



Chang Chun Group

2018



Corporate
Social
Responsibility

Contents



About This Report	2
Retrospect and Outlook of Sustainability Strategies	3
Key CSR Performance of CCPG in 2018	4

1 A Diligent, Pragmatic, and Integrity-Oriented Enterprise

1.1 About CCPG	8
1.1.1 Current State of Group Operations	8
1.1.2 Product Introduction and Location of Operation	9
1.1.3 Operating Performance	12
1.2 Corporate Governance and Sustainability	13
1.2.1 Corporate Governance	14
1.2.2 Risk Management	14
1.2.3 Sustainable Strategy	17
1.3 Stakeholder Communications	28

2 A Trusted Material Supplier

2.1 Kinetic Energy of CCPG Products	38
2.1.1 Green Processes and Products	38
2.1.2 Chemical Management	42
2.1.3 Product Quality Management	45
2.1.4 Customer Communications and Services	47
2.2 Responsible Chemistry	49
2.2.1 Workplace Safety	49
2.2.2 Process Safety	55
2.2.3 Response and Management of Major Incidents	56
2.3 Sustainable Supplier Management	61
2.3.1 Procurement Business Ethics and Respect of Human Rights	62
2.3.2 Supplier Management System	63
2.3.3 Legal Compliance and Local Care	66
2.3.4 Green Procurement and Circular Economy	66

3 A Sustainable Producer that Prospers with the Environment

3.1 Environmental Management Policy	70
3.2 Response to Climate Change	71
3.2.1 Energy Conservation and Carbon Reduction Action	72
3.2.2 Greenhouse Gas (GHG) Emissions Management	75
3.2.3 Climate Change Adaptation	76
3.3 Water Cycle and Management	78
3.3.1 Water Management	78
3.3.2 Wastewater Management	80
3.4 Emissions Management	81
3.4.1 Air Pollutant Emissions Management	81
3.4.2 Waste Management	83

4 An Enterprise that Creates a Friendly Workplace

4.1 CCPG Talents	86
4.1.1 Human Resource Policy	86
4.1.2 Talent Composition	87
4.2 Talent Cultivation and Development	91
4.3 Employee Care and Benefits	94
4.3.1 Employee Benefits	94
4.3.2 Healthy Workplace	97

5 A Creator of Value for All

5.1 Education	102
5.2 Local Engagement	103
5.3 Environmental Conservation	104
5.4 Caring for Disadvantaged Groups	106

GRI Standards Indicator Reference Table	108
Appendices	113



About This Report

This Report is an extension of CCPG's commitment to sustainable development in 2017. CCPG aims to be "a diligent, pragmatic, and integrity-oriented enterprise", "a trustworthy material supplier", "a sustainable producer that prospers with the environment", and "an action taker in creating a friendly workplace". The contents of social engagement are detailed in an independent chapter titled "a creator of value for all" in 2018 to express CCPG's active creation of social value and mutual prosperity with society.

CCPG discloses its implementation of corporate social responsibilities in 2018 in this Report to domestic and foreign stakeholders as we join hands in creating a sustainable future.

Report Scope and Boundary

CCPG established the Executive Board in 2014, with the collective Group name CCPG created by the merging of Chang Chun Plastics Co., Ltd. (CCP), Chang Chun Petrochemical Co., Ltd. (CCPC), and Dalian Chemical Industry Co., Ltd. (DCC). The scope and boundary of this Report include CCPG's Taipei Head Office, all Taiwan-based factories, and six CCPG foreign production factories. Please refer to 1.1.1 Company Profile for detailed information.

Reporting Period and Issuance Date

CCPG shall regularly publish its Corporate Social Responsibility Report for the previous year each year. The previous report was published in December 2018 and the current "Chang Chun Group 2018 Corporate Social Responsibility Report" is published in June 2019, covering the disclosure period of January 1, 2017 to December 31, 2017. To demonstrate trends in changes each year, certain information in this Report includes statistics in the past 3 years (since 2016). The scope of disclosure of other statistics and information that differ from the aforementioned scope shall be specified in the chapters.

Report Compilation and Audit

This Report is compiled with information provided by CCPG's CSR Executive Secretariat, four CSR task forces, all departments under the Taipei Executive Board, all Taiwan-based factories, and six foreign factories. To ensure that the report is accurate and meets stakeholders' expectations, all content was approved by CCPG's CSR Committee before its official release.

Report Compliance Standards

The contents and structure of the report are based on the GRI Standards published by the Global Reporting Initiative (GRI) in 2016. The information disclosure of relevant content indexes is carried out based on the following Core Options, fully illustrating CCPG's material issue management policies and implementation performance in Economic, Environmental, and Social Issues.

Contact

Feel free to contact us if you have any questions regarding the contents of the Report.

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Chapter 1
A Diligent,
Pragmatic, and
Integrity-Oriented
Enterprise

Chapter 2
A Trusted Material
Supplier

Chapter 3
A Sustainable
Producer that
Prospers with the
Environment

Chapter 4
An Enterprise that
Creates a Friendly
Workplace

Chapter 5
A Creator of
Value for All



Retrospect and Outlook of Sustainability Strategies

CCPG has always upheld a sustainable strategy based on its core business. We integrate product R&D and customer services to improve our market share and competitiveness. The chemical industry has been affected by international political and economic affairs in recent years. CCPG upholds its business philosophy and remains fully committed to improving production efficiency and achieving the best performance. In addition, we actively respond to the risks brought forth by climate change and turn risks into opportunities. Faced with numerous difficulties and challenges, we continue to implement transformation and upgrade and we also work hard to expand into new markets in ASEAN, India, Europe, United States, and Central and South America to disperse market risks and improve overall profitability.

Advancement of the Framework for Sustainable Development

We continue to use the Corporate Social Responsibility Committee to strengthen environmental, social and corporate governance (ESG). We aim to integrate all resources in the most effective manner to advance sustainable development. This year, we followed the United Nations Sustainable Development Goals and continuously reviewed the targets we have set for the future. The Group shall advance its ISO quality, environment, safety and health management systems in accordance with CSR goals to seamlessly integrate CCPG's CSR policies with regular operations.

Talent Cultivation for Long-Term Local Development

CCPG's talent cultivation strategy focuses on the establishment of the Group's systems, abundant training resources, competitive salaries, and cultural restraint. We established the Chang Chun e-Learning online platform to consolidate all training records and courses and encourage managers to attend management training in order to improve the competencies of core leaders. Based on the characteristics of the industry, we seek process safety and focus on employees' physical and mental health so that each CCPG employee internalize safety requirements in their daily life and at work. We also established a systematic occupational health management structure and established the "CCPG good mood hotline" psychological counseling hotline. As a result of our hard work, the average turnover rate for domestic employees of the Group in the past three years has been below 3%.

Innovative Products and Green Procedures

CCPG Group seeks to become a high-value supplier in the green industry. We fully support innovation, R&D, and technology independence. The Group obtained a total of 830 patents this year and we have invested more than NT\$373 million in scientific research each year. CCPG developed the world's only process carbon capture technology which recycled 98,000 tons of carbon dioxide in 2018. In terms of renewable energy investments, the solar power generation equipment in CCPC Miaoli Factory generated 2 million kWh of electricity in 2018 after it was inaugurated. It effectively reduces CO2 emissions from power generation.

Environmental Protection and Safety First

It is the duty and obligation of the leader and all employees of the Group to build and maintain a healthy, safe, and environmentally-friendly workplace. To reduce the impact of air pollution on the environment, we invested funds and technologies to remove pollution or odors produced in the factories and set up the monitoring equipment in factories to demonstrate the Group's hard work and resolve for improving the environment. We have integrated resources of the industry, government, academia, and private sectors more effectively in recent years as we actively established a response system for the entire Group. We have actively organized drills and training based on hazard assessment and simulations from our factories to external environments and from process to public pipelines of petrochemicals. We aim to effectively reduce the impact of material incidents when they occur.

Connect Value to Create Sustainability

CCPG aims to use its procurement power to influence and strengthen suppliers' CSR awareness. CCPG also continues to use the signing of the Code of Conduct, local special procurement cases, and implementation of the packaging materials recycling policies to encourage multiple suppliers to provide support and actively implement improvement measures. The effectiveness of CSR operations began to take hold and improve through continuous communication between CCPG and suppliers. We hope to generate positive effects on the society and environment. We began the sustainable supplier corporate social responsibility assessment this year and we shall start from the main materials suppliers. Through increasingly intensive understanding and communication, we aim to establish a more comprehensive supplier management system and achieve closer integration in the procurement strategy.

CCPG Executive Board Chairman

Chairman

Key CSR Performance of CCPG in 2018

About This Report

Retrospect and Outlook of Sustainability Strategies

Key CSR Performance of CCPG in 2018

Chapter 1
A Diligent, Pragmatic, and Integrity-Oriented Enterprise

Chapter 2
A Trusted Material Supplier

Chapter 3
A Sustainable Producer that Prospers with the Environment

Chapter 4
An Enterprise that Creates a Friendly Workplace

Chapter 5
A Creator of Value for All



Anti-corruption training

98%

The completion rate in 2017

100%

The completion rate for new employees in 2018

100%

The Group policy communication rate

CSR training programs

14 CSR training programs

Organized 14 CSR training programs for 487 employees who directly/indirectly process CSR affairs.

5,714 employees

Organized online CSR awareness courses and completed training for 5,714 employees.

Won EcoVadis silver medal

CCP, CCPC, and DCC were ranked among the top 30% among more than 40,000 global companies whose environmental, social, and corporate governance performances were assessed by EcoVadis, earning silver medals for the companies.

Governance

Products

Supply Chain

Environment

Society

more than 2,000 copies of SDS

250 GHS labels

CCPG provided more than 2,000 copies of safety data sheets (SDS) 250 GHS labels to domestic and foreign customers in the official languages of the customer's region for customers to clearly understand product information.

15 audits of ISO management system

We completed 15 cross-border mutual quality/environment/safety and health audits and 29 supplier audits to improve the ISO Management System.

Supplier Declaration of Conflict-Free Minerals promotion

100%

Obtained signatures from all suppliers for contracts and transactions in Taiwan.

100%

Obtained signatures from all suppliers in foreign regions.

70%

More than 70% of procurement in the projects were from local suppliers.

830 patents

CCPG owns a total of 830 patents, an increase of 59 patents from 2017.

Recycled 98,191 tons of CO₂

CCPG adopted a unique acetic acid process and recycled 98,191 tons of CO₂ as raw materials.

Client satisfaction reached above 4.47 points

In 2018, the customer satisfaction surveys results (based on a full score of 5 points) were 4.57 points for CCP, 4.47 points for CCPC, and 4.6 points for DCC.

Supplier Code of Conduct promotion

100%

Obtained signatures from all suppliers for contracts and transactions in Taiwan.

100%

Obtained signatures from all suppliers in foreign regions.

100%

All new procurement personnel received CSR training.

More than 50%

Planned the supplier corporate social responsibility assessment mechanisms and completed the survey on the disclosure status of the CSR policy of main materials suppliers. Obtained voluntarily disclosed information on CSR policies from more than 50% domestic and foreign suppliers.

Contractors fully conducted safety and health training

CCPG provides labor safety and health education courses for all contractor workers that enter a CCPG factory for construction.

Full implementation of green accounting

CCPG adopted green accounting

Toxic chemical substances certification management platform

Established a toxic chemical substances certification management platform to manage the legality of imports and exports of toxic substances.

Invested nearly NT\$120 million in the maintenance of underground pipelines

CCPG invested nearly NT\$120 million in the maintenance and management of underground pipelines in 2018.

Invested NT\$2.55 billion in environmental protection

Invested NT\$2.55 billion in environmental protection in 2018 and focused on pollution prevention and waste disposal.

Solar power generation equipment

Invested NT\$120 million We invested NT\$120 million in renewable energy equipment in 2018 and installed rooftop solar PV panels over an area of approximately 5,000 pings in CCPC Miaoli Factory.

2 million kWh of electricity

The system generates approximately 2 million kWh of electricity each year.

Ranked 1st place nationwide

The CCPG Formaldehyde Allied Defense Organization was awarded the first place in the 2018 National Toxic Chemical Disaster Allied Defense Organization evaluation.

ISO 50001

As of 2018, CCPC Miaoli Factory, CCP Dafa Factory, and CCP Kaohsiung Factory have obtained ISO 50001 certification. The Group plans to obtain certification for all factories in 2020.

Industrial-academic cooperation for safety and health

We invest more than NT\$10 million in safety each year and invest more than NT\$4 million in health each year.

Reduced 1,396 tons of NO_x

We reduced nitrogen oxides (NO_x) by 1,396 tons from 2017.

Reduced 398 tons of SO_x

We reduced sulfur oxides (SO_x) by 398 tons from 2017.

Reduced 78 tons of TSP

We reduced total suspended particles (TSP) by 78 tons from 2017.

Reduced 39 tons of VOCs

We reduced volatile organic compounds (VOCs) by 39 tons from 2017.

Received the Health and Care Award

CCPC Dafa Factory received the Health and Care Award in 2018 and used the Healthy Workplace Certification to improve the quality of the workplace and protection of employees' health.

Set CCPG goal of reducing 3% on water, electricity, and gas consumption per unit

CCPG established the energy conservation and carbon reduction implementation unit in 2018 and established a goal for the Group of reducing unit energy consumption by 3% each year.

100% reinstatement rate after parental leave

CCPG employees have a 100% reinstatement rate after parental leave.

285 social welfare activities

CCPG participated in or sponsored a total of 285 domestic and overseas social welfare activities as of 2018.

Training programs

7,500 sessions

In 2018, CCPG organized more than 7,500 sessions of training programs and employee training hours totaled 380,645 hours with an average of 44.6 hours per employee.

the "Reef Garden" project

CCSG sponsored approximately NT\$450,000 to the artificial reef project/global and national climate action and worked with the National Parks Board (NParks) in the completion of the "Reef Garden" project.

e-Learning System

198 courses

As of 2018, human resources and each unit have uploaded a total of 198 courses on the Chang Chun e-Learning System including various self-produced or online courses provided in collaboration with other units/institutions.

Added 70 online courses

Chang Chun e-Learning System added 70 online courses in 2018.

Human rights training courses

2,803 training hours

From 2017 to 2018, a total of 5,606 employees in factories in Taiwan passed the human rights training courses and tests on the Chang Chun e-Learning System with a total of 2,803 training hours.

1,739 training hours

3,478 employees in overseas factories passed the tests with a total of 1,739 training hours.

Human rights policy seminars

CCPG organized seven human rights policy seminars in 2018 and organized online human rights policy courses.



Chapter 1

A Diligent, Pragmatic, and Integrity-Oriented Enterprise

1.1 About CCPG

1.2 Corporate Governance and Sustainability

1.3 Stakeholder Communications

When the Group's Executive Board was established in 2014, corporate governance, compliance, and risk management were all incorporated into Group-level integrated management. Since 2016, CCPG has further established CSR governance mechanism; to meet its self-expectation as a corporate citizen, environmental, social and supply chain issues have been incorporated into the scope of CCPG's governance. CCPG hopes that all subsidiaries' resources and expertise can be well connected to ensure the Group's sustainable development through systematic and integrated approaches.

1.1 About CCPG

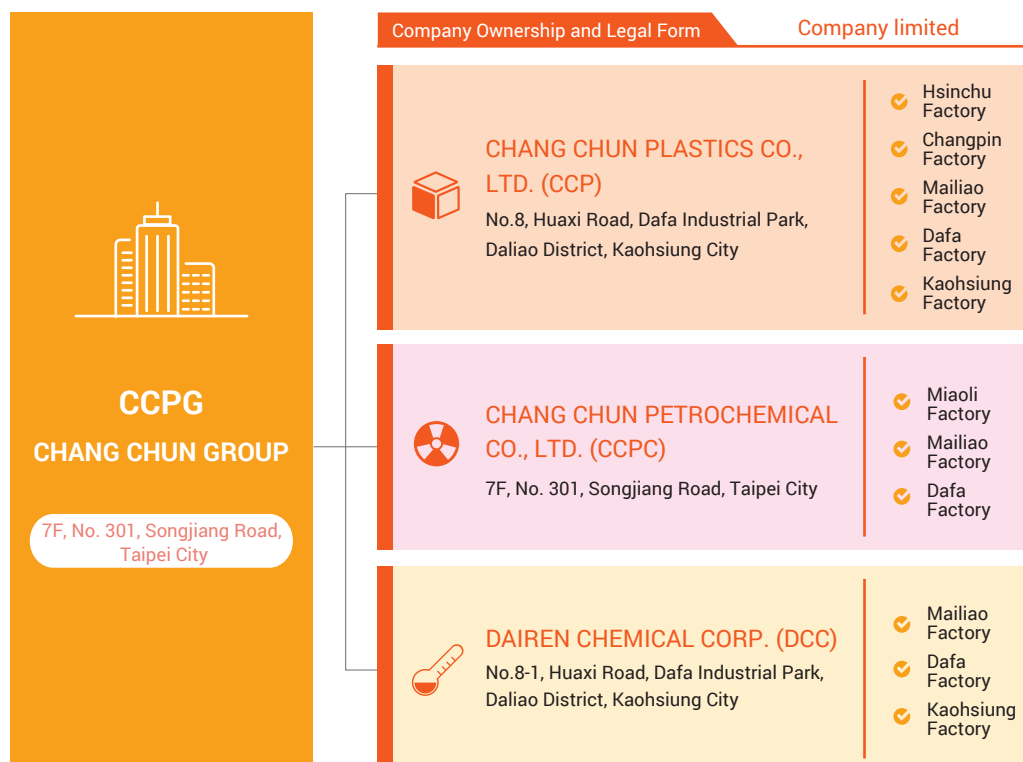
CCPG consists of three companies. With three founders' selfless minds, they work with great efforts day and night, through perfect long-term teamwork, which has not changed after more than six decades.

1.1.1 Current State of Group Operations

In 1949, CCPG's three founders, Mr. Liao Ming-Kun, Mr. Lin Shu-Hong, and Mr. Tseng Shin-Yi, created Chang Chun Plastics Co., Ltd. (CCP) with an initial capital of NT\$500, and sowed the first seed for CCPG.

In 1964, Chang Chun Petrochemical Co., Ltd. (CCPC), was founded. This is CCPG's second core company. CCPC produced methanol using natural gas from Miaoli and was a pioneer in Taiwan's petrochemical industry. In 1979, Dairen Chemical Corp. (DCC), CCPG's third core company, was established to produce vinyl acetate monomers.

CCPG actively expands its international business development and operates four main production sites through three core companies in Mainland China. The companies from north to south include Chang Chun Chemical (Panjin) Co., Ltd., Chang Chun Dairen Chemical (Panjin) Co., Ltd. (established in 2011), Chang Chun Chemical (Jiangsu) Co., Ltd. (established in 2002), Dairen Chemical (Jiangsu) Co., Ltd. (established in 2003), and Chang Chun Chemical (Zhangzhou) Co., Ltd. (established in 2003); it has three main production sites in Southeast Asia including CCD (Singapore) Pte. Ltd., Chang Chun (Singapore) Pte. Ltd. (established in 2010), Dairen Chemical (M) Sdn. Bhd. (established in 1998), and PT. Chang Chun DPN Chemical Industry Co., Ltd. (established in 1992).



Overseas Operations

- Abbreviation
- Finance Merger Entity
- Description

Chang Chun Chemical (Jiangsu) Co., Ltd.

- CCJS
- CCP
- Joint venture of CCP and CCPC

Chang Chun Chemical (Zhangzhou) Co., Ltd.

- CCZZ
- CCP
- CCP's wholly owned subsidiary

Chang Chun (Singapore) Pte. Ltd.

- CCSG
- CCP
- Joint venture of CCP and CCPC

Chang Chun Chemical (Panjin) Co., Ltd.

- CCPJ
- CCPC
- Joint venture of CCP and CCPC

Chang Chun Dairen Chemical (Panjin) Co., Ltd.

- CCDDPJ
- DCC
- Joint venture of CCP, CCPC, and DCC

Dairen Chemical (Jiangsu) Co., Ltd.

- DCCJS
- DCC
- DCC's wholly owned subsidiary

CCD (Singapore) Pte. Ltd.

- CCDSG
- DCC
- Joint venture of CCP, CCPC, and DCC

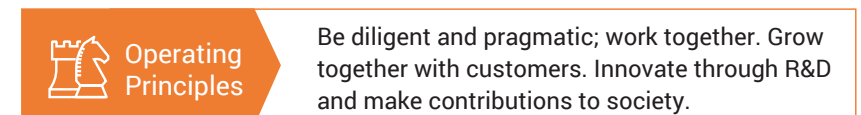
Dairen Chemical (M) Sdn. Bhd.

- DCCM
- DCC
- DCC's wholly owned subsidiary

Note: To display related statistics in the report, the merged entities of each company are specified based on the principles for the compilation of consolidated financial statements.

The Group produces hundreds of products including general chemicals, synthetic resin products, thermosetting plastics, high-performance engineering plastics, electronic materials, and semiconductor chemicals and it makes extensive contributions to industry development and improvements in people's lives.

Business Philosophy



CCPG adheres to the principle of "Environment is the Most Precious Asset for Mankind, and Environmental Protection is our Responsibility", by introducing the world's most advanced technologies and equipment, continuously improving manufacturing processes, promoting industrial waste reduction, implementing pollution prevention, researching and developing various technologies to enhance the effectiveness of pollution treatment. CCPG considers "Environmental Sustainability" one of the Group's primary goals and has taken both environmental protection and social responsibilities as its top priorities as CCPG continues to progress toward sustainable development.

1.1.2 Product Introduction and Location of Operation

CCPG's products occupy very important positions in the upstream and midstream of the petrochemical industry. They can be widely used as raw materials for end products of many industries. The descriptions of all companies' main products and applicable industries are as follows. For main descriptions of each product please refer to "Application" and "Products" on the Group's website.

CCPG Digital Catalog



	Major Products	Major Applications of Products	Major Markets
CCP	Epoxy resins, engineering plastics, bisphenol A, copper clad laminate, phenol	Electronic, coatings, and thermosetting molding materials	Taiwan, Mainland China, Japan, South Korea, Southeast Asia and the United States
CCPC	Copper foil, hydrogen peroxide, electronics-grade chemical products, antioxidants, polyvinyl alcohol	Chemicals, textiles, coatings, resins, semiconductors, medicine, electronics, paper & pulp, plastic	Taiwan, Mainland China, Japan, South Korea, Southeast Asia, United States, Europe, and South Africa
DCC	Vinyl acetate, VAE emulsion, VAE powder, 1,4-butanediol, and PTMEG	Chemicals, coatings, resins, adhesives, paints, civil engineering, elastic fibers	Taiwan, Mainland China, Asia, America, Australia, Europe and Africa, etc.



Global Locations of Operation

About This Report

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Chapter 1
A Diligent, Pragmatic, and Integrity-Oriented Enterprise

Chapter 2
A Trusted Material Supplier

Chapter 3
A Sustainable Producer that Prospers with the Environment

Chapter 4
An Enterprise that Creates a Friendly Workplace

Chapter 5
A Creator of Value for All



Headoffice



Affiliates



Subsidiary



Factory



CCP



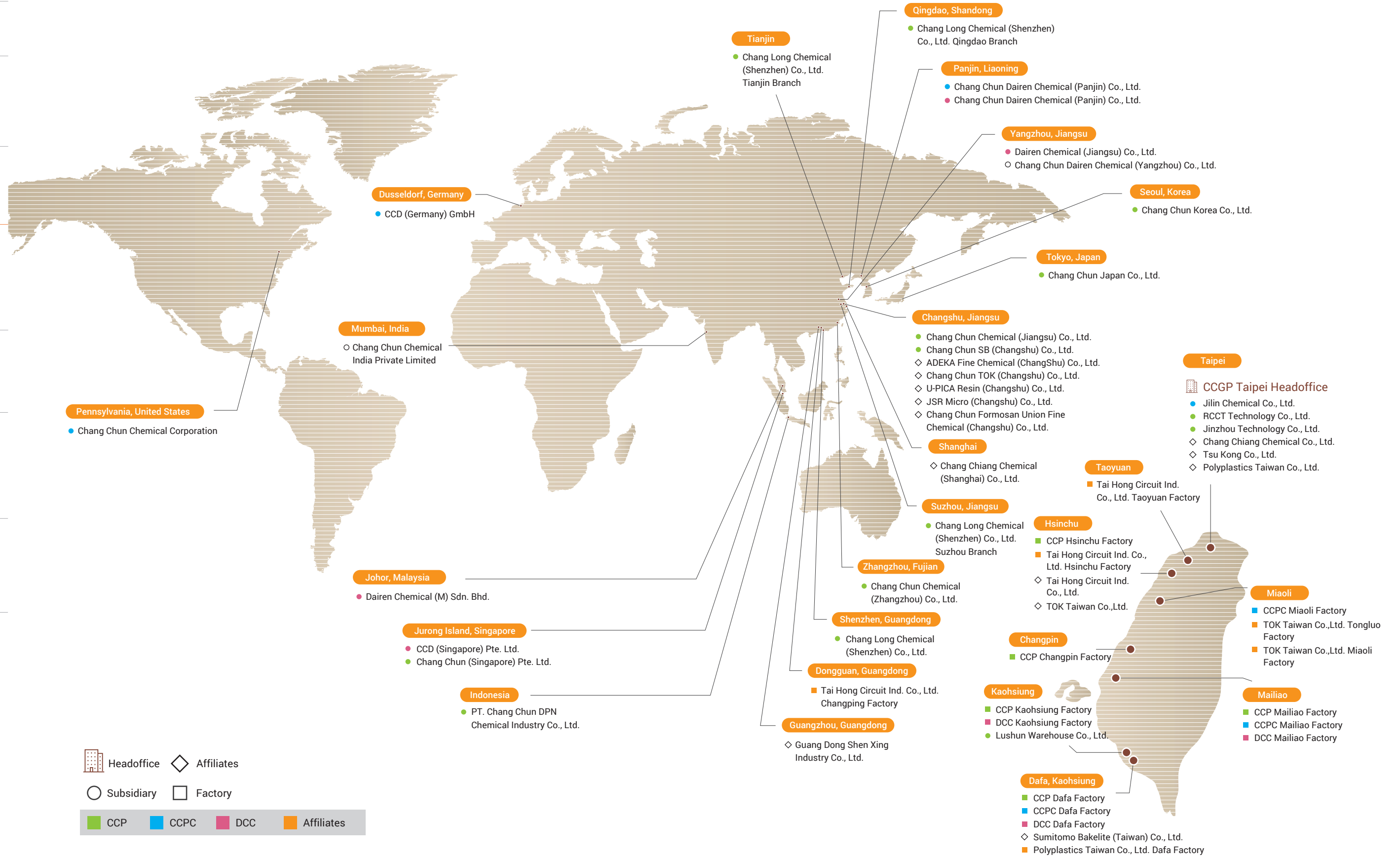
CCPC



DCC



Affiliates



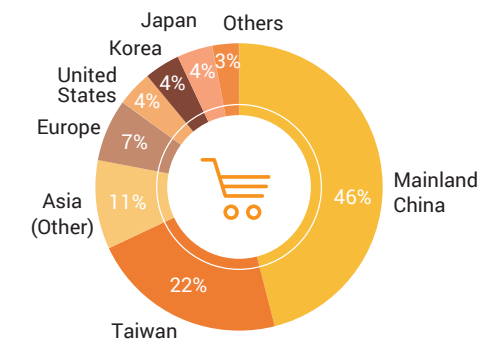
1.1.3 Operating Performance

CCPG's revenue in 2018 remained stable and its sales were expanded across the globe. The Group also continued to strengthen business developments in Europe, the United States, and emerging markets.

CCPG's stable financial performance contributed to the distribution of dividends as feedback for shareholders when the Group achieves earnings in the current year. The Board of Directors of the three companies have formulated the 2018 earnings distribution proposal for distribution in 2019.

Good financial performance is mainly exemplified in the continuous increase of growth in revenue and profitability which are key to sustainability corporate development. CCPG's good financial performance in recent years and its creation of long periods of stable economic value won tw AA-ratings from Taiwan Ratings.

Distribution of Revenue by Sales Territory

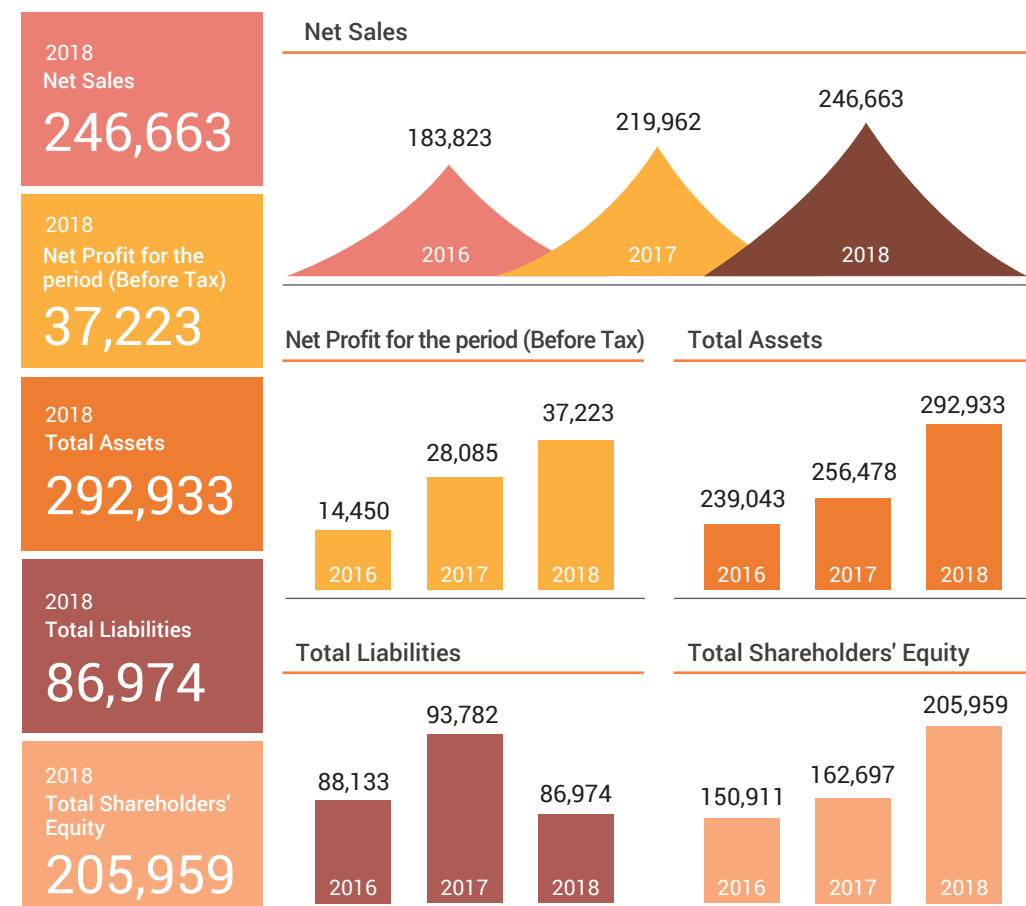


Taiwan Ratings
Reference website



2016 - 2018 CCPG Operating Performance

Unit: NT\$ million



Note: This table includes data from the consolidated financial report inspected and certified by a CPA. In addition to the boundaries of the Report, it also includes information of merged subsidiaries.

Consolidated Financial Statements of CCP, CCPC, and DCC for 2018

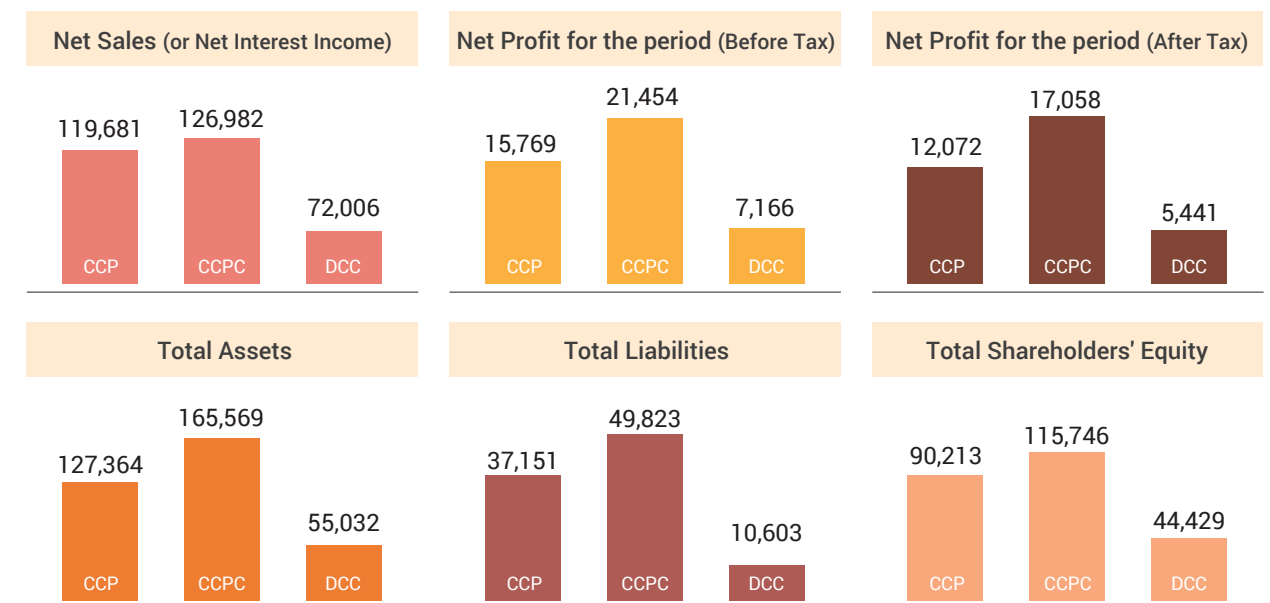
The world economy maintained stable growth in 2018 and the expansion of the US economy fueled growth in consumption across the world, which benefited the products of the Group. Revenue and profitability were higher than levels in previous years while total assets and shareholders' equity also achieved rapid growth. The performance indicators were the highest in three years.

Consolidated Financial Statements of CCP, CCPC, and DCC for 2018



CCPG 2018 Operating Performance - Per Company

Unit: NT\$ million



Note 1: Note: This table includes data from the consolidated financial report inspected and certified by a CPA. In addition to the boundaries of the Report, it also includes information of merged subsidiaries.

Note 2: According to related financial regulations, CCP is an independently merged entity; CCPG's merged entity already includes DCC and CCPC's amount listed above already includes DCC.

1.2 Corporate Governance and Sustainability

CCPG insists on operational transparency, and sets up a Board of Directors following laws and regulations, such as "Company Act", "Securities and Exchange Act" etc.; at the same time, CCPG also focuses on shareholders' equity and employee benefits. For a long time, the Board of Directors has continuously improved its corporate governance system, and conducted self-examination to reinforce employees' awareness of legal compliance as well as supervision and management of its subsidiaries; meanwhile, it also deepens its corporate social responsibility, emphasizes the concept of sustainable development, and maximizes the interests of its stakeholders.

In 2014, the Group established its Executive Board, composed of senior executives from three companies, and the Group's Chairman serves as Chief Executive Officer, three general managers serve as Chief Financial Officer, Chief Technical Officer and Chief Operating Officer respectively. The Group's resources and information are integrated by the Head Office's department and offices, under the Executive Board's jurisdiction, and invested in the three companies' production factories and overseas locations of operation. Starting from the Group's own core business, CCPG focuses on three aspects including environmental protection, social relations, and corporate governance by providing well-cared products and services to create a better life for our society.

Please refer to CCPG's official website for the organization of the CCPG Executive Board



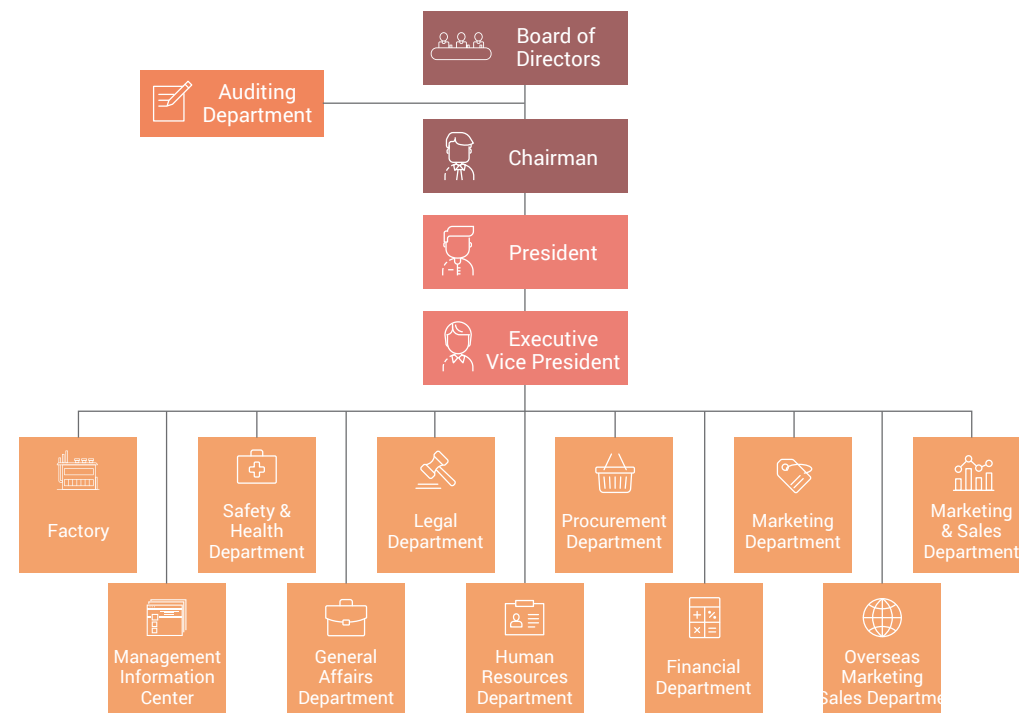
1.2.1 Corporate Governance

CCPG's corporate governance is effectively supervised and strategically guided by each company's Board of Directors. CCPG assigns dedicated auditing personnel to complete the supervision function, and conducts operational audits for each company and each department. This is to ensure that the business operations are conducted without any irregularities, that all information is correct, that its disclosure is immediate, and that the laws and regulations are strictly followed. The supervisors learn about the Company's actual operations through the audit report and financial statements and propose recommendations.

Secondly, in principle, the Board of Directors meets on a quarterly basis, and the frequency of meetings is increased when necessary. The Board of Directors, on a quarterly basis, listens to the management team's reporting, including President and Executive Vice President, etc., and has dialogues with management team members. The management team proposes the company's vision and strategy to the Board of Directors. The Board of Directors assesses the feasibility of the company's strategy and urges the implementation schedule.

Procedures for the selection of Directors and Supervisors of CCPG companies have been established in accordance with related regulations and rigorous selection procedures. In addition to professional management expertise, the Group also values personal ethics and leadership skills to ensure their professionalism and independence and provide the most appropriate strategic guidance for the future development of companies in the Group. The three main companies each held 4 to 7 Board of Directors meetings based on business requirements in 2018. The "Shareholder Service Unit Internal Control System", "Procedures for the Acquisition or Disposal of Assets", "Regulations for Lending to Others", and "Regulations for Endorsements and Guarantees" were amended in 2018 to improve corporate operating procedures and strengthen the improvement of the Board of Directors on corporate governance and compliance.

The professional experience and related discussion items of the members of the Board of Directors and supervisors have been disclosed in the Annual Reports of the companies of the Group. The corporate governance frameworks of CCP, CCPC, and DCC are shown in the figure below.



1.2.2 Risk Management

CCPG upholds the Group's core management philosophy of "Integrity, Customer First, Creative Innovations" as revealed by CCPG's three founders. In 2016, CCPG clearly defined Chang Chun Group Code of Conduct as the guidelines for all employees to follow while cooperating with customers, suppliers and other business partners, shaping the Group's ethical corporate culture.

In order to effectively grasp business risks and opportunities, after we assess the impacts of relevant issues on its sustainable operation, the risk management is divided into six major aspects. Each department responsible produces a risk matrix according to probability and severity of occurrences, proposes response countermeasures with respect to high-risk issues, conducts management following PDCA process, and regularly reviews and tracks effectiveness at the management review meeting. Their goal is to continue to strengthen CCPG's management system and reduce operational risk.

CCPG's Six Risk Management Aspects



Legal compliance

Establishment of the "Legal Compliance Committee"


CCPG established the "Legal Compliance Committee" to ensure that the corporate governance and management activities of the Group comply with the requirements of competent authorities. The President of the Executive Board serves as the Chair of the Committee and members include the directors of departments, factory directors, and presidents of overseas factories. They conduct self-evaluations and assessment in accordance with the "Legal Compliance Management Regulations" and Legal Department accompanies the audit units in onsite inspections and regularly reports to the Board of Directors. The Committee continues to follow up on the improvement status of units with discrepancies to improve the Group sensitivity for legal compliance.

Legal Compliance and Anti-Corruption Training

Starting from 2017, the Directors, Supervisors, and employees in management and non-management roles completed legal compliance and anti-corruption training and passed tests through the Chang Chun e-Learning Platform. Starting from 2019, CCPG shall organize legal compliance and anti-corruption training every year to implement the Group's code of ethics.


Management: Entry-level supervisors (inclusive) and above; Non-management: general staff.

Taipei Office and factories in Taiwan



The training completion rate in 2017

98%



The completion rate for new employees in 2018

100%

Factories in China

CCPJ

100%

CCJS

100%

CCPG CCDSG

100%

DCCJS

95%

CCZZ

93%

DCCM

Training is expected to be completed by the end of 2019

Announcement of Related Anti-Corruption Policies

For internal personnel, we use channels such as announcement boards and emails to announce related anti-corruption information. As of the end of 2018, we completed communication with 760 management personnel and 7,780 non-management personnel. The communication ratio of the entire Group was 100%. For external entities, we require suppliers and contractors to sign integrity statements to effectively communicate our anti-corruption policies.

Employees or stakeholders suspected of involvement in illegal activities or violations of codes of conduct may be reported through confidential channels such as the reporting hotline and mailboxes (please refer to 1.3 Communication with Stakeholders). The Group shall investigate and impose penalties to prevent related incidents from recurring.

Internal Control and Risk Management

CCPG companies have established Auditing Departments of the Board of Directors and they adopt independent auditing systems to review whether the conducts of CCPG companies meet regulations, internal rules, and operating procedures based on "Internal Control System" and "Internal Audit Implementation Guidelines" established in accordance with the scale and characteristics of companies. They conduct internal control evaluations each year and report results to the Board of Directors. The results are used to issue the "Statement on Internal Control" of each company.





The Auditing Department conducted routine assessments on 17 factories and overseas subsidiaries of the Group in 2018. It also conducted unscheduled project audits and special audits for internal control cycles. A total of 48 recommendations for improving internal cycles were filed within the year (statistics are provided below) and corrective measures for improvement based on 39 recommendations have been completed. The 9 long-term corrective measures still in progress have been included in the system for management and follow-up till the completion of improvement measures.

Internal Control Cycle	Recommended Corrections	Completed Corrections	Corrections in Progress
Sales Cycle	22	19	3
Production Cycle	8	6	2
Procurement Cycle	7	6	1
Financing Cycle	4	3	1
Property, Plant and Equipment Cycle	2	2	0
Other Control Operations	5	3	2
Total	48	39	9

The Auditing Department has established an independent report mailbox ccpgaudit@ccp.com.tw to actively implement anti-corruption and anti-fraud operations. If a company employee or external party discovers any illegal conduct committed by an employee of the Group, he/she may report the violation.

Financial Risk Management

The Group's financial risks are divided as follows:

 Credit Risk The main goal is to maintain the quality of accounts receivable. We use credit investigations, payment insurance, endorsements and guarantees, and control of loans and capitals to lower risk of financial losses arising from the failure of customers or the trading targets of financial instruments to perform contractual obligations.	 Liquidity Risk Maintain cash, cash equivalents, high-liquidity securities and sufficient bank financing limits, etc., required for operations to ensure that the Company has sufficient financial flexibility and liquidity.
 Market Risk Properly manage exchange rates and interest rate, control the degree of exposure within an acceptable range, and thereby optimize returns on investment.	 Property Risk Various property insurances are purchased for operating assets, such as fire insurance, property insurance and cargo transportation insurance, to thereby reduce the risk of losing business assets caused by natural disasters or non-natural disasters, by transferring part of the risks to insurance companies.

Quality Risk Management

In 2016, a quality risk management system was formulated; from high-risk items identified through annual risk matrix, and major change issues raised by the "List of Internal and External Issues" and "List of Stakeholders and topics of Concern", the Company assesses the risk levels which may influence the Group's companies' quality management system, in order to take corresponding countermeasures and control measures, reduce the impacts on products and services, and increase competitive advantages.

Environmental and Occupational Safety and Health Risks

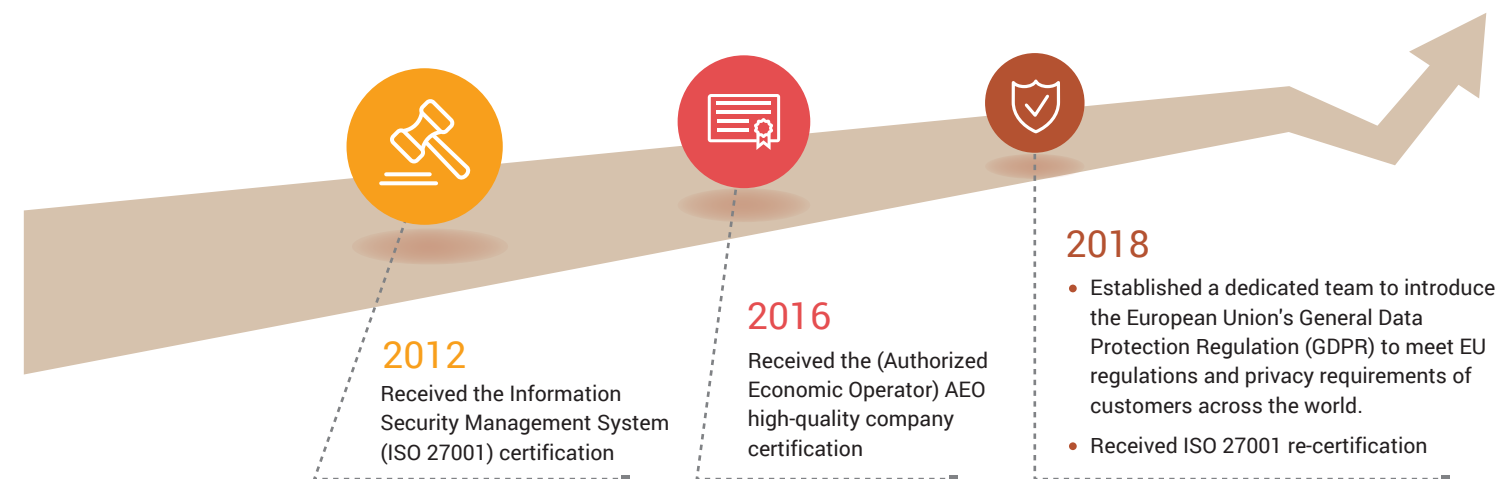
Occupational safety and health are the most important issue of concern to CCPG. CCPG has implemented new ISO requirements and updated the material issues, environmental concerns, and safety and health hazard identification to implement risk assessments inside and outside the factories. CCPG also actively advances four major plans including the Job Safety Analysis (JSA), standard operating procedures (SOP) for operation safety requirements, hazard and operability study (HAZOP), and labor health protection as well as comprehensive emergency response procedures to reduce the Group's environmental, health, and safety risks. Please refer to 2.2 Responsible Chemistry for a detailed description.

Confidential Business Information Protection

To meet information security requirements of employees, customers, and related stakeholders, CCPG introduced the Information Security Management System (ISMS) and Trade Secret Management System (TSMS) and received various information security certifications.

To improve the information security of the Group, we introduced the mobile office, next-generation firewall, and mail safety system in 2018. We also plan to incorporate AEO and legal compliance as key points in information security audits in 2019.

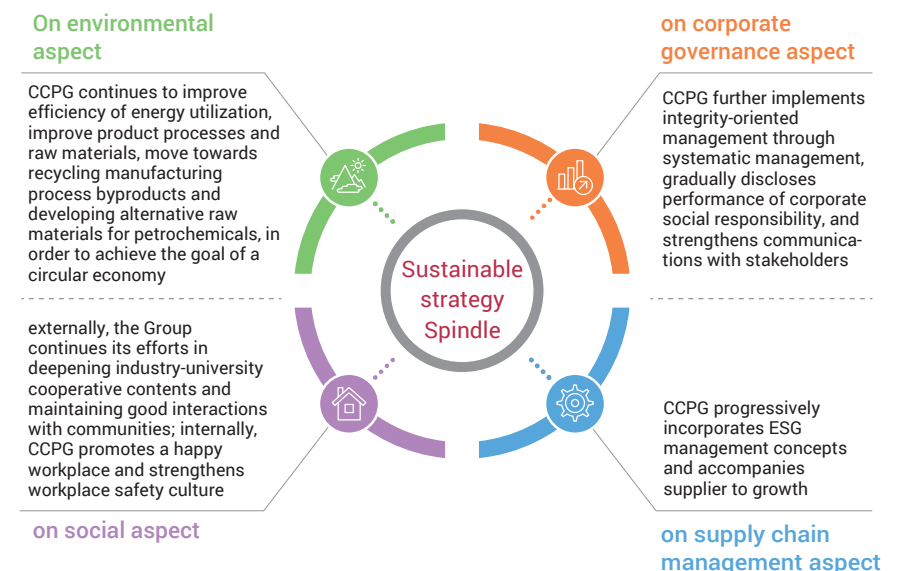
In addition, we attach great importance to information security issues. We provide continuous information security training programs each year and implements the "Information Security Policy" and "Business Secret Management Goals and Policy" to continue to enhance employees' safety awareness through continuous promotion of the policies.



1.2.3 Sustainability Strategy

CCPG was founded upon corporate social responsibilities. In its pursuit of growth in corporate earnings and sustainable development, it remains rooted in business ideas and the formulation of its corporate culture as it seeks common prosperity in environmental protection and corporate growth.

The Group is devoted to developing a sustainable strategy based on its core business, and its planning is therefore pragmatically oriented. The focuses of its strategy encompass four aspects: social, environmental, corporate governance, and supply chain management.

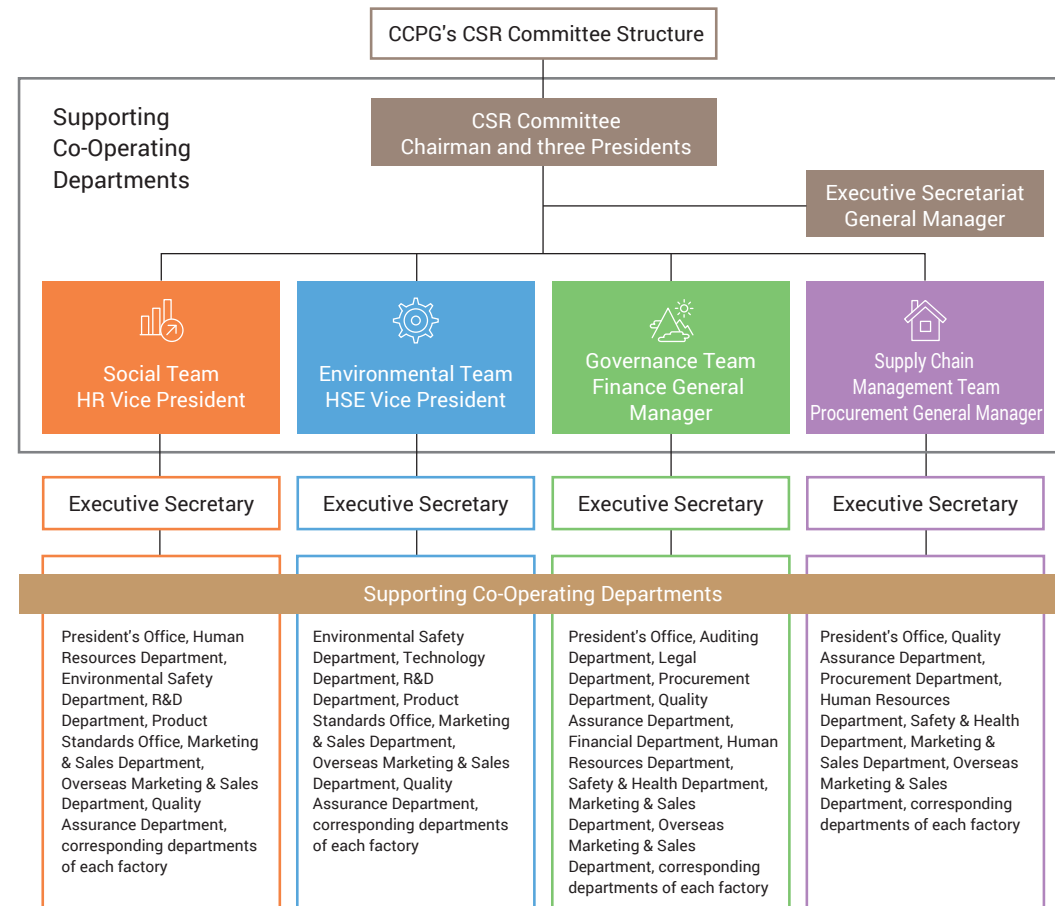


CSR Governance and Management Organization

CCPG established its CSR Committee in 2017. Following the Group's organizational structure, the Chairman serves as Committee Chairman, and three General Managers serve as Committee Vice Chairmen. Under the Chairman and Vice Chairmen, Executive Secretariat, Governance Team, Social Team, Environmental Team, and Supply Chain Management Team are established, and the Executive Director of the Executive Secretariat and all team leaders are held by heads of responsible departments and they are also members of the Committee.

The CSR Committee assigns the Executive Secretariat to be in charge of confirming execution and implementation of various CSR tasks, supporting co-operating departments, integrating issues with factory representatives, and reporting results of sustainable performance and stakeholder communications, on a quarterly basis, to CSR Committee.

CCPG's CSR Committee Structure



In order to implement the Group's sustainable development strategy, the CSR Committee, in collaboration with its subordinate CSR teams, formulates short-term and mid to long-term sustainable development goals as well as action plans, and systematically plans related risk management issues for each responsible unit to implement and report. The heads of all CSR teams are responsible for leading and supervising the implementation status and reporting regularly to the Executive Secretariat.

convened in 2018

CSR team meetings	CSR Committee meeting
4 times	1 time

The Executive Secretariat organized related CSR education and training in 2018

- 1 session of GRI Standards training
- 14 CSR awareness and training courses
- online e-Learning courses

training 6,201 people

Explain the key points in the GRI changes to the four CSR teams

Training for all employees is scheduled for completion before the end of 2019 to instill sustainability into the minds of the employees.

In addition, CCPG understands that the integration of our sustainable development strategy and the UN's Sustainable Development Goals (SDGs) requires overall investment and support of the organization. We began implementing analyses for different phases based on the following steps:



CCPG has always worked hard toward the following 11 goals for sustainable development. We encourage all employees to increase their understanding of SDGs and inspire employees to help society through their professional work. We also implemented CCPG's core ideal for "creating sustainable value with society" with which CCPG will grow and prosper along with stakeholders, satisfy the society's needs and expectations for CCPG, and expand our positive influence.

The sustainable development goals and action plans are shown in the following table:



Team Goal Setting and Action Plan

Governance Aspect			Completed	In progress
2018 Achievement Status Description	2019-2020 Short-term Goals and Action Plans	Mid-and-Long-Term Goals and Action Plans		
Group ethics and integrity				
<ul style="list-style-type: none"> ✓ Chang Chun Group Code of Conduct was published on the official website in 2017 ✓ The Auditing Department is responsible for the anti-corruption investigation procedures and the independent whistleblowing mailbox ccpgaudit@ccp.com.tw was added ✓ CCPG used E-learning for legal compliance and anti-corruption training in 2017-2018. Please refer to 1.2.2 Risk Management for the completion rate ✓ The Product Standards Department is responsible for patents and the Legal Department is responsible for trade secrets 	Implement the Group's code of ethics <ul style="list-style-type: none"> ■ Human rights and legal compliance training and education are implemented each year starting from 2019 and expand the scope of training to overseas factories 	Implement the Group's code of ethics <ul style="list-style-type: none"> ■ Establish grievance, reporting channels and internal investigation procedures ■ Strengthen internal training and education 		
Co-exist and co-prosper with stakeholders				
<ul style="list-style-type: none"> ✓ 147 questionnaires were recovered (110 in 2017 and 37 internal questionnaires in 2018), and 13 material topics were analyzed. Related performances were disclosed in the 2017 CSR Report 	Understand stakeholders and their connections with the Group <ul style="list-style-type: none"> ■ Expand the scope of the stakeholder questionnaire distribution to six overseas factories ■ Establish and promote social targets; deepen connections with stakeholders 	Obtain stakeholders' trust and respect for the Group <ul style="list-style-type: none"> ■ Establish diversified and systematic communication channels, interact with stakeholders, and explain their issues of concern 		
Product quality				
<ul style="list-style-type: none"> ✓ Integrated and improved the factory quality system including department target management, review records management, and audit management ✓ Completed 11 training sessions for the Eight Disciplines Problem Solving (8Ds) ✓ Factories cultivated quality assurance talents in accordance with the training maps 	Continuous improvement of product quality <ul style="list-style-type: none"> ■ Integrate the Group's quality operating system ■ Continuous improvement of operation standardization ■ Strengthen training for statistics, process, and quality management ■ Continuous improvement for customer complaints and non-compliance 	Establish customer-oriented quality requirements and expectations <ul style="list-style-type: none"> ■ Improve Q&A ■ Improve statistical technologies for process management and control and quality management ■ Value changes in quality and improve product quality in the manufacturing process ■ Introduce automatic analysis equipment ■ Establish knowledge databases 		

Governance Aspect			Completed	In progress
2018 Achievement Status Description	2019-2020 Short-term Goals and Action Plans	Mid-and-Long-Term Goals and Action Plans		
Group's sustainable development				
<ul style="list-style-type: none"> ✓ Included in the 2018 CSR budget ✓ Evaluate CSR issues in the assessments of risks/opportunities in the ISO quality and environmental safety and health system 	Promote CSR governance framework <ul style="list-style-type: none"> ■ Evaluate CSR issues in the ISO assessments of risks/opportunities Connect to the United Nations Sustainable Development Goals (SDGs) and use universal language and goals <ul style="list-style-type: none"> ■ Organize SDG workshops to integrate SDGs with the core competencies of CCPG and develop feasible action plans 	Link the Group's core values and products with CSR <ul style="list-style-type: none"> ■ Periodically assess CSR implementation performance and management principles 		
Corporate image				
<ul style="list-style-type: none"> ✓ CCPG issued a CSR Report in December 2018 and it shall issue CSR Reports each year to disclose information on related CSR activities ✓ CCPG has placed the Traditional Chinese and English versions of its CSR Report on its official website for stakeholders to download and to achieve effective communication 	Reinforce information transparency and establish the Group's CSR image <ul style="list-style-type: none"> ■ Establish a CSR website to improve the accessibility of the website and the effects of external communications 	Become CSR benchmark for industry peers <ul style="list-style-type: none"> ■ Continue to improve CSR strategies and programs 		
CSR advocacy and commitment				
<ul style="list-style-type: none"> ✓ The digital signature of the "Supplier Code of Conduct" was provided online in 2018 on the B2B supplier platform website 	<ul style="list-style-type: none"> ✓ The Group shall continue to complete the 100% signing of the Supplier Code of Conduct ✓ The Group shall continue to complete the revision of English standard contract and include it in the Supplier Code of Conduct 	Develop sustainable procurement policies and advocate related concepts <ul style="list-style-type: none"> ■ Update the contents and include them in the Supplier Code of Conduct based on the sustainable supply chain strategy ■ Implement supplier CSR training and education and facilitate CSR value exchanges and communication ■ Plan the establishment of a B2B platform for foreign suppliers and launch the digital signing of the "Supplier Code of Conduct" 		
CSR risk assessment and management				
<ul style="list-style-type: none"> ✓ Completed the investigation of the CSR information of suppliers of main materials in 2018 	<ul style="list-style-type: none"> ✓ Reassess the suppliers risk evaluation factors [quality/safety/environmental protection/human rights/society] and complete the CSR risk evaluation questionnaire before June 30, 2019 ✓ Complete the CSR questionnaire survey and statistics for important suppliers of main materials before the end of December 2019 	Practice supplier CSR performance management and risk assessment <ul style="list-style-type: none"> ■ Continue to conduct onsite audits for high-risk suppliers ■ Commend suppliers with good performance ■ Encourage suppliers to continue practicing CSR with adjustments in procurement strategies 		

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A Trusted Material SupplierChapter 3
A Sustainable Producer that Prospers with the EnvironmentChapter 4
An Enterprise that Creates a Friendly WorkplaceChapter 5
A Creator of Value for All



Environmental Aspect		Completed		In progress	
2018 Achievement Status Description		2019-2020 Short-term Goals and Action Plans		Mid-and-Long-Term Goals and Action Plans	
<div></div>					
Group energy conservation & carbon reduction					
<div>✓ Conducted an inventory of greenhouse gas emissions in the Group's domestic and overseas factories</div> <div>✓ Executed a total of two greenhouse gas Programmatic CDM projects for offsetting 15,505 tCO2e/year (CCPC Mailiao Factory and DCC Mailiao Factory)</div> <div>✓ Established water usage balance tables for CCPG Mailiao Factory, CCPC Miaoli Factory, and CCPG Dafa Factory</div> <div>✓ Completed multiple water conservation and energy conservation projects; refer to 3.2.1 Energy Conservation and Carbon Emissions Reduction Plans and 3.3.1 Water Management</div> <div>✓ Established CCPG internal waste inspection forms to ensure that waste disposal meets regulatory requirements</div>		<div>Reduce unit energy consumption by 3% for energy and water consumption at various factories</div> <div>■ Clarify the calculation basis for financial data</div> <div>■ Compile energy consumption data at each factory</div> <div>■ Inventory and manage existing waste</div>		<div>Optimize Group energy usage structure and performance</div> <div>■ Improve the energy conservation and carbon emissions reduction management system</div> <div>■ Establish an energy conservation and carbon emissions reduction platform</div> <div>■ Produce digital review forms</div> <div>■ Establish waste reduction KPIs</div> <div>■ Performance management of carbon emissions reduction action plans in various factories</div>	
Group regulations management system					
<div>✓ Completed and implemented air pollution, water pollution, waste, toxic chemical substances, and environmental regulations compliance audit functions</div>		<div>Establish reports and identification of the irregularities of Group operations</div> <div>■ Regulations management system - irregularity report</div> <div>■ Regulations management system - identification report</div> <div>■ Non-compliance - Improvement management</div>		<div>Compliance with laws to prevent risk exposure of the Group</div> <div>■ Expand the scope of reports for changes in regulations to include regulations under the jurisdiction of various departments of the Head Office</div> <div>■ Define and evaluate the boundaries of regulations (involvement of business management)</div> <div>■ Formulate procedures for changes, identification reports, and approval</div> <div>■ Regulations management system seminar</div>	

Environmental Aspect	2018 Achievement Status Description	2019-2020 Short-term Goals and Action Plans	Mid-and-Long-Term Goals and Action Plans



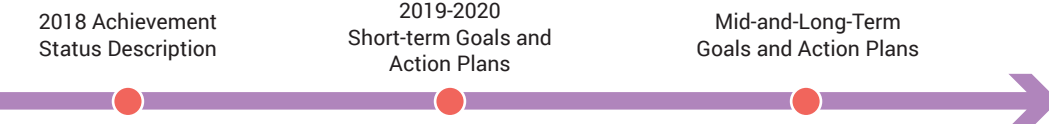
Environmental Aspect			✓ Completed	✓ In progress
2018 Achievement Status Description	2019-2020 Short-term Goals and Action Plans	Mid-and-Long-Term Goals and Action Plans		
ISO 45001 Safety and Health Management System				
<ul style="list-style-type: none"> Established ISO 45001 information Integrated ISO management system for education and training in all plants Revised five universal document 	<p>Conduct external audit verification in 2020.</p> <ul style="list-style-type: none"> Organize ISO 45001 management system version upgrades and internal auditor training courses for all plants Add and revise the occupational safety and health management system 	<p>Obtain ISO 45001 certification and continuous improvement procedures</p> <ul style="list-style-type: none"> Organize ISO 45001 education and training for all plants Continue to integrate and optimize the procedures 		
Seven-year PSM project				
<ul style="list-style-type: none"> Continue to optimize related platforms for safety Established the MOC system and introduced hazard assessment and evaluation mechanisms Shared PSM implementation results with process safety engineers 	<p>Intensify the implementation of PSM in all factories</p> <ul style="list-style-type: none"> Establish an information system to manage the PHA implementation status Revise the PSM audit manual and commence PSM audits in all factories Optimize the MOC system and procedures Use the MOC system to optimize the execution rate and effectiveness of PSSR 	<p>Continue to improve PSM performance in all factories</p> <ul style="list-style-type: none"> Continue to review PSM procedures for revision Intensify PSM concepts Regularly review and amend the audit manual to cultivate audit and observation capabilities of PSM auditors 		
Strengthen emergency response and information management				
Added objectives for 2019	<p>Improve the allied defense and factory emergency response performance</p> <ul style="list-style-type: none"> Improve the response capabilities for leaks of massive amounts of allyl alcohol and leaks of various toxic substances Improve high-risk process procedures in the factories Establish off-peak response plans 	<p>Intensify the allied defense and factory emergency response performance</p> <ul style="list-style-type: none"> Compile statistics on the emergency response plans and personnel training items in all factories to improve the effectiveness of resource investments and strengthen emergency response management Cooperate with external response organizations and strengthen the resources for response 		
Establish a platform for digital permit forms				
Added objectives for 2019	<p>Establish a platform for high-risk operation permit forms</p> <ul style="list-style-type: none"> Integrate the permit systems of Group's factories Establish a digital system and database 	<p>Ensure that all factories maintain effective control over high-risk operations</p> <ul style="list-style-type: none"> Use graphics to display the locations and number of high-risk operations and compile statistics on the assignment of safety supervisors Compile statistics on high-risk operations 		

Environmental Aspect			✓ Completed	✓ In progress
2018 Achievement Status Description	2019-2020 Short-term Goals and Action Plans	Mid-and-Long-Term Goals and Action Plans		
Establish PSI management mechanisms				
Added objectives for 2019	<p>Integrate the Group's PSI procedures</p> <ul style="list-style-type: none"> Implement full-scale PSI inventory and establish a PSI management tracking system 	<p>Strengthen PSI implementation</p> <ul style="list-style-type: none"> Integrate process safety information system 		
Cultivate the occupational safety awareness of all employees				
Added objectives for 2019	<p>Reduce the number of injuries and injury rate (IR) by 20%</p> <ul style="list-style-type: none"> Conduct interactive safety identification and catastrophic scenario training for factories in Taiwan and China Review and improve of individual occupational injuries Implement operation safety analysis to promote safe conduct observation and safety culture training 	<p>Improve personnel's safety awareness and build a safety culture for the Group</p> <ul style="list-style-type: none"> Continue to reduce the occurrence of occupational hazards Use seed instructors to continue to implement education and training for entry-level technical personnel 		
Implement effective evaluation of special hazardous operations				
<ul style="list-style-type: none"> Completed baseline investigations for all factories Completed the establishment of operation environmental monitoring plan template 	<p>Identify special hazardous operations in all factories</p> <ul style="list-style-type: none"> Review the scope of execution Verify the current state of implementation and related guidelines 	<p>Continue to implement effective evaluation of special hazardous operations</p> <ul style="list-style-type: none"> Review the monitoring plans and monitoring reports of factories Screen high-risk areas for chemical exposure 		
Health inspection and analysis management system				
<ul style="list-style-type: none"> Completed the compilation of employee health examination data from past years Completed the user function requirements for the health examination analysis and management system to facilitate system design and development 	<p>Continue to compile employee health examination data from past years</p> <ul style="list-style-type: none"> Define and group various health examination data Verify the clinical standards for various health examination data 	<p>Establish analysis functions and health management modules</p> <ul style="list-style-type: none"> Design connections in the health education system Train factory nurses in the use of the analysis management system 		



Social Aspect

✓ Completed ✓ In progress



Diverse talent recruitment system and channels

- ✓ Achieved more than 95% in annual planned manpower requirement adequacy ratio and more than 90% in recruitment adequacy ratio for temporary demands. Completed manpower replenishments within six weeks
- ✓ Participated in 4 campus recruitment events, International Trade Institute (ITI) talent recruitment and talent job fairs
- ✓ Applied for R&D substitute servicemen recruitment for 2018 and the Group recruited 17 substitute servicemen
- ✓ Optimized interview procedures and improved efficiency
- ✓ Completed work proficiency assessment procedures for new recruits in the probation period

Expand recruitment channels

- Enter the campus to increase the visibility of the Company (organized 8 sessions of campus talent recruitment activities)
- Share the Group's recruitment experience and promotional materials and resources to overseas companies
- Optimize the talent recruitment website
- Leverage the government Southbound Policy and the Group's internationalization strategy to participate in overseas Chinese students association. The Group aims to participate in such activities in two schools in 2019

Key talent recruitment

- Analyze functional requirements and give feedback to talent recruitment

Optimize talent cultivation and placement regulations

- ✓ Expanded the operations of the Chang Chun e-Learning Platform to overseas factories
- ✓ Placed the digitalized annual training program system online to share course resources
- ✓ Established regulations for internal instructors and related training to train internal instructors for leadership and management courses
- ✓ Optimized the performance evaluation system for overseas factories
- ✓ Conduct an inventory of professional talents and establish a key talent database

Optimize existing education and training institutions and system for full promotion, visits, and implementation

- Optimize and promote the internal instructor system
- Model mentors' experience sharing and reward regulations
- Edit and produce the mentorship system and internal instructors' skill training in digital online courses

Expedite the establishment of professional courses

- Help the Group's factories and Head Office produce digital education materials
- Organize six sessions of digital course production teachers' training courses
- Establish work manuals and conduct an inventory of work items

Improve managers' management skills

- Organize coach-style assistance skill courses for Section Chief supervisors
- Plan annual training programs based on the theme of communication

Integrate overseas human resources businesses and promote the Group's policies

- Human Resources Department provides close-range assistance to implement various systems in overseas factories

Continue to promote the CCPG employees' book clubs to encourage the exchange of experience and knowledge

- Encourage employees to learn independently and provide all employees with free platforms for learning English and Japanese

鞏固人才發展藍圖

- 建立關鍵人才庫，並發展員工個人發展計劃與組織儲備幹部計畫

Social Aspect

✓ Completed ✓ In progress



Talent retention and management Diversify the system

- ✓ Routine work satisfaction surveys for supervisors ranked section chiefs
- ✓ Exit interviews with resigned employees
- ✓ Interviews with heads of departments and factory managers. Proposed adjustments based on the recommended training programs and performance evaluation regulations
- ✓ Established the birth incentive system
- ✓ Provided education subsidies for children of overseas employees
- ✓ Established employees' psychological consulting hotlines
- ✓ Regularly provided discount information for daycare centers to employees in all factories
- ✓ Organized 4 "Raising Chang Chun Pediatric Seminars" with the Raising Children Medical Foundation

Full promotion of the non-salary benefit items

- Organize rewards collectively for senior employees who have provided 20 years of services
- CCPG good mood hotline and promotion in overseas regions
- Sign contracts with daycare institutions and expand to contracts with elderly care institutions
- 6+1 project for the New Labor Pension System

Strengthen relations with employees

- Human Resources Department interviews employees returning from overseas assignments and provide suitable resources
- Organize work satisfaction surveys for Section Chiefs every two years

Review the salary structure of overseas companies

Construct a happy workplace

- Formulate reward and talent retention related measures
- Regularly collect employees' opinions for the Company to review and improve corporate strategy
- Enhance employee benefits and build a friendly working environment
- Promote club activities and encourage employees to establish various clubs

Increase the level of social welfare participation

- ✓ Organized blood donation activities (donated 1,252 bags of blood) and three beach clean-up activities for the Group
- ✓ Implemented the summer internship program
- ✓ CCPG participated in or sponsored a total of 285 domestic and overseas activities as of the end of 2018

Expand the ideals and experience in organizing various social welfare activities to overseas companies of the Group

- Continue to organize domestic and foreign factories in blood donation activities and beach clean-up activities this year and design events to respond to children's environmental education

Continue to promote summer internships for junior and senior undergraduate students and first-year graduate students

- Use the Major Industry-Academia Collaboration Plan to work with National Tsing Hua University in forward-looking green chemical engineering technologies to reduce the carbon footprints of products

Integrate the Group's resources for social investment

- Propose long-term and continuous charity activities
- Promote Taiwan's petrochemical strength and actively participate in the government's high-value petrochemical industry promotion

1.3 Stakeholder Communications

CCPG takes stakeholders' needs and expectations very seriously and it uses questionnaires to conduct surveys and identify and analyze stakeholders' issues of concern as the reference for information disclosure in the report and as the basis for formulating corporate social responsibility policies to facilitate effective communications with different stakeholders.

Identification

7 Categories of Stakeholders

We used the AA1000 SES 2015 Stakeholder Engagement Standards to identify seven categories of stakeholders of CCPG including employees, suppliers (including products, freight services, engineering and etc.), customers, governments/competent authorities, shareholders / joint ventures, community residents, and trade associations.

22 Sustainable Issues

The feedback from internal and external stakeholders, issues related to the core material topics of CCPG, CSR regulations/standards, sustainability trends in the petrochemicals industry, and benchmark companies in the industry were used to compile a list of 22 sustainability issues.

6 material topics were adjusted when compared to the topics addressed in 2017:

Original Material Topic	Topic after Adjustment	Reason for Adjustment
■ Product quality ■ Product health and safety	Product quality and safety	Both topics involve products and they are therefore merged
■ Talent enticements and welfare system ■ Talent training, education, and development	Talent recruitment and cultivation	Both topics involve talent recruitment and cultivation and they are therefore merged
■ Talent enticements and welfare system ■ Labor relations and labor conditions	Labor relations and benefits	Both topics involve talent retention and they are therefore merged
■ Corporate image ■ Sustainable development and strategy	Sustainable development and strategy	Both topics involve corporate development and they are therefore merged
■ Corporate governance ■ Business ethics and integrity	Corporate governance and integrity	Both topics involve governance and they are therefore merged
■ Community engagement and social investment	Community engagement and community care	Adjustment of the title of the topic

Analysis

Opinion survey of **74** senior executives
325 effective questionnaires from domestic and foreign stakeholders

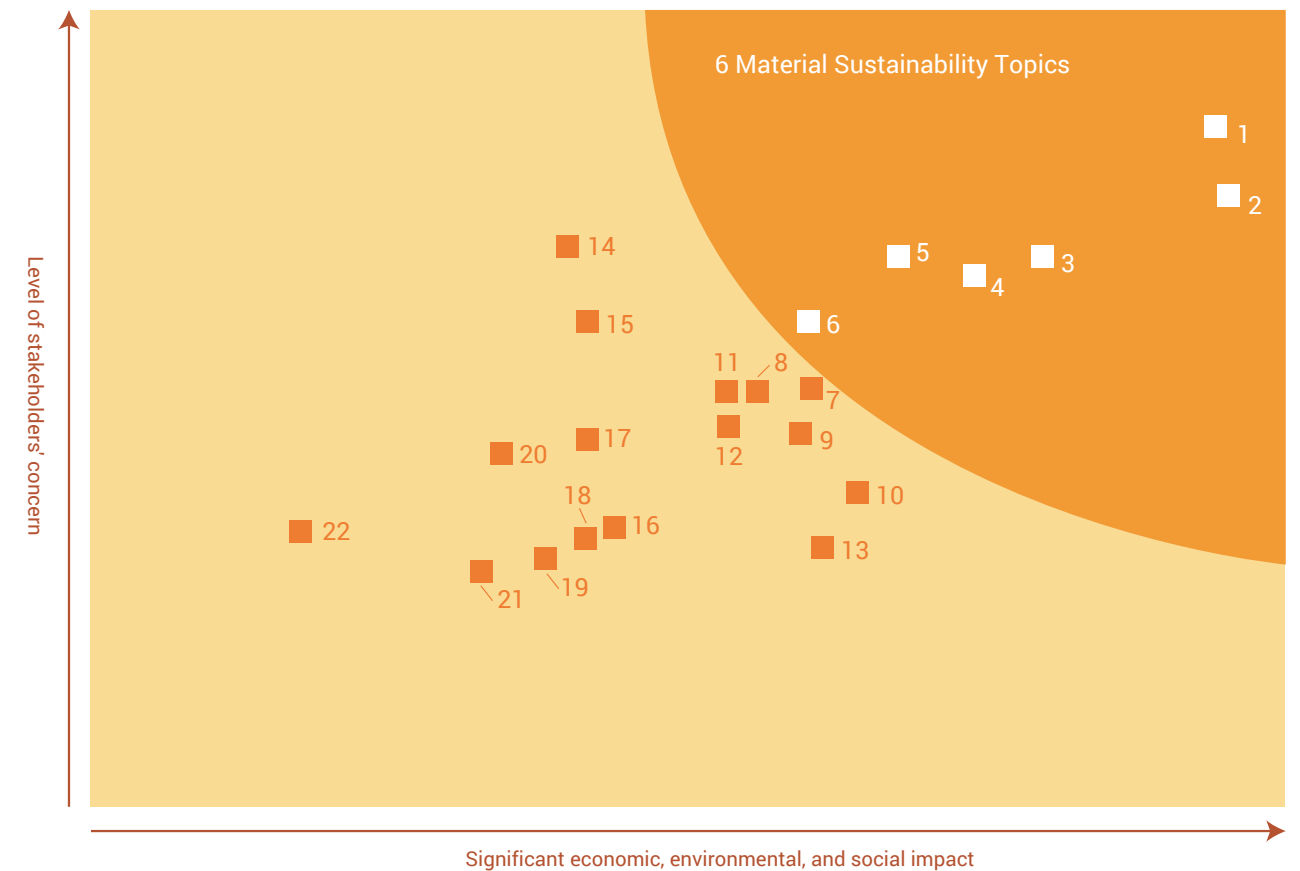
The Group adopted GRI Standards and adjusted material topic questionnaires to collect information on the level of concern of internal and external stakeholders on various issues as the main basis of analysis for the Materiality Matrix.

Validation

6 Material sustainability topics

The CSR Committee discusses internally the analysis results compiled from external stakeholders and senior executives and consults the opinions of external experts before reporting to the Chairman and the Presidents of the three companies to produce the 2018 CCPG Materiality Matrix. 6 topics were deemed to be key and significant topics to CCPG and they were prioritized for disclosure.

With regard to the corresponding topics in the GRI standards, as the product quality and safety topics have a significant impact on the companies' CSR and important stakeholders, CCPG decided to add product quality and safety management approaches as the basis of disclosure in this Report.



6 Material Sustainability Topics

1. Response and management of major incidents
2. Occupational safety and health
3. Product quality and safety
4. Air emission management
5. Customer relationship management
6. Supplier management

Other topics

7. Risks and opportunities
8. Sustainable development strategy
9. Business performance
10. Talent recruitment and cultivation
11. Environmental impact management and assessment
12. Waste management
13. Labor relations and benefits
14. Corporate governance and integrity
15. Product transportation security
16. Energy management
17. Chemicals management
18. Legal compliance
19. Water resource management
20. Product strategy and R&D innovation
21. Community engagement and community care
22. Climate change mitigation and adaptation

Scope and Boundaries of Material Topics

Issues	Corresponding GRI Standards	The significance of material topics to CCPG	Stakeholders								Management Approach and Related Information	Page
			Employees	Suppliers		Customers	Governments/ Competent Authorities	Shareholders/ Joint Ventures	Community Residents	Trade Associations	Corresponding Sections and Chapters	
Response and management of major incidents	GRI 102-11	Through response training for personnel, incident review and analysis, and regular emergency response drills, employees are familiarized with skills and correct procedures for responding to emergencies. The measures effectively reduce the impact on the society and environment in the event of material incidents.		●			●	●	●	●	2.2.3 Material Incident Management & Response	52
Occupational safety and health	GRI 403	Effectively promote and implement health and safety policies to construct a workplace where laborers can contribute their hard work and achieve sustainable development of Chang Chun Group.	●				●	●	●		2.2.1 Workplace Safety	45
											2.2.2 Process Safety	51
											4.3.2 Healthy Workplace	93
Product quality and safety	GRI 416	We are committed to providing customers with satisfying products and services and grow along with customers and suppliers. We work hard and innovate to improve quality and ensure that all quality-related activities and product safety meet government regulations, product-related regulations, and customer demands.	●			●				●	2.1.2 Chemicals Management	38
	GRI 417										2.1.3 Product Quality	41
Air emission management	GRI 305	CCPG is committed to providing a good living environment for all citizens. Providing citizens with clean air and blue skies is the most powerful driving force for us to continue to improve air pollution.					●		●		3.4.1 Air Pollutant Emissions Management	77
Customer relationship management	GRI 418	CCPG has always upheld the business philosophy of customer first. It is the goal of all employees to provide comprehensive customer services and increase customer satisfaction.		●		●					2.1.4 Customer Communications and Services	43
Supplier management	GRI 204 GRI 404	Suppliers are CCPG's strategic partners for improving products and services as well as important stakeholders for implementing corporate social responsibilities. CCPG adopts and implements a sustainable supplier policy to effectively manage suppliers, grow with suppliers, and achieve the goal of sustainable development.		●		●					2.3 Sustainable Supplier Management	57

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In order to pursue sustainable development, CCPG must categorize stakeholders, establish communication channels to effectively collect information from stakeholders, and clarify stakeholders' needs and expectations as important references for the Board of Directors for formulating social responsibility policies and operations.

Stakeholder Engagement

We take stakeholders' needs and expectations very seriously and we use feedback from questionnaires issued by units to identify and analyze stakeholders' topics of concern. The communication channels/frequency in 2018 are shown in the table below

 Stakeholder	 Communication Channel	 Communication Frequency in 2018
Customers	<ul style="list-style-type: none">Phone, letter, fax, webpageVisits by customers, visiting the customersExhibitions and trade fairsCustomer satisfaction surveyCustomer's evaluation of factoriesEstablish customer grievance channels	<ul style="list-style-type: none">Conducted 1 customer satisfaction surveyParticipated in 3 large-scale exhibitionsIrregular telephone, email, fax and webpage communicationsIrregular customer visits and technical services
Suppliers/ contractors	<ul style="list-style-type: none">Phone, letter, fax, webpageMutual visits with suppliers/contractorsTraining and education for suppliers/contractorsSupplier evaluation and audit	<ul style="list-style-type: none">Irregular mutual visits with suppliers/contractorsCCPG provides multiple training sessions to suppliers and contractors each year and it provided 31,297 of training and tests sessions for contractors in 20187,910 suppliers were evaluated65 suppliers were auditedIrregular telephone and email communicationsTwo transportation safety meetings each year
Community residents surrounding factories	<ul style="list-style-type: none">All factories provide grievance telephone, mailbox, security guard boothsParticipate in/sponsor community activitiesEnvironment/public facility adoption and maintenanceInvite residents to visit the factoriesProvide scholarship sponsorship for local and nearby colleges	<ul style="list-style-type: none">Irregular visits to community residentsCCPG participated in and sponsored a total of 285 social activitiesActively sponsor local activities and public facility adoption and maintenanceCCPG provided 90 internship opportunities to local and nearby college graduates
Shareholders/ joint ventures	<ul style="list-style-type: none">Board of DirectorsManagement meeting and monthly report	<ul style="list-style-type: none">4 meetings of the Board of Directors each yearHold monthly management meetings
Employees/ labor unions	<ul style="list-style-type: none">Various work meetings (quality/environment/safety/production, etc.)Various employee benefit meetingsInternal meetings or seminarsAnnual performance evaluationTraining and educationGrievance mailbox, E-bulletin board, questionnaire surveys, interviews	<ul style="list-style-type: none">Work meetings (weekly/monthly/quarterly/annually)Employee benefit meetings (quarterly)Various irregular meetingsIrregular communications, including grievance mailbox, E-bulletin board, questionnaire surveys, interviews, etc.Performance evaluation once a year and 4 regular evaluations each year
Governments/ competent authorities	<ul style="list-style-type: none">Coordinate with central and local competent authority operations, including relevant advocacy and briefing sessions, reviews, audits and meetings, etc.Visits by government officialsJoint fire drillsOfficial correspondences	<ul style="list-style-type: none">Declaration, reviews and factory on-site inspectionsOfficial correspondences and telephone communicationsIrregular visits by government officialsIrregular participation in meetings (review meetings/business conferences/briefing sessions/seminars/forums) multiple times a year
Trade Associations	<ul style="list-style-type: none">Participate in meetings held by trade associations	<ul style="list-style-type: none">Participate in meetings irregularly

CCPG establishes multiple communication channels to address different types of issues: For internal labor and human rights-related issues, employees may bring forth their opinions or appeals through labor-management conference platform and labor union organizations; and for residents nearby factories, smooth communication channels are made available; and for those who are most concerned about environmental issues, feedback information from different platforms is also actively provided; and as for whether the enterprise operations are in line with the principle of good faith, they are supervised by permanent internal audit and internal control units; CCPG also has a smooth censure and reporting system, and investigates related incidents independently.

 Issue	 Grievance Channel	 Process	 Results
Legal compliance	In the event that any department, factory or individual discovers illegal incidents, the Legal Department shall be notified for investigations. Illegal activities may be reported by way of telephone, fax, letters, or emails (CCPGLG@ccp.com.tw). (ccpgaudit@ccp.com.tw)	As for the illegal incidents reported, the Legal Department should conduct investigations or engage in joint investigations with the Auditing Department and compile reports. The parties involved in illegal incidents shall be corrected and punished, and the recurrence of illegal incidents shall be prevented.	There were no violations that involved in legal compliance issues in 2018.
Society and economy	CCPG requires all departments to duly abide by laws and regulations. They are required to actively report illegal activities or notify the Legal Department to conduct investigations. Illegal activities may be reported by way of telephone, fax, letters, or emails (CCPGLG@ccp.com.tw).	Departments shall actively investigate violations in social or economic sectors along with the Auditing Department and formulate reports for filing. Departments shall review compliance issues for violations and response measures for preventing future violations.	There were no social or economic violations in 2018.
Environment	Each factory's Environmental Health and Safety Department Each factory's security guard booth Each factory provides grievance telephone and mailbox	After grievance cases are received, relevant units at the factory are notified to handle, then report processing status and follow-up results to each company's management levels.	There were 13 cases with penalties exceeding NT\$100,000 in 2018. (Please refer to 3.1 Environmental Management Policy)
Corporate human rights and labor conditions	Once any department, factory or individual discovers any cases violating human rights and labor conditions, it shall be reported through labor-management platforms, labor union organizations, telephone, fax, letters, or email (achiang@ccp.com.tw).	When factory directors or the company's human resources department are notified of grievance cases, they shall actively investigate and process the cases. If the grievance cases are proven to be true, the violating parties shall be held accountable according to work rules and relevant laws and regulations. In the case of false accusations and frame-ups, the complainants shall be punished according to the work rules.	There was no human rights or labor related grievance in 2018.

External Participation

CCPG actively participates in trade associations, academic societies, social gatherings and other non-profit organizations to enhance industrial development and progress through various exchange and sharing activities. In order to exercise specific influence and enhance the value of industrial chain, CCPG assigns managers, according to their expertise, to assume roles in related organizations and lead industry development or participate in academic research.

I. Signing the "Responsible Care Global Charter"

Upholding the spirit of "Caring for the Society and Taking Self-Discipline as Our Own Responsibility", CCPG's subordinate companies started signing the commitment and statement of Responsible Care Global Charter in 2000 and continued to improve chemical manufacturing industry's management systems in environment, health and safety (EHS) aspects, in accordance with international standards, to jointly promote social co-prosperity and sustainable development of chemical Industry in our country.

II. Participation in French EcoVadis Supplier Sustainability Ratings

EcoVadis is a third-party rating platform in France that promotes the sustainable development of the global supply chain. Its review method is constructed based on international CSR standards. CCP, CCPC, and DCC, the three parent companies of CCPG, participated in the EcoVadis assessment and won silver awards. They were also ranked among the top 30% of companies among more than 40,000 participating companies. CCPG uses a third-party platform to actively ensure the Group's fulfillment of corporate social responsibilities to achieve the goals of sustainable development.

III. Relevant Trade Unions and Associations

In 2018, CCPG participated in a total of 23 industry associations, 12 R&D associations and academic societies, and 37 other associations. CCPG also serves important roles in 17 organizations and the Group actively communicates with external entities to maximize benefits for sustainable development of the Group.

About This Report

Retrospect
and Outlook of
Sustainability
StrategiesKey CSR
Performance of
CCPG in 2018

Chapter 1

A Diligent,
Pragmatic, and
Integrity-Oriented
Enterprise

Chapter 2

A Trusted Material
Supplier

Chapter 3

A Sustainable
Producer that
Prosper with the
Environment

Chapter 4

An Enterprise that
Creates a Friendly
Workplace

Chapter 5

A Creator of
Value for All

CCPG Executive Board Chairman Lin Shu-Hong was awarded the "12th Pan Wen Yuan Award" from the Pan Wen Yuan Foundation on November 27, 2018 for his lifelong dedication to expanding chemical technology and innovative research in Taiwan. Under the leadership of Executive Board Chairman Lin Shu-Hong, CCPG developed multiple innovative processes and products and cultivated sustainable development for the environment and society, leaving a lasting impression on the chemical technology and industry in Taiwan.



CCPG President Lin Fu-Shen took over as Chairman of the Petrochemical Industry Association of Taiwan in August 2017 and leads the Association in active communication with the government and other associations.



CCPG received AXALTA recognition and received the Supplier of the Year award in 2018.



CCPC received the Excellence in Cost Supplier Award from Asahi India Glass Ltd. in 2018 which recognized our hard work.



CCPG received the Outstanding Supplier Award from Taiwan Semiconductor Manufacturing Company Limited in 2018.



CCPC received the Panasonic Business Partnership Award in 2018.

Industry Association

Chinese National Federation of Industries	<ul style="list-style-type: none"> Vice Chairman Huang Ho-Ching serves as Alternate Director President Chen Jung-Tsung serves as Alternate Director 	Petrochemical Industry Association of Taiwan	<ul style="list-style-type: none"> Chairman Liao Long-Shing serves as Executive Director President Chen Jung Tsung serves as Director President Su Shih-Kuang serves as Director President Lin Fu-Shen serves as Chairman
Taiwan Responsible Care Association	<ul style="list-style-type: none"> President Su Shih-Kuang serves as Director President Lin Fu-Shen serves as Executive Director 	Taiwan Paper Industry Association	<ul style="list-style-type: none"> President Chen Jung Tsung serves as Director
Taiwan Flat Panel Display Materials and Devices Associations	<ul style="list-style-type: none"> Assistant Vice President Tsai Jing-Jin serves as Director 	Taiwan Synthetic Resins Manufacturers Association	<ul style="list-style-type: none"> Chairman Liao Long-Shing serves as Director President Chen Jung Tsung serves as Supervisor President Su Shih-Kuang serves as Chairman
Taiwan Synthetic Resin & Adhesives Industrial Association	<ul style="list-style-type: none"> Executive Board Vice Chairman Chen Shien-Chang serves as Honorary Chairman Vice Chairman Huang Ho-Ching serves as Honorary Chairman President Chen Jung Tsung serves as Executive Director President Lin Fu-Shen serves as Director Senior Department Director Chao Huan-Chang serves as Occupational Safety Consultant 	Taiwan Chemical Industry Association	<ul style="list-style-type: none"> CCPG Executive Board Vice Chairman Chen Shien-Chang serves as Vice Chairman President Su Shih-Kuang serves as Convener of the Board of Supervisors

R&D Associations and Academic Societies

Chinese Petroleum Institute	<ul style="list-style-type: none"> President Chen Jung Tsung serves as Director 	Taiwan Nanotechnology Industry Development Association	<ul style="list-style-type: none"> Assistant Vice President Huang Kun-Yuan serves as Director
Taiwan Institute of Chemical Engineers	<ul style="list-style-type: none"> CCPG Executive Board Vice Chairman Chen Shien-Chang serves as Executive Director President Chen Jung Tsung serves as Director President Su Shih-Kuang serves as Director President Lin Fu-Shen serves as Director 		

Other Associations

The Third Wednesday Club	<ul style="list-style-type: none"> CCPG Executive Board Chairman Lin Shu-Hong serves as Director 	Straits Economic and Cultural Interchange Association	<ul style="list-style-type: none"> President Su Shih-Kuang serves as Director
Taiwan CIO Association	<ul style="list-style-type: none"> Manager Huang Chih-Shan serves as Supervisor 	Miaoli County Fire Department Association	<ul style="list-style-type: none"> Chairman Liao Long-Shing serves as Consultant
Cross-Strait CEO Summit	<ul style="list-style-type: none"> CCPG Executive Board Chairman Lin Shu-Hong serves as Alternate Director 	Taipei Accounting Association	<ul style="list-style-type: none"> President Su Shih-Kuang serves as Vice Chairman

Note: Refer to Appendix A for a list of trade unions and associations in which the Company does not serve important roles.



Chapter 2

A Trusted Material Supplier

2.1 Kinetic Energy of CCPG Products

2.2 Responsible Chemistry

2.3 Sustainable Supplier Management

Expertise and products in chemical materials are CCPG's core capabilities that allow them to prosper and facilitate innovation and transformation of other industries for low-carbon emissions and sustainable future. Responsible chemistry is fused within CCPG's DNA. We adopt green manufacturing process, products, and workplace safety management and team up with customers and suppliers to play our roles in the value chain and maximize the benefits and value of green materials.

2.1 Kinetic Energy of CCPG Products

CCPG aims to be a trusted material supplier. We have established comprehensive quality policies, strengthened manufacturing process controls, ensured the product quality and stable supplies, valued each requirement and idea of customers, implemented strict management of chemicals and products, and actively invested in innovation and development in order to continuously provide customers with high-quality products.

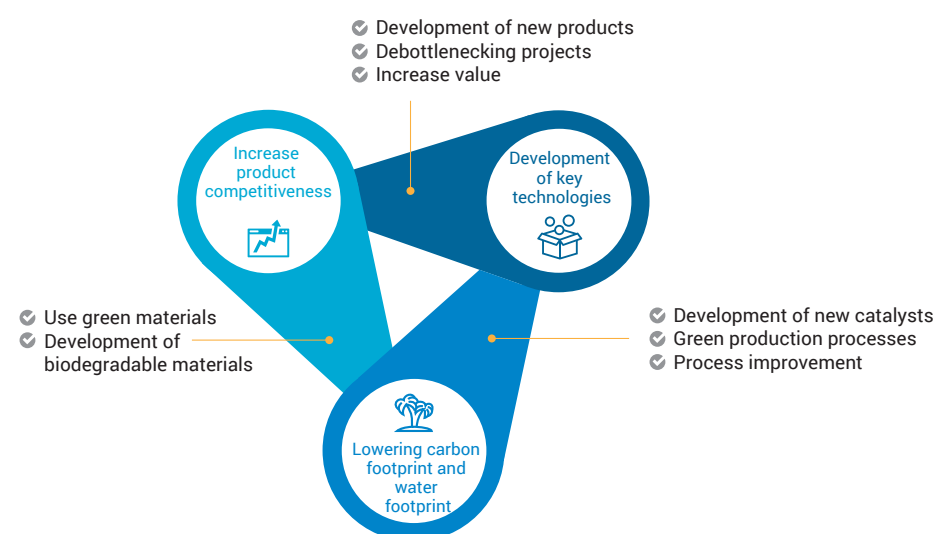
2.1.1 Green Processes and Products



As Taiwan's second largest chemical industrial group, CCPG's products range from engineering plastics, chemical electronic materials, plastic additives, adhesives, medical intermediates, industrial intermediates, and resins. Although we work hard to integrate the upstream and downstream supply chain and independently develop the necessary materials and chemical intermediates for products, certain materials must be purchased from external sources or produced from purchased materials. The supply chain has not been integrated. In addition, materials, chemical intermediates, and products rely on traditional petrochemicals and many processes employ strong acid, alkali, or solvents and chemicals that may negatively impact the environment.

The rise of environmental awareness and social responsibility in recent years has led to severe challenges for CCPG and related domestic industries for environmental protection and sustainable development. They are also important challenges that we must face.

CCPG's challenges and solutions

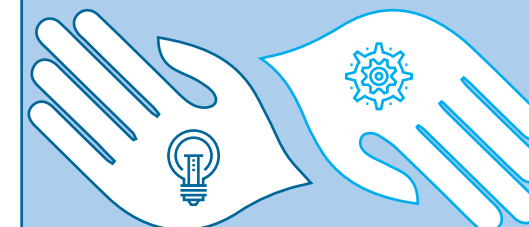


Research and development are important for CCPG. We have established the Innovation Research Division and Application Development Division under the CCPG Executive Board and CCPG factories across Taiwan have also established R&D Departments to continue advancement in innovation through the internal value chain. It also takes into account its economic, energy, environmental, process safety, and social responsibilities to actively develop byproducts that make full use of the process, products from waste materials, and non-petrochemical plastic products based on its core value of sustainable development. CCPG also seeks to improve the process to produce initial/intermediary materials and use energy/resource integration and green chemical technologies to achieve a circular economy.

CCPG R&D Teams' Missions

Innovation Research Division

R&D plans for new products, progress tracking, implementation of evaluation on results, instructions and reviews of patent and intellectual property rights applications for new products and processes.



Application Development Division

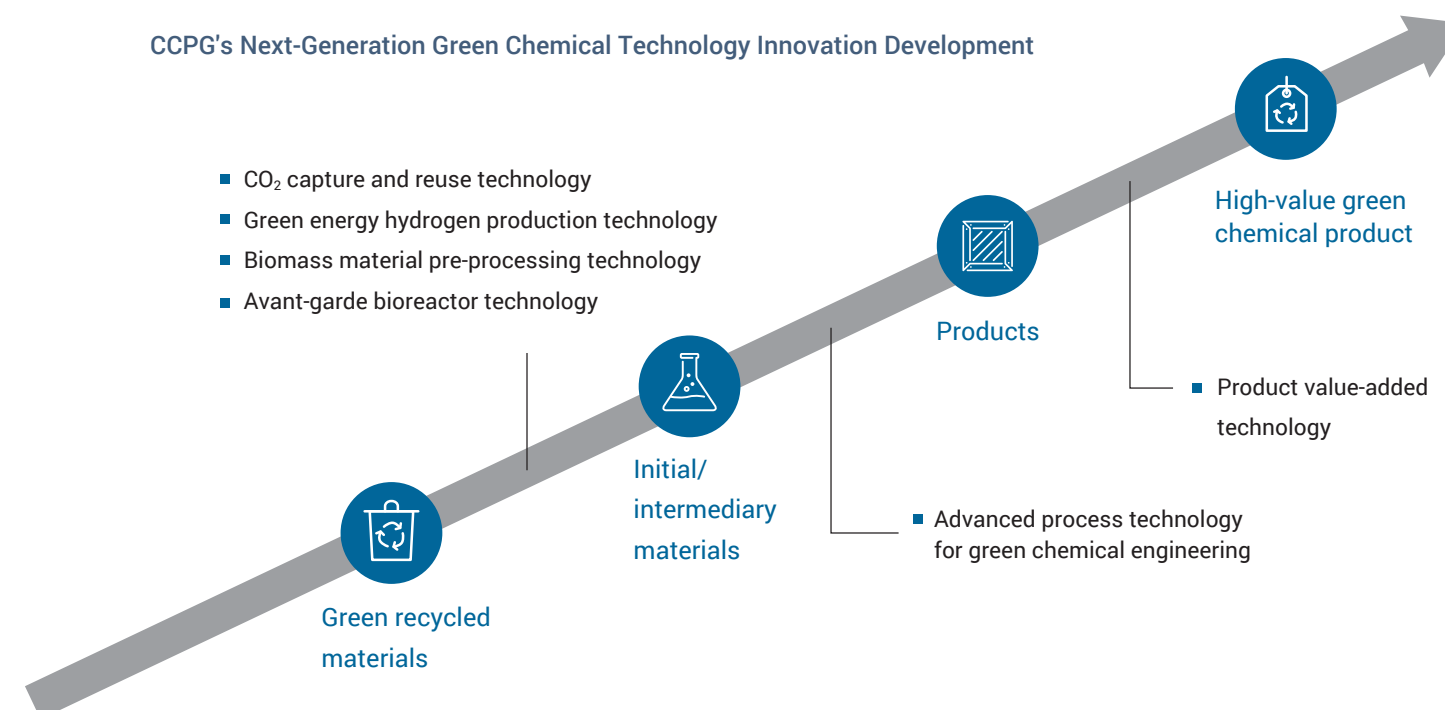
Application and development plans for existing products, progress tracking, implementation of evaluation on results, instructions and reviews of patent and intellectual property rights applications for existing products and processes.

CCPG continues to invest resources in research and development. The amount of research and development investment in 2018 reached 2.3% of the net profit before tax and it obtained a total of 830 patents. CCPG also actively implements industrial and academic cooperation and alliances with strategic partners. It invests more than NT\$32 million each year and its partners include Tsinghua University for which the Forward-Looking Industry and Academia Collaboration Plan is heading into the fifth year, as well as National Taiwan University, National Chiao Tung University, National Central University, National Chung Hsing University, Yuan Ze University, Chung Hua University, Taiwan University of Science and Technology, Chung Cheng University, Industrial Technology Research Institute, Plastic Industry Development Center and Food Industry Research and Development Institute, etc. CCPG has adopted green chemicals process improvement, and biomass materials as development targets to help the Group develop new high added-value products, improve core technologies of existing products, optimize existing processes, and improve the expertise of researchers of the Group. CCPG's main innovation and results shall be described later in this Chapter.

2018

	CCP	CCPC	DCC
Number of CCPG patents obtained in 2018	20	37	2
Number of CCPG patents accumulated	430	310	89

CCPG's Next-Generation Green Chemical Technology Innovation Development





CCPG shall enter sectors including renewable energy, biomass materials, and medical and healthcare materials. In addition to building green technologies from upstream resources to downstream products, CCPG shall also use the development of valuable technologies in green energy, biomass processes, and products such as carbon capture, reduction of volatile organic compounds (VOCs) and toxic waste, development of catalysts to improve process efficiency, and R&D and certification of biodegradable materials. We shall build technology niches so that CCPG's product line would not only maintain or reach its top position in the world but also obtain advanced opportunities in the transition of shale gas and chemical processing of coal and become a benchmark enterprise in responding to climate change.

Green Processes and Green Product Applications

1,4-Butanediol (BDO)

➔ Use in biodegradable plastic raw materials

The polybutylene succinate (PBS) a next-generation biocompatible and biodegradable green material made from the polymerization of succinic acid and BDO produced by CCPG. It is safe and non-toxic and it can be degraded by multiple types of microorganisms in the natural world to ultimately form carbon dioxide and water that helps reduce ocean waste.

Reuse of CO₂

➔ Acetic acid production

CCPG has developed a unique acetic acid manufacturing process. CCPC's Mailiao Factory collects the CO₂ emitted by nearby factories in their production processes as the materials for acetic acid with an annual production of 600,000 tons to replace the existing coke pyrolysis process while reducing CO₂ emissions and air pollutants. The CO₂ recycled for use in the process totaled 98,191 tons in 2018 as the Group succeeded in recycling waste.

Reuse and recycling of thinners and developers used in semiconductor/optoelectronics industries

We developed the thinners and TMAH developers (tetramethylammonium hydroxide) recycling and reuse technologies to help semiconductor/optoelectronics industries process waste liquid thinners and developers and use purification procedures for recycling to achieve a circular economy. This recycling technology also helps customers reduce TMAH contents to meet national standards.

Gamma-Butyrolactone (GBL)

➔ Usage as lithium battery liquid electrolyte

GBL was regarded as process waste. In response to the development of the circular economy, process waste reduction requirements, and the power battery industry in recent years, the current design process refines GBL into products for sale. It can be compounded to form N-Methyl-2-pyrrolidone (NMP) which is used as materials for the liquid electrolyte of lithium batteries. Power battery production has grown rapidly in recent years. The rise of new energy policies and energy storage projects for transportation and mobile communication would also help growth in the energy storage battery market.

Polyvinyl alcohol (PVA)

As calls for reduction of plastics grow increasingly strong, plastic packaging and plastic straws for beverages have become the focus of reforms. PVA has good physical and chemical attributes (it can be dissolved in water, made into film, and become biodegradable) and it is one of the best choices for materials for environmentally friendly packaging.



Detergent packaging



Paper straw

Vinyl acetate emulsion (VAE emulsion)

➔ Usage in eco-friendly and low-VOC paint

VAE emulsion can be used to produce waterborne emulsion paint which replaces traditional indoor paints and drastically reduces the health and environmental impact of VOCs. The waterborne paint product was awarded the national certification for Green Building Material and its VOC content (VOCs 1.4g/L) was far lower than EU standard of 30g/L (flat).

We also used new technologies to improve the VAE emulsion paint so that it can absorb and counter the formaldehyde in the air after it is painted on indoor walls. It can remove up to 90% of the formaldehyde.

Vinyl acetate emulsion powder (VAE powder)

➔ Usage in energy conservation in buildings

VAE powder can be used in the exterior insulation finishing system (EIFS) to effectively insulate the building to prevent unnecessary waste of energy and improve energy efficiency.



Epoxy

➔ Applications in large-scale offshore wind turbine blades

Wind is natural energy. The epoxy we developed can be used in large-scale offshore wind turbine blades with an installed capacity of more than 6MW. Each turbine can reduce approximately 14 tons of CO₂ emissions each year to provide a cleaner source of power.



Coating resin

The reduction of VOC emissions is important to resolving the current air pollution and the industry has converted solvent-borne coating to waterborne coating.

CCPG is committed to using resins in the waterborne coating to develop high solids and low viscosity coating resin and powder coating resin to avoid polluting water. It also uses biomass materials whenever possible to lower CO₂ emissions.

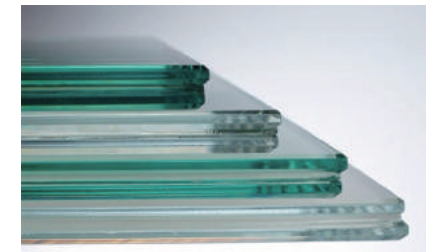
The directions of environmentally friendly development of resins for coating are as follows:

- Waterborne coating: Water-based epoxy, water-base amino resin, water soluble polyester resin coating, and water-based acrylic resin
- High solids low viscosity coating: New liquid epoxy
- Powder coating: Solid type epoxy resin and polyester resin
- Formaldehyde-free amino resins
- The use of biomass materials: Materials extracted from plants

Polyvinyl butyral film (PVB film)

➔ Applications in automobile and construction safety glass

PVB film is used in automobiles and construction safety glass. We will develop films with sound and heat insulation functions in response to future market demands.



Building film



Automotive film

Electrodeposited (copper foil)**➔ Applications in electric vehicles and lithium energy storage batteries**

CCPG is currently one of the world's largest producers of electrodeposited copper foil. The electrodeposited copper foil is used in the lithium battery industry and the batteries are used for electric vehicles and hybrid vehicles as well as energy storage system (ESS) industries that make energy consumption more efficient. In response to rapid growth in the EV and ESS market, CCPG shall continue to expand production and conduct additional research and development to increase the quality of copper foil to facilitate the increase in the energy density of lithium batteries in the future.



Electric vehicle market

Increase the value of polytetramethylene ether glycol (PTG) products

The development of PTG is trending toward thermoplastic elastomer (TPEE) and thermoplastic polyurethane (TPU) and researches are focused on energy and resource conservation and reuse. The waste acid produced in the production process of PTG can be refined into sulfuric acid and it meets the ideals for a circular economy.

Acetaldehyde transformation

CCPG reprocesses acetaldehyde produced in the manufacturing process and into acetic acid. It reduces the effluent or process required for 3,200 tons of acetaldehyde and it meets the ideals for recycling and reusing resources.

Research and development of the halogen-free polybutylene terephthalate (PBT)

In response to recent demands for halogen-free materials in the Chinese market, CCPG has improved the performance of halogen-free products for promotion in the market.

Low-VOC powder

Develop low-VOC powder for use in algae mud paint decoration materials that reduce VOC emissions by 60-80%.

Recycling waste side materials from soft PCB

CCPG Hsinchu Factory provides different types of waste side materials from soft PCB to customers to reuse our waste side materials, help customers with tests for new products, and contribute to the circular economy.

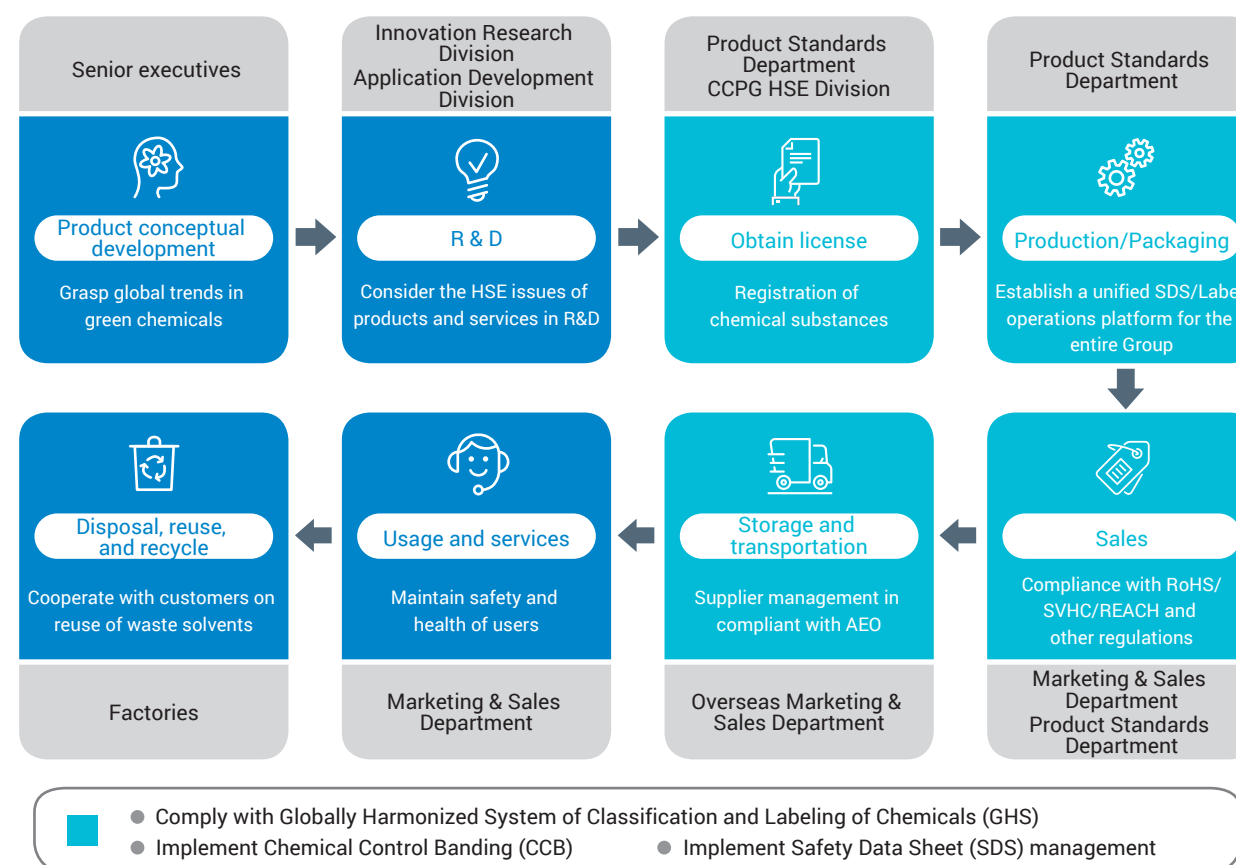
2.1.2 Chemical Management

For chemical management, CCPG prioritizes legal and regulatory compliance above all and it focuses on product compliance to satisfy customer demands and confidence in products. CCPG HSE Division is responsible for ensuring that products meet regulations on chemical products in the place of production while the Product Standards Department is responsible for ensuring that products meet the regulations of countries where they are sold. Affiliate companies of the Group can consult CCPG HSE Division or Product Standards Department through the IT system, on the telephone, or in person to quickly learn about the compliance status of products.

Countries administer chemical registration to implement the goals of the Strategic Approach on International Chemicals Management (SAICM) for 2020. The key to attaining the goals of the Product Standards Department for 2020 is to actively participate in the chemical registration in various countries to learn more about the hazards of the products of the Group and carefully deliver information on the hazards to downstream customers.

Internal management procedures for chemicals

We established a sound chemical management system. The process starts from the inventory of products and materials and clarifies the Group's internal operating procedures from pre-registration assessment and identification of chemical substances to the registration of the scientific data of the substances and the completion of the safety assessment of the chemical. As of today, we have completed the registration or entry of dozens of chemicals in the EU, China, and Taiwan. We also have multiple chemicals in Korea for which we must complete regulatory obligations before the statutory period in order to provide customers with product compliance protection.

CCPG Chemical Management Value Chain

CCPG HSE Division promotes chemical management models in each factory every year and it continues to update the chemical operation lists and information on substances in various factories to construct a system platform that integrates procurement, storage system for replenishing finished products, and missing information for chemicals in raw materials. A toxic chemical substances certification management platform is also established to control the compliance measures for toxic substances in import/export. CCPG has established a regulatory database on chemicals and management mechanisms for low amounts of toxic substances in 2018. The system provides information for production and management units to identify the risks of chemicals and evaluate the management of such systems to prepare related management measures in advance and meet requirements for legal compliance.

Management mechanisms for low amounts of toxic substances

Low amounts of toxic substances refer to cases where the total amount of toxic chemical substances in operations is lower than the minimum level for management and control specified in the "Toxic and Concerned Chemical Substances Control Act". In the purchase request terminals in the procurement system, we require the entry of the CAS No. of the chemical when an applicant requests the purchase of low amounts of test samples or drugs for the system to determine whether it is toxic and provide an alert for management and control. We plan to establish a management system for low amounts of toxic substances (scheduled for completion in 2019) to manage the purchase volume, usage volume, and storage volume and ensure compliance with regulations.

Results of chemical registration/entries in 2018

In 2018, the Product Standards Department completed the REACH registration of two products and four materials to ensure that products meet REACH requirements. In addition, the Act on the Registration and Evaluation of Chemical Substances of Korea (K-REACH legislation) is currently being amended and pre-registration will begin in the first half of 2019.

Results of material suppliers' REACH compliance survey

Based on the results of REACH surveys from materials suppliers, approximately 30% of the suppliers met REACH requirements and 70% of the suppliers did not meet REACH requirements. The main reason for the noncompliance was that their markets are not in the EU. Therefore, the Company must register certain materials independently or seek alternative suppliers that meet REACH requirements.

Results of the establishment of the toxic chemical substances certification management platform

The toxic chemical substances certification management platform is a web-based management platform developed independently by CCPG. It was launched in 2018. CCPG factories can upload toxic chemical certifications (including permits, registration documents, and approval documents) to the management platform to effectively manage toxic chemicals and meet compliance requirements.

Results of the database of regulations on chemicals

CCPG has conducted an inventory of chemical substances listed for management by regulations of competent authorities (Environmental Protection Administration, Occupational Safety and Health Administration, and Ministry of Economic Affairs) and integrated a list of management items in the Company's ERP system under "Chemicals Regulations". It is connected to the procurement system to provide chemicals regulations notices so that applicants and procurement personnel can receive alerts before purchases. The Group also established the statistical functions for chemical regulations and usage which are used for reporting to competent authorities. It also provides a system of the legislation for chemical substances for employees to reduce the noncompliance risks for chemicals.

Employee workplace safety management

CCPG conducts education and training sessions on chemical management each year and assesses the employees' risks of exposure in the production process. It then adopts measures such as substitution, isolation, engineering controls, and personal protection equipment to eliminate the possibilities of exposure to chemical hazards. It also follows regulatory requirements to classify risks into different levels and consolidate the reporting items. The goal of the aforementioned chemical management mechanisms is to impose "zero harm" to employees. Qualified agencies are consigned to perform at least two inspections on the operating environment each year to protect the health and safety of employees. Please refer to 4.3.2 Healthy Workplace for detailed description.

Product safety and customer service

International regulations on the management of chemicals change rapidly and customers may request to understand product compliance at any time. As related regulations on hazardous substances across the world grow increasingly strict, in addition to regular analysis and inspection equipment, CCPG also established ICP-OES, ICP-MS, GC/MS, and LC/MS analysis instruments to help customers take care of the inspection tasks of harmful materials. A set of rigid management mechanisms have also been established for the chemical transportation process. Please refer to 2.3.2 Supplier Management System for detailed description.

In addition to restricted chemical products, a few of CCPG's products have been listed or will be listed as precursors of psychotropic substances. To demonstrate and fulfill corporate responsibilities, CCPG, members of the industry, as well as industrial associations have begun to adopt global independent management to prevent illegal use and proliferation and effective management from production management to investigations on the use of the end customer have been implemented. In 2018, CCPG reviewed the implementation plans for market supervision and operations of the European Chemical Industry Council with Taiwan Responsible Care Association and members of the industry.

2.1.3 Product Quality Management

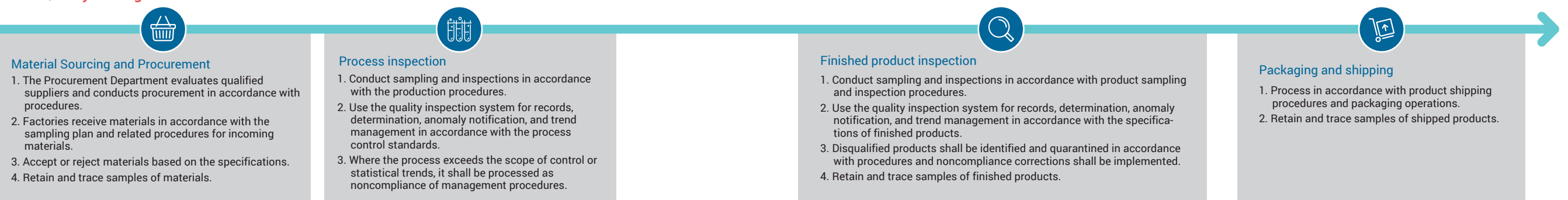


"Product quality and safety" management approach



CCPG upholds the quality policy of "continue improvements, honor commitments, improve quality, and satisfy customers" to provide customers with satisfying products and services. To ensure stability in quality and supply, we implement rigorous quality management to strengthen control of the production process and we have established a supplier management system (refer to 2.3 Sustainable Supplier Management System for details) to promote sustainable development of the supply chain.

Quality Management Procedures





"Quality" is of great importance to customers and the Group. CCPG QA Division establishes a quality goal each year and reviews related quality issues and improvements in system execution with quality assurance managers of all factories each month. In addition, we also use monthly management meetings in factories and production and sales activities for various products to explore quality improvement plans, new product development, and the development of new specifications for existing products. We hope to use continuous improvements for innovation and R&D to improve product quality and competitiveness and increase customers' trust and satisfaction with our products.

CCPG has a comprehensive traceability management system that uses codes or batch numbers to track raw materials from entry and semi-finished products to product shipping and other production stages. Any anomaly in any stage can be traced upwards. CCPG maintains comprehensive control over materials usage and production processes to improve the efficiency of processing anomalies and achieve rigorous and comprehensive product quality assurance purposes.

Enhance quality education

To cultivate a culture of quality in CCPG and continue to enhance employees' professional skills for quality, the Group organized 11 sessions of the 8D Problem-Solving courses in 2018. CCPG plans to organize training for the Seven Basic Tools of Quality and Statistical Process Control (SPC) in 2019. The courses above are included in the personal career development plans of quality assurance personnel to cultivate quality assurance talents for CCPG.

Product certification

All CCPG products have obtained quality management system (ISO 9001: 2015) certification. We have received the IATF 16949 automobile quality management system certification for CCPC Miaoli Factory, CCP Kaohsiung Factory, CCPC Mailiao Factory, and CCJS which produce products for the automobile supply chain to pursue high-quality products and services.

CCPG ISO 9001 certificate



Quality system audit

We adopted topic-centric and ad hoc internal and external audits (at least one audit for each factory each year) and unscheduled audits by customers to review the effectiveness of the Group's quality management system and use PDCA for review and continuous improvements. In 2018, we also organized 15 mutual audits across borders and between factories to facilitate exchanges between business personnel, share quality management experience, and enhance operating procedures. We organized 29 sessions of supplier audits to work with suppliers to improve product quality and reduce potential risks.

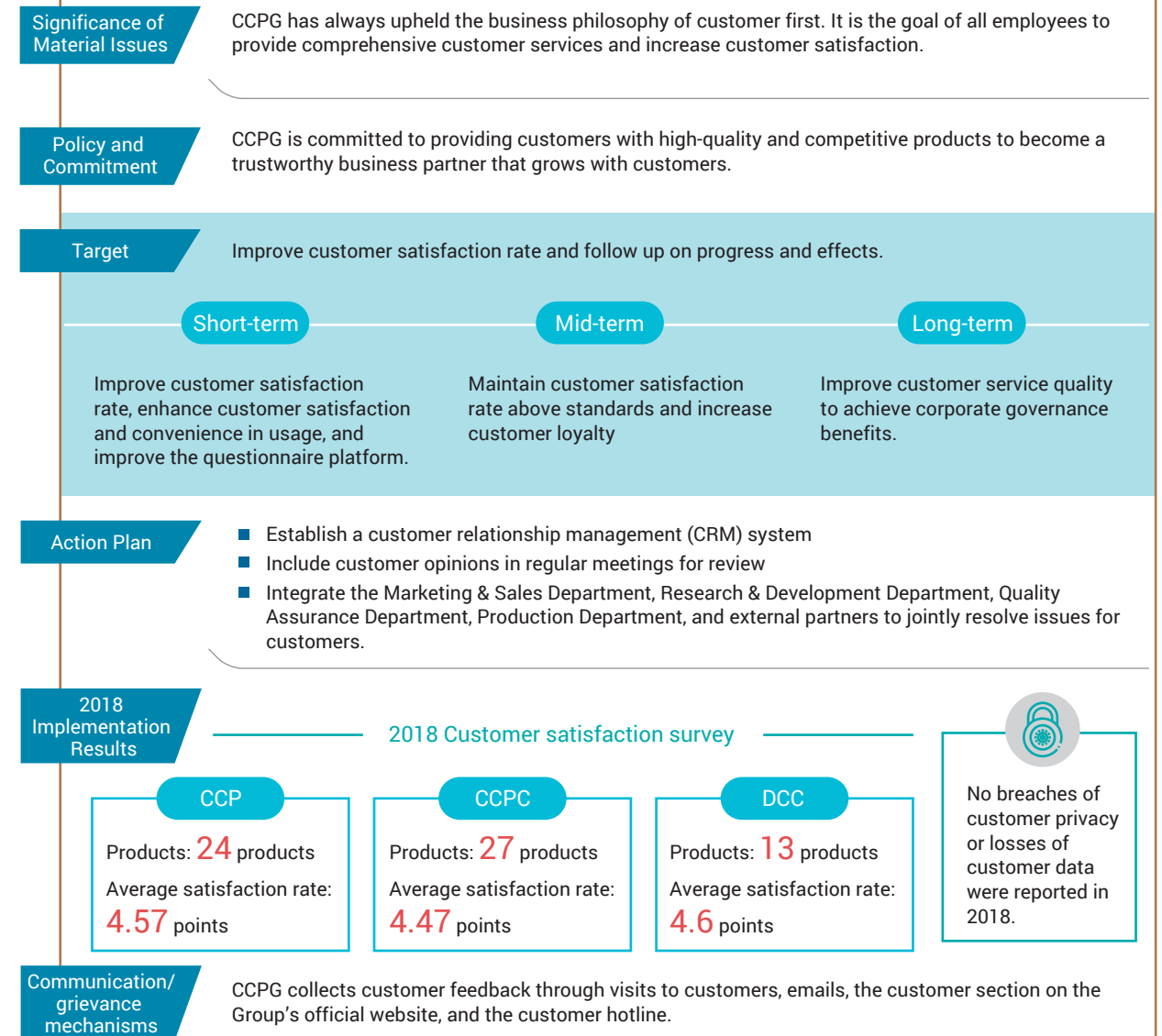
Product safety and labeling

CCPG products are tested for substances of very high concern (SVHC) based on the REACH regulation of the EU as well as RoHS requirements for hazardous substances in electrical and electronic equipment. In addition, certain products (e.g. food-grade PBT plastic engineering materials produced by CCP Kaohsiung Factory) have obtained GMP certification (EC No. 2023-2006) and meet BPA-free, FDA 21 CFR 177.2600 and EU 1935/2004 toxicity characteristic leaching procedure standards. They can thus be used in food containers and cosmetics. CCPC Miaoli Factory's PBF products obtained the Product Safety Representative (PSB/PSR) certificate in 2018 and met related requirements in VDA 6.3. The Factory provided outstanding product quality to the European vehicle supply chain.

CCPG is committed to the goal of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) to reduce the harm of chemicals on humans and the environment. We are aware of the development of related policies and the Product Standards Department and Safety & Health Department are responsible for planning and implementing the Group's related GHS procedures and operations including the establishment of GHS hazard classification for all products, SDS and labeling compilation tasks, and regional emergency response consultation telephone lines. CCPG also provides SDS in accordance with its global operation strategies and legal requirements of local nations as the basic requirements for product sales and provides customers with correct product safety information (refer to 2.1.2 Chemicals Management). There were no violations of laws or regulations in product safety labeling in CCPG in 2018.

2.1.4 Customer Communications and Services

Management approach for "customer relationship management"



Good customer communication

CCPG places great emphasis on a customer-oriented quality cycle system and the management of customer relations. We periodically use customer visits, customer satisfaction surveys and customer opinion forms for periodic tracking to maintain good communications with customers. We use customer feedback for corrections or development to reduce errors and customer complaints. We also formulate response strategies from the customer's perspective and use operations, R&D, quality assurance units, and even external partners to jointly explore the reasons for customer complaints and create maximum social value for both CCPG and customers.

We aim to become a trustworthy business partner that grows with customers. To strengthen customer relations, we have adopted the communication methods described above and actively participate in important international exhibitions such as CHINACOAT, CHINAPLAS, India Chem, and Glasstec in Germany to communicate market information with customers face-to-face and establish spontaneous communication channels.

CCPG's official website provides customers with a platform for the exchange of opinions, requests for information, and requests for quotations. In addition, we shall also use this platform to quickly process customer questions and opinions. The latest information from CCPG will also be announced on the website for customers to obtain important information from us at all times.

Product Information Disclosure

The Group's website provides customers with clear and detailed product information for each industry and product type. Customers can obtain information on the features, specifications, and applications of the Company's products and download digital catalogs and related certifications. If customers wish to request product specifications and chemical safety information or if they have any questions regarding products, they can also submit their requests and opinions on the website and the responsible units shall respond to related messages.

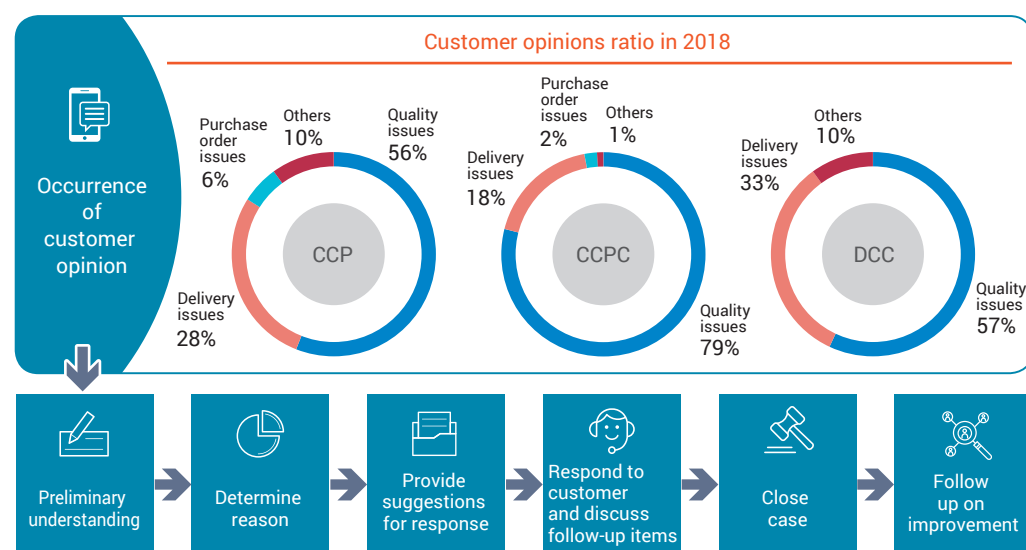
CCPG Digital Catalog



Processing Customer Opinions

To learn about customers' valuable opinions, the Group has established clear customer complaint channels, product return and replacement procedures, and compensation application procedures. We collect customer feedback through visits to customers, emails, the customer section on the Group's official website, and the customer hotline. All related opinions are registered in the customer opinion system and the reason and progress of opinions. Related units designated by supervisors are responsible for analyzing the causes from different levels, responding to customers as quickly as possible, and submitting adequate improvement plans. CCPG formulates improvement measures based on data from the customer opinion system to prevent the same issues from recurring.

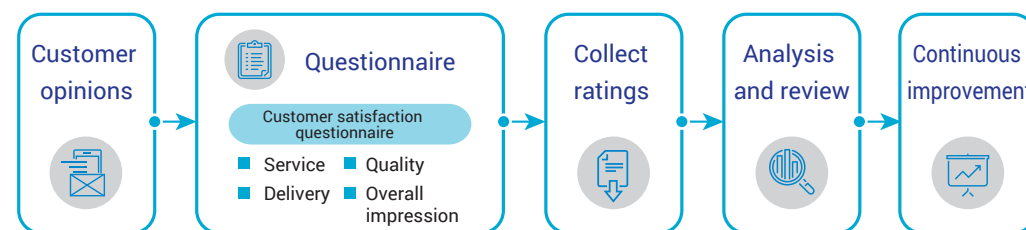
Customer Opinion Processing Procedures



Customer satisfaction survey

CCPG values customer opinions and it conducts a customer satisfaction survey every year. The customers surveyed the top ten customers in terms of sales volumes or customers who have filed complaints in the current year. The four main topics covered in the surveys included service, quality, delivery schedule, and overall impression. We inspect whether products and services meet customer expectations. We also collect opinions for continuous improvement. Customer satisfaction is the highest principle and we seek to maintain good relationship and communication channels with customers.

Customer satisfaction survey model



Note: The overall average of each item is adopted and the top total score is 5 points.

Starting from 2018, the products for customer satisfaction surveys are adjusted to: 24 products for CCP, 27 products for CCPC, and 13 products for DCC. CCPG strictly controls customer information. Please refer to the Management Approach in Customer Relationship Management for achievements in 2018. CCPG did not infringe on customer privacy or lost customer information in 2018. Please refer to 1.2.2 Risk Management for related practices.

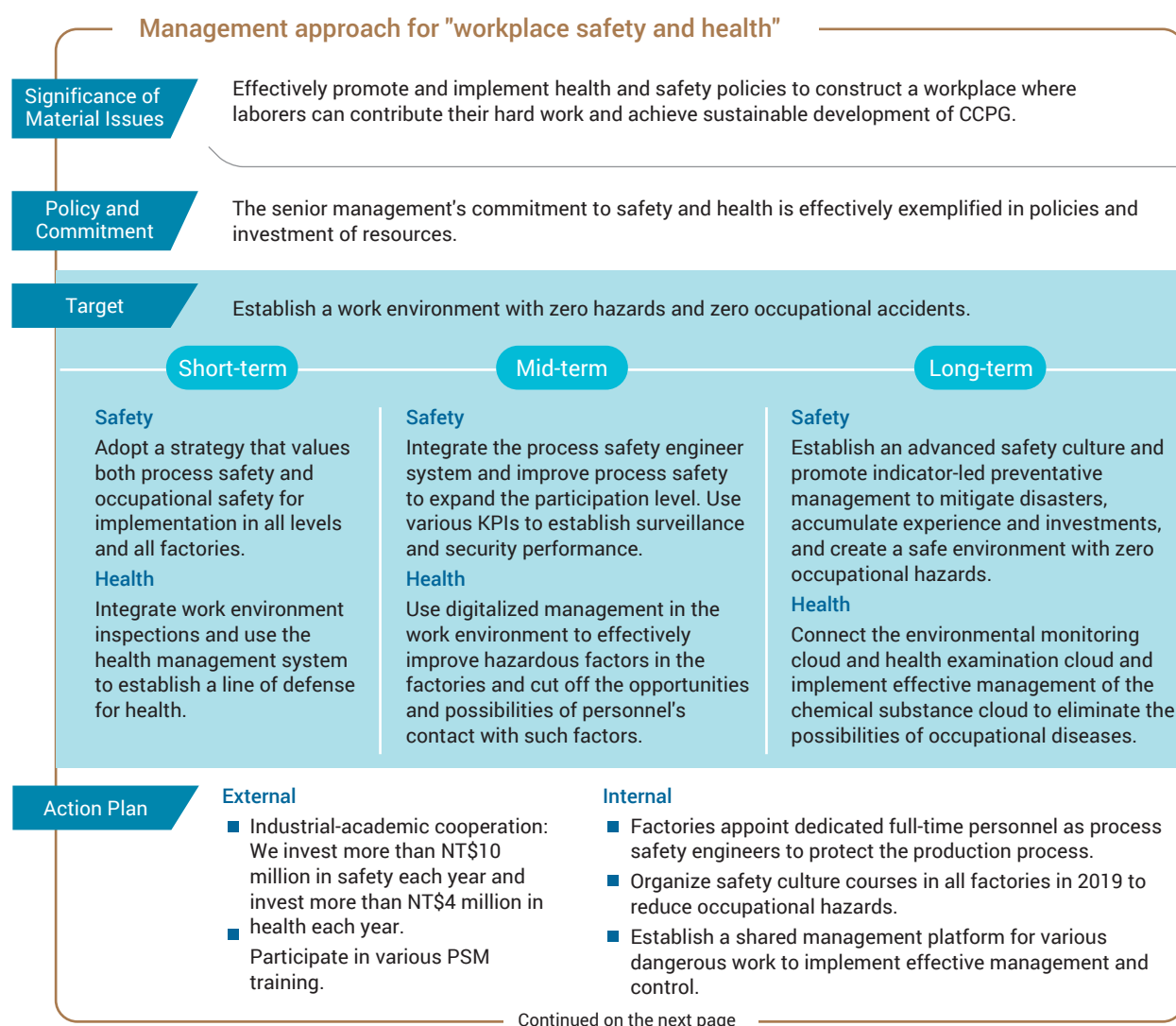
2.2 Responsible Chemistry

Responsible care is the voluntary commitment of the global chemical industry for continuous improvement of its performance in environmental protection, health, and safety. CCPG identifies with and supports responsible care. It also actively internalizes the chemistry spirit into the Group. We implement ESH policies and process safety management (PSM) in the three companies of the Group and continues to make improvements toward the goal of zero incidents. CCPG also hopes to expand the entire product cycle into CCPG's responsible care system.

2.2.1 Workplace Safety



To build a safe work environment for the Group, CCPG's Taipei Office and factories (including six overseas factories) have passed occupational health and safety certification (OHSAS 18001) and factories in Taiwan have passed Taiwan Occupational Health and Safety System (TOSHMS) certification. In addition, the Occupational Health and Safety System (ISO 45001:2018) was announced on March 12, 2018. We shall proceed with the version upgrades in 2019 and complete the certification in 2020.



Continued on the next page

Continued from the previous page

2018
Implementation
Results

Safety

- Integration of the CMMS system and establishment of accumulated process safety information
- Integrate and optimize MOC to prevent risks derived from changes.
- Implement incident reporting, investigations, transparent management, and experience sharing.
- Establish a safety monitoring system to manage high-risk operations.
- Establish a seed instructor system.

Health

- Complete the operations, tendering and acceptance regulations for the Group.

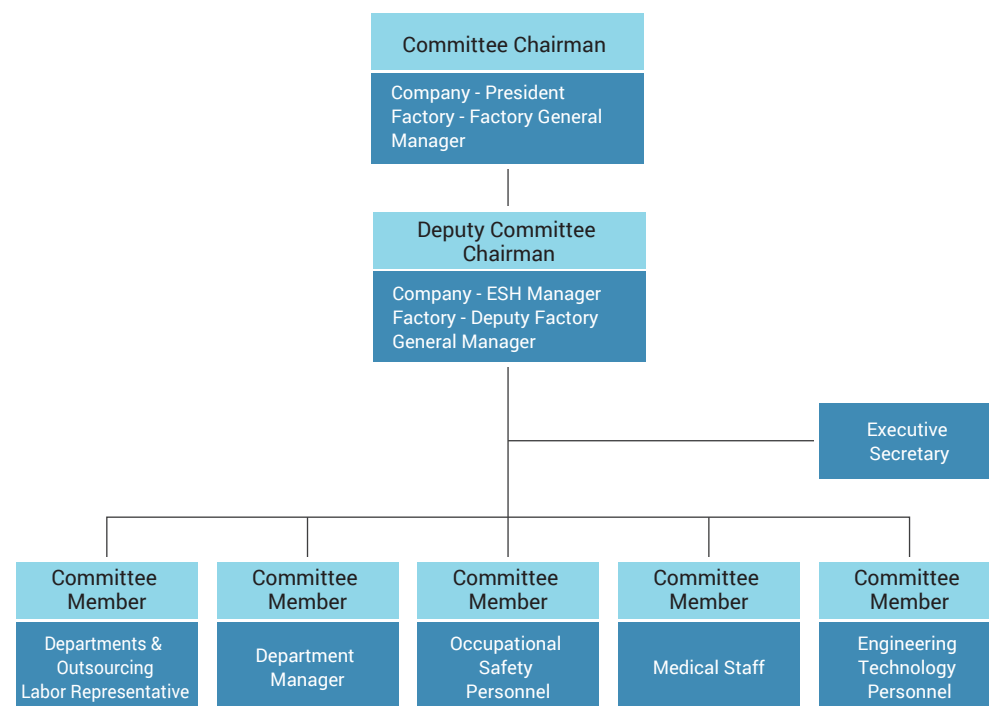
Communication/
grievance
mechanisms

If a factory discovers any ESH issues or injustice, they can report to the safety and health supervisor of the factory. If comprehensive issues are discovered, they can be reported to the CCPG HSE Division to ensure effective resolution.



Advancement of the Workplace Safety and Health Committee

CCPG values workplace safety and promotes culture and system of safety through committees of different levels, meetings and employee engagement that allow the safety policies to be implemented in the work of every employee and optimize the safety system based on feedback from employees. We have established and implemented the "Regulations on the Operations of the Workplace Safety and Health Committee" and established Workplace Safety and Health Committees of the Group and various factories. The table shows the number of members and the percentage of staff members of the companies and factories in 2018. The Safety and Health Committee is responsible for drafting, coordinating, and supervising affairs related to the environment, safety, sanitation, and health in the factories. They shall also organize quarterly meetings of the Workplace Safety and Health Committee to facilitate employee consultation and participation.

CCPG Workplace Safety and Health Committee Organizational Structure



CCPG Occupational Injury Statistics from 2016 to 2018

Region	Company	Operations	Total Number of Safety and Health Committee Members	Committee Staff	Percentage of Committee Staff
 Taiwan	CCP	Taipei Office	13	9	69%
		Hsinchu Factory	30	14	47%
		Changpin Factory	12	4	33%
		Mailiao Factory	17	7	41%
		Kaohsiung Factory	24	9	38%
		Dafa Factory	22	8	36%
	CCPC	Taipei Office	15	9	60%
		Miaoli Factory	42	14	33%
		Mailiao Factory	24	10	42%
		Dafa Factory	22	8	36%
	DCC	Taipei Office	13	9	69%
		Mailiao Factory	16	6	38%
		Dafa Factory	23	9	39%
 overseas	DCCJS		30	18	60%
	DCCM		10	9	90%
	CCZZ		24	10	42%
	CCJS		93	91	98%
	CCSG		23	13	57%
	CCPJ		15	13	87%

Note 1: A total of 53 occupation injury incidents (including offsite traffic accidents) occurred in 2018 and they have all been included for management and references as the basis for optimization and improvements.

Note 2: Please refer to Appendix B for the statistics on the number of occupational injuries of CCPG companies in 2018

CCPG Occupational Injury Statistics from 2016 to 2018

Year	2016			2017			2018		
Gender	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total occupational injury incidents (number of cases)	33	2	35	37	3	40	28	6	34
Traffic accidents (number of cases)	9	2	11	23	3	26	18	1	19
Injury rate (IR)	0.52	0.31	0.49	0.71	0.43	0.67	0.55	0.51	0.54
Absentee rate (AR)	0.33%	0.28%	0.32%	0.36%	0.24%	0.34%	0.26%	0.28%	0.27%
Lost day rate (LDR)	44.46	13.31	40.14	34.47	3.29	30.02	7.68	11.93	8.27
Deaths	0	0	0	1	0	1	0	0	0

About This Report

Retrospect
and Outlook of
Sustainability
StrategiesKey CSR
Performance of
CCPG in 2018Chapter 1
A Diligent,
Pragmatic, and
Integrity-Oriented
EnterpriseChapter 2
A Trusted Material
SupplierChapter 3
A Sustainable
Producer that
Prosperes with the
EnvironmentChapter 4
An Enterprise that
Creates a Friendly
WorkplaceChapter 5
A Creator of
Value for All



Occupational injury description

The reasons for occupational injuries in CCPG factories include falling, injuries and burns caused by mechanical operations, and spillage of chemicals inside the factories. Outside the factories, traffic accidents are more common. A total of 19 offsite traffic accidents occurred in 2018, down 7 from 2017. In response to traffic accidents, we educate employees on traffic safety on the way to and from the workplace in the department safety and health meetings to remind employees that they must develop defensive driving skills. The companies encourage employees to carpool or take shuttle buses instead of riding motorcycles so as to prevent traffic accidents from reoccurring. To prevent personnel from inside the factories from injuries inside factories due to operations of machinery and equipment, we provide education on standard operating procedures for employees and modifications and require them to wear personal protective equipment. We also review the Job Safety Analysis (JSA) of the operation and establish the most suitable risk mitigation measures (e.g. amendments to the standard operating procedures or corrections to the equipment) to prevent similar accidents from recurring.

Promote a seed instructor system

To strengthen employee safety and their occupational safety awareness and build a solid foundation for the process safety and management system based on occupational safety, CCPG began implementing a seed instructor training system with industrial safety education materials in 2018. The CCPG Executive Board Chairman and CCPG HSE Division Director served as instructors for 3-6 personnel from each factory ranked senior engineer or above that have correct occupational safety knowledge, good public speaking skills, and more than five years of related experience in process, equipment, technology, and occupational safety. They serve as seed instructors after they qualify for tests in the training program.

Seed instructors provide education on the Group's "industrial safety and health education materials" to all employees of each factory at least once every year to improve their knowledge in industrial safety and health. Additional training is provided for the construction of new factories, annual overhauls, and other special conditions to ensure that related personnel understand and abide by safety operation standards and reduce occupational hazards.



Executive Board Chairman Mr. Lin provides training for seed instructors of all factories



The seed instructors provide training for employees of the factories and contractors

Workplace disaster prevention and processing

We use statistics to analyze the cause of accidents and the results of investigations and formulate prevention plans for accidents that have already occurred in various workplace safety meetings. We then use safety and health hazard identification and risk assessment methods to uncover potential harm and implement control in order to protect the safety and health of employees.

Operating procedures of safety and health hazard identification and risk assessment



CCPG is committed to protecting the safety of all employees. In addition to personal protection equipment and related procedures and management, CCPG continues to invest to improve related safety and fire safety equipment. Investments totaled NT\$285 million in 2018. We expect to reduce the possibilities of accidents and improve the capacity for responding to accidents to reduce damage caused by accidents.

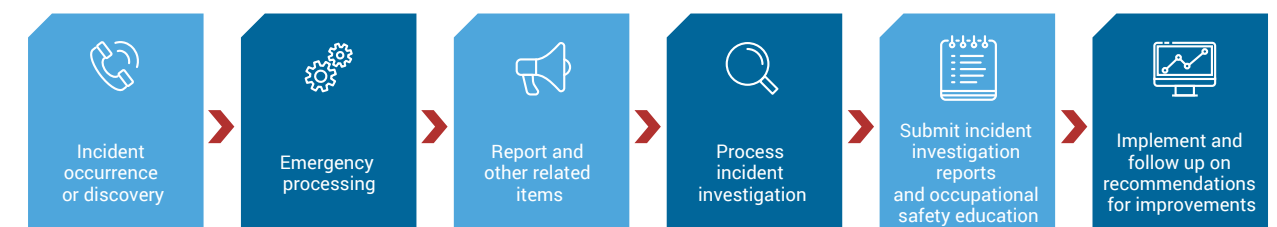
CCPG Investments in Safety and Fire Safety in 2018

Unit: NT\$ million

	CCP	CCPC	DCC
Investments in Safety and Fire Safety in 2018			
CCP Group Total	84		
CCPC Group Total		146	
DCC Group Total			54
Taiwan	73	137	39
Overseas	11	9	15

Any accident in the Group, even near misses that do not lead to occupational incidents, shall be processed in accordance with regulations on incident management and investigations. Each accident shall become a supplement that makes the Group safer.

Incident processing and investigation management regulations



An accident involving a clamping injury occurred during the inspections and repairs for a combination machine in 2018 and caused injuries to a repairman. The Group subsequently conducted intensive investigations, implemented comprehensive improvements for the equipment and management, and established the following improvement measures:

1. Add a secondary power cut-off switch for servo drive equipment.
2. Enhanced training for personnel and strictly required personnel to take measures to cut off power/lock switches/label equipment before power equipment inspections to prevent inappropriate operations of the machinery.
3. Conducted an inventory of equipment in the Group where the power source cannot be switched off during repairs and reassess whether current management and control measures are sufficient for the management and ongoing improvements to prevent similar accidents from happening.
4. Integrated the Group's work permit forms and procedures for firework operations, operations in confined spaces, elevated operations, and crane operations to implement safety inspection points before, during, and after operations and include safety measures such as cut off power/lock switches/label equipment.



CCPG completed the operational safety analysis for forklift operations in 2017 and completed related risk mitigation measures in 2018 such as the installation of the speed limiters and speeding alarms as well as plans for separating vehicle and personnel paths and optimization of operating procedures. To implement speed limit management, we installed more than 300 speeding alarms (the installation rate was 85% as of 2018) to effectively improve bad driving habits of forklift drivers and reduce speeding. The separation of vehicle and personnel paths requires plans based on actual conditions in the workplace environment. It protects personnel responsible for basic maintenance from the dangers of collisions with forklifts.



Example of CCPG separation of personnel and vehicles

Contractor Safety Management

To protect contractors and reduce the safety and health risks in contractors' operations, services, and activities at the Company, we establish environmental protection, safety, and health management procedures, organize coordination and organization meetings, and discuss with contractors before we assign the contracted work. We also inform the contractor of the hazardous factors of the work environment and operations such as elevated operations, repetitive moving tasks that may cause musculoskeletal disorders. We also supervise contractors in performing physical examinations for their employees in accordance with the risks of operations and provide health management measures. In addition to managing the safety and health of CCPG employees, we revised the "Operating Procedures for the Prevention of Musculoskeletal Disorders Caused by Repetitive Moving Tasks" in 2017 and included contractors into its applicable scope. We plan to begin automatic packaging machine operations in the high-risk areas for musculoskeletal disorders in 2018 to prevent musculoskeletal injuries for contractor personnel.

With regard to the safety and health performance of contractors in the factories, CCPG Mailiao Factory rewards contractors with outstanding performance in safety and health and rates their performance based on participation in meetings, number of occupational safety incidents, number of violations, document review, and onsite management. The manager of the factory presents awards to contractors with outstanding performance after comprehensive quarterly evaluations. In addition, safety and health personnel are responsible for communicating occupational safety issues in daily toolbox meetings. They use prizes to encourage interactions from time to time and contractors responded well to the activities. It improved the effectiveness of education and delivery of information in the toolbox meetings. Based on the experience of success above, the Group shall expand the contractor incentives system and implement both reward and penalties to inspire the sense of honor of contractors to achieve significant improvements of contractor safety and health standards.



A contractor with outstanding overall performance in safety and health received an award from factory manager - CCPG Mailiao Factory

2.2.2 Process safety



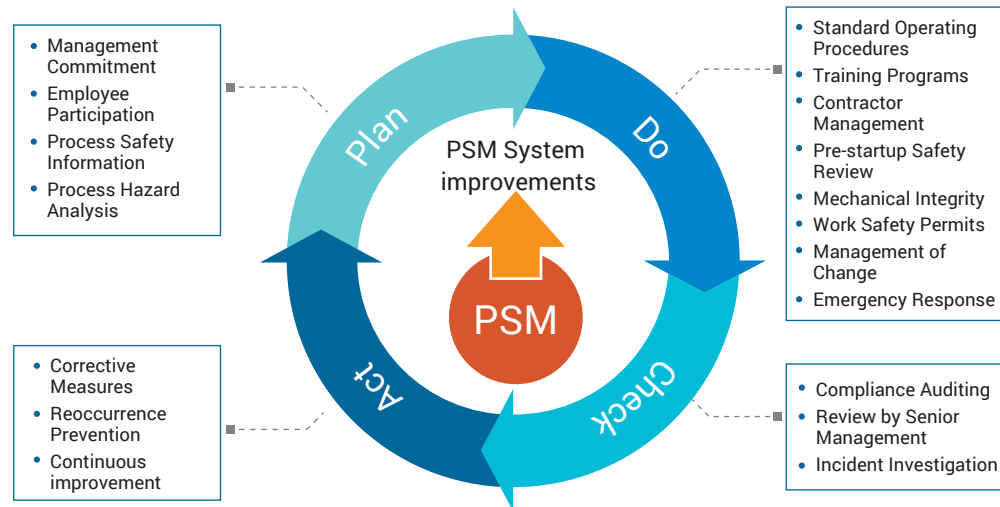
CCPG adopted 14 management elements in the three major structures for occupational safety, process safety, and mechanical integrity for the advancement of the internal management system. CCPG also developed the process safety management platform and included the overall PSM performance indicators, PSM audits, PSM management meetings, and related PSM technologies of all factories into the management system. With the commitment of senior management and full participation from employees, we integrated various PSM factors and constructed a more comprehensive safety net for continuous improvements of PDCA procedures.

Installation of following mechanisms and systems have been completed and they are described below:

Mechanisms	Explanation	2018 Performance
Establishment of the piping and instrumentation diagram (P&ID) management system	The Group established a P&ID system to implement P&ID inventory systematically and integrate the CMMS system to control P&ID updates. The aim is to make P&ID management meet principles for promptness, accuracy, and confidentiality to establish a strong foundation for process safety development.	The Group's P&ID system is managed by the system which verifies the validity of each diagram. Through a comprehensive inventory, the system established the integrity of process safety information.
Integration and installation of the computerized maintenance management system (CMMS)	The CMMS integrates major functions for procurement, inventory, equipment, finance, and safety management and adopts RBI (risk-based inspection), RCM (reliability-centered maintenance), and SIS (safety instrumented system), we could effectively control and improve static, dynamic, and instrumental reliability.	A nine-tier structure is established for the CMMS system in accordance with ISO 14224 standards and it was officially launched in factories of the Group in 2018. The system includes sub-systems for equipment maintenance management, improvement proposals, management of changes, and work assignment forms.
Establishment of the process safety management platform	The system provides comprehensive records and monitoring of the operations of PHA (e.g. HAZOP, JSA, etc.) in PSM. The Group has more than 3,500 tanks, more than 40 hazardous work sites, and more than 200 hydrogen sulfide hazard hot zones which are systematically managed and controlled with the platform.	The platform connects to the process safety engineers which are the core of CCPG's process safety management tasks to promote, execute, and follow up on hazard evaluation tasks in factories through connected management.
Integration of incident reporting mechanisms of the Group	Information on accidents and near misses in the Group is transferred and investigated through this platform. Once an incident occurs, the factories shall issue reports and notifications on the system in accordance with the specified schedule to begin horizontal self-inspections and inventories to review whether risks are still present. The system helps CCPG's transparent management and prevents accidents from reoccurring.	We classified incidents based on the level of severity by referencing international standards. For more severe and more frequent incidents, we shall integrate more resources to provide a more comprehensive review and to formulate and implement preventive measures.
Pipeline Safety Management System	Underground pipelines are inherently different from the production process. The pipelines pass under urban roads and CCPG is deeply aware of the importance of risk management for such pipelines. The Chairman and President regularly organize pipeline safety management meetings and used the latest international regulations to establish a safety management system for pipelines. They schedule regular risk assessments, inspection plans, and response drills to ensure the safety of pipeline usage.	CCPG invested nearly NT\$120 million in the maintenance and management of underground pipelines in 2018 including Intelligent Pig for five pipelines. More than 70km of pipelines were inspected and overall conditions of the pipelines were good.

Establish a PSM-based security management system





We continue to invest resources to implement the process safety system not only because of our persistence for safety but also for our goal of zero occupational injuries. In 2016, the Group formulated the following process safety plans and resource investment for the next 3 years:

Item	Short-Term Goals	Achievement Status	Expected Benefits
Cultivate process safety management (PSM) related professional personnel	Achieve 100% growth in the number of API510, API570, and API653 of the American Petroleum Institute (API), other Individual Certification Program (ICP) inspectors, and PSM-related professional certificates before 2020 by increasing the number of licenses from 19 to 38	As of 2018, CCPG has a total of 28 international API and functional safety engineer licenses.	Professional technical skills required for the implementation of mechanical integrity (MI)
Implement dedicated full-time personnel	Complete professional PSM training for 32 process safety engineers by 2017 and recruit all required engineers before 2018	Full-time process safety engineers have been appointed and they can be fully dedicated to related process safety management tasks	Implement and continuously improve process safety management
Introduce foreign technologies and resources	Since 2013, CCPG has begun strategic cooperation with National Kaohsiung University of Science and Technology, Yunlin University of Science and Technology, and domestic experts in the industry through education, training, and professional consultation	External experts provided advanced PSM courses in 2018 to enhance training for chemical hazards.	Effectively improved CCPG employees' knowledge and expertise in PSM

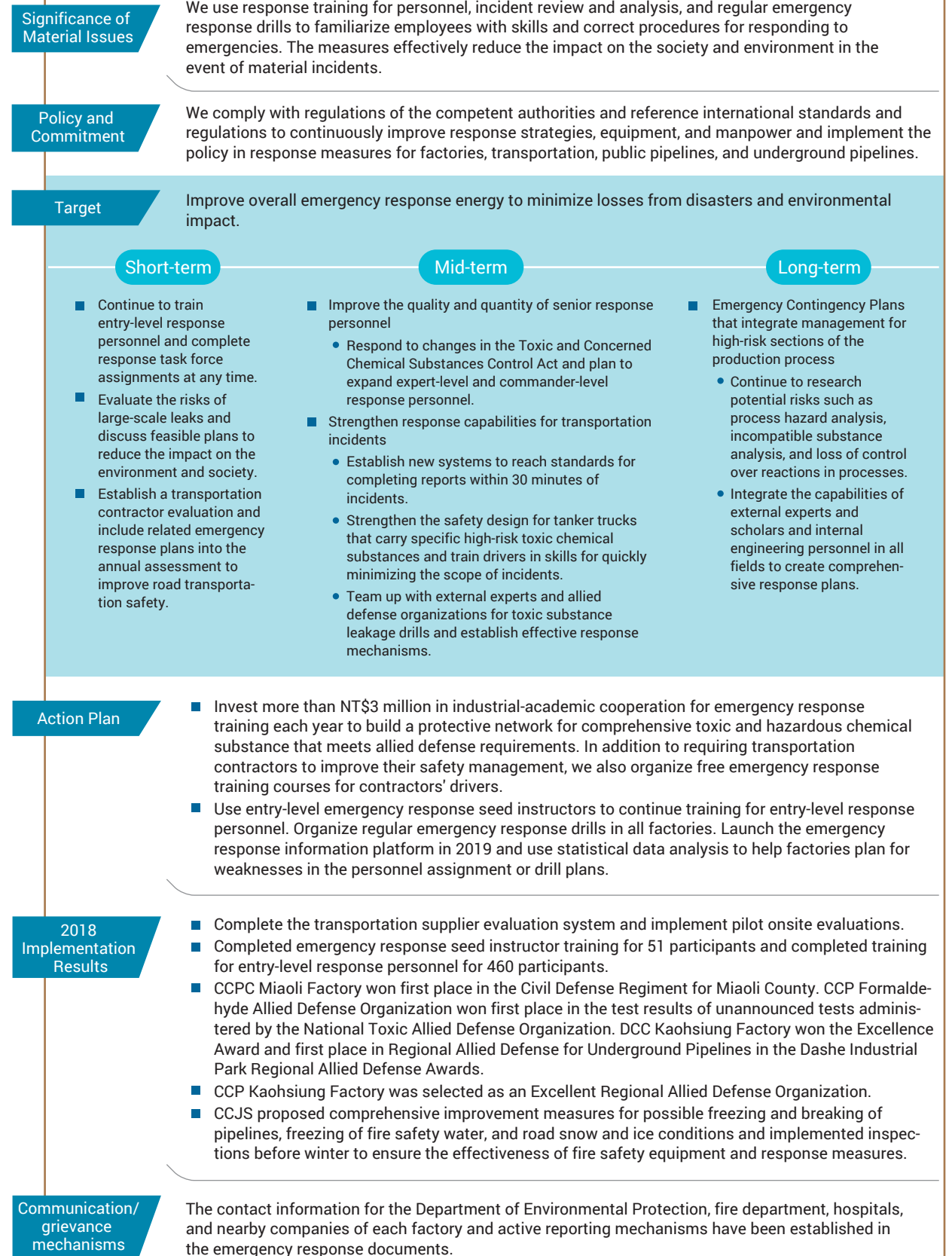
2.2.3 Response and management of major incidents

CCPG's emergency preparation and response plans for are planned in advance to prevent accidents caused by all kinds of disasters at the workplace and to prevent and reduce losses to personnel, equipment, and properties.

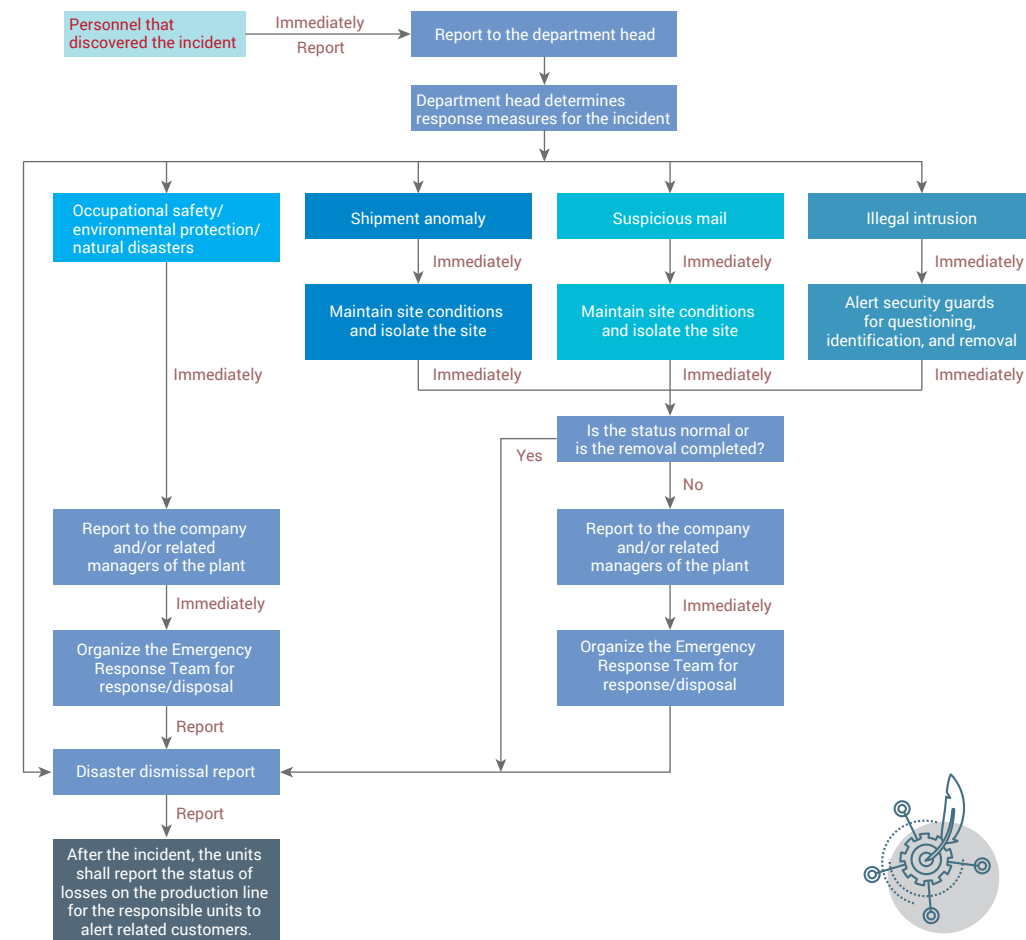
Fires, explosions, poisoning, accidental local pollution, and other accidents may occur in the work environment due to leaks of chemicals. Major accidents may also occur for the aforementioned reasons that are by natural disasters. In response to illegal entry, anomalies in shipments, suspicious mail, the departments, and factories must implement all existing organizations, manpower, command system of the workplace for the units in the workplace to implement response measures in order to reduce damage, reduce harm to personnel, and restore normal conditions as quickly as possible.

CCPG launched the emergency response seed instructor training program in 2018 and assigned seed instructors to complete the training for preliminary response personnel in the factories so that CCPG employees have the necessary skills to put on protective gear, breathing masks, and protective equipment, use leak prevention tools and gas detection equipment. CCPG aims to quickly deploy resources and disaster relief resources, manpower, and equipment at early stages of the incidents to minimize losses in the disasters and the impact on the environment.

Management Approach for "response and management of major incidents"



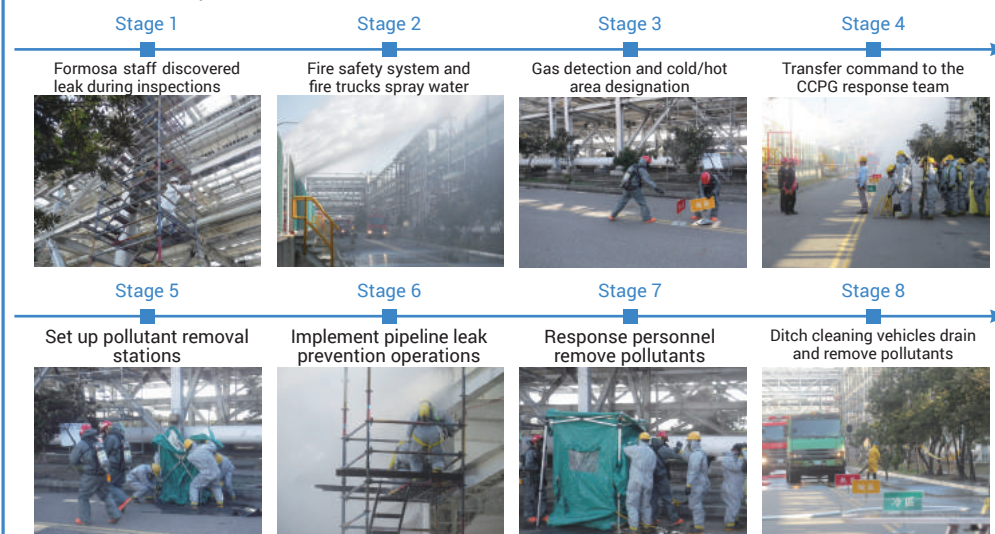
Emergency contingency plan procedures



Key plans for emergency response drills in 2018

CCPG Mailiao Factory - Continue to participate in allied defense drills of the public pipelines in the No. 6 Naphtha Cracker Complex

As the public pipelines of CCPG Mailiao Factory are part of the public pipeline system of the No. 6 Naphtha Cracker Complex, the Factory began integrating the fire department of the Complex, pipeline management teams, and related response organizations in large-scale coordinated drills since 2017 to familiarize our employees in related response measures and continue improvements. They serve as the last line of defense in the safety framework of public pipelines whose purpose is to minimize the impact of disasters.



DCCJS - Expanded comprehensive drill scenarios and improved response capabilities

DCCJS conducts a factory-level drill every six months to continuously improve response operations for fires, explosions, leaks, and nighttime incidents and improve incident control and management capabilities.



CCPJ - Establish a dedicated firefighting team and continue to implement fire safety response exercises for the entire factory

CCPJ established the dedicated firefighting team in 2018 and purchased a 25-ton foam fire truck and 327 related fire safety equipment. A total of 38 full-time and part-time firefighters were recruited. CCPJ organizes four fire drills for part-time firefighters each month and organizes at least 24 fire safety response exercises for the entire factory each year.

Panjin Fire Department Branch invited CCPJ to jointly organize the "Panjin Petrochemicals Enterprise Fire Safety Management Conference" in September 2018. The Deputy Mayor of Panjin City, Panjin City Fire Department, persons responsible for fire safety in petrochemicals enterprises, and other stakeholders attended the conference to observe CCPJ's fire drill.



CCPG pipeline transmission disaster emergency response

We continued to improve its independent maintenance and management of the underground industrial pipelines, abide by the regulations of related competent authorities and referenced international standards and regulations to implement a comprehensive evaluation on the safety of pipelines. Pipeline maintenance and operations plans were established each year. The Company also implemented comprehensive management with electronic onsite pipeline inspections, monitoring, and management of input and output end, corrosion potential and closed-interval potential of regular inspections, periodic Intelligent Pig inspections for assessing the integrity of pipelines, etc., to prevent pipeline damage and leaks and ensure the normal and safe transmission of material fluids. It also uses the regional defense organization to build public safety awareness and public relations for underground industrial pipelines. A total of 2018 drills were conducted in 2018 including autonomous plans, emergency response drills for allied defense, and implementation of the agent system to establish more comprehensive emergency response mechanisms for chemical leak incidents, and continue to maintain effective management of the integrity of underground industrial pipelines.



Regional defense organization drill - Benzene pipeline leak



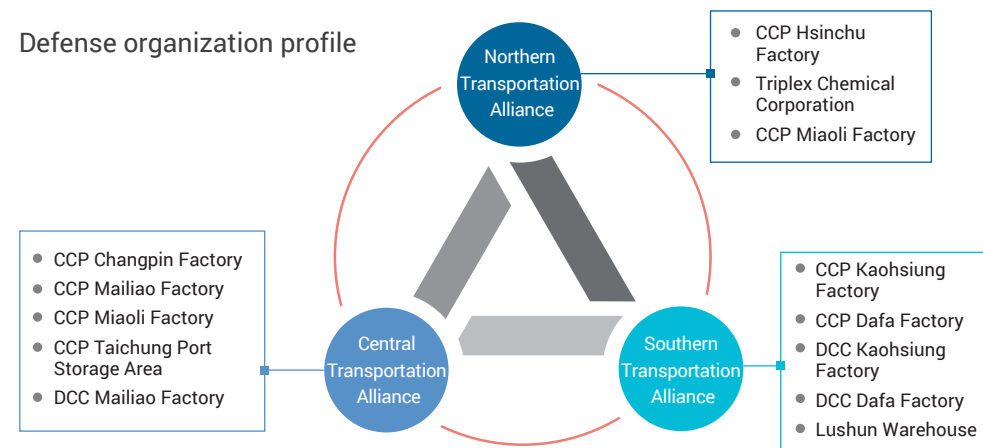
Regional defense organization drill - Ethylene pipeline leak

CCPG road transportation disaster emergency response

A broad range of materials and products produced by CCPG are transported via road transport to midstream and downstream factories for use. The transportation area encompasses counties and cities in Taiwan. However, chemicals may leak in the transportation process due to natural disasters or negligence in personnel operations that cause transportation vehicles to be overturned or collisions. The incidents could harm other individuals on the road and damage the environment.

To ensure that leaks of chemicals transported by CCPG can be controlled in the event of overturns or leaks on the road within the most opportune period and the affected scope can be effectively reduced and controlled, the CCPG transportation defense organization is formulated by integrating the Group's response capabilities in the northern, central, and southern production factories. In the event of an accident involving chemicals transported by the Group, response personnel in nearby production factories can be immediately sent to provide support, perform collaborated rescue, reduce losses from disasters, and prevent secondary pollution. In 2018, the Group continues to conduct drills for an emergency response to road transportation disasters to strengthen personnel's familiarity with various operations.

Defense organization profile



CCP Toxic Chemical Disaster Allied Defense Organization hosted onsite response demonstration for allied defense for formaldehyde in 2018

The Formaldehyde Allied Defense Organization of CCP Hsinchu Factory and CCPC Miaoli Factory was awarded first place in the 2018 National Toxic Chemical Disaster Allied Defense Organization evaluation and it organized onsite response demonstration for allied defense for formaldehyde.



2.3 Sustainable Supplier Management

Significance of Material Issues

Suppliers are CCPG's strategic partners for improving products and services as well as important stakeholders for implementing corporate social responsibilities. CCPG adopts and implements a sustainable supplier policy to effectively manage suppliers, grow with suppliers, and achieve the goal of sustainable development.

Policies

- Procurement business ethics and respect of human rights
- Supplier Management System
- Legal Compliance and Local Care
- Green procurement and circular economy

Target

- Supplier Code of Conduct promotion - Obtain signatures from all suppliers before 2020.
- Supplier Declaration of Conflict-Free Minerals promotion - Obtain signatures from all suppliers before 2020.
- Implement the Sustainable Supplier Corporate Social Responsibility Assessment - Complete the survey on main materials suppliers before 2019.
- Obtain at least 50% of procurement from local suppliers in the projects

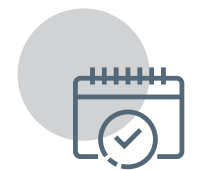
Action Plan

- Supplier Code of Conduct promotion
- Supplier Declaration of Conflict-Free Minerals promotion
- Implement Supplier Social Responsibility Risk Assessment
 - Establish the Supplier Social Responsibility Assessment Questionnaire
 - Complete questionnaire survey and statistics on main materials suppliers
 - Implement onsite audits on high-risk suppliers.



2018 Implementation Results

- Supplier Code of Conduct promotion
 - Obtain signatures from all suppliers for contracts and transactions in Taiwan.
 - Obtain signatures from all suppliers in foreign regions.
- Supplier Declaration of Conflict-Free Minerals promotion
 - Obtain signatures from all suppliers for contracts and internal transactions in companies in Taiwan.
 - Obtain signatures from all suppliers in companies in foreign regions.

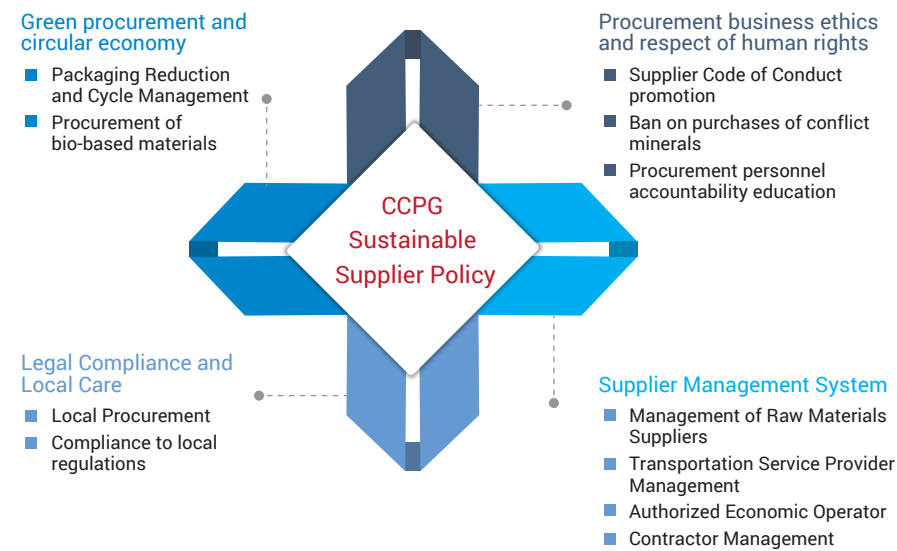


Communication/grievance mechanisms

- Continue to maintain communication with external suppliers and provide assistance and policy promotion for internal employees.
- Grievance mechanism: Complaint mailbox ccpgaudit@ccp.com.tw



CCPG's Sustainable Supplier Policy can be divided into business ethics and respect for human rights, supplier management system, legal compliance and local care, and green procurement and circular economy:



2.3.1 Procurement business ethics and respect of human rights

Supplier Code of Conduct promotion

To continue to improve the corporate social responsibilities of the supply chain partners, CCPG educates all suppliers on issues such as labor rights, human rights issues, business ethics, and conflict minerals. Suppliers complete the signing process during the establishment of contracts or agreements for transactions. The process of the signing of the Supplier Code of Conduct in 2018 is shown in the table. We plan to complete 100% signing rate for all suppliers of the Group by 2020.

Supplier Code of Conduct signed by CCPG suppliers in 2018

Region	Plant	Implementation status
Taiwan	Taipei Office and factories in Taiwan	100% signing rate through standard form contracts 100% signing rate for domestic materials suppliers
Overseas	All factories	100% signing rate

Ban on purchases of conflict minerals

CCPG's basic policy for conflict minerals used by suppliers are as follows:

- No conflict minerals have been used as production materials in any of CCPG's products.
- DCC Mailiao Factory, Kaohsiung Factory, CCDSG, and DCCJS use precious metals as the catalyst in the production process. In addition to the metals they own, they obtain other necessary metals through leases and they recycle the metals after use. They also work hard to reduce the loss rate in recycling and minimize the consumption rate of resources.
- CCPG requests all precious metal lease service providers to submit declarations stating that they do not use conflict minerals.
- For other materials and equipment suppliers, the statement is included in the "CCPG Supplier Code of Conduct" and the signature is completed through standard form contracts or files created for suppliers.

Procurement personnel accountability education

In addition to procurement strategies for suppliers, CCPG also believes that first-line procurement personnel who communicate with suppliers must be educated on corporate social responsibilities. In addition to providing education and training on corporate social responsibilities for new procurement personnel, we also seek to develop basic ideas and help them understand the Group's CSR Policy. After becoming official employees, the CSR Team regularly uses the Group's e-learning education and training platform to organize courses on other related topics and continue to strengthen the CSR awareness of procurement personnel.

2.3.2 Supplier Management System

CCPG aims to continuously improve suppliers' management system and requirements to reduce the quality, environmental protection, safety, and social risks of suppliers and thus reduce suppliers' CSR risks.

CCPG's supplier management system is explained as follows from the three categories for main raw materials, transportation service providers, and contractors:

Management of Raw Materials Suppliers

CCPG imposes management regulations in the table on suppliers of raw materials:

Supplier Type	Management Regulations
New suppliers	<ul style="list-style-type: none"> Meet quality, environmental, health, and government regulations Obtain ISO 9001 or other quality system certification Quality assurance, production, and procurement departments form an assessment team to conduct on-site evaluation tasks on new suppliers. Those that meet requirements become qualified suppliers Disqualified suppliers are notified of the reasons for disqualification and they may reenter the assessment process after they make improvements.
Existing suppliers	<ul style="list-style-type: none"> CCPG compiles the delivery records of products from the supplier to each factory in the previous year and evaluates suppliers based on the quality, environment, services, and integrity of delivery documents. Suppliers with higher ratings will see increases in the frequency of CCPG's purchases in the current year. No purchases shall be made from disqualified suppliers in the current year. CCPG arranges annual supplier audit plans to assess the suppliers' quality system, supplier management, materials delivery, production management, and environmental safety management.

Note: The aforementioned guidelines may differ due to different local regulatory requirements and regulations for operations.

After the aforementioned evaluations, CCPG listed 110 qualified raw materials suppliers in Taiwan and 345 in foreign countries in 2018, totaling 455 suppliers (the number of qualified suppliers is calculated based on individual companies in the Group. If a supplier is a qualified supplier of two CCPG companies, it shall be calculated once for each company).

In addition, based on concerns for CSR risks, CCPG began implementing CSR risk assessments on main materials suppliers in 2018. The subjects of assessments were suppliers whose procurement amount totaled 70% of the procurement of all factories. The assessments shall be conducted once every three years in the future. The assessment is divided into two stages. The first stage is mainly implemented to facilitate understanding of the disclosure of CSR information by important suppliers of main materials:



Statistics on disclosure of CSR policies by CCPG's important suppliers of main materials

Company	Number of suppliers without CSR disclosure	Number of suppliers with CSR disclosure	Total number of suppliers of main materials	Ratio of suppliers with CSR disclosure
CCP	14	23	37	62%
CCPC	12	20	32	63%
DCC	6	14	20	70%
Overseas	32	88	120	73%
Total	64	145	209	69%

Note: The number of qualified suppliers is calculated based on individual companies in the Group. If a supplier is an important supplier of two CCPG companies, it shall be calculated once for each company.

The results of the assessment showed that more than 60% of CCPG's important suppliers of main materials in Taiwan have disclosed CSR information, as have 73% of such suppliers in foreign companies. It is evident that many main materials suppliers have voluntarily disclosed CSR information.

We shall continue to implement phase 2 CSR questionnaire surveys and we expect to complete the survey before the end of 2019. We shall use the results of the survey to determine the risk rating of suppliers and draft auditing plans for high-risk suppliers.

Transportation Service Provider Management

CCPG regards transportation and logistics as part of product quality and the management regulations on transportation service providers are specified in the table:

Supplier Type	Management Regulations
New suppliers	<ul style="list-style-type: none"> ISO 9001 certified (Taiwan) AEO certified (Taiwan) Obtain related transportation licenses for controlled chemicals in accordance with regulations Vehicles must be equipped with GPS equipment (Taiwan) Investigate contractors' safety, health, driver, vehicle safety, and vehicle and equipment maintenance systems as well as their implementation status
Existing suppliers	<ul style="list-style-type: none"> The status of the previous year is evaluated based on the satisfaction survey filled out by the operating unit and suppliers with poor performance will be required to perform improvement plans for verification Suppliers are graded based on the annual satisfaction survey results and those that fail to reach standards will not be appointed

Note: The aforementioned guidelines may differ due to different local regulatory requirements and regulations for operations.

After the aforementioned evaluations, CCPG listed 56 qualified transportation service providers in Taiwan and 121 in foreign countries in 2018, totaling 177. 100% of the transportation service providers passed the evaluation.

In addition, to improve the evaluation system for qualified suppliers, CCPG began planning a new management system for operations in Taiwan in 2018 based on the "Road Safety & Quality Assessment System" (RSQAS). It is expected to be completed before 2020.

Authorized Economic Operator (AEO)

CCPG has obtained AEO certification in Taiwan and included raw materials suppliers and transportation service providers into the business partner management procedures. CCPG conducts a periodic or spontaneous assessment of safety operation procedures and facilities of business partners and ensures that the standard safety requirements are met to reduce risks and logistics safety.

CCPG has established related management procedures to evaluate transportation service providers each year and use the ratings to formulate the annual auditing plans. The auditing plans are used to audit business partners. CCPG audited 17 raw materials suppliers and transportation service providers in Taiwan and 41 main materials suppliers in 2018 and all of them passed the audit.

Contractor Management

CCPG requires contractors to comply with local regulations and be responsible for providing insurance coverage and ensuring the safety of employees or contracted personnel. In addition, CCPG factories have enacted regulations and penalties for contractors to effectively manage the conduct of contractor personnel in factories in order to maintain safety in factory operations. The management regulations on transportation service providers are provided below:

Supplier Type	Management Regulations
New Contractors	<ul style="list-style-type: none"> Content of the "profit-seeking enterprise registration certificate" Qualification certifications required by related industries or governments Qualifications and licenses of related personnel Labor insurance or accident insurance required by local governments Factory safety and health training for contractor personnel
Existing contractors	<ul style="list-style-type: none"> CCPG periodically verifies related qualification certifications of various contractors and the validity period for personnel training CCPG established and announced related penalties and requests contractors to pay fines for violations Contractors with severe violations or those that fail to implement improvement measures shall be suspended

Note: The aforementioned guidelines may differ due to different local regulatory requirements and regulations for operations.

After the aforementioned evaluations, CCPG listed 1,000 qualified contractors in Taiwan and 626 in foreign countries in 2018, totaling 1,626.

CCPG provides labor safety and health education courses for each worker that enters a CCPG factory for construction. Only individuals who have thoroughly completed the training are permitted to work onsite. If the individual needs to enter the factory again after the validity period of the training course, he shall be required to take the training course again. The purpose of such actions is to effectively promote safety awareness for the operators of suppliers and to lower the risks of accidents. CCPG provided 31,297 instances of training and tests for contractors in 2018 and the statistical data on the number of participants are as follows:

CCPG's Training Hours Statistics for Contractors from 2016 to 2018

Year/Gender	2016			2017			2018		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Training hours	8,099	801	8,900	14,841	858	15,699	27,220	1,901	29,121
Number of instances at the end of the year	8,600	1,205	9,805	16,075	941	17,016	29,399	1,898	31,297
Average hours	0.94	0.66	0.91	0.92	0.91	0.92	0.93	1.00	0.93

Note 1: Note: Previous contractors only require refresher training which consists of fewer training hours, therefore the average training hours are lowered.

Note 2: Please refer to Appendix C for the statistics on the training hours provided by CCPG companies to contractors in 2018.

2.3.3 Legal Compliance and Local Care



Local Procurement

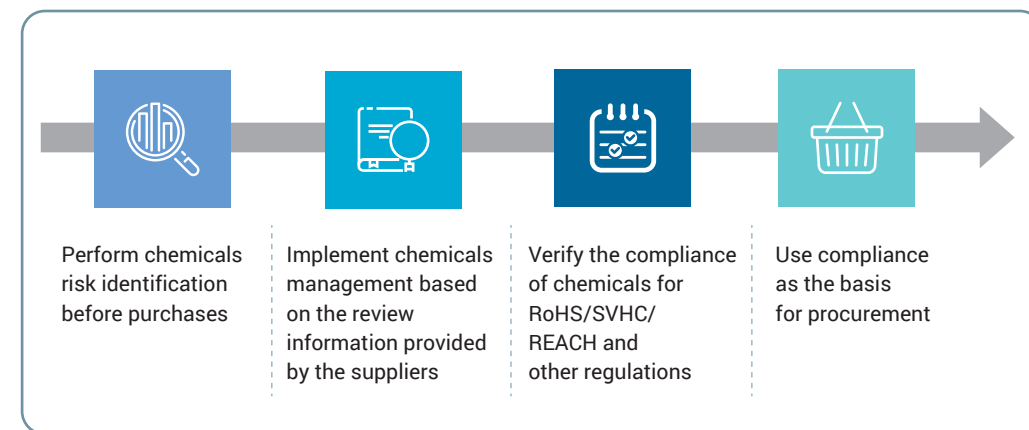
CCPG prioritizes local companies in the country of the factory for procurement projects for expansion or annual overhaul projects. We seek to achieve common growth and development with local enterprises while adhering to principles such as quality and cost. The total amount of procurement projects from local companies in the country of the factory of individual CCPG factories accounted for more than 70% of the total procurement amount of the Group in 2018.

Compliance to local regulations

To meet the EU's REACH and RoHS regulations and reduce the impact of chemicals on the ecology, CCPG established a set of chemicals management mechanisms based on the characteristics of the products (refer to 2.1.2 Chemicals Management for the management regulations) and requires materials suppliers of related products to provide the following information for review:

- 100% signing of the environment and substance management protocols for REACH/RoHS regulations in the "CCPG Supplier Code of Conduct".
- Provide ICP-AES test data for testable substances or analysis reports from third-party certification institutions (e.g. SGS) on the 10 hazardous substances specified in RoHS.
- Provide the Safety Data Sheet (SDS) management.

CCPG Environment and Substance Management Procedures



2.3.4 Green procurement and circular economy



Packaging Reduction and Cycle Management

CCPG materials and products require a diverse range of packaging and transportation methods. CCPG continuously evaluates suitable transportation and packaging methods for its independent units, suppliers, and customers to achieve environmental protection goals while meeting customer requirements. The improvements can be divided into three categories:

- A. Recycling packaging materials with customers/suppliers (including procurement within the Group)
- B. Increasing customers' shipment volume from low volume to high volume
- C. Convert to recyclable (repeated use) materials

Summary of CCPG Packaging Materials Reduction and Cycle Management Results in 2018 (By Company)

Improvement Type	Region	Targets	Packaging Materials/Implementation Method	Annual Recycled (Reduction) Amount
A	CCP	Group	Recycling of iron barrels for finished products	689 iron barrels
			Recycling of PE barrels for finished products	1,650 PE barrels
			Recycling of bulk bags for finished products	111,238 bulk bags
	CCPC	Customers of the Group	Recycling of wooden crates for finished products	40,767 wooden crates
			Recycling of FRP tubes for finished products	27,995 FRP tubes
			Recycling of shipping pallet	2,500 pallets
			50-LTR plastic barrels	3,000 plastic barrels
			200kg plastic barrels	500 plastic barrels
		Group	Recycling of iron barrels for finished products	1,490 iron barrels
			Recycling of PE barrels for finished products	9,239 PE barrels
			Recycling of bulk bags for finished products	8,399 bulk bags
		DCC	Recycling of PE barrels for finished products	107 PE barrels
			Recycling of bulk bags for finished products	3,145 bulk bags
	CCPJ	Group	Recycling of bulk bags for finished products	24,414 bulk bags
	CCJS	Customers	Recycling of wooden crates for finished products	54,572 wooden crates
B	CCP	Customers	220kg iron barrels converted to 1MT IBC barrels	2,200 iron barrels
			20kg packaging bags converted to 25kg packaging bags	10,000 packaging bags
C	CCP	Suppliers	Original IBCs converted to ISO tanks	1,608 IBC barrels
	CCPJS/CCJS	Customers	Seabulk inner bags converted to environmentally-friendly bags	5,000 Seabulk inner bags

The safety of packaging must be considered as we advance recycling and reducing packaging materials to ensure secure storage of products in the transportation and storage process. Therefore, CCPG shall continue to seek innovative packaging materials or transportation methods. Simultaneously, CCPG shall improve factoring unloading, transportation and storage equipment, and automation to reduce the use and consumption of packaging materials and achieve environmental protection goals.

Procurement of bio-based materials

Epoxy is one of the main products of CCPG. Epichlorohydrin (ECH) is a very important material of epoxy and it can be produced from propene, a petrochemicals material, or glycerol, a bio-based material. Producing ECH from glycerol can reduce the dependency on petrochemicals materials. In addition, production with glycerol also reduces the amount of waste wastewater produced and it is better for the environment. CCPG's purchases of Epichlorohydrin produced from glycerol has grown at least 15% each year from 2016 to 2018.





Chapter 3

A Sustainable Producer that Prosperes with the Environment

3.1 Environmental Management Policy

3.2 Response to Climate Change

3.3 Water Cycle and Management

3.4 Emissions Management

Among all the industries, the chemicals industry has always been regarded as an energy-intensive industry with high environmental risks. It is our basic mission and goal as a sustainable producer to minimize the environmental impact of CCPG's daily operations and process and fully implement environmental protection measures in all factories and for all employees. CCPG will continue to improve the cost analyses of products and prepare for the future carbon pricing trends through environmental cost accounting that integrates products and finances.

3.1 Environmental Management Policy



CCPG deeply understands that enterprises should not only pursue profits but also perform their corporate social responsibilities. CCPG has therefore listed "environmental protection" as a top priority and we firmly believe that the implementation of a sound management system can improve the environment and contribute to people's wellbeing.

CCPG's management goal is to adopt standards that are consistent with or superior to regulations and implement related environmental protection measures. To achieve this goal, the factories shall continue to improve waste recycle and production efficiency in order to reduce the level of pollution generated in the production process. It shall also invest in pollution prevention and process improvement equipment in order to implement optimal feasible measures for equipment maintenance, repairs, replacement, and installation and achieve sustainable development goals.

CCPG's Environmental Safety and Health Policy

CCPG's factories have all introduced environmental management systems (ISO 14001) to ensure that the emissions and waste disposal in the factories' production process comply with legal requirements and provide management and responses on major environmental issues. The Group has also introduced ISO 9001, TOSHMS, and OHSAS 18001. Through these systems, we expect to achieve optimum management covering all three dimensions of environment, employee safety and health and product quality. Completed ISO 14001: 2015 and ISO 9001: 2015 third-party certification in 2018. Upgrade third-party certification from OHSAS 18001 to ISO 45001 in 2020. Please refer to 1.3. Stakeholder Communication for related complaint mechanisms.

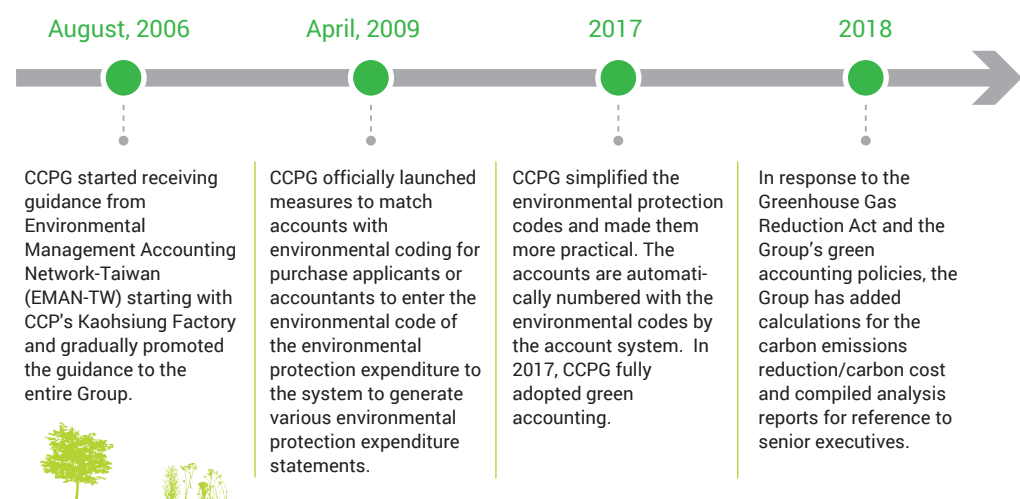
CCPG's
Environmental
Safety and Health
Policy



Environmental Protection Related Expenditures

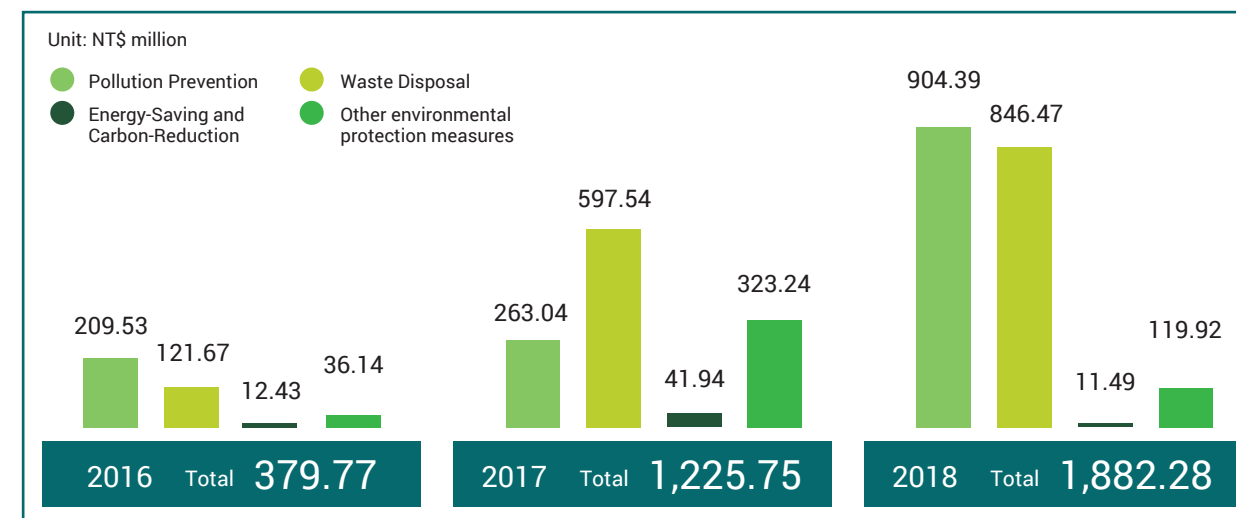
CCPG voluntarily increases environmental protection expenditures and improves resource productivity in order to fulfill its sustainable development ideals and reduce the impact of the production process on the environment. The environmental protection expenditures in 2018 totaled NT\$1.88 billion and they mainly included pollution prevention and waste disposal which accounted for 48.1% and 45.0% of total environmental protection expenditures, respectively. The investment for environmental projects (projects involving more than NT\$1 million) amounted to NT\$670 million (please refer to Appendix D for detailed statistics) in 2018. We expect to increase environmental protection project investments by more than 5% starting from 2018.

To clarify the environmental protection expenditures of companies of the Group, we continue to promote the following green accounting measures:



In response to trends in environmental protection regulations, we have conducted internal assessments on the cost of carbon to facilitate overall carbon asset management for the future. At the same time, we have also evaluated investments on pollutant prevention equipment and other capital expenditures to reduce the impact of products or processes on the environment and improve the management of environmental costs. As greenhouse gas emissions will be priced in the carbon trading market in China, we regard greenhouse gas emissions as part of future financial management. CCPG shall include carbon emissions and carbon cost-benefit analysis for new investment or expansion of production lines and CCPG HSE Division shall conduct environmental cost-benefit assessments from the perspective of carbon emissions management for CCPG.

CCPG's Related Environmental Protection Expenditures from 2016 to 2018

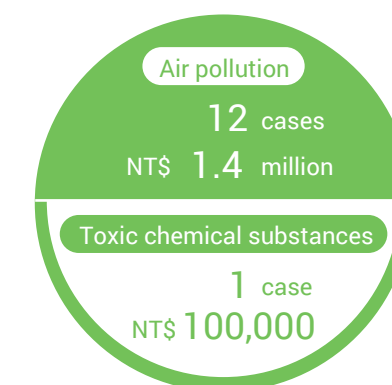


Note: Statistics from overseas factories have been included since 2017.

Compliance

The Group has reviewed the discrepancies by each case and completed improvements and follow-up inspections. In addition, it also established the "Regulation Identification Guidelines" in 2017 which included: identification of compliance issues in ESH regulations, management of response targets for significant impact in ESH regulations, periodic assessment of compliance of licenses, inquiry of regulations, and notification and implementation of inspection results to facilitate unified management and verification of identification and process-related regulations. The implementation units for the regulations are the persons in charge of the Safety and Health Department and supervisors of production departments. They aim to reduce the number of penalties by 80% over the short-term and achieve zero penalties in the mid to long-term plans in order to be responsible to community residents and the nearby environment.

CCPG's Environmental Violation Cases and Fine Statistics in 2018



Note 1: The incidents disclosed here are mainly cases of inadequacies with fines of over NT\$100,000.

Note 2: There were no cases of penalties exceeding NT\$100,000 in overseas factories.

Note 3: Refer to Appendix D for the environmental violation cases and fine statistics of CCPG companies in 2018.

3.2 Response to Climate Change

CCPG adopts active management and positive engagement attitudes on climate change as well as energy conservation issues and risks. We organize energy conservation and carbon reduction meetings each month to adjust the implementation of energy conservation and carbon reduction measures and keep following up on the effectiveness. With regard to the management plan, the CCPG HSE Division periodically obtains information, tracks changes in related regulations, and provides responsive measures. It also conducts an inventory of greenhouse gases each year to verify the energy conservation and carbon emissions reduction effects of the current year and submit the plan for the next year for implementation.

3.2.1 Energy Conservation and Carbon Reduction Action

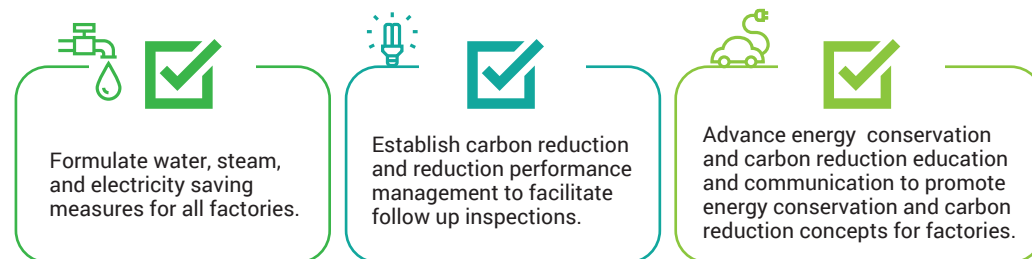


We continue to advance energy conservation and carbon emissions reduction measures, improve energy efficiency, and implement energy and greenhouse gas management to reduce impacts on the global environment and climate.

CCPG Energy Conservation and Carbon Reduction Advancements

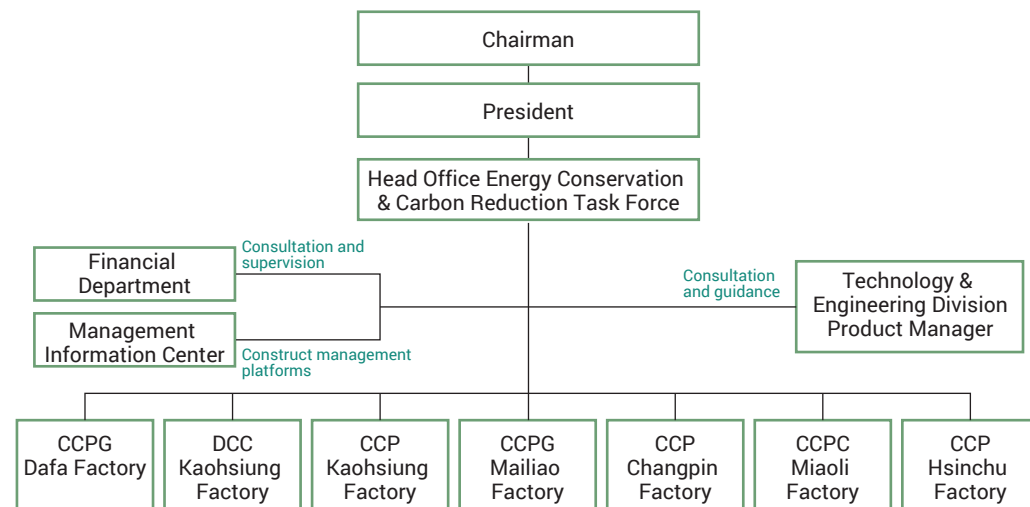
CCPG established the energy conservation and carbon reduction implementation unit in 2018 and established a goal for the Group of reducing unit energy consumption by 3% each year. During the implementation period, the Chairman organizes meetings personally each month to regularly review energy and water consumption reduction measures and comply with related government policies for energy conservation and carbon emissions reduction in all factories.

Energy conservation implementation strategy:

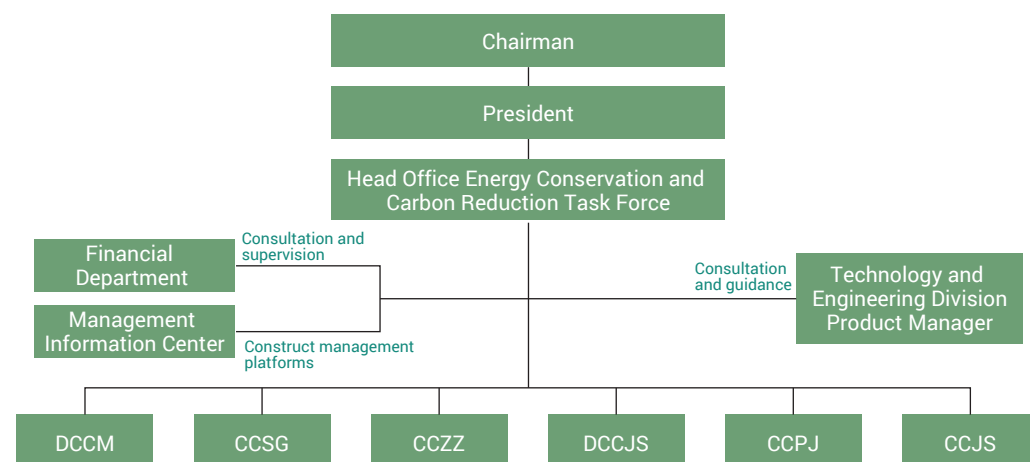


Energy Conservation and Carbon Reduction Organization Structure

CCPG Energy Conservation and Carbon Reduction Advancement Organization Structure (Taiwan)



CCPG Energy Conservation and Carbon Reduction Advancement Organization Structure (Overseas Factories)



CCPC Miaoli Factory Renewable Energy Installation

We actively cooperate with the government's energy policy and invested NT\$120 million in renewable energy facility in 2018 and installed a total of 6,060 solar PV panels over an area of approximately 5,000 pings in CCPC Miaoli Factory. The installed capacity is 1,999.8KWp and it generates approximately 2 million kWh of electricity each year. Investments in renewable energy save energy and reduce carbon consumption. They also effectively reduce power consumption to achieve environmental protection, sustainability, and clean energy applications to establish a green company image for the Company.



Introduce the ISO 50001 Energy Management System to Factories

To effectively manage energy use and improve energy efficiency, the highest-ranking executives required the full implementation of the ISO 50001 Management System. As of 2018, CCPC Miaoli Factory, CCP Dafa Factory, and CCP Kaohsiung Factory have obtained certification and the Group is expected to obtain third-party verification by 2020. With the support of the management system, we seek to help companies reduce energy consumption, fulfilling corporate social responsibilities, and preserve the competitiveness of products of the Group.

CCPG Energy Consumption from 2016 to 2018

Unit: Gigajoules (GJ)

Energy Type	2016	2017	2018
Externally purchased electrical power	6,742,800	8,602,365	9,274,135
Diesel	92,783	146,339	70,468
Natural gas (NG)	2,732,308	2,978,728	3,477,325
Heavy oil/fuel oil	866,929	777,793	713,302
Coal	58,323,943	53,794,377	54,678,767
Externally purchased steam	18,387,515	20,336,166	22,833,364
Steam sold to external parties	4,630,043	5,205,461	6,826,130
Electrical power sold to external parties	1,407,088	1,392,646	1,562,741
Total	81,109,147	80,037,661	82,658,490

Note 1: CCPG does not use biodiesel or liquefied petroleum gas.

Note 2: All statistics in Chapter 3 are rounded off.

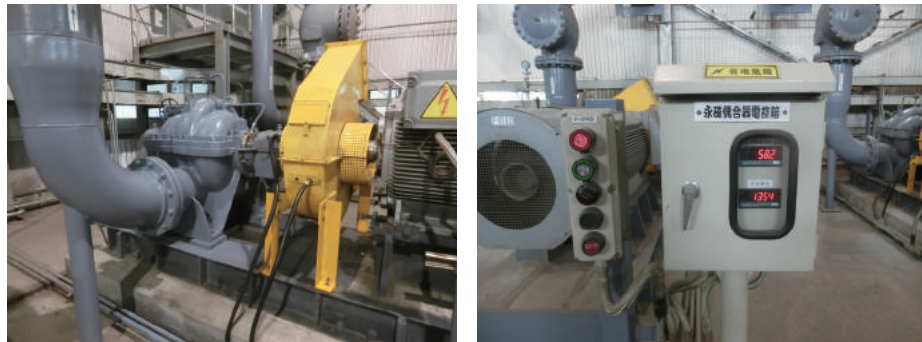
Note 3: Refer to Appendix D for the energy consumption of all CCPG companies in 2018

CCPG uses solid research and development, process technologies, process design, and engineering capabilities to use all kinds of methods for comprehensive factory energy conservation. The energy conservation strategies are listed as follows. Please refer to Creative Innovations under 2.1.1 for various green processes and products.



Cooling Tower System Water Hydropower Balance Analysis

CCPJ measured the cooling water distribution in the epoxy resins (LER) process in 2018 and conducted a hydropower analysis. It discovered that the current operating conditions exceeded the minimum requirements in the analysis and implemented parameters adjustments in separate phases, suspended the use of excess pumps, and adopted permanent magnet water pumps to achieve energy conservation in the cooling water system. The measures save 2,228,196kWh of electricity each year.



Reduced Pressure and Improved Energy Conservation in the Thermal Oil System

CCP Changpin Factory conducted a hydropower analysis of the thermal oil system of the Di-tert-butylphenol (DTBP) process in 2018. Based on the results of the water analysis, the impellers were cut to reduce a total of 30m of hydraulic head and reduce the current for the pump from 191A to 136A, reducing the effective power by 125.6KW to 85.2KW. These measures save NT\$880,000 in the cost of electricity operations each year.

Improved Fuel Transportation System

In 2018, the fuel transporter used in the steam and power cogeneration process of CCP Hsinchu Factory originally used compressed air to transport fuel. As transportation via compressed air consumes a high amount of energy, it was determined after the review to replace the system with a bucket elevator. It saves operating cost and increases the amount of backup compressed air for use by the factory. It also saves 3,773,000 kWh of electricity each year and reduces CO2 emissions by 2,377 tons each year.

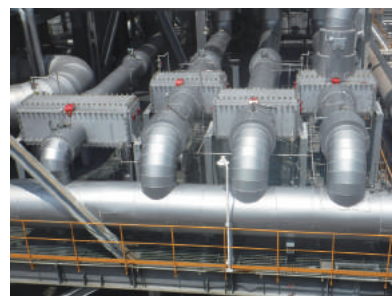


Cross-process Heat Integration

Steam generated in the BDO production process of DCC Dafa Factory can be recycled for use in the allyl alcohol (AAL) production process. Excess steam from the AAL process can be supplied to the polytetramethylene ether glycol (PTG) production process for use.

After the heat integration, the unit steam consumption for AAL declined by 16.8%.

AAL waste heat recovery system



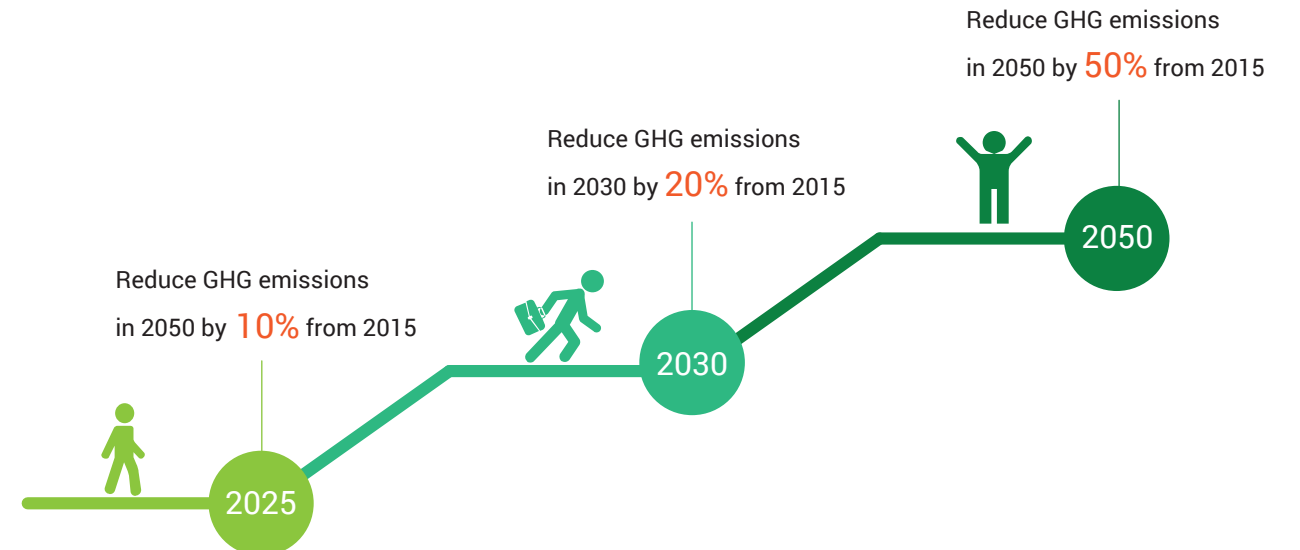
BDO waste heat recovery system



3.2.2 Greenhouse Gas (GHG) Emissions Management



CCPG complies with Taiwan's greenhouse gas emissions reduction targets and we have established reduction goals for the Group for the year 2025, 2030, and 2050. We also established short, medium, and long-term GHG action plans to follow up on energy consumption, GHG emissions, and reduction benefits. CCPG also uses the monthly energy conservation & carbon reduction meeting organized each month to review whether the carbon reduction performance of the Group has reached reduction targets. Special teams shall conduct evaluations and improvements for factories that failed to reach reduction goals.



From June to August each year, factories in Taiwan shall obtain ISO 14064-1 greenhouse gas certification from third-party certification units and obtain statements issued by third-party certification institutions. We also register related reports on the National Greenhouse Gas Registration Platform before the end of August each year in accordance with regulatory requirements. Factories in China also advance annual GHG inventory in accordance with the "Guidelines for Accounting and Reporting Greenhouse Gas Emissions for Petrochemicals Production Enterprises in China".

CCPG GHG Emissions from 2016 to 2018

		Unit: kt-CO ₂ e		
Region	GHG Type	2016	2017	2018
Taiwan	Direct GHG emissions (Scope 1)	3,048	3,137	3,397
	Indirect GHG emissions (Scope 2)	3,237	3,498	3,576
Overseas	Direct GHG emissions (Scope 1)	2,239	2,057	1,759
	Indirect GHG emissions (Scope 2)	692	736	1,085
Group Total	Direct GHG emissions (Scope 1)	5,288	5,194	5,156
	Indirect GHG emissions (Scope 2)	3,929	4,234	4,661

Note 1: GHG emissions in Scope 1 included carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and hydrofluorocarbons (HFCs). No other gases were emitted.

Note 2: GHG emissions in Scope 2 included carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). No other gases were emitted.

Note 3: The inventory of greenhouse gases at CCPG factories includes the inventory of Scope 1 and Scope 2 statistics which are reported to the Environmental Protection Administration and greenhouse gases under Scope 3 are not inventoried.

Note 4: Among the overseas factories, only the factories in China conducted inventories of CO₂ emissions. DCCM calculated emissions based on emission coefficient factors of Taiwan.

Note 5: CCSG begins including Scope 2 emissions in the calculations starting this year.

Note 6: Refer to Appendix D for the greenhouse gas emissions of all CCPG companies in 2018.



Advancement of the GHG Offset Program

CCPG evaluates the factories in Taiwan and advances efficient carbon reduction programs that meet the required methodology. We filed applications for greenhouse gas emissions offset programs including the two greenhouse gas offset program applications in 2017. They included CCPC's "blower/pump variable-speed control conversion project" which is expected to offset 7,790 tCO₂e from 2019 to 2028 and DCC Mailiao Factory's "VAM2/VAM3 process heat integration engineering improvement project" which is expected to offset 147,260 tCO₂e from 2019 to 2028. We delivered the two cases to the Environmental Protection Administration for registration in 2018. After receiving the notice from the EPA and the registration review meeting, we expect to obtain a total of 15,505 tCO₂e in offset credit each year.

Establishment of the Group's Internal Carbon Cost System

CCPG uses the information on fuel type, power, steam, and process gases and liquids and the emission coefficient from the annual greenhouse gas inventory lists of the factories to establish the Group's internal carbon cost system. We also use the cost allocation principles of the finance system to calculate the carbon cost of each product and use the greenhouse gas inventory of the factories for annual verification so that the internal carbon cost information can be closer to actual emissions. The measures help the Group conduct carbon asset management on the carbon market once laws and regulations are passed to implement total emissions controls.

3.2.3 Climate Change Adaptation



We actively respond to the risks brought forth by climate change and turns risks into opportunities. Factories stored appropriate reserve materials and optimized production schedules to reduce impacts on the production process. They also advanced energy conservation plans to reduce carbon emissions in response to the requirements in the Greenhouse Gas Reduction and Management Act and advances the carbon cost and energy conservation and carbon emissions reduction measures in response to the impact of future carbon taxes.

In addition, we also established early warning measures and standard operating procedures for natural disasters in response to torrential rains, typhoons, and water shortages generated by extreme weather. The establishment of procedures and control of all sorts of updated information effectively integrates execution in factories and decision making in the CCPG Executive Board in Taipei for full control of internal and external conditions. CCPG also reviews climate change issues in 2018 and proposes new response strategies. All levels of the Group are therefore able to make the most suitable decision and actions at the most appropriate times and implement them effectively to reduce the impact on the Group. We also plan to introduce the Task Force on Climate-related Financial Disclosures (TCFD) framework in 2019 to implement financial disclosure and management for climate change risks.

Factories' Response Strategies for Climate Change

Factories' Response Strategies for Climate Change

Incident



Water shortage
and reduction of
output

Response

- Increase water storage by increasing the water level of the water tank, connecting temporary pipelines to the basement, and using storage tank for solid objects (silos) to store water
- Increase the reutilization rate of water resources
- Increase rainwater recovery rate
- Reduce water consumption
- Add water recycling facility
- Adjust the operating efficiency of the waste water treatment facilities
- Adjust the concentration level of the cooling tower to reduce water release volume

New response measures in 2018

- Build rainwater storage tanks to recycle rainwater for use in the cooling tower.
- Reduce the heat load of the cooling tower and reduce industrial water consumption.
- Add rainwater recovery equipment and improve the rainwater recovery plan.

Incident



Flooding caused
by rain

Response

- Build rainstorm collection pools
- Increase the building elevation of factories
- Perform periodic inspections and clear the drainage system; open up other water channels to divert water flow during torrential rains

New response measures in 2018

- Enhance inspections and clear the drainage system; open up other water channels to divert water flow during torrential rains



Power blackouts

- Increase the ratio of cogeneration power
- Adopt solar power generation
- Improve manufacturing process and reduce power consumption
- Use electricity-saving equipment
- Adopt high-efficiency motors
- Set air-conditioning temperature to 27°C
- Establish blackout emergency response work guidelines to conduct exercises for backup emergency power generator to ensure dual-loop power supply

New response measures in 2018

- Replace mercury-vapor lamps with LED lamps



Natural disasters

- Strengthen response measures for typhoons
- Implement patrols and replacement of old pipelines to ensure that the production process can be maintained during natural disasters and ensure the stable supply of water, electricity, and steam through public pipelines
- Improve earthquake evacuation drills
- Increase the wind-proof level of buildings
- Purchase related insurance to ensure compensation after disasters
- Establish disaster response organizations and organize regular disaster prevention exercises
- Pay attention to extreme weather reports and adopt corresponding preventive measures in advance such as measures against blizzards and low temperatures.



Extreme cold weather response measures

CCJS is located in a high-latitude area and it is often impacted by extremely cold weather. To protect production and ensure safe operations, CCJS implements factory-wide inspections for insulation measures before winter each year. To prevent freezing of outdoor fire safety pipelines, it adjusts valves appropriately to keep the fire safety water flowing. It also retains related snow removal equipment to prevent the pile-up of snow.



3.3 Water Cycle and Management

CCPG pays attention to water resource management issues and continuously improves the efficiency of the use of water resources in day-to-day operations. The energy conservation and carbon reduction advancement team set a goal of reducing water consumption per unit by 3%. The factories perform evaluations to review the water consumption status and water conservation performance and they also formulate improvement plans to improve the management of water resources. These measures are aimed to enforce water conservation, recycling, and reuse in the process and it promotes good performances to other factories for them to learn.

3.3.1 Water Management



Rainwater is the most precious gift from the heavens and the Group is also committed to advancing rainwater recovery. Our efforts reduce the use of tap water and raw water and demonstrate the Group's commitment to maintaining a clean factory environment. Each employee maintains good habits of 7S on-site management rules, and they regularly perform leak prevention and water and sewage separation tasks to recycle high-quality rainwater.

In June 2018, CCPG Dafa Factory completed nearly 13 hectares of the recovery area and recovered a total of 68,877 tons of rainwater in 2018.

In September 2018, CCJS began operating the rainwater and clean sewage recovery system and recovered a total of 113,360 tons of water in 2018.

In response to the shortage of water resources, we have established short and mid to long-term goals for the management of water resources in order to implement the Group's water usage efficiency improvement measures and continue to optimize the efficiency in the use of water resources:

CCPG Water Resource Management Goals

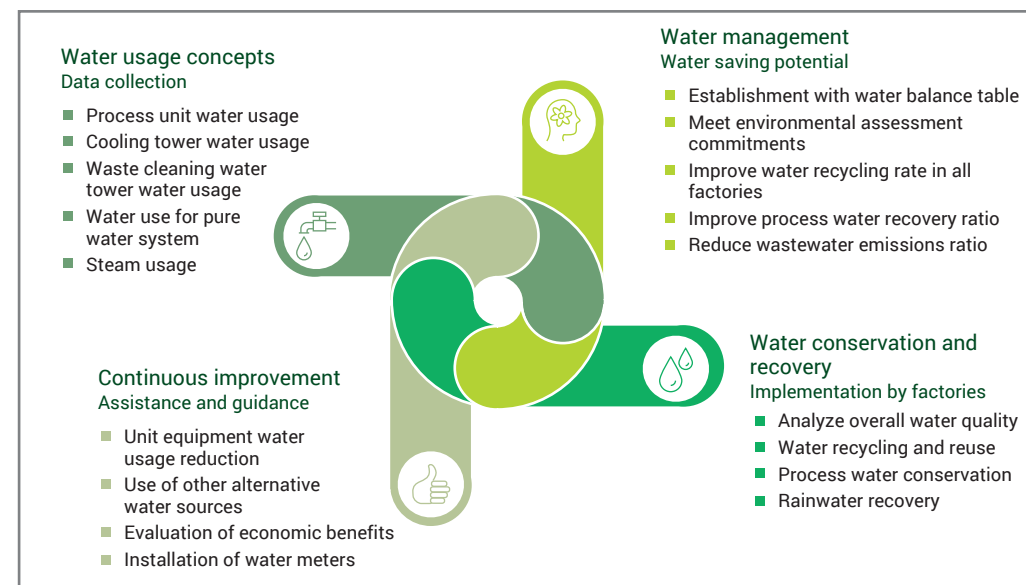
2016-2019 short-term goals

Complete water usage efficiency measures in CCPG Mailiao Factory, CCPC Miaoli Factory, and CCPG Dafa Factory

2019-2029 mid to long-term goals

Reduce unit water consumption by 3% in all processes of the Group

CCPG's strategic water efficiency improvement plan



CCJS Cooling Water Tower Wastewater Recovery Project

To improve the water resource usage rate, CCJS installed an intermediary water recovery system with a maximum processing volume of 130 tons/hour. Wastewater from the cooling tower enters through the water intake and is filtered by the processing system to produce recycled water which can be reused in the cooling tower. The total investment of the project was approximately RMB 16 million and we recovered 406,823 tons of water in 2018.



CCPC Miaoli Factory Cooling Water Tower Wastewater Recovery Project

CCPC Miaoli Factory constructed a coagulation and flocculation sedimentation system, ultra-filtration equipment, and reverse osmosis equipment to obtain recycled water. Water discharged from the cooling water contains high conductivity, high level of hardness due to calcium and magnesium, high carbonate alkalinity, high silicon concentration, and other substances which must be overcome one by one to obtain fresh recycled water and achieve water conservation targets. The total investment of the project was approximately NT\$34 million and the factory recovers approximately 720 tons of water each day.

CCPG Water Resources Statistics from 2016 to 2018

Unit: Thousand kiloliters

Environment Indicator	2016	2017	2018
Running water consumption	18,739	17,543	17,757
Reservoir water consumption	3,491	3,435	3,520
River water consumption	17,911	18,418	17,930
Rainwater consumption	N/A	N/A	180
Pure water sold	1,937	2,073	2,256
Pure water purchased	1,704	1,830	1,879
Total water intake	39,908	39,153	39,010

Note 1: Only CCPC Miaoli Factory used reservoir water.

Note 2: Only CCPC Miaoli Factory used river water from Houlong River and CCJS used river water from Yangtze River.

Note 3: CCJS and CCPG Dafa Factory completed rainwater recovery systems.

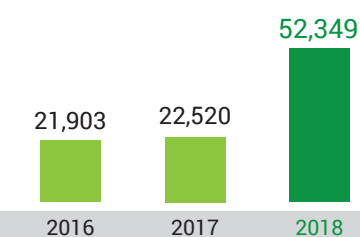
Note 4: Please refer to Appendix D for the statistics on the water resources of CCPG companies in 2018

DCC Dafa Factory Process Water Conservation Project

The Factory improved the regenerative procedures of the resin bed in the PTG process to reduce the COD and THF in the wastewater produced in the regeneration process and stabilize the wastewater control values of the process (COD<6,000ppm, THF<500ppm). After the completion of the project, wastewater production declined from an average of 368 tons per month to 350 tons per month and wastewater production declined by 5% from 2017.

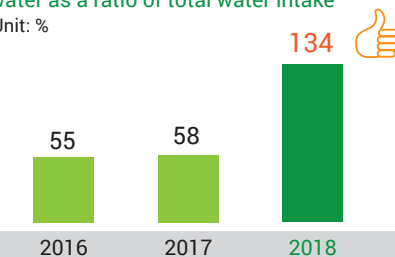
Total volume of recycled and reused water

Unit: Thousand kiloliters



Total volume of recycled and reused water as a ratio of total water intake

Unit: %



Note 1: Scope of recycled water inventory was redefined in 2018: Steam condensate recovery volume, process recycling water, the sum of waste recovery and reuse volume (process/public use).

Note 2: 134% means that each drop of water was reused 1.34 times.

Note 3: Please refer to Appendix D for the statistics on water recycling of CCPG companies in 2018

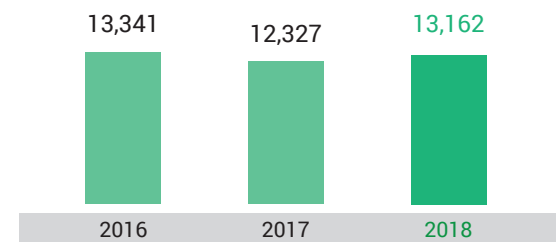
3.3.2 Wastewater Management



Each factory has constructed wastewater processing plants and they use biological and chemical procedures to process wastewater produced in the production process based on the characteristics of the wastewater in order to meet environmental protection regulations.

Total discharge volume

Unit: Thousand kiloliters



Note 1: The wastewater of CCP Hsinchu Factory, CCP Changpin Factory, CCPG Dafa Factory, DCC Kaohsiung Factory and overseas factories that meet effluent standards is discharged to the wastewater treatment plant of the industrial zone; CCPC Factory discharges wastewater into Houlong River, CCPG Mailiao Factory discharges wastewater into Taiwan Strait; CCP Kaohsiung Factory discharges wastewater into Houjin River.

Note 2: Please refer to Appendix D for the statistics on the wastewater of CCPG companies in 2018

CCPG Mailiao Factory Biological Wastewater Recovery Project

CCPG Mailiao Factory completed the biological wastewater recovery project in 2018 and reduced wastewater effluent volume. The wastewater is more difficult to recycle due to its characteristics and the Factory therefore planned rigorous feasibility tests on the water quality of the wastewater in the early planning stages and established the water intake control standards for the recovery system to ensure that the filtration system would not be subject to sedimentation of inorganic compounds and biological blockages. After the completion of the system, it produces approximately 845 tons of water per day and recycles nearly 250,000 tons of water each year. The recycled water can be used to replenish water used in the cooling tower for the process to reduce the use of raw water.

Effluent Wastewater Quality Monitoring

To strengthen wastewater monitoring and control and implement active management, the factories in Taiwan have installed automatic monitoring systems at each discharge point for instantaneous notifications. Irregular data are processed through automation electronic notification procedure to effectively control the water quality of wastewater discharge points. The Head Office strictly requires factories to transmit at least 90% of valid monitoring data each month. Factories that fail to reach this standard will be regularly announced for review. We have implemented plans to include overseas factories into the management system.

Effluent wastewater quality monitoring system diagram

Wastewater status in all factories					
CCP Hsinchu Factory Normal					
Monitoring item and limit	General monitoring item				
	Chemical oxygen demand (COD)	Conductivity	Suspended solids	Temperature	Ph
Monitoring display data	29.4	0.4	19	26	6.6

3.4 Emissions Management

CCPG follows the "Corporate Social Responsibility Policies" and adopts pollution prevention measures to prioritize the environmental risks in various production procedures and reduce pollution from the process. In addition to truthfully reporting the level of air pollutant emissions and quantity of waste, we also pay attention to the processing of waste in order to effectively reduce impacts on the environment and ensure compliance to environmental protection regulations.

3.4.1 Air Pollutant Emissions Management



Management approach for "air emission management"

Significance of Material Issues	CCPG is committed to providing a good living environment for all citizens. Providing citizens with clean air and blue skies is the most powerful driving force for us to continue to improve air pollution.		
Policy and Commitment	Source improvement, green production processes, air pollutant reduction		
Target	CCPG is committed to actively reducing and removing odors caused by VOC gases or solvents. In response to particulate contaminants, sulfur oxides, and nitrogen oxides, we continue to adopt optimal feasible control technologies to reduce the air pollutants produced from cogeneration boilers.		
	Short-term	Mid-term	Long-term
	<ul style="list-style-type: none"> Zero odor dispersion in the process 	<ul style="list-style-type: none"> Reduce TSP, SOx, NOx, and VOCs by 5-10% from 2017 	<ul style="list-style-type: none"> Zero failure of prevention equipment and aim for zero emissions from the flare stack
Action Plan	<ul style="list-style-type: none"> Establish management approaches including technical feasibility, environmental friendliness, and regular progress tracking. Establish management standards to meet and exceed regulatory requirements. Organize factories within the Group to form project teams for compliance and implementation. 		
2018 Implementation Results	<ul style="list-style-type: none"> Organized regular review meetings with level 1 supervisors to provide an explanation. Instructed the factory managers and personnel responsible for process and EHS in the factories to evaluate and discuss the feasibility of such plans for implementation and gradually achieve management targets. 		
Communication/grievance mechanisms	Customers can use the customer hotline, Customer section on CCPG official website, and e-mail to communicate or file complaints.		

We have long been dedicated to improving air pollution and we try to use the latest preventive measures developed in the country or in foreign countries to promote optimal feasible solutions for processes. Our performance in air pollution control has exceeded domestic standards and met the optimal feasible control technologies. CCPG's air pollutant improvement performance is described below:

1. Cogeneration power plant air pollutant reduction:

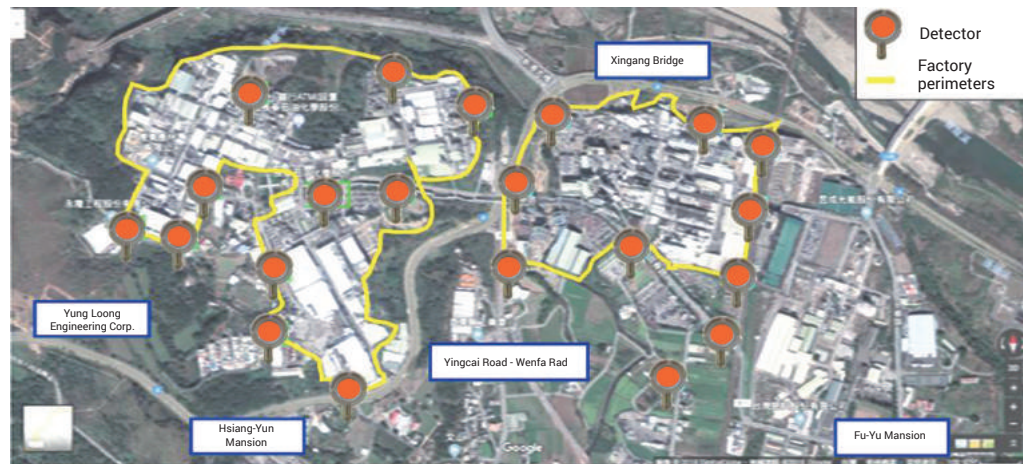
The dosage of magnesium hydroxide and cycling water volume have been increased in the flue gas desulfurization equipment in the steam and power cogeneration process. The amount of sulfur has also been decreased by reducing the use of bituminous coal. The sulfur oxide emissions concentration after the procedures were reduced to 11-17ppm (the BACT emissions standard is 25ppm and the national standard is 70ppm). CCPG used the wet electrical static precipitator and gas heat exchanger to reduce emissions concentration to 3-15mg/Nm3 to remove particulate contaminants. In addition, CCPG also set up multiple air pollutant prevention equipment including smoke ventilation and desulfurization equipment, low nitrogen oxides incinerator, enclosed coal stockpile, and transmission systems. Furthermore, cogeneration emissions standards have been increased in China to enforce ultra-low emissions. Therefore, particulate contaminants, sulfur oxides, and nitrogen oxides emissions have significantly decreased in 2018 from levels in 2017.



2. Volatile organic compounds (VOCs) reduction and odor control:

To reduce and control the impact of odor on nearby residents, CCPG installed VOC sensors on the perimeters of factories and in process areas and use wind speed and wind direction factors to track sources of VOC emissions and implement improvements. Improvement measures included a full inventory of the composition of exhaust, flow volume, size, and set pressure of pressure safety valves (PSVs) and whether they are connected to pollution prevention equipment. The input in the batch process input station was converted to negative pressure suction or enclosed positive pressure input through pipelines. The equipment units are divided into different areas of responsibility and autonomous inspection frequency has been increased. Once the concentration of VOC leaks reaches 300ppm, maintenance and repairs are implemented within 48 hours to close off the leakage. If reviews show that improvements cannot be performed, anti-leak measures shall be implemented for improvement.

Locations of VOCs detectors on factory perimeters



3. Storage tank emissions reduction:

To reduce the frequency of operations of the breather valves in internal floating roof tank caused by drastic changes in internal vapor pressure from differences in temperature, CCPG added insulation layers for the storage tank to stabilize the storage tank temperature and reduce vaporization of VOCs. The measures reduce approximately 96.56 tons of vaporization each year.

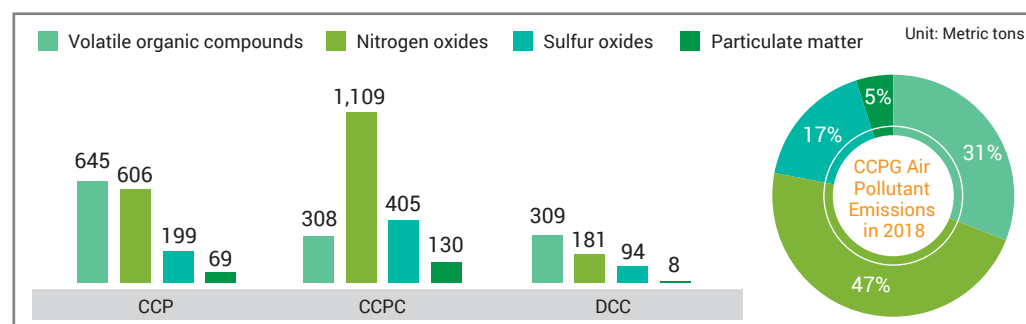
Internal floating roof tank insulation layer comparison



4. Improve the removal efficiency of the scrubber.

To improve the removal efficiency of traditional scrubbers, factories added solvent scrubbers on the front end of the scrubbers to absorb VOCs from exhaust gases that do not dissolve in water through solvent scrubbers. On the rear end, the scrubber continues to absorb water-soluble VOCs. The scrubbing solution used in the two scrubbers is recycled to the process for reuse to reduce wastewater production. 95-99% of the VOCs from exhaust gases can be removed and the pipeline emissions concentration is also lowered to less than the aroma threshold value to prevent odors from affecting nearby residents.

CCPG Air Pollutant Emissions in 2018



3.4.2 Waste Management



To implement waste management, we are committed to implementing improvements for operations and technologies in processes. We are deeply aware that reduction at the source is more important than waste recycling or disposal and should be prioritized. All outsourced waste disposal tasks are contracted to qualified contractors. We also file online reports to track the movement of the waste and factories organize at least one visit to the disposal sites of waste of concern each year. The Head Office organizes waste regulations compliance audits each year and organizes internal administrative measures for each factory to fulfill environmental responsibilities.

CCPC Miaoli Factory Vaporization Concentration and Waste Reduction Project

The smoke desulfurization equipment in the cogeneration plant produces wastewater that contains magnesium sulfate at a rate of 80 tons per hour. CCPC Miaoli Factory installed a set of mechanical steam recompression system that uses vaporization concentration to remove most of the water. The wastewater is crystallized, dehydrated, and dried to form magnesium sulfate heptahydrate. The measures reduce the production of wastewater and reduce wastewater treatment expenses. The magnesium sulfate can be used as fertilizers with this environmentally-friendly measure.

DCC Dafa Factory Waste Solvent Reduction Project

The waste solvent produced in the production process includes 27% THF. A purification process is implemented to reduce the THF content to 9.9% and recycle the THF. The waste solvent is reduced from 220kg per hour to 150kg per hour, which is a reduction of 32%.

DCC Kaohsiung Factory Bulk Bag Waste Reduction Project

In the past, materials in the VAEP area of DCC Kaohsiung Factory were supplied in bulk bags which lead to messy environments and consume manpower. Large amounts of waste bulk bags are produced after the materials are injected. After an evaluation, the injection was converted to gas transportation to reduce operating time and maintain environmental cleanliness. The measures reduce 7,145kg of waste bulk bags and pallets each year.

CCPG Waste Disposal Statistics from 2016 to 2018

Unit: Metric tons

Environment Indicator	2016	2017	2018
Total general industrial waste	420,198	407,718	395,713
Total recycled general industrial waste	336,671	320,274	330,971
Total incinerated general industrial waste	35,898	43,142	45,357
Total buried general industrial waste	43,856	37,595	13,981
Total general industrial waste processed through other methods 'Heat treatment, solidification, physical processing, chemical processing, etc.'	3,773	6,707	5,404
Total hazardous industrial waste	42,408	35,980	54,473
Total recycled hazardous industrial waste	15,442	13,001	1,324
Total incinerated hazardous industrial waste	26,606	22,025	38,770
Total buried hazardous industrial waste	360	537	880
Total other hazardous industrial waste processed through other methods 'Heat treatment and high-temperature wet air oxidation'	NA	417	13,499
Total waste quantity	462,606	443,698	450,186

Note: Please refer to Appendix D for the statistics on the waste of CCPG companies in 2018



Chapter 4

An Enterprise that Creates
a Friendly Workplace

4.1 CCPG Talents

4.2 Talent Cultivation and Development

4.3 Employee Care and Benefits

Companies would cease to exist without people. "People" are CCPG's greatest assets. We use various human resources management policies and the employee assistance program (EAP) to construct comprehensive talent recruitment, cultivation, promotion, and retention system and promote employees' physical and mental health management. We provide a friendly work environment to build a sense of cohesion for employees and strengthen their sense of identity with the Company.

4.1 CCPG Talents

Outstanding talents have played the most important roles in CCPG's growth and achievements throughout the years. CCPG's most substantial assets and foundation lie in passionate work ethics, abundant professional expertise, and integrity. We therefore continue to pursue flexible and diverse talent management systems and human resource policies.

4.1.1 Human Resource Policy



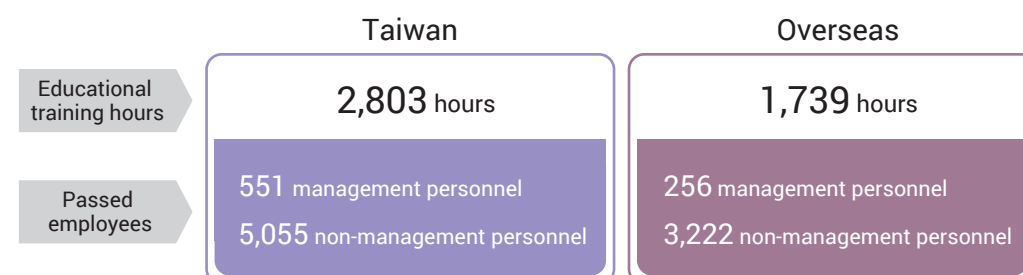
Employees are CCPG's most important partners as well as some of the most important stakeholders. We value human rights and follow internationally recognized guidelines for sustainability and human rights, including the core labor standards of basic conventions in the United Nations Global Compact and the International Labour Organization. CCPG also complies with local applicable laws and regulations of the location where each factory is based in.

We established the CCPG Code of Conduct in 2017 and it was signed and approved by the Chairman of the Board. The Code of Conduct is binding to all CCPG employees across the world. We are committed to providing employees with respect and ensure a safe and secure workplace for employees to pursue the sustainable development of the Group and environmental sustainability as well as abide by business ethics. We reviewed 5 human rights issues based on international human rights regulations in the sustainability evaluations, and benchmark trends and requirements to ensure that each issue is provided with comprehensive management mechanisms to mitigate risks to human rights.



To implement related policies for human rights, the Taipei offices, factories in Taiwan, and overseas factories completed human rights education, training, and tests through the Chang Chun e-Learning System in 2018. The training includes: Fair and equal treatment, prohibition on forced labor, ban on child labor, anti-discrimination, harassment prevention, protection of employee privacy rights, ensuring humane treatment, and providing a healthy and safe environment.

Implementation of Human Rights Education and Training in 2018



Note 1: Management roles refer to employees ranked section chiefs and above.

Note 2: The statistics are based on the related education and training and the number of CCPG employees who have taken the tests in 2018.

Starting from 2019, we list human rights education and training as mandatory courses for all employees of the Group in order to strengthen their awareness of regulations. We also require new employees to complete training within 3 months of reporting for duties so that new employees can quickly acquire related knowledge. In addition, we also provided human rights education and training courses in simplified Chinese and English for factories in China, CCDSG, and DCCM to expand knowledge of human rights, improve employees' self-awareness, and protect their own rights.

We adopted a top-down approach to educate and implement the human rights policy of the Group. Human rights policy seminars were arranged for department managers in 2018 to enhance training on the Group's human rights policy. The managers were required to educate employees in their departments after participating in the training.



A human rights policy seminar organized for department managers of the Group

Key points in human rights seminars

1. Overview of labor rights
2. Ban on forced and child labor
3. Fair and equal treatment
4. Sexual harassment prevention



4.1.2 Talent Composition



We actively advance into major campuses and institutions while applying for the selection of R&D substitute servicemen and participating in industry-academy collaborations. We also provide competitive salaries and benefits as well as comprehensive and professional education and training programs to actively seek out talented employees.



All laborers in operations in Taiwan are local laborers.

Campus talent recruitment and company introduction seminar in National Chiao Tung University



AI Academy recruitment seminar



Information security talents recruitment seminar



R&D substitute servicemen recruitment





CCPG has always been committed to taking care of local residents, prioritizing the hiring of outstanding local talents, and providing competitive compensation. The salaries of new employees are established based on the price index, scarcity of the post, field of study of job seekers and connection to the content of work, difficulty of the tasks, and related licenses to undergo comprehensive assessments. When new employees are recruited, priorities are given to local residents. More than 85% of the employees at CCPC Miaoli Factory, DCC Kaohsiung Factory, CCP Kaohsiung Factory, and CCPG Dafa Factory are local residents.

Ratio of Local Employees in 2018

Unit: numbers

Factory	Number of people employed	Number of local employees	Percentage of local employees	Remarks
CCP Hsinchu Factory	735	618	84.1%	Taoyuan Hsinchu Miaoli Region
CCPC Miaoli Factory	1,768	1,590	89.9%	Miaoli Region
CCP Changpin Factory	196	138	70.4%	Taichung Changhua Region
CCPG Mailiao Factory	570	411	72.1%	Yunlin Region
CCPG Dafa Factory	865	745	86.1%	Kaohsiung Region
CCP Kaohsiung Factory	447	391	87.5%	Kaohsiung Region
DCC Kaohsiung Factory	219	195	89.0%	Kaohsiung Region

The number of employees hired by CCPG in Taiwan and overseas has increased by nearly 4% each year. The average turnover rate of employees in Taiwan is below 1% and CCPG has been praised for its 100% appointment rate for local labors in Taiwan. In addition, 100% of the management were promoted from entry-level employees of the Group. The number of female employees has grown consecutively in recent years and the number of hired female employees has grown by at least 5% in the past three years. Most of CCPG's employees are 30-50 years old. The average age of the employees is approximately 39 years old and the average years of service are approximately 13 years. The employees are in the life stage when they have rich experiences and full physical strength.

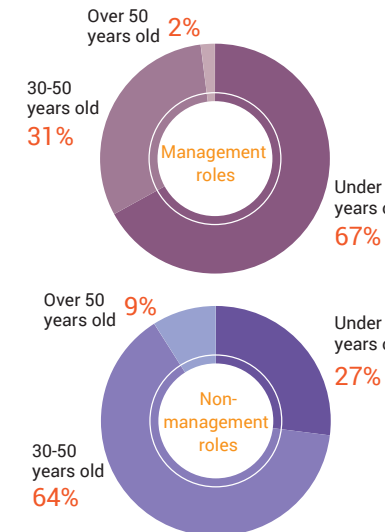
2016-2018 CCPG Employee Composition

Unit: numbers

Contract Type	Region	2016		2017		2018	
		Male	Female	Male	Female	Male	Female
Fixed-Term Contract Temporary Employees	Taiwan	37	31	51	26	58	32
	Overseas and assignment	0	0	0	0	0	2
	Subtotal	37	31	51	26	58	34
Non-Fixed Term Contract	Taiwan	4,332	316	4,575	329	4,833	352
	Overseas and assignment	2,667	773	2,555	820	2,386	877
	Subtotal	6,999	1,089	7,130	1,149	7,219	1,229
Group Total		7,036	1,120	7,181	1,175	7,277	1,263

Note: Please refer to Appendix E for the composition of employees in companies of CCPG in 2018

Percentage of Age Distribution of CCPG Employees in 2018



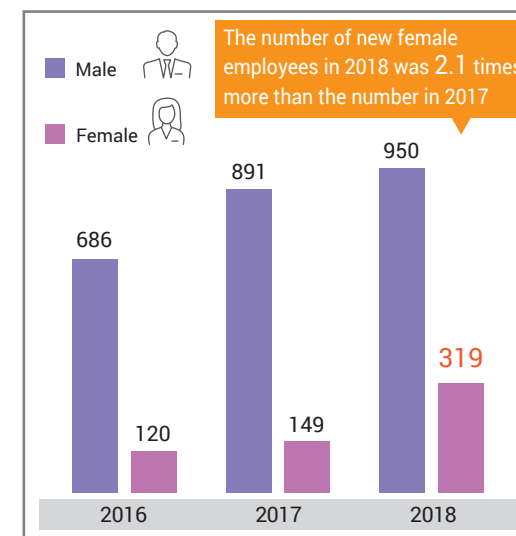
Age Distribution of CCPG Employees in 2016-2018

Unit: numbers

Distribution of age	2016		2017		2018	
	Management roles	Non-management roles	Management roles	Non-management roles	Management roles	Non-management roles
Under 30 years old	14	2,499	11	2,273	15	2,100
30-50 years old	450	4,354	438	4,741	505	4,960
Over 50 years old	208	631	218	675	238	722
Total	672	7,484	667	7,689	758	7,782

Note: Please refer to Appendix E for the distribution of employee age groups in companies of CCPG in 2018

2016-2018 CCPG Employee Growth Rate



Age Distribution of New CCPG Employees in 2016-2018

Unit: numbers

Distribution of age	Region	2016		2017		2018	
		Male	Female	Male	Female	Male	Female
Under 30 years old	Taiwan	302	38	399	33	442	53
	Overseas	350	69	310	87	300	178
30-50 years old	Taiwan	151	7	84	7	97	9
	Overseas	84	34	62	45	104	79
Over 50 years old	Taiwan	2	1	7	0	5	0
	Overseas	2	0	1	0	2	0
Group Total		686	120	891	149	950	319

Note: Please refer to Appendix E for the distribution of new employee age groups in companies of CCPG in 2018

Age Distribution of Resigned CCPG Employees in 2016-2018

Unit: numbers

Distribution of age	Region	2016		2017		2018	
		Male	Female	Male	Female	Male	Female
Under 30 years old	Taiwan	73	19	98	21	110	8
	Overseas	287	65	349	54	247	71
30-50 years old	Taiwan	108	8	75	4	107	23
	Overseas	86	18	110	32	103	63
Over 50 years old	Taiwan	82	5	75	6	65	4
	Overseas	1	0	1	0	1	0
Group Total		637	115	708	117	633	169

Note 1: The turnover includes retirement, dismissal, death, discontinuation of student worker/consultant contract upon expiry, and personnel transfers between companies of the Group.

Note 2: Please refer to Appendix E for the distribution of resigned employee age groups in companies of CCPG in 2018

Distribution of Employee Rankings in CCPG in 2016-2018

Unit: numbers

Rank	2016		2017		2018	
	Male	Female	Male	Female	Male	Female
Executives	23	3	27	3	34	3
Senior managers	79	3	70	4	72	4
Mid-level managers	151	10	152	9	142	9
Junior managers	440	57	439	58	435	61
Regular employees	6,343	1,047	6,493	1,101	6,594	1,186
Group Total	7,036	1,120	7,181	1,175	7,277	1,263

Note: Please refer to Appendix E for the distribution of employee rankings in companies of CCPG in 2018

In 2018, the proportion of local-hire senior managers was 100 percent in Taiwan and 9 percent for overseas areas. The Group adopts comprehensive management and competence training to actively cultivate local management personnel.

2018 CCPG Senior Executive Distribution

Total number of senior managers (executives + senior managers)		Local-hire senior executives		Percentage	
Taiwan	64 people	Taiwan	64 people	Taiwan	100%
Overseas	47 people	Overseas	4 people	Overseas	9%

We explicitly declare in various management measures, operating procedures and policy announcements that there shall be no discrimination in recruitment, selection, performance evaluation, salary adjustment, promotion, salary, retirement, dismissal, dismissal, training and education, benefit measures, etc. due to factors, such as gender, religion, political affiliation, age, marital status, sexual orientation, or race. CCPG hired 38 people with disabilities in 2018 and protects their equality and employment rights to create a friendly employment environment. CCPG also provides retiring employees with opportunities for appointment as consultants based on their professional skills.

Distribution of CCPG Employee Diversity in 2016-2018

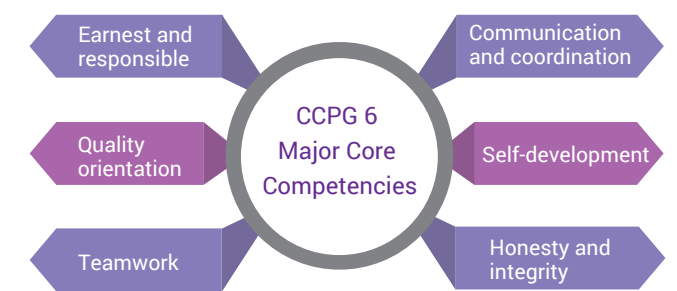
People with disabilities					
Management roles			Non-management roles		
2016	2017	2018	2016	2017	2018
1 person	1 person	1 person	41 people	38 people	37 people

Note: Please refer to Appendix E for the distribution of employee diversity in companies of CCPG in 2018

4.2 Talent Cultivation and Development



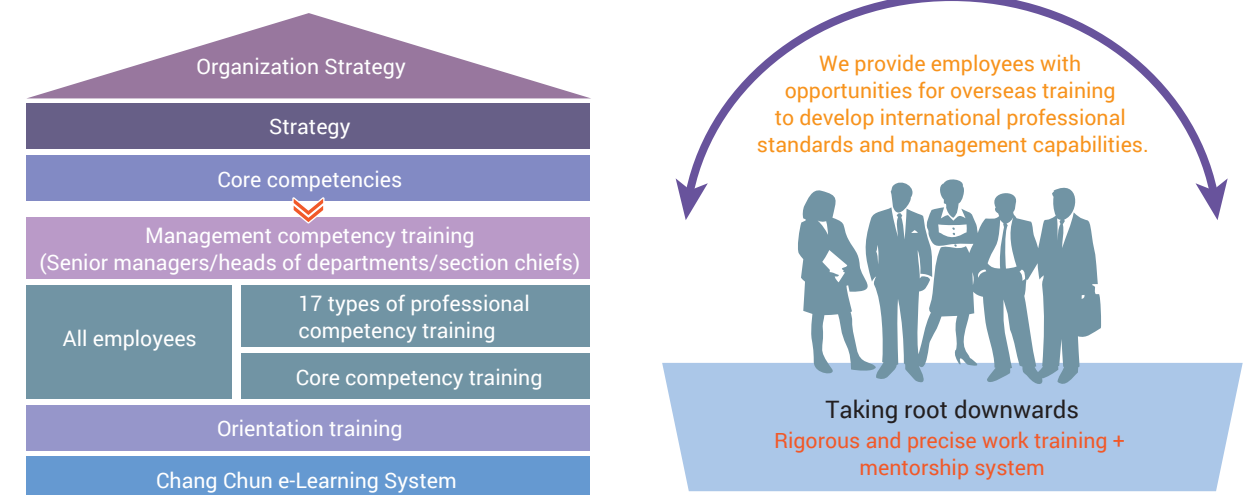
Talent cultivation is an important element in CCPG's development of human resources and its solid strength for gaining a foothold in an international competitive arena. CCPG defined the six core competencies of the Group in 2016 in hopes of building common cultural viewpoints, a code of conduct, and consistent values for all CCPG employees. CCPG's Talent Development Committee was established in the same year and it is chaired by the Chairman and President. The Committee discusses and formulates plans for talent recruitment, cultivation, promotion, and retention with the head of the Human Resource Department each month.



CCPG promotes education and training based on the development strategy of the Group each year to grow with each employee and achieve the goals of the organization. The structure of CCPG's education and training system is shown in the figure below:

We implement employee hiring and training with high levels of intensity and breadth. They are divided into two aspects: "Taking root downwards" and "Horizontal expansion." The former enhances employees' overall professional quality through our rigorous and precise work training, supported by mentor system; the latter provides young employees the opportunities for overseas training and helps employees develop international professional standards, management capabilities, and world-class vision.

CCPG's education and training system



CCPG plans comprehensive and up-to-date education and training courses and plans a series of high-quality training programs for candidates for leadership roles. CCPG designs professional courses with top-down focuses and in-depth analysis based on professional competencies to strengthen employees' work skills and improve teamwork through horizontal management skills. CCPG encourages employees and provides them with opportunities to unleash their potential and continue to improve the performance of the employees, departments, factories, companies, and the Group.

2018 CCPG Education and Training Hours Analysis

Unit: hours

Male		Female		Group Total	
Management	32,757 hours	Management	2,227 hours	380,645 hours	
Non-management	314,095 hours	Non-management	31,566 hours		

Note: Please refer to Appendix E for the analysis of training provided by CCPG companies in 2018

About This Report

Retrospect
and Outlook of
Sustainability
StrategiesKey CSR
Performance of
CCPG in 2018Chapter 1
A Diligent,
Pragmatic, and
Integrity-Oriented
EnterpriseChapter 2
A Trusted Material
SupplierChapter 3
A Sustainable
Producer that
Prosperes with the
EnvironmentChapter 4
An Enterprise that
Creates a Friendly
WorkplaceChapter 5
A Creator of
Value for All

CCPG's education and training programs can be classified by the recipients into the following three categories:

Orientation training for "new employees"

Provide new employees with basic training and divide them into common training for the Group (including professional competencies), common training for each unit (including factories and subsidiaries), and orientation training (including departments of the head offices and factories) so that each new employee can receive complete and comprehensive education and training. We also produced manuals for new employees in 2018 to help them understand the Company's operations, systems, and training resources.

2018 Orientation training for new employees



In addition, CCPG has established a "mentorship" system for new employees to quickly integrate into the organization and adapt to the corporate culture and work environment. We produced online courses on the mentorship system in 2018 to let mentors of new employees understand the system and related operations.

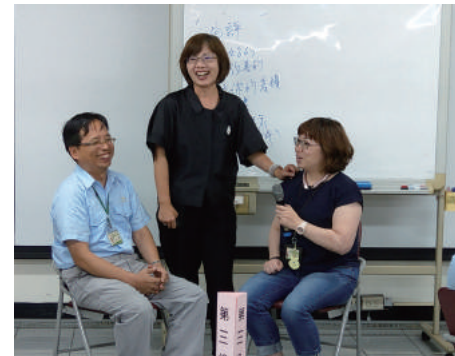
Core, management, and professional competency training for "current employees"

More than 7,500 courses on "core, management, and professional competency training" were organized for current employees of the Group in 2018. The training programs are described below:

1. Management personnel

CCPG provides corresponding management competency training for employees in different management roles to provide supervisors with the same values and common goals and to cultivate their management competencies required for completing their tasks. CCPG aims to cultivate consistent corporate culture, management skills, and behavioral patterns for management personnel. More than 514 participants from the Group have taken part in related training and the overall satisfaction rate was more than 4.7 points (based on a total possible score of 5 points).

Manager communication and assistance skill course



The vibrant consensus meeting for the Human Resource Department and personnel responsible for education and training in factories

2. Advanced training for employees assigned overseas

Starting from 2018, employees who had originally served in factories in Taiwan and were assigned overseas need to complete advanced training on the Chang Chun e-Learning System. Employees are able to learn more about related regulations on leaves, family members, regulations for dormitories, and factory environment.



3. Human Resource Department and personnel responsible for education and training in factories

In 2018, we organized a vibrant consensus meeting for the Human Resource Department and personnel responsible for education and training in factories to improve the consensus on implementing consistent standards for annual training plans, the education and training system, and operating procedures.

Internal instructor training (Train the trainer)

CCPG cultivated the skills of internal lecturers and their capabilities for promoting training programs to improve the quality of training for internal instructors. In addition, CCPG also used internal training courses, materials, and handouts to accumulate internal intellectual properties of the Group and use them to pass down knowledge and experience and build a corporate culture that encourages sharing of knowledge. The training programs organized in 2018 included training for the lecturing skills of internal instructors, foreman management training for the Group, and digital course production training.

Internal instructors' lecturing skill training in 2018



Digital course production teachers' training course in 2018



The CCPG e-Learning system was used to integrate the education and training database of CCPG in 2016. Data from past courses were collected, analyzed, and integrated as reference information for training courses in 2018 and 2019. We expanded the Chang Chun e-Learning System to overseas regions in 2018 so that employees in overseas regions can use the Chang Chun e-Learning System to attend general knowledge courses. We also began AEO integration and placed compliance courses online for learning, testing, and progress tracking.

Chang Chun e-Learning System

As of 2018, a total of 198 courses have been uploaded on the Chang Chun e-Learning System including various self-produced or online courses from other units/institutions. 70 of the courses were added in 2018.

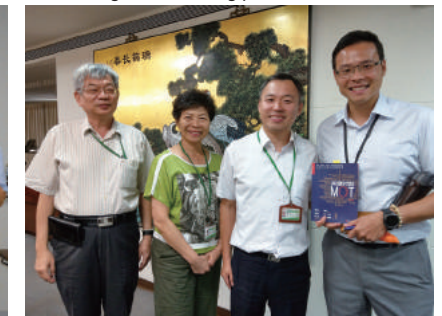


In addition, we also collaborated with external online learning platform institutions to provide CCPG employees with more diverse online learning resources such as the Japanese online learning platform and EMBA magazine learning platform. For the extended applications of the EMBA magazine learning platform, we organized essay contests and book clubs for employees to share their views after reading. Employees can discuss and share their views to enhance the effectiveness of their studies.

EMBA magazine learning platform essay contest



EMBA magazine learning platform book club



The implementation and effects of education and training are exemplified in employees' work performance, zero occupational safety incidents, and the career development of core managers. Moreover, the Group carries out two key management reviews every year and conducts internal audits on the implementation status of annual training and education plan proposed by all departments and factories. There were no major deficiencies in 2018.

4.3 Employee Care and Benefits

CCPG is committed to advancing both employee salary and benefits as well as a work environment that balances work and life. We provide various benefit systems and health care measures. We expanded regular physical health care to psychological counseling to create a healthy workplace and a happy company loved by all.

4.3.1 Employee Benefits

"Talent retention" requires dedication. In nearly 70 years of history, CCPG employees have enjoyed salaries and benefits superior to the average standards in the industry. CCPG has implemented salary adjustments each year and provided year-end bonuses, remuneration, and benefits system to satisfy every CCPG employee.



"Bonus" benefits

Annual festival bonus

- Bonuses for the three traditional holidays including Mid-Autumn Festival, Dragon Boat Festival, and Labor Day
- Chinese New Year work commencement red envelope
- Bonuses
- Year-end bonus

Incentive system

- CCPG awards senior employees who have provided 20 years of services with a gold coin
- Employees are provided with gift money of up to one month's salary
- Childbirth incentives and daycare subsidies
- 6+1 project for the New Labor Pension System with incentives for employee payment

Care for employees assigned overseas

- Allowances for overseas assignments
- Subsidies for education for children of Taiwanese employees assigned overseas.

"Non-bonus" benefits

Health Care

- Labor insurance premiums level and pensions payments are based on full salary
- Group insurance for employees
- Free annual health examination
- CCPG good mood hotline consultation and services

Work Benefits

- Subsidies for purchases of employee cafeteria facilities and employee uniforms
- Free work meals for Chinese employees of factories in China
- The Company provides accommodations, transportation to and from work, and airplane tickets back to Taiwan for Taiwanese employees assigned overseas.

Emergency Relief

- Interest-free emergency aid loan based on employees' salary
- Funeral subsidies for the death of employees or their family members

Self-Growth

- Organize diverse training programs (professional courses, management courses, online courses, and health and psychological support courses)
- Free English and Japanese language courses

Enrich Life

- Establishment of an employee welfare committee to appropriate benefit funds for subsidies for employee travels in accordance with laws
- Two days of employee travel leave each year
- Subsidies for employee sports activities, holiday activities, and club activities
- Subsidies for activities of (retired) employees' associations

Work and Family Balance

- Promotion of CCPG family day activities and family seminars
- Encourage employees to apply for parental leave for child rearing without salary

2018 Group Senior Employee Service Award Ceremony



2018 CCJS model employees' tour in Taiwan



2018 CCPG Family Seminar



CCPG Good Mood Hotline

CCPG launched the good mood hotline consultation and services for domestic and foreign employees in March 2018. Employees can use the telephone or communication software such as LINE to request help from professional psychologists for health, life, and work. Each employee is eligible for two one-on-one interviews each year to effectively help employees overcome low points in their lives and increase the cohesion and solidarity in order to improve overall work and life quality.

All consultation meeting records and personal information of employees who sought help shall be permanently confidential. Without legal procedures or written authorization of the party, the information shall not be provided to any unit or individual. Therefore, the Company does not know about the list of personnel who sought consultation and if employees are transferred to additional counseling, it would not affect employees' work, promotions, performance evaluations, or related rights and interests.

From March to the end of December 2018, a total of nine people called for telephone consultation on subjects such as managers, family, and psychological issues.



CCPG is grateful for employees' long-term contributions and dedication. Retirement with peace of mind exemplifies how CCPG takes care of its employees. We have established the "Labor Pension Preparatory Fund Supervision Commission" to supervise the use of employee pension funds. Companies appropriate sufficient funds to the pension preparatory fund each month and appoint third-party actuarial consulting firms to calculate the pension funds and ensure that the companies' financial resources are sufficient for paying employees' pensions. CCPG also awards retirees with a one-ounce pure gold coin marked with CCP for CCPG for commemoration and for their legacy.



CCPG encourages employees to apply for parental leave for child rearing without salary based on their actual needs. Companies approve 100% of applications for parental leave for child rearing without salary from both male and female employees and 100% of employees are reinstated to their original posts after the parental leave. This measure allows employees to take care of the future of the nation with peace of mind.

Analysis of Unpaid Parental Leave for Child Rearing without Pay in CCPG in Taiwan in 2016-2018

Item	2016		2017		2018	
	Male	Female	Male	Female	Male	Female
Number of employees eligible for parental leave in 2018	193	21	212	26	595	19
Number of employees on parental leave in 2018	6	2	10	4	17	6
Application Rate	3.1%	9.5%	4.7%	15.4%	2.9%	31.6%
Number of people reinstated from parental leave in 2018	7	3	2	0	7	4
Number of employees applying for reinstatement in 2018	7	3	2	0	7	4
Reinstatement Rate	100%	100%	100%	-	100%	100%

Note 1: Application rate = Number of employees on parental leave in 2018 / number of employees eligible for parental leave in 2018

Note 2: Reinstatement rate = Number of employees applying for reinstatement in 2018 / number of people reinstated from parental leave in 2018

Note 3: Please refer to Appendix E for the analysis of unpaid parental leave for child rearing without pay in CCPG companies in Taiwan in 2018

Analysis of Unpaid Parental Leave for Child Rearing without Pay (maternity leave) in CCPG in Overseas Regions in 2016-2018

Item	2016		2017		2018	
	Male	Female	Male	Female	Male	Female
Number of employees eligible for maternity leave in 2018	134	57	160	56	157	57
Number of applicants for maternity leave in 2018	134	57	160	56	157	57
Application Rate	100%	100%	100%	100%	100%	100%
Number of employees reinstated from maternity leave in 2018	131	52	152	49	154	53
Number of employees applying for reinstatement in 2018	131	52	152	49	154	53
Reinstatement Rate	100%	100%	100%	100%	100%	100%

Note 1: Application rate = number of employees on parental leave in 2018 / number of employees eligible for parental leave in 2018

Note 2: Reinstatement rate = number of employees applying for reinstatement in 2018 / number of people reinstated from parental leave in 2018

Note 3: Please refer to Appendix E for the analysis of unpaid parental leave for child rearing without pay (maternity leave) in CCPG companies in overseas regions in 2018

Labor-Management Relations and Communications

CCPG's subordinate factories established the first labor union as early as 1971 and more than 90% of employees have joined the labor unions. CCPG has 10 corporate labor unions and convenes regular meetings with labor representatives each year to ensure smooth communication channels between employees and the management. Please refer to Appendix E for the composition of the labor unions in each subsidiary company.

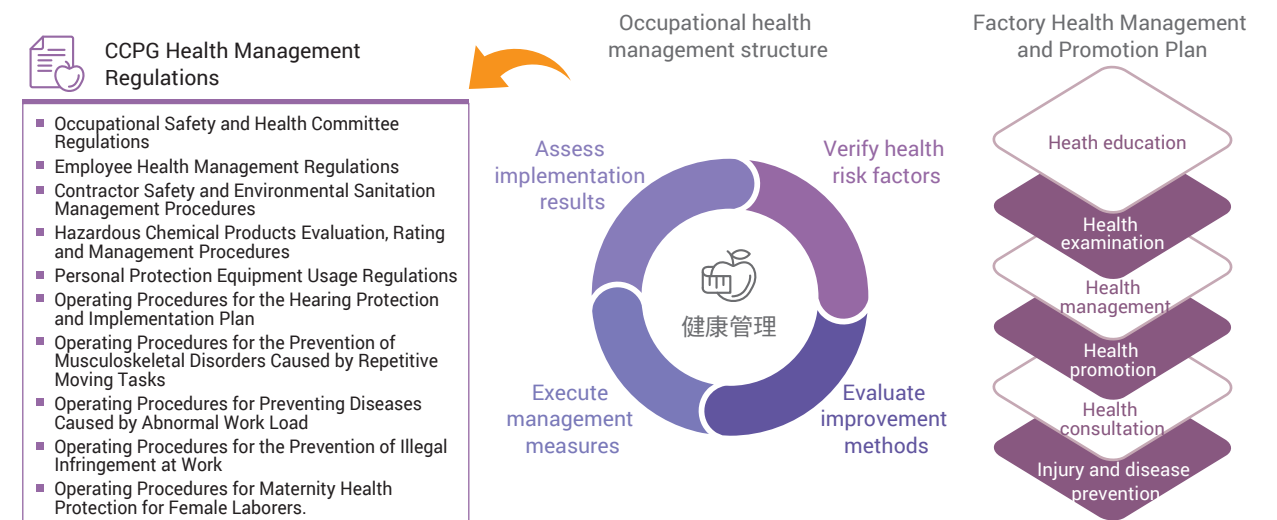
To ensure smooth and transparent communication between labor and management and effective broadcast of information on material incidents, CCPG has established multiple labor-management communication channels to resolve labor-management disputes through communication. In addition to the annual meeting of union representatives, labor pension fund supervisory committee, and labor-management meetings, employees may also use unofficial communication channels such as using telephones, email, and face-to-face communication with factory supervisors and union officers. Employees may also use the Employee Welfare Committee, employee grievance channels, interviews with the human resources department to propose opinions and suggestions to companies of the Group. The topics of discussion in 2018 mainly included improvement of parking lots and facilities and environmental quality, additional cafeteria equipment, update of dormitory facilities in the factories, and suggestion on year-end bonus and pay raises, which all reached conclusions that satisfied both the labor and the management.

4.3.2 Healthy Workplace



To promote a healthy workplace environment for employees, CCPG has adopted a systematic occupational health management framework to provide comprehensive management and regulations for implementation from the identification of health risk factors, evaluation of improvement methods, and implementation of management measures to the evaluation of performance. CCPG has established health-related regulations for operations to achieve the aforementioned goals and implement related measures to protect employees' health.

In CCP Hsinchu Factory, the Factory uses the aforementioned systematic occupational safety management structure and the health requirements of its employees to establish a health management and promotion plan for the entire Factory. It also gradually implemented and completed measures for improving employees' health status, consolidate a consensus on a healthy workplace, and improve employees' competitiveness.



Health examination



Health promotion - Injection of flu vaccination funded by the public



Health promotion - Weight-loss activities such as aerobic boxing



CCP Hsinchu Factory and CCPC Mailiao Factory received the "Healthy Workplace Certification Health Initiation Mark" from the Health Promotion Administration of the Ministry of Health and Welfare. Their main health management tasks focused on the promotion of a tobacco-free environment, implementation of workplace health promotion tasks, and obtaining the "Healthy Workplace Certification Health Initiation Mark" to build a healthy workplace and organization and improve employees' physical and mental health. We also established a healthy workplace environment through the participation of employees' family members and contractors to fulfill corporate social responsibilities. CCP Hsinchu Factory and CCPC Mailiao Factory plan to apply for the "Health Promotion Mark" in 2019.

Healthy Workplace Certification Health Initiation Mark - CCP Hsinchu Factory



Healthy Workplace Certification Health Initiation Mark - CCPC Mailiao Factory



CCPG plans short and medium-term goals for the health management for employees and contractors. They include a comprehensive survey of chemical risk factors in employees' workplace environment and reduction of exposure content to one-tenth of the maximum permissible levels. The long-term goals include the risk analysis of the top five highly infectious diseases in the Group for investments of related health management resources for high-risk diseases to create a healthy workplace environment.

Employee Health Management

We encouraged employees to exercise and we developed the app "CCP Play" in 2017 to allow employees to record the number of steps they take each day and the distance they walk. It also allows employees to view past data and learn about their exercises and habits in life. It also includes a daily rankings function to add fun to exercising for employees.

Occupational Health Management Measures

We believe that most diseases are not developed merely due to one single factor, therefore, during annual physical examinations, we also provide questionnaires to inquire employees' past medical history, lifestyle habits and self-aware symptoms. Through data analysis and observation of trend changes, the factory medical (care) personnel would conduct health education reminder and health care practices in order to eliminate the risk factors that may possibly cause illness and thereby prevent diseases from developing.

CCPG's ERP system also includes an "Employee Health Management System" that keeps records of employees' past physical examination data for employees to view changes in their data and always pay attention to their health. CCPG's ERP system has passed the ISO 27001 information security certification for seven consecutive years. Employees' physical examination data are properly and securely stored and they do not have to worry about data leaks.

Special Hazards Operations Management

Each year, CCPG conducts regular special hazard physical examinations, in accordance with law, according to how its employees are exposed to different hazard workplaces, and records employees' actual daily working status, tested concentration and number of operations in chemical operations environment, and provide the aforementioned records to the physical exam doctors to use as the basis to determine whether there was occupational exposure and confirm whether the employees developed diseases due to occupational exposure. For the employees with abnormal test results, CCPG would refer to physicians' suggestions to carry out administrative measures, such as improving the nature of risk sources or transferring affected employees away from current workplace, etc. Please refer to Appendix E for the items included in special physical examination items.

The special hazard physical examinations in 2018 included
13 examinations totaling
907 participants in Taiwan and
18 examinations totaling
2921 participants in overseas regions.
 The coverage rate was 100% and no special hazards were discovered.

Motherhood in Workplace

CCPG continues its commitment to establishing a high-quality motherhood friendly environment for female employees. We follow the laws and regulations, such as the Act of Gender Equality in Employment, the Labor Health Protection Regulation, and Standards for Establishment and Administration of Public Breastfeeding (Collecting) Rooms, and plan to set up 10 breastfeeding rooms in all of the Group's factories. They have been completed in 2018. They will be available in all factories and they will be managed by designated staff in accordance with the usage, cleaning and maintenance regulations. Female employees, contractors or visitors will enjoy a comfortable and private breastfeeding environment during their pregnancy and breastfeeding periods.





Chapter 5

A Creator of Value for All

5.1 Education

5.2 Local Engagement

5.3 Environmental Conservation

5.4 Caring for Disadvantaged Groups



CCPG participated in or sponsored a total of 285 domestic and overseas social welfare activities in 2018.

CCPG implements its spirit of "giving back what one takes from society to the society" and continues to interact with community organizations and strengthen local relations. CCPG also uses long-term feedback to local communities through the efforts of the Group's domestic and overseas factories. We have worked hard continuously in education, local care, environment, and care for disadvantaged groups.

5.1 Education



CCPG continues to use its core competencies and resources to contribute to advance education in chemistry. CCPG implements Industry-university cooperative projects, organizes student visits, and helps students understand business operations to cultivate young students' interest in the petrochemicals industry and become talents for CCPG in the future.

In 2018, CCPG continued to implement the industry-high school cooperative projects established between Renwu Senior High School and 13 companies (including CCPG, Formosa Plastics Renwu Factory, USI Kaohsiung Factory, Dashe Industrial Park Manufacturers' Association, etc.) and sponsored the "Petrochemicals Industry-Academia Class" of Renwu High School in talent cultivation including company visits and scholarships. CCPG aims to invigorate the local economy, promote local economic development, and reduce the emigration of the local population. CCPG also employs industrial and academic resources to invigorate education, reduce gaps between urban and rural areas, and provides employment to help them develop their talents and for the prosperity of companies, schools, and the local community.

In addition, foreign factories provided schools with scholarships to encourage young students with outstanding performance to work hard. We help students who face difficulties complete their studies and achieve the goals for academic cultivation. In addition, we also organize student visits to help students obtain knowledge and learn more about CCPG which would also benefit their future careers.



CCPG Kaohsiung Factory and DCC Kaohsiung Factory participated in the contract signing ceremony of the Petrochemicals Industry-Academia Class of Renwu Senior High School in 2018



CCP Hsinchu Factory donated transportation expenses for schoolchildren of Huaxing Elementary School who live in remote areas so that children can attend school with greater ease and study more successfully.



CCJS distributed scholarship awards at Shenyang University of Technology Liaoyang Campus to help more financially-challenged students with outstanding performance work hard and complete their studies.



DCCM organized chemical engineering educational visits and introduced CCPG products to college students of chemical engineering departments who were about to graduate and share our hard work and contributions to environmental health and safety.



5.2 Local Engagement



CCPG has always maintained great relations with local communities and actively organizes or participates in activities such as blood donations, marathons, donations, exercises, and summer camps with local communities based on needs in local communities to establish good relations with residents. CCPG companies also establish close and diverse communication channels with heads of boroughs and neighborhoods, persons in charge of community units, and residents. In addition, we also actively respond to maintenance tasks of various public facilities such as public toilets and streetlights. These tasks allow us to give back to society and make the surrounding environment more attractive and clean.

CCP Changpin Factory took up the maintenance tasks of the public toilets in the Baguashan Scenic Area and sponsored items such as toilet paper, liquid soap, and fragrances to improve the quality of the facilities for people and maintain a clean environment.



CCPC Miaoli Factory responded to the Miaoli City Office's policy and took over maintenance of streetlights to provide employees and citizens of Miaoli with a safe way home.



CCPC Miaoli Factory and CCP Hsinchu Factory participated in the "Allied Defense Organization Onsite Response Capabilities Exercise" organized by the Toxic and Chemical Substances Bureau of the Environmental Protection Administration, Executive Yuan.



About This Report

Retrospect and Outlook of Sustainability Strategies

Key CSR Performance of CCGP in 2018

Chapter 1 A Diligent, Pragmatic, and Integrity-Oriented Enterprise

Chapter 2 A Trusted Material Supplier

Chapter 3 A Sustainable Producer that Prospers with the Environment

Chapter 4 An Enterprise that Creates a Friendly Workplace

Chapter 5 A Creator of Value for All



CCPG Mailiao Factory sponsored and participated in the "NTU Agricultural Economics Education Camp for Economics and Management" organized by Department of Agricultural Economics, National Taiwan University. The event has been organized for seven consecutive years and it has built wonderful memories for children in remote areas in Yunlin each year. The event was organized in Dongshi Elementary School for the first time in 2018 to provide schoolchildren of Dongshi Township with vibrant and fun summer education experience in rural areas.



DCCJS organized the second mini-marathon with the Sunshine Community in 2018 to promote exercise to all citizens, strengthen relations between community residents and the Company, and foster harmonious relations between the community and the Company.

CCPG factories in Taiwan and CCZZ actively responded to blood donation activities in 2018. A total of 9 such activities were organized and we donated 1,252 bags of blood.



5.3 Environmental Conservation



CCPG pursues environmental protection and the harmonious development of the environment. CCGP internally established energy conservation and carbon emissions reduction operations and ESH policies such as improving the production process to reduce pollution, conserving energy, fully implementing waste reduction, and resource recycling and reuse. CCGP regularly participates externally in large-scale environmental protection activities organized by local governments and communities where the factories are located, such as annual beach cleaning up activities, river cleaning up and hiking activities, community clean-up activities, and adoption of air quality cleansing areas. Through close cooperation with communities, CCGP achieves the goal of being neighborly and cohesion of environmental awareness within the Company.

CCSG donated approximately NT\$450,000 to the artificial reef project/global and national climate action and worked the National Parks Board (NParks) in the completion of the "Reef Garden" project.



CCP Changpin Factory assigned personnel to maintain the cleanliness of the Ching'an Waterway air quality purification area and perform cleaning tasks such as weeding. A total of 2,550kg of waste was removed.



CCPG has always been committed to protecting the beach and the environment and organized six beach clean-up activities in 2018 including three activities organized by CCGP Mailiao Factory, one activity organized jointly by CCP Hsinchu Factory and CCPC Miaoli Factory, one activity organized jointly by CCP Changpin Factory and CCGP Mailiao Factory, and one activity organized jointly by CCGP factories in Kaohsiung. They cleaned up 1,987.3kg of waste and contributed to the protection of Taiwan's beautiful coastlines.

CCPG Dafa Factory, CCP Renwu Factory, DCC Dashe Factory, and the Environmental Protection Bureau of Kaohsiung City Government jointly organized a winter beach clean-up activity. The event included beach clean-up as well as environmental education booths and attracted 300 attendants. CCGP President Su Shih-Kuang and the Director of the Environmental Protection Bureau of Kaohsiung City Government jointly completed the beach clean-up oath.

CCP Changpin Factory and CCGP Mailiao Factory -
2018 "CCPG Ocean Protection" beach clean-up activity



CCP Hsinchu Factory and CCPC Miaoli Factory - 2018
"CCPG Ocean Protection" beach clean-up activity



CCPG President Su Shih-Kuang participated in the beach-cleanup oath activity



CCPG Kaohsiung Factory co-organized "Winter Beach Clean-Up Activity" with Environmental Protection Bureau, Kaohsiung City Government



On Earth Day, CCPG Dafa Factory cleaned the surrounding environment on the banks of Gaoping River and cleared approximately 150kg of waste. The Factory became a role model for the community and encouraged more companies of Dafa Industrial Park to participate in CSR activities.

CCPG Dafa Factory - Participated in the 2018 Earth Day and Chaoliao Village clean-up activities



CCPG Dafa Factory participated in the "sustainable green energy" activity organized by the Environmental Protection Bureau of Kaohsiung City Government and provided energy conservation subsidies on campus to replace old lighting equipment with LED lamps. The Factory sponsored the replacement of lamps in Daliao Junior High School in Daliao District, Kaohsiung City to provide students in the community with a brighter and more comfortable learning environment.

CCPG Dafa Factory spared no efforts on making the environment beautiful and adding greenery to the factory. The Factory took over the care of nearby roadside trees to make the Factory and Industrial Park more beautiful and add greenery to the community.



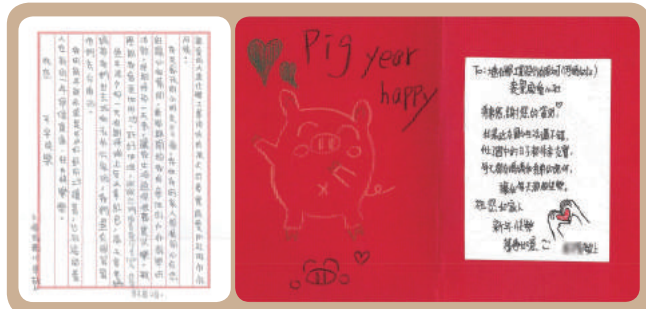
5.4 Caring for Disadvantaged Groups



CCPG has always provided love and care to disadvantaged groups in society and often provides donations to social welfare organizations, provides financial support to children from poor families, cares for the elderly who live alone in local communities, and organizes activities to support the elderly and children. We hope to lead initiatives to encourage more people to contribute and participate.

CCPG Mailiao Factory's Love and Care Club actively participates in the children financial support program of the family support center. Starting from 2005, the Factory has provided financial support to three children from the family support center each year until they graduate from high school. The letters from children who received financial support have always been a comfort to the club members and they are the best source of encouragement for us to continue to contribute to charity.

CCPG Mailiao Factory - A letter from a child who received financial support



CCPG Mailiao Factory - Children's home visits



CCPG Mailiao Factory visited the Xinyi Children's Home in Dounan, Yunlin and donated funds raised by the Love and Care Club in hopes of bringing warmth to children and providing them with actual support.

CCPG Dafa Factory - Healthcare consulting activity

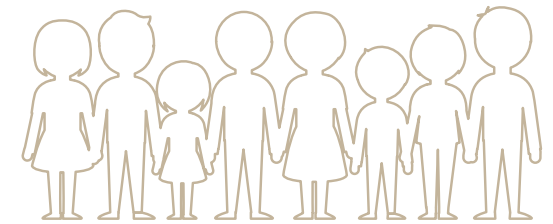


CCPG Dafa Factory organized health care consulting services for low-income households in winter and provided them with free consulting services related to health.

CCPG Dafa Factory - "CCPG Elderly Healthcare" community elderly care activity



CCPG Dafa Factory organized the "CCPG Elderly Healthcare" community elderly care activity along with the Department of Public Health and organized health promotion, life training, and health information promotion activities in the Daytime Long-Term Care Center of Zhaoming Community to strengthen the close relations between CCPG and the community.



CCPJ - Welfare institution care activity



CCPJ organized the "Contribute Love and Warm People's Hearts" activity in 2018 and employees visited the Panjin Social Welfare Institution to donate food and daily necessities.

CCZZ - Support for Baijiao Village



CCZZ provided support to households with financial difficulties in Baijiao Village. In addition to the onsite visit, CCZZ also donated money, food, and daily necessities.

GRI Standards Indicator Reference Table

General Disclosures


GRI Standards	Disclosure Item		Chapter	Page number
GRI 102: General Disclosures	Organizational Profile			
	102-1	Name of organization	1.1.1 Current State of Group Operations	8
	102-2	Activities, brands, products and services	1.1.1 Current State of Group Operations	8
			1.1.2 Product Introduction and Location of Operation	9
	102-3	Location of headquarters	1.1.1 Current State of Group Operations	8
	102-4	Location of operations		
	102-5	Ownership and legal form		
	102-6	Markets served	1.1.1 Current State of Group Operations	8
			1.1.2 Product Introduction and Location of Operation	9
	102-7	Scale of the organization	1.1.2 Product Introduction and Location of Operation	9
			1.1.3 Operational Performance	12
	102-8	Information on employees and other workers	4.1.2 Talent Composition Appendix E	83 114
	102-9	Supply chain	2.3 Sustainable Supplier Management	57
	102-10	Significant changes to the organization and its supply chain	- No material changes in 2018	
	102-11	Precautionary principle or approach	1.2.2 Risk Management	14
			2.2 Responsible Chemistry	45
			2.2.2 Process Safety	51
			2.2.3 Response and Management of Major Incidents	52
	102-12	External initiatives	1.3 Stakeholder Communications Appendix A	25
	102-13	Membership of associations		109
	Strategy			
	102-14	Statement from senior decision-maker	Retrospect and Outlook of Sustainability Strategies	3
	102-15	Key impacts, risks, and opportunities	1.2.2 Risk Management	14
	102-16	Values, principles, standards, and norms of behavior		
	102-17	Mechanisms for advice and concerns about ethics		
	Governance			
102-18	Governance structure	1.2.1 Corporate Governance 1.2.3 Sustainable Strategy	14 17	
102-19	Delegating authority	1.2.3 Sustainable Strategy	17	
102-20	Executive-level responsibility for economic, environmental, and social topics			
102-24	Nominating and selecting the highest governance body	1.2.1 Corporate Governance	14	

GRI Standards	Disclosure Item		Chapter	Page number
GRI 102: General Disclosures	Stakeholder engagement			
	102-40	List of stakeholder groups	1.3 Stakeholder Communications	25
	102-41	Collective bargaining agreements	4.3.1 Employee Benefits Appendix E	90 114
	102-42	Identifying and selecting stakeholders	1.3 Stakeholder Communications	25
	102-43	Approach to stakeholder engagement		
	102-44	Key topics and concerns raised		
	Reporting practice			
	102-45	Entities included in the consolidated financial statements	About this Report 1.1.2 Product Introduction and Location of Operation	2 9
	102-46	Defining report content and topic boundaries	1.3 Stakeholder Communications	25
	102-47	List of material topics		
	102-48	Restatements of information	About this Report	2
	102-49	Changes in reporting	1.3 Stakeholder Communications	25
	102-50	Reporting period	About this Report	2
	102-51	Date of most recent report		
	102-52	Reporting cycle		
	102-53	Contact point for questions regarding the report		
	102-54	Claims of reporting in accordance with the GRI Standards		
	102-55	GRI content index	GRI Standards Indicator Reference Table	104


Topic-Specific Standards

◆ Indicates material topics

GRI 200: Economic Standards


GRI Standards	Disclosure Item		Chapter	Page number
Economic performance				
GRI 201: Economic performance	201-2	Financial implications and other risks and opportunities due to climate change	3.2.3 Climate Change Adaptation	72
	201-3	Defined benefit plan obligations and other retirement plans	4.3.1 Employee Benefits	90
Market presence				
GRI 202: Market presence	202-2	Proportion of senior management hired from the local community	4.1.2 Talent Composition Appendix E	83 114
Indirect economic impacts				
GRI 203: Indirect Economic Impacts	203-2	Significant indirect economic impacts	5.1 Education	98
			5.2 Local Engagement	99
			5.3 Environmental Conservation	100
			5.4 Caring for Disadvantaged Groups	102
Procurement practices 				
GRI 103: Management approach	103-1	Explanation of the material topic and its boundary	2.3 Sustainable Supplier Management	57
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 204: Procurement practices	204-1	Proportion of spending on local suppliers		
Anti-corruption				
GRI 205: Anti-corruption	205-2	Communication and training about anti-corruption policies and procedures	1.2.2 Risk Management	14
	205-3	Confirmed incidents of corruption and actions taken	1.3 Stakeholder Communications	25


GRI 300: Environment Standards

GRI Standards	Disclosure Item		Chapter	Page number
Energy				
GRI 302: Energy	302-1	Energy consumption within the organization	3.2.1 Energy Conservation and Carbon Reduction Action Appendix D	67
	302-4	Reduction of energy consumption		
	302-5	Reductions in energy requirements of products and services		111
Water				
GRI 303: Water and effluents	303-1	Total water withdrawal by source	3.3.1 Water Management Appendix D	74 111
	303-2	Water sources significantly affected by withdrawal of water		
	303-3	Water recycled and reused		
Emissions 				
GRI 103: Management approach	103-1	Explanation of the material topic and its boundary	3.4.1 Air Pollutant Emissions Management	77
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		

GRI Standards		Disclosure Item	Chapter	Page number
GRI 305: Emissions	305-1	Direct (Scope 1) GHG emissions	3.2.2 Greenhouse Gas (GHG) Emissions Management Appendix D	71
	305-2	Energy indirect (Scope 2) GHG emissions		111
	305-5	Reduction of GHG emissions	3.2.1 Energy Conservation and Carbon Reduction Action	67
	305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	3.4.1 Air Pollutant Emissions Management	77
Effluents and waste				
GRI 306: Effluents and waste	306-1	Water discharge by quality and destination	3.3.2 Wastewater Management Appendix D	76 111
	306-2	Waste by type and disposal method	3.4.2 Waste Management Appendix D	79 111
Environmental compliance				
GRI 307: Environmental compliance	307-1	Non-compliance with environmental laws and regulations	1.3 Stakeholder Communications	25

GRI 400: Social Standards

GRI Standards	Disclosure Item		Chapter	Page number
Employment				
GRI 401: Employment	401-1	New employee hires and employee turnover	4.1.2 Talent Composition Appendix E	83 114
	401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	4.3.1 Employee Benefits Appendix E	90 114
	401-3	Parental leave		
Labor/management relations				
GRI 402: Labor-management relations	402-1	Minimum notice periods regarding operational changes	4.3.1 Employee Benefits	90
Occupational health and safety 				
GRI 103: Management approach	103-1	Explanation of the material topic and its boundary	2.2.1 Workplace Safety	45
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 403: Occupational health and safety	403-1	Workers representation in formal joint management–worker health and safety committees	2.2.1 Workplace Safety Appendix B	45 110
	403-2	Hazard identification, risk assessment, and communication on occupational health and safety		
	403-3	Occupational health services		
Training and education				
GRI 404: Training and education	404-1	Average hours of training per year per employee	4.2 Talent Cultivation and Development Appendix E	87 114
	404-2	Programs for upgrading employee skills and transition assistance programs		
	404-3	Percentage of employees receiving regular performance and career development reviews		
Diversity and equal opportunity				
GRI 405: Diversity and Equal Opportunity	405-1	Diversity of governance bodies and employees	4.1.2 Talent Composition Appendix E	83 114

GRI Standards	Disclosure Item		Chapter	Page number
Non-discrimination				
GRI 406: Non-discrimination	406-1	Incidents of discrimination and corrective actions taken	1.3 Stakeholder Communications	25
			4.1.2 Talent Composition	83
Child labor				
GRI 408: Child labor	408-1	Operations and suppliers at significant risk for incidents of child labor	4.1.1 Human Resource Policy	82
Forced or compulsory labor				
GRI 409: Forced or compulsory labor	409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	4.1.1 Human Resource Policy	82
Human rights assessment				
GRI 412: Human rights assessment	412-2	Employee training on human rights policies or procedures	4.1.1 Human Resource Policy	82
Supplier social assessment				
GRI 414: Supplier social assessment	414-2	Negative social impacts in the supply chain and actions taken	2.3.1 Procurement Business Ethics and Respect of Human Rights	58
Customer health and safety				
GRI 416: Customer health and safety	416-1	Assessment of the health and safety impacts of product and service categories	2.1.2 Chemical Management	38
Marketing and labeling				
GRI 417: Marketing and labeling	417-1	Requirements for product and service information and labeling	2.1.3 Product Quality Management	41
Customer privacy 				
GRI 103: Management approach	103-1	Explanation of the material topic and its boundary	2.1.4 Customer Communications and Services	43
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 418: Customer privacy	418-1	Substantiated complaints regarding concerning breaches of customer privacy and losses of customer data		
Socioeconomic compliance				
GRI 419: Socioeconomic compliance	419-1	Non-compliance with laws and regulations in the social and economic area	1.3 Stakeholder Communications	25

CCPG Specific Topics




Topics	Disclosure Item		Chapter	Page number
Product quality 				
GRI 103: Management approach	103-1	Explanation of the material topic and its boundary	2.1.3 Product Quality Management	41
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
Response and management of major incidents 				
GRI 103: Management approach	103-1	Explanation of the material topic and its boundary	2.2.3 Response and Management of Major Incidents	52
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		

Appendix A List of trade unions/associations of CCPG (non-important roles)

Industry Associations	Other Associations	
<ul style="list-style-type: none">Taiwan Electrical and Electronic Manufacturers' AssociationTaipei Chemical Material Business AssociationTaiwan Printed Circuit AssociationTaiwan Battery AssociationChinese Industrial Machinery AssociationChina Electronics Materials Industry AssociationChina Synthetic Resin Supply and Sales AssociationChina Petroleum and Chemical Industry FederationChina Chemical Industry Environmental Protection AssociationChina Phenolic Resin AssociationChina Chemical Fibers AssociationFederation of Malaysian ManufacturersMalaysian Petrochemicals AssociationMalaysia External Trade Development CorporationChemical Industries Council of Malaysia	<ul style="list-style-type: none">Occupational Hygiene Association of TaiwanChung-Hua Association for Financial and Economic StrategiesPressure Vessel AssociationDashe Industrial Park Manufacturers AssociationTaiwan Japan Association for Business CommunicationImporters and Exporters Association of TaipeiChinese National Association of Industry and Commerce, Taiwan (CNAIC)Dafa Industrial Park AssociationMiaoli County Industrial AssociationMiaoli County Employment Relation AssociationImporters and Exporters Association of MiaoliKaohsiung County Industrial AssociationYunlin Hsien Industrial AssociationRenwu Industrial Park Manufacturers AssociationTaiwan Cogeneration AssociationIndustrial Safety and Health Association (ISHA) of the R.O.C.	<ul style="list-style-type: none">Hsinchu Industrial Park AssociationHsinchu County Industrial AssociationChanghua County Industrial AssociationChanghua County Changhua Coastal Industrial Park Industry AssociationAssociation of Bio-Based Material Industry associationTaiwan Halal Integrity Development AssociationTaiwan Association for Hydrogen EnergyTaiwan Compatriot Investment Enterprises Association of ChangshuJiangsu Provincial Association of Enterprises with Foreign InvestmentJiangsu Customs Brokers AssociationYangzhou City Association of Enterprise with Taiwan InvestmentFire Protection Association of Yangzhou Chemical Industry ParkTechnical Supervision Association of YizhengTaipei Investors' Association in MalaysiaSingapore Business Federation
R&D Associations and Academic Societies		
<ul style="list-style-type: none">Fractionation Research, Inc.Chinese Chemical SocietyThe Chinese Institute of Environmental EngineeringNational Central University Catalyst and Reaction Engineering Production and Research AllianceHuizhi Club (National Cheng Kung University Chemical Culture and Education Foundation)	<ul style="list-style-type: none">Advanced Microsystems & Package Technology AllianceCatalysis Society of TaiwanTaiwan Safety CouncilPolymeric Foam Technology Alliance, National Taiwan University of Science and Technology	

Appendix B CCPG Occupational Injuries Statistics

2018 CCGP Occupational Injury Statistics (by company)

Region	Company	CCP			CCPC			DCC		
	Gender	Male	Female	Total	Male	Female	Total	Male	Female	Total
 Taiwan	Total occupational injury incidents (number of cases)	4	1	5	6	0	6	3	0	3
	Traffic accidents (number of cases)	6	0	6	8	0	8	0	0	0
	Injury rate (IR)	0.48	0.51	0.48	0.57	0.00	0.55	0.31	0.00	0.30
	Absentee rate (AR)	0.30%	0.26%	0.29%	0.24%	0.41%	0.25%	0.55%	0.58%	0.55%
	Lost day rate (LDR)	3.70	18.93	5.01	4.63	0.00	4.42	7.19	18.13	7.79
	Deaths	0	0	0	0	0	0	0	0	0
 Overseas	Total occupational injury incidents (number of cases)	13	4	17	1	1	2	1	0	1
	Traffic accidents (number of cases)	1	1	2	0	0	0	3	0	3
	Injury rate (IR)	0.73	0.64	0.70	0.27	1.34	0.45	0.66	0.00	0.53
	Absentee rate (AR)	0.16%	0.25%	0.18%	0.15%	0.11%	0.14%	0.05%	1.10%	0.22%
	Lost day rate (LDR)	17.11	12.66	15.82	1.08	22.81	4.71	8.46	0.00	6.80
	Deaths	0	0	0	0	0	0	0	0	0
 Group Total	Total occupational injury incidents (number of cases)	17	5	22	7	1	8	4	0	4
	Traffic accidents (number of cases)	7	1	8	8	0	8	3	0	3
	Injury rate (IR)	0.60	0.61	0.60	0.53	0.54	0.53	0.45	0.00	0.40
	Absentee rate (AR)	0.23%	0.14%	0.21%	0.22%	0.69%	0.25%	0.44%	0.57%	0.46%
	Lost day rate (LDR)	10.15	13.91	10.89	4.16	9.10	4.47	7.68	4.99	7.37
	Deaths	0	0	0	0	0	0	0	0	0

Note 1: There were no occurrences of occupational diseases in CCGP in 2018. The occupational disease rate (ODR) is therefore 0.

Note 2: GRI Injury Rate (IR) = number of occupational injury incidents/(work hours + overtime hours)x200,000*




Note 3: GRI Absentee Rate (AR) = (number of occupational injury leave hours + number of sick leave hours)/(work hours + overtime hours)x100%

Note 4: GRI Lost Day Rate (LDR) = number of lost days/(work hours + overtime hours)x200,000*

Note 5: *: Refers to the percentage of for every 100 employees calculated based on 40 work hours each week and 50 weeks each year

Appendix C CCGP's Training Hours Statistics for Contractors




CCGP's training hours statistics for contractors in 2018 (by company)

Region	Company	CCP			CCPC			DCC		
	Item	Male	Female	Total	Male	Female	Total	Male	Female	Total
 Taiwan	Training hours	6,841	330	7,171	4,963	316	5,279	2,201	80	2,281
	Number of instances at the end of the year	8,754	330	9,084	4,963	316	5,279	2,201	80	2,281
	Average hours	0.78	1.00	0.79	1.00	1.00	1.00	1.00	1.00	1.00
 Overseas	Training hours	10,889	973	11,862	1,293	68	1,361	1,033	134	1,167
	Number of instances at the end of the year	10,889	973	11,862	1,293	68	1,361	1,299	131	1,430
	Average hours	1.00	1.00	1.00	1.00	1.00	1.00	0.80	1.02	0.82
 Group Total	Training hours	17,730	1,303	19,033	6,256	384	6,640	3,234	214	3,448
	Number of instances at the end of the year	19,643	1,303	20,946	6,256	384	6,640	3,500	211	3,711
	Average hours	0.90	1.00	0.91	1.00	1.00	1.00	0.92	1.01	0.93

Appendix D CCGP Environmental Statistics


CCGP Environmental Protection Project Investment Expenditures in 2018

Unit: NT\$ million

Region	Item	CCP	CCPC	DCC
 Taiwan	A. Pollution prevention	114	228	13
	B. Waste disposal	N/A	27	6
	C. Energy conservation and carbon reduction	41	N/A	10
	D. Other environmental protection measures	2	10	8
 Overseas	A. Pollution prevention	54	N/A	108
	B. Waste disposal	N/A	N/A	N/A
	C. Energy conservation and carbon reduction	N/A	N/A	42
	D. Other environmental protection measures	5	N/A	N/A
 Group Total	A. Pollution prevention	168	228	121
	B. Waste disposal	N/A	27	6
	C. Energy conservation and carbon reduction	41	N/A	52
	D. Other environmental protection measures	7	10	8
Total		215	265	187

Note: As DCC's project investments are classified under different categories, pollution prevention has been included in two other categories in the calculations.

CCPG Environmental Violation Cases and Fine Statistics in 2018 - per Company

Company		CCP		CCPC		DCC		Group Total	
Unit: case, in NT\$10,000		Number of Cases	Amount	Number of Cases	Amount	Number of Cases	Amount	Number of Cases	Amount
 Taiwan	Air pollution	6	70	3	40	3	30	12	140
	Toxic chemical substances	0	0	1	10	0	0	1	10
	Subtotal	6	70	4	50	3	30	13	150

Note 1: The incidents disclosed here are mainly cases of inadequacies with fines of over NT\$100,000.

Note 2: There were no cases of penalties exceeding NT\$100,000 in overseas factories.

CCPG Energy Consumption in 2018 - per Company




Unit: Gigajoules (GJ)

Energy Type	CCP		CCPC		DCC	
	Taiwan	Overseas	Taiwan	Overseas	Taiwan	Overseas
Externally purchased electrical power	1,199,038	1,552,426	2,872,796	17,435	2,404,055	1,228,385
Diesel	9,455	10,631	14,608	4,647	2,367	28,760
Natural gas (NG)	822,908	1,003,668.00	14,211	N/A	1,025,895	610,643
Heavy oil/fuel oil	128,562	29,912	176,396	16,530	345,372	16,530
Coal	8,968,207	12,957,472	24,208,626	6,264,755	N/A	2,279,707
Externally purchased steam	4,486,294	1,894,080	2,616,718	N/A	9,999,561	3,836,711
Steam sold to external parties	1,422,761	N/A	3,429,423	1,914,571	N/A	59,375
Electrical power sold to external parties	217,232	17,448,189	1,081,302	264,207	N/A	N/A
Energy consumption subtotal	13,974,471	17,448,189	25,392,630	4,124,589	13,777,250	7,941,361
Total energy consumption	31,422,660		29,517,219		21,718,611	

Note: The Group does not use biodiesel or liquefied petroleum gas.

CCPG Greenhouse Gas (GHG) Emissions in 2018 - per Company

Unit: kt CO₂e

GHG Type		CCP	CCPC	DCC
 Taiwan	Direct GHG Emissions (Scope 1)	941	2,152	303
	Indirect GHG Emissions (Scope 2)	507	1,682	1,387
 Overseas	Direct GHG Emissions (Scope 1)	1,038	471	250
	Indirect GHG Emissions (Scope 2)	458	16	612
 Group Total	Direct GHG Emissions (Scope 1)	1,980	2,623	553
	Indirect GHG Emissions (Scope 2)	964	1,698	1,999

Note 1: GHG emissions in Scope 1 included carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and hydrofluorocarbons (HFCs). No other gases were emitted.

Note 2: GHG emissions in Scope 2 included carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). No other gases were emitted.

Note 3: The inventory of greenhouse gases at CCPG factories includes the inventory of Scope 1 and Scope 2 statistics which are reported to the Environmental Protection Administration and greenhouse gases under Scope 3 are not inventoried.

Note 4: Among the overseas factories, only the factories in China conducted inventories of CO₂ emissions. DCCM calculated emissions based on emission coefficient factors of Taiwan.

Note 5: CCSG begins including Scope 2 emissions in the calculations starting this year.

CCPG Water Resources Statistics in 2018 - per Company

Unit: Thousand kiloliters

Environment indicator	CCP		CCPC		DCC	
	Taiwan	Overseas	Taiwan	Overseas	Taiwan	Overseas
Running water consumption	2,728	6,821	85	1,511	3,162	3,450
Reservoir water consumption	N/A	N/A	3,520	N/A	N/A	N/A
River water consumption	255	5,818	8,375	N/A	3,482	N/A
Rainwater consumption	N/A	164	7	N/A	9	N/A
Pure water sold	2,046	N/A	N/A	105	N/A	105
Pure water purchased	104	N/A	864	N/A	848	63
Total water intake	13,844		14,257		10,909	

Note 1: Only CCPC Miaoli Factory used reservoir water.

Note 2: Only CCPC Miaoli Factory used river water from Houlong River and CCJS used river water from Yangtze River.

Note 3: CCJS and CCPG Dafa Factory completed rainwater recovery systems.




CCPG Water Recycling Statistics in 2018 - per Company

Environment indicator	Unit	CCP	CCPC	DCC
Total volume of recycled and reused water	Thousand kiloliters	16,553	28,742	7,054
Total volume of recycled and reused water as a ratio of total water intake of each company in 2018	%	120	202	65

Note: Scope of recycled water inventory was redefined in 2018: Steam condensate recovery volume, process recycling water, the sum of waste recovery and reuse volume (process/public use).

CCPG Waste Water Statistics in 2018 - per Company

Unit: Thousand kiloliters

Region	CCP	CCPC	DCC
 Taiwan	4,677	3,620	1,114
 Overseas	2,177	844	730
 Group Total	6,854	4,464	1,844

Note: The wastewater of CCP Hsinchu Factory, CCP Changpin Factory, CCPG Dafa Factory, DCC Kaohsiung Factory and overseas factories that meet effluent standards is discharged to the wastewater treatment plant of the industrial zone; CCPC Factory discharges wastewater into Houlong River, CCPG Mailiao Factory discharge wastewater into Taiwan Strait; CCP Kaohsiung Factory discharge wastewater into Houjin River.

CCPG Waste Disposal Statistics in 2018 - per Company

Unit: Metric tons

Environment indicator	CCP		CCPC		DCC	
	Taiwan	Overseas	Taiwan	Overseas	Taiwan	Overseas
Total general industrial waste	66,812	82,770	197,936	44,398	1,671	2,126
Total recycled general industrial waste	56,678	82,385	153,604	37,920	367	17
Total incinerated general industrial waste	3,165	137	41,233	0	583	239
Total buried general industrial waste	5,144	247	1,542	6,478	522	47
Total general industrial waste processed through other methods 'Heat treatment, solidification, physical processing, chemical processing, etc.'	1,826	0	1,557	0	199	1,822
Total hazardous industrial waste	10,800	10,999	6,163	7,538	0	18,973
Total recycled hazardous industrial waste	0	1,077	141	17	0	89
Total incinerated hazardous industrial waste	9,833	9,696	6,022	7,343	0	5,876
Total buried hazardous industrial waste	226	226	0	178	0	251
Total other hazardous industrial waste processed through other methods 'Heat treatment and high-temperature wet air oxidation'	742	0	0	0	0	12,757
Total waste subtotal	77,612	93,769	204,099	51,936	1,671	21,099
Total waste	171,381		256,035		22,770	

Appendix E CCGP Social Information



2018 CCGP Employee Composition - per Company

Unit: numbers

Contract Type		Region	CCP		CCPC		DCC	
			Male	Female	Male	Female	Male	Female
Fixed-Term Contract Temporary employees	Student employees, contracted drivers, consultants	Taiwan	11	9	45	19	2	4
		Overseas and assignment	0	0	0	0	0	2
		Subtotal	11	9	45	19	2	6
Non-Fixed Term Contract	Other employees	Factories in Taiwan	1,791	192	2,186	100	856	60
		Overseas factories and assignment	1,514	648	328	95	544	134
		Subtotal	3,305	840	2,514	195	1,400	194
Group Total			3,316	849	2,559	214	1,402	200

Age Distribution of CCGP Employees in 2018 - per Company

Unit: numbers

Region	Age Distribution	CCP		CCPC		DCC	
		Management roles	Non-management roles	Management roles	Non-management roles	Management roles	Non-management roles
 Taiwan	Under 30 years old	0	350	0	590	0	128
	30-50 years old	95	1,084	97	1,354	61	619
	Over 50 years old	80	394	78	231	41	73
 Overseas	Under 30 years old	12	664	3	171	0	197
	30-50 years old	174	1,288	33	209	45	406
	Over 50 years old	19	5	7	0	13	19
Group Total		380	3,785	218	2,555	160	1,442

Age Distribution of CCGP New Employees of in 2018

Unit: numbers

Age Distribution	Region	CCP		CCPC		DCC	
		Male	Female	Male	Female	Male	Female
Under 30 years old	Taiwan	145	22	253	21	44	10
	Overseas	224	127	38	41	38	10
30-50 years old	Taiwan	45	3	40	4	12	2
	Overseas	81	71	11	2	12	6
Over 50 years old	Taiwan	4	0	1	0	0	0
	Overseas	0	0	0	0	2	0
Group Total		499	223	343	68	108	28

Age Distribution of Resigned CCGP Employee in 2018 - per Company

Unit: numbers

Age Distribution	Region	CCP		CCPC		DCC	
		Male	Female	Male	Female	Male	Female
Under 30 years old	Taiwan	56	2	30	4	24	2
	Overseas	194	58	22	7	31	6
30-50 years old	Taiwan	46	9	51	12	10	2
	Overseas	68	55	10	2	25	6
Over 50 years old	Taiwan	30	4	34	0	1	0
	Overseas	0	0	0	0	1	0
Group Total		394	128	147	25	92	16

Note: The turnover includes retirement, dismissal, death, discontinuation of student employee/consultant contract upon expiry, and personnel transfers between companies of the Group.

Distribution of CCGP employee Ranks in 2018 - per Company

Unit: numbers

Rank	Region	CCP		CCPC		DCC	
		Male	Female	Male	Female	Male	Female
Executives	Taiwan	2	0	7	3	4	0
	Overseas	10	0	5	0	6	0
Senior managers	Taiwan	17	0	15	1	15	0
	Overseas	11	2	1	0	13	1
Mid-level managers	Taiwan	39	1	46	3	24	1
	Overseas	20	1	5	0	8	3
Junior managers	Taiwan	103	13	89	11	50	8
	Overseas	139	22	30	2	24	5
Regular employees	Taiwan	1,641	187	2,074	101	765	55
	Overseas	1,334	623	287	93	493	127
Group Total		3,316	849	2,559	214	1402	200

Distribution of CCGP Employee Diversity in 2018 - per Company

Unit: numbers

Diversity	CCP		CCPC		DCC	
	Management roles	Non-management roles	Management roles	Non-management roles	Management roles	Non-management roles
People with disabilities	0	14	0	17	1	6

2018 CCPG Education and Training Hours Analysis - per company

Unit: hours

Category	CCP			CCPC			DCC			2018 Subtotal
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Management roles	15,571	808	16,379	8,774	543	9,317	8,412	876	9,288	380,645
Non-management roles	142,966	20,541	163,508	98,759	3,584	102,343	72,370	7,441	79,811	

Analysis of Unpaid Parental Leave for Child Rearing without Pay in CCPG in Taiwan in 2018 - per Company

Unit: numbers

Item	CCP		CCPC		DCC	
	Male	Female	Male	Female	Male	Female
Number of employees eligible for parental leave in 2018	180	5	287	9	128	5
Number of employees on parental leave in 2018	7	2	6	3	4	1
Application rate	3.9%	40.0%	2.1%	33.3%	3.1%	20.0%
Number of employees reinstated from parental leave in 2018	1	1	4	1	2	2
Number of employees applying for reinstatement in 2018	1	1	4	1	2	2
Reinstatement rate	100%	100%	100%	100%	100%	100%

Note 1: Application rate = Number of employees on parental leave in 2018 / number of employees eligible for parental leave in 2018

Note 2: Reinstatement rate = Number of employees applying for reinstatement in 2018 / number of people reinstated from parental leave in 2018

Analysis of Unpaid Parental Leave for Child Rearing without Pay (maternity leave) in CCPG in overseas regions in 2018 - per Company

Unit: numbers

Item	CCP		CCPC		DCC	
	Male	Female	Male	Female	Male	Female
Number of employees eligible for maternity leave in 2018	97	37	28	8	32	12
Number of employees for maternity leave in 2018	97	37	28	8	32	12
Application rate	100%	100%	100%	100%	100%	100%
Number of employees reinstated from maternity leave in 2018	96	35	27	9	31	9
Number of employees applying for reinstatement in 2018	96	35	27	9	31	9
Reinstatement rate	100%	100%	100%	100%	100%	100%

Note 1: Application rate = Number of employees on parental leave in 2018 / number of employees eligible for parental leave in 2018



Note 2: Reinstatement rate = Number of employees applying for reinstatement in 2018 / number of people reinstated from parental leave in 2018

CCPG Labor Union Composition

Region	Year of Establishment	Number of Members	Union Member Percentage	Region	Year of Establishment	Number of Members	Union Member Percentage
CCP Hsinchu Factory	1979	745	100%	DCC Kaohsiung Factory	1985	197	90.0%
CCP Dafa Factory	1996	445	93.7%	DCC Dafa Factory	1999	302	89.9%
CCPC Miaoli Factory	1971	1751	96.3%	CCSG	2014	10	27.8%
DCC Mailiao Factory	1996	193	80.4%	CCDSG	2014	43	29.9%
CCP Kaohsiung Factory	1979	460	98.1%	DCCJS	2013	334	100%

Operations of Special Physical Examination Items Performed by CCPG in 2018 - per Company

Unit: numbers

Region	Inspection item	CCP	CCPC	DCC	Total
		Number of people underwent special physical examinations in 2018			
 Taiwan	Dimethyl formamide operations	29	5	2	36
	Formaldehyde operations	179	22	2	203
	Dust operations	10	37	N/A	47
	Ionizing radiation operations	14	18	7	39
	Operations in noisy environments	125	110	87	322
	Benzene operations	52	52	33	137
	Chromic acid operations	7	35	1	43
	Tetrachloroethane operations	4	N/A	N/A	4
	N-hexane operations	1	2	N/A	3
	Nickel operations	N/A	18	25	43
	Arsenic operations	N/A	5	N/A	5
	Mercury operations	21	N/A	N/A	21
	Carbon disulfide operations	N/A	4	N/A	4
	Total	442	308	157	907
 Overseas	Dust operations	549	185	19	753
	Ionizing radiation operations	20	N/A	N/A	20
	Operations in noisy environments	158	280	343	781
	Chromium operations	234	161	N/A	395
	Benzene operations	376	117	186	679
	Nickel operations	3	N/A	N/A	3
	Vinyl chloride operations	N/A	N/A	55	55
	Hydroquinone operations	N/A	N/A	10	10
	Carbon monoxide operations	N/A	N/A	9	9
	Methanol operations	45	N/A	5	50
	Sulfuric acid operations	N/A	N/A	40	40
	Hydrochloric acid operations	N/A	N/A	11	11
	Acetic acid operations	N/A	N/A	10	10
	Sodium hydroxide operations	N/A	N/A	41	41
	Allyl alcohol operations	N/A	N/A	14	14
	Tetrahydrofuran operations	N/A	N/A	12	12
	Vinyl acetate operations	N/A	N/A	13	13
	Hydrogen peroxide operations	N/A	N/A	25	25
	Total	1,385	743	793	2,921

Note: Special occupational health examinations are performed in accordance with related regulations for occupational health exams established by the competent authorities in charge of labor at the location of the factories. They focus on the types of related chemical substances and inspection items.



Chang Chun Group