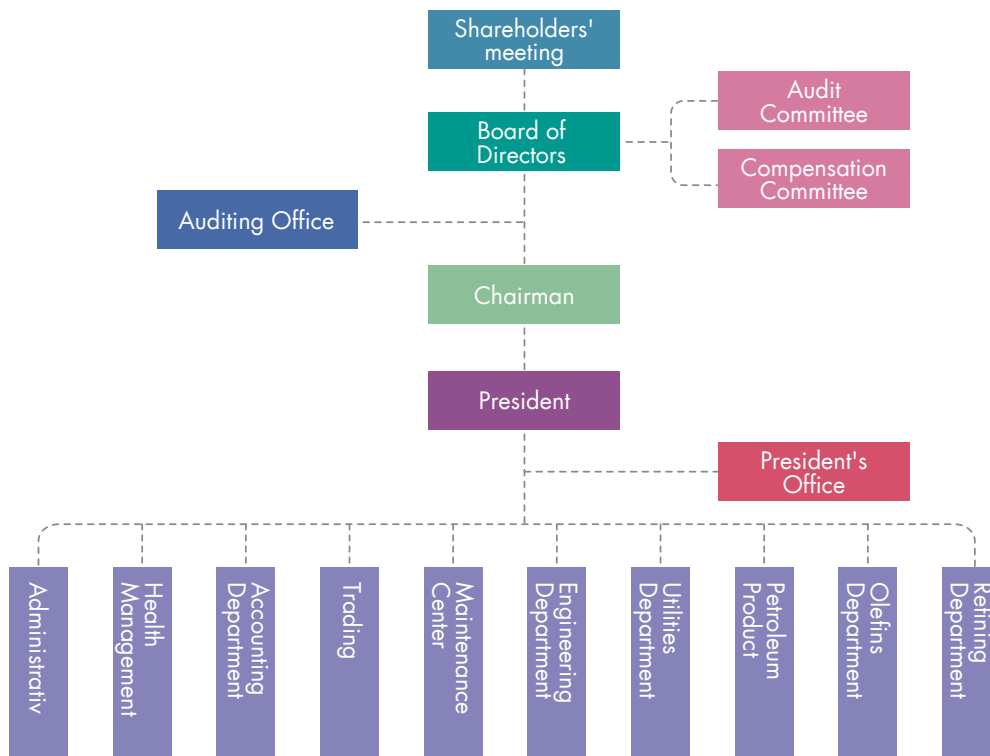
In honor of the theme that you must put back into society what you have taken out, business in the public interest such as medical care and education is prioritized for investment of corporate resources in the pursuit of overall mankind welfare.

Sustainable Management

Individual operations are in explicit compliance with rules and regulations to improve quality and efficiency at work. Long-term profit-making potential is strengthened through rationalized management and quality fair-priced raw materials are provided to customers, creating a win-win and robust partnership.

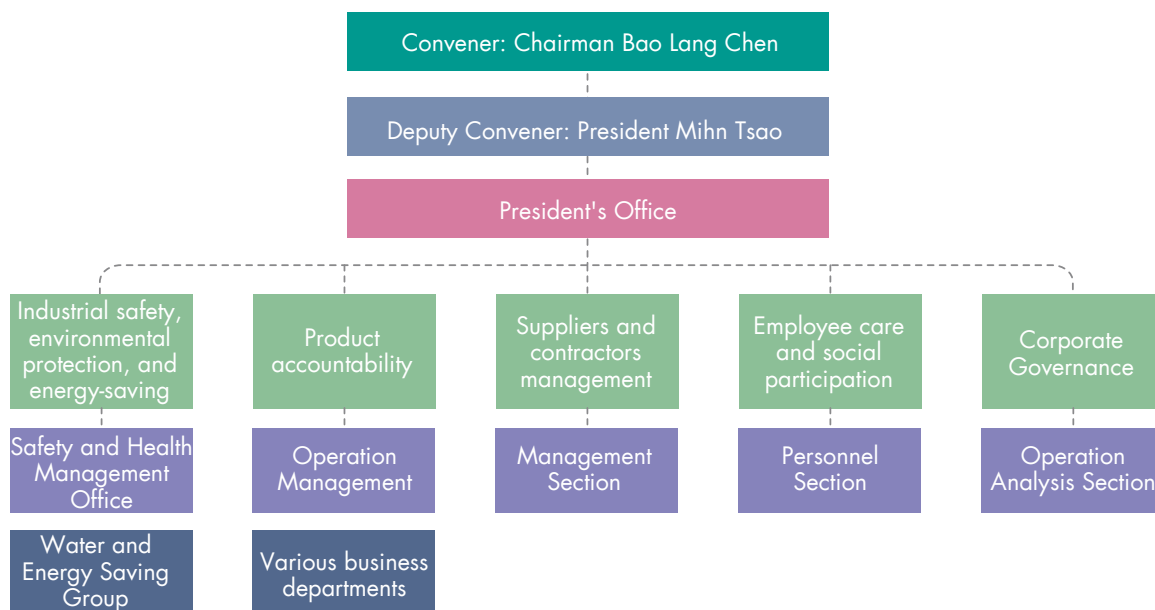
Corporate Governance Structure and Sustainable Governance Organization

The organizational framework of FPCC features specific responsibilities. The Chairman is not involved in any administrative affairs in order to ensure the independent operation of the company. The various business departments operate under the President, and engage in cross-departmental communication in addition to their own operations, supporting one another in order to accomplish their operational goals.



For the Company's sustainable development, the chairperson of FPCC is the convener and the President is the vice convener, and the President's Office and related units are combined into the sustainable governance organization "FPCC Social Responsibility Task Force," which carries out CSR related tasks. Multiple smooth communication channels are used to understand what stakeholders are concerned about and their needs, which serve as an important basis for establishing the corporate sustainability policy.

Organization chart of the FPCC Social Responsibility Task Force



Board of Directors, Audit Committee, Compensation Committee

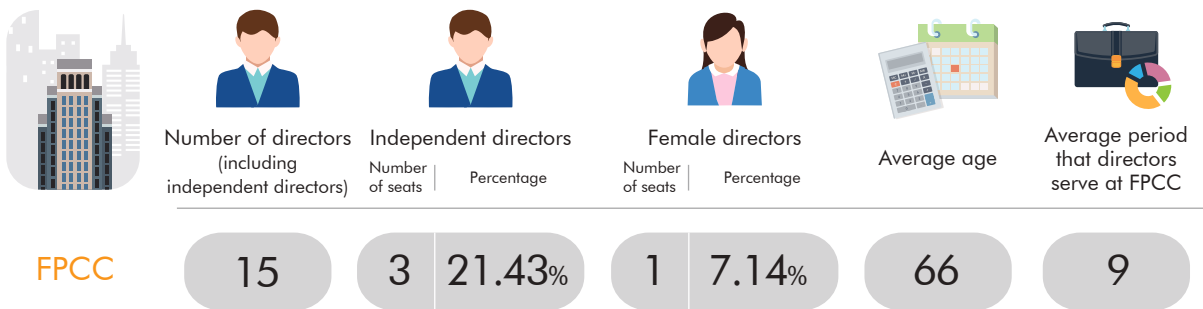
Overview of the Board of Directors



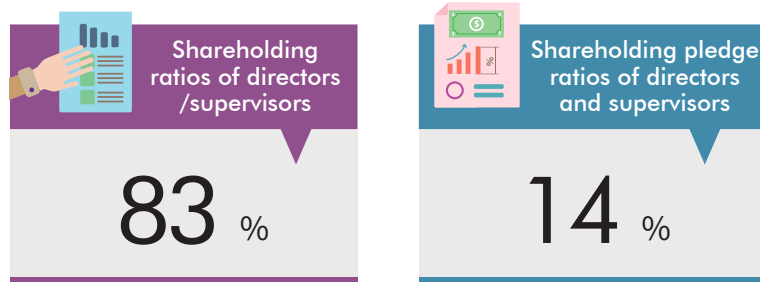
FPCC directors are elected to three-year terms via the candidate nomination system. The Corporate Governance Best Practice Principles was established to ensure the Board of Directors diversity policy is implemented and that directors have the knowledge, skills and the competencies required to perform their duties.

The Board of Directors currently has 15 members with an average age of 66 years old, and the average period that directors serve at FPCC is about 9 years, providing the most suitable strategies and guidance for the Company's development. To improve the professional competencies and legal literacy, FPCC arranges courses for directors to gain new knowledge each year. For details on the academic background and experience of directors, their professional knowledge and independence, continuing education, and shareholding, please refer to our website (<http://www.fpcc.com.tw/>) and the annual report disclosed at shareholders' meetings.

The Board of Directors, in principle, meets at least once a quarter. A total of 6 board meetings were held in 2018 with an attendance rate of 87%.



The shareholding ratios of directors and supervisors at FPCC has been around 83% for the past five years, which is far greater than the FSC's requirement of 2% at minimum for public offering companies of the same size. Meanwhile, the shareholding pledge ratio of directors and supervisors is only around 14%. These ratios show that the Board of Directors and shareholders of FPCC are highly correlated in terms of interest and hence the former is trustworthy for the latter.



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Operation of the Audit Committee

FPCC's Audit Committee is formed by independent directors. The Audit Committee supervises the Company's business condition and financial position based on the principles of integrity and independence. It helps the Board of Directors carry out supervisory and other duties as set forth in the Company Act, the Securities and Exchange Act, and other related laws. The Audit Committee met 6 times in 2018 with an actual attendance rate of 100%. Details are disclosed in the corporate governance section of the Company website (<http://www.fpcc.com.tw/>).

Title	Name	2015		2016		2017		2018	
		Actual attendance	Attendance rate	Actual attendance	Attendance rate	Actual attendance	Attendance rate	Actual attendance	Attendance rate
Convener	C.P. Chang	4	100%	5	100%	5	100%	6	100%
Committee Members	Chi-Tang Lo	3	75%	3	60%	5	100%	2	100%
Committee Members	Yu Cheng	3	75%	5	100%	5	100%	6	100%
Committee Members	Sush-der Lee	-	-	-	-	-	-	4	100%
Total		10	83.33%	13	86.67%	15	100%	18	100%

Note: After the reelection of directors in the shareholders' meeting on 6/14, Chi-Tang Lo was relieved and Sush-der Lee assumed the position of committee member.

Overview of Operation of the Compensation Committee

FPCC set up the Compensation Committee in August 2011 to review compensation policies and systems for the corporate directors and managers and provide the Board of Directors with suggestions; this helped prevent compensation policies guiding directors and managers to be engaged in corporate risky appetite behavior.

At present, all the three members serving on the Compensation Committee are independent directors. The committee met three times in 2018 with an actual attendance rate of 100%. Details are disclosed in the corporate governance section of the Company website (<http://www.fpcc.com.tw/>).

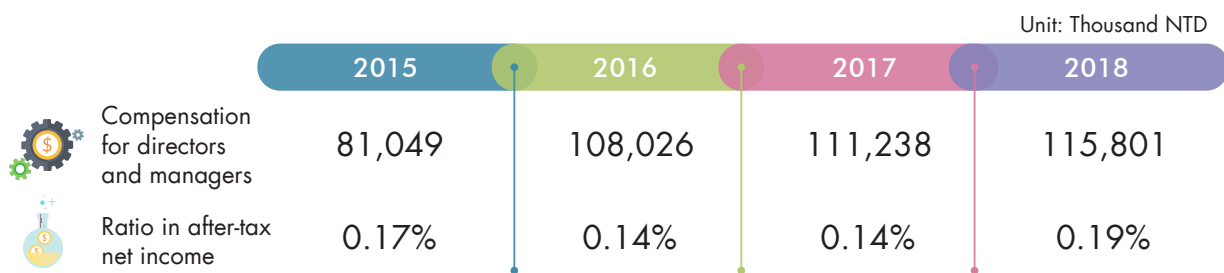
Title	Name	2015		2016		2017		2018	
		Actual attendance	Attendance rate	Actual attendance	Attendance rate	Actual attendance	Attendance rate	Actual attendance	Attendance rate
Convener	C.P. Chang	3	100%	2	100%	2	100%	3	100%
Committee Members	Chi-Tang Lo	2	67%	1	50%	2	100%	1	100%
Committee Members	Yu Cheng	2	67%	2	100%	2	100%	3	100%
Committee Members	Sush-der Lee	-	-	-	-	-	-	2	100%
Total		7	77.78%	5	83%	6	100%	9	100%

Note: After the reappointment of committee members in the Board of Directors meeting on 6/14, Chi-Tang Lo was relieved and Sush-der Lee assumed the position of committee member.

Compensation for directors and managers

For the remunerations for directors and managers, independent directors receive compensation and transportation subsidies on a monthly basis. Transportation subsidies, in particular, are paid according to actual attendance in Board meetings. Annual compensation for managers mainly includes the salary, incentives, and bonuses in addition to the pension fund and the welfare fund. The Chairperson rates the overall performance and fulfillment of personal "annual objectives at work" within the scope of responsibilities for managers in terms of performance assessment, to ensure that executives understand and work together to accomplish corporate strategic goals and to combine the incentive system and the personal performance of supervisors as well as the overall corporate performance.

The total value of compensation and its ratio in after-tax net income for directors and managers at FPCC



Strengthening Information Transparency

FPCC's measures to strengthen two-way communication with stakeholders:

- Information is regularly and irregularly disclosed on the Market Observation Post System in accordance with the law. All information was disclosed in accordance with the law in 2018, and we were not fined by the Taiwan Stock Exchange and Financial Supervisory Commission for violating our reporting obligation.
- Attend 4 investor seminars each year.
- Continue to optimize the Company website and strengthen information disclosures, including disclosing the human rights policy in the corporate governance section, employee compensation and salary adjustment mechanism, and implementing ethical corporate management education.
- Set up an Investor Section on the company's website to provide investors with related information, appoint a dedicated contact person to answer related questions, and appoint a spokesperson as the liaison with shareholders and institutional investors.

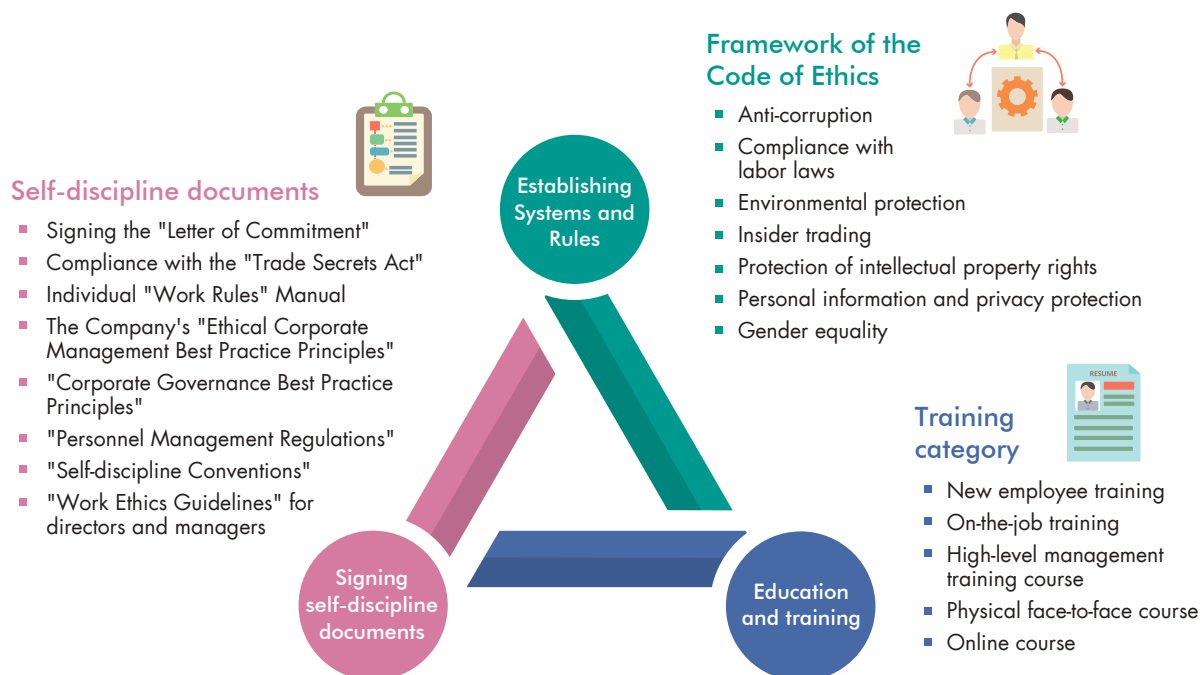
Concrete results are reflected in each accreditation performance review. In the Information Disclosure and Transparency Ranking System of the Taiwan Stock Exchange, FPCC has secured a Grade A or higher rating for ten consecutive years, starting from the 3rd session of the ranking system in 2006. In addition, in the first corporate governance accreditation that started in 2014, FPCC ranked in the Top 20% for four consecutive years among listed companies that took part in the rating.

Code of Conduct, Anti-corruption Policy, Internal Audit System

Code of Conduct

We established 17 regulations, including the Corporate Governance Best Practice Principles and Ethical Corporate Management Best Practice Principles, to ensure that the business philosophy is upheld. The regulations are disclosed in the corporate governance section of the Company website (<http://www.fpcc.com.tw/>).

Anti-corruption with policy



Establishing Systems and Rules

We established systems or rules for different fields, and uphold the spirit to not wrong the innocent or let the guilty go for any unethical conduct. We terminate the employment of or cease to do business with violators, and will take suitable legal action.

Signing self-discipline documents

We prepared self-discipline documents for unethical conduct. All employees are required to sign the "Letter of Commitment", comply with the "Trade Secrets Act", and receive a "Work Rules" manual. Employees in positions that deal with vendors (such as: procurement, outsourcing) are required to sign the "Self-discipline Conventions", and a regular job rotation system is implemented to prevent corruption. We established the Work Ethics Guidelines for directors and managers, which strictly prohibits offering, committing, requesting or accepting any illegitimate benefits, or being involved in any conducts that would be construed as dishonest, illegal or in breach of trust, whether directly or indirectly, while carrying out their duties.

Education and training

For all employees to have legal concepts of anti-corruption, we provide related regulations and the concept of rule of law during new employee orientation, specialized position training, and supervisor training. Furthermore, we planned an online course for anti-corruption law promotion to instill employees with the right ethical concepts, while increasing their ability to identify corruption risks.

Complaints channel

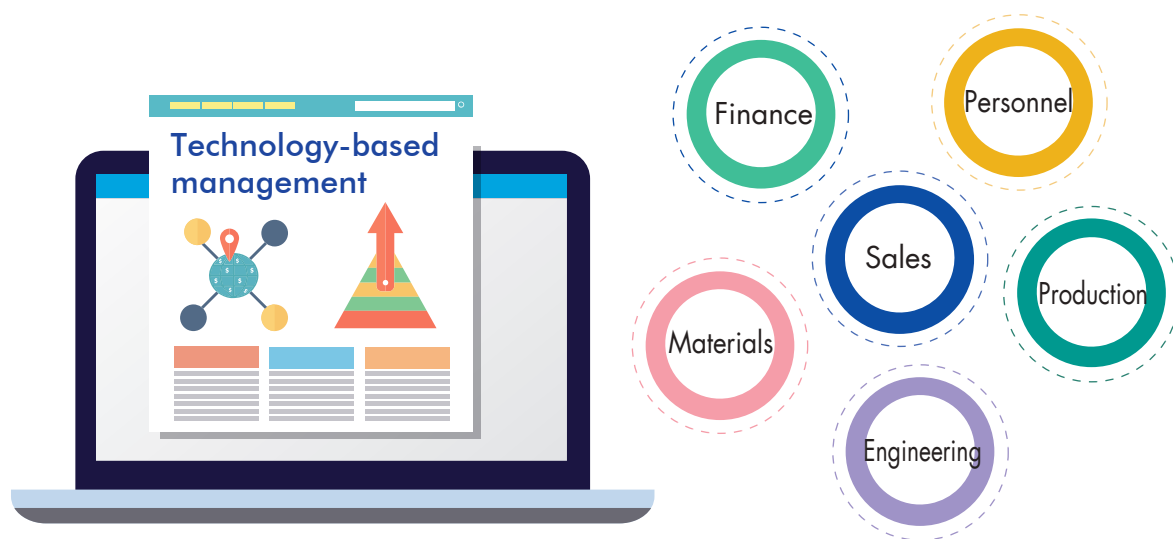
The Company provides internal channels for reporting illegal conduct through the Employee Complaint Operating Guidelines. Employees can fill out a complaint form when they become aware of any illegal or inappropriate behavior likely to undermine personal or corporate rights, or attempts by an employee to use his/her position to obtain improper interests. Complaints are handled by the supervisors of related departments. The Company and investigators all conduct investigations and submit reports based on the spirit of fair and just, and the entire process is maintained confidential.

Execution

Based on the policy described above, we conducted a corruption risk assessment for all of our business locations in 2018, and found there was no severe corruption risk.

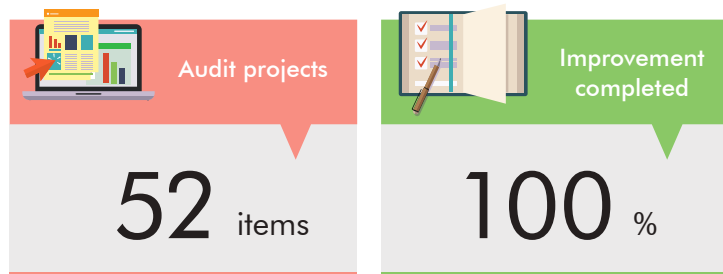
Internal Audit

FPCC has established effective and complete internal control mechanisms. All operations are computerized, using technology-based management to link together six major functions, namely personnel, finance, business operation, production, materials, and engineering. The effectiveness of the internal control system is evaluated by the Board of Directors each year, and a statement of the internal control system's effectiveness is issued. The 2018 effectiveness evaluation was approved by the Board of Directors on March 11, 2019.



According to the 2018 audit plan approved by the Board of Directors, items to be audited include sales and receivables, purchase and payment, production, salaries and wages, financing, fixed assets, computer information, and investment in a transaction cycle – 52 items in total, in order to accomplish goals relating

operational effectiveness and efficiency, reliability of financial reports, and compliance with applicable laws. Results of the actual audit showed 15 areas with deficiency and most of them had to do with documentation or incomplete data; they were not major deficiencies. Internal control system deficiencies and abnormalities found in the inspection were already included in the produced audit report and have been followed up periodically, and have been completed corrected as of now. The improvement rate is 100%.



Implementation of internal audit

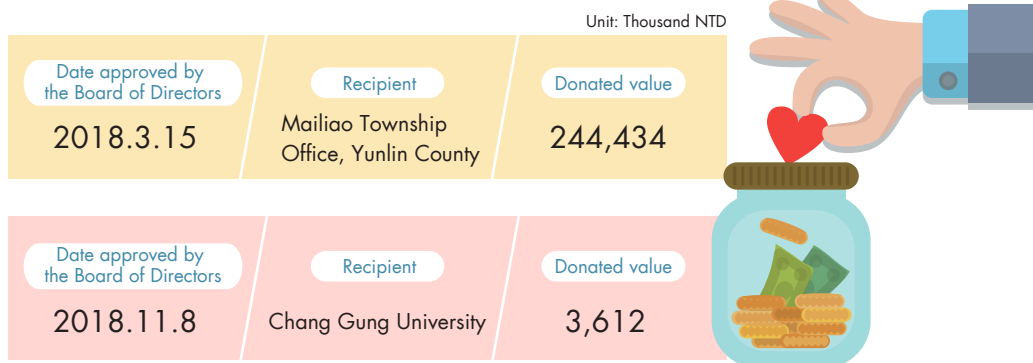
	2015	2016	2017	2018
 audit projects	47 items	50 items	53 items	52 items
 Number of deficiencies found	10 cases	9 cases	13 cases	15 cases
 Number of improvements completed	10 cases	9 cases	13 cases	15 cases
 Improvement rate	100 %	100 %	100 %	100 %

Public Policy and Membership in Associations

Donation and political contribution policy

Donations made in 2018 were based on considerations to give back to communities and fulfill our CSR. We did not make any political donations for lobbying, and any donations to a related party or a major donation to a non-related party must be approved by the Board of Directors.

Donation proposals submitted to the Board of Directors for approval in 2018



Public policy engagement

FPCC reflects its advice regarding the energy industry mainly through the annual advice white paper of the Chinese National Federation of Industries and expresses its opinions and viewpoints on applicable industrial regulations when consulted by government authorities to keep smooth communications with government authorities going. The 2018 white paper of the Chinese National Federation of Industries provides recommendations for the allocation of centrally-funded tax revenues, energy policy, and labor issues to the government.

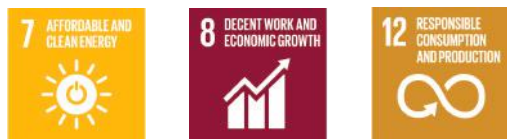
Participation in non-profit organizations

In order to help industries in Taiwan improve their operation outlook, FPCC has been proactively participating in various industrial associations and societies by serving as chairman, director/supervisor, and representative at the said organizations. We conduct exchanges with counterparts on operational experience through associations and organizations, and share the latest market intelligence, supply and demand changes, and technical information, in hopes of making contributions to the industry as a whole.

Name	Role	The Company's representative
Petrochemical Industry Association of Taiwan	Standing Supervisor	Chairman Bao Lang Chen
Chinese Petroleum Institute	Standing director	Chairman Bao Lang Chen
Sino-Arabian Cultural & Economic Association	Standing director	Chairman Bao Lang Chen
Taiwan Institute of Chemical Engineers	Standing director	Chairman Bao Lang Chen
Center for Corporate Sustainability	Director	Chairman Bao Lang Chen
Sino-Indonesia Cultural & Economic Association	Director	Chairman Bao Lang Chen
Taiwan Responsible Care Association	Director	Director Heng-Sheng Wu
Chinese Association for Energy Economics	(General member)	—
Chinese Chemical Society	(General member)	—
Association of Ocean Pollution Control	(General member)	—
Pressure Vessel Association of the ROC	(General member)	—
Taiwan Safety Council	(General member)	—
Water Industry Development and Promotion Association	(General member)	—
The Society for Nondestructive Testing & Certification of Taiwan	(General member)	—
Yunlin Hsien Industrial Association	(General member)	—
Yunlin County Employment Relations Association	(General member)	—



1.2 Sustainable Development Business Model



Industry overview

The domestic petrochemical industry is affected by the direction of policies. There have been no major expansions in recent years, and there has been no new production capacity as well. However, Asia countries including China and South Korea have been adding new production capacity. Facing this pressure from competitors, FPCC maintained steady production and did not make any material changes to production in 2018.

Company Business Model, Products, and Production Capacity

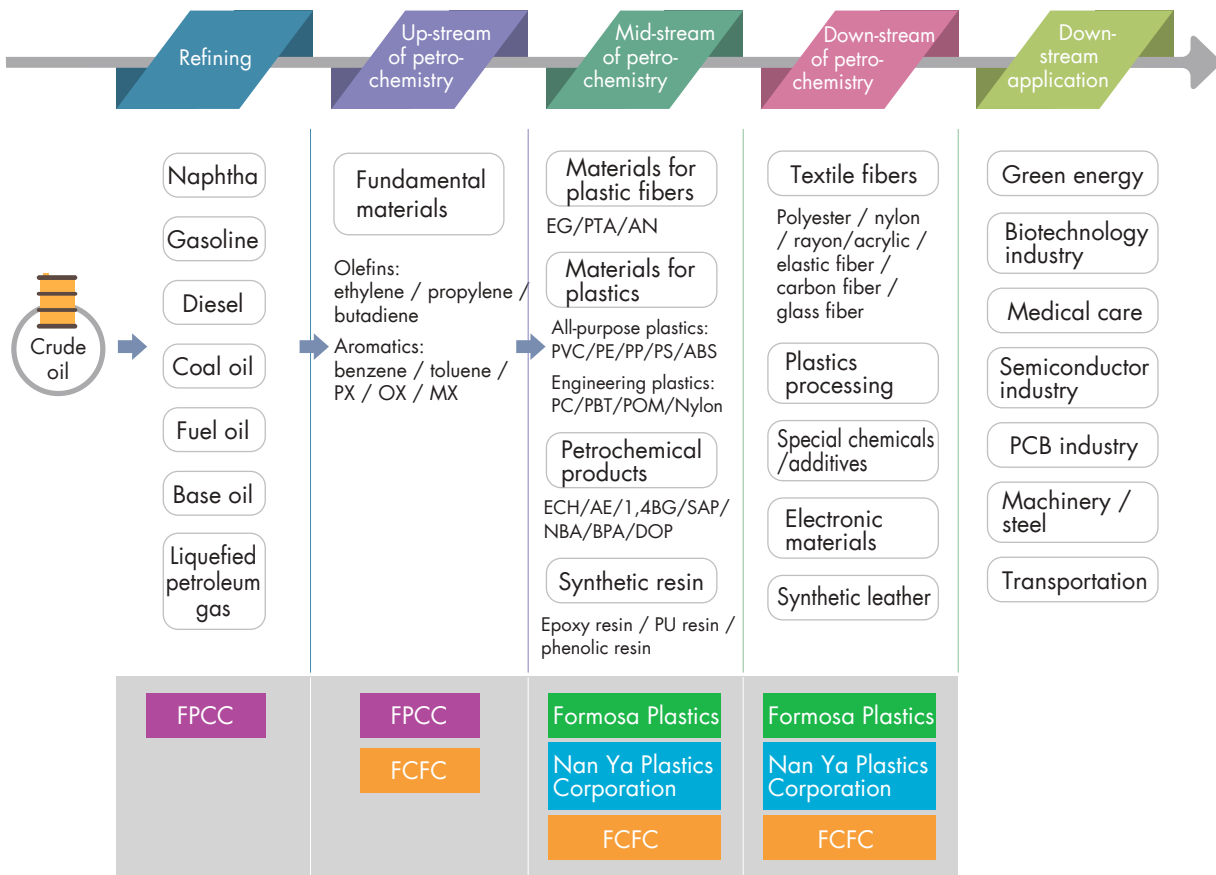
About the sixth naphtha cracker project

The offshore industrial park in Mailiao, Yunlin County is located at the estuary of Zhuoshui River at the northmost point of Yunlin County. It stretches about 8 km to the north and south and extends over 4 km off the coastline. The area is commonly known as "Feng Tou Shui Wei" and is not easily accessible. There is strong northeast monsoon for six months every year, and the strict environment and climate makes construction very difficult. It took the collective efforts of all employees starting in 1994 to complete the phase 1-4 construction of the sixth naphtha cracker project.

- ↳ Cumulative investments in the park is approx. NT\$755.1 billion (including the industrial port and power plant).
- ↳ Around 109.15 million cubic meters of sand were used for reclamation. The volume of the sand is equivalent to that required for a 373 km-long freeway, that is, the distance between Keelung and Kaohsiung. The width was equivalent to eight lanes of road, and the height was equivalent to a three story building.
- ↳ The area of the land reclaimed was around 2,255 hectares, which is about 8% the size of Taipei City and around 0.062% of the overall area of Taiwan.
- ↳ The park is around 2,603 hectares in total; that is more than four times the combined area of Linyuan Petrochemical Industrial Park (403 hectares), Dashe Petrochemical Industrial Park (109 hectares), and Toufen Petrochemical Industrial Park (95 hectares).
- ↳ There are 54 petro-chemistry-related facilities and the total length of pipelines within the plant alone is more than 3,000 km.

Correlation map of products manufactured by the Formosa Plastics Group

The petrochemical industry generally consists of fundamental materials, intermediate materials, and applied and processed products in the down-stream, which are quite closely related with one another. The fundamental materials it produces include olefins and aromatics, which are made with naphtha refined from crude oil and having gone through high-temperature and high-pressure cracking or recombination. FPCC is located at the upstream of the industrial chain and its main material is crude oil imported from overseas. Main products include a variety of oil products and petrochemical basic raw materials. Please refer to the annual report for information on the supply of main raw materials and main suppliers and customers.



FPCC's production capacity and organizational scale in 2018



Refining business

The daily refining volume of the sixth naphtha cracker is 540 thousand barrels. The production volume of naphtha, in particular, can reach 3.75 million tons, to supply the requirements at related factories within the Mailiao Industrial Park. Meanwhile, gasoline, diesel, aviation fuels, and liquefied petroleum gas are produced.

Olefins business

There are three naphtha crackers in total and total ethylene throughput reaches 2,935 thousand tons a year.

Utilities business

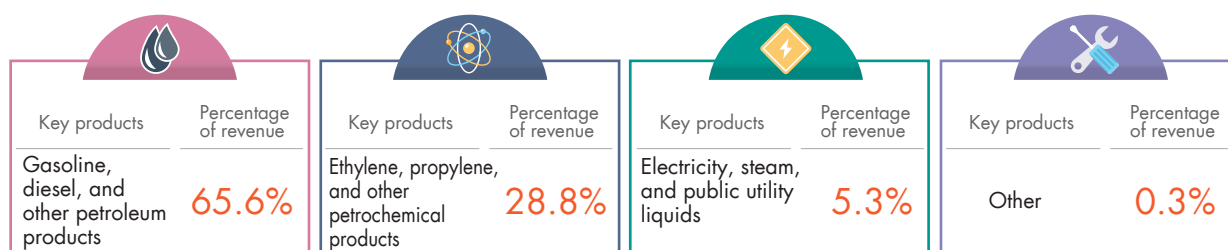
There are currently 16 sets of machines configured for the qualified heat and power combined co-generation system. The gross installed capacity is 2.75 GW. It is the largest heat and power combined co-generation plant throughout Taiwan, and generates electricity, steam, industrial water, ultra pure water, nitrogen, oxygen, and compressed air.

2018 Production Volume

With regard to production volume, we maintained steady production throughout 2018 and production is not significantly different compared to the previous year. Please refer to our website (<http://www.fpcc.com.tw/>) and the annual report disclosed at shareholders' meetings for details.

Main products and services

FPCC's main products and services include gasoline, diesel and other petroleum products, ethylene, propylene and other petrochemical products, and public utility liquids. Oil products accounted for 65.5% of our business revenue in 2018, while petrochemical products accounted for 28.8%. These are the most important core business items.



For details on products and services, please refer to our website (<http://www.fpcc.com.tw/>) and the annual report disclosed at shareholders' meetings.

Quality certified products and services:

Energy that is new and better – Formosa 95+ Lead-free Gasoline "steady, cost-effective, powerful, and clean"

Formosa Oil is a local brand of Taiwan that has been devoted to producing high-quality products to be sold domestically and internationally. In the international oil product market, our products are widely recognized for their good quality, and are sold to advanced countries such as Germany, the US, Japan, and Australia.

By applying the world's most advanced processes and equipment, FPCC conducts in-depth research into the development of global engine technology. With its refining techniques and experiences accumulated over the years, the new formula "95 Plus Lead-free Gasoline" has been developed through improved processes and research studies in engine laboratories. It fulfills international standards and actual road tests and has taken root in the domestic oil product market, so that new products are equipped with more outstanding driving stability, fuel efficiency, and horsepower performance, among other characteristics.



Formosa Oil – Whole new formula super diesel

Facing the rapid development of vehicle engine technology, Formosa Oil released the whole new formula super diesel in response to the strict environmental protection laws worldwide and consumers' high expectations for a good product. The new super diesel meet the standards for the highest level diesel used in Japan and Euro 5 vehicles. It offers the advantages of smooth flow, good mileage at a low price, greater power climbing slopes, and less carbon deposit, making it the best choice for commercial vehicles.



TAF (Taiwan Accreditation Foundation) Certification

The Flow Calibration Laboratory at FPCC's Maintenance Center obtained the Chinese National Laboratory Accreditation (CNLA) certification in 2003, and the Gasoline and Diesel Engine Laboratory under the Refining Department obtained it in 2004. CNLA is also the former of the Taiwan Accreditation Foundation–Department of Laboratory Accreditation (TAF), in order to enhance the skills and capabilities and quality levels of its laboratories to accordingly achieve certification in the international community and facilitate economic activities and trade. Once certified, test reports and calibration certificates issued by the laboratories can bear the certification symbol to prove applicable capabilities.



REACH Registration of Chemicals

Ethylene, propylene, butadiene, Isoprene (IPM), piperylene (PIPS), dicyclopentadiene (DCPD) produced by FPCC have been registered under REACH, which is a safety regulation of the European Union requiring registration, evaluation, authorization, and access control of chemicals. Registration under REACH will help distribution of our products to the European Union and facilitate promotion of business.

JHOSPA (Japan Hygienic Olefin and Styrene Plastics Association)

JHOSPA was founded in 1973 in response to the Food Hygiene Act in Japan and has established regulatory standards for the raw materials of food containers/packages, additives, and hygiene of finished products. FPCC has food-grade white oil products 380N and 550N certified by the JHOSPA to be qualified additives.

Pursuing higher value products in search of momentum to drive the next generation forward

- ✿ The joint venture with Kraton to produce 40 thousand tons of hydrogenated styrenic block copolymer (HSBC) a year officially released a product in February 2017, and carried out stable production according to the production and sales plan for 2018. Meanwhile, new specification products continue to be tested.
- ✿ Factory construction for the joint venture with Idemitsu Kosan Co., Ltd. to produce 43,800 tons of HHCR is currently being carried out, and a test run will be completed in 2019 to begin formal production.
- ✿ In response to the government's environmental protection policy, we will plan future gas stations into green buildings, and will use nine evaluation indicators, specifically biodiversity, greening, foundation water retention, daily energy conservation, carbon reduction, waste reduction, indoor environment, water resources, and wastewater and waste improvement. In coordination with the trend of green energy, we will promote the installation of a rooftop or ground PV tracking power generation system in gas stations. The new Formosa Oil signboards and high bay lights will use LED lighting to achieve energy conservation and carbon reduction in all aspects.
- ✿ We are planning the construction of a desalination plant to replace a portion of industrial water use, making our water use more flexible.
- ✿ As the number of domestic investment opportunities has significantly decreased, we are actively carrying out our Louisiana State investment project, which constructs an ethane cracker and downstream plants, in hopes of achieving sustainable development.
- ✿ The UV LED sterilization equipment we jointly developed with Nikkiso is applied to air purifiers, drinking water sterilization, and other deodorization and sterilization equipment. We set up a subsidiary in 2018 to carry out preliminary production and sales plans, and have submitted applications in each country to complete the establishment of a joint venture in 2019.

Operational performance

management approach (MA)

GRI Standards corresponding: Economic performance

Our operations focus on steady production, and we make flexible adjustments to production and sales based on the market situation, aiming to maximize shareholder equity and maintain stable finances. We do not engage in unrelated financial operations to maintain the Company's stability.

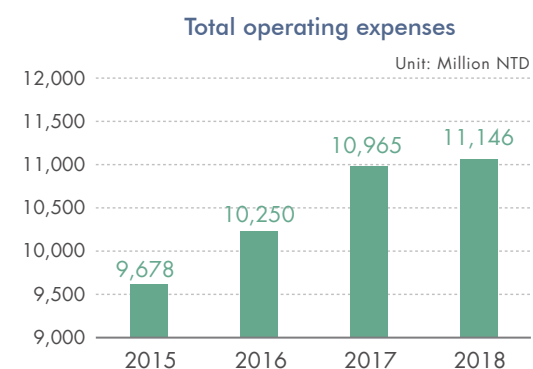
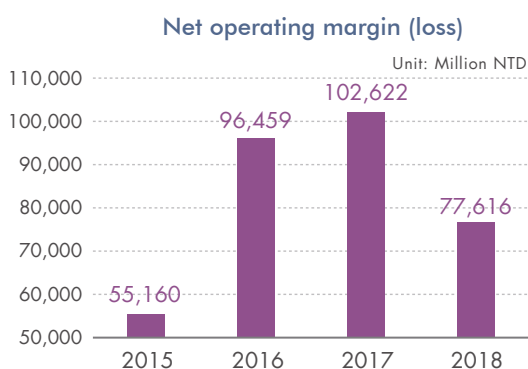
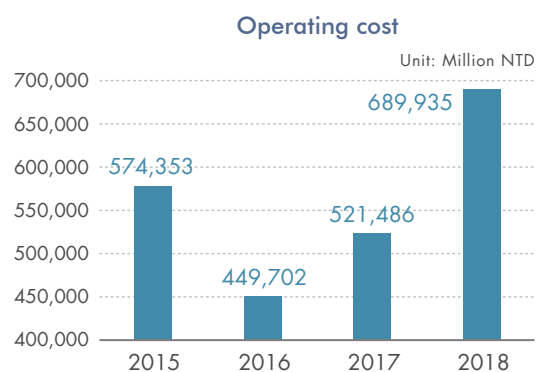
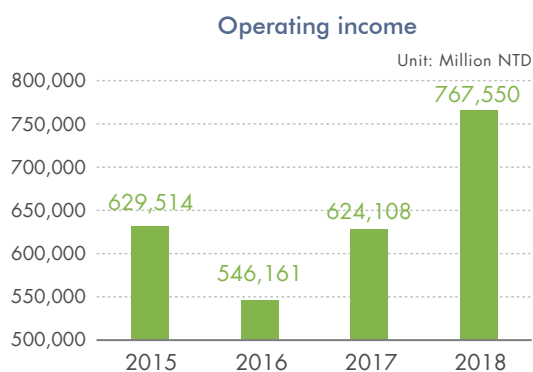
Sustainability Issue: Economic performance

Our commitment and responsibilities: To ensure the Company's steady operation, execution of the dividend policy, and for shareholders to gain stable return on their investment.

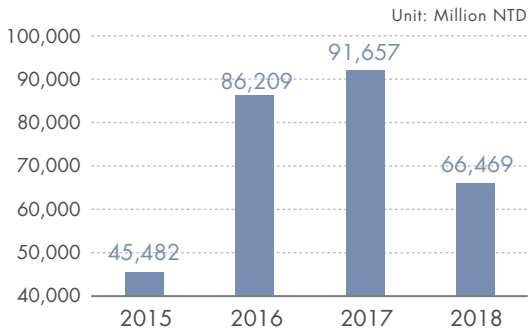
Our goals: Ensure the steady operation of processes while strictly abiding by labor safety and environmental protection principles. Implement management for strict cost control. Steady dividend yield better than the interest rate in the financial market.

Operational performance

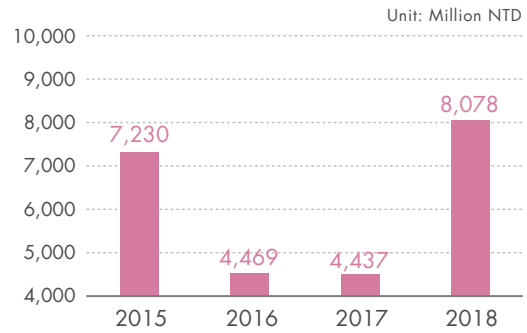
FPCC's consolidated revenue was NT\$767,550,218 thousand in 2018, up 23% compared to the NT\$624,107,892 thousand in 2017. However, oil price fluctuations resulted in a lower difference with the price of finished products, so consolidated pre-tax profit of NT\$74,547,113 thousand was down 22% compared to the NT\$96,094,545 thousand in the previous year.



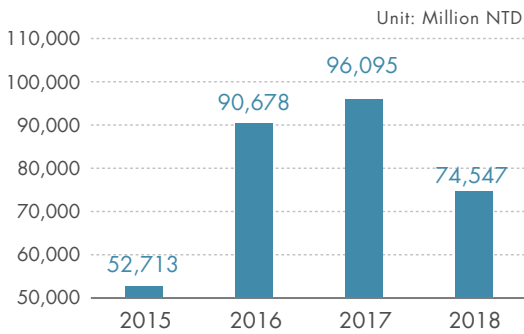
Operating profit (loss)



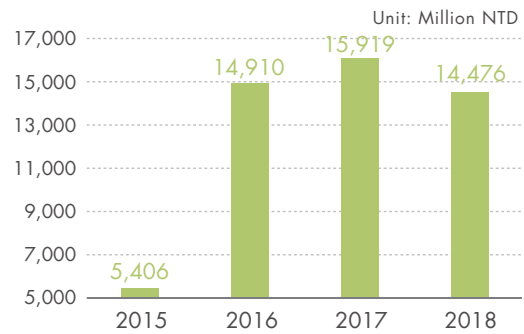
Total non-operating income and expenses



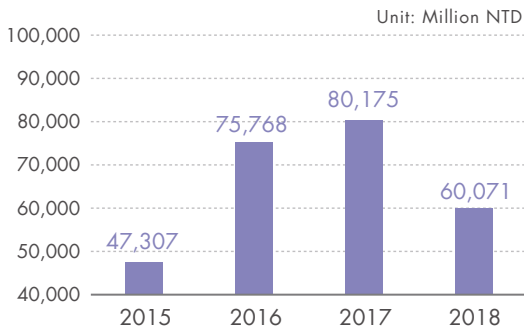
Pre-tax profit



Income tax costs (profit)

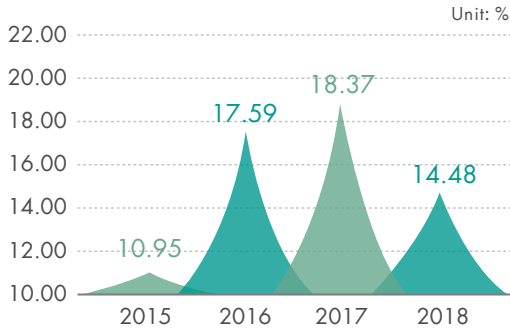


Current after-tax net profit

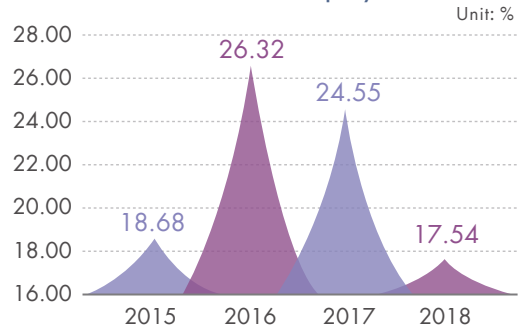


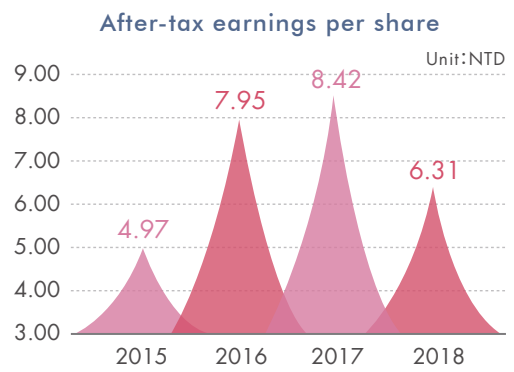
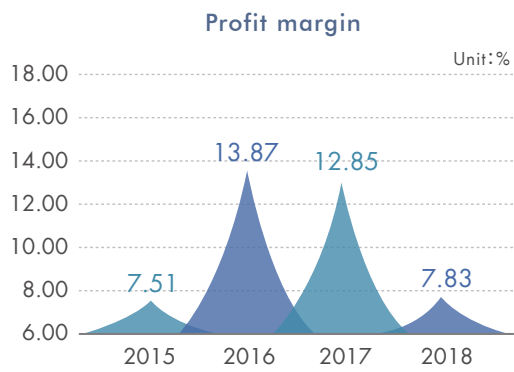
Financial ratios

Return on assets

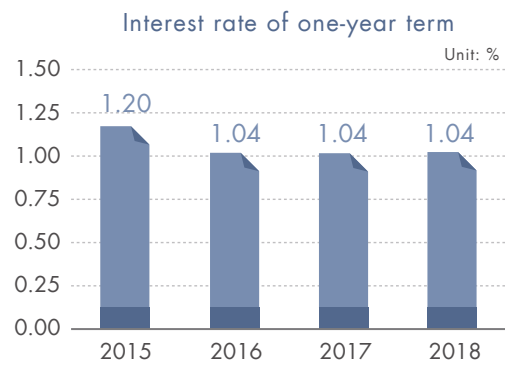
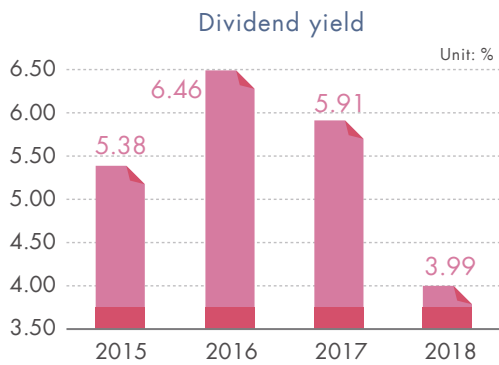
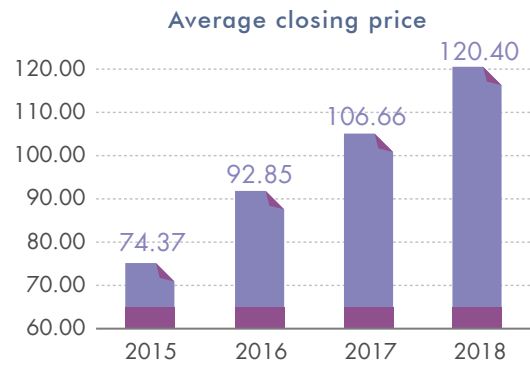
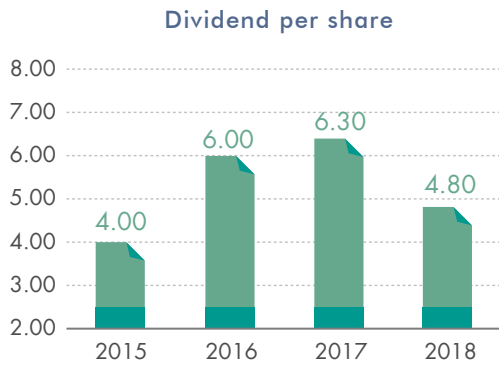


Return on equity





Dividend distribution



1.3 Risk and Crisis Management

management approach (MA)

GRI Standards corresponding: Strategy – Key impacts, risks, and opportunities

- 📌 Sustainability Issue: Risk and Crisis Management
- 📌 Our commitment and responsibilities:
We will respond to and analyze business risks in a timely manner, and understand the probability and subsequent impact of the risks to implement appropriate risk aversion strategies.
- 📌 Our goals: Establish effective risk analysis and management mechanisms and suitably identify risks, effects, and level of impact.

Risk management system

To achieve sustainable development, companies must consider potential risks and evaluate their operations. Each department has its own responsible unit for risk management, to plan and evaluate the probability and the extent of impacts of risk issues on corporate operation. The risk review unit also plans related response measures.

FPCC's risk management is mainly carried out by the President's Office, which identifies potential business risks and jointly evaluates the probability and impact of the risks together with related business departments based on the nature of the risks, appropriately informing management to adjust the Company's business strategy.

Operational risk assessment

Risk assessment item	Risk management unit	Risk review	Response measure
1. Fluctuating interest rates, exchange rates and inflation	President's Office, Accounting Department, Finance Department, Formosa Plastics Group Main Management Office	Board of Directors, Auditing Office, Computer audits and periodic spontaneous inspections, meetings participated in by financial supervisors	<p>1. Interest rate: For long-term debts associated with floating rates, the financial market's status should be carefully evaluated, and interest rate swap contracts should be established with well-known international banks while the interest rate is relatively low.</p> <p>2. Exchange rate volatility: In response to shortages in daily operating foreign exchange funds, spot or forward exchanges should be purchased when the exchange rate on the market is favorable.</p> <p>3. Inflation: According to the information released by the Directorate-General of Budget, Accounting and Statistics, Executive Yuan, the annual growth in consumer commodity prices was 1.35% and that in the core consumer commodity price was 1.22% in 2018. The risk of inflation is low and hence does not have significant impacts on FPCC's losses and gains.</p>

Risk assessment item	Risk management unit	Risk review	Response measure
2. High risk, high leveraged investing, loaning to others, endorsement, and derivative instrument transaction	President's Office, Finance Department, Formosa Plastics Group Main Management Office	Board of Directors, Auditing Office, Computer audits and periodic spontaneous inspections, meetings participated in by financial supervisors	<p>1. High risk, high leveraged investing: The petrochemical industry is a mature and stable one, with low risk, and FPCC has been known for its robust management and sound financial standing; it is not involved in high leveraged investing.</p> <p>2. Loaning to others: Loaning to others is based on applicable laws and regulations. The recipient, value, duration, and interest calculation method have to be approved by the Audit Committee and Board of Directors before they are enforced, and they are evaluated and reviewed periodically. Regarding the purposes of the loans, they are mostly short-term capital movement, and the recipient of the loan has to have a sound financial standing and robust management. No losses from bad debts have occurred to date.</p> <p>3. Endorsement: The party to require endorsement is in principle a parent company, subsidiary, or an enterprise related to FPCC in business operation. The endorsement mostly deals with financing and imported tax donation guarantees. Since the parties that require endorsement all have sound financial standings and robust management, FPCC has never borne losses from endorsement.</p> <p>4. Derivative instrument transaction: Transactions of derivative instruments are meant for mitigating market risk, not for arbitrage and opportunistic purposes.</p>
3. R&D projects	President's Office, Manager's Offices at Each Business Department, Formosa Plastics Group Main Management Office	Board of Directors, Auditing Office, production and distribution meetings, operation performance meetings	There is no such risk after evaluation.
4. Changes in important domestic and international policies and laws	President's Office, Formosa Plastics Group Main Management Office, Legal Department	Board of Directors, Auditing Office	FPCC remains highly attentive to any changes to domestic and international political and economic situations, establishment of major policies, and regulatory changes, and arranges staff to receive professional training if necessary.
5. Technology change	President's Office, Manager's Offices at Each Business Department, Formosa Plastics Group Main Management Office	Board of Directors, Auditing Office, production and distribution meetings, operation performance meetings	The petrochemical industry's technologies are generally mature. There have not been technical changes that have had significant impacts.
6. Change in corporate image	President's Office, Formosa Plastics Group Main Management Office	Board of Directors, Auditing Office	Adhering to its management belief of hard work and being down-to-earth, aiming at perfection, sustainable management, and giving back to society, FPCC is known for its good corporate image and will continue to seek advancement applying the same belief in the future in order to contribute even more to society.

Risk assessment item	Risk management unit	Risk review	Response measure
7. Mergers or re-investments	President's Office, Manager's Offices at Each Business Department, Formosa Plastics Group Main Management Office	Board of Directors, Auditing Office, production and distribution meetings, operation performance meetings	We did not engage in an mergers and acquisitions. Detailed investment plans and complete evaluations are conducted before making re-investments, and evaluation results are approved by the Audit Committee and Board of Directors before formally making investments.
8. Expansion of facilities	President's Office, Manager's Offices at Each Business Department, Formosa Plastics Group Main Management Office	Board of Directors, Auditing Office, production and distribution meetings, operation performance meetings	There is no such risk after evaluation.
9. Centralized procurements or sales	President's Office, Manager's Offices at Each Business Department, Formosa Plastics Group Main Management Office, Procurement Department	Board of Directors, Auditing Office, production and distribution meetings, operation performance meetings	<p>1. Procurements: The main suppliers of raw materials for the refining plant and naphtha crackers are oil producing countries in the Middle East. The region, however, is known for its occasional instability, which is associated with the risk of interrupted supply, and will further impact the production volume in these countries. FPCC has optimal refining techniques and sufficiently flexible processes, and has entered into long-term purchase agreements with overseas suppliers to diverge the risk, properly prevent against instability in the supply of raw materials, and control purchase costs.</p> <p>2. Sales: The domestic and international sales of 2018 accounted for 58% and 42%, respectively. Major customers for the domestic oil product sales have signed the sale contract and hence the sales are very steady. International sales, however, will have to depend on the production and distribution of the refining plant and prices of oil products on the international market; oil products are sold internationally to the Southeast Asia, Korea, Australia, Europe, and America. Petrochemical products are mainly sold to individual companies within the Mailiao Park and hence involve relatively minimal risk.</p>
10. Transfer of shares held by directors, supervisors, and major shareholders	President's Office, Finance Department, Shareholder Service Office, Legal Department, Formosa Plastics Group Main Management Office	Board of Directors, Auditing Office	There is no such risk after evaluation.

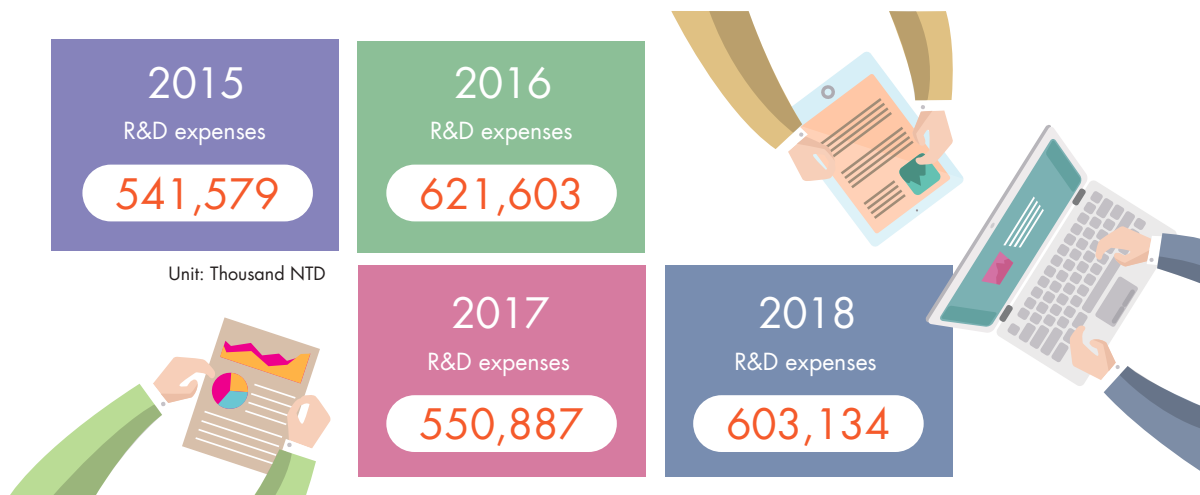
Risk assessment item	Risk management unit	Risk review	Response measure
11. Change in management	President's Office, Finance Department, Shareholder Service Office, Legal Department, Formosa Plastics Group Main Management Office	Board of Directors, Auditing Office	There is no such risk after evaluation.
12. Litigation or non-litigation incidents	President's Office, Manager's Offices at Each Business Department, Legal Department	Board of Directors, Auditing Office, production and distribution meetings, operation performance meetings	Ongoing proceedings involving FPCC are evaluated and determined to have no major impacts on shareholder equity or prices of securities.
13. Climate change	President's Office, Manager's Offices at Each Business Department, Formosa Plastics Group Main Management Office	Board of Directors, Auditing Office	We will actively respond to the agreements made in response to climate change, such as GHG reduction, and changes to environmental protection laws and regulations, and will use the best available technology for process adjustment and to reduce impacts on the environment. For climate change and environmental risk management, please refer to section "2.1 Environmental Protection Strategies and Policies" of this report.
14. Information Security Risks	President's Office, Formosa Plastics Group Main Management Office, Information Department	Board of Directors, Auditing Office	<p>1. To ensure information security and stability on the Internet, prevent information system incidents and computer file damage, and strengthen personal information protection, we have established related management regulations and handling guidelines, as well as layers of controls and protection mechanisms in applications, operating system, and network system. We hope to thus effectively control corporate information system risks and maintain business continuity. To ensure information security and create a trustworthy environment for information use, our information security policy is as follows:</p> <ol style="list-style-type: none"> (1) Comply with regulatory requirements and raise information security awareness. (2) Emphasize risk management and protect information security. (3) Require the participation of all employees and pursue continuous improvement. <p>2. Information networks worldwide are interconnected and make business more flexible and faster, but have also led to an endless stream of information security incidents. These cyber attacks may paralyze network services, use computer viruses or malware to affect information system service or access classified data, or use social engineering to steal classified data; insufficient information security awareness of internal personnel may also lead to the leakage of classified data. With consideration to related risks, we already have complete information security measures in place, as described below:</p>

Risk assessment item	Risk management unit	Risk review	Response measure
			<p>(1) We have adopted a defense-in-depth framework, established IPS, malware address filtering, and APT systems, and also established employee Internet access, e-mail, and personal information leakage control mechanisms to prevent cyber attacks.</p> <p>(2) We established door access control, system login ID verification, password control, access rights, and regularly scan for vulnerabilities. We also installed anti-virus software and update security patches, control USB access, and established backup mechanisms to strengthen endpoint protection.</p> <p>(3) Each year we provide employees with information security education and training, and administer tests to raise employees' information security risk awareness.</p> <p>(4) We review our information security measures and regulations every year, follow information security issues, and formulate response plans to ensure their appropriateness and effectiveness.</p> <p>3. Due to the rapid developments in hacking technologies and methods, it is impossible to completely eliminate cyber attacks, but we already have substantial information security measures in place and offer education and training to lower the impact of cyber attacks.</p>

Creative Thinking, Integrated Research and Development, Lower Risk

Individual facilities under FPCC are configured with their own process improvement department, where professional chemical engineering technicians are devoted to researching process improvements; they research and develop technologies to improve specific items so as to stabilize production, enhance the production volume, bring down costs, increase the production value, reduce energy consumption, and minimize pollution and emissions, among other goals to lower operating risks.

Research and development expenditure over the past three years



1.4 Supply Chain Management and Customer Relationship Management

management approach (MA)

GRI Standards corresponding: Organization Profile – Supply Chain

- 📌 Sustainability Issue: Stability of imported materials
- 📌 Our commitment and responsibilities:
Our main raw materials include crude oil, naphtha, and coal. Raw material purchase greatly affects the steady operation and production cost of our processes. Hence, it is necessary to effectively maintain stable raw material supply.
- 📌 Our goals:
To ensure the steady operation of process with stable raw material supply, and maintain stable purchase prices to effectively control production cost.

Stability of imported materials

The primary raw materials that FPCC uses include crude oil, naphtha, and coal, all of which have to be imported from overseas. As such, when wars, unrest, disasters, or political power struggles occur, or when sea freight prices rise, then the stability of the material supply will be undermined.

Management Policy

We have adopted the following approaches to maintaining stable raw material supply:

1. FPCC, with our optimal refining techniques and sufficiently flexible processes, can purchase different types of crude oil from different oil producing countries.
2. We have entered into long-term purchase agreements with overseas oil and coal suppliers to diverge risks.
3. We have also developed diversified feed-in options to replace part of naphtha operations with LPG, and minimize the dependency on naphtha. This helps properly mitigate the effects of an unstable supply of raw materials and controls our material purchase costs.
4. We use our own adjustment capabilities to ensure stable supply for processes.
5. We use financial derivatives for hedging against raw material purchases.

Partnership with Suppliers and Contractors

In the industrial value chain, FPCC has been keeping a desirable relationship with all partners. Our suppliers and contractors mainly include manufacturers, distributors, or dealers and engineering contractors (construction or outsourced design, etc.).

Management Policy

We have MAs in place for the management of suppliers and contractors. These policies fulfill quality and industrial safety requirements. In addition, efforts are made to require that manufacturers doing business with us meet environmental protection, industrial safety, and human right requirements in compliance with fair trade principles. If they do not meet requirements, they will be rejected and they will be rated for subsequent dispositions. It is our hope to jointly pay attention to and minimize environmental impacts associated with operations with the value chain and help each other on the road to sustainability.

Sustainability Issue

Whenever making a purchase, we ask upstream suppliers to meet criteria such as applicable industrial safety qualification as per national requirements, ISO qualification, indication of hazardous materials, and illustration. In addition, manufacturers need to properly recycle used containers or carrying aids. Suppliers are asked to precisely follow the requirements in the Quotation and Order Notice, and the stance of the Group in sustainable management should be declared in forms.

Manufacturer Rating

All the suppliers that deal with us have to go through written evaluation and also site evaluation if it is considered necessary. We will only work with qualified suppliers, and select high quality partners suitable for long-term cooperation from qualified suppliers. We also implement contractors differential management, education and training, and construction safety management.

Transport Safety Guidance

To ensure that oil products are safely transported, we use our subsidiary - Formosa Petrochemical Transportation Corp. as our main transport partner. The vehicle arrangement, driver schedule, and the management systems of Sixth Naphtha Cracker Forwarding are under control. Each vehicle is installed with the GPS system and alarm to facilitate scheduling and control. Meanwhile, external audits will be performed to ensure vehicle security on transport contractors of FPCC's partners periodically and drivers are asked to complete the alcohol test and have their blood pressure and heart rate measured before they go on a mission; these are meant to ensure a safe transport process and create a win win situation.

Assisting Business Partners in Improving their Business Management Performance

- 💡 We actively install the point of sale (POS) intelligence software and hardware equipment for franchisees with long-term collaboration and help them improve management and bring down operation cost. The information flow can also be used to maximize the joint marketing effect and enhance the overall operational performance.
- 💡 We provide guidance to franchisees on how to run gas stations with local features. They can flexibly combine their own products, the local features, or other advantageous resources, such as scenic areas, to attract consumers to fill up at their stations while increasing revenue from secondary businesses.
- 💡 We work with banks in joint marketing and continue to develop self-service systems at gas stations, helping franchises streamline their labor and lower the operating costs.

Authorized Economic Operator (AEO) Certification

AEO certification means that government-approved businesses and their up-stream and down-stream partners, that is, the overall supply chain, are safe and the trade safety measures meet the criteria for quality businesses. This will be a growing trend for international trade in the future, and also one of the prioritized policies to be promoted by our customs authority.

We started the AEO certification process in June 2013 and completed all the items requiring certification in less than six months. We became a certified AEO on December 6, and also became the largest business to obtain the AEO certification in Taichung Customs's history. The acquisition of the AEO certification allows goods imported and exported us to enjoy the lowest inspection ratio and other preferred arrangements, such as payment of the import/export taxes according to the monthly summary.



Transport Fleet Deal

In light of the hard work of professional drivers, we issued the TAXI card to help them cut down gas expenditure. In 2018, we further worked with Taiwan Taxi Co., Ltd. in issuing team member cards, and also released a gas card in cooperation with Uber, so that they will get preferred deals when they fill up at FPCC gas stations. The cards allow even more professional drivers to benefit from preferred deals.



In addition, with joined effort from these gas stations, we issue the FPCC Business Card so that large forwarding fleets can enjoy more convenient gasoline adding service. The expenses are settled at the end of each month and an invoice will be issued. It is a relatively simple declaration/write-off process compared to the traditional way of issuing receipts car by car. In addition, inquiries and download of transaction details can be done through e-Commerce to facilitate gas mileage management by customers and improve gas-saving efficacy.

Grease Distributors Congress

In order to know the actual operation of grease distributors and to accomplish the goal of increasing business performance, sales, and visibility of FPCC grease on the market, distributors of FPCC grease throughout Taiwan are invited to take part in the distributors congress organized by the chief distributor of FPCC grease on a yearly basis; it is meant to help the distributors enhance their competitive advantages on the market by creating a more competitive operating environment and recognize distribution partners with outstanding performance.

Customer Relations, Satisfaction Survey

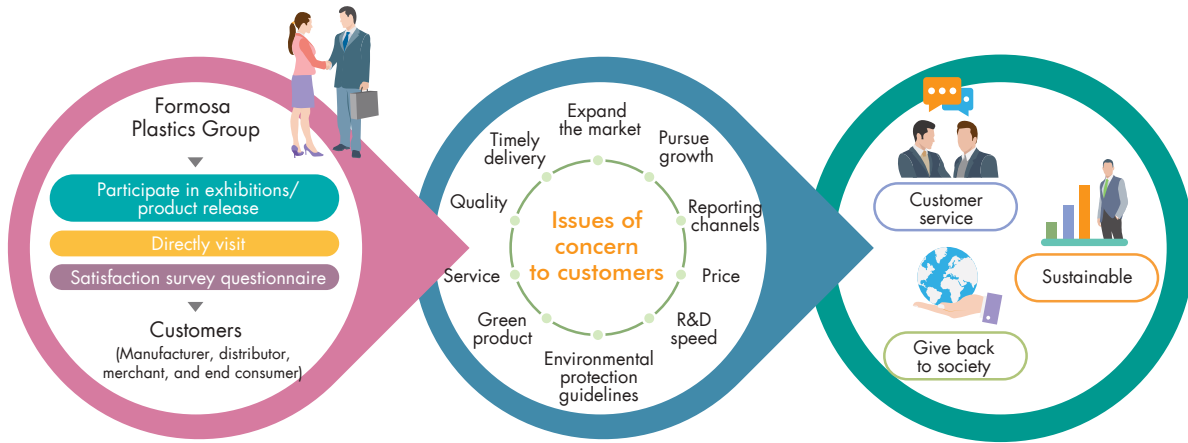
Building good partnerships is an important issue that FPCC has always been highly concerned about. We are constantly engaging in innovation and assist customers in obtaining high quality competitive products. We strive to become a trustworthy business partner of our customers that grows together with them. In order to strengthen customer relations, representatives from our business department will periodically visit customers and create interactive and timely communication channels that help include feedback from customers in our operations, and use the feedback to make future improvements.

Disclosure of Product Information

On the FPCC's official website (<http://www.fpcc.com.tw/tc/products1.php>), descriptions of specifications and safety data sheets of various oil products and the latest oil price information are available in the "Products and Services" section.

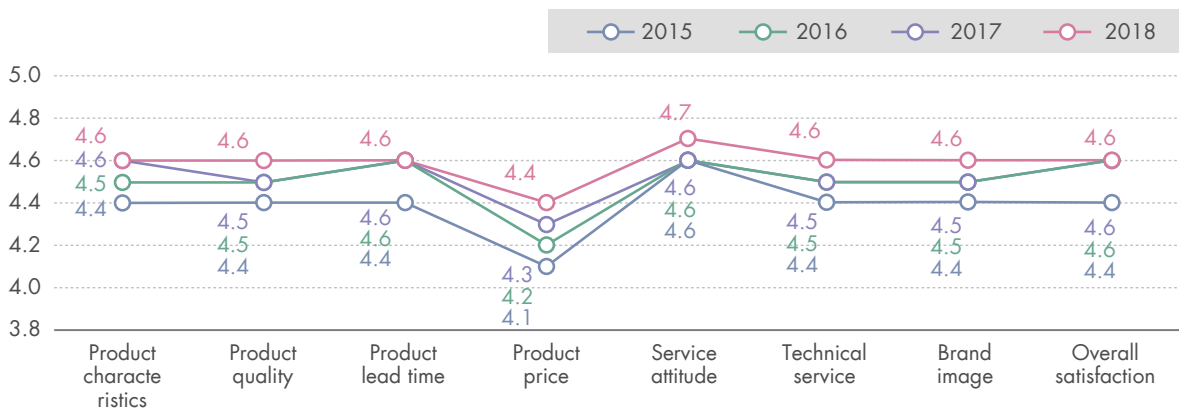
Customer Feedback and Management

To understand the precious opinions of our customers, we have defined specific procedures for customers to file complaints, return or exchange goods, and apply for compensation. Customers can express their opinions through the Customer Feedback Form, service hotline provided on our website, and e-mail. We will periodically summarize issues of concern to customers, and then classify and analyze the issues based on their importance and urgency. The priority of improvements that need to be made is determined on this basis. For complaints about products, sales representatives fill out the "Complaint Handling Form" and keep records of the handling status in the computer. With regard to channels for customers to express their opinions, we did not receive any customer complaints about privacy violation or data leakage in 2018.



Customer satisfaction survey

In order to enhance customer satisfaction, opinions about and suggestions for various products and services of FPCC are collected from customers. Meanwhile, to fulfill the commitment to quality of ISO 9001 and to demonstrate our emphasis on customer satisfaction, we will perform customer satisfaction survey at least once a year at present targeting domestic and international customers. The survey covers eight major domains, namely, product characteristics, product quality, product lead time, product price, service attitude, technical service, brand image, and overall satisfaction. Questions included in the survey will be modified as per issues of concern for customers.



Note: 5 represents "very satisfied"; 4 indicates "satisfied"; 3 is "no comments"; 2 means "dissatisfied"; and 1 is "very dissatisfied."

The results of the 2018 Customer Satisfaction Survey show that we received a score higher than "satisfied" in all aspects. FPCC will include the suggestions provided by customers into our operational policy in order to live up to the expectations of the general public.

Achievements

Awards in 2018



- Recognized for excellence in GHG reduction in 2018
- Won the Taiwan Institute for Sustainable Energy's Corporate Sustainability Report Award – Energy Industry in 2018

2

Navigating Towards a Green Future





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Chapter Summary

Industries are changing at a growing pace due to globalization. To achieve sustainable development and allow the sustainable use of resources, FPCC established a dedicated unit for energy conservation and carbon reduction. The unit promotes the circular economy of raw materials, water resources, energy, and waste across plants and companies, and aims to achieve energy conservation and carbon reduction, resource integration, and zero waste.

Stakeholders: Investors/shareholders, customers, government agencies, suppliers and contractors, environmental protection groups, experts and scholars, local residents, and employees

Sustainability Issue: GHG management, air pollution prevention, water resources, wastewater treatment, and waste management

Sustainable Development Goals (SDGs)



Strategy

Effective management is carried out in four aspects, namely GHG management, air pollution prevention, water resources and wastewater treatment, and waste management (the goal is to achieve energy conservation and carbon reduction, resource integration, and zero waste)

- 🔍 Strengthen industry-academia collaboration
- 🔍 Promotion of green events
- 🔍 Implement circular economy across plants and companies



Targets in 2018	2018 Performance	Targets in 2019	Mid-term and Long-term Goals
Greenhouse Gas			
<ul style="list-style-type: none"> ■ Continue to cooperate with the government's "industry GHG reduction audit" ■ Implement energy conservation measures ■ Application for GHG offset project (recycling of waste heat) ■ Plan the compilation of carbon footprint inventory for sulfur liquid 	<ul style="list-style-type: none"> ■ Reduced GHG emissions by 93,184 tons CO₂e in response to the voluntary GHG reduction audit by the Industrial Development Bureau, Ministry of Economic Affairs ■ Energy conservation measures reduced 142,000 tons CO₂e in 2018 ■ Promotion of GHG offset project (recycling of waste heat) ■ GHG emissions in 2017 was reduced by 3% compared to 2016 ■ Completed the carbon footprint inventory for sulfur liquid 	<ul style="list-style-type: none"> ■ Continue to cooperate with the government's "industry GHG reduction audit" ■ Implement energy conservation measures ■ Implementation of GHG offset project (recycling of waste heat) ■ Used solid recycled fuel (RDF or SRF) and reduced GHG emissions 	<ul style="list-style-type: none"> ■ Take energy conservation and carbon reduction measures in coordination with the national goal to reduce emissions in 2030 by 20% compared to 2005

Targets in 2018	2018 Performance	Targets in 2019	Mid-term and Long-term Goals
Air pollution prevention			
<ul style="list-style-type: none"> ■ Promote SO_x and NO_x emission reduction per unit of product ■ Increase air pollution reduction equipment ■ Plan the use of low sulfur fuels in processes ■ Implement the oil product quality improvement plan ■ Engaged in industry-academia collaboration with National Taiwan University in simulating the reduction of PM_{2.5} in Yunlin-Chiayi-Tainan when process equipment is changed to gas equipment 	<ul style="list-style-type: none"> ■ SO_x emissions per unit of product decreased 5.00% compared to the average of the most recent five years ■ NO_x emissions per unit of product decreased 5.37% compared to the average of the most recent five years ■ Added MGGH, WESP, and the second Flare Gas Recovery System (FGRS2). ■ Submitted an application for an environmental impact assessment for the oil product quality improvement plan ■ Results of the industry-academia collaboration project with National Taiwan University show that the 19 coal-fired boilers of FPCC and Mailiao Power Corporation have a minor (<2%) effect on PM_{2.5} in Yunlin, Changhua, Chiayi, and Tainan. 	<ul style="list-style-type: none"> ■ Promote SO_x and NO_x emission reduction per unit of product. ■ Increase air pollution reduction equipment ■ Plan the use of low sulfur fuels in processes ■ Continue to implement the oil product quality improvement plan (apply for environmental impact assessment) ■ Plan a new high voltage shore power system for cargo ships 	<ul style="list-style-type: none"> ■ Continue to implement the oil product quality improvement plan (complete installation) ■ Plan a new waste heat boiler to recycle process gas

2018 年目標	2018 年績效	2019 年目標	中長期目標
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Water Resource Management:

<ul style="list-style-type: none"> Implement water use reduction and water conservation measures Obtain environmental impact assessment documents for desalination plant Increase rain water storage rate [Industry-academia collaboration] Implement the Wastewater Microorganism Research Project with Academia Sinica 	<ul style="list-style-type: none"> Water conservation measures reduced water use by 3,372 tons/day in 2018 Obtain the letter of approval to establish the desalination plant Rain water storage rate reached 97.6% Completed phase 1 of the Wastewater Microorganism Research Project with Academia Sinica Unit product water consumption in 2018 decreased 1.6% compared to 2017 	<ul style="list-style-type: none"> Implement water use reduction and water conservation measures Continue to implement wastewater reduction measures Increase the rain water storage rate Plan phase 2 of the Wastewater Microorganism Research Project jointly implemented with Academia Sinica 	<ul style="list-style-type: none"> Complete the establishment of the desalination plant
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Waste Management

<ul style="list-style-type: none"> Implement waste reduction Submit applications for waste reuse projects, and process inorganic sludge into plaster products 	<ul style="list-style-type: none"> Implement sandblasting waste reuse projects (application for qualifications) Implement inorganic sludge reuse projects (application for qualifications) 	<ul style="list-style-type: none"> Implement waste reduction Submit applications for waste reuse projects, and process inorganic sludge into plaster products 	<ul style="list-style-type: none"> Implement reuse projects for waste that is buried Plan the establishment of waste liquid and oil sludge incineration facilities to independently handle wastewater and oil sludge from washing ship cabins
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2.1 Environmental Protection Strategies and Policies

FPCC aims to achieve a win-win situation for "labor safety, environmental protection, and economy", and creates and maintains a safety and health and environmental management system. In 2003, FPCC established the safety, health, and environment policy: strict compliance with regulatory requirements, reinforced communication, prevention against pollution, plant waste reduction, hazard identification, risk control, plenary participation, and constant improvement, 8 consistent principles in total in order to accomplish the goal of sustainable management.

To fulfill its commitment to environmental protection and prevention against pollution, FPCC adopts the latest process equipment and technology as well as management method:



Air pollution and GHG management

Comprehensive adoption of the best available control technology (BACT). All the production units are equipped with a continuous automatic surveillance control system that is connected with the environmental protection authority.



Water Resources and Wastewater Management

For wastewater collection, a rainfall-sewage separation system has been adopted. There is a wastewater treatment plant to exclusively process wastewater from the industrial park. After it is treated, the effluent is capable of sustaining aquarium fish. In addition, the continuous wastewater recycling helps lessen the stress on water resources.



Waste Management

Classification and recycling is thoroughly enforced. By means of the enterprise resources planning system (ERP) and the online declaration system, the storage, clearance, and treatment processes are kept track of, and comprehensive follow-ups are also conducted.

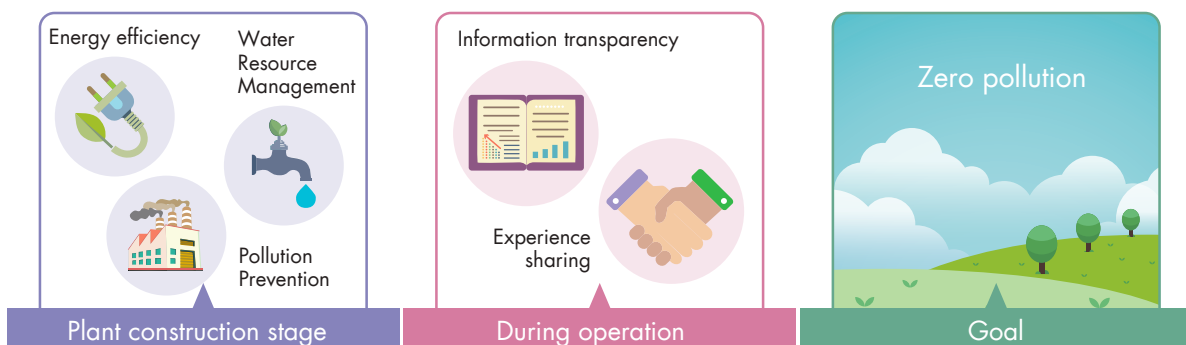
Green and Environmental Protection Policy

Fundamental petrochemical materials in the upstream of the petrochemical industry in Taiwan were produced and provided by CPC Taiwan in the early days. Because the domestic demand could not be satisfied, the Formosa Plastics Group started its sixth naphtha cracker program in the region of Mailiao, Yunlin to help address the issue. The vertically integrated petrochemical industrial park was hence established.

Goal:

Show concern about environmental issues such as the GHG, air pollution, wastewater, and waste at plants with the goal of achieving zero pollution.

Plant construction stage:



FPCC applied the best available technology (BAT) and best available control technology (BACT) ideas during the design stage of the plant already by adopting the most advanced pollution prevention and control equipment with the best energy efficiency. After the operation began, water resources and energy consumption have been strictly controlled through constant discussions of possibilities to seek improvements.

During operation:

FPCC has been proactively promoting various environmental protection efforts. The KPI and annual goals are established to periodically keep track of how individual indicators are implemented and the fulfillment of goals. Efforts are made to reinforce guidance provided to departments lagging in their performance while those with outstanding performance are rewarded in order to boost the sense of participation and accomplishment among employees.

Experience sharing:

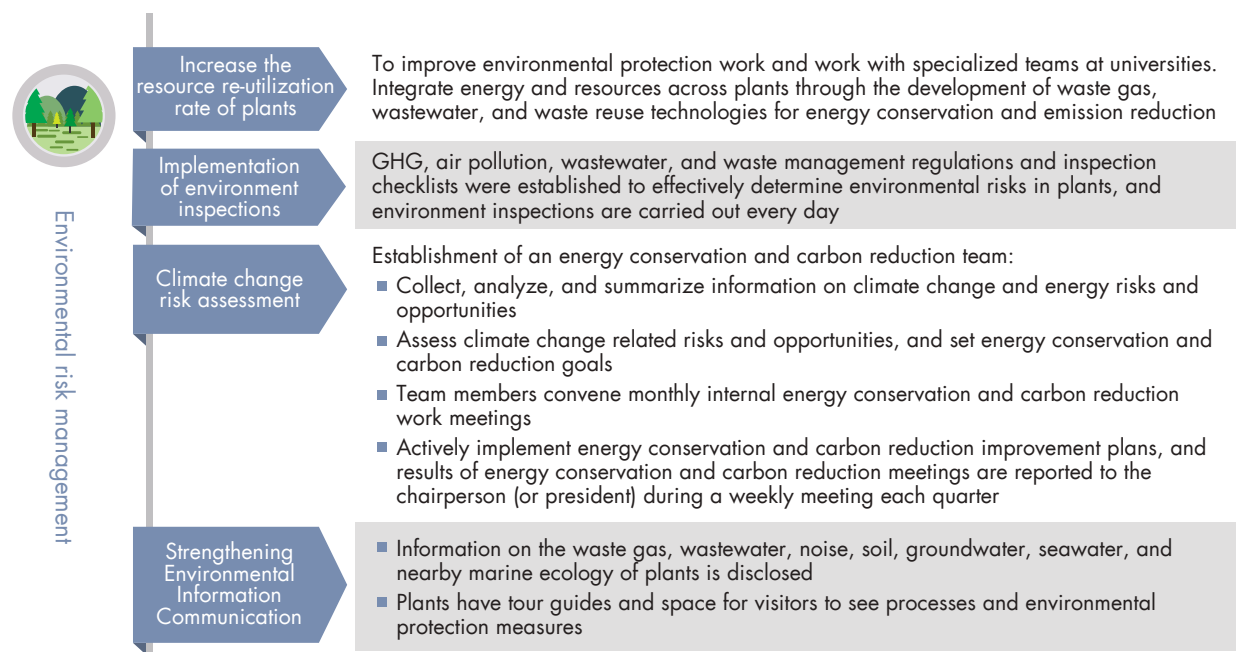
Believing in a global village, FPCC organizes seminars and observational tours to share its experience and accomplishments in energy-saving and carbon reduction as well as pollution prevention and treatment.

Information transparency:

For environmental issues that the general public is concerned about, FPCC continues to authorize impartial professional institutions to perform investigations, and releases the results in its CSR reports and environment monitoring information (disclosed at <https://airtw.epa.gov.tw/>) in order to clarify and explain improvements.

Environmental risk management

FPCC implements environmental risk management through a variety of methods. Besides complying with environmental protection laws and regulations, we are reducing the environment's impact on our operational risks through four measures, specifically increasing the resource re-utilization rate of plants, implementing environment inspections, climate change risk assessment, and strengthening environmental information communication. We are also directing our efforts towards energy conservation and carbon reduction.



Green Production and Environmental Accounting

Green Energy Practice

Apart from proactive cutbacks on energy consumption and greenhouse gas emissions, FPCC is also devoted to the development and realization of clean energy. Currently, NT\$30 million has been invested in four 660 kW wind power generators in Formosa Plastics Group Mailiao Industrial Park, and will generate around seven million kWh per year, to meet the demand on the premises.

Green Transportation

In terms of domestic oil product transportation, FPCC mainly adopts long-distance pipelines instead of oil tankers when a long distance is involved, to effectively fulfill the energy-saving and carbon reduction goals. There are a total of four 12" pipelines for long-distance storage and transportation. These pipelines are buried along the west coast highway from the Mailiao plant to the Taipei storage and shipping station at Taipei Harbor in Bali, stretching 229 km long and channeling unleaded gasoline, aviation fuel, and diesel.



Long-distance Pipeline Safety Management

To ensure that transportation through long-distance pipelines outside the premises is safe, we inspect the pipelines on a daily basis. In addition, we perform cathodic protection potential tests on a quarterly basis to effectively protect the pipelines from corrosion-resultant leaks. We also authorize professional service providers to do pipeline current mapping (PCM) or close interval potential survey (CIPS) for the testing of the integrity of the enveloping layer of underground pipelines, and use a smart pipeline inspection gauge (PIG) to inspect the thickness of pipelines. Meanwhile, we have set up surveillance systems at important facilities in addition to transportation and storage monitoring systems to ensure the safety of transportation operations.

Environmental Expenditures and Benefits

The environmental accounting system ensures specific documentation of financial information concerning environmental activities such as the investment, maintenance of environmental equipment, research and development, and processing fees so that FPCC can make decisions and perform analyses from the perspective of environmental protection; it helps increase FPCC's competitive advantages.



Breakdown of environmental cost in past years

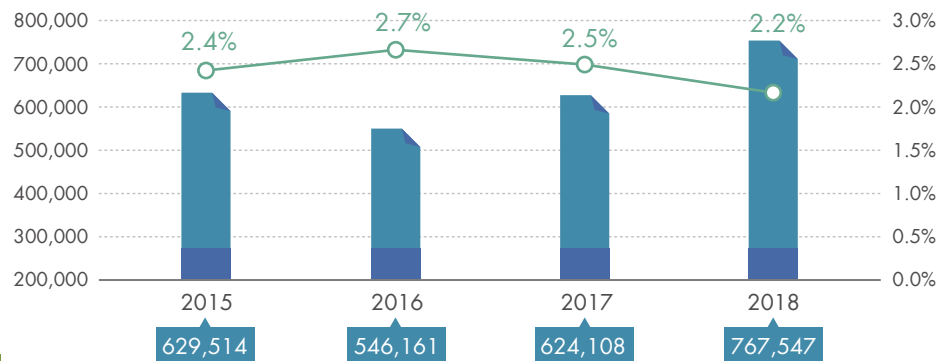
Unit: NTD million

Item	2015	2016	2017	2018
Business overhead	13,961	13,219	14,131	15,072
Related costs from the downstream and upstream of suppliers and customers	16	24	26	26
Activity management cost	271	343	456	392
R&D cost	18	7	10	6
Social events cost	146	144	148	133
Losses and compensation	1	7	17	13
Other expenses such as processing fees, taxes, and energy tax	866	947	1,046	1,258
Total	15,279	14,691	15,834	16,900

Note: Business overhead in the table includes costs derived from green purchases, recycling and reproduction of manufactured or sold products, and product services as part of the environmental protection effort.

Ratio of environmental cost to business revenue over past years

Unit: NTD million



Environmental protection violations

We received 18 environmental protection fines in 2018, in which 6 were major environmental protection violations (major events involving NT\$1 million or more disclosed on the Market Observation Post System). Our violations were mainly due to abnormal emissions from equipment components, and we have thus strengthened management mechanisms for equipment components. We further analyzed the increase in our fines, and found that it was mainly due to disputes over the determination of products and waste. We have filed administrative appeals in accordance with the law.

Losses and punishments associated with environmental pollution over the years

	2015	2016	2017	2018
Air pollution	4/NT\$400,000	6/NT\$600,000	9/NT\$1,000,000	11/NT\$2,700,000
Water pollution	0/NT\$0	0/NT\$0	1/NT\$1,089,000	1/NT\$300,000
Waste pollution	1/NT\$144,156,000	1/NT\$2,142,000	5/NT\$9,174,000	5/NT\$12,006,000
Other	1/NT\$100,000	1/NT\$600,000	0/NT\$0	1/NT\$1,200,000

2.2 GHG management

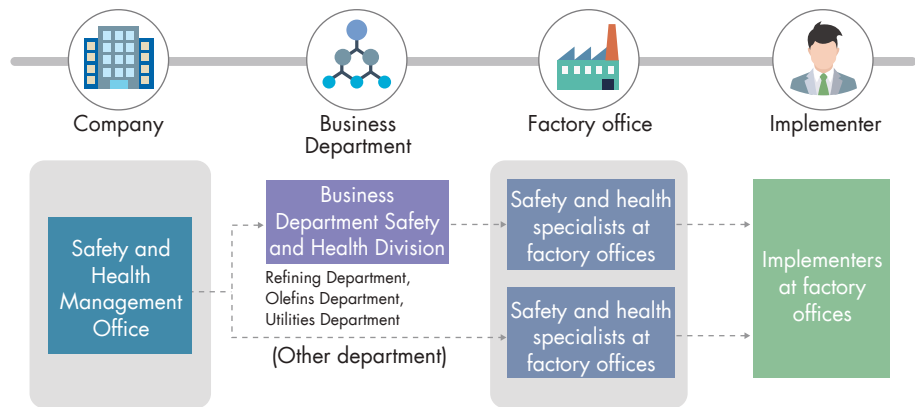


management approach (MA) → GRI Standards corresponding: Energy, emission

- 📌 Sustainability Issue: GHG management
- 📌 Our commitment and responsibilities:
In coordination with the national goal to reduce emissions in 2030 by 20% compared to 2005, we have implemented numerous process improvement and energy management projects, and also established a dedicated unit for implementing energy conservation and carbon reduction.
- 📌 Our goals:
Reduce the effect on climate change.

GHG management framework

FPCC began compiling GHG inventories in accordance with ISO 14064-1 in 2005, and commissioned BSI Taiwan to verify the GHG inventory.



Greenhouse gas emission status

Unit: tons CO₂e

	2014	2015	2016	2017
Scope 1	29,766,908	29,225,312	27,910,823	26,952,581
Scope 2	141,929	129,452	111,809	162,266
Gross emissions (Scope 1 + Scope 2)	29,908,837	29,354,764	28,022,632	27,114,847

Note 1: Scope 1 means direct emissions of greenhouse gases.

Note 2: Scope 2 means indirect emissions of greenhouse gases.

Note 3: Global warming potential (GWP) before 2016 is based on the second assessment report (SAR) of IPCC in 1995. GWP after 2016 (inclusive) is based on the fourth assessment report of the IPCC in 2007. The emission factors for electricity and steam are in-house factors that have been validated by verification institutions.

Note 4: GHG emissions data for 2018 had not been verified by the verification institution when this year's report was published, so the data will be disclosed next year.

Analysis of GHG emissions over the years (for the entire company)

	2014	2015	2016 (A)	2017 (B)	(B-A)/A
Greenhouse gas emissions (CO ₂ e thousand tons)	29,909	29,355	28,023	27,115	-3.2%
Business revenue(NTD million)	913,085	629,514	546,161	624,108	+14.3%
GHG emission per unit revenue (CO ₂ e thousand tons/NT\$1 million)	0.033	0.047	0.051	0.043	-15.7%

Further analysis of GHG emission per unit revenue shows that GHG emissions in 2017 decreased 3.2% compared to the previous year while revenue increased 14.3%. Hence, GHG emission per unit revenue decreased to 0.043 thousand tons/NT\$1 million.

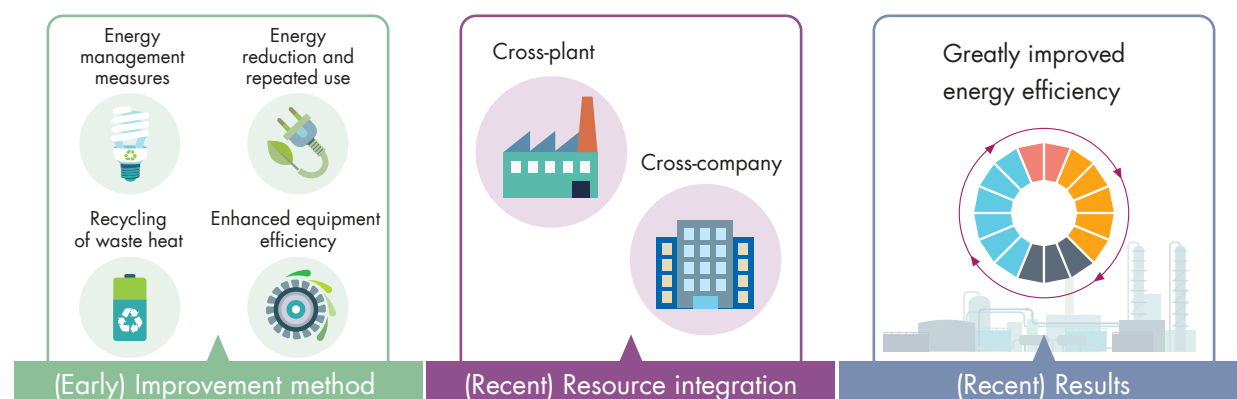
Analysis of GHG emissions over the years (oil-gas industry)

	2014	2015	2016 (A)	2017 (B)	(B-A)/A
Greenhouse gas emissions (CO ₂ e thousand tons)	12,224	12,518	12,287	12,180	-0.87%
Business revenue(NTD million)	869,470	589,508	509,093	583,769	14.67%
GHG emission per unit revenue (CO ₂ e thousand tons/NT\$1 million)	0.014	0.021	0.024	0.021	-13.55%

Note: Only GHG emissions and revenues for refining and olefin related processes are presented

The Company's scope of business mainly covers that oil-gas industry and power generation industry. Combining statistics for the two industries may be unfair due to the significant differences between the two industries. Hence, we separated the oil-gas and olefin (refining) industries, and further analyzed GHG emission per unit revenue. We found that GHG emissions in 2017 decreased 0.9% compared to the previous year while revenue increased 15%. Hence, GHG emission per unit revenue decreased to 0.021 thousand tons/NT\$1 million.

Energy management



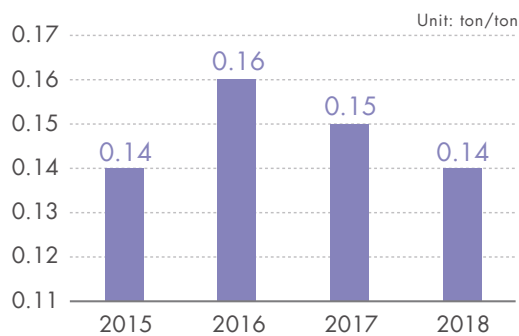
appointed dedicated personnel at business departments and factory offices to implement numerous process improvement and energy management projects, so as to continue reducing emissions.

Summary of historical energy-saving performance

	Accumulated volume (1999-2017)	2018	Accumulated volume (1999-2018)	Ongoing	Total
Number of cases improved	1,214	196	1,410	353	1,763
Steam saved (ton/hour)	821.1	33.4	854.5	97.3	951.8
Electricity saved (Thousand kWh/hour)	127.7	6.8	134.5	16.1	150.6
Fuels saved (ton/hour)	86.1	0.9	87.0	3.1	90.1
CO ₂ e reduction (Ten thousand tons/year)	456.4	14.2	470.6	38.5	509.1
Investment amount (NTD 100 million)	54.0	3.1	57.1	17.6	74.7

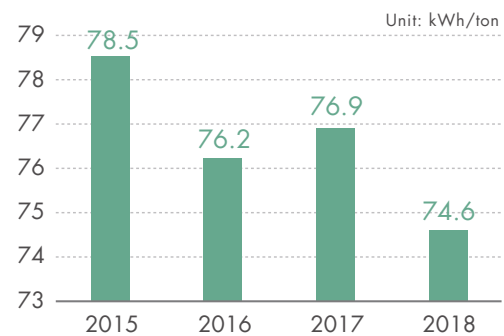
Note: Source: The Formosa Plastics Group computer-based database for environmental protection improvements

Summary of historical consumption of steam per unit of product



Note: Source: The Formosa Plastics Group Business Intelligence system (BI) database

Summary of historical consumption of electricity per unit of product



Note: Source: The Formosa Plastics Group Business Intelligence system (BI) database

FPC used 4,998.7 thousand tons of gases in 2018, on average the volume of gases used per hour was 570.6 tons, which is equivalent to 0.14 ton/ton per unit. The volume of electricity used throughout the year was 2,621 million kWh, and on average 299,234 kWh was used per hour, which is equivalent to 74.6 kWh/ton per unit. All were controlled within a reasonable range.

Carbon Disclosure Project (CDP)

We maintain a positive and active attitude towards GHG-related issues, and began filling out the CDP questionnaire in 2017. We reviewed each questionnaire item and continued to make improvements each year, improving our rating from C in 2017 to B in 2018. We continue to carry out GHG-related management, actions, and disclosures.

2.3 Air pollution prevention



management approach (MA)

GRI Standards corresponding: Emissions, Local Communities

- 📌 Sustainability Issue: Air pollution prevention
- 📌 Our commitment and responsibilities
We will continue to reduce pollution and prevent odor, and will also execute pollution emission inspections (monitoring) to achieve environmental and corporate sustainability goals.
- 📌 Our goals
To lower the impact of air pollutants generated from our operations on the environment and local communities.

Air Quality Impacts Evaluation and Consultation Committee

Due to public concern of air pollutant emission from Mailiao Industrial Park affecting the air quality in Yunlin, Chiayi, and Tainan, we established the "Evaluation and Consultation Committee for Impacts on Air Quality by Mailiao Industrial Park," and actively communicate with stakeholders through industry-academia collaboration and community communication.

Air pollution and waste gas management

To understand the impacts of emissions on the environment and people's health, we comprehensively adopted the best available control technology (BACT), as well as the world's most advanced process improvement and pollution prevention technologies.

Best Available Control Technology (BACT)

Low-contamination gases and fuels are used. Oil-gas recycling systems are established. Static dust collectors and bagged dust collectors are set up. Low nitrogen oxide burners and denitrification exhaust facilities as well as desulfurization exhaust facilities (FGD) are created. There is also other advanced equipment available to prevent air pollution, such as high-temperature oxidizers, active carbon absorption systems, and closed-end coal pocket and transmission systems. Along with precise prevention and care and training and operation, individual pieces of equipment can perform optimally in terms of the treatment efficacy to effectively prevent contamination.

Monitoring (Inspection) Operations Management

Continuous Emission Monitoring System (CEMS), factory-wide chimney monitoring and filming, Fourier Transform InfraRed (FTIR) surrounding surveillance, (GasFindIR) gas detection infrared camera, external air quality monitoring, weekly joint (roving) testing for foreign odors, periodic testing of equipment elements, periodic testing of discharge channels, waste gas burning tower monitoring facilities.



Volume Reduction Measures Management

The wastewater site is covered and waste gases are collected and treated. Tail gases that contain sulfur from the manufacturing process are recycled, treated, and reused. Residual fuels from the manufacturing process are supplied to other plants to be reused. The amount of required equipment is reduced. Waste gases from the cleaning of storage tanks are collected and treated. Tail gases from storage tank nitrogen sealing and waste gas burning towers are all recycled and reused.

Pollution Emission Control

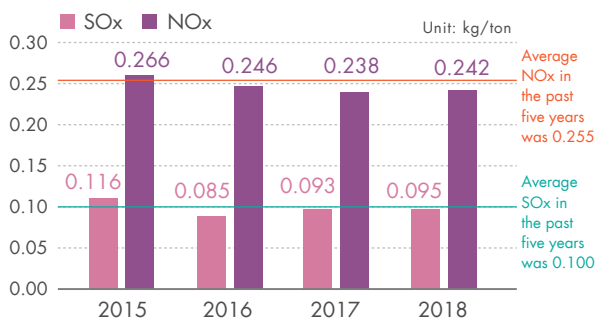
Air pollutant emissions cap, fixed air pollutant operation certificate control, environmental evaluation-based commitment to emission control.

FPCC began complying with international standards and follows the government's policy to ban the use of halons, CFC-11, and CFC-12 since it was established in 1992. Now, R-134a, R-401a, and R-410a are the main coolants used, and sulfur and benzene contents in gasoline and diesel products strictly follow regulations of the European Union.

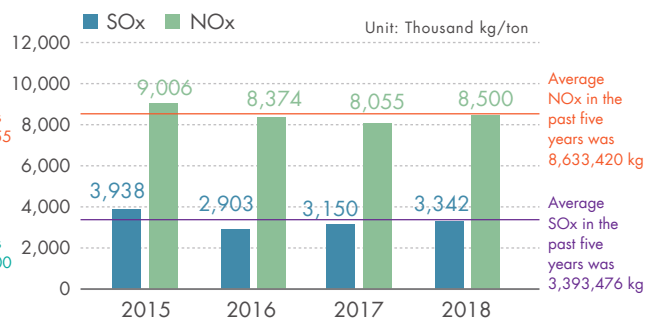
Category	Ingredient	Domestic market		International market	
		Guidelines	Actual value	Guidelines	Actual value
 Gasoline	Benzene	1.0 vol%,max	0.52	1.5 vol%,max	1.19
	Lead	0.013 g/l,max	<0.003	0.01 g/l,max	<0.003
	Sulfur	10ppm,max	6.40	50ppm,max	42.80
 Diesel				150ppm,max	105.30
				10ppm,max	8.00
	Sulfur	10ppm,max	8.10	500ppm,max	367

The best available pollution prevention equipment is used for air pollution prevention. In 2018, sulfur oxides (SOx) emission per unit of product was 0.095 kg/tons, nitrogen oxides (NOx) was 0.242 kg/tons (excluding Mai-Liao Power Corporation), down 5.00% and 5.37% compared to the most recent five-year average of 0.100 kg/ tons and 0.255 kg/tons, respectively. In 2018, our SOx emission was 3,342,940 kg/year and NOx emission was 8,500,352 kg/year, 1.49% and 1.54% lower than the most recent five-year average of 3,393,476 kg/year and 8,633,420 kg/year, respectively. In the future, we will continue to reduce emissions of SOx, NOx, and particulate pollutants per unit product, increase MGGH, ultra low nitrogen oxide burners, and WESP, and plan the use of low sulfur fuels in processes.

Historical SOx and NOx discharge per unit of product



Historical SOx and NOx discharge at FPCC



Note: Source: Quarterly summary reports from each department at FPCC to declare total volume of air pollutants discharged

Park_Air Quality Assessment:

The sixth naphtha cracker has an eight-layer intensive environmental monitoring grid for rapidly tracing emissions to the source and ensuring the quality of the local environment.

Illustration of the geographical location of the eight-layer environmental monitoring grid of the sixth naphtha cracker

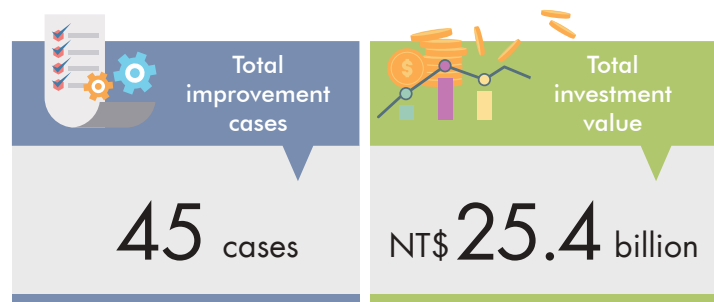


Locations of monitoring equipment inside the premises



Foreign Odor Control and VOCs Reduction

Mailiao Industrial Park is the first of its kind throughout Taiwan that implements cap control. Apart from the pollutants that have already fulfilled environmental assessment requirements, FPCC continues to actively make improvements to reduce the quantity of volatile organic compounds (VOCs). FPCC invested a total of NT\$2.54 billion in 45 improvement projects as of 2018.



In addition, the original open aerators that tend to give rise to VOCs and foreign odor emission in the wastewater treatment area are now covered with lids and piping is configured to collect discharged gases for biological treatment at activated sludge aeration tanks, in order to remove foreign odor associated with waste gases and prevent emission of VOCs.

Wastewater treatment plant (before improvement)



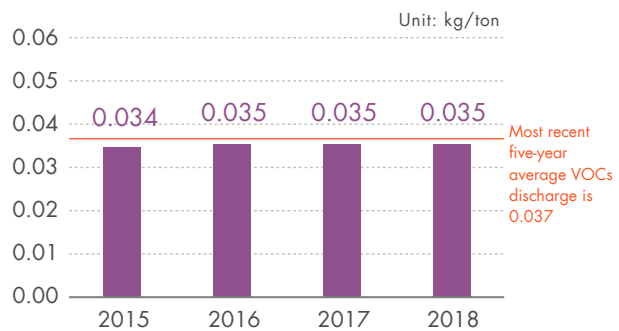
Wastewater treatment plant (after improvement)



Discharge Management of VOCs

VOCs mainly come from processes (discharge channels), storage tanks, loading operations, wastewater treatment area, and grease-water separation pond, waste gas burning tower, and equipment elements. Our VOCs discharge in 2018 decreased 5.71% compared to the most recent five-year average of 0.037 kg/ton. In the future, we will increase air pollution reduction equipment (oil-gas recycling system and collection from storage tank to CFB or waste heat boiler), and continue to reduce VOCs discharge per unit product.

Historical VOCs discharge per unit of product



Note: Source: Quarterly summary reports from each department at FPCC to declare total volume of air pollutants discharged

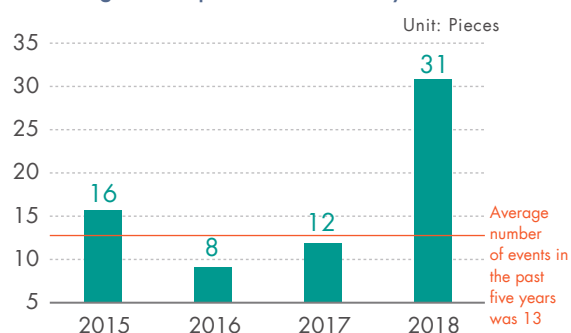
VOCs discharge reduction and improvement over the years

Item \ Year	2015	2016	2017	2018	Accumulated volume 1999-2018
Number of cases improved	5	2	1	2 (Ongoing)	45
Discharge channels (ton/year)	1.83	2.28	10.06	0	28.90
Equipment elements (ton/year)	3.40	0	0	0	5.25
Storage tanks (ton/year)	0	0	0	71.90	94.54
Loading facilities (ton/year)	0	0	0	0	0.31
Total (ton/year)	5.23	2.28	0	0	47.04
Investment value (NTD thousand)	193,680	640,908	560,000	376,123	2,540,179

Note: Source: The Formosa Plastics Group computer-based database for environmental protection improvements

We began implementing the process foreign odor source improvement project in 2014. The number of foreign odor events found during self-inspections in 2015-2017 declined after making improvements, and overall foreign odor control has significantly improved. The number of foreign odor events increased in 2018 due to the application of stricter standards (any odor is determined to be foreign odor) and including annual process maintenance into control. In the future, we will review and improve annual maintenance emission control measures to effectively lower the number of foreign odor events.

Number of foreign odor events found during self-inspections over the years



Monitoring of moving pollution sources

To maintain the air quality in Yunlin County, we require diesel vehicles that enter Mailiao Industrial Park to submit exhaust inspection qualification documents when applying for an entry permit. If a diesel vehicle is reported by the competent authority due to its exhaust, the vendor must be re-inspected to obtain a qualification document, otherwise the vehicle will be prohibited from entering the premises. According to diesel vehicle exhaust inspection statistics of the Environmental Protection Bureau of Yunlin County, all 233 diesel vehicles stopped on roads near Mailiao Industrial Park in 2018 conformed to standards, and the non-conforming rate was 0%, showing significant improvements. Results of stopping diesel vehicles in recent years are as follows:

Year	Traffic flow (A)	Number of diesel vehicles stopped (B)	Number of inspections	Number of non-conforming vehicles (D)	Non-conforming rate of inspections	Non-conforming rate of stopped vehicles (D/B)	Non-conforming rate of traffic flow (D/A)
2015	1,650	(C)	101	(D/C)	7.9%	2.4%	0.5%
2016	1,875	375	126	2	1.6%	0.5%	0.1%
2017	1,850	393	156	0	0.0%	0.0%	0.0%
2018	3,240	223	108	0	0.0%	0.0%	0.0%

Industry-academia collaboration:

FPCC and National Taiwan University engaged in industry-academia collaboration in the implementation of "FPCC and Mai-Liao Power Corporation PM2.5 Assessment and Management Strategies" (three-year project). The project obtained air quality simulation data through meteorological and air quality model simulations and discharge channel PM2.5 testing for coal-fired power generators. Based on TEDS9.0 of the Environmental Protection Administration and 2013 air quality model simulation results, project results show that the 19 coal-fired boilers of FPCC and Mai-Liao Power Corporation had a 1.24% (0.41 $\mu\text{g}/\text{m}^3$) effect on the annual average PM2.5 (32.96 $\mu\text{g}/\text{m}^3$) in Yunlin County; a 0.21% (0.07 $\mu\text{g}/\text{m}^3$) effect on the annual average PM2.5 (32.75 $\mu\text{g}/\text{m}^3$) in Changhua County; a 0.67% (0.23 $\mu\text{g}/\text{m}^3$) effect on the annual average PM2.5 (34.08 $\mu\text{g}/\text{m}^3$) in the Yunlin-Chiayi-Tainan air quality area.

Results in 2016

1. Planning meteorological and air quality model simulations
2. Planning discharge channel PM2.5 testing for coal-fired/petroleum coke power generators
3. Planning PM2.5 testing at Mailiao Industrial Park border stations

Results in 2017

1. Using meteorological and air quality model simulations to estimate the effect of Mailiao Plant's coal-fire/petroleum coke power generators on reducing PM2.5 by 10%, 20%, and 40% during periods with poor air quality
2. Completed discharge channel PM2.5 testing for coal-fired/petroleum coke power generators
3. Completed PM2.5 testing at Mailiao Industrial Park border stations

Results in 2018

Based on model simulation results, the 19 coal-fired boilers of FPCC and Mai-Liao Power Corporation have a 1.24% (0.41 $\mu\text{g}/\text{m}^3$) effect on the annual average PM2.5 (32.96 $\mu\text{g}/\text{m}^3$) in Yunlin County; a 0.21% (0.07 $\mu\text{g}/\text{m}^3$) effect on the annual average PM2.5 (32.75 $\mu\text{g}/\text{m}^3$) in Changhua County; a 0.67% (0.23 $\mu\text{g}/\text{m}^3$) effect on the annual average PM2.5 (34.08 $\mu\text{g}/\text{m}^3$) in the Yunlin-Chiayi-Tainan air quality area.

2.4 Water Resources, Wastewater, and Waste Management

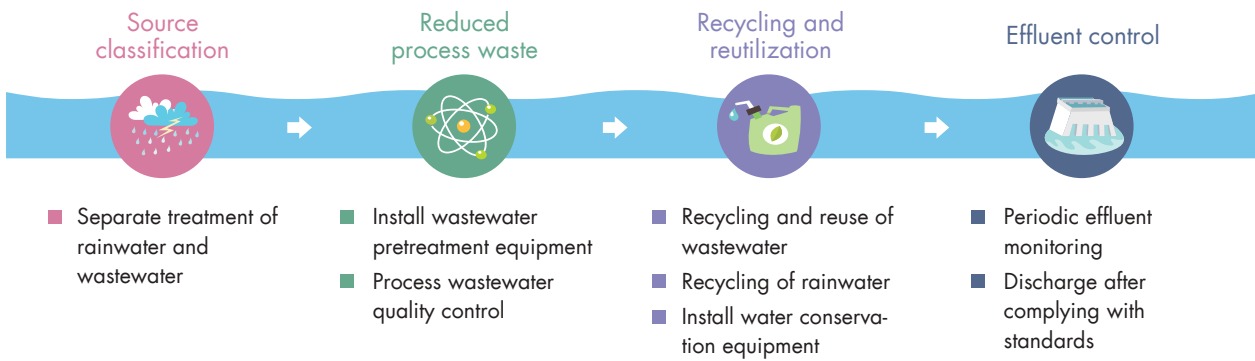
management approach (MA)

GRI Standards corresponding: Water Resources, Wastewater, and Waste

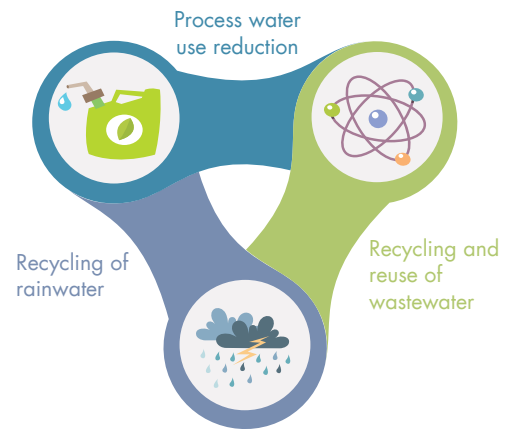
- 📌 Sustainability Issue: Water Resources Management, Wastewater Treatment, and Waste Management
- 📌 Our commitment and responsibilities
We will properly manage resources based on the principles of source management, process waste reduction, recycling, and terminal control, and actively implement water conservation, wastewater recycling, and waste management plans to ensure that our impact on the environment is minimal
- 📌 Our goals:
To improve resource reuse and accelerate treatment processes, increase resource usage efficiency, and lower the impact on the environment.

Water Resource Management

Water used on the premises mainly consists of surface water and tap water. In order to effectively use water resources, we reduce the volume of water consumed by optimizing our process and enforcing related measures to conserve water and bring down evaporation losses; this helps minimize the demand for water on the one hand and boost the efficacy in utilization of water resources.



We established a desalination plant with the capacity of 100,000 tons/day to provide greater flexibility for domestic water use and also to achieve sustainable development. The desalination plant has already passed the environmental impact assessment. We continued to implement wastewater recycling and reuse measures, and also collect rainwater on a comprehensive scale throughout the premises to enlarge the rainwater collection area. Between 2001 and 2018, we completed a cumulative total of 435 water conservation improvement cases, invested NT\$1.01 billion, and reduced water consumption by 86,097 tons/day.



- Implement water conservation projects.
- Implement the wastewater recycling and reuse project.
- Implement the rainwater recycling and reuse project.
- Implement the 100,000 ton/day desalination plant construction project.

Re-utilization of Water Resources in Factories

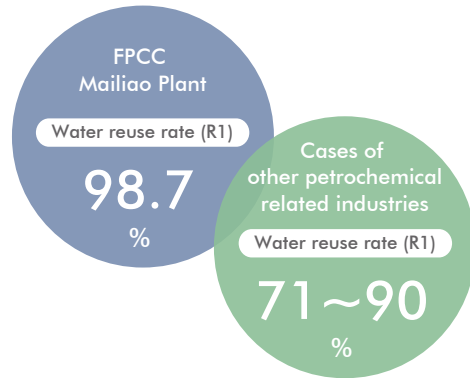
Our unit water consumption showed a downward trend in 2018, daily water consumption was approx. 97,000 tons, and rainwater re-utilization was 8,444 tons. The volume of rainwater re-utilized, in particular, was equivalent to the daily domestic water consumption of 31,900 people.

Daily volume of rainwater re-utilized in **2018** **7,881** tons

Equal to the daily domestic water consumption of 31,900 people

Note: Daily domestic water consumption of one person in 2016 was 0.265 tons (Source: Taiwan Water Corporation)

We continued to optimize our processes in 2018 to reduce our unit water consumption, and implemented water conservation management and evaporation loss reduction measures. These measures reduced our unit water consumption to 1.029 ton/ton, down 0.017 ton/ton compared to last year. When calculated by the water indicator in the "Water Consumption Protocol Review Operating Guidelines" announced by the Ministry of Economic Affairs, the water reuse rate (R1) is 98.7% in Mailiao Park. Compared to other related counterparts in the petrochemical industry, whose R1 values are mostly 71% to 90% according to the information collected by the Industrial Development Bureau, Ministry of Economic Affairs, the reuse rate is already significantly superior.



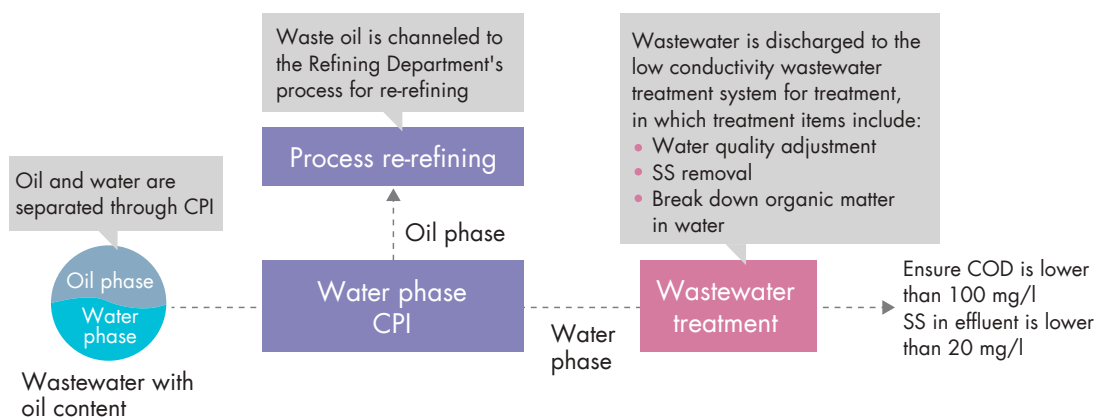
Note: R1 = " Volume of water reutilized / (Total water withdrawal + Volume of water reutilized)"

Overview of Water Conservation Over the Years

Year/Factor	Accumulated volume (1999-2017)	2018	Accumulated volume (1999-2018)	Ongoing	Total
Number of cases improved	364	71	435	123	558
Volume of water conserved (ton/day)	82,725	3372	86,097	11,710	97,806
Investment amount (NTD 100 million)	9.2	0.9	10.1	12.7	22.8
Improvement results (NT\$100 million/year)	3.5	0.1	3.6	0.5	4.1

Note: Source: Formosa Plastics Group water conservation and energy-saving improvements regulatory computer-based database

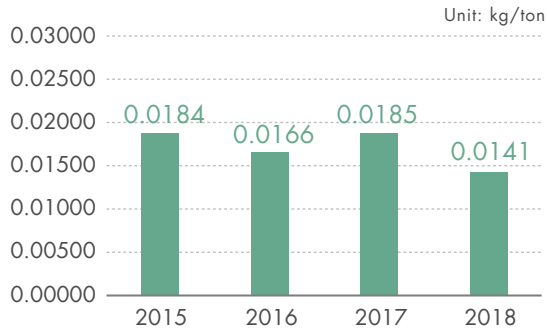
Water Pollution Prevention and Treatment Guidelines and Wastewater Management



Water resources used in product manufacturing include industrial ultra pure water and steam, which are mainly used for equipment heating, heat exchange, heat recovery, equipment cooling, and power generation facilities, allowing raw materials to be made into high quality products through the manufacturing process.

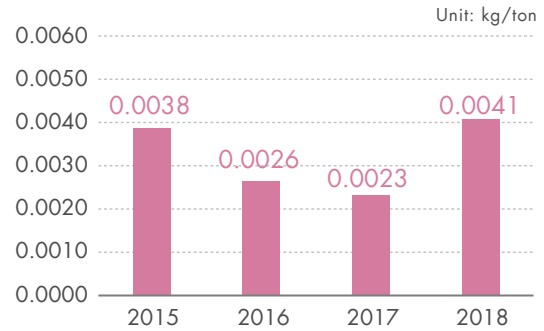
COD discharge per unit of product in 2018 was 0.0141 kg/tons and SS discharge per unit of product was 0.004 kg/tons. COD discharge per unit of product was lower compared to 2017, showing that wastewater biological treatment has been effectively improved. SS discharge per unit of product slightly increased due to the optimization of the biofilm system, which resulted in unstable water quality during the transitional phase. We will continue to improve our wastewater treatment performance to comply with standards.

Historical COD discharge per unit of product



Note: Source: The Formosa Plastics Group water pollution prevention and treatment management computer-based database

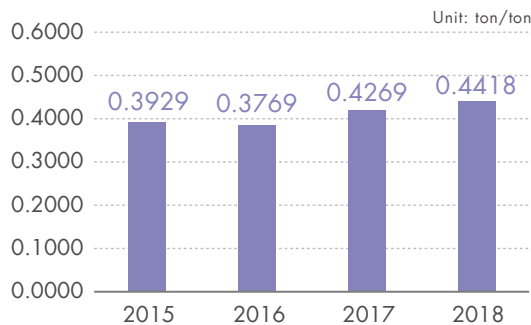
Historical SS discharge per unit of product



Note: Source: The Formosa Plastics Group water pollution prevention and treatment management computer-based database

The effluent volume generated by FPCC at Mailiao Industrial Park throughout 2018 was 42.5 thousand tons per day. Quality of water eventually discharged into the Taiwan Strait seawaters met the effluent criteria. The volume of wastewater discharged per unit of throughput in 2018 increased 3.5% compared to the previous year to 0.442 ton/ton. This was mainly due to a portion of wastewater recycling being suspended during the optimization of the biofilm system, scaling in FGD facilities reduced cooling water and wastewater reuse, and increased usage of industrial water. After optimization of treatment facilities is completed and suitable recycled water quality conditions are adjusted, wastewater discharge per unit of product will be improved and decrease.

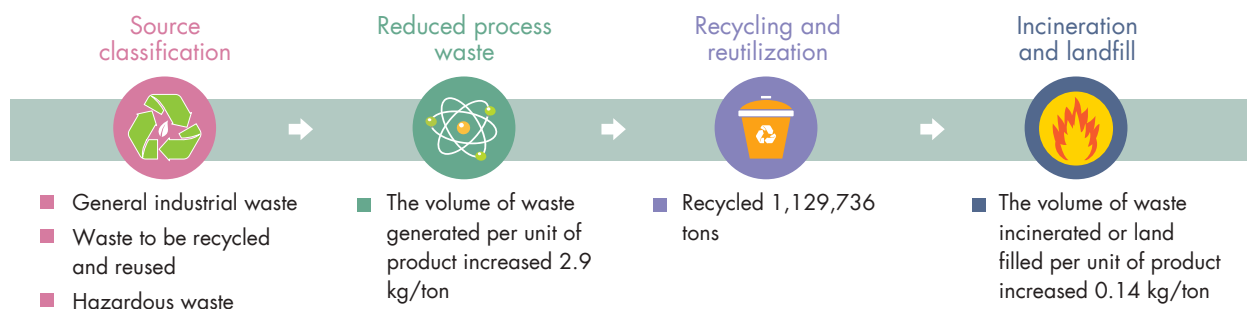
Historical wastewater discharge per unit of product



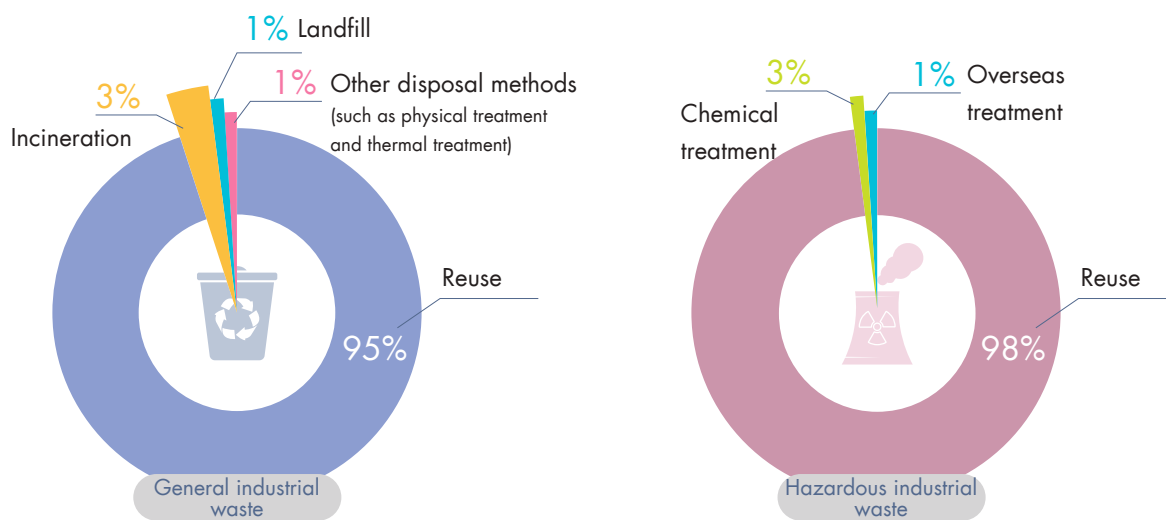
Note: Source: The Formosa Plastics Group water pollution prevention and treatment management computer-based database



Waste Management



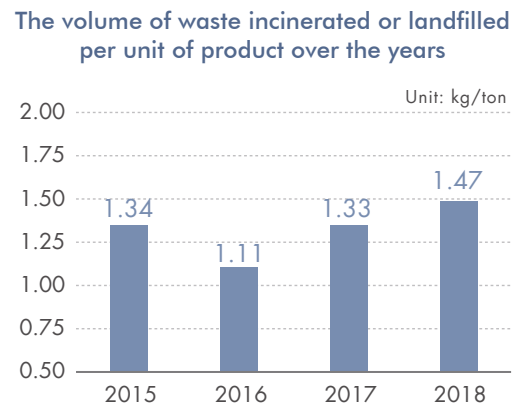
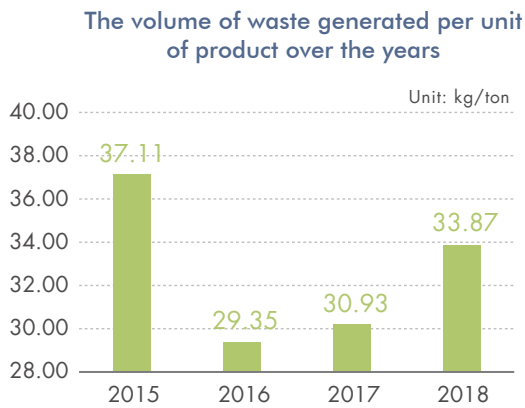
In terms of outsourced treatment of waste, reuse will be prioritized, followed by incineration and landfill. Industrial waste cleared in 2018 totaled 1,190,158 tons, in which general industrial waste accounted for 1,189,878 tons and hazardous waste accounted for 280 tons. All of the waste was properly treated at a legal treatment facility. Of the general industrial waste, 95% (1,129,736 tons) was recycled, 3% (35,932 tons) was incinerated, 1% (15,547 tons) was landfilled, and 1% (8,663 tons) was treated using other methods (e.g., physical treatment, thermal treatment, and chemical treatment). Of the hazardous waste, 98% (275 tons) was incinerated, 1% (3 tons) used chemical treatment, and 1% (2 tons) was treated overseas. Compared to last year, waste generated per unit of product increased 2.9 kg/ton, and the volume of waste incinerated or landfilled per unit of product increased 0.14 kg/ton due to relatively few regular inspections of coal-fired boilers and higher hours of operation, which increased the amount of coal ash generated. Regular inspections of other processes resulted in the increase in the amount of waste cleared.



Overview of waste management over the years

	2015	2016	2017	2018
Waste clearance quantity (ton)	1,255,566	1,000,888	1,045,509	1,190,158
Product (ton)	33,834,040	34,100,586	33,807,030	35,143,295
The volume of waste cleared per unit of product (kg/ton)	37.11	29.35	30.93	33.87
Incinerated or land filllandfilled (kg)	45,210,908	37,945,880	44,945,390	51,754,636
The volume of waste incinerated or land filllandfilled per unit of product (kg/ton)	1.34	1.11	1.33	1.47

Note: Source: The Formosa Plastics Group waste management computer-based database



Issues of concern

1. Press conference on the selection of factory offices with excellent energy and water saving performance in 2018

In response to the government's policy to promote energy and water conservation in industries, FPG has dedicated efforts to water conservation, energy conservation and carbon reduction. The selection of factory offices with excellent energy and water saving performance has been held since 2009 to encourage the proposal of energy and water saving plans. The factory offices selected during each press conference then participate in the outstanding energy and water saving unit selection held by the Ministry of Economic Affairs. The awards we won over the years shows that government's recognition of FPG's energy and water saving results.

As of the end of 2017, a total of 2,690 water conservation improvement projects were completed and can save 123.08 million tons of water a year, which is equal to the capacity of 23 Baoshan Reservoirs (or the annual water consumption of 1,349,000 people); a total of NT\$8.43 billion was invested in the projects. a total of 9,430 energy conservation improvement projects were completed and can reduce CO₂ emission by 11.61 million tons a year, which is equal to the amount of carbon absorbed by 31,294 Daan Forest Parks (or 1.5 billion trees); a total of NT\$23.65 billion was invested in the projects.

To strengthen industry-academia collaboration and gain greater benefits from improvement projects, we invited members of the industry to attend press conferences in Taiwan's top universities starting in 2016, and shared FPG's energy and water saving accomplishments.

The press conference on the selection of factory offices with excellent energy and water saving performance is jointly organized with academic units, and not only hopes to use the expertise of academia for us to achieve better energy and water saving results, but also gives schools the opportunity to combine teaching with practice, so that young students will understand how the industry saves energy and water. FPG has always upheld its CSR and insists on getting to the root of things to do the best it can. Energy and water conservation is a challenge that has no end. We have always believed that it is possible find a balance between economic development and environmental protection.

Detailed press release <https://www.fpg.com.tw/tw/issue-news/2018/253>

2. Review Results of FPG's Application for Certification of Environmental Education Facilities in Mailiao Industrial Park

December 20th, the Environmental Protection Administration rejected the application for certification of "FPG's Mailiao Industrial Park Environmental Education Facilities." Committee members pointed out that there are many foreign species in Ama Park, so it is not suitable for environmental education facilities. Some committee members felt that FPG is not engaging in environmental education, but rather public relations. FPG believes that the accusation of committee members is not untrue, and not only provided facts for clarification, but also stressed the original intention for environmental education.

Endemic trees in Ama Park include *Koelreuteria henryi* Dummer, *Bischofia javanica*, *Melia azedarach*, *Hibiscus tiliaceus*, *Millettia pinnata*, *Cerbera manghas*, and *Scaevola sericea* Forst. f. ex Vahl. *Lantana camara* and *Leucaena leucocephala*, which were mentioned by committee members, are both naturalized species introduced to Taiwan by the Dutch during early periods, and were not introduced by the park; the species only account for a small percentage.

FPG has always considered economic development and environmental protection to be equally important. Yet, modern society still sees the petrochemical industry the same way it did several decades ago, as being a high water consumption, high energy consumption, and high pollution industry. Citizens have thus opposed numerous development plans, and put the nation's major development projects on hold. We are worried about the constant disputes this has caused in society.

Therefore, FPG opened Mailiao Industrial Park to visitors in 2015, and invited all sectors to visit the park to communicate with the public. The number of visitors reached 13,020 in January-October 2018, which coincided with Yunlin County Government's invitation to promote the certification of environmental protection facilities. We realized that it was an opportunity to transform complex environmental data into easy-to-understand popular science knowledge, and engaged in interactions to determine the meaning of balancing economic development and environmental protection, as well as concrete measures. On this basis, we have a high level of willingness and determination to promote environmental education.

Mailiao Industrial Park features industrial pollution prevention and environmental and ecological conservation, and can therefore serve as the largest environmental education site with the most abundant resources in Taiwan. FPG has the willingness and resources to contribute to Taiwan's environmental education. We deeply regret the fact that our application was rejected by the Environmental Protection Administration, but our original intention has not changed, and we will continue to promote environmental education and engage in more in-depth communication with citizens.

Detailed press release <https://www.fpg.com.tw/tw/issue-news/2018/270>



3

Improving Labor Safety





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Chapter Summary

Ever since the Company was founded, we have upheld the spirit to get to the bottom of things and seek constant improvement, and established a safety and health management system on this basis. Besides complying with basic regulatory requirements, we are also implementing hazard prevention and risk control, and aim to implement the responsible care system. We hope to lead the development of safety and health in the industry through the implementation of safety and health management at all levels, and by creating a safety and health culture in the Company.

Stakeholders: Employees, customers, residents at operation sites, environmental protection groups, government institutions, experts and scholars, investors/shareholders, and suppliers and contractors

Sustainability Issue: Industrial and Public Safety, Occupational Health and Safety

Sustainable Development Goals (SDGs)



Strategy

- Strengthen risk management and accountability for safety, and strengthen industry-academia collaboration
- Implement safety and health management at all levels
- Create a safety and health culture in the Company



Targets in 2018	2018 Performance	Targets in 2019	Mid-term and long-term vision
Create a safety and health culture in the Company			
<ul style="list-style-type: none"> Formulate 10 improvement plans for accidents to eliminate the root cause Organize 1 safety culture consensus building workshop for managers Complete the self-inspection electronic system and integrate process and maintenance related inspection functions to improve the operational efficiency of employees 	<ul style="list-style-type: none"> Accident analysis and countermeasure formulation and implementation results are as follows: 0 accidents, death rate per thousand people in major occupational accidents was 0; frequency of disabling injuries was 0; severity of disabling injuries was 0, all lower compared to 2017. We found a discrepancy with the conclusions in the previous 7 consensus building workshops, which are "too many audits" and "too much paperwork and over complex forms" after looking into the issues, and therefore suspended the consensus building workshop for supervisors (1 batch). The self-inspection electronic system was completed and is operating on a trial basis. 	<ul style="list-style-type: none"> Implement improvement plans formulated based on the cause of accidents in 2018 to prevent the accidents from occurring again. Offer "supervisor safety leadership" training courses. Conduct self-inspections, take precautions, handle, and reduce abnormalities. 	<ul style="list-style-type: none"> Aim to achieve zero accidents Enhance the Company's safety culture

Targets in 2018	2018 Performance	Targets in 2019	Mid-term and long-term vision
Labor safety risk management			
<ul style="list-style-type: none"> ■ Establish a false alarm management platform and integrate the accident database to strengthen accident prevention management ■ Provide guidance to contractors with self-management, and establish 14 JSA templates and conduct inspections ■ Improvement of employee SOP/JSA quality ■ Supervise the implementation of chemical assessments and classification management as well as general hazard knowledge plans on site, so as to avoid exposing chemicals to hazards in the operating environment 	<ul style="list-style-type: none"> ■ There were no process safety incidents in 2018 ■ The false alarm management platform and integrated accident database systems are currently being developed ■ Strengthen contractors' accident management; the number of accidents involving contractors in 2018 was 7, down 6 accidents compared to the 13 accidents in 2017 ■ The average number of abnormalities found in monthly labor safety compliance audits was 0.73 cases/plant ■ Established 14 JSA templates for reference by contractors ■ Report 204 priority management chemicals and 0 controlled chemicals ■ Annual PSM certification: "Six certifications including employee participation," "Five certifications including incident investigation" and "MI certification" were obtained by 33, 21, and 11 people, respectively. ■ There are 17 categories of employee safety and health training required by law, 44 batches were held, and 1,392 employees received training; EHS promotion and training sessions totaled 1,670 sessions with 46,743 participants. ■ Contractor two door access control safety and health training: 725 sessions with 33,325 participants from 3,601 contractors; Cumulative number of employees with safety and health management certifications reached 3,090 and professional technology certifications reached 18,568. 	<ul style="list-style-type: none"> ■ Completed the false alarm management platform to monitor false alarms in the Company for preventive management. ■ Improvement of employee SOP/JSA quality ■ Strengthen contractor management: <ol style="list-style-type: none"> 1. Summarize construction accidents of contractors in the most recent five years and add a JSA template for reference. 2. Compiled JSA checklists to improve the implementation of JSA. ■ Supervised the implementation of chemical assessments and classification management as well as general hazard knowledge plans on site, so as to avoid exposing chemicals to hazards in the operating environment. The chemical prioritized for management in the second phase announced in 2018 were included in the materials reported in 2019. ■ Completed the first process safety evaluation report for Class A Business Entities in accordance with Article 15 of the Occupational Safety and Health Act. 	<ul style="list-style-type: none"> ■ Completed a database of company events to pass down experience for employees to learn from. ■ Encourage contractors to improve their self-management ability and lower their accident rate. ■ Implement comprehensive chemical management in the Company.

Targets in 2018	2018 Performance	Targets in 2019	Mid-term and long-term vision
Occupational health management			
<ul style="list-style-type: none"> ■ Ratio of employees who received general and special physical examinations reached 100% ■ Abnormal results in special health examinations decreased to 0.35% ■ 60% of employees completed blood pressure measurements by themselves ■ Established a referral mechanism with Yunlin Chang Gung Memorial Hospital, and followed up on employees with high health risk to lower the risk of occupational diseases and health hazards. ■ Utilize the i health physical fitness instrument electronic health management system to effectively manage employees with high health risks. ■ Continue to promote health promotion activities to lower the rate of occupational illness and injury leave among employees, and achieve self-management of employee health. 	<ul style="list-style-type: none"> ■ Actively follow up on the condition of 84 employees with chronic illness that has not been properly controlled, and show concern with supervisors in the workplace to protect employees' health. ■ 100% of employees received special health examinations, the rate of abnormal results was 0.49%, up 0.07% compared to the previous year. Continued to monitor the operating environment to understand the health risks and exposure of employees. ■ Physicians provided services to 641 employees on site. ■ High risk of cerebral and cardio vascular diseases caused by workload decreased from 1.3% to 0.8%. ■ The blood pressure of all employees was measured in February, and 540 employees were found with abnormal blood pressure and provided with individual health guidance. ■ Completed the implementation of an electronic ergonomics system. ■ Set up 23 i health physical fitness instruments for employees to manage their own health. 	<ul style="list-style-type: none"> ■ Ratio of employees who received general and special physical examinations reached 100%. ■ Compile a list of employees with abnormal health conditions to monitor and manage high risk cases. ■ Abnormal results in grade 4 special health examinations decreased to 0.4%. ■ Establish health management big data collection, warning, and classified management mechanisms using the i health physical fitness instrument, and actively provide individual health education and follow-up from the back-end system. ■ Average usage of the i health physical fitness instrument reached 80%. ■ Strengthen emergency response capabilities and provide all employees with CPR+AED re-training. ■ Continue to promote health promotion activities to lower the rate of occupational illness and injury leave among employees, and achieve self-management of employee health 	<ul style="list-style-type: none"> ■ Achieve warning and classified management mechanisms through big data collection, and actively provide employees with individual health education and health follow-up. ■ Employee actively manage their own health. ■ All employees participate in CPR+AED skills training.

3.1 Creating a Labor Safety Culture

3.1.1 Labor safety culture promotion

We understand that stable production performance must be maintained to achieve sustainable development, and a good safety culture is indispensable to maintaining stable production. We have created a labor safety culture based on our safety and health policy. The meaning of this culture is not only about the Company's occupational safety and health performance, but also the safety performance and atmosphere among employees, how they think and act, and the Company's environment.

Safety Culture Consensus Building and Focus

As we work hard to promote occupational safety and health (OHSAS 18001) and process safety management (PSM) systems, we also want to comprehensively understand the current status of the Company's safety culture and seek opportunities for improvement. We continued to make improvements after finding potential issues through the two safety culture assessments in 2011 and 2016, and continued handle the issues and build a consensus at each level.

We organized 7 batches of consensus building workshops in 2017 based on the issues selected from the 2016-2017 assessment, and employees that participated in each batch agreed to prioritize the issue of "organization human resources and work pressure." The issue was further focused on "too many audits" and "over complex forms" in 2018. After looking into the issues and the on-site investigation, we found that "too many audits" and "over complex forms" did not match the actual situation, and we thus commissioned a team to propose five core recommendations for improving our safety management, providing the direction for the next phase of improvements to our safety culture.

- (1) Safety's best friend is having a margin for error.
- (2) Trust is an essential element of an excellent corporate culture.
- (3) The policy of seeking the truth and even holding people accountable.
- (4) Discipline and authorization.
- (5) Supervisors have the time and ability to care for, provide guidance to, and encourage their subordinates.

We continue to implement improvement measures in phases based on the core recommendation above.

3.1.2 Occupational Accident Statistics, Prevention, Methods, and Follow-up

In 2018, our death rate per thousand people due to major occupational accidents, frequency of disabling injuries, severity of disabling injuries, and comprehensive injury index were all 0, and the number of accidents, death rate per thousand people due to major occupational accidents, and injury severity rate all decreased compared to last year, while comprehensive injury index was lower compared with similar industries.

Ratio of injuries at work in the most recent four years

Year	Mean number of employees throughout the year			Total work hours and days elapsed		Number of cases	Total days lost	Frequency of disabling injuries	Severity of disabling injuries	Comprehensive injury index
	Male	Female	Total	Total work days	Total work hours elapsed					
2015	4,543	348	4,891	1,210,441	9,994,536	1	6,000	0.10	600	0.25
2016	4,592	374	4,966	1,211,953	10,118,292	2	251	0.20	25	0.07
2017	4,594	379	4,973	1,233,714	10,226,585	1	59	0.10	5.8	0.02
2018	4,665	401	5,066	1,266,763	10,532,797	0	0	0	0	0.0

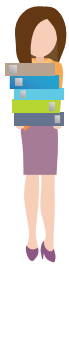
Severity of disabling injuries (SR) = (Total number of days lost × 10⁶)/Total work hours elapsed

Frequency of disabling injuries (FR) = (Number of disabling injuries × 10⁶)/Total work hours elapsed

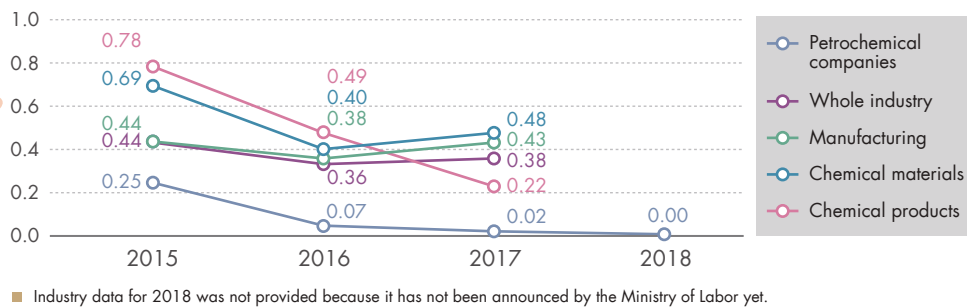
Comprehensive injury index = ((FR*SR)/1,000)^{1/2}

For the past four years, accidents at work have only happened to men and all of them happened in our Mailiao Plant in Yunlin County; the number of employees injured at work in 2018 was 0.

Statistics are only for formal employees of FPCC.



Comparison of FPCC and the Industry's Comprehensive Injury Index in 2015-2018



Ratio of occupational injuries of contractors in the most recent two years

Year	Total work hours and days elapsed		Number of cases	Total days lost	Frequency of disabling injuries	Severity of disabling injuries	Comprehensive injury index
	Total work days	Total work hours elapsed					
2017	1,703,850	13,630,797	13	89	0.51	6	0.06
2018	1,262,167	10,097,336	7	104	0.69	10.3	0.08

Severity of disabling injuries (SR) = (Total number of days lost × 10⁶)/Total work hours elapsed

Frequency of disabling injuries (FR) = (Number of disabling injuries × 10⁶)/Total work hours elapsed

Comprehensive injury index = ((FR*SR)/1,000)^{1/2}

Statistics are for contractors of FPCC, in which statistics for total work hours and days elapsed start from 2017.

Occupational Accident Prevention

We analyzed the cause of incidents and formulated prevention plans based on investigation results for parallel implementation. We assess and control risks through JSA and PHA to discover potential hazards and implement controls in advance, thereby ensuring employee safety and health.

There were no occupational accidents in 2018. There were 7 occupational accidents involving contractors (1 was a contingency) in 2018, causing 6 disabling injuries, specifically burn injury (2 people) and hit/fell/falling object/cut (1 each). We will continue to strengthen contractors' safety management through monthly EHS reports, designated training, and reinforcement measures to reduce risk.

Promotion of occupational accident prevention and EHS reporting

工安宣導資訊	工安宣導資訊(續)
<p>堆高機行進中與人員擦撞。(關鍵128教材-02安全的反義詞不是危險，而是不注意)</p> <p>一、事故摘要： 承攬廠商員工宮00，於(SAR#2承攬人自備工具箱前，準備檢查盲板抽換作業所用之扳手尺寸，當日9時20分許，煉製三廠現場操作人員林00駕駛堆高機，以倒車方式經過該工具箱前時，林員向右後方回頭查看行駛路徑，雖有看到宮員位於車道旁，但卻未能注意宮員右腳伸出車道線，致該堆高機右後側碰撞到宮員右腳。</p> <p>二、原因分析： 直接原因-堆高機採倒車行進過程中與人員碰撞，造成人員腳盤受傷。</p> <p>2019/5/9 1</p>	<p>間接原因-</p> <p>不安全環境： 1.工具箱置放位置與製程區通道間距過小(54cm)。 2.工具箱無法正常開啟，須另外加壓受力。</p> <p>不安全行為： 1.駕駛人員與站立人員，未注意相對安全間距不足。(防禦駕駛觀念不足)。 2.人員站立時，未與車子保持適當間距。(因須著力，採弓字步站立，致右腳超出車道界線)。</p> <p>三、學習重點： 1.堆高機駕駛人員安全防禦駕駛觀念不足，因SAR#2單元北側通道空間狹小，迴轉空間不足，故採倒車行駛進入通道，應注意而未注意通道旁有人員站立。</p> <p>2019/5/9 2</p>

Handling and Follow-up of Occupational Accidents

Two employees fell down in 2018. Even though the accidents did not result in the loss of any work hours, we still analyzed the cause according to the occupational accident improvement process and formulated improvement measures. Besides following regulatory procedures when handling occupational accidents, we utilize objective, professional investigation procedures to find the true cause of accidents and blind spots in management, so as to make thorough improvements.

A third party independent investigation unit in the Company investigates the accident → The unit involved in the accident implements controls until improvements are completed → The third party independent investigation unit verifies improvements at the unit involved in the accident → Case closed.

The Company's nurse and collaborative psychological institution and physician provide healthcare, consultation, and reinstatement evaluation based on the psychological condition of personnel and reinstatement requirements.

Traffic Accident Prevention

Traffic accidents while commute to work have always been the main cause of employee absence. For traffic accident prevention, we use traffic accident examples and defensive driving concepts during labor safety and environmental protection day to raise employees' safety awareness. In the event of an accident, the supervisors will show concern and the employee involved in the accident will be asked to share his/her experience of the importance of traffic safety when the right time comes. Employees were involved in a total of 11 traffic accidents in 2018, and the number of days lost was 532 days. We hope that the collective efforts of all employees will continue to lower the rate of traffic accidents.

Implement new approaches to traffic safety management

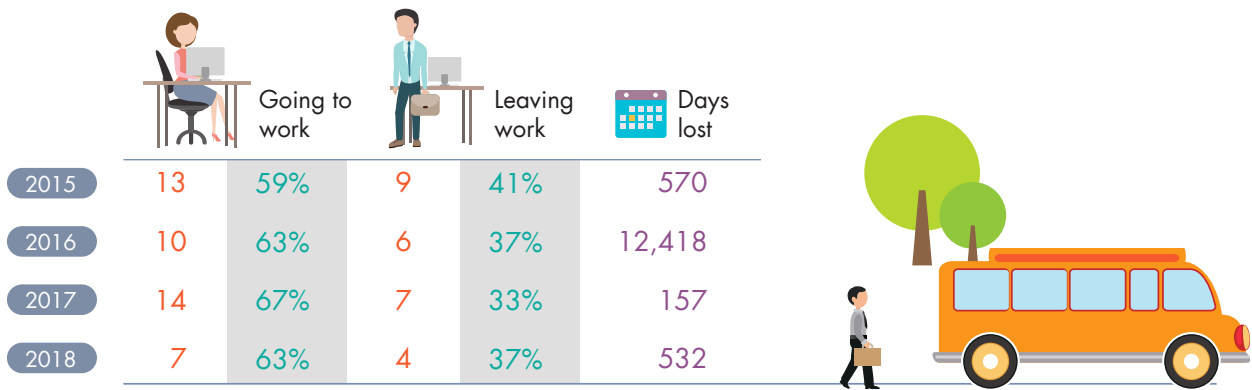
提高夜間行車及工作安全:設置高反光貼紙及警告標語
於本廠三輪車後置物箱、工程安全帽張貼高反光貼紙,大幅提高夜間辨識效果,確保同仁夜間騎車及工作安全。



Provide traffic information



Number of employee traffic accidents while commuting and days lost in the most recent four years



3.2 Labor safety risk management

management approach (MA)

GRI Standards corresponding: Occupational Health and Safety

- Sustainability Issue: Industrial and public safety
- Our commitment and responsibilities: We will actively comply with international standards, technologies, and provide personnel with professional training to achieve zero accidents, improving the industry's work environment
- Our goals: To establish risk management concepts, manage processes, equipment, and personnel based on their risk level, more quickly eliminate current risks, implement safety and health management at all levels, and create a safety and health culture in the Company

3.2.1 Process Safety Management (PSM)

Besides complying with government regulations, we manage production processes, equipment, and personnel based on PSM, and also refer to the PSM laws of the U.S. OSHA and technical document specifications issued by the CCPS of the AIChE.

There were no process safety events during operation in 2015-2018. When each process safety event occurs, an investigation group formed by experts in relevant fields will investigate the facts and causes, and propose improvement measures in various aspects, including hardware (equipment, care and maintenance, etc.) and software (personnel training, technical enhancement, etc.). Measures are simultaneously implemented by all factory offices and follow-up is carried out until all improvements are completed. We periodically commission a third party (Safety and Health Technology Center) to conduct an external audit, and receive the guidance and supervision of the Industrial Development Bureau, Ministry of Economic Affairs to verify our implementation progress.

With regard to PSM training, the EHS Center continues to commission the Technical Training Center to assist in personnel training, hoping that the training mission will establish more accurate knowledge and management of process safety.

Year \ Item	MOC	PHA	PSM		
			5 certifications	6 certifications	MI
2013	59	-			
2014	17	91			
2016	5	4		26	
2017	-	-	46	7	32
2018	-	-	21	33	11
Total	81	95	67	66	43

Description: PSM personnel certificates are divided into three categories:

1. "Six certifications including employee participation,"
2. "Five certifications including incident investigation" and
3. "MI certification"; factory offices not involved in processes are not required to obtain MI certification. A total of 40 employees obtained all certifications.

3.2.2 Employee and Contractor Professional Training and Certification

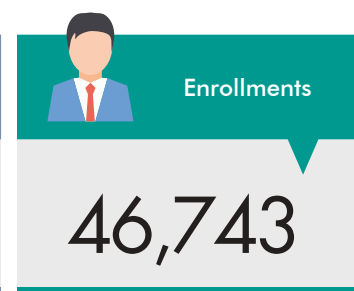
Employee Safety and Health Training Required by Law

Training institutions approved by the central competent authority are periodically commissioned to organize safety and health training required by law, so as to strengthen employees' safety and health knowledge, and ensure that employees (from Occupational Health and Safety supervisors to basic level operators) have the necessary professional knowledge and skills. This enables employees to actively discover potential hazards during operations, and take precautions to lower operating risks. A total of 44 batches of training were held between 2015 and 2018; 17 types of training were organized with 1,392 participants.



Employee EHS Promotion and Training

In 2018, a total of 1,670 sessions on company regulations and systems, occupational safety and health related laws, general knowledge on hazards, personal protective equipment/ first aid equipment, traffic safety, accident examples, emergency response drills, and health seminars were held for 46,743 participants.



Employee position-specific certification

To enhance the professional capabilities of personnel. The Technical Training Center organizes numerous position-specific certifications that are divided into four functions, namely engineering, EHS, maintenance, and process, including: process operator, machinery maintenance technician, instruments and electronics engineer, safety and health management

personnel, environmental protection management personnel, pollution prevention personnel, fire safety management personnel, and PSM personnel; 29 certifications in total. Number of young employees that obtained certifications in 2018 reached 691.



Contractor On-site Education and Training

Before entering the plant, construction personnel of contractors must complete the corporate safety and health educational training and test (one door access). If they intend to enter the construction area (two door access), they must complete the safety and health educational training and test organized by each business department to obtain formal construction qualifications.

Contractor two door access educational training in 2018: 725 sessions with 33,325 participants from 3,601 contractors.



Contractor Certification

1. Safety and health management personnel certification

The Technical Training Center began organizing certifications in September 2013 to strengthen the management abilities of contractors' safety and health management personnel, and a total of 3,090 people completed training and obtained the certification as of 2018.



2. Professional technology certification

In January 2011, the Technical Training Center began organizing professional technology certifications for construction scaffold installation and dismantling, general machinery installation and dismantling, bolt installation and removal, control valve repair, switchgear repair, general meter calibration, wiring repair, painting, electric welding, temperature control, steel bars, and piping; as of the end of 2018, a total of 18,568 obtained certifications.



Establishing the Company's case database after referencing the experience of other countries

To improve the operational safety of front line employees, we referenced the experience and concepts shared in "Easy-to-understand Production Site Safety Management – 128 Key Words of Safety and Stability, PLUS 101 Key Words of Safety and Stability" published by the High Pressure Gas Safety Institute of Japan and Process Safety Beacon of the U.S. CCPS (Center for Chemical Process Safety), and completed 128 training materials using occupational accidents, major abnormalities, and false alarms in 2010-2018. The training materials are available on the Company's internal sharing platform.

危害辨識與預防

現場安全管理128則案例小組討論



輪班人員128安全管理導讀

安全和穩定的關鍵用詞128，與異常案例結合

安全與穩定

碼槽處推行方式

優良檢討內容

檢討紀錄

藉由檢討所得延伸之案例

碼槽處推行方式

0



台塑石化股份有限公司
FORMOSA PETROCHEMICAL CORPORATION


§ 案例宣導 §

宣導	施工架組配人員進行腳梯檢核作業，人員不慎跌落地面受傷 (屬128教材-認為守護自身安全而進行的作業，也是危險作業)
事故摘要	2名施工架組配人員進行換熱器施工架高處作業，施工人員將腳梯板放置於傾斜面(另一塊腳梯板上)且未綁緊固定，隨後施工人員站上腳梯板，腳梯板受力勞動後，導致2名施工人員重心不穩跌倒撞及腳梯板後摔落地面，腳梯板受力變形變形回折。
異常原因	1. 直接原因： 施工架組配過程中，腳梯板滑動，導致作業人員重心不穩跌落受傷 2. 間接原因： 不安全行為： (1) 腳梯作業人員未全部掛勾安全帶 (2) 施工架組配作業主管未全程在場監督 不安全環境： 施工架腳梯板未確實固定 3. 根本原因： (1) 人員安全意識不足。 (2) 作業人員未遵守安全規定。
學習重點	1. 施工架組配作業中，腳梯組配作業主管應全程在場指揮、監督。 2. 施工架組配作業及高處作業人員均應確實掛勾使用安全帶。 3. 腳梯板應以附院層或鐵線綁緊固定，未妥善固定前，人員不得站立於腳梯板上。
圖示	 <p>腳梯板受力後變形</p>

日期：2017年9月22日(持續改善處)


3.2.3 Chemicals Management

Purchase, Manufacturing, Handling, and Use of Chemicals




Priority management chemicals


204 items



Controlled chemicals

0 items





Purchase

- Suppliers are asked to provide safety data sheets of chemicals
- Record the hazard classification, composition, and concentration of chemicals
- Complete annual reporting procedures in accordance with the law

Manufacturing

- Prepare and regularly update safety data sheets
- General knowledge training on employee hazards
- Hazardous chemical labeling
- Compile a list of chemicals and complete annual reporting procedures in accordance with the law

Handling and Use

- Periodically update supplier safety data sheets
- General knowledge training on employee hazards
- Hazardous chemical labeling
- Compile a list of chemicals and complete annual reporting procedures in accordance with the law

Assess

- Implement chemical control banding (CCB) based on the chemical's hazard, volume used, and amount spread through air
- We commission a testing company in accordance with the law to conduct exposure assessment, operating environment monitoring, statistical analysis of results, and risk classification

3.2.4 Transportation and Traffic Safety

Statistical Analysis of Accidents

The number of traffic accidents that occurred in the most recent four years (2015-2018) was 1, 2, 0, and 1; the number of traffic accidents per million kilometers was 0.11, 0.23, 0, and 0.13. The transportation company (Sixth Naphtha Cracker Forwarding) we have worked with for years has been involved in fewer traffic accidents compared with the average in Taiwan.

	Number of traffic accidents	Number of traffic accidents per million kilometers ¹	
		Transportation Company	Taiwan
2015	1	0.11	3.69
2016	2	0.23	3.66
2017	0	0	3.33
2018	1	0.13	3.02

Note: Using the data announced by the Department of Statistics, Ministry of Transportation and Communications for calculation, we multiplied the number of traffic accidents by the ratio of trucks to all registered vehicles, and divided it by a million kilometers to obtain the number of traffic accidents per million kilometers.

Implementation of Driving Safety Improvement Measures

To ensure traffic safety and lower the number of traffic accidents, we required our subordinate transportation company (Sixth Naphtha Cracker Forwarding) to make improvements in personnel training, equipment upgrade, in hopes of maintaining zero accidents, reducing the hazards and risks of drivers, and fulfilling our CSR.

Carrying out tank truck accident emergency response drills



Safety Seminars: We organized transportation company safety seminars, including descriptions of the implementation of the Management Regulations for External Vehicles Assisting with Transportation, vehicle safety device explanation, and implementation of joint defense organization for emergency response to hazardous objects, in hopes of jointly improving traffic safety capabilities.

Transportation safety seminars for transportation companies



Joint defense for toxic chemical incidents: We participated in toxic chemical incident joint defense organization training, including general education, expert and commander-level training courses, in hopes of training emergency response personnel to rapidly control the disaster area, preventing damage to the environment and ecology, and reducing the loss of lives and assets.

Education and training for toxic chemical incident joint defense organization



Health management: Healthy employees are the biggest asset of any company. By promoting workplace health management and implementing labor health programs in accordance with the Occupational Safety and Health Act, it is hoped that health issues can be identified and treated at the early stages and that the mental and physical health of employees can be maintained. Health promotion not only helps employees control and improve their health, it increases work efficiency and enhances driving safety.

Health Promotion Activities for Professional Drivers



3.2.5 Employee Self-management of their Area of Responsibility

To effectively manage improvements and follow-up on abnormalities found by process personnel during inspections of their personal area of responsibility, we established a PDA-based smart inspection system for self-inspections of labor safety, aiming to improve work efficiency and achieve implementation goals. The automatic reminders of electronic inspection records assist supervisors in understanding the progress of improving abnormalities, and can also lower the risk of malfunctions.

Reminder of Form Output and Inspection Results

PDA執行巡檢

2018年10月17日 下午 03:00 38,766 (2018年10月) [公用事業部公用一廠動力部]自主檢查執行情形
 2018年10月17日 下午 03:00 7,224 (2018年10月) [保養中心機油機檢保養二廠公用保養部]自主檢查執行情形
 2018年10月17日 下午 03:00 36,056 (2018年10月) [公用事業部公用三廠公用部]自主檢查執行情形
 2018年10月17日 下午 03:00 4,238 (2018年10月) [油務事業部機油機檢保養一廠保養三課]自主檢查執行情形
 2018年10月17日 下午 03:00 5,670 (2018年10月) [保養中心機油機檢保養一廠保養三課]自主檢查執行情形

每月10號及20號，主動發送自主檢查執行情形供主管及執行人員了解目前執行狀態
 每月25號開始，若有未完成之自主責任區，將持續主動提醒至月底

自主檢查巡檢結果確認

核簽主管登入系統後，進行自主檢查巡檢結果確認

編號	地點區區	異常	異常描述	發現日期	處理日期	完成	檢核人員
1		異常	異常描述	2018/10/17	2018/10/17	完成	N000130249 吳志宏
2		異常	異常描述	2018/10/17	2018/10/17	完成	N000130273 李國勝
3		異常	異常描述	2018/10/17	2018/10/17	完成	N000130295 王智誠
4		異常	異常描述	2018/10/17	2018/10/17	完成	N000130317 謝國慶
5		異常	異常描述	2018/10/17	2018/10/17	完成	N000130339 謝國慶
6		異常	異常描述	2018/10/17	2018/10/17	完成	N000130361 謝國慶
7		異常	異常描述	2018/10/17	2018/10/17	完成	N000130383 謝國慶
8		異常	異常描述	2018/10/17	2018/10/17	完成	N000130405 謝國慶
9		異常	異常描述	2018/10/17	2018/10/17	完成	N000130427 謝國慶
10		異常	異常描述	2018/10/17	2018/10/17	完成	N000130449 謝國慶
11		異常	異常描述	2018/10/17	2018/10/17	完成	N000130471 謝國慶
12		異常	異常描述	2018/10/17	2018/10/17	完成	N000130493 謝國慶
13		異常	異常描述	2018/10/17	2018/10/17	完成	N000130515 謝國慶
14		異常	異常描述	2018/10/17	2018/10/17	完成	N000130537 謝國慶
15		異常	異常描述	2018/10/17	2018/10/17	完成	N000130559 謝國慶
16		異常	異常描述	2018/10/17	2018/10/17	完成	N000130581 謝國慶
17		異常	異常描述	2018/10/17	2018/10/17	完成	N000130603 謝國慶
18		異常	異常描述	2018/10/17	2018/10/17	完成	N000130625 謝國慶
19		異常	異常描述	2018/10/17	2018/10/17	完成	N000130647 謝國慶
20		異常	異常描述	2018/10/17	2018/10/17	完成	N000130669 謝國慶

Abnormality Tracking and Project Closure Management

異常追蹤管理

異常編號	異常描述	異常日期	異常地點	異常狀態	異常處理	異常追蹤	異常關閉
1	異常描述	2018/10/17	異常地點	異常狀態	異常處理	異常追蹤	異常關閉
2	異常描述	2018/10/17	異常地點	異常狀態	異常處理	異常追蹤	異常關閉
3	異常描述	2018/10/17	異常地點	異常狀態	異常處理	異常追蹤	異常關閉

巡檢過程所記錄的所有異常項目，皆納入系統功能「異常追蹤管理」進行追蹤管制

異常追蹤管理主管核簽

依各廠處於系統設定的核簽流程進行自主檢查異常追蹤管理核簽

異常編號	異常描述	異常日期	異常地點	異常狀態	異常處理	異常追蹤	異常關閉
1	異常描述	2018/10/17	異常地點	異常狀態	異常處理	異常追蹤	異常關閉
2	異常描述	2018/10/17	異常地點	異常狀態	異常處理	異常追蹤	異常關閉

3.2.6 Contractor Operational Safety Management

Using Surveillance Cameras to Assist with Management

We set up surveillance cameras at fixed locations where the personnel of contractors are gathered to perform work (such as high risk constructions subject to periodic inspections), so as to deter the personnel of contractors from engaging in abnormal behavior and thereby assist with management.

Surveillance Camera Footage



Statistics of periodic inspections during construction periods show that the rate of abnormalities was 4.5% in the second half of the year, lower than the 13.5% in the first half of the year. This shows that surveillance cameras serve as a deterrent for abnormal behavior of contractors and reduce abnormalities that occur.

Enhanced Management of Lifting Operations

Due to the relatively high number of abnormalities involving lifting operations in 2017, we implemented the following measures for lifting operations this year:

1. When lifting objects heavier than 20 tons, confirmation from the safety supervisor, construction supervisor, and contractor is required before the first lifting operation

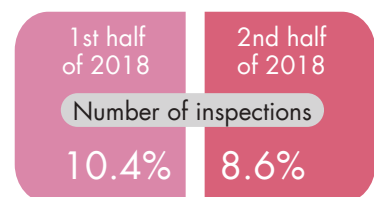
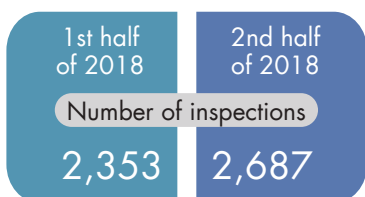
Joint confirmation by three parties



Signatures on work permit for confirmation



Statistics from self-inspections of lifting operations in 2018 show that the abnormality rate of 8.6% in the second half of the year was lower than the 10.4% in the first half of the year, showing the effectiveness of enhanced management of lifting operations.

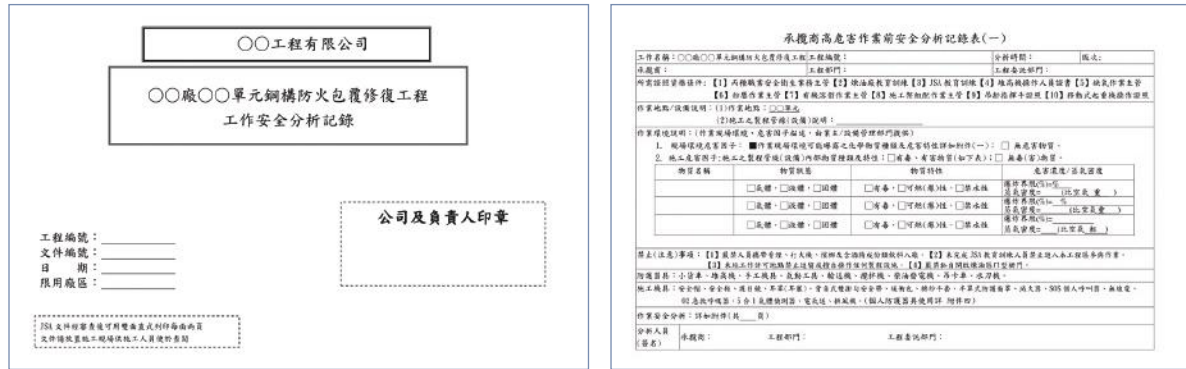


Accuracy of JSA and implementation of on-site inspections

To increase the accuracy of JSA, we provided JSA templates (14 in total) on accidents that previously occurred, high risk work, and routine operations for contractors to use as reference.

Furthermore, we require the worksite director of contractors or safety and health personnel to check JSA results for the construction each day, and document it in the daily safety and health inspection form.

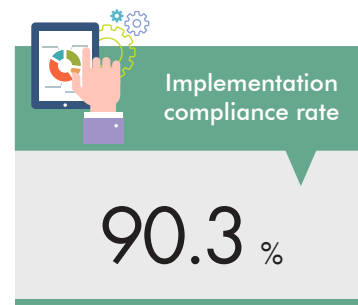
Contractor JSA Template



Guidance to Improve the Management Abilities of Safety and Health Management Personnel of Engineering Contractors for High Risk Work

For high risk work, such as tower and heat exchanger dismantling and cleaning, storage tank cleaning, catalyst loading and unloading, and flame operations involving operating equipment, the safety and health personnel of contractors are stationed at the worksite to supervise and manage safety and health operations, ensuring the operational safety of construction workers.

After inspections and interviews, we found that an improvement in their safety and health management abilities. Of the 103 cases inspected in 2018, abnormalities were found in 10 cases, and implementation compliance reached 90.3%.



Compliance audit

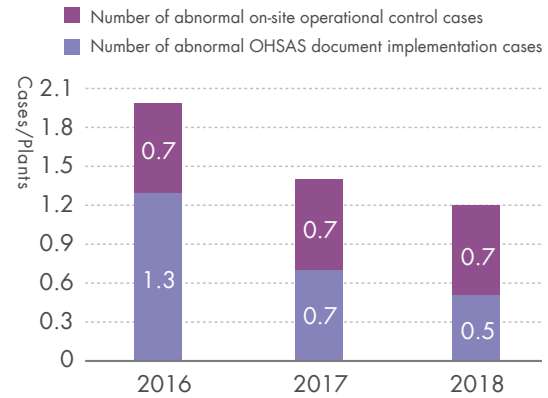
We conduct monthly, semi-annual, and irregular audits to verify the implementation results and compliance of each unit's safety and health system, PSM, accident investigation, general safety and health management, self-inspection, worksites, equipment, safety protection and hazards management for hazardous machinery, contractors, chemicals, and operating environment management.

1. Monthly compliance audits: With regard to on-site safety management by each unit, average number of abnormalities was 0.73 abnormalities/plant in 2018, lower than the average of 0.87 abnormalities/plant in the most recent three years.

Year	2016	2017	2018	Total
Number of abnormalities	44	43	44	131
Number of times at the plant	46	45	60	151
Number of abnormalities/plant	0.96	0.96	0.73	0.87

2. Semi-annual compliance audits: Abnormalities in management system execution was 0.5 abnormalities/plant in 2018, and number of abnormalities in on-site operations management was 0.7 abnormalities/plant; both decreased compared with the previous two years.

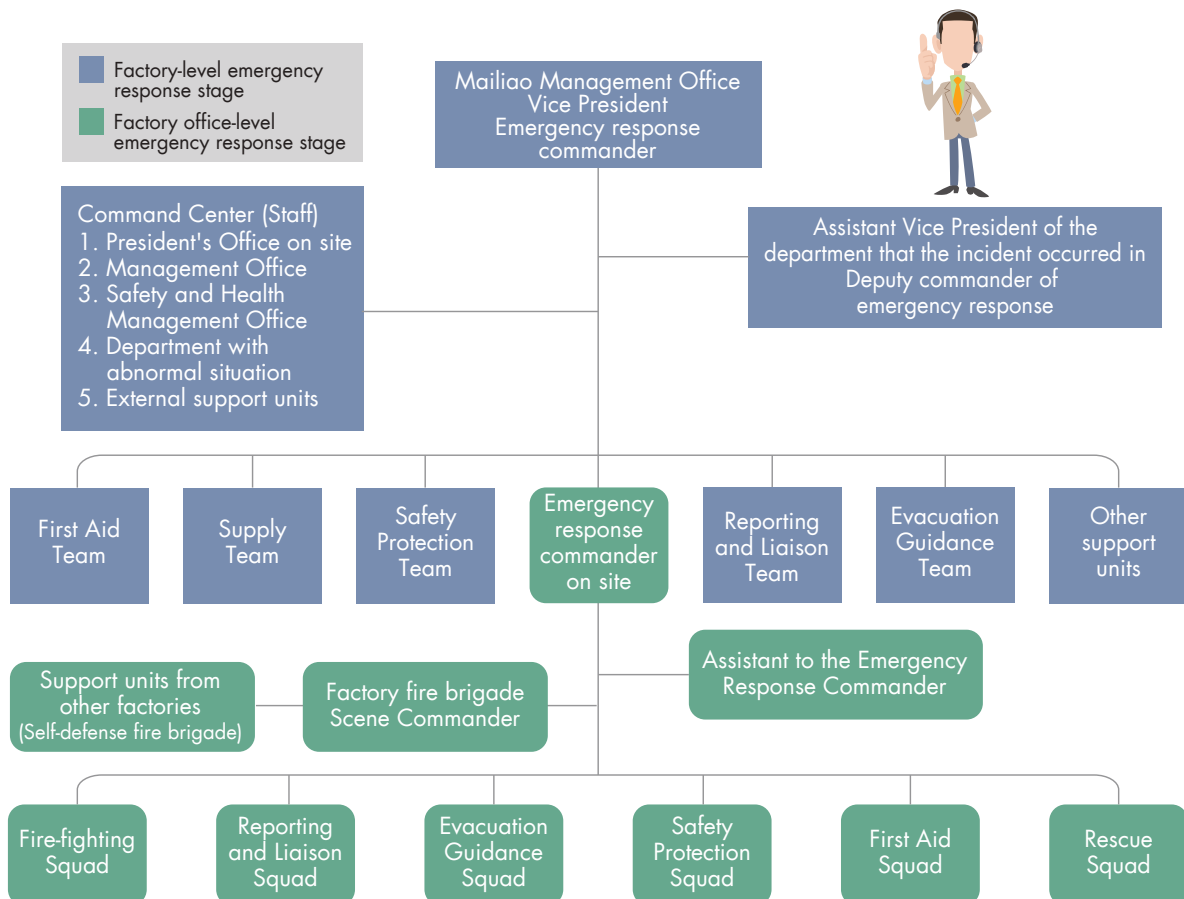
	2016	2017	2018
Average number of abnormalities during management system execution	1.3	0.7	0.5
Average number of abnormalities during on-site operations management	0.7	0.7	0.7
Total	2	1.4	1.2



3.3 Emergency response and drills

Emergency Response Management System

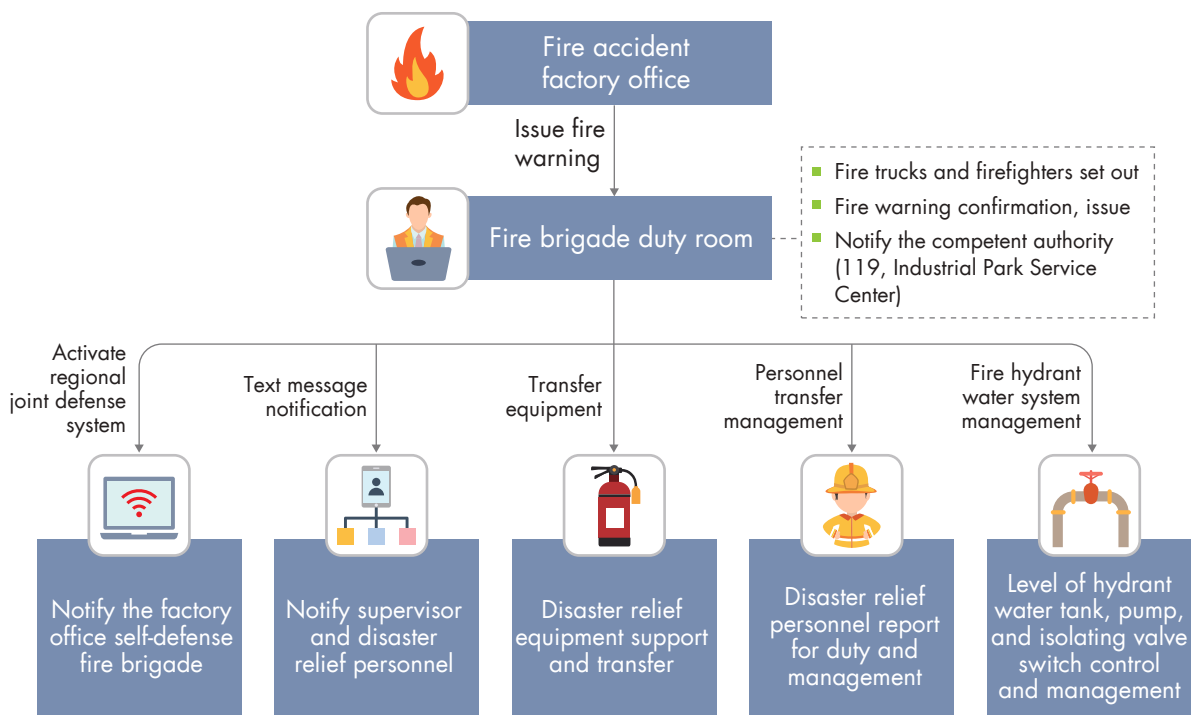
Ensures that incidents are quickly and effectively handled when they occur, minimizing the damage caused by emergency incidents to personnel, assets, and the environment. Emergency response operations are carried out in two stages.



Regional Joint Defense Organization of Plants

FPCC planned four regional joint defense areas of responsibility by region and plants. Each region has a self defense fire brigade with a total of 424 personnel. If a process plant encounters an emergency, the "fire safety regional joint defense computerized reporting system" is immediately utilized to notify all fire safety personnel within the region to follow instructions of the plant's fire brigade and participate in disaster relief work.

The control room of each plant has a "fire safety regional joint defense computerized reporting system" for emergency response and management. The system can issue fire warnings and gather the disaster relief capabilities of different plants. The system's functions are as follows: issue fire warnings, call together members of the self-defense fire brigade, text message notification, disaster relief equipment support, disaster relief personnel management, firefighting pump reporting and management.



Emergency response groups shift handover system

For on-site operators to carry out emergency response operations within the shortest time when an emergency incident occurs, the supervisor on duty assigns emergency response organization work to operators during shift handover based on emergency response personnel requirements. The assignments are entered in the work items during shift handover to determine the functions and manpower of emergency response groups.

Personnel training

To help personnel on site to understand and become familiar with emergency response procedures, methods, techniques, and handling measures, we arrange different levels of training contents that become progressively harder to improve the emergency response abilities of personnel.

Training level	Training item	Trainees	Training frequency	
Level 1	Level of general knowledge	Basic fire safety concepts and reporting measures	New recruits	Carried out after reporting for duty
Level 2	Level of operation	Handheld fire extinguisher and smoke room training	Direct labor	Once every two years
			Indirect labor	Once every four years
Level 3	Technical	Self-defense fire brigade training (including hose and mobile nozzle operations)	Self-defense fire brigade reserve personnel	Once every six months
		Self-defense fire brigade periodic training (operation of various equipment and large flow fire hose nozzle)	Current personnel of the self-defense fire brigade	Once a quarter
Level 4	Professional	Specialized training for various firefighting equipment and vehicle operation	Full-time fire brigade	Once a month
Level 5	Emergency response commander	Emergency response operations training	Cadre members of the full-time fire brigade and all level supervisors on site	As needed

Firefighting vehicles and emergency rescue equipment

The park has a plant-level fire brigade with 30 firefighting and emergency vehicles, foam concentrate, and emergency rescue equipment. This includes a 10,000 gallon/minute large flow nozzle to effectively extinguish large storage tank fires.

We also have chemical incident response vehicles equipped with various chemical protection equipment (grade A protective clothing, grade C protective clothing, and chemical protection pack), decontamination equipment (decontamination shed, onshore oil storage tank), and leakage prevention equipment for emergency response personnel to use. Furthermore, we purchased the "Mailiao Marine", which is the first oil spill vessel in Taiwan, to respond to marine pollution.



Execution of Emergency Response Drills

"Emergency response" is the last line of defense for safety. FPCC take every drill seriously, and rigorously plans and executes each drill exceeding regulatory requirements. Each year we execute marine pollution drills at Mailiao Industrial Park's exclusive port, toxic chemical incident response drills, and joint emergency response drills with the Environmental Protection Bureau and Fire Department, as well as expanded joint drills with Mailiao Association for Safety & Health. We utilize regional joint defense mechanisms to control and handle incidents within the shortest time possible. We also plan public area pipeline drills each year to become familiar with related reporting and handling procedures.

FPCC planned the complex disaster emergency response drills in 2018 to strengthen the disaster relief capabilities of front line emergency response personnel. The drills combine process blackout emergency stop, fire accident, and toxic chemical incident, raising the training level to strengthen disaster relief capabilities and reduce damages sustained during disasters.

Type of drill	Number of drills required by the law (Annually)	Number of drills executed (Annually)	Remarks
Marine pollution prevention drills	3	9	Mailiao Industrial Park's exclusive port co-organizes drills with government disaster relief units such as the Environmental Protection Bureau each year.
Joint emergency response drills with the county government	4	4	Mailiao Industrial Park co-organizes emergency response drills with disaster relief units, such as the Fire Department and Environmental Protection Bureau of Yunlin County Government, each quarter.
Expanded joint drills with Mailiao Association for Safety & Health	No regulations	2	The emergency response drills organized by the Mailiao Industrial Park joint defense organization allows different joint defense organizations to work better together in disaster relief.
Public area pipe carrier drills	No regulations	4	In the Mailiao Industrial Park public area pipe carrier drills, pipeline companies and nearby factory offices work together in emergency response.
Toxic chemical incident response drills	8	24	Emergency response drills organized by factory offices involved in toxic chemicals mainly strengthen training of emergency response procedures for toxic chemical incidents, including reporting, division of hazard area, environment concentration monitoring, and personnel decontamination.
Factory office emergency response drills	46	176	The emergency response drills held every six months in accordance with the law focus on first response, evacuation of unrelated personnel, rescue, and first aid. Process blackout emergency stop was added in 2018 to strengthen disaster relief capabilities.
Total			219

Yunlin County toxic chemical incident response drill and expanded joint drill with Mailiao Association for Safety & Health in 2018



Public area pipe carrier emergency response drills



海洋污染防治演練



3.4 Occupational health management

management approach (MA)

GRI Standards corresponding: Occupational Health and Safety

- 📌 Material issue: Occupational health and safety
- 📌 Our commitment and responsibilities: Create a happy, healthy, and safe workplace
- 📌 Our goals:

To comply with requirements of the Occupational Safety and Health Act, use science-based health risk assessment results for management and follow-up on individuals, and systematically implement workplace health management projects through cross-departmental collaboration to prevent cerebral and cardio vascular diseases caused by work, as well as carry out ergonomic assessments and improvement, epidemic prevention, and first aid.

3.4.1 Occupational Illness Prevention and Management

Special Operations that are Hazardous to Health

Statutory special operation sites at FPCC include those involving high temperature, noise, ionizing radiation, carbon disulfide, dimethyl formamide, hexane, etc.; 13 in total. Doctors will visit our sites according to the frequency required by the law, and will evaluate the health of employees performing special operations and the association with their work. The evaluations are jointly conducted together with supervisors, employees, nurses, and safety and health personnel at the site. Based on the situation, job adjustments made as a preventive measure and competency evaluations were carried out for 206 employees, general injury and illness consultation and educational training were provided to 435 employees. Furthermore, Nurses carry out graded management and follow-up on 535 people based on examination results. Employees have gained a higher level of trust due to their familiarity with the services provided by doctors we have worked with over the years, and it has raised their health management awareness. The number of employees that received services increased 119% since the measure was implemented in 2013. Starting in January 2018, the number of visits by the occupational illness specialist was increased to 8 times a month (the law only requires 6 visits).

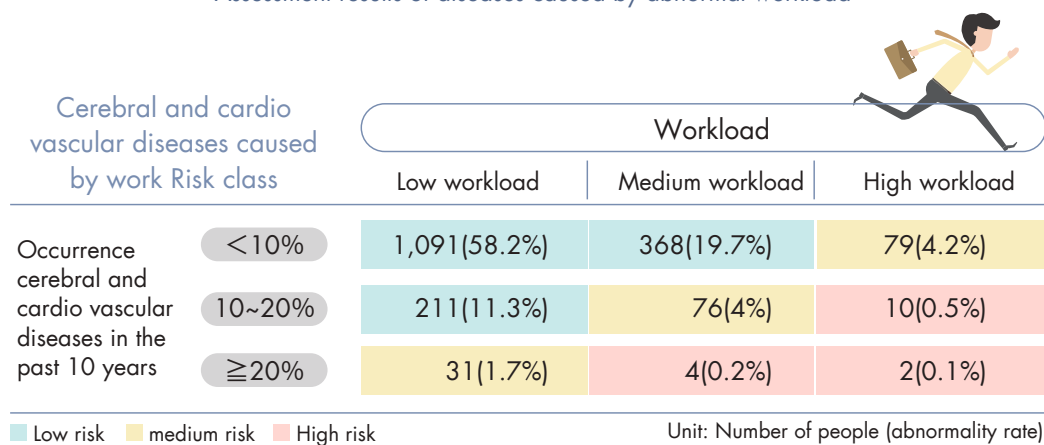
The abnormality rate in the special health examination this year increased 0.07% compared to 2017. We will continue to prevent occupational illnesses through health examinations and follow-up, care for individual health of employees, and environment monitoring. Personnel under grade 4 management all engage in noise operations. We have adopted new personal protective equipment (3M Peltor integrated with Motorola connector) to prevent exposure during operations when personnel need to remove their ear plugs for communication. As of the end of 2018, special health examinations were completed for 100% of employees, and there were no cases of occupational illness.

Item		2015	2016	2017	2018
Physician provides on-site services	Number of people subjected to job adjustment for preventive management or competency evaluations	24	54	64	206
	Number of people who received general injury and illness consultation and educational training	52	153	163	435
Nurses carry out graded management based on examination results and number of people tracked (employees with abnormal results in special health examinations)		658	540	593	535
Number of employees that received annual special health examinations		1,367	1,443	1,413	1,414
Number of employees under grade 1 management		709	903	814	872
Number of employees under grade 2 management		653	536	593	535
Number of employees under grade 4 management		5	4	6	7
Abnormality rate in special health examinations (number of employees under grade 4 management/total number of employees)		0.37%	0.28%	0.42%	0.49%

Preventive management of cerebral and cardio vascular diseases caused by work

Since 2014, we have accumulated the analysis data of 8,160 people. In 2018, we continue to follow up on personnel at high risk of diseases caused by workload and conducted a re-assessment, in which the percentage of high risk personnel decreased from 1.3% to 0.8%. We will continue lower the risk of cerebral and cardio vascular diseases through case management and health promotion activities.

Assessment results of diseases caused by abnormal workload



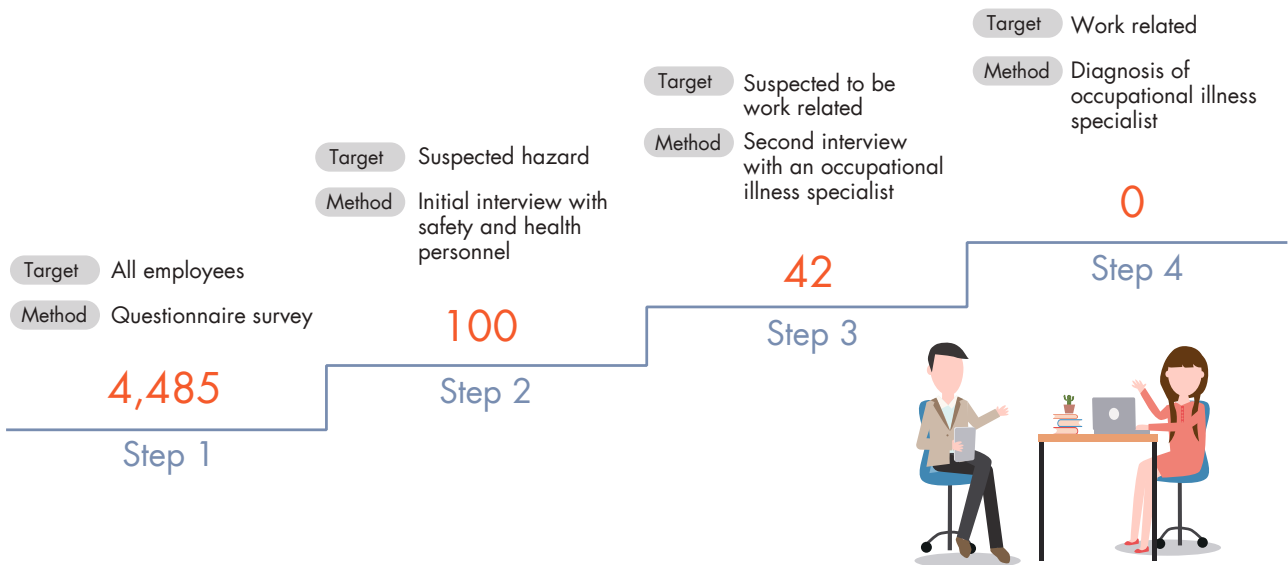
Other first aid, health education, and health promotion projects

Artificial Hazard Assessment and Management

We began administering the Nordic Musculoskeletal Questionnaire to all employees every three years starting in 2015, and used the electronic questionnaire we developed to identify high risk groups for implementing improvement plans.

Furthermore, nurses arrange visits by the doctor to individuals with suspected work-related musculoskeletal symptoms, so as to determine its association with work, the employee's competency, and provide health education and recommendations for rehabilitation and exercise. The doctor visited 42 employees in 2018 and determined that none of the symptoms were work related and all were due to personal factors.

Ergonomic questionnaire survey and results



Emerging Infectious Disease Prevention and Health Education

We are actively preventing emerging, notifiable infectious diseases in cooperation with local health centers and the Third Branch (Mailiao) of the CDC, and also organize dengue fever vector prevention activities in the Company. We regularly and irregularly provide infectious disease prevention and health education information through monthly EHS reports and employee healthcare activities. Starting in 2017, we began working with Formosa Biomedical Technology Corporation in providing preventive healthcare knowledge through videos on healthott.com.

職業衛生宣導資訊(續)

※是流感？還是感冒？
 流感與一般感冒病原不同，感冒主要是由**鼻病毒、冠狀病毒、腺病毒**等引起；流感則是**流感病毒**引起。

一般感冒 V.S 流感

 <p>咳嗽 喉嚨痛 流鼻涕 不一定發燒</p>	 <p>反覆發燒 38 度 C 咳嗽 肌肉痠痛 疲憊感 一人傳染全家</p>
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台塑石化公司_安衛環通報(安衛處發行)

醫健康網

十大死因之一！ 你是糖尿病候選人嗎！



立即看影片

醫健康網 關於我們 主題專區 ▾ 系統影音 ▾ 知識文章



我的鼻子像水龍頭中醫看過敏性鼻炎

台灣屬於海島型氣候，潮濕的天氣讓過敏性鼻炎的盛行率超過3成，除了環境的因素之外，過敏性鼻炎有很強的遺傳因素

2017/02/23



新思維、高規格正視老年婦女的健康促進

台灣早已正式邁入高齡化社會，近幾年來老年人口（65歲以上）的比例也不斷提升，預期未來，此一趨勢將更為明顯。

2017/02/23



心煩躁躁更年期

更年期症候群除了西醫治療外，也可考慮中醫藥物調養、針灸、生活起居與食療的調養，中西醫不同的治療模式可有相輔相成的

2016/12/22



人生第二次轉大人—更年期

更年期是何爾蒙不穩定的過渡時期，常見如潮熱盜汗、失眠、情緒煩躁等，多屬中醫「腎陰虛」證型，飲食衛教配合中藥有不錯

2016/12/22



耳鳴

引起耳鳴的病因有很多，及早接受西醫檢查，排除重要疾病所併發的可能性，及早接受中醫的治療，才能取得較好的療效。

2016/12/22



經前症候群

經前症候群指婦女在月經前出現身體、精神以及行為方面改變，月經來潮後，症狀自然消失。中醫治療以調肝為主，結合健脾、

2016/12/22



你又發燒心了嗎？淺談胃食道逆流的中醫治療

久咳、胸悶、口苦也可能是胃食道逆流的症狀，依據不同中醫證型，使用和胃降逆的中藥治療收效良好，但仍需配合生活與飲食

2016/12/22



中醫看痛經

痛經用中醫藥調理具有良好的療效，但要了解是否有器質性病變，不能一味進補，有需要時也須配合西醫檢查及治療。

2016/12/22

Periodic re-training of first aid personnel

We appoint one first aid personnel for every 50 employees in accordance with the Occupational Safety and Health Act to be able to immediately provide first aid. Mailiao Industrial Park has 539 entry-level first aid technicians (EMT-1). To maintain the effectiveness of their professional certification and their first aid skills, we require every first aid technician to complete 8 hours of first aid re-training every year to protect the lives of employees and contractors.

Furthermore, we provide 33 Automated External Defibrillators (AED) and completed the CPR (Cardiopulmonary Resuscitation)+AED training of all employees. We organized 30 CPR+AED re-training courses in 2018, and also prepared 300 inhalers and 25 injections of antidotes for hydrogen sulfide poisoning on site and at a chemical incident responsibility hospital nearby.

CPR+AED training



Beginner First Aid Technician Training



4

Local Development and Practices





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Chapter Summary

FPCC has spared no effort in caring for its employees, giving back to society, and ecological conservation. Besides providing employees with good salaries, benefits, education and training, communication channels, and friendly measures, we also care for employees' mental and physical health and provide assistance. We strengthened the employee care and protection net and created a healthy and happy culture of care. Furthermore, we provide local residents with health promotion, traffic improvement, and environmental education, subsidize local charity activities to increase resident participation, in hopes of realizing the vision of becoming like family to them.

- 🏠 **Stakeholders:** Employees, residents at operation sites, government institutions, investors/shareholders, customers, environmental protection groups, suppliers and contractors, and experts and scholars
- 🏠 **Sustainability Issue:** Employee profile and benefits; education, training, and talent cultivation; occupational health and safety; and local community development and communication

🏠 **Sustainable Development Goals (SDGs)**



Strategy

- Employee health promotion and building a care and protection net
- Expand social engagement and improve residents' living environment



Targets in 2018	2018 Performance	Targets in 2019	Mid-term and Long-term Goals
Consolidate internal relationships			
<ul style="list-style-type: none"> ■ Improve the workplace environment <ul style="list-style-type: none"> ◆ Build new employee dormitories, add 966 employee dorm rooms, and change all rooms to 2 people/room. ◆ Add an indoor activity center ■ Maintain employee health ■ Participation of obese employees in the employee healthy lifestyle challenge reached 95% ■ Employee turnover rate of 3% and under 	<ul style="list-style-type: none"> ■ Improve the workplace environment <ul style="list-style-type: none"> ◆ Built employee dormitories and the indoor activity center, expected progress was 49%, actual progress was 48.7%, and completion is expected in 2020 ■ Maintain employee health <ul style="list-style-type: none"> ◆ Participation of obese employees in the employee healthy lifestyle challenge reached 73.9% (incomplete) ■ Employee turnover rate of 2.05% (achieved) 	<ul style="list-style-type: none"> ■ Improve the workplace environment <ul style="list-style-type: none"> ◆ Construction of employee dormitories and the indoor activity center expected to be completed on 2020.3.15 ■ Maintain employee health <ul style="list-style-type: none"> ◆ Participation of obese employees in the employee healthy lifestyle challenge reached 95% ◆ Body fat of obese employees who participated in the employee healthy lifestyle challenge decreased 1.5% ■ Employee Care Program <ul style="list-style-type: none"> ◆ Newly promoted supervisor (2018) sensitivity and empathy training ■ Employee turnover rate of 3% and under 	<ul style="list-style-type: none"> ■ Construction of employee dormitories and the indoor activity center expected to be completed in 2020 ■ Employees are FPCC's greatest asset, and we continue to maintain employee health through different methods ■ To reduce the number of employees and contractors' vehicles going into and out of Mailiao Industrial Park during rush hour every day, we subsidize employees to take shuttle buses and have increased the number of shuttle bus routes
Improve external relationships			
<ul style="list-style-type: none"> ■ Establish Mailiao Social Education Park (library and activity center) ■ Free health examinations for 9,500 local residents 	<ul style="list-style-type: none"> ■ Construction of Mailiao Social Education Park began and is expected to be completed in 2020 ■ Free health examinations for 9,928 local residents 	<ul style="list-style-type: none"> ■ Continue the construction of Mailiao Social Education Park, which is expected to be completed in 2020 ■ Free health examinations for 9,500 local residents 	<ul style="list-style-type: none"> ■ Assist in the planning and share expenses of Yunlin County Route No. 2 to reduce the traffic load at Mailiao Township; planning is being carried out in coordination with the county government ■ Being like family to local residents

4.1 Employee Structure



FPCC views employees as its most important asset and provides good work and environment

FPCC supports and complies with the United Nations Universal Declaration of Human Rights, and established its own human rights policy to protect employees' rights and interests.

Human Resource Structure

In 2018, the total number of full-time employees at FPCC was 5,285 with an average age of 41. Due to industry characteristics, the men-women ratio was around 11:1, in which the majority were aged 40 to 49. The ratio of employees with a bachelor degree or above was around 69%. The number of employees holding an entry-level supervisor or a lower-level position and working in the central part of Taiwan each accounted for around 80%. The mean number of years having worked for FPCC among the employees was 12.7 years. The employee structure shows the fundamental approach of FPCC to hire outstanding locals for corporate sustainability.

Formal employees accounted for 96.7% of all employees in 2018 and informal employees (e.g. consultants, fixed-term contract-based personnel, work-study students, directors) accounted for 3.3%. The ratio of formal employees has increased each year, and 100% are Taiwanese.

Ratios of formal and informal employees over the past four years

Unit: persons

Type of staff	2015			2016			2017			2018		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Formal employees (A)	4,543	348	4,891	4,592	374	4,966	4,616	386	5,002	4,690	421	5,111
Consultant	12	2	14	10	2	12	8		8	5	1	6
Fixed-term contract-based employees	137	35	172	120	27	147	110	22	132	113	22	135
Work-study students	16	11	27	16	4	20	26	4	30	19	8	27
Director	7	1	8	7	1	8	6	1	7	5	1	6
Informal employees Subtotal (B)	172	49	221	153	34	187	150	27	177	142	32	174
Total (C=A+B)	4,715	397	5,112	4,745	408	5,153	4,766	413	5,179	4,832	453	5,285
Ratio of formal employees (A/C)	95.7%			96.4%			96.6%			96.7%		

We continue to implement innovative organization management and streamline the organizational structure. In 2018, a total of 105 formal FPCC employees were separated (including 28 retirees), which is an employee turnover rate of 2.05%. The separation rate of our formal employees remained below 3% in the most recent four years, better than the petrochemical industry, which fully demonstrates what we have accomplished in taking care of our employees and their trust in and identification with the Company.

Age distribution of separated formal employees of FPCC

Year	Age group	Male		Female		Average separation rate in Taiwan's industries
		Head count	As a percentage of total	Head count	As a percentage of total	Petroleum and coal product manufacturing sector
2015	Age 30 and below	41	0.84%	7	0.14%	12.2%
	Ages 31-50	41	0.84%	7	0.14%	
	Age 51 and above	37	0.76%	0	0%	
	Subtotal	119	2.43%	14	0.29%	
2016	Age 30 and below	36	0.72%	6	0.12%	8.7%
	Ages 31-50	30	0.6%	7	0.14%	
	Age 51 and above	25	0.5%	0	0	
	Subtotal	91	1.83%	13	0.26%	
2017	Age 30 and below	37	0.74%	5	0.1%	7.9%
	Ages 31-50	30	0.6%	4	0.08%	
	Age 51 and above	20	0.4%	0	0%	
	Subtotal	87	1.74%	9	0.18%	
2018	Age 30 and below	42	0.82%	5	0.1%	8.5%
	Ages 31-50	19	0.37%	7	0.14%	
	Age 51 and above	32	0.63%	0	0%	
	Subtotal	92	1.82%	12	0.23%	

Note: Source of industry information: Directorate-General of Budget, Accounting and Statistics (time series data inquiry - exit rate)

Formula: Number of male (female) employees separated/Number of formal employees

FPCC has been fair, impartial, and open with its recruiting operation and has never hired child labor to do any work. We maximize our recruitment sources through multiple channels and hire according to the performance of each examinee. The number of new formal employees totaled 208 in 2018, accounting for 4.07% of all employees. Most new employees were under the age of 29, and accounted for 3.21% of all employees. We will continue to recruit new employees as the source of organizational innovation.

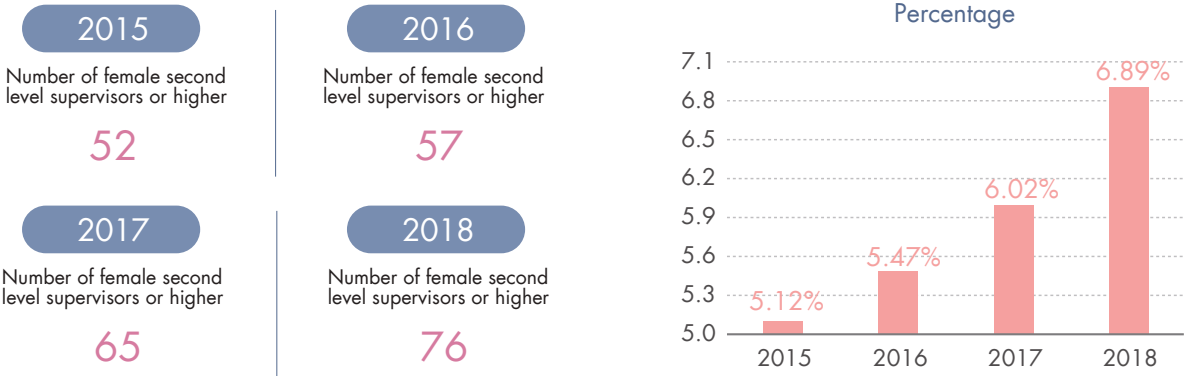
Age distribution of new formal employees of FPCC in 2018

Category	Sub-committee	Male		Female	
		Head count	As a percentage of total	Head count	As a percentage of total
Age	Age 30 and below	142	2.78%	31	0.61%
	Ages 31-50	22	0.43%	12	0.23%
	Age 51 and above	1	0.02%	0	0%
	Subtotal	165	3.23%	43	0.84%

Formula: Number of new male (female) employees/Number of formal employees

There are specific regulations in place for the promotion, evaluating, training, and reward or punishment systems for all employees, so that everyone is treated fairly. As such, no discrimination, violation of human rights, or forced labor incidents occurred in 2018. The ratio of people with physical or mental disorders hired over the most recent four years meets the requirement set forth in the People with Disabilities Rights Protection Act of no less than 1% of the total number of employees.

FPCC takes gender equality very seriously. Even though the ratio of female employees is relatively low due to industry characteristics, promotion channels are transparent and standardized. The ratio of second level female supervisors to all second level supervisors has increased over the past four years, and shows our efforts in creating a workplace environment with gender equality.



Number of involuntary absent hours in the most recent four years

Year	Absent hours		Total work hours elapsed	Absentee rate	
	Male	Female		Male	Female
2015	26,715	2,460	9,994,536	0.27%	0.02%
2016	28,728	1,961	10,118,292	0.28%	0.02%
2017	27,333	2,497	10,226,585	0.27%	0.02%
2018	27,247	7,664	10,532,797	0.26%	0.07%

Number of involuntary absent hours includes: Total hours of occupational sick leave, hospitalized sick leave, non-hospitalized sick leave, and menstrual leave.

Absent hours before 2018 did not include menstrual leave.

Statistics are only for formal employees of FPCC.

Unpaid parental leave

In order to realize the idea of a happy workplace, we set up the nursery room on the premises and created friendly offices to meet the needs of colleagues who need to breastfeed or collect their breast milk during business hours and offers child care leave; colleagues who meet the criteria may adjust their work hours to reflect their needs. Our reinstatement rate and retention rate were both 100% for three consecutive years.

Unit: persons

Status	2015			2016			2017			2018		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Number of employees eligible for parental leave	-	-	-	383	32	415	341	28	369	282	26	308
The actual number of employees who applied for parental leave	4	1	5	3	7	10	3	0	3	2	2	4
Number of employees expected to reinstate their employment status for the year (A)	3	1	4	2	0	2	3	2	5	1	0	1
Number of employees who applied for reinstatement of their employment status for the year (B)	1	1	2	2	0	2	3	2	5	1	0	1
Reinstatement rate % (B/A)	33%	100%	50%	100%	-	100%	100%	-	100%	100%	-	100%
Retention rate	100%	100%	100%	100%	-	100%	100%	-	100%	100%	-	100%

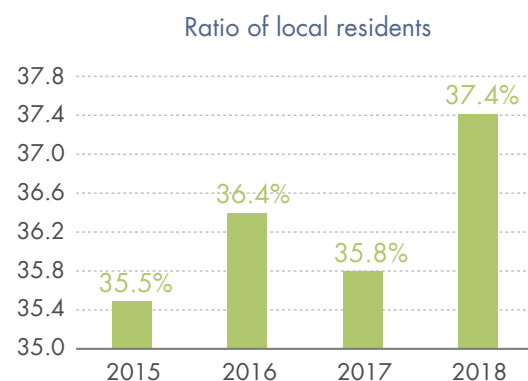
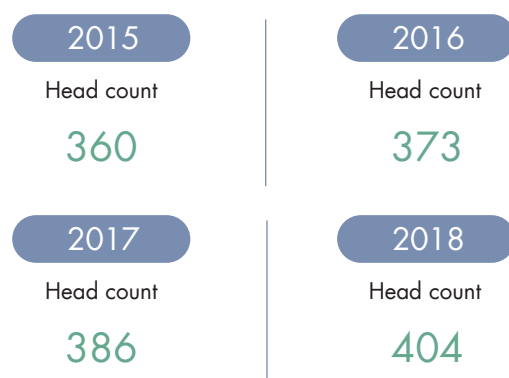
Note: 1. "Retention rate" refers to the ratio of employees who were reinstated after parental leave and stayed for at least one year.

2. Retention rate formula: Number of employees still active 12 months after being reinstated from parental leave/Number of employees reinstated from parental leave in the previous reporting period x 100%

3. Statistics on "Number of employees eligible for parental leave" were gathered starting in 2016.

Hiring local workers

FPCC's principle is to prioritize local residents when recruiting entry-level employees in order to give back to local communities. We also proactively develop local residents to become outstanding management staff. The ratio of local residents in second level or higher managerial positions was maintained above 35% in the most recent four years.



Performance Management and Educational Training

management approach (MA)

GRI Standards corresponding: Training and Education

The development of big data and artificial intelligence technologies has drawn attention to the concepts of Industry 4.0 and intelligent manufacturing, and FPCC has spared no effort in the implementation of related projects. In 2017, we donated NT\$7.5 million to Academia Sinica to establish an AI Academy, and subsequently sent employees to receive AI training and implemented various AI projects, so that employees will understand the latest technologies. We also collaborated with National Tsing Hua University in a project to implement the latest technologies, which will improve our production control, processes, and product quality, transforming and upgrading FPCC to become more profitable.

Sustainability Issue: Education, training, and talent cultivation

As of the end of 2018, FPCC had sent 14 employees to receive AI training, and another 30 employees are preparing to receiving training. Employees that complete training will engage in AI improvements at the production site.

Our commitment and responsibilities

FPCC views employees as the foundation stone of sustainable development. We use a computerized training management system to organize training of required competencies at each stage, and utilize the latest AI technologies in training to enhance our competitiveness.

Our goals

To provide a good and complete training framework and create an excellent training environment to improve employees' professional skills, so that they can continue to learn and improve when they are not at work. We hope to thus attract and retain outstanding talent and develop an outstanding enterprise.

Performance Management

Our performance management system lets supervisors review their annual work performance together with employees to set appropriate work goals. Supervisors provide employees with guidance and assistance in work based on regular reviews and observations. Meanwhile, along with a comprehensive training system and the knowledge and skills required for their job responsibilities, a future career blueprint is planned for colleagues.

All employees are subject to monthly work performance assessments, performance scores are provided to supervisors as a basis for assessing performance bonuses, and are referenced for year-end bonuses to ensure the objectivity of work performance evaluations. Employees with excellent performance are given promotion and raise opportunities and channels. Year-end bonuses are distributed based on the Company's business performance and employees' individual work performance. Supervisors align employee work performance with Company goals through performance management, and evaluate employees' ability development to create win-win for the Company and individual employees.

Education and training

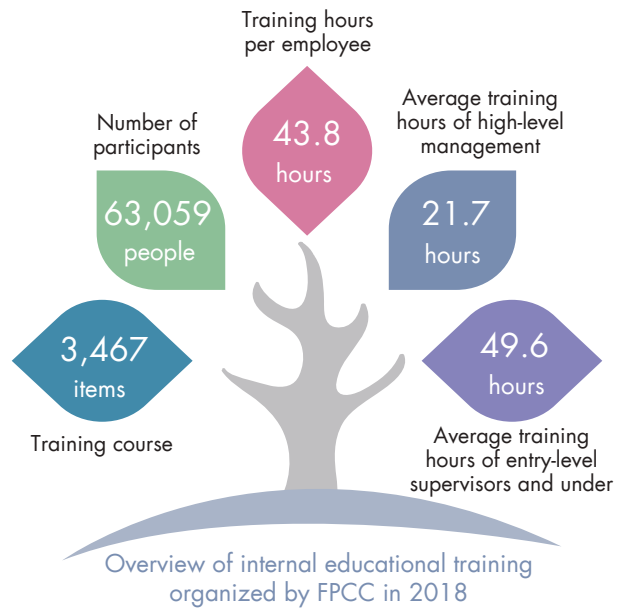
FPCC attaches great importance to employees' career planning and growth, and utilizes an electronic training management system to complete each stage of training. All the training courses and completion deadlines needed for each colleague are controlled through the computer, too. The computer will remind each department to organize training by a given deadline in order to consolidate the goal of helping colleagues acquire comprehensive skills.

Employee education system of FPCC



Besides periodically arranging job rotation and professional training, we also organize seminars on major laws and regulations, new technologies, and systems. We irregularly organize courses on different topics, such as Business English Workshop, Visual Inspection Technical Training, and Safety Supervisor Training.

All employees, regardless of male or female, are subject to periodic performance assessments. If employees are having trouble adapting to their departments, supervisors will arrange suitable care for the employee, and provide guidance for the employee to successfully perform work.



(Unit: Hours)

Year	High-level management			Entry-level supervisors and under			Company-wide mean number of hours		
	Male	Female	Subtotal	Male	Female	Subtotal	Male	Female	Subtotal
2015	15.7	12.2	15.5	54.9	11.3	51.6	47.0	11.5	44.4
2016	23.1	11.3	22.4	50.8	13.0	47.8	45.1	12.8	42.7
2017	24.2	11.0	23.4	53.0	25.8	50.7	46.8	23.3	45.0
2018	22.8	7.1	21.7	52.5	19.1	49.6	46.2	16.9	43.8

Note: The number of training hours received by each male employee in 2018 was around 46.2 and it was around 16.9 for each female employee. Female employees, in particular, received relatively little professional training because 51% of them worked as assistants. The number of training hours of high-level management is less than entry-level supervisors and under, because they already received most of the training they need when they were entry-level supervisors and under.

Security guard training

FPCC has its internal security guards to take care of access security management at its factories and the Formosa building. All security guards have to receive complete professional security guard training, including: Industrial safety (fire prevention, first aid, safety and health), security guard code of conduct, access control rules and applicable requirements, knowledge of applicable laws and regulations (the Criminal Code, the Civil Code), human rights, physical performance and catch techniques, how to drive a fire engine, for example. Meanwhile, they have to take a test on rules and systems and physical performance test on a monthly basis in order to keep their optimal professional levels and physical performance. In addition, real situations that have occurred during work are shared and discussed, including emergency responses, phone protocol, on-duty protocol, among others, in order to avoid violating the code of conduct or infringing upon human rights.

4.2 Employee Benefits and Care

management approach (MA)

GRI Standards corresponding: Occupational Health and Safety, Diversity and Equal Opportunity, Freedom of Association and Collective Bargaining, Market Presence

📌 Sustainability Issue: Employee profile and benefits

📌 Our commitment and responsibilities

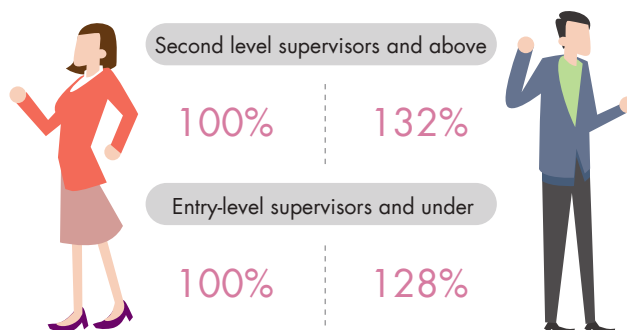
FPCC views employees as the foundation stone of sustainable development. We protect labor rights through our salary and benefits system, diverse communication channels, employee care program, and health management and promotion.

📌 Our goals

To provide good salaries and benefits, diverse communication channels, and achieve gender equality, and strive to create a high quality work environment to attract and retain outstanding talent and develop a happy enterprise.

4.2.1 Compensation and Welfare

To attract and retain outstanding talent, we offer salaries far higher than the minimum wage and at a medium-to-high salary level in the industry. In the case of junior college graduates, their starting salary as basic-level employees is about 158% the minimum wage, and starting salary as a specialist is about 118% the minimum wage. Compensation criteria are established to reflect the required education and experience for the specific talent. They are not different between men and women. We established a Compensation Committee and the policy to periodically review whether if the compensation of management and individuals is reasonable.



Note: Male employees had higher salaries than female employees in 2018 because of the difference in seniority for second level supervisors and above and of the fact that men rotated for field work and received increased allowances for the rotation for entry-level supervisors and under.

In response to the implementation measures of the New Corporate Governance Blueprint (2018-2020) announced by the FSC in April 2018, our "Information on Salaries of Full-time Employees in Non-managerial Positions," which was disclosed to improve the quality of corporate governance information disclosures and better fulfill our social responsibility, is as follows:

Unit: Person/NTD

Year/Item	Non-managerial position		
	Number of full-time employees	Salary of full-time employees	Average salary of full-time employees
2018	5,166	7,312,109,000	1,415,000

Welfare System

In order to serve and care for the needs of all employees, there is a Management Office on the premises to take charge of related tasks such as logistic support and welfare services. In addition, a service satisfaction survey is conducted each year to improve quality of services. The Employee Welfare Committee is formed by both labor and management in accordance with the law and handles employee welfare related affairs. For details on the benefits system, please visit <http://fpcc-csr.eorz.net/index.php>



4.2.2 Communication channels

Adhering to the principles of sincerity and transparency, FPCC ensures that employees are informed in advance of any major changes to its operation in accordance with the Labor Standards Act and other laws and regulations. Employees can provide FPCC with suggestions through the Employee Welfare Committee, labor-management meetings, labor unions, and Occupational Safety and Health Committee; they may also reflect issues through the complaint system. There were no violations of the human rights of local residents by FPCC in 2018. There were no human rights cases filed through the internal complaints mechanism. All employees are 100% protected by any agreement reached in labor-management meetings or with labor unions on salary increase or year-end bonus, for example. Details are provided below:

Committee Item	Welfare Committee		Labor-Management Meeting		Labor Union	Occupational Safety and Health Committee	
	Management	Employee	Management	Employee	Member	Management	Employee
Tenets	To promote employee benefits		To strengthen labor relations		To protect rights of employees	As per the Occupational Health and Safety Management guideline requirements	
Member	Management	Employee	Management	Employee	Member	Management	Employee
Head count	5	12	9	9	3,423	26	13
Ratio	29%	71%	50%	50%	78%	66.7%	33.3%
Number of meetings held in 2018	Once every two months		Once every two months		Director and supervisor meetings once every three months	Once every three months	
Proposals in 2018	73		31		11	1	
Completed	71		30		9	1	
Ongoing	2		1		2	0	
Completion rate	97%		97%		82%	100%	

Welfare Committee

Employees can reflect their opinions about related benefits by submitting proposals to the Employee Welfare Committee. We also set up physical opinion boxes, online opinion boxes using our information system, and the "799" hotline. Employees can use the channels to report issues they encounter at work or in life. We have dedicated personnel to register and handle cases, providing smooth communication channels for employees.

Labor-Management Meeting

For labor-management meetings at FPCC, they are attended by nine people representing the employer and another nine people representing the employees. The employer representatives consist of supervisors from related departments (five supervisors from the management and four first level supervisors). They sufficiently communicate opinions with employees' representatives, who are chosen by the labor union. Issues discussed in labor-management meetings throughout 2018 had to do with the planning of employee benefits, preferred changes to labor conditions, promotion of labor-management collaboration, and enhancement of work efficiency, 31 in total and all of them were effectively addressed.

Labor Union

A total of 11 proposals were made in 2018, in which we first responded to and resolved issues relating to health and safety. When handling major labor-management issues, highest-level management negotiate with the labor union to reach an agreement, and ensure the harmony of labor-management relations and the Company's sustainable development. There were no labor-management disputes or any damages sustained as a result of the disputes in 2018.

Occupational Safety and Health Committee

We established an Occupational Safety and Health Committee in accordance with the law; 2/3 of committee members are supervisors from business departments, occupational health and safety personnel, and medical personnel, and the remaining 1/3 of committee members are labor representatives elected by the labor union; there are 39 committee members in total. The committee convenes quarterly meetings to review and coordinate occupational health and safety management affairs.

4.2.3 Implementation of the Employee Care Program

We have implemented the Employee Care Program through seminars, training, collaboration with external organizations, and our website since June 2014.

Services of the Employee Consultation Hotline

In 2018, 35 cases were opened via the hotline of the Taichung Office of the Teacher Chang Foundation, in which employees called the hotline themselves in 21 cases and the Company referred employees in 13 cases. Follow-up was still being carried out for one case last year. The ages of employees were mostly 40-49 years old (51.4%). Employees learned about the hotline service through Company information and guidance from their supervisors. Employees mainly consulted labor-management issues (37.1%), most of which were questions about labor conditions and their competency at work. Most of the issues were resolved after providing guidance and explanation.

Number of times employees used the psychological consultation services (2018):

Compared to 2017, the number of services provided increased from 57 to 148 (an increase of 60%).



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台塑石化公司

職場心靈
SPA

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2017年四-五月講座

日期	時間	講者	講題	講者背景
4/25 (一)	13:30-15:00	呂佩玲	管理、談判、HR實務	安海內閣律師事務所 律師
4/25 (一)	15:30-17:00	呂佩玲	管理、談判、HR實務	安海內閣律師事務所 律師
4/26 (二)	13:30-15:00	謝淑芬	新進員工適應力	PKS 法律事務所 法律顧問
4/26 (二)	15:30-17:00	林月華	新進員工適應力	法律顧問
4/27 (三)	13:30-15:00	林月華	新進員工適應力	法律顧問
4/27 (三)	15:30-17:00	謝淑芬	新進員工適應力	法律顧問
4/28 (四)	13:30-15:00	謝淑芬	新進員工適應力	法律顧問
4/28 (四)	15:30-17:00	謝淑芬	新進員工適應力	法律顧問
5/3 (二)	13:30-15:00	謝淑芬	新進員工適應力	法律顧問
5/3 (二)	15:30-17:00	謝淑芬	新進員工適應力	法律顧問
5/4 (三)	13:30-15:00	謝淑芬	新進員工適應力	法律顧問
5/4 (三)	15:30-17:00	謝淑芬	新進員工適應力	法律顧問
5/9 (二)	13:30-15:00	謝淑芬	新進員工適應力	法律顧問
5/9 (二)	15:30-17:00	謝淑芬	新進員工適應力	法律顧問

台塑石化公司、張老師基金會台中分駐所 聯合主辦

Dedicated Personnel for Providing Employee Guidance

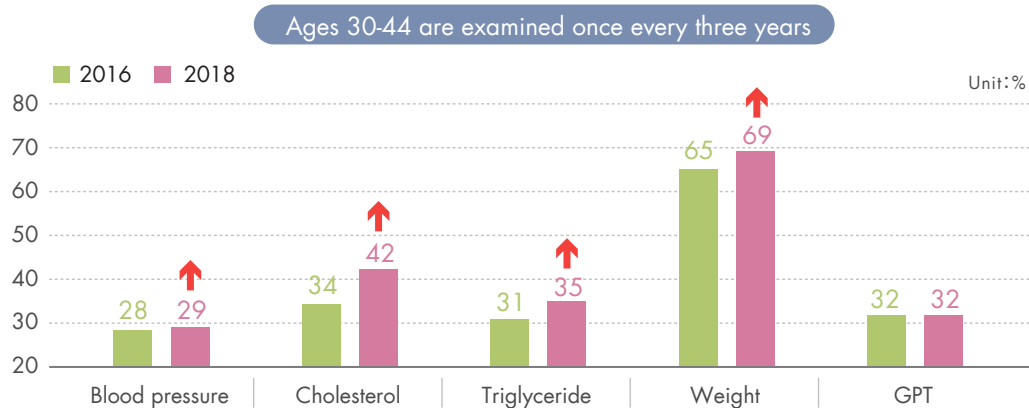
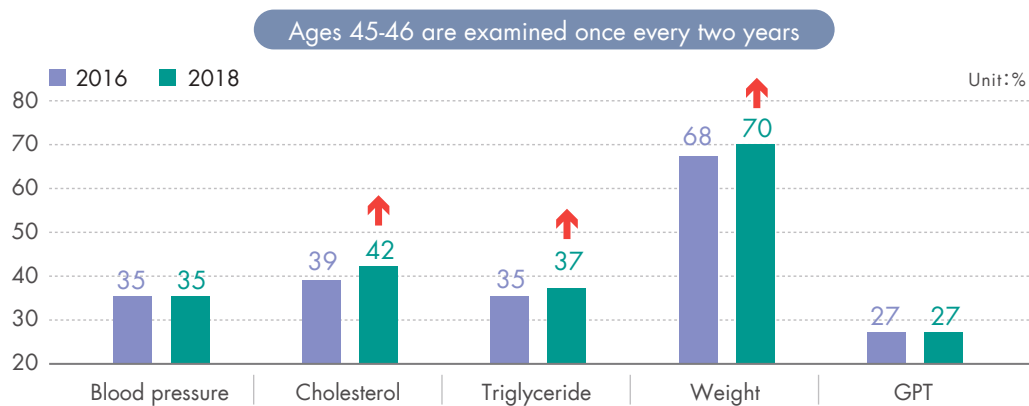
The Company continues to provide dedicated personnel for providing employee guidance, and a total of 1,288 cases were handled between 2015 and 2018.



4.2.4 Employee Health Management and Promotion

To prevent employees from temporarily or permanently leaving the workplace due to health issues, which will cause difficulties with personnel transfer, we began organizing health promotion and management activities in 2015, after examining health examination results and the top five most common abnormal results (blood pressure, cholesterol, triglyceride, weight, and GPT) in 2018, we found that:

1. Blood pressure and liver function abnormality rate were under control thanks to the implementation of employee blood pressure measurement month (started in 2017) and periodic follow-up on employees with abnormal liver function (started in 2015).
2. Cholesterol, triglyceride, and weight show a gradual increase. Employees aged 30-44 (commonly known as the prime years), in particular, showed that fastest rise.



Abnormal weight is the main risk factor that causes chronic diseases such as high blood pressure, high blood sugar, and high cholesterol. We collaborated with companies in different fields, and worked with Chang Gung Memorial Hospital and Formosa Biomedical Technology Corporation in the promotion of preventive medicine and disease prevention, hoping to raise employees' health awareness and lead a healthy lifestyle.

Health Promotion Activities that Encourage Healthy Lifestyles

We organized the 3rd Healthy Lifestyle Challenge in 2018, and utilized the 23 i health physical fitness instruments throughout the Company, as well as a series of lectures by professional physical fitness instructors and nutritionists from Formosa Biomedical Technology Corporation, so that employees will be able to manage their own health.

A total of 1,483 employees, or one fourth of all employees, participated in the event. Participants lost a total of 2,291 kg, on average each person lost 1.9 kg, and body fat decreased 1.6%.

We organized health promotion activities based on health examination report analysis results after discussions with supervisors, including:

- ✿ High efficiency exercise course – A series of sports seminars and activities are organized for all employees.
- ✿ HIIT – Enhances employees' endurance and reduces body fat by increasing muscle to achieve a healthy physique.
- ✿ Healthy Diet – Organizes healthy diet seminars to teach employees how to eat a balanced diet and gain a healthy physique.
- ✿ Seminars and activities for quitting smoking and quitting chewing betel nut – Analysis of abnormal workload data starting in 2016 showed that smoking was an important hazardous factor that resulted in high risk of cerebral and cardio vascular diseases among employees. We thus organized seminars and activities in 2018 for quitting smoking and quitting chewing betel nut, hoping to raise employees' health awareness and reduce smoking and oral cancer.
- ✿ To eliminate the high risk factor "smoking," we selected employees who smoked to attend seminars on quitting smoking and chewing betel nut, and requested the assistance of Mailiao Health Center with carbon monoxide concentration testing and doctors from the family medicine department of Chiayi Chang Gung Memorial Hospital with oral cancer screening.

Weight loss and diet seminars



Sports seminar



Oral cancer screening



Science-based Employee Health Management and Efficacy

Analysis of the 2018 health examination results showed a 0.1% and 2% decrease in the blood pressure and triglyceride abnormality rates compared to 2017, respectively, but the abnormality rate of cholesterol and blood sugar increased. This shows that active efforts should be made in employee cholesterol and blood sugar management in the future.



Abnormality rate in annual health examinations over the years

Year	Abnormal blood pressure (>140/90 mmHg)	Abnormal cholesterol (>200 mg/dL)	Abnormal triglyceride (>150mg/dL)	Abnormal blood sugar (>100mg/dL)
2015	31.5%	35.2%	31.3%	24.7%
2016	29.3%	40.8%	34.1%	20.2%
2017	33.0%	39.1%	37.3%	18.2%
2018	32.9%	43.0%	35.3%	21.3%

We are raising employees' health awareness by working with the professional team of Formosa Biomedical Technology Corporation, creating a healthy workplace and atmosphere, and using science-based management (big data, app, etc.) to achieve the goal of "healthy workplace."

- 🍎 **Employees:** Employees can measure their own blood pressure, blood oxygen, electrocardiogram, blood sugar, cholesterol, triglyceride, uric acid, and body composition, and can use the website or app to check their health measurement records.
- 🍎 **Nurses:** Nurses use the back-end information system's warning mechanism for monitoring. We use the health examination results of all employees and their "i health physical fitness instrument" use records, and worked together with Formosa Biomedical Technology Corporation to use Big Data in establishing warning and classified management mechanisms, actively providing individual health education and follow-up from the back-end system.

Employees' i health physical fitness instrument measurements



Event photos



『台塑生醫 i 醫+ APP』

- ✓ 整合各類健康資訊
- ✓ 串連您使用的健康APP及運動手環
- ✓ 異常管理與即時關懷
- ✓ 完整聯貫健康、營養、體適能三合一內容
- ✓ 協助您個人的專屬健康計劃目標設定
- ✓ 紀錄、推播個人化健康關懷訊息

立即掃描
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隨時隨地紀錄您的健康狀態

台塑生醫「i醫+」擁有多樣化健康管理及紀錄功能，不論「飲食」、「運動」或「個人健康量測記錄」都能協助您一手掌握！



個人化健康任務及目標設定

不論是每日喝水量、卡路里攝取、運動次數、飲食方案等目標設定，我們提供多元完整的記錄功能，並有醫師團隊給予的健康計劃目標及專屬會員的健康處方，讓您輕鬆達標！



異常管理即時關懷

健康管理數值輸入後發現異常？「i醫+」APP立即化身會員專屬個人小祕書，即時推播資訊，提醒您該採取的衛教建議，半小時後再次關懷您的健康數值，為您做第一線的健康異常把關！



多元課程 打造最佳學習平台

各式健康衛教影音隨選隨看，讓深奧的健康知識變成簡單易懂的內容，方便您自我學習、樂於分享！

4.3 Local community development and communication

management approach (MA)

Local communities

- 🏠 Sustainability Issue: Local community development and communication
- 🏠 Our commitment and responsibilities:
To uphold the philosophy to "take from society; give back to society", utilize our influence to care for communities, and support local development.
- 🏠 Our goals:
To give back to local communities, care for communities, and support local development through our business locations, actively engage in industry-academia collaboration, and drive the development of upstream and downstream industries.

Resident Healthcare

Health Risk Assessment

We commissioned National Cheng Kung University to implement a long-term program that evaluates health hazards caused by harmful air pollutants, and the health risk assessment of 64 specific hazardous air pollutants were completed as of the end of 2017. The scope of assessment in the past covered: Mailiao, Taixi, Dongshi, Lunbei, and Baozhong townships. We expanded the assessment to even more townships in 2018, and included Sihua Township and Changhua's Dacheng Township. The total carcinogenic risk value on average was 5.07×10^{-7} and the maximum total carcinogenic risk value was 6.38×10^{-6} . All were between 10^{-6} and 10^{-4} and all the maximum total non-carcinogenic risk values were below 1. In other words, the impacts on human health fall in the category of acceptable risk.

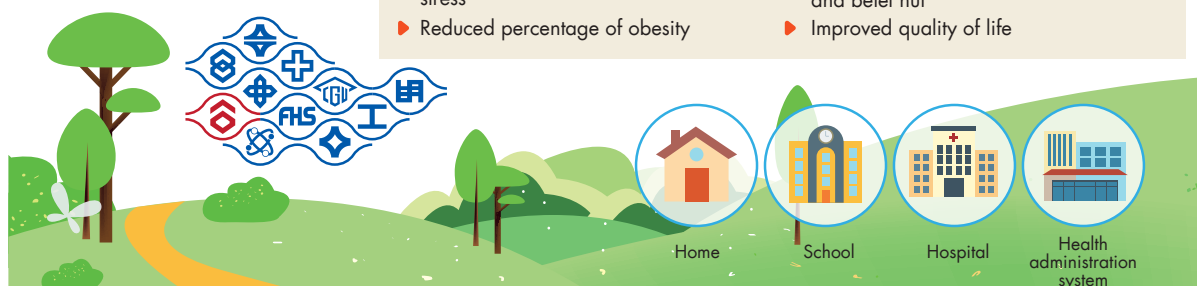


Health Promotion

Care for the health of local residents and develop communities. Health promotion and education for local residents is implemented in hospitals, communities, and schools, developing Mailiao into a model community of health promotion in the locality.

Beautiful new world

Vision for a Healthy Community
on the Coasts of Yunlin



Health care

- Improved quality of healthcare
 - Improved health of local residents
- Joint implementation with public and private organizations

Medical check-up

- Abnormality control
- Increase follow-up rate
- Diagnosis treatment
- Annual follow-up



Health research

- Building and maintaining a health database
- Health data analysis
- Results sharing

Health survey

- Resident health trends
- Health issues of concern to residents and society
- Care implementation measures

Enhanced Quality of Medical Care

Yunlin Chang Gung Memorial Hospital has a medical team of 300 members in 2018; 522 beds were available to the public. The hospital offers 25 specialized western medicine and Chinese traditional medicine clinic services. Medical services provided in 2018 include 134,279 outpatient services, 14,704 emergency room services, and 17,279 bed-days. We continue to expand both the scope and scale of services and continue to improve the quality of medical care in the coastal area of Yunlin.

Yunlin Chang Gung Memorial Hospital shoulders the responsibility of 24-hour emergency care and improving quality of local medical care in the coastal area



Free Health Examinations for Mailiao Residents

We have commissioned Yunlin Chang Gung Memorial Hospital to perform health examinations for residents in Mailiao and Taixi Townships free of charge since 2010. In 2018, 10,090 residents completed health examinations, and 722 residents with abnormal results returned for follow-up visits. This allows residents to learn about their health condition through health examinations, so they can discover diseases during an early stage and receive treatment. After monitoring the health of local residents for a long period of time, results show that our operations do not have a significant effect on residents' health.

Mailiao Area Living Environment Improvement

Noise Improvement Action and Performance

We periodically commission a qualified testing institution to carry out monitoring operations at nine locations near the park. Monitoring results show that the night market, temple fair, and school bells, as well as cicadas chirping and frogs croaking resulted in occasional high values at some locations. All remaining values complied with control standards. This shows that the operations of Mailiao Industrial Park do not have a significant effect on local noise.



Note: Locations with noise monitoring stations in the surroundings of Mailiao Industrial Park

Traffic Improvement Action and Performance

To reduce the number of employees and contractors' vehicles going into and out of Mailiao Industrial Park during rush hour every day, which causes traffic jams, we actively implemented the shift system for employees and contractors, provide shuttle buses, instructed employees and contractors to take the dedicated road for trucks and Access Road No. 1, and recruited volunteer traffic police to direct traffic at important intersections nearby to maintain good traffic order. Furthermore, to ensure the safety of students going to school, we hired crossing guards to provide assistance when children are going to Qiaotou Elementary School, guiding them safely across the road.

Environmental Knowledge Promotion

Rising environmental awareness in recent years has made environmental protection a topic of public concern, and environmental education has become a national movement. To let the public understand the Sixth Naphtha Cracker's performance in circular economy and energy and water conservation, as well as Formosa Plastics Group's efforts in environmental protection, Mailiao Industrial Park in 2015 began widely inviting the public to personally experience what the park is like, and share their experience with family and friends afterwards. We hope that they will make environmental protection, energy and water conservation, and ecological conservation a part of daily life, and will see for themselves that the Sixth Naphtha Cracker places equal emphasis on environmental protection and industrial development.

Furthermore, Mailiao Industrial Park designed environmental education courses that are energetic, experience-based, and interactive with a story-telling approach to let citizens more easily understand the key points above. The course outlines are as follows:

- (1) History of industrial development and environmental protection in Taiwan: Shares the process of seeking a balance in industrial development and environmental protection over the years with different sectors, reminding them that environmental protection should also be prioritized while pursuing industrial development. It allows the general public to implement environmental protection in their daily lives, and also allows us to understand the expectations of different sectors for us, so that we can continue to make improvements.
- (2) Air quality and pollution prevention: Due to the contradicting descriptions of the air above the same piece of land, as well as the transition of Mailiao Industrial Park first being welcomed by residents, who then began to protest after a labor safety and fire accident, and further on to close cooperation recently, the changes that occurred during this period have made guests concerned about the issue of local air quality. By describing

what air pollution is, how the government is improving air quality, and how Formosa Plastics Group is sequentially making improvements when facing concerns of air pollution brought by Mailiao Industrial Park, students learn that Mailiao Industrial Park prioritizes environmental protection while pursuing economic development. This raises public awareness of environmental protection, and will allow measures for reducing air pollution to be taken in daily life.

- (3) Water resource utilization and water conservation: Using the issue of water consumption in Mailiao Industrial Park, which is an issue citizens are concerned about, the allocation of Zhuoshui River's water resources is discussed from the historical background, various data, and phenomena. Guests are guided to discuss the advantages and disadvantages of building Jiji Weir in groups and give a presentation on stage. Interactions and discussions on the issue make people think about the purpose and meaning of artificially changing water resource distribution, the impact on the environment, and how to find a balance. The inconvenience and impact of insufficient water resources on each industry cause people to cherish water resources and conserve water. Examples of how Mailiao Industrial Park taps new sources of water and reduces water consumption inspire people to come up with water-saving methods, and further use the methods in daily life.
- (4) Effluent management and friendly to the marine environment: The impact of sea reclamation at Mailiao Industrial Park and wastewater generated from operations are the people's main concerns about the marine environment. Hence, Formosa Plastics Group must strictly manage effluent from Mailiao Industrial Park, reducing and recycling effluent until the ultimate goal of recycling all effluent is eventually reached. Even though there is currently still effluent, there are numerous layers of monitoring to ensure that the effluent does not affect the marine environment. This lets citizens understand and consider the benefits of sea reclamation, and the environmental impact during construction and after construction is complete. The independent thinking process improves citizens' understanding of the environment and thinking ability.
- (5) Planning of Mailiao Industrial Park environmental education facilities: The existing administration building, environmental monitoring center, environmental protection and ecological laboratory, and Mailiao Port are used in coordination with teaching plans, dedicated personnel and volunteers to provide environmental education. Related plans are as follows:

Course theme	History of industrial development and environmental protection in Taiwan	Air quality and pollution prevention	Water resource utilization and water conservation	Effluent management and friendly to the marine environment
Course name	History of petrochemistry	Development of petrochemistry	Beautiful Mailiao	No leakage
Course content and location	Environmental education classroom course (60 minutes) <ul style="list-style-type: none"> 📍 History of industrial development in Taiwan 📍 History of environmental protection in Taiwan 📍 Mailiao Industrial Park's reflection and efforts in environmental protection and social responsibility 	Environmental education classroom course (80 minutes) <ul style="list-style-type: none"> 📍 Air pollution issues faced by Mailiao Industrial Park 📍 Introduction to air pollution and its source 📍 Air pollution improvement in Mailiao Industrial Park 	Environmental education classroom course (80 minutes) <ul style="list-style-type: none"> 📍 The importance of water resources and water conservation methods 📍 Zhuoshui River water resource allocation issues 📍 History of ground water development and reason for overpumping 	Environmental education classroom course (60 minutes) <ul style="list-style-type: none"> 📍 Advantages and disadvantages of sea reclamation 📍 Introduction to marine environmental quality standards 📍 Wastewater treatment and recycling
		Field study (40 minutes) <ul style="list-style-type: none"> 📍 Experience how the environmental monitoring center monitors air quality and tracks pollution 📍 Experience the relationship between biological indicators and air quality in Ama Park 	Field study (40 minutes) <ul style="list-style-type: none"> 📍 Experience the No. 6 Naphtha Cracker Tailing Pond 📍 Water cleansing principles and practices 	Field study (60 minutes) <ul style="list-style-type: none"> 📍 Introduction to ecological laboratory 📍 Mailiao Port experience and water quality testing
Subjects and time	<ul style="list-style-type: none"> 🕒 60 minutes 👤 Adult 👥 20-35 people 	<ul style="list-style-type: none"> 🕒 120 minutes 👤 Adult 👥 20-35 people 	<ul style="list-style-type: none"> 🕒 120 minutes 👤 Adult 👥 20-35 people 	<ul style="list-style-type: none"> 🕒 120 minutes 👤 Adult 👥 20-35 people

4.4 Local ecological conservation

Onshore Ecological Impact Assessment



In order to understand the impacts Mailiao Industrial Park has caused on fauna and flora in the surrounding areas, we commissioned professional institutions to investigate the ecologies of animals, birds, mammals, amphibians, reptiles, butterflies, and plants by analyzing the changes in the species composition, population dynamics, and quantity, among others, in order to understand the current fauna and flora status in these areas and evaluate the impacts on the local environment following commissioning of the Sixth Naphtha Cracker. Survey results over the years show that the number of plant species remained stable, animals are mainly affected by the four seasons and fluctuate stably with each season, and are not significantly affected by Mailiao Industrial Park.

Ecological Survey at Sea



Marine Ecology Impacts Evaluation and Consultation Committee

We established the Evaluation and Consultation Committee on Impacts of Water Discharge from Mailiao Industrial Park of Formosa Plastics Group on Marine Ecology in 2010. The committee convenes a meeting every six months, and invites domestic and foreign scholars to jointly conduct reviews, assisting us in using argumentation to clarify the impact of effluents from Mailiao Industrial Park on nearby sea areas.

Based on the survey results as of 2018, no noticeable impacts on the marine water quality, ecology, aquaculture period, fishery resources, and beach nourishment and slinging had been found. The surveys and analyses will continue, and response measures will be formulated if there is an impact, so as to ensure the sustainability and stability of the quality of local residents' living environment and the marine ecological environment.

EcoPorts–Mailiao Port

Our vision for Mailiao Port is to internalize sustainability concepts into the industry's operations, and create a paradigm for sustainable development. Mailiao Port will continue to work towards developing green operations, implement green port control measures, implement its environmental policy to fulfill its CSR, and lead by example in autonomous management.

Mailiao Port began implementing a plan to apply for the EcoPorts Certification of the European Sea Ports Organization in October 2016, in hopes changing the trend of port facilities and activities causing the environment to deteriorate. After years of efforts, Mailiao Port passed the EcoPorts Certification and obtained the certificate on September 7, 2018.



Mailiao Port–Intertidal Zone and Land Ecology

- **Birds:** Photography of migrant birds in areas around Mailiao Port is listed in the Mailiao Port Marine Ecology and Environment Photography Project. Based on records of bird distribution over the years, there is a total of 69 bird species.
- **Beef wood windbreak forest:** Mailiao Port has the largest beef wood forestation land in Taiwan.
- **Intertidal zone:** Mailiao Township is by the sea and has an intertidal zone that covers about 47 km². The continental shelf is flat and has an abundance of marine organisms, such as fiddler crabs and soldier crabs are everywhere to be seen. There are also many resident birds and migrant birds, which represent the good condition of the marine ecological environment around Mailiao Port.

Mailiao Port–Marine Ecology

Mailiao Port has a rich underwater ecology, and species documented include Annelida, Cnidaria, Mollusca, Arthropoda, Echinodermata, and Chordata; there are 6 phylums, 72 families, and 148 species in total. The cumulative number of species has increased along with the higher frequency of surveys.

Scientific name: *Spondylus* sp.

Common name: Spiny oysters



Scientific name: *Pandion haliaetus*

Common name: Western osprey



Scientific name:

Chlidonias hybrida

Common name:

Whiskered tern

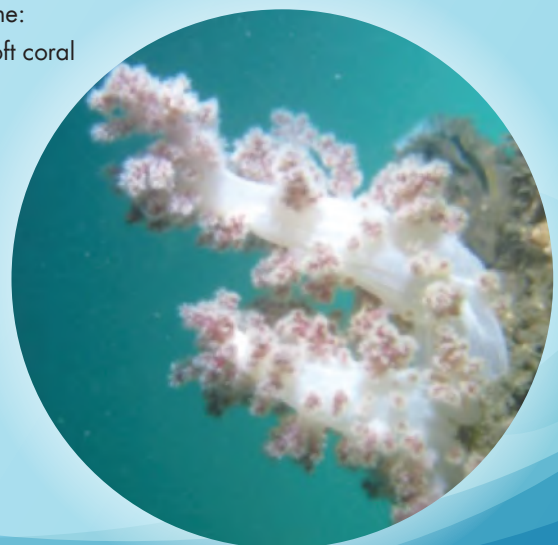


Scientific name:

Nephtea chabrolii

Common name:

Indonesian soft coral



4.5 Policy of Giving Back to Society

FPCC Societal Care

Give back to the locality and combine local characteristics:

We co-organized the Taiwan Balloon Festival gas station event in Taitung together with Wu-Tau and the tea brand "Yuan Cui" for the first time in 2018. We visited Kids Alive International in Taitung County with Mr. Li Chao-Chen, founder of Jyi Shing Enterprises Co., Ltd. (Wu-Tau), to help underprivileged children.

Formosa Oil gas stations made a donation to Kids Alive International.

Besides Chishang lunch boxes, Yuan Cui tea, and rice, we also donated Formosa 95+ toy trucks to the children.



FPCC makes donations when you fill up your tank:

We began implementing the gas station remodeling project in 2017, and expanded the project to Tainan in 2018. On the day the FPG gas station at Rende interchange was opened, we donated NT\$200 for every kL of gas sold that day to the north and south Tainan offices of the Taiwan Fund for Children and Families, helping over 5,000 underprivileged children.

Participation in Local Events and Giving Back to Communities

To care for local residents of Mailiao, FPCC employees volunteered in care activities in 7 nearby townships (Mailiao Township, Taixi Township, Lunbei Township, Dongshi Township, Baozhong Township, Sihu Township, and Dacheng Township); a total of 150 employees volunteered. Local charity events we participated in and subsidized in 2018 are as follows:

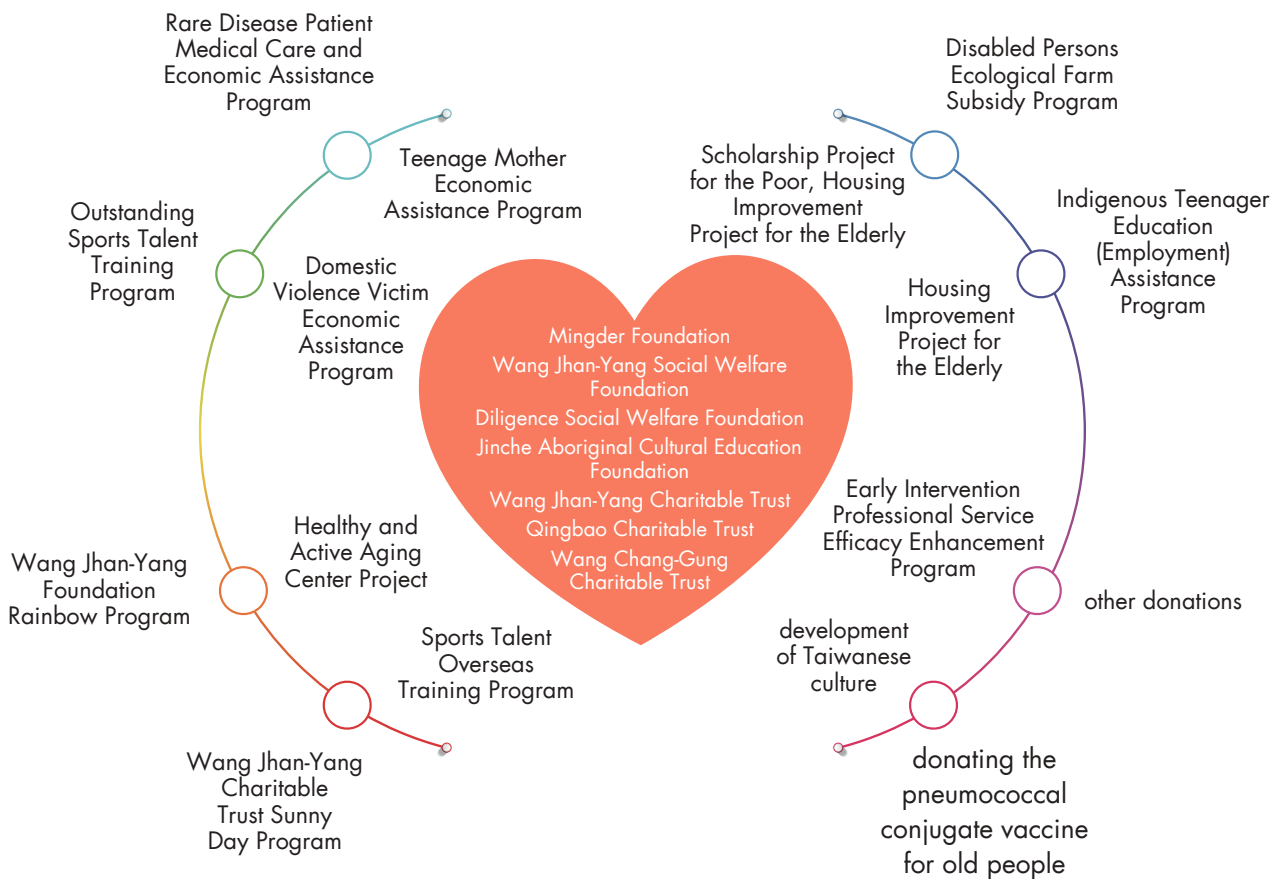
- (1) Subsidies for breakfast of underprivileged families in seven nearby townships: Subsidies totaled NT\$41.5 million and benefited 12,619 people in 2011-2018; we also funded Mailiao Township residents in building 22 canteens for the elderly.
- (2) Scholarships for employees' children: Subsidies totaled NT\$45.97 million and benefited 14,440 people in 2004-2018.
- (3) Emergency aid: We provided a total of NT\$30.91 million in 611 cases in 2012-2018.
- (4) Gifts to low income households during the three holidays: Subsidies totaled NT\$85.97 million and benefited 26,116 people in 2011-2018

- (5) Culture and Art Performances: A total of 334 performances with over 330,000 viewers were held in 2011-2018, and the cumulative amount of sponsorship reached NT\$90 million.
- (6) Friendly neighbor funds distributed each year (township office): In 2018, we subsidized the National Health Insurance premiums and electricity bills (NT\$309,330,000 in total) of 43,793 residents.
- (7) Caring for the health of local residents (township office): Provided free health examinations for local residents, and actively notified them to return for follow-up when any abnormal results were found (spent NT\$112,330,000 in 2018).
- (8) Fulfilling social responsibility (county government): To increase the forestation area for air quality improvement, greening, and beautification, we matched government forestation subsidies in the amount of NT\$120,570,000; Improved the safety of roads damaged by heavy trucks.

Joint Effort throughout Formosa Plastics Group

After doing business for more than 60 years, the Formosa Plastics Group understands the different needs of society, and established seven foundations and charitable trusts. In addition, with joint efforts from private professional groups and scholars and experts, individual public interest programs are implemented based on the principles of being "comprehensive, general, and systematic." Over the years, the Group has devoted nearly NT\$57.72 billion in social welfare, such as education, healthcare, and social welfare, and continued to help the needy in society.

Seven Foundations, Charitable Trusts, and Their Implementation Programs



Summary of corporate social care and public interest donations

Unit: 100 million NTD

Year	Category	Public interest involved	Donated value
1960-1980	Education	Organization and continuous donations to Ming Chi University of Technology	279.5
		Organization and continuous donations to Chang Gung University	
		Organization and continuous donations to Chang Gung University of Science and Technology	
1960-1980	Healthcare	Organization of Chang Gung Memorial Hospital	28.4
		♥ Helping poor patients seek medical attention	
1990	Care for the minorities	♥ Helping aboriginal students attend school (get a job) and related sponsorships	24.5
		The founder donated 361 cochlear implants	
		♥ Chang Gung Memorial Hospital followed up by donating 580 cochlear implants. Counting the founder's donation, a total of 941 people benefited.	
		Promoting quality of service provided at welfare institutions for the physically and mentally disabled and other social welfare units	
1990	Care for the environment	Welfare for children, teenagers, and women	13.4
		Donating to Yunlin Second Prison, Taipei Prison, and Kaohsiung Prison for the AIDS inmate Rainbow Program, and donating Yunlin Second Prison and Kaohsiung Prison for the drug crime inmate Sunny Day Program.	
		Recycling and treatment of kitchen leftover	
2000-present	Care for the elderly	Cultivation of organic vegetables	7.2
		Planting trees for forestation	
	Care for the elderly	♥ Building Chang Gung Health and Culture Village	7.2
		Donating 1.16 million doses of the pneumococcal conjugate vaccine worth over NT\$950 million for old people; Benefits for the elderly, including housing improvement for the elderly, meals delivered to elderly people living alone, and healthy and active aging center	
	After-math reconstruction	1. Reconstruction of disaster areas and old and dangerous buildings (76 buildings) 2. Donation for reconstruction after typhoons and earthquakes	48.4
	Cultural promotion	Donations to cultural theaters symbolic of Taiwan	0.9
	Sporting promotion	Promoting sports and developing outstanding sports talent	2.4
	Health Promotion	Devotion to various health promotion research and academic research at the three universities	2.5
	Local contribution	Contributions to areas in the surroundings of individual premises of the Formosa Plastics Group	135.7
	Other	Chang Gung Social Welfare Fund and other donations	11.3
Total			554.2

Note: 1. Items marked "♥" are donations provided with the revenue of Chang Gung Memorial Hospital and hence are not included in total value of donations.

2. This table shows only donations within the region of Taiwan.

Appendices





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Independent Third Party Attestation Statement	141

Corresponding GRI Standards

⊕ Full disclosure ⊖ Partial disclosure 🦋 Sustainability Issue

Item No.	Title	Disclosure status	Corresponding chapter	Remarks
GRI 102: General Disclosures 2016				
Organization Profile				
102-1	Name of organization	⊕	1.1 Corporate Governance	
102-2	Activity, Brand, Products, and Services	⊕	1.2 Sustainable Development Business Model	
102-3	Location of Head Office	⊕	1.1 Corporate Governance	
102-4	Business office	⊕	1.1 Corporate Governance	
102-5	Ownership and legal form	⊕	1.1 Corporate Governance	
102-6	Markets for services	⊕	1.2 Sustainable Development Business Model	
102-7	Organizational scale	⊕	1.2 Sustainable Development Business Model 1.1 Corporate Governance	
102-8	Information on employees and other workers	⊕	4.1 Employee Structure	
102-9	Supply chains	⊕	1.2 Sustainable Development Business Model	
102-10	Material Changes to the Organization and Supply Chain	⊕	1.2 Sustainable Development Business Model	No material changes
102-11	Warning Principles or Guidelines	⊕	1.3 Corporate Risk Management	
102-12	External Initiatives	⊕	2.2 GHG management 4.1 Employee Structure	
102-13	Membership of Associations	⊕	1.1 Corporate Governance	
Strategy				
102-14	Statement from Senior Decision-maker	⊕	Message from the Chairman	
102-15	Key impacts, risks, and opportunities	⊕	Message from the Chairman 1.3 Corporate Risk Management	
Ethics and Integrity				
102-16	Values, principles, standards, and norms of behavior	⊕	1.1 Corporate Governance	
Governance				
102-18	Governance structure	⊕	1.1 Corporate Governance	
Communication with stakeholders				
102-40	Stakeholder Groups	⊕	Stakeholder Engagement	



Item No.	Title	Disclosure status	Corresponding chapter	Remarks
102-41	Collective Bargaining Agreement	+	4.2 Employee Benefits and Care	
102-42	Identification and selection of stakeholders	+	Stakeholder Engagement	
102-43	Guidelines for communication with stakeholders	+	Stakeholder Engagement	
102-44	Key topics and concerns raised	+	Stakeholder Engagement	
Reporting Practice				
102-45	Entities included in the consolidated financial statements	+	Report Overview	
102-46	Defining report content and topic boundaries	+	Stakeholder Engagement	
102-47	List of material topics	+	Stakeholder Engagement	
102-48	Restatements of information	+	Report Overview	
102-49	Changes in reporting	+	Report Overview	
102-50	Reporting period	+	Report Overview	
102-51	Date of most recent report	+	Report Overview	
102-52	Reporting cycle	+	Report Overview	
102-53	Contact point for questions regarding the report	+	Report Overview	
102-54~ 102-56	Claims of reporting in accordance with the GRI Standards, GRI contents index, External assurance	+	Report Overview	
GRI 103: Management approach 2016				
General requirements on reporting the management approach				
103-1	Explain material topics and their boundaries		Report Overview	

⊕ Full disclosure ⊖ Partial disclosure 🦋 Sustainability Issue

Item No.	Title	Disclosure status	Corresponding chapter	Remarks
GRI 200: Topic-specific disclosures – Economic 2016				
🦋 Economic performance				
103-2~ 103-3	Management approach	⊕	1.2 Sustainable Development Business Model	
201-1	Direct economic generated and distributed	⊕	1.2 Sustainable Development Business Model	
201-2	Financial implications and other risks and opportunities due to climate change	⊖	1.3 Corporate Risk Management	
201-3	Defined benefit plan obligations and other retirement plans	⊕	4.2 Employee Benefits and Care	
Market Presence				
202-1	Ratios of standard entry level wage by gender compared to local minimum wage	⊕	4.2 Employee Benefits and Care	
202-2	Proportion of senior management hired from the local community	⊕	4.1 Employee Structure	
Indirect Economic Impacts				
203-1	Infrastructure investments and services supported	⊕	1.2 Sustainable Development Business Model	
203-2	Significant indirect economic impacts	⊕	2.1 Environmental Protection Strategies and Policies 4.3 Community development and communication	
Anti-corruption				
205-1	Operations assessed for risks related to corruption	⊕	1.1 Corporate Governance	
205-2	Communication and training on anti-corruption policies and procedures	⊕	1.1 Corporate Governance	
205-3	Confirmed incidents of corruption and actions taken	⊕	1.1 Corporate Governance	There were no incidents of corruption in 2018
Anti-competitive behavior				
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	⊕		No related situations
GRI 300: Topic-specific disclosures – Environment 2016				
🦋 Energy				
103-2~ 103-3	Management approach	⊕	2.2 GHG management	



Item No.	Title	Disclosure status	Corresponding chapter	Remarks
302-1	Energy consumption within the organization	⊖	2.2 GHG management	
302-3	Energy Intensity	⊕	2.2 GHG management	
302-4	Reduction of energy consumption	⊖	2.2 GHG management	
302-5	Reductions in energy requirements of products and services	⊕	2.2 GHG management	
 Water				
103-2~ 103-3	Management approach	⊕	2.4 Water Resources, Wastewater, and Waste Management	
303-1	Water withdrawal by source	⊕	2.4 Water Resources, Wastewater, and Waste Management	
303-2	Water sources significantly affected by withdrawal of water	⊕	2.4 Water Resources, Wastewater, and Waste Management	
303-3	Water recycling and reuse	⊕	2.4 Water Resources, Wastewater, and Waste Management	
Biodiversity				
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	⊕	4.4 Local ecological conservation	
304-2	Significant impacts of activities, products, and services on biodiversity	⊕	4.4 Local ecological conservation	
304-3	Habitats protected or restored	⊕	4.4 Local ecological conservation	
 Emissions				
103-2~ 103-3	Management approach	⊕	2.2 GHG management	
305-1	Direct (Scope 1) GHG emissions	⊕	2.2 GHG management	
305-2	Energy indirect (Scope 2) GHG emissions	⊕	2.2 GHG management	
305-4	GHG emissions intensity	⊕	2.2 GHG management	
305-5	Reduction in greenhouse gas emissions	⊕	2.2 GHG management	
305-6	Emissions of ozone-depleting substances (ODS)	⊕	2.3 Air pollution prevention	
305-7	NO _x , SO _x , and other significant air emissions	⊕	2.3 Air pollution prevention	
 Effluents and waste				
103-2~ 103-3	Management approach	⊕	2.4 Water Resources, Wastewater, and Waste Management	

Item No.	Title	Disclosure status	Corresponding chapter	Remarks
306-1	Water discharge by quality and destination	+	2.4 Water Resources, Wastewater, and Waste Management	
306-2	Waste by type and disposal method	+	2.4 Water Resources, Wastewater, and Waste Management	
306-3	Significant spills	+	2.1 Environmental Protection Strategies and Policies	
306-4	Transport of hazardous waste	+	2.4 Water Resources, Wastewater, and Waste Management	
306-5	Water bodies affected by water discharges and/or runoff	+	2.4 Water Resources, Wastewater, and Waste Management 4.4 Local ecological conservation	
Environmental Compliance				
307-1	Non-compliance with environmental laws and regulations	+	2.1 Environmental Protection Strategies and Policies	
Supplier environmental assessment				
308-1	New suppliers that were screened using environmental criteria	+	1.4 Customer and Supply Chain Relationship Management	Suppliers must 100% comply with the Company's suppliers and contractors management policy
308-2	Negative environmental impacts in the supply chain and actions taken	-	1.4 Customer and Supply Chain Relationship Management	
GRI 400: Topic-specific disclosures – Social 2016				
🦋 Labor relations				
103-2~ 103-3	Management approach	+	4.1 Employee Structure	
401-1	New employee hires and employee turnover	+	4.1 Employee Structure	
401-2	Minimum notice periods regarding operational changes	+	4.2 Employee Benefits and Care	
401-3	Parental leave	-	4.1 Employee Structure	
Labor/Management Relations				
402-1	Minimum notice periods regarding operational changes	+	4.2 Employee Benefits and Care	
🦋 Occupational health and safety				
103-2~ 103-3	Management approach	+	3.2 Labor safety risk management 3.4 Occupational health management 4.2 Employee Benefits and Care	



Item No.	Title	Disclosure status	Corresponding chapter	Remarks
403-1	Labor representatives in the formal Safety and Health Committee jointly formed by labor and management	+	4.2 Employee Benefits and Care	
403-2	Types of injury, injuries, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	+	3.1 Creating a Labor Safety Culture	
403-3	Workers with high incidence or high risk of occupational diseases	+	3.4 Occupational health management 4.2 Employee Benefits and Care	
🦋 Training and education				
103-2~ 103-3	Management approach	+	4.1 Employee Structure	
404-1	Average hours of training per year per employee	+	4.1 Employee Structure	
404-2	Employee competency enhancement and assistance programs	-	4.1 Employee Structure	
404-3	Percentage of employees receiving regular performance and professional development reviews	-	4.1 Employee Structure	
Diversity and Equal Opportunity				
405-1	Diversity of governance units and employees	+	4.1 Employee Structure	
405-2	Ratio of basic salary and remuneration of women to men	-	4.1 Employee Structure 4.2 Employee Benefits and Care	
Non-discrimination				
406-1	Incidents of discrimination and corrective actions taken	+	4.1 Employee Structure	
Freedom of association and collective bargaining				
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	+	4.2 Employee Benefits and Care	
Child labor				
408-1	Operations and suppliers at significant risk for incidents of child labor	+	1.4 Customer and Supply Chain Relationship Management	
Forced or Compulsory Labor				
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	+	1.4 Customer and Supply Chain Relationship Management	

Item No.	Title	Disclosure status	Corresponding chapter	Remarks
Security Practices				
410-1	Security personnel trained in human rights policies or procedures	+	4.1 Employee Structure	
Rights of indigenous people				
411-1	Incidents of violations involving rights of indigenous peoples	+	4.1 Employee Structure	There were no disputes in 2018
Human rights assessment				
412-1	Operations that have been subject to human rights reviews or impact assessments	+	4.1 Employee Structure	
412-2	Employee training on human rights policies or procedures	-	4.1 Employee Structure	
412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	+		FPCC did not sign any major investment agreements or contracts in 2018
Local Communities				
103-2~ 103-3	Management approach	+	2.3 Air pollution prevention 4.3 Community development and communication	
413-1	Operations with local community engagement, impact assessments, and development programs	+	2.3 Air pollution prevention 4.3 Community development and communication	
413-2	Operations with significant actual and potential negative impacts on local communities	+	2.3 Air pollution prevention 4.3 Community development and communication	
Supplier Social Assessment				
414-1	New suppliers that were screened using social criteria	+	1.4 Customer and Supply Chain Relationship Management	Suppliers must 100% comply with the Company's suppliers and contractors management policy
414-2	Negative social impacts in the supply chain and actions taken	-	1.4 Customer and Supply Chain Relationship Management	
Public Policy				
415-1	Political contributions	+	1.1 Corporate Governance	
Customer Health and Safety				
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	+	1.2 Sustainable Development Business Model	None



Item No.	Title	Disclosure status	Corresponding chapter	Remarks
Marketing and Labeling				
417-1	Requirements for product and service information and labeling	+	1.4 Customer and Supply Chain Relationship Management	
417-2	Incidents of non-compliance concerning product and service information and labeling	+		No incidents
417-3	Incidents of non-compliance concerning marketing communications	+		There were no violations in 2018
Customer Privacy				
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	+	1.4 Customer and Supply Chain Relationship Management	
Socioeconomic Compliance				
419-1	Non-compliance with laws and regulations in the social and economic area	+		There were no violations in 2018
Category: Supplementary indicators for the oil-gas industry				
Indirect Economic Impacts				
GRI-OG1	Type and value of validated storage and production estimates	+		FPCC mainly operates its business in Taiwan and is not involved in oil drilling. Hence, this indicator is not applicable
Energy				
GRI-OG2	Renewable energy investment amount	+	2.1 Environmental Protection Strategies and Policies	
GRI-OG3	Total amount of renewable energy generated by green energy materials	+	2.1 Environmental Protection Strategies and Policies	
Biodiversity				
GRI-OG4	Number and ratio of biodiversity risk assessment and monitoring locations	+	4.4 Local ecological conservation	
Effluents and waste				
GRI-OG5	The volume of oil contaminated water and oil produced water and its management	+	2.3 Air pollution prevention	
GRI-OG6	Burning and fugitive hydrocarbon discharged	+	2.1 Environmental Protection Strategies and Policies 2.2 GHG management	

Item No.	Title	Disclosure status	Corresponding chapter	Remarks
GRI-OG7	Volume of drilling muds and handling policy	+		FPCC is not involved in oil drilling in Taiwan
Products and services				
GRI-OG8	Benzene, lead, sulfur in fuels	+	2.1 Environmental Protection Strategies and Policies 2.2 GHG management	
Rights of indigenous people				
GRI-OG9	Whether if there are corresponding measures for operations that affect indigenous people	+		FPCC operations did not affect indigenous peoples in 2018
Local Communities				
GRI-OG10	Quantity and description of valid disputes with local communities and residents	+	2.3 Air pollution prevention 4.3 Community development and communication	FPCC mainly operates its business in Taiwan and is not involved in oil drilling, but discloses incidents related to operations in Taiwan
GRI-OG11	Number of mines decommissioned and currently being decommissioned	+		FPCC is not involved in mining in Taiwan
Involuntary relocation				
GRI-OG12	Involuntary relocation, number of households relocated, and the impact on their lives	+	4.3 Community development and communication	FPCC did not cause any involuntary relocation in 2018
Process Safety				
GRI-OG13	Number and type of process safety events having occurred in operational activities	+	3.2 Labor safety risk management	FPCC mainly operates its business in Taiwan and is not involved in oil drilling, but discloses incidents related to operations in Taiwan
Fossil Fuel Alternatives				
GRI-OG14	Biomass energy that complies with sustainable development standards and amount purchased	+	2.1 Environmental Protection Strategies and Policies	



Independent Third Party Attestation Statement

INDEPENDENT ASSURANCE OPINION STATEMENT

Formosa Petrochemical Corporation 2018 Corporate Social Responsibility Report

The British Standards Institution is independent to Formosa Petrochemical Corporation (hereafter referred to as FPCC in this statement) and has no financial interest in the operation of FPCC other than for the assessment and verification of the sustainability statements contained in this report.

This independent assurance opinion statement has been prepared for the stakeholders of FPCC only for the purposes of assuring its statements relating to its corporate social responsibility (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 FPCC. 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 FPCC only.

Scope

The scope of engagement agreed upon with FPCC includes the followings:

1. The assurance scope is consistent with the description of Formosa Petrochemical Corporation 2018 Corporate Social Responsibility Report.
2. The evaluation of the nature and extent of the FPCC's adherence to AA1000 AccountAbility Principles (2018) in this report as conducted in accordance with type 1 of AA1000 Assurance Standard (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 the FPCC 2018 Corporate Social Responsibility Report provides a fair view of the FPCC 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 FPCC and the sample taken. We believe that the 2018 economic, social and environmental performance information are fairly represented. The CSR performance information disclosed in the report demonstrate FPCC's efforts recognized by its stakeholders.

Our work was carried out by a team of CSR report assurers in accordance with the AA1000AS (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 FPCC's description of their approach to AA1000AS (2008) with 2018 Addendum and their self-declaration in accordance with GRI Standards: Core option were fairly stated.

Methodology

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

- a review of issues raised by external parties that could be relevant to FPCC'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.
- 5 interviews with 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 AA1000AP (2018).

Conclusions

A detailed review against the Inclusivity, Materiality, Responsiveness and Impact of AA1000AP (2018) and GRI Standards is set out below:

Inclusivity

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

Materiality

FPCC has established relative procedure in organization level, as the issues which were identified by all departments have been prioritized according to the extent of impact and applicable criterion for sustainable development of organization. Therefore, material issues were completely analyzed and the relative information of sustainable development was disclosed to enable its stakeholders to make informed judgments about the organization's management and performance. In our professional opinion the report covers the FPCC's material issues.

Responsiveness

FPCC has implemented the practice to respond to the expectations and perceptions of its stakeholders. An Ethical Policy for FPCC is developed and continually provides the opportunity to further enhance FPCC's responsiveness to stakeholder concerns. Topics that stakeholder concern about have been responded timely. In our professional opinion the report covers the FPCC's responsiveness issues. However, the future report should be further enhanced by the following areas:

- Encouraging to work towards a type 2 of AA1000AS (2008) with 2018 Addendum engagement with a view to providing the reliability of sustainability performance information that stakeholder concerns.

Impact

FPCC has identified and fairly represented impacts that were measured and disclosed in probably balanced and effective way. FPCC has established processes to monitor, measure, evaluate and manage impacts that lead to more effective decision-making and results-based management within the organization. In our professional opinion the report covers the FPCC's impact issues. However, the future report should be further enhanced by the following areas:

- Encouraging to consider international peers' practices to develop the relevant CSR strategies of the bank.

GRI Sustainability Reporting Standards (GRI Standards)

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

Assurance level

The moderate level assurance provided is in accordance with AA1000AS (2008) with 2018 Addendum in our review, as defined by the scope and methodology described in this statement.

Responsibility

The CSR report is the responsibility of the FPCC'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 sectors, and trained in a range of sustainability, environmental and social standards including AA1000AS, ISO 14001, ISO 45001, ISO 14064 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:



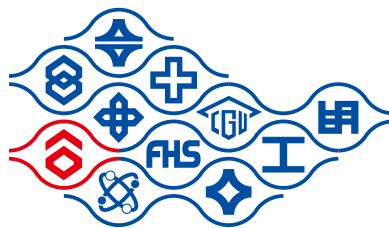
Peter Pu
Managing Director BSI Taiwan
2019-04-12



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

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Formosa Petrochemical Corporation

Address : No. 201, Dunhua N. Rd., Songshan Dist., Taipei City 105, Taiwan (R.O.C.)

Tel : 886-2-27122211

Email : csr01@fpcc.com.tw

www.fpcc.com.tw