Powerchip

2017

Powerchip Technology Co., Ltd.

Corporate Social Responsibility

About "Powerchip 2017 Corporate Social Responsibility Report"

Powerchip is a company specializing in wafer fabrication. We strive for safety, health and environmental protection in all domains and have a management philosophy of sharing our achievement together with our employees, customers and society. We are willing to not only provide employees a safe and healthy working environment but also take environmental protection, green production, occupational injury prevention and corporate social responsibility as a part of our business and management. We strongly believe in achieving the final goal of sustainable development by implementing the environment, safety and health management system as well as building channels for communication with our employees, customers, contractors, suppliers, contract manufacturers, the public, and other stakeholders.

Report Scope and Boundary:

As one of the members of the global village, we publish the "Powerchip 2017 Corporate Social Responsibility Report" in consideration of the social responsibilities that should be taken. It transparently presents the company's government, economic management, social responsibility, the achievement of sustainable environment development as well as strategic goals to the employees, customers and the public. This report is published in June, 2018. It contains all kinds of performance from January 1st, 2017 to December 31st, 2017. The boundary of the report extends to our P1/2, P3 Foundries in Hsinchu Science-based Industrial Park. It has been a year since the publication of "Powerchip 2016 Corporate Social Responsibility Report," in August 2017, the scope and boundary are the same as the previous version and there is no information that needs revision or declaration. The contents, thus, are not revised and the scope remains the same.

Editorial Principles:

This report is in accordance with the Global Reporting Initiative G4(GRI) guideline (GRI G4) and the contents complied with the core items of disclosure; To ensure the public transparent and open presentation of our CSR results and strategic goals, we entrusted BSI Taiwan to inspect at a moderate level for the 2017 report based on the AA 1000AS and GRI G4. We will make CSR reports continuously every year and publish them on our official website.

Contact Information:

If you have any suggestions or advices about this report, please contact us:

Powerchip Technology Co.,Ltd.

Tsai Hsin-Ju, EHS Division in Department of Risk Management

Address : No. 12,Li-Hsin 1st Rd, Hsinchu Science Park, Hsinchu, 300, Taiwan R.O.C.

Phone : 886-3-5795000 ext. 2350

Fax : 886-3-5792040

E-mail : sindy@powerchip.com

Website : www.powerchip.com

Table of Contents

Ch1

Strategy and Vision

1.1 Words from the Founder / 1.2 Words from the President /
1.3 Social Responsibility and Commitment

Founder : Frank Huang

1.1 Words from the Founder

Since the foundation of Powerchip in 1994, we have been focusing on the memory chip production and marketing. With the changing of the global industry, we have transformed into the only professional wafer OEM manufacturer of integrated memory and logic technology in Taiwan by improving our process technology constantly, developing innovative products and promoting international strategic alliances, and leaped into the world Top Five. In the future, we will cooperated with the international company and center on the special filed of wafer OEM market like AI, automobile and industrial memories and medical optical chip to deploy new production capacity that satisfies the demand of the world-class customer.

Advanced technology and delicate quality make us stand firmly in the semiconductor industry. The care for our employees, society and environment are our unchangeable mission statements. Though the financial crisis in 2008 had great impact on the global memory manufacturers including Powerchip, we worked in concert with our upstream and downstream partners to deeply understand the close and unbreakable dependent relationships of the company with employees and society. In the future, we will face challenges with a prudent and perseverant attitude, operate our business cautiously, grow and earn profits in adversity to protect the interests of our employees and shareholders. For society, we will advance our cultural tastes, give assistance and care to people who are in need through Powerchip Foundation, internal public welfare groups, Employees' Welfare Committee and other systems to take our corporate citizen social responsibilities. The Powerchip Environmental Protection Foundation will also keep promoting energy-saving and carbon-reducing to manifest the symbiotic relationship between our company and the environment.

We firmly believe that sharing the operating results with the employees, partners, the public, and the environment on the way to the growth and development of the company is the best selection for the creation of unfailing growing dynamics for an enterprise. We will face, communicate and handle all problems and challenges with an active and sincere attitude, as we always do, and we will hold this belief and become a great corporate citizen of sustainable development.

1.2 Words from the President

President : Alex Wang

I am delighted with the publication of the "Powerchip 2017 Corporate Social Responsibility Report". As a global leading manufacturer in the semi-conductor field, we create profit for our shareholders and take the responsibilities for the employees, customers, suppliers, economy, environment and society. We disclose relevant information in the 2016 CSR report in the hope to help all of the stakeholders understand our commitments and efforts, and demonstrate our emphasis and determination to implement the corporate society responsibility and sustainable development of Powerchip.

We have set the operating goal to become "a world-class leading technology company with competitiveness and stable profitability" and have exited the unpredictably problems of the DRAM industry with careful strategic deployments, sound financial plans, and accurate implementation actions. The wafer foundry business is prosperous. It not only creates stable profitability for the company, but also contributes cash to the operation of the business. Though the financial and operating conditions are gradually improved from the bottom of the valley, we are well-informed that fulfillment of the social responsibility is a more essential strategic thinking and duty of the company in addition to the basic responsibility of making profits and creating economic benefits. Therefore, we will use diverse development strategies and management models to turn external challenges into new business opportunities. Besides making profits for the shareholders, we have to create more value for all the stakeholders to mitigate the impact on the society, environment and economy and try our best to fulfill the corporate citizen responsibilities.

Last, we appreciate all the partners who grow together with us. We will try our best to manage business and reward all the stakeholders with actual operational performance. For our customers, we will study and develop all types of product technologies, satisfy different requirements of the customers for their production planning and strengthen their trust to us. For our investors, we will improve our performance and stable profitability, reduce investment risk for shareholders, create more profits and increase long-term investment willingness. For our employees, we will try our best to protect their interests, health and safety and provide encouragement in a timely manner. We will also develop a healthy and excellent occupational environment to attract outstanding talents. For our suppliers, we will implement every production plan to help them satisfy our requirements for all materials and components and reduce their operational risk of production and storage. We will hold the philosophy of "giving back to society what it gives us" and perform our corporate social responsibility continuously. We are also looking forward to suggestions from those who have been concerned about us to make us sturdy.

1.3 Social Responsibility and Commitment

Our vision comes from the logo of Powerchip. The three-dimensional square in the middle represents the application of our leading technology to the design and manufacture of high-performance semiconductor chips. The oval stands for our goal to fulfill different requirements from the world markets, professions and people of all kinds. We will realize our vision of globalization and international marketing with our professionalism, extraordinary quality and satisfactory service. The blue-green color displays the blue sky and the green earth. The color also shows that we also strive for environmental protection, resources preservation and corporate responsibility while pursuing its growth.

Powerchip is a company specializing in wafer fabrication. We strive for safety, health and environmental protection in all domains and have a management philosophy of sharing our achievement together with our employees, customers and society. We are willing to not only provide employees a safe and healthy working environment but also take environmental protection, green production, occupational injury prevention and corporate social responsibility as a part of our business and management.

We strongly believe in achieving the final goal of sustainable development by implementing the environment, safety and health management system as well as building channels for communication with our employees, customers, contractors, suppliers, contract manufacturers, the public, and other stakeholders. We promise to obey the following philosophy and criterion to create better quality of life for our employees and communities:

1. Managers at all levels commit themselves to providing required resources and implement daily environment, health and safety management to ensure the suitability, adequacy, and effectiveness of the management system.
2. Safety, environmental protection, production and quality are equally important.
3. We are compliant with Electronic Industry Code of Conduct (EICC), domestic ESH regulations and other relevant norms.
4. It is our direct responsibility to protect the environment, prevent predictable danger and control damage.
5. In consideration of the issues on the mitigation of climate change, adaptation, and sustainable use of resources, we will conduct energy-saving and carbon-reduction activities to promote efficient use of resources.
6. We will make review and improvement continuously to enhance the effectiveness for our environment, safety and health management.

Ch2

Company Profile

2.1 Introduction / 2.2 Corporate governance / 2.3 Business Performance / 2.4 Stakeholders' Identification and Communication / 2.5 Material issues / 2.6 Awards

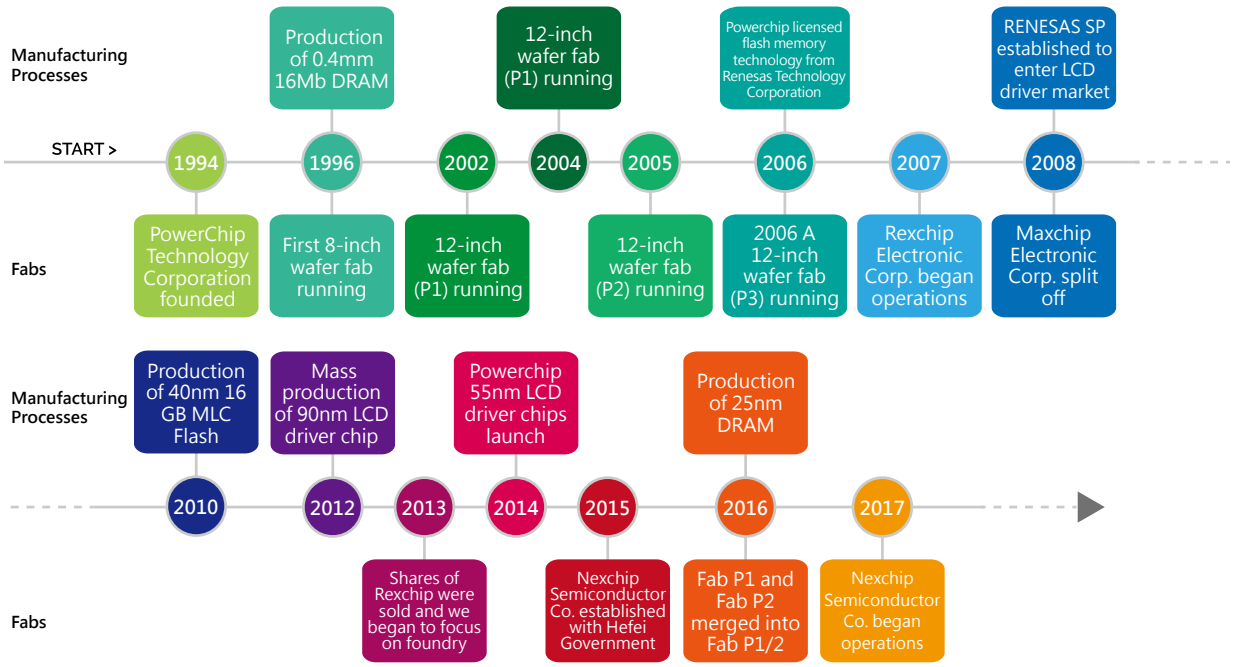
Sustainable development of the enterprise is our ultimate business goal. The professional manager and the open, clear decision-making mechanism are the foundation of our governance. We expect to follow the industry and market trends to develop new products and technologies actively to ensure steady growth of business performance. We share profits with our employees, shareholders, customers and partners to build a stable long-term cooperative relationship.

2.1 Introduction

Powerchip was founded in Dec. 1994 in Hsinchu Science-based Industrial Park in Taiwan. Our business scope covers various memories, logic ICs, image sensor ICs, power management ICs and other foundry products. We have 4,902 employees and our capital reached NT$ 22.81 billion by Dec. 2017. The consolidated revenue in 2017 was NT$ 46.3 billion.

Our production base is located in Hsinchu Science-based Industrial Park. The first 8-inch wafer fab started the operation in 1996. Initially, we and Japan's Mitsubishi Electric Co. formed a strategic alliance in DRAM technology, production and sale to increase international competitiveness and technological strength. In 2003, Elpida took over the Mitsubishi DRAM business but our long-term cooperative relationship continues. In 2006, we and Elpida jointly ventured the Rexchip Electronic Corp. in Central Taiwan Science-based Industrial Park. In 2016, we successfully manufactured our first 25-nanometer standard memory, and we continue to use the top memory process technology to provide domestic and overseas memory design companies with memory chip production and marketing services.

To adapt to the transformation strategy, we split the 8-in fab to become the independent Maxchip Electronic Corp. focusing on professional fabrication of panel driver IC and power management products. In 2013, we sold shares of Rexchip to American Micron and began to focus our resources on foundry. Our 12-inch fabs began to manufacture display driver ICs, power management ICs and memories. After integration, so far we have two 12-inch wafer fabs with total monthly 100 thousand wafers (P1/2, P3 fabs). In Oct. 2015, we signed a cooperation agreement with Hefei City Construction and Investment Holding (Group) Co., Ltd. in Anhui Province to establish a joint-venture company, Nexchip Semiconductor Co. The construction of the plant was completed in April 2017, and machinery and equipment were moved in during the same period. The test production of display driver ICs began at the end of 2017. With this joint-venture project, we may not only expand our wafer foundry business, but also work in cooperation with the upstream and downstream manufacturers in the supply chain in Taiwan to develop the semi-conductor market in China and create a win-win situation for the semi-conductor industries cross the Taiwan Strait.



With a great foundation of memory technology, we started to develop high capacity flash memory (NAND FLASH) technology on our own and became the only company in Greater China with the comprehensive technologies in design, process development and mass production of NAND FLASH. The high-capacity 16Gb MLC flash memory was the winner of the 2012 Taiwan Excellence award from the Ministry of Economic Affairs.

Taiwan Excellence award 2012

16Gb MLC flash memory
Powerchip Technology Co.,Ltd

In the logic technology field, we focus on the technology of small display driver ICs (SDDI - Small Display Driver IC). The mass production of the 55nm LCD driver chips was launched in 2014. We are now one of the most important global small display driver IC manufacturers and the largest SDDI foundry and primary foundry partner for SDDI design enterprises in the world. As for the foundry technology fields such as the CMOS image sensing and power management, we provide customers with competitive, professional wafer foundry services with our advanced 12-in wafer technology. Now, we are the global leading manufacturer in the production of mobile phone display driver ICs, and have an unshakable position in the mobile device market.

Our vision is to use sophisticated technology and customer service to become a world-class semiconductor company with stable profits. With advanced technology and capacity, we provide multivariate, professional wafer foundry services for markets of information, communication and consumer electronics. In the future, we will continue to promote international cooperation strategy, introduce cutting-edge technologies, develop our own technology and steadily expand the market in order to accumulate competitive advantages in the rapidly changing high-tech industry, and become the professional wafer foundry supplier that can create a win-win situation for our customers.

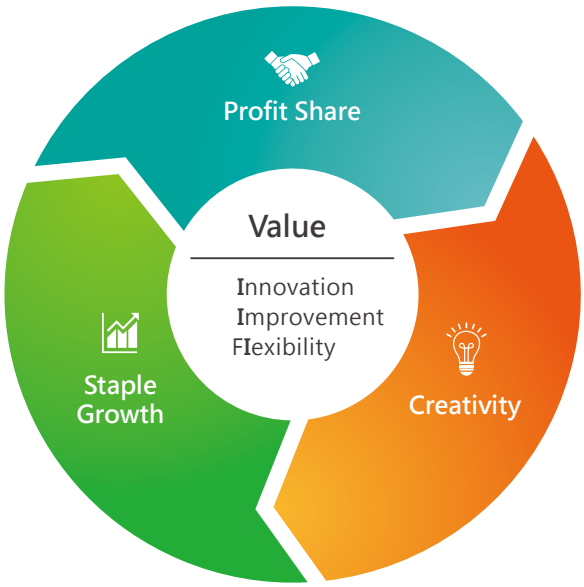
2.1.1 Corporate mission

Our corporate mission is to build an effective management team, provide customers with the best product and service, and improve the quality of life for people and bring maximum benefits to investors (shareholders and employees). Our corporate culture emphasizes three major values: innovation, improvement and flexibility. These are our core and we integrate them into our core business philosophy. We may emphasize that Powerchip is a company growing and prospering with the society.

To keep growing in the fiercely competitive market, we are dedicated to the following operating strategies:

- Promoting the "Open Foundry" wafer manufacturing mode;
- Accumulating process capabilities and build a process platform with logic applications (DDIC, IMC, Sensor) and memories (DRAM, Flash) as the core;
- Developing the forward-looking biotechnologies, vehicle ICs, and IoT applications in the semi-conductor field;
- Enhancing the capacity adjustment flexibility to reduce the risk of business cycle;
- Combining the upstream and downstream supply chains to development the China market;Our business philosophy highlights the following:

We promise to comply with the Code of Conduct - Responsible Business Alliance (RBA) Version 6.0 (formerly the Electronic Industry Code of Conduct, EICC) and give consideration to labor, health, safety, environment, code of ethics and management systems. We also promise to fulfill our corporate responsibility for positive and sustainable development of society.



2.1.2 Our service

With Taiwan as our base, we have established 12-inch wafer fabs in Hsinchu Science-based Industrial Park to provide professional foundry services. Steadily, we offer professional foundry services in the fields of LCD driver IC, image sensor IC, NFC IC, power management IC and various memory products (DRAM, NAND Flash, NOR Flash, etc.). Through our innovative "Open Foundry" model leading in the industry, we co-develop process technology with customers, help them design chips and enhance our cooperative relationship with them. We make use of existing experience in memory development and production to develop integrated memory chips and integrate processes of various logic and memory chips. By doing so, we make ourselves different from other foundry competitors in the industry and tailor the most competitive wafer foundry services.

★ Our location

Corporate Headquarters / Fab P1/2 Foundry

Address: 12, Li-Hsin 1st Rd. Hsinchu Science Park, Hsinchu, Taiwan, R.O.C.

Tel: 886-3-5795000

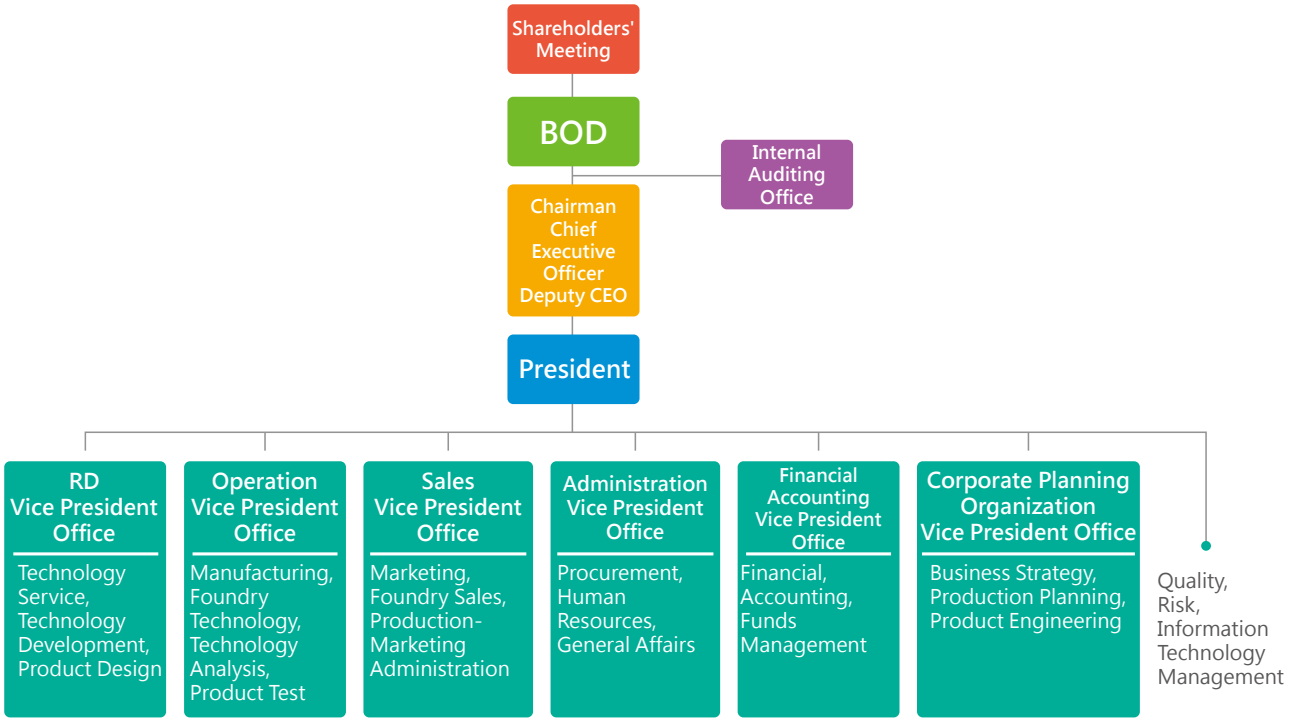
Fab P3

Address: No. 16-1 Li-Hsin Rd. Hsinchu Science Park, Hsinchu, Taiwan, R.O.C

Tel: 886-3-5791000

2.1.3 Our organization structure

By December 2017



2.2 Corporate governance

We established our Articles of Association and various regulations based on the R.O.C. Company Act, Securities and Exchange Act and other relevant regulations. We formulate and implement the corporate governance structure on the premise that we follow the state laws, regulations and various internal regulations and systems. Our regulations associated with corporate governance are disclosed on our official website (http://www.powerchip.com.tw) for inquiry.

We set the BOD and supervisors in our corporate governance structure based on relevant legal regulations. The BOD is composed of directors. All directors and supervisors are voted by all shareholders. It is the duty of the directors to establish the vision, strategy, business and budget plan. The directors must also plan our med-term and long-term development direction, and supervise our business and plan and its implementation. It is the duty of the supervisors to monitor the implementation of our business and the diligence of the director and manager. The supervisors must also monitor the enforcement of our internal control system to diminish our financial crisis and business risk.

2.2.1 BOD

Our BOD is composed of 13 directors and 3 supervisors. It bears the responsibility for our operation, development and supervision. All of them have professional background and experience. They are very helpful in the operational decision-making and planning of operational strategies. Three of the thirteen directors are independent directors. The BOD invites experts of high social prestige and industrial status to participate in the corporate governance.

We arrange our directors and managers to participate in courses related to economy, society and environment every year. The implementation of continuing education of directors in 2017 is disclosed on Pages 24~25 of our annual report.

We have diligence regulations that expressly specify the recusal in the conflict of interest. The recusal due to conflict of interests is specified in the meeting regulations of the BOD. The director shall not participate in the discussion or resolution if he/she or the legal person represented by him/her has an interest therein. Relevant issues of recusal are recorded in the meeting minutes.

Our management team is composed of professional managers reviewed and approved by the BOD. All of them have professional knowledge in specific fields and extensive experiences in the industry. They are in charge of our daily operation and management. As for economic, social and environmental aspects, the Vice Presidents of Financial Accounting and Administration, as well as relevant high-level managers make decisions and deliver reports about these aspects at the meeting.

BOD members		
Title	Name	Remark
Chairman	Steve R.L. Chen	Representative of Zhi Ren Technology Co., Ltd.
Director	Frank Huang	
Director	Tsai Guo-Zhi	Representative of Powerflash Enterprise Co., Ltd.
Director	Alex Wang	Representative of Li Yuan Investment Co., Ltd.
Director	K. T. Tong	Representative of Novax Technologies, Inc.
Director	Peter Ting	Representative of PowerWorld Capital Management Corp.
Director	Xu Qing-Xiang	Representative of eMemory Technology Inc.
Director	Tsukamoto Katsuhiro	Representative of Zhi Xiang Investment Co., Ltd.
Director	Jerry Shao	Reprensentative of Zhi Te Co., Ltd.
Director	Tsai Chu Hsieh	Representative of Syntronix Corp.
Independent director	Nagasawa Koichi	
Independent director	Zhang Chang-Bang	Former Political Deputy Minister
Independent director	Liu Jiong-Lang	Former principal of National Tsing Hua University
Supervisor	Huang Chong-Heng	
Supervisor	Chen Jin-Long	
Supervisor	Lin Rong-Sheng	Representative of AeroVision Avionics Inc.

2.2.2 Management team

Title	Name
Operation Director	Steve R.L. Chen
Founder and CEO	Frank Huang
Deputy CEO	Tsai Chu Hsieh
President	Alex Wang
Senior Vice President	K. T. Tong
Senior Vice President	Peter Ting
Senior Vice President	Yi Chiang Shih
Vice President	Eric Tang
Vice President	Joe Wu

Title	Name
Vice President	Milton Hsieh
Vice President	James Liu
Vice President	Jerry Shao
Vice President	Peter Chen
Vice President	Joe Chen
Assistant Vice President	Pang Chung-Yi
Assistant Vice President	Wu Ming-Chang
Assistant Vice President	Zhang Shou-Ren
Assistant Vice President	Chen Jiann-Liang
Assistant Vice President	Qiu Chiu-Yuan

2.2.3 Internal audit

Our Internal Auditing Office is an independent unit with designated auditors. It is subordinated directly to the Board of Directors and executes regular auditing operations according to the annual auditing plan approved by the Board of Directors. It also executes special audit cases, if required, to identify possible nonconformities in the internal control system and make improvement suggestions. The Internal Auditing Office incorporates the improvement proposals of the audited units in the audit report and take follow-up actions after the reported is submitted and approved to make sure that they have taken appropriate improvement measures in time. After the completion of various regular audits and follow-ups, it issues the audit and follow-up reports and reports them to the President, Chairman, independent directors and supervisors

2.2.4 Diligence promotion

We encourage the employees to build an honest and trustworthy relationship with our suppliers during operation of the business based on fair, reasonable and legal principles. For this, we established the "Diligence Promotion Committee" on June 1, 2005 to help them understand that they shall strictly abide by the integrity and genuine principles while dealing with the upstream and downstream stakeholders associated with our business. The Committee also takes the responsibility for dealing with compromise of the integrity occurring during operation of the business and reported internally and externally.

We established the "Diligence Standards" on August 1, 2006. On November 1, 2017, we amended the "Diligence Standards" and established the "Code of Conduct on Gifts and Business Hospitality" to ensure the employees conduct their business in accordance with ethical standards. When handling lobbying, gift acceptance, business entertainment or other incidents involving in both personal and company interests, the employees shall abide by these reasonable, explicit, transparent and open standards. The "Diligence issue declaration/reporting system" was launched officially on September 1, 2006. We have an email address for whistleblowers: ethic@powerchip.com. For any illicit conducts involved while our colleagues carrying out the operation, internal and external parties may report to the committee anonymously or by name.

2.2.5 Information security

Information security is an issue that may occur in any application node of the company. In consideration of the importance in the close relationship between the information security and the operation of the company, we establish a dedicated and independent "Information Security Office" with designated personnel and subordinate it directly to the President. Relevant regulations and control measures are available to protect the confidential information and continuous operation of the company and ensure the best benefits for the company and its shareholders, employees, customers, and suppliers.

We take the following control measures to ensure the security of the information assets that we and our customers or partners deliver:

1. We establish the "Information Security Policy" and "Information Security Management Regulations" according to ISO 27001, and amend the latter annually, if needed, depending on the current situation.
2. We establish the "Personal Information Management Regulations" with reference to the Personal Information Protection Act.
3. The "Information Security Committee" meeting is held every six months to discuss the issues related to information security. The President acts as the chairman of the Committee and the members are the representatives of the information, manufacture, R&D, human resources, risk management, information security, legal affairs, and quality management units.
4. Information security promotion, education and training activities are organized regularly for all the employees of the company to ensure that they have adequate information security awareness.
5. At least one information security audit is executed every year, and every unit is required to execute self-evaluation of information security once a year.
6. Action such as encryption of documents, control of peripheral equipment, management of outbound mails, printing and photocopying, and other IT control measures are used to minimize the disclosure risk of confidential information.
7. Door control and monitoring systems as well as the assess rights are inspected regularly to ensure best protection of the physical environment and important equipment.
8. Any employee who acts in violation of the information security regulations shall be reported to the human resources unit for further appropriate handling. Dismissal or litigation may be the result in case of serious violation.
9. We provide the "Partner's Words" and "SIEM Information Security Incident Management Platform" at our portal. All the employees can leave a message about the issue of information security.

2.2.6 Associations/guilds and national/global reporting initiatives we've joined

Taiwan IoT Technology and Industry Association · TwIoTA	Chairman/Director/Executive Supervisor/ Supervisor
Cross-Strait CEO Summit	Secretary-general
Taiwan IC Industry and Academia Research Alliance · TIARA	Supervisor/Member
The Third Wednesday Club	Member
JEDEC Solid State Technology Association	Member
The Allied Association for Science Park Industries	Director/General Convener of the Environmental Protection Committee/Deputy Convener of the Security and Health Committee/Deputy Convener of the Joint Protection Committee
Environmental, Safety and Health (ESH) Committee of Taiwan Semiconductor Industry Association	Member
Hsinchu City Nurses Association	Member
Taiwan Environmental Management Association	Member
Institute of Internal Auditors-Chinese Taiwan	Member
Hsinchu City Human Resources Management Association	Member

2.3 Business Performance

The consolidated revenue in 2017 was NTD 46.3 billion and the net income after tax was NTD 8.03 billion. The EPS was NTD 3.54. Since transforming into a wafer foundry company, we have shown our performance with stable profitability.

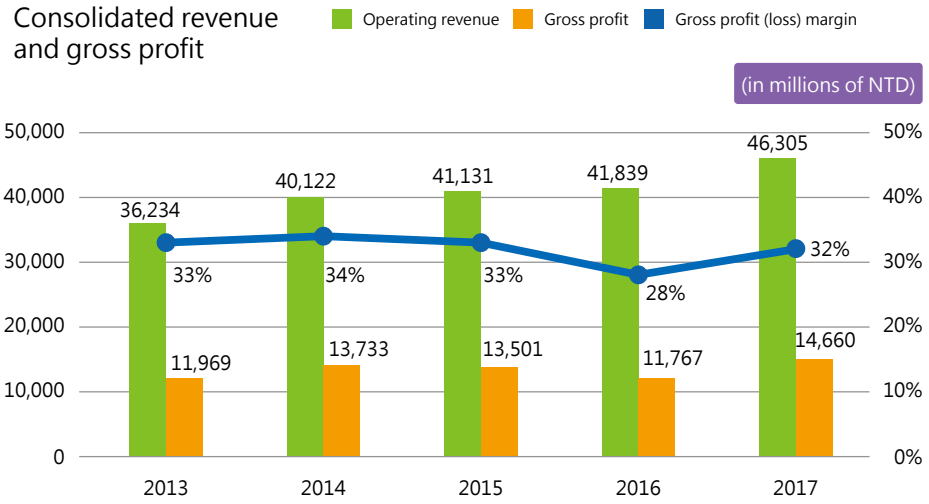
Since our transformation to a wafer foundry service provider, we have demonstrated a performance of profitability for many years and paid off most of the loans to the bank. In 2018, considering the short supply of memories in the market and the strong end-user demands for logical products, our OEM orders, gross margins and capacity utilization rates may remain at a higher level. From now on, we will do our utmost to develop the open foundry technology and expand the foundry product portfolio to diminish the operational risk. We pursue an operation model with steady profits in the long run.

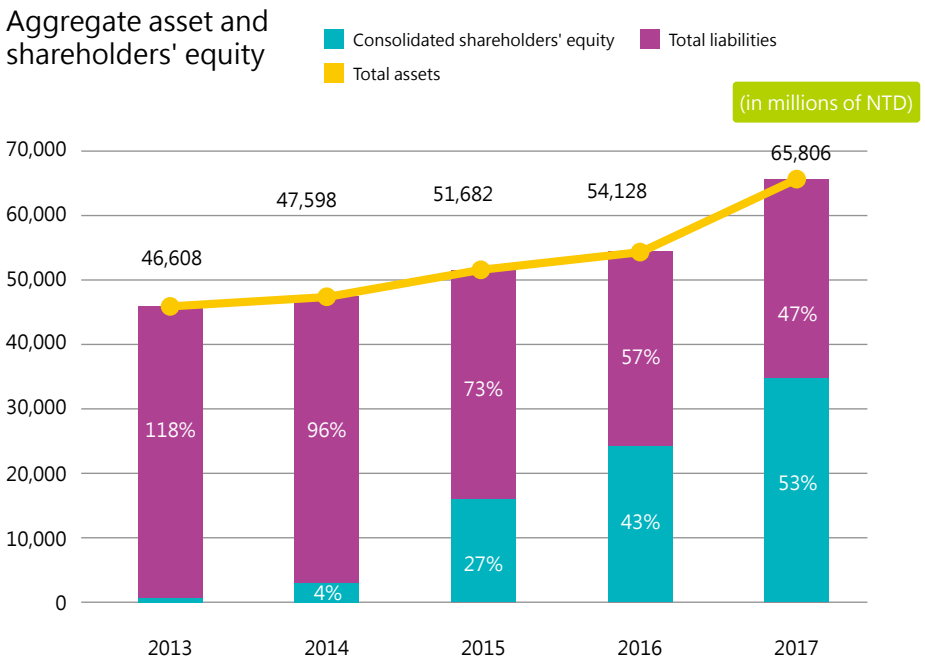
We will continue to reinforce the financial structure, pursue for stable profit, expand production cautiously and introduce strategies regarding new process and multivariate products actively. We integrate the effort of employees and create better operational performance. (For more information about our operating performance and annual financial statement, visit official website.)(http://www.powerchip.com.tw/?node=investment#financial)

▲ Our operation condition in the last five years

	2013 年	2014 年	2015 年	2016 年	2017 年
Employee welfare expenses (in millions)	6,275	7,178	7,502	9,337	10,379
Tax expenditure (in millions)	43	44	53	46	53

Item/Year	IFRS (in millions)				
	2013	2014	2015	2016	2017
Operating revenue	36,234	40,122	41,131	41,839	46,305
Gross profit	11,969	13,733	13,501	11,767	14,660
Operating income (loss)	11,584	10,488	10,101	7,865	10,305
Non-operating income (expense)	1,228	1,689	(282)	(1,294)	(1,207)
Pre-tax net profit (loss)	12,812	12,177	9,819	6,571	9,098
Deduction: Income tax expenses (profit)	1,153	48	(463)	4	1,029
Net income (loss)	11,659	12,129	10,282	6,567	8,069
Other comprehensive income for the period	(354)	429	(666)	(164)	325
Total comprehensive income for the period	11,305	12,558	9,616	6,403	8,394
Earnings (loss) per share (dollar)	5.06	5.28	4.51	2.88	3.54
Gross profit (loss) margin	33%	34%	33%	28%	32%





The financial information of the Foundation is not incorporated in the assets

2.4 Stakeholders' identification and communication

The departments of risk, safety and environment held a cross-department discussion and jointly established the "Powerchip Technology Stakeholders' Questionnaire Survey" to understand our stakeholders. The major stakeholders that are identified by influence and interaction frequency include employees, job seekers, customers, contractors/subcontractors, suppliers, investors (shareholders), government agencies, nearby foundries/neighbors, the media and public associations.

The departments participate in public hearing/symposium/workshop activities, hold shareholders' meetings/symposiums/employees' quarterly meetings, issue annual reports/ CSR reports, and organize educational training via internal and external websites as well as interactive web pages for employees/contractors/suppliers. They also communicate with stakeholders by email/phone and using other communication channels. The departments use different communication channels to collect, understand and respond to the issues that stakeholders are concerned about to ensure effective communication with them. The issues in which stakeholders are most interested, such as operation and management of the company, sustainable development and protection of the environment, and social responsibility, are announced externally in the annual, financial report and CSR reports issued every year.

2.5 Material issues

The departments collect the issues that stakeholders are most concerned about via the "Powerchip Technology Stakeholders' Questionnaire Survey" and "various communication channels. Only the issues that have a statistic percentage of more than 60% in their importance shall be listed as material issues after being discussed and assessed in cross-department meetings.

1 Discussing the scope of the stakeholders
1. Correspondent departments
2. Focused issues

2 Collection of focused issues
by questionnaire

3 Determining the material focused issues
Collect the issues that the internal/external stakeholders focus on and have a statistic percentage of more than 60% as material focused issues

4 Confirming again
Suitability of Material Focused Issues

01 Stakeholders Identification and Questions

- Contact person/range of stakeholders: Confirming the completeness and suitability of the target.
- Designing contents and questions in the questionnaire: Confirming the completeness and suitability of the question belonged to each unit.

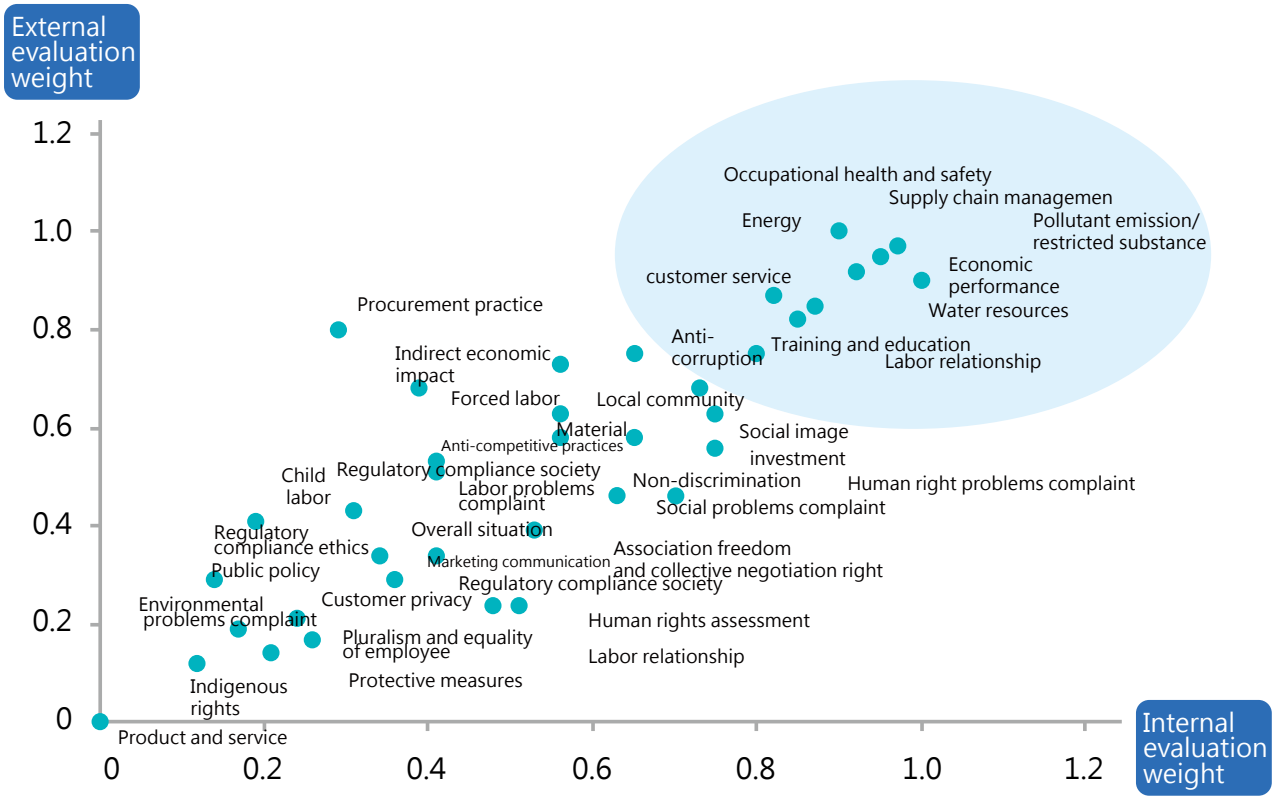
02 Investigate the Issues that Stakeholders Are Most Concerned

- Establishment of the Contact Channel: We have an elaborate division of labor now, but we are planning to establish it on our website to minimize the contact channel establishment of each issue.
- Regular/ad hoc survey: we voluntary send out surveys at the end of every year/Stakeholders fill out the form on our website (check the relevant issues and send them back to the contact person to know)
- Summarization and Statistical Analysis: The Department of Risk, Safety and Environment summarizes and conducts statistical analysis.

03 Resolution of the annual focused issues

- Selection of the focused issue: The Department of Risk, Safety and Environment summarizes the issues that the internal and external stakeholders focus on and have a statistic percentage of more than 60%.
- Resolution of Material Considering Aspects: After the confirmation of each channel, we decide the direction of the annual performance to be the foundation for each unit to perform the annual work the next year.

In 2017,the material issues we selected include "economic performance", "energy", "water resources", "pollutant emission/restricted substance", "supply chain management", "employment relationship", "occupational health and safety", "training and education", "customer service" and "anti-corruption". These material issues will be disclosed in the report to demonstrate our management and performance.



Material issues and considerations

Material issues and considerations	Organization boundary	DMA	Category	GRI	Reference Chapter
Economic performance	Internal: Powerchip External: Investor (shareholder)	2.3 Business Performance	Economy	G4-EC1	2.3 Business Performance
Energy	Internal: Powerchip External: Government agency	IV. Environmental Sustainability	Environment	G4-EN3	4.1 Resource Management
Water resources	Internal: Powerchip External: Government agency	IV. Environmental Sustainability	Environment	G4-EN10	4.4 Water Resource Management
Pollutant emission/ restricted substance	Internal: Powerchip External: Government agency, public association, customer, nearby foundry/ neighbor	IV. Environmental Sustainability	Environment	G4-EN15 G4-EN16 G4-EN22 G4-EN23 G4-EN27	4.2 Greenhouse Gas 4.3 Air Emission Management 4.4 Water Resource Management 4.5 Waste Reduction and Management
Supply chain management	Internal: Powerchip External: Government agency, customer, supplier, contractor	3.1 Supply chain management	Society Labor	G4-HR11 G4-HR6 G4-HR5 G4-SO10	3.1.2 Sustainability regulations for the supply chain
Employment relationship	Internal: Powerchip External: Government agency	3.4 Employment	Labor	G4-LA2	3.4 Employment
Occupational health and safety	Internal: Powerchip External: Government agency	3.3 Safety and Health Management	Labor	G4-LA6	3.3 Safety and Health Management
Training and education	Internal: Powerchip External: Government agency	3.4 Employment	Labor	G4-LA9	3.4.5 Training and development
Market presence	Internal: Powerchip External: Customer, investor (shareholder)	3.4 Employment	Labor	G4.EC5 G4.EC6	3.4.2 Selection and retention of talents
Customer service	Internal: Powerchip External: Customer	3.2 Product Service	Society	G4-PR5	3.2.3 Customer/ product service and satisfaction tracking
Anti-corruption	Internal: Powerchip External: Customer	2.2.4 Diligence promotion	Society	G4-SO5	2.2.4 Diligence promotion

Stakeholder		Communication
1	Employee	1. We hold company quarterly meetings and one-on-one communicate with employees. 2. The executive of the department and the employee communicate with each other every six months. 3. We hold the employee physical examination regularly every year. 4. We establish a clinic as a channel providing employees and their dependents with health care medical services and health consultation. 5. We announce information on the real-time internal website, Employee Welfare Committee's website and "Partner Column" promptly and respond to problems. 6. We send health information to implement health education via E-mail, website and health and management system occasionally. 7. We convene the ESH Committee meeting regularly every quarter. 8. We hold the anniversary/family day/year-end party/other activities regularly every year.
2	Candidate	1. Communication during interview 2. Company website
3	Customer	1. We respond to and communicate with customers anytime directly via real-time network platform (official website, phone and E-mail) for the customer. 2. We carry out the real-time customer audit and give out the survey to receive response (with the audit response and OQC Waive Form). 3. We visit customers regularly or occasionally. We deliver a presentation, hold a discussion and make a report to share ideas. 4. We implement real-time customer satisfaction monitoring.
4	Contractor	1. We build a contractor network information system for communication. 2. The contractor signs the "Letter of Guarantee for Compliance with the Safety, Hygiene and Environmental Protection Rules for Contractors". 3. We set up a contractor consultative organization and convene regular meetings every month for communication. 4. We track the health condition of the contractor regularly every year. 5. Our 24/7 health center offers health consultation service to the contractor. 6. We provide health care to ill or injured contractors. 7. We hold a seminar to notify the contractor for the construction risk.
5	Supplier	1. We convene interactive business communication meetings regularly every year. 2. We organize a meeting for the inspection of chemical suppliers every year. 3. We hold communication and coordination meetings, carry out the vendor audit and promote company policies (e.g., environmental, safety and quality issues, payment policy, transportation, etc.). 4. We meet with suppliers face-to-face to promote the company policy or share the market information. 5. We convene the meeting to explain the environment, safety and health policy and corporate responsibility requirements occasionally according to the announcement of new company policy. 6. We convene the meeting for the company goal and the guidance for environment, safety and health.
6	Investor/ partner	1. We report and explain to the investors in the shareholders' meeting every year and explain the issues they concern about. 2. We join the meeting for the domestic and international investment institution. 3. We join the project meeting regularly every year or exchange staffs for interaction and learning. 4. We provide the industrial safety and health information in the company annual report every year. 5. We issue company annual report/CSR report every year to let shareholders know our financial and operation information. 6. We disclose the company information on the Market Observation Post System (MOPS) regularly.
7	Competent Authority	1. The government agency appoints the auditors to our fab for auditing irregularly every year and we take cooperative actions for the auditing. We also join various seminars organized by the government agency. 2. We irregularly interact with National Taxation Bureau, Revenue Service Office, Science Park Bureau, Taipei Exchange (TPEx) and the competent authority by phone, E-mail, public hearing and seminar.
8	Nearby foundry/ neighbor	We report accidents and conduct emergency response and support exercises. (including devices)
9	Media	Interview face-to-face with the media depending on the current requirement. We also hold phone interview, call press conference and provide news information...etc., if necessary.

Stakeholder		Communication
10	Public association	1. We hold the discussion, communicate, respond or report information and application issues via official letter, Internet and phone. 2. We irregularly take part in the seminar and workshop for promotion of regulations. 3. We attend selection for various contests and provide relevant information and report response. We also participate in the audit and on-spot inspection for communication and interaction. 4. We subscribe relevant studies information based on business needs every year. 5. The analyst visits regularly or occasionally (including having a conference call with us) to exchange industry information. 6. We join the overseas meeting.

2.6 Awards

Powerchip abides by domestic laws and regulations. Meanwhile, we also strive for environmental protection and improvement for pollution prevention. Our performance is recognized and awarded by relevant authorities. Relevant award information over the recent years is shown below.

2007

- Annual award winner for Science Park Factory Green Landscaping
- The Sixteen Session of Enterprise Environmental Protection and Golden Dragon Award from Environmental Protection, Administration Executive Yuan, R.O.C.
- 2007 Excellent Performance Award for Science Park Industry Environmental Protection
- 2007 Water Conservation Unit Merit Reward

2008

- 2007 Excellent Company for Voluntary Industry Greenhouse Gas Emission Reduction 2008 Premium Award for Excellent Carbon
- Reduction Corporate of Hsinchu Science Park

2009

- Passed TOSHMS: 2007 Validation of Taiwan Occupational Safety & Health Management System.
- Received Excellent Staff Award for Labor Safety and Health from Hsinchu Science Park Administration Bureau
- Received Personal Excellent Performance Prize for the Fifth Session of Atomic Energy Safety Merit Award
- 2009 Merit Award for Excellent Energy Conservation Company of Hsinchu Science Park
- Health Promotion Mark for Performance Assessment of Self-certification of Healthy Workplace

2010

- Received the Forth Session of National Industry Safety Award from Ministry of Labor, Executive Yuan R.O.C.
- Received 2010 Excellent Unit Award for Labor Safety and Health from Hsinchu Science Park Administration Bureau (P1/2 Foundry).
- Received 2010 Excellent Staff Award for Labor Safety and Health from Hsinchu Science Park Administration Bureau (Head Office).
- Received 2010 Excellent Staff Award for Labor Safety and Health from Hsinchu Science Park Administration Bureau (P1/2 Foundry).
- Received 2010 National Waste/ Wastewater/Air Pollution Dedicated Staff Model from Environmental Protection Administration
- Receive 2010 Premium Award for Science Park Factory Green Landscaping
- PAS2050 Product Carbon Footprint Certification approved.

2011

* Excellent Service Unit for the Nineteenth Session of National Labor Safety and Health
* Corporate Operations Group Personal Contribution Award for the Fourth Session of Safety Partnership Annual Meeting
* Received 2010 Excellent Staff Award for Labor Safety and Health from Ministry of Labor, Executive Yuan R.O.C. (Merit Award)
* Received 2011 National Waste/ Wastewater/Air Pollution Dedicated Staff Model from Environmental Protection Administration
* Received 2011 Excellent Weight-loss Workplace for the "100% Health, Go Taiwan" activity of Health Promotion Administration

2012

* 2011 Excellent Service Staff of National Labor Safety and Health Corporate Operations Group, Ministry of Labor
* Received Appreciation from TOSHMS Promotion of Northern Region, Ministry of Labor, Executive Yuan R.O.C.
* Received 2012 Merit Award for Energy-saving and Carbon-reducing Mark from Ministry of Environmental Protection, Administration Executive Yuan, R.O.C.
* Received 2012 Excellent Weight-loss Workplace for the "100% Health, Go Taiwan" activity of Health Promotion Administration

2013

* Received 2013 Merit Award for Energy-saving and Carbon-reducing Mark from Ministry of Environmental Protection, Administration Executive Yuan, R.O.C. (P1/P2 Foundry)
* Received 2013 Excellent Company for Science Park Factory Green Landscaping and Environmental Preservation Competition

2014

* Received Merit Award for Science Park Water Conservation
* Received 2014 Excellent Unit Award for Labor Safety and Health from Hsinchu Science Park Administration Bureau (P1/2 Foundry).
* Received 2014 Excellent Company for Science Park Factory Green Landscaping and Environmental Preservation Competition

2015

* Received 2015 Science Park Excellence Award for Labor Safety and Health Staff (P3 Foundry)
* Received 2015 Excellent Company for Science Park Factory Green Landscaping and Environmental Preservation Competition
* Received Excellent Corporate Award for Ammonia Wastewater Reduction (P1/2 and P3 Foundry)

2016

* Received 2016 Science Park Excellence Award for Labor Safety and Health Staff (P3 Foundry-2 staffs)
* Received 2016 Science Park Excellence Award for Labor Safety and Health Unit (P3 Foundry)
* Received 2016 Excellent Company for Science Park Factory Green Landscaping and Environmental Preservation Competition
* Received 2016 EPA Excellent Award for Handling Performance of Toxic Chemicals (P3 Foundry)

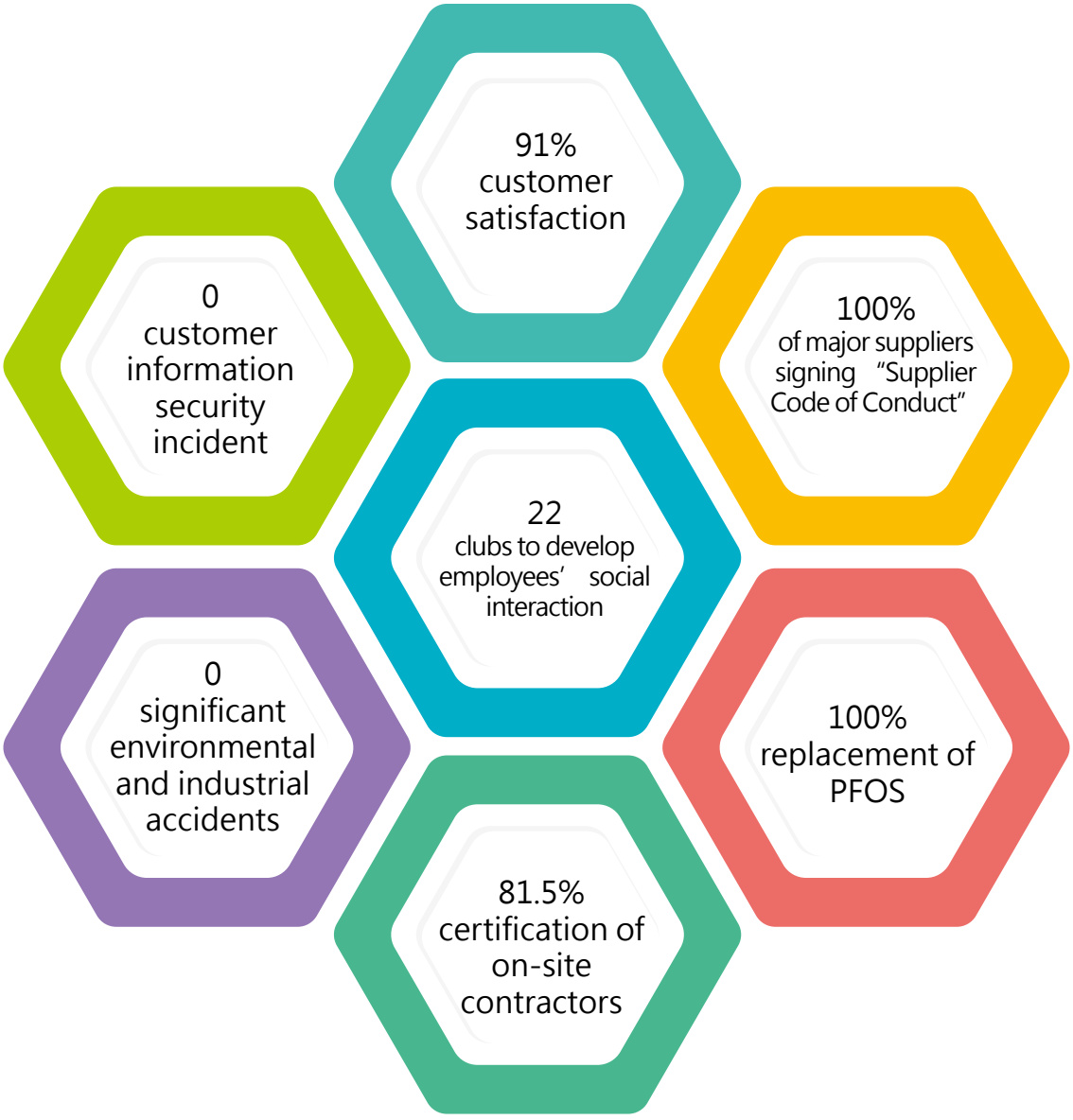
2017

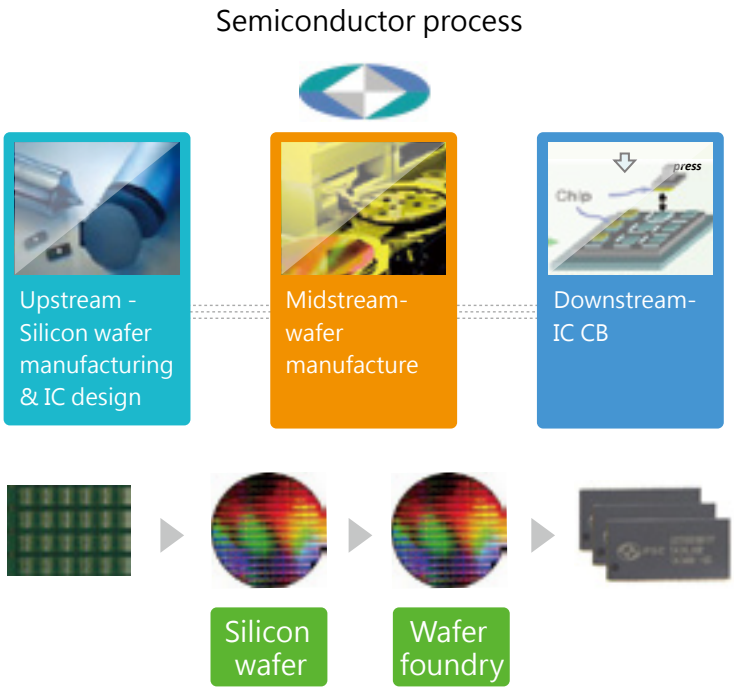
* Received 2017 Excellent Company for Science Park Factory Green Landscaping and Environmental Preservation Competition
* Received 2017 Science Park Excellence Award for Labor Safety and Health Staff (P1/2 Foundry)
* Received 2017 Science Park Excellence Award for Labor Safety and Health Staff (Head Office)
* Received 2017 Excellent Enterprise on Waste Reduction- Excellence Award (P1/2 Foundry)
* Received 2017, the 11th Benchmarking Enterprise Honor of the National Occupational Safety and Health Award
* Received 2017Excellent Health Workplace Promoter Award from the Health Promotion Administration, Ministry of health and Welfare

Ch3 Corporate Social Responsibility

3.1 Supply Chain Management / 3.2 Product Service / 3.3 Safety and Health Management /
3.4 Employment / 3.5 Employee Welfare System /
3.6 Employee Health Management and Promotion / 3.7 Social Welfare

The World Business Council for Sustainable Development (WBCSD) states that corporate social responsibility is a continuing commitment of the business to comply with ethical requirements and contribute to economic development while improving the quality of life of the employees and their families as well as the community and society at large. We bring into this goal in our operation and continue to forge ahead toward this goal. We make economic contribution while improving work environment and caring about physical and mental health of the employees as well as their development at workplace. We integrate our employees, supply chain partners, community residents and associations to build a living area where we can all live happily, enjoy prosperities and carry out sustainable development.





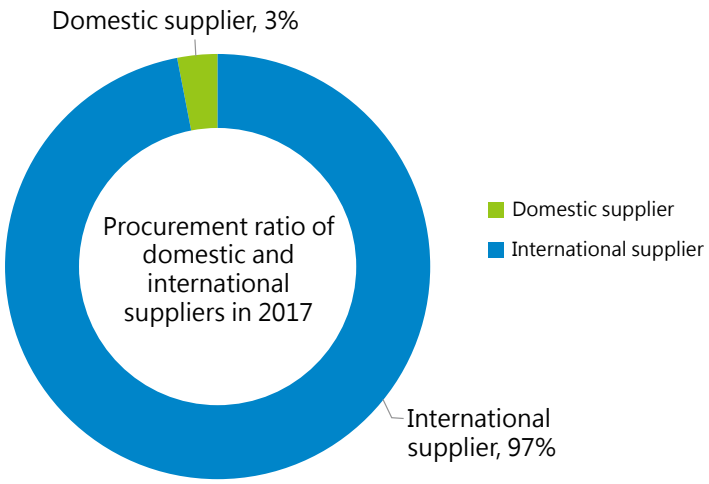
▲ Fig. 3-1 Our process supply chain pattern

3.1 Supply chain management

3.1.1 Building a sustainable partnership with the supplier

In our intermediate process of semiconductor die, we etch the blank wafer according to the circuit diagram made by the IC (Integrated Circuit) design company, and then hand over the wafer to the downstream company to carry out chip packaging. We are very close to the upstream and downstream companies so we really care about the geographical relationship.

Taiwan science-based parks possess a complete semiconductor supply chain and provide us with prompt and robust support. Efforts and supports from local suppliers are indispensable essential elements for us to increase our competitiveness in the industry. By supporting the local supplier, we can reduce the shipping fee and time cost, create local work opportunities and promote the industry development to create mutual benefits and win-win status. Our local procurement ratio is considerably high. We make contributions to the support of the industrial supply chain and advancement of local development. (A domestic vendor refers to the supplier with a VAT number in Taiwan Area.)



▲ Fig. 3-2 Procurement ratio of domestic and international suppliers in 2017

3.1.2 Sustainability regulations for the supply chain

Our suppliers supply (raw) materials in 5 categories:

Wafer, photo resist, chemical, gase and sputter target. In addition to the quality, lead time and compliance with EHS regulations, the suppliers are encouraged to make a contribution to their corporate social responsibility. The periodically executed supplier regulations have the following goals:

Evaluation of suppliers

Major (raw) material suppliers are rated in the aspects of procurement, industrial safety, quality, and engineering once every six months. The internal supplier regulations are implemented through this evaluation and we can make sure that the ISO documents are not expired and need to be updated. A deficiency and improvement meeting must be held, if the evaluation result shows improvement is needed. 50 suppliers were rated in the second half of 2017 and all of them have finished the evaluation. No supplier needs to held deficiency and improvement meeting.

Improvement of supply quality

The quality of the suppliers is inspected through audit in accordance with ISO documents and assistance is given in the improvement of internal processes. We also help them acquire relevant ISO certificates to improve their competitiveness. By implementing the "Authorized Economic Operator (AEO) Certification" (hereinafter referred to as "AEO"), we assist in relevant internal activities, provide documents required for the certification, and help major (raw) material suppliers acquire the AEO qualification. 46 suppliers have been involved and 8 suppliers have acquired the AEO qualification. Promotion of AEO is conducted among unqualified suppliers to improve the quality of supply.

Conflict metal regulations

We inspect the conflict metal and request the suppliers for the information of the latest version actively every time it is revised. We also request suppliers to comply with national environmental protection regulations. We encourage them to be engaged in R&D and innovation, propose solutions for reducing the burden on the environment and live long with the environment. None of our suppliers currently uses conflict metal.

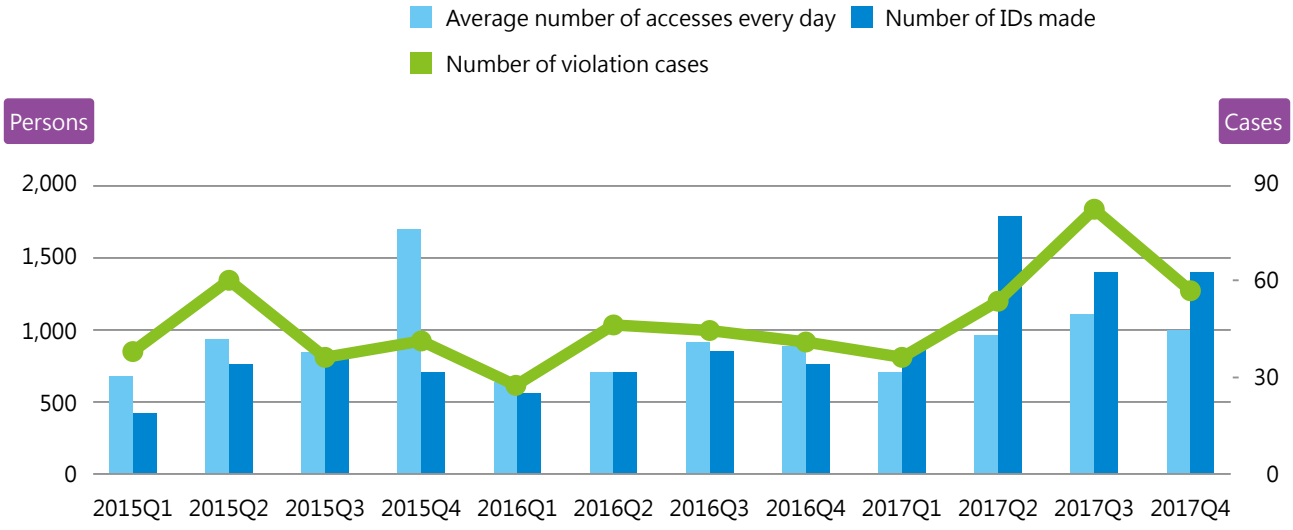
Supplier Code of Conduct (SCoC)

We incorporate the labor, human rights and social impact in the supply chain management and dedicate ourselves to the improvement of the issues with respect to the society and environment. We request the suppliers to sign the "Supplier Code of Conduct" 92 suppliers have signed the document. Promotion questionnaires of the "Electronic Industry Code of Conduct (EICC) <renamed as RBA (Responsible Business Alliance) Code of Conduct>" were distributed to major suppliers and all of the questionnaires were returned. We will continuously uphold the principles of integrity, reciprocity and fairness in the hope to grow together with our suppliers.

3.1.3 Building a specific and effective contractor management system

By implementing separate management systems and holding periodical promotion meetings (Fig. 3-3) according to the property of the consultative organization in conjunction with the contractor electronic management system, all staffs of the contractor entering our plant can understand our regulations and environmental hazards in the plant area. We carry out the contractor evaluation system, personnel operating ability certification and operational control. Therefore we can get feedback created from safety management tasks of the contractor from different stages. Therefore we can ensure the quality at every level and make sure the compliance of the contractor's qualification to access our factory areas (Fig. 3-4). More contractors entered in our plant area in comparison with 2016 to carry out the rebuilding project of our plant in 2017. It was more often that we audited the performance of the contractor on the site. We notified the contractors of the hazard before the operation so that they could manage on their own on the site. By 2017, 402 suppliers (about 81.5% of all the suppliers) were selected in accordance with the Contractor Operation Hazard Rating and accepted our guidance. We will promote the contractor self-certification system to reduce the operation risk of the contractor.

▲ Fig. 3-3 The representative meeting of the Powerchip Contractor Coordination Council



▲ Fig. 3-4 Management status of Powerchip' s contractors

3.2 Product Service

3.2.1 Building a green supply chain and Green Product (GP)

SONY

2018 / 04 / 03

グリーンパートナー環境品質認定通知書

Notification of Green Partner Certification

Attn ： 菱洋エレクトロ（株） 御中
RYOYO ELECTRO CORPORATION

拝啓 貴社益々ご清栄のこととお慶び申しあげます。
平素は、弊社環境品質保証活動に多大なるご協力を賜り、お礼申し上げます。
貴社のグリーンパートナー環境品質認定手続きが完了しましたのでご通知申し上げます。
今後とも弊社環境品質保証活動にご協力を賜りますようお願い致します。
Thank you for your kind support on Sony Green Partner Activities.
We would like to inform you that Green Partner Certification has been authorized.
Your continuous cooperation on Sony environmental quality assurance activities is highly appreciated.

認定範囲 / Scope of Green Partner Certification

ファクトリーコード	マニュファクチャラー名称（英文）	工場名称（英文）	監査期限
Factory Code	MC Name	FC Name	Expiry Date
FC004543	RYOYO ELECTRO CORPORATION	HQ(Trading Company)	2020/03/31
FC011848	Powerchip Technology Corporation.	(No Factory Name)	2020/03/31

ソニーグローバルマニュファクチャリング＆オペレーションズ(株)
Sony Global Manufacturing & Operations Corporation
調達物流 IPO 部門 / Procurement, Logistics and IPO Division
グリーンパートナー事務局 / Green Partner Secretariat

▲ Fig. 3-5 Green Partner Certificate

Since 2002, we have introduced the production of lead-free products. We follow the international trend for environmental protection and correspond to the customer needs. Since 2003, we have actively promoted green design, green purchase, green manufacturing and green packaging. Since 2003, we have been approved and certified by international customers such as SONY and CANON and become a green partner of our customer. (Fig. 3-5) To carry out green management effectively, we integrate plant manufacturing with quality for easier implementation based on the spirit of ISO. We build a series of green management procedures to complete the Hazardous Substance Free (HSF) procedure and plan for product realization. The events include the selection of the green management representative, educational training for all employees, themed internal audit, annual audit of the vendors, continuous supervision of the material and product, customer feedback, and support for the vendors in the establishment of the hazardous material management system.

Our green management synchronizes with international regulations. For our products, we use the Life Cycle Assessment (LCA) system to find out the environmental impact of all products and assess the pollution improvements based on the impact. In addition, we comply with the Restriction of the use of certain Hazardous Substances (RoHS) in electrical and electronic equipment and Substance of Very High Concern (SVHC) for the sample assessment and purchase of the material, the packaging and delivery of the product, as well as the packaging material.

It is necessary to control the environmentally restricted material from the source. In consideration of the international regulations and the emphasis and restriction that many countries imposed on PFOS (Perfluorooctane Sulfonate) and PFOA (Perfluorooctanoic Acid), we implemented the hazardous substance free plan for years and used the resistors without PFOS and PAFS (Perfluoroalkyl Sulfonat) (Table 3-1). We've completed 100% of the replacement at the end of 2017. We will continuously test the chemicals coming in the factory in the hope to select the environmental friendly material with preference while maintaining a stable process.

Table 3-1 Our PFOS survey and corresponding confirmation form

Part No.	PFAS C1-C4	PFAS C5-C7	PFOS C=8	PFAS ≥ C-9	PFOA	Content ratio	Replacement
32-01-0051S			BARCs				Replaced
32-01-0009			BARCs			2.38%	Replaced
32-01-0035			BARCs				Replaced
32-01-0014	Resists					0.04%	Replaced
32-01-0002	Resists					<0.01 %	Replaced
32-01-0008	Resists					<0.5 %	Replaced
32-01-0010	Resists					<0.01 %	Replaced
32-01-0011	Resists					<0.01 %	Replaced
32-01-0057	Resists					<0.5 %	Replaced

The amount of environmentally hazardous substances increases continuously. Due to the constraints on process technology, chemicals in a few processes are non-replaceable. Sometimes the chemicals are required by the customer or cannot be replaced with other materials. As for the plan for reduction of hazardous substances such as PFOA/PFOS, we have requested the suppliers to cooperate and send the material for PFOA/PFOS examination during the stage of new material assessment. After the product is put into production after going through the pilot run, we will send the material for examination again. We will make sure that the product meets the international regulations and the environmental protection criteria specified for the product by the customer. Furthermore, we control the green management of our own product and foundry product based on equivalent criteria. We actively share our resource and green knowledge provided by the industry, government and academia with all customers, suppliers, outsourcing vendors and even competitors. We hope to ensure smooth interaction with the upstream and downstream suppliers to acquire their support in favor of continuous development of the green management.

We invited suppliers to the supplier workshop in 2016 to help them understand more about our requirements and directions with respect to the green environmental protection and product quality. (Fig. 3-6) We briefed the suppliers about our green control and quality requirements. Personnel of the SGS FAR EAST LIMITED were invited to give comprehensive explanation of the development of international green regulations and relevant restriction on substances. Other matters such as quality of material, control of chemicals, and Electronic Industry Code of Conduct (EICC) were somewhat disseminated in the workshop. The purpose of the workshop was to take more care of the environment together with the suppliers in order to coordinately improve the economic and environmental development, enhance interaction and relationship between partners, and incorporate them in the green supply chain.

▲ Fig. 3-6 Supplier workshop

▲ Fig. 3-7 Powerchip's chemical control concept

Another important thing we do is to "start from ourselves". We continuously provide courses related to management of hazardous substances, promote the regulations and awareness of the environmentally restricted substances, and make use of the e-Learning application to help the personnel, from the President to all the employees, finish the courses and pass the examination through training. We also publish following green KPIs (Key Performance Indicators) on the GP e-Net:

1. The delivery provided in GP test report of productive (raw) material/letter of undertaking = 100%
2. Annual GP tests executing rate of Powerchip products = 100%

The indicator requirements were satisfied in 2017 under green management and control measures. By executing the internal audit, we discuss the internal operation of the department with the group face-to-face or via e-auditing and make sure that employees can interact with each other for knowledge exchange. Through these training, we educate the employees and make sure they know that everyone is responsible for environmental protection. Control of hazardous substances is the obligation that we all must fulfill.

3.2.2 Customer privacy and data protection

We respect the maintenance of the long-term partnership with our customer and protect the confidentiality during the business contact. We have a specialized team responsible for customer contact and visit customers regularly and actively. Our common belief is to solve problems rather than creating them. No incident regarding customer complaint for privacy violation or data loss has occurred so far.

3.2.3 Customer/product service and satisfaction tracking

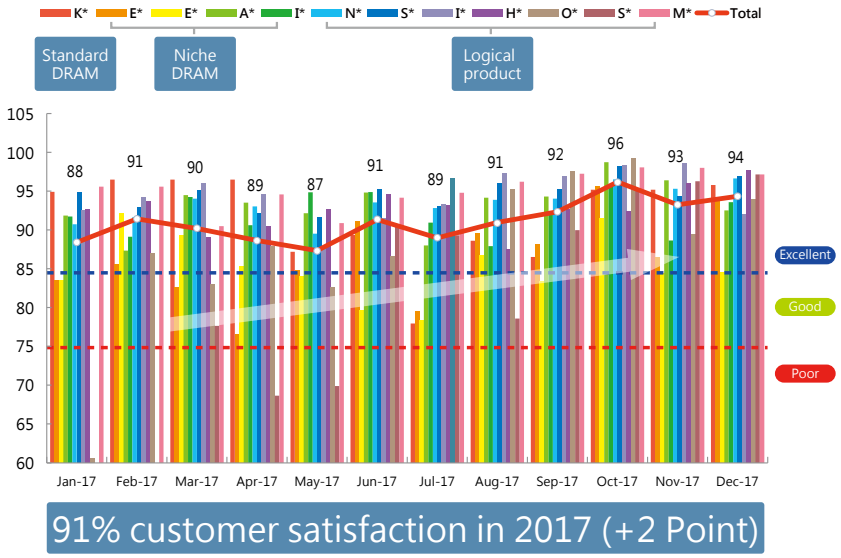
We value customer opinions and we are willing to solve problems with customers. We have specialized personnel, special line and specialized department for customers to contact us any time. We hold a face-to-face discussion meeting with customers regularly and give out surveys for them to report problems. We want to know the problems that the customers have anytime and solve them with the customer in the shortest time possible. We report the relevant records to the management at the operational performance meeting. The contents and results of the customer satisfaction survey in 2017 are described below:

3.2.3.1 Contents of the customer satisfaction survey

1. Target/product/score: Major customers (more than 2000 pieces put into production). The products included niche and standard DRAM and Driver IC, Power, CIS, and other OEM logic products. Rating was made for quality, technology, and delivery.
2. Survey: Monthly self-evaluation; comments on the feedback that customers give every month.
3. Results and description of the survey in 2017: Overall customer satisfaction was 91% on average (higher than last year by 2%) and is "Good".
   (1) The number of MRB (Material Review Board) major cases was reduced by 61% in comparison with last year, indicating a substantial decrease of major quality cases.
   (2) The delivery in 2017 was higher than last year by 15%.
   (3) The overall yield rate was higher than last year by 2%.
4. Continuous improvement: With the FQIS (Foundry Quality Index System) as a platform, the quality system was reviewed and improvement proposals were raised at the management review meeting every six months.

- 品質 Quality 45%
- 技術 Technology 30%
- 交期 Delivery 25%
- 客訴 Complaint -10%
- 停線 Incident -10%

▲ Fig. 3-8 Customer satisfaction survey



▲ Fig. 3-9 Powerchip customer satisfaction

3.3 Safety and Health Management

We have two 12-inch semiconductor plants for now. We have almost 4,900 on-site operators. We use more than 1,000 types of chemicals and carry out tens of thousands of types of various process steps simultaneously. Relevant operating items and control measures shall be changed according to the process steps. Therefore it is very important to plan and implement the perfect risk management process, and an appropriate daily management system must be established. We can control the physical hazards effectively only with complete integration and control of various systems linked with each other. Through these systems, we can reach the goal of maintaining the sustainable operation of the corporation. We implemented the management measures cautiously and conscientiously, and the results were highly recognized by the competent authority. In 2017, we were proud of winning the Benchmarking Enterprise Honor of the National Occupational Safety and Health Award.

3.3.1 Safety health and environment committee

We set up the "Occupational Safety, Health and Environment Committee" and raise suggestions for formulated safety, health, and environment policies. We review, negotiate and suggest safety and health related issues. This committee is composed of the President, executives of all departments and employee representatives (labor members up to 97.5%, which meets the regulations). We create the consulting and research system for our safety, health and environmental protection issues. Through management functions such as planning, implementation, examination and improvement, we accomplish the goal of and improve the HSE management standards. Therefore we can avoid occupational accidents, improve environmental health and guarantee the safety and health of our employees.

Table 3-2 Introduction of members of the Occupational Safety, Health and Environment Committee

Title	Position	Number of people
Chairman	Deputy of the business manager	1
Secretary	Helping the committee with coordination of committee issues	1
Committee	Executive, supervisor and director	18
Committee	Engineering technician	23
Committee	Medical worker	1
Committee	Safety and health personnel	2
Committee	Employee representative	48

3.3.2 Designating the HSE goal and relevant action plan

Our HSE goal for 2017 was to "pursue the sustainable environmental protection and fulfill the corporate social responsibility", "enhance HSE management results", "improve the environmental safety in the factory and enhance the emergency responding ability", and "diminish the operating loss due to the internal hazards". Specific outcomes are listed below:

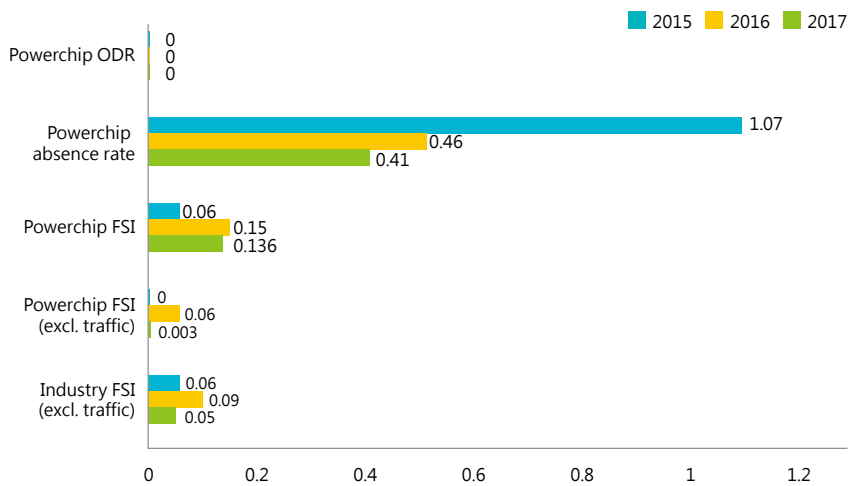
(1) Innovative and sustainable environment development: Promoting energy-saving and carbon-reduction to achieve the overall energy-saving goal of 1.44%.
(2) Strengthening the HSE management: We carried out numerous control measures such as implementing various on-site inspections and issuing deficiency notices for more than 7,885 cases. Therefore, our Frequency-Severity Indicator (FSI=0.003) meet the annual goal of the Company (0.02), the goal of zero significant environmental and industrial accidents was achieved.
(3) Reinforcing the environmental safety in the factory and the ability to respond to emergency: As for out specific outcomes, we have carried out the emergency response drill, appointed the instructor for each department to teach beginners, and established the ERT certification system.
(4) Diminishing the operating loss due to the hazards in the plant: As for specific outcomes, we have enhanced the disaster prevention ability of the contractor, audited the performance of the contractor, supplier and subcontractor, and set up the backup system for the damage prevention system.

3.3.3 Disabling injury

We provide excellent and safe working environment and mechanical equipment according to relevant laws and march forward with the "zero industrial injury" as the goal. Protection of the employees for their safety and health is the goal that we are making efforts to achieve.

The FSI, occupational disease rate, and absence rate over the past three years are statistically displayed in Fig. 3-9 and Table 3-3. One lost-time accidents occurred in 2017, and analysis of the causes, review of the operation procedures, and planning of preventive measures were carried out among the factories to avoid recurrence of similar accidents.

The statistics for the [FSI (internal industrial injury/traffic accident)] shows that the traffic accident on the way to and from the office is the primary reason for loss of working hour. In addition to improvement of the operational safety training, we considered to plan different proactive measures such as reinforcement of the traffic safety awareness among the employees and provision of hands-on training courses to enhance the risk awareness and defensive driving concept of the employees.



▲ Fig. 3-10 The data trend of Powerchip's occupational accidents over the past three years

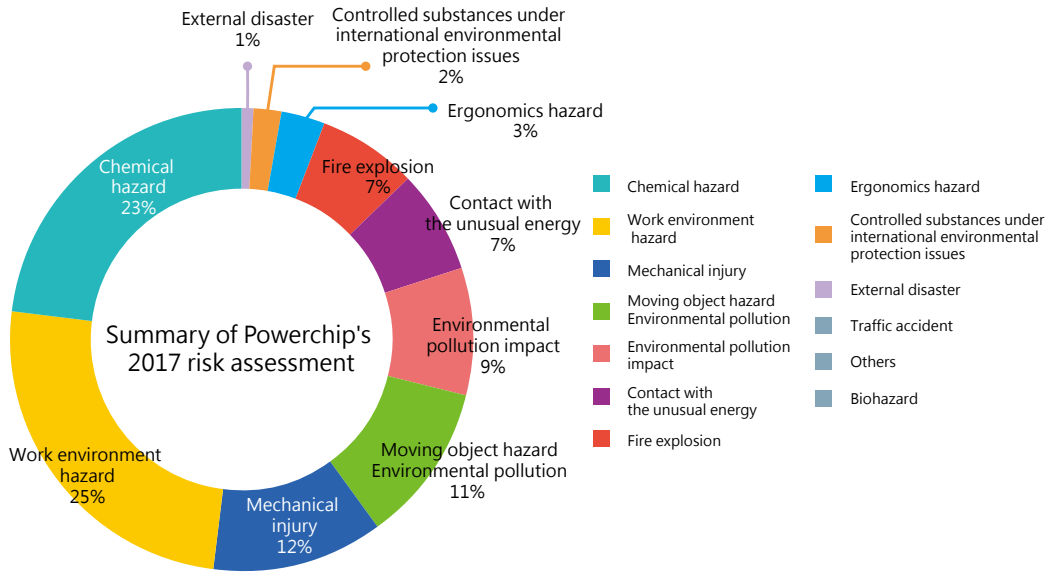
Table 3-3 Occupational disease and absence rate

Item	2015	2016	2017
Occupational disease rate	0	0	0
Absence rate	1.05	0.44	0.41

▲ Note : Occupational disease rate = Total occupational diseases/total person-work hours (hour) *100%; absence rate = absence hours/total person-work hours (hour)*100% (person leave, sick leave, absent without leave)

3.3.4 Control of the HSE assessment

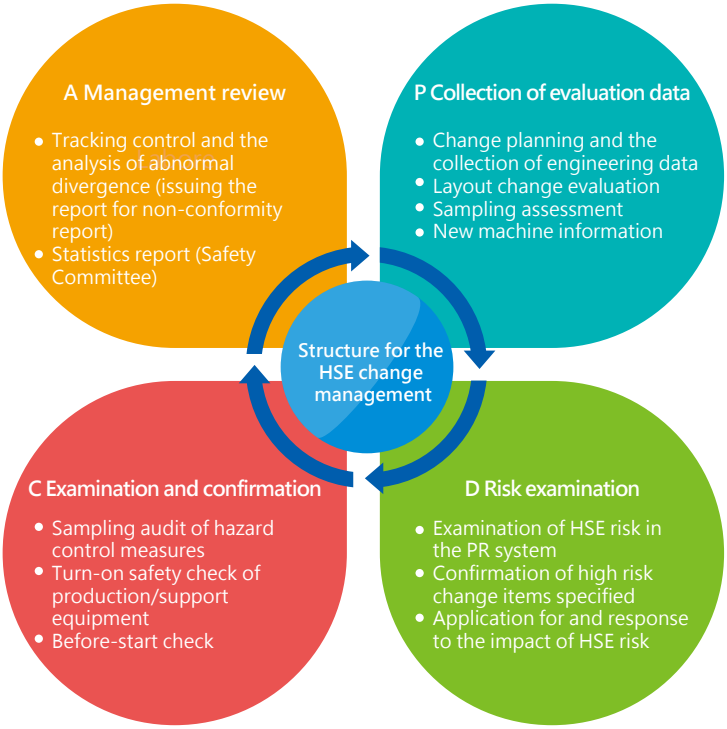
We comply with the spirit for continuous improvement of HSE management system. In 2017 we modified the risk assessment document and carried out the reevaluation of operation in major departments. In consideration of the operation in different factories, we updated the risk identification for capacity planning and response, as well as the confirmation of abnormal events. We have completely checked all operational risks of various operating activities in the plant and assessed the control outcome via the semi-quantitative method. We also made sure that the main points of the process activity and the risk assessment comply with the current operating activity. We listed the operations with high risk and potential health risk in the project for focused management. According to the summarized results of risk assessment from all departments in 2017, the ratio of working environment hazard (25%) and chemical hazard (23%) were higher than that of the rest of operational risk types. After evaluation and discussion, the Occupational Safety, Health and Environment Committee decided that all departments should observe the control measures, carry out the daily inspection, wear PPE during the operation, provide educational training regularly, implement management of waste sorting, and execute the emergency response drill to ensure that all hazards were under effective control. All departments should carry out control of on-site operation safety procedures and ensure that employees work at ease in a safe environment.



▲ Fig. 3-11 Summary of Powerchip's 2017 risk assessment

3.3.5 Implementation of the change management

During the process of change control, the most important starting point is to learn the information of change in advance. While requiring all units to report the change information actively, we establish the layout change request system, sample assessment request system (chemicals and parts and accessories) and other electronic systems such as the Planning Web system (equipment/machine change information) and ECMS (Engineering Change Management System). According to the preliminary internal risk audit and impact assessment in 2017, 14 cases were identified as the changes with high HSE risk. These changes should be activated only after the departments of risk, safety and environment and other relevant departments in all factories made sure that these cases had no impact on existing safety protection.



▲ Fig. 3-12 Powerchip' s change management structure

3.4 Employment

3.4.1 Numbers of employees and expertises

Employees are Powerchip's most important assets and drive the company to grow continuously and stably. As a result, we take talent cultivation seriously and strive to develop a better workplace. We provide complete educational training and welfare systems, and we expect that all employees have good healthy conditions mentally and physically when they work hard for the company. We also hope our employees make use of their expertises at work to promote personal and corporative growth.

Table 3-4 Total number of Powerchip' s employees and manpower status in 2016 as of December 31, 2016.

Category	Age	2017 Number		Percentage	2016 Number		Percentage
		Male	Female		Male	Female	
Manager	Below 30 (incl.)	0	0	0%	0	0	0%
	31-50	367	72	85.6%	385	75	86.1%
	Above 51 (incl.)	66	8	14.4%	66	8	13.9%
	Total	433	80	100%	451	83	100%
Employee	Below 30 (incl.)	561	354	21.5%	685	414	25.2%
	31-50	1,806	1,518	77.3%	1,747	1,476	73.8%
	Above 51 (incl.)	34	17	1.2%	30	16	1.0%
	Total	2,401	1,898	100%	2,462	1,906	100%
Employment status	Full-time	2,834	1,979	100%	2,913	1,989	100%
	Part-time	0	0	0	0	0	0
Total		4,813			4,902		
Seniority avg.		8.41 years			8.21 years		

▲ Note 1: Managers are the personnel above the section level.
▲ Note 2: 18 contracted staffs (male: 8; female 10) are not included.

3.4.2 Selection and retention of talents

The philosophy of the company is to respect and cherish talents and support them with excellent occupational environment as well as career development. We also hope to recruit suitable and sufficient professional talents through different channels, such as Internet media, print media, office of employment service institutions and so on. Furthermore, we also value the leisure time of our employees and provide them with all kinds of club activities and places for their leisure time, so that they can have healthy bodies and release their pressure after work to make balance between life and work.

As for talent retention, in addition to a complete insurance and retirement system, we give bonuses depending on our operational condition and personal performance to motivate the employees. Our annual employee compensation amount is up to NT$ 10.379 billion.

Besides, we offer a fair evaluation and promotional system as well as exclusive educational training. We also encourage our employees to engage in self-learning and self-development and give them thorough career planning.

Appointment of all employment and human rights protection of the workers are compliant with the regulations. We do not hire children and the work conditions do not differ due to race, religious belief, gender, age, marriage status, or political standpoint. We hire a total of 38 employees with disabilities (24 males and 14 females at the end of 2017). There were 18 managers at the level above the Assistant Vice President in 2017 and all of them are Taiwanese.

Table 3-5 Employment status (against the total number of 4813 employees)

Category		New employee		Resigned (incl. retired)	
		Number	Percentage	Number	Percentage
Below 30 (incl.)	Male	268	5.7%	128	2.6%
	Female	111	2.3%	51	1.0%
31-50	Male	84	1.7%	140	2.9%
	Female	61	1.2%	110	2.2%
Above 51 (incl.)	Male	5	0.1%	10	0.2%
	Female	0	0.0%	1	0.1%
Total	Male	357	7.3%	287	5.7%
	Female	172	3.5%	162	3.3%

Table 3-6 Unpaid Parental Leave

Category	Male	Female	Total
2017 Expected number of reinstated people	6	30	38
2017 Actual number of reinstated people	3	21	24
2017 Reinstatement rate	50.0%	70.0%	63.0%
2017 Retained peoples	3	22	25
2017 Retention rate	60%	84.6%	80.6%
2016 Expected number of reinstated people	8	40	48
2016 Actual number of reinstated people	5	26	31
2016 Reinstatement rate	62.5%	65.0%	64.6%
2016 Retention rate	20.0%	87.5%	75.9%
2017 Qualified people	521	305	826
2017 Employees taking unpaid Parental Leave	7	32	39

Formula : Expected number of reinstated people = Number of expected reinstated people in the current year due to unpaid parental leave

Reinstatement rate = Actual number of reinstated people / expected number of reinstated people

2017 Retention rate = 2016 reinstated people who are still on the job on 12.31.2017 / 2016 actual number of reinstated people

▲ Note: The number of qualified people is an estimated value.

3.4.3 Promotion of labor relation

As for interaction with employees, we not only have communication platforms for exchange of opinions but also hold labor relation meetings irregularly, so our employees can make suggestions directly and their problems can be solved in time. We also discuss about labor conditions in the meeting, including working hours, leave days and other relevant issues to protect the interests of all employees. Moreover, we participate in labor relation promotion activities and other relating seminars held by the government annually for the purpose of maintaining good labor relation and promoting positive interactions between the company and employees.

The main topics of the 2016 labor relation meeting was the 2017 annual schedule planning and discussion of the amendments of the Labor Standards Act, the representatives of both parties reach a consensus through rational and peaceful communication.

Table 3-7 2017 Powerchip's labor relation meeting date

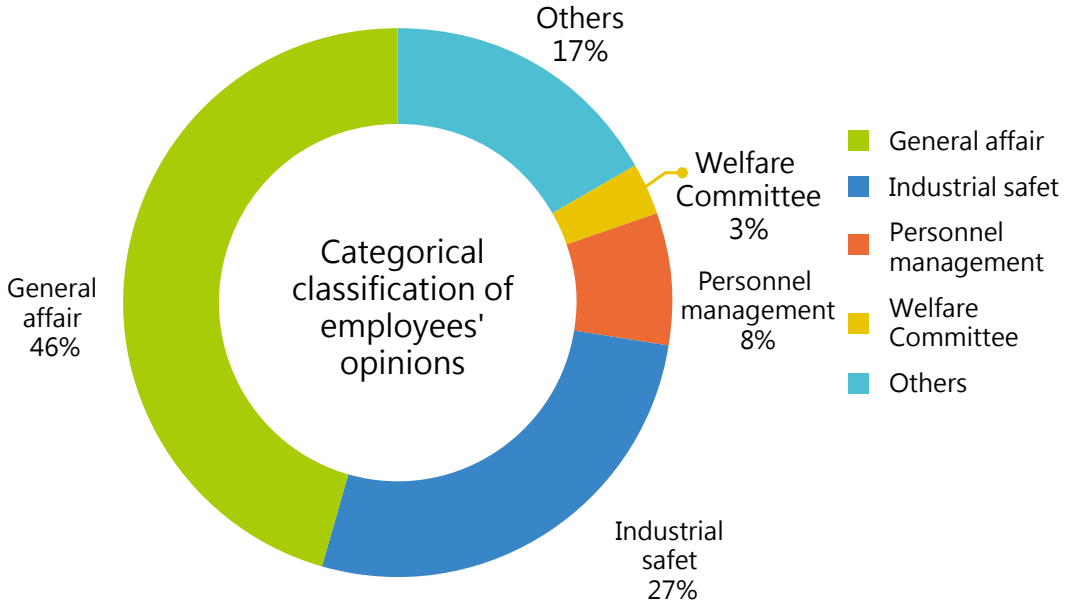
Session	Date
The tenth labor relation meeting of the 4th session	March 16
The eleventh labor relation meeting of the 4th session	June 23
The twelfth labor relation meeting of the 4th session	September 27
The thirteenth labor relation meeting of the 4th session	December 27

3.4.4 Employee care

The human resource division has a staff relation department that offers our employees assistance, consultation, and referral service to release their emotional pressure and improve work performance. Moreover, the staff relation department has communication platforms, such as "employee care website" and "Partners' Words", and a complaint pipeline for occupational bullying. These are established for reporting and communication of problems from different sources. We also provide our employees with a fair working environment without discrimination.

Table 3-8 2016 employee's opinions through "Partners' Words"

Category	Cases
Personnel system	25
Industrial safety problem	86
General affair problem	143
Welfare Committee problem	8
Others	52
Total	314
Total cases replied	314



▲ Fig. 3-13 2017 summary of Powerchip employee opinions

3.4.5 Training and development

For the growth of both the employees and the company, we have a series of educational training systems which was established on the basis of the company's business philosophy, long-term operation strategy and talent development strategy. The standard training courses include professional, management and general courses that were made with the participation of high-level managers in the education training committee, so that they can conduct personal competency evaluation to identify competency gaps and training requirements. Through internal and external training, our employees can enhance their working skills, adapt themselves to the rapid-changing environment, improve their performance at work, upgrade product and service quality as well as create both personal and organizational competitiveness. These enable mutual development of the personal career and corporate business.

We provided 217 training courses (include online-learning) in 2017 and 21,891 employees participated in these courses. An e-learning course on labor and human right policies and professional ethics regulations was provided at the end of November 2017. 4,138 employees with a completion rate of 85% finished this course by April 12, 2018.

Table 3-9 2016 average training hours per employee

	Male	Female
Manager	32.4 hrs. /person	31.9 hrs. /person
Employee	38.3 hrs. /person	33.6 hrs. /person

▲ Note: Managers are the personnel above the section level

3.5 Employee Welfare System

Powerchip Welfare Committee not only gives our employees holiday gift coupons, birthday gift coupons, wedding congratulation gifts, children allowances, hospital allowances, funeral allowances, scholarships for the children of our employees and emergency relief loans in various amount for different incidents. We also hope our employees have balancing development between their work and leisure. Accordingly, a multi-function Sports ground was built on the 9th floor of the company. There are basketball courts, tennis courts, volleyball courts, billiard tables, table tennis tables and so on. Also, gymnasium, aerobics rooms, Karaoke and video rooms are built on the 5th floor of the company. These facilities offer the employees different places for leisure activities. The company also has a variety of clubs with different courses for our employees to choose and we also encourage them to enhance their social interaction, nourish their hobby and strengthen their physical fitness. More than 700 contracted stores provided discounts for the employees.

The Welfare Committee also holds many activities for our employees such as club competitions, drama appreciation, cultural and art activities and family days to enhance our care to the family members of the employees and also for the purpose of stimulating employee morale at the workplace and improving the quality of work.

3.5.1 Diverse club activities

Powerchip encourages our employees to establish clubs and hold club activities. So far, we have 22 clubs including the badminton club, table tennis club, tennis club, volleyball club, billiard club, basketball club, book club, softball club, aerobics club, video club, public welfare club, mental health club. Our purpose is to make our employee enhance their social interaction, nourish their hobby and enrich their life. Various club activities are held on a regular basis. We had 2017 Powerchip Cup for group competitions in professional ball games such as basketball, softball, billiards, badminton, volleyball, table tennis, bowling and so on and 251 teams had joined the competition. In addition to competition within the company, Powerchip clubs participate in external competitions and win honor for the company enthusiastically. In 2017, the softball club won the 1st and 2nd Cooperative Bank Cup prize and the 2nd Science Park Cup prize; the tennis club won the 2nd Science Park Cup prize for women; the volleyball club won the 1st Science Park Cup prize for men and the 3rd Science Park Cup prize for women; the basketball club won the 2nd and 4th Science Park Cup prize for men.

▲ The 1st Volleyball Science Park Cup prize

▲ The 1st Softball Cooperative Bank Cup prize

3.5.2 Cozy family activities

We also take care of the family members of our employees and try our best to maintain and hold several family activities irregularly. We invite our employees to participate in the activities with their family members, so they can strengthen their family relationship and have a strong sense of belongingness with Powerchip.

<1> Powerchip Family Day

" Powerchip Family Day" is a special activity for our employees and their family members. We held the activity at Lihpao Land in August 2017 and more than 10,000 employees, including their family members, participated in the activity. It not only drove the husband-wife and parent-child interaction, but also aroused more extensive interpersonal communication. The participants enjoyed delicious food, experienced the happy time and joyful atmosphere, and admired splendid performance in the evening party.

<2> Eighteen Peaks Mountain hiking

We held two family hiking activities in 18 Peaks Mountain in June and July, 2017. 1,889 employees participated in the activities with an attendance rate of 61% and 65%, respectively. Except for hiking, we also arranged some games, DIY activities, performances and lottery activities for the participants to enjoy together and strengthen their bodies.

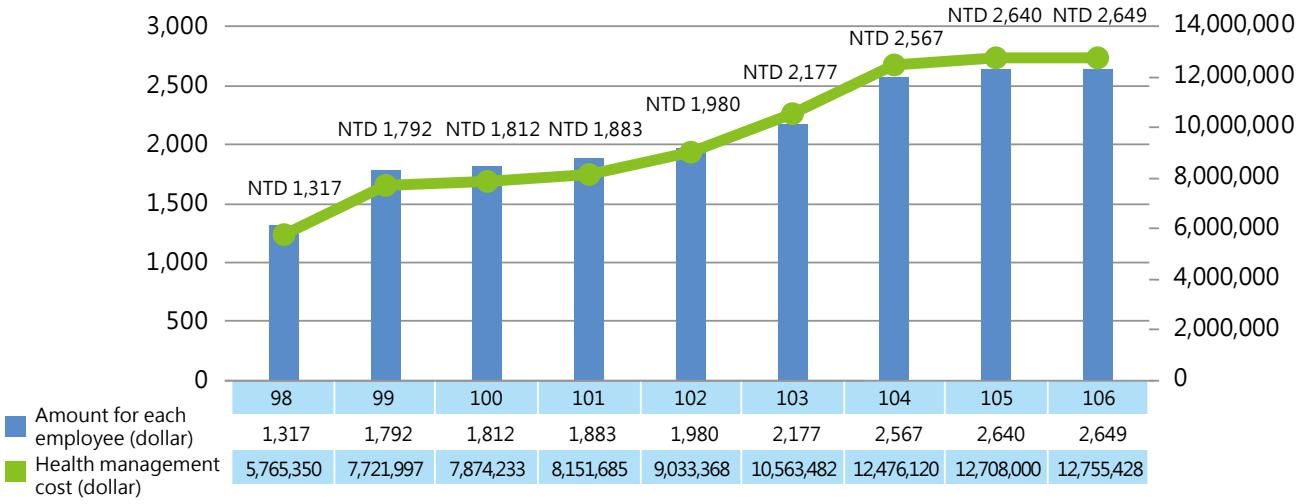
<3> Culture and art appreciation

We organize different culture and art appreciation activities every year, including parent-child theaters and seminars held by celebrities in order to bring employees more humanistic atmosphere and encourage parent-child interaction and learning to ensure balanced work and recreation of the employees. We planned 5 theaters in 2017 including two children theaters - <Ocean Treasure Hunting Adventures> (Ifkids) and <Judging the Stone> (Song Song Song Children's & Puppet Theatre) and three theaters for adults - <Class Reunion! Shoes!> (All U people theatre), <Zhuangzi - The Art of War> (Story Works), and <MRT 2> (a free music play from Perfect Match). There were 4,155 audiences coming to these dramas. All the participants were immersed in the enjoyable atmosphere while watching them. Both parents and children were satisfied mentally and had a wonderful as well as cozy time together. Apart from the theater, we also held many culture and art lecture activities with the topics of public welfare, motivation, health, education, and cosmetology. Many celebrities were invited to share their life experience and professional knowledge and help the employees understand more about other professional fields.

3.6 Employee Health Management and Promotion

Due to the philosophy that employees are the most important properties of the company, Powerchip is concerned about the health of our employees and wants them to receive a complete health care with a series of health planning from physical examination to health promotion activities. In addition to establishing and promoting a complete professional health management system to take more care of employee's health, we make more investment in the health management and execute this policy even the Company encounters any operational difficulties. We are eager to achieve the goal of "double win situation for both work and health" to strengthen the entire corporate competitiveness!

The employee health management planning is extended from the prevention concept of the three sections with five levels. The first section of prevention - health promotion (the first level) : includes annual physical examination, health lectures. The first section of prevention - specific protection (the second level) : includes the project management for high-risk groups (special operators, high-risk group of cardiovascular diseases, senior labors, night-shift workers, maternity health protection personnel, etc.). The second section of prevention - early diagnosis and prompt treatment (the third level) : includes case diagnoses for overtime workers and interviews with occupational medicine doctors. The third section of prevention - medical treatment (the forth level - disability limitation, the fifth level - rehabilitation): referral assistance to appropriate hospitals for treatment, rehabilitation and other therapeutic measurements. The health management planning keeps our employees healthy physically, mentally and spiritually. As a result, the company has been taking relevant suggestions from specialists and scholars into account since 2007 in order to review the execution of internal business for its integration and planning. We establish the actions in our occupational diseases prevention management for the final goal of "work without pain and disease, live with health" to be implemented from the perspectives of Prevention, Return to work, Compensation (PRC). Meanwhile, we also review potential hazardous operations, update the list of these operations and incorporated them in the internal supervision. The multiple preventive measures and diversified management actions enable the personnel in charge of the promotion won the Excellent Health Workplace Promoter Award from the Health Promotion Administration, Ministry of health and Welfare.



▲ Fig. 3-14 Health management cost development trend

▲ Fig. 3-15 Comprehensive health management

3.6.1 Employee health management

Powerchip provides our employees complete and better physical examination annually. We also track every abnormal health items through the whole process to reach the purpose of "early detection and early treatment" . Besides, the employees who received special physical examination will be divided into levels for health management in accordance with the result of their diagnosis by the doctors in the health center: Besides, the employees who received physical examination will be divided into levels for health management in the health center in accordance with the result of their diagnosis at the hospital:

Table 3-10 Health management levels

Level	Physical Re-examination Notice Category	Tracking period	Include the hospital's diagnosis of the re-examination period	Physical re-examination reply condition
Level A	Immediate re-examination	Noticed at the same day	Employees with major abnormal conditions after the physical examination	A-1 level: need re-examination and reply (including personnel of Level-3 special operation, the risk group of cardiovascular disease and the persons working overtime more than 45 hours on average)
				A-2 level: external factors might influence the data. After confirmation and exclusion still suggest to re-examine and reply
Level B	Send re-examination notice	3 months after the physical examination	Need tracking after 1~3 months with the doctor's diagnoses	Level B-1: need re-examination and reply (include risk group of cardiovascular disease)
				Level B-2: No need for re-examination and reply
Level C	Give health and safety education	6 months after the physical examination	Need tracking after 6 months or a year with the doctor's diagnoses	

We make case management tacking for high-risk groups (high-risk group of cardiovascular diseases, maternity health protection employees, special operators and so on), provide them with professional counseling service and transfer them to the occupational medical doctors for occupational health services to help them find suitable work. At the same time, we will provide the same health care management to the long-term contractors in Powerchip and request them to finish physical examination regularly for developing a healthy and non-infectious workplace.

3.6.2 Health promotion and psychological counseling

According to the health checkup results and seasonal changes, the company will hold different types of ultrasound checkups, health promotion activities for losing weight, health care for group of cardiovascular diseases, checkups for breast cancer as well as cervical cancer and so on in order to take care of the physical health of our employees. Besides, we also hold various types of lectures and provide professional specialist consult services for improving the life competency and cultivate the right mental health for our employees.

3.6.3 IT health management

Our employees can check their medical reports for each year through the electronic health management system to manage their health condition. Moreover, they can also make appointments for hospitals, sign up for health promotion activities and consult for their health problems online. The system also offers various and comprehensive health services to strengthen our employees' abilities for health self-management and obtain the function of prevention and health care.

3.6.4 Powerchip clinic

The company has established Powerchip clinic in the factory to provide health management services such as clinic visit, health advisory, prophylactic inoculation and so on to our employees even to their family members, the employees of our affiliated companies and the contractors. There are doctors of occupational health services that offer health education and health guidance to help them find suitable work.

▲ Fig. 3-16 Powerchip's clinical service information

We have full-time nurses who work in the factory for 24 hours a day, 7 days a week. They give professional services for health protection and care, hold health promotion activities and provide emergency rescue and relief acts for the complete health care for our employees.

3.6.5 Advocacy platform

- There are medical common sense and information of every activity on the home page of Powerchip health management website for our employee's references.
- The website also includes health Q&A and mom & baby websites that our employees can exchange information through their questions.
- We will update the bulletin boards on a regular basis , post health information and posters for health education and so on.
- Send e-mails of different types of health promotion activities and messages about health information for our employees' references.

▲ Fig. 3-17 Powerchip’ s health management system information

3.6.6 Approaches for legal infectious diseases control and Emergency Response Training

Large scales of infectious diseases have been spread rapidly for the past years including avian influenza, Middle East respiratory syndrome coronavirus (MERS) and so on. Thus, how to control these diseases has become a challenge of every corporate. The company has made [Preventive Plan of Infectious Diseases] in accordance with the related government regulations. The contents of the planning include information about infectious diseases (refer to the information on the website of Centers for Disease Control, R. O. C. (Taiwan)), the structure and authority for the crisis management team, the prevention policy of the company and procedures for related measures, related criterion of the prevention and how to face a sudden epidemic. The Preventive Plan of Infectious Diseases applies related approaches according to the level of the epidemic. We not only establish the "crisis management team for infectious diseases" to integrate the company's resources at the first place, the health center will also keep contact with our medical units and amend all of the prevention measures and advocacies such as preparation of the prevention reserves, body temperature monitoring of all staffs (including the manufacturers, visitors and family members of our employees) in the factory, set criterion for sterilization method and frequency (including every operational areas, staff dormitories, factory vehicles and so on), workplace isolation criterion as well as infection control criterion, etc. We also take more measures to promote the advocacy and hold educational training lectures about the infectious diseases to release the panic.

We planned to execute emergency personnel practice and examine courses quarterly and regularly held emergency personnel refresher training to greatly increase the emergency response capability of the emergency personnel. The required number of the Company' s emergency personnel is 98 in accordance with the regulations and currently the Company has 188 legitimate emergency personnel, which has far exceeded the regulations. For the related courses contents, considering the characteristics of 24 hours shift work of the employees, the Company applied the E-learning system and health management system for the employees to receive health information and take training courses anywhere and at any time.

3.7 Social Welfare

3.7.1 The Powerchip Environmental Protection Foundation

The Powerchip Environmental Protection Foundation aims at promoting environmental education and pushing forward the domestic and international application of environmental protection. We work on or sponsor the studies, discussions and relevant events regarding domestic and international environmental protection fields. We actively promote our outcomes to individuals, the society and corporations and implement environmental protection in daily life.


▲ Old Trees Fostering Home



▲ Planting cherry blossoms to beautify/greening the environment

Table 3-11 Business of the Powerchip Environmental Protection Foundation in 2017

Year	Operational Project	Implementation Contents
Business operations in 2017	Old Trees Fostering Home	We implemented the plan for old tree protection, promoted the objects related to our committee and hired management consultants to help with tree care and relevant consultation. NT$ 40,000 per month and total amount of NT$ 480,000 in a year.
	Assistance of government agencies, corporations and associations with promoting environmental activities	◆ We sponsored NT$ 90,000 to "Hand in Hand to protect the Earth" the children earth conservation interaction performance teaching proposal held by Taiwan Concern Social Service Association. Time: 2017/4/13~4/14 Place: Each one performance at 5 elementary schools in Kaohsiung City and Tainan City and Chiayi City, total 300 minutes. Participants: About 1,063 ◆ We sponsored NT$ 80,000 to the "Energy Saving" environmental protection promotion activity held by Taiwan Indigenous Peoples Culture Promotion Association. Time: 2017/4/11,4/13 Place: Each one performance at 4 elementary schools, including Ximen Elementary School and Fuxing Elementary School in Taipei City, Sing-gong Elementary School and Sishu Elementary School in Tainan City. Participants: About 545
	Planting cherry blossoms to beautify/greening the environment	Execution date: 2017/11/22 Removed the original camphor tree (which deep rooted in the floor, causing partial destruction and the tree condition was poor) 2017/11/30 Planted 8 cherry blossoms (4 Yoshino cherry blossoms and 4 Taiwan Cherry) Execution location: No.68, Sec. 3, Nanjing E. Rd., Zhongshan Dist., Taipei City 104 (located behind the Foundation' s building) Total cost: NT$ 181,629.

▲ the children earth conservation interaction performance

3.7.2 The Coastal Cleanup of Powerchip Employee and Their Family

Powerchip has deeply rooted in the local for 20 years and understood it is all stakeholders' responsibility to maintain a clean beach. To support Hsinchu City's World Earth Day in April 22, fearless of rain and wind, we cleaned the garbage at the Fortune Sand Bay with the enterprises, NEOs and the public. In addition to support the "National Organized Coastal Cleanup Adoption Activity" promoted by the Environmental Protection Administration, we also adopted a beach and became a coastal cleanup member. With the assistance of Hsinchu City's Environmental Protection Administration, we successfully held a coastal cleanup activity with the participation of our employees and their family on September 23rd. Besides the onsite description of the marine debris' impact on the ecology and the International Marine Debris Monitoring Record Sheet <ICC chart> application, we also picked up approximately 0.2 tons of waste and was cleaned up by the Environmental Protection Administration's truck. We expected to accomplish the significance of environmental protection issues of cleaning up the coast and reducing plastic to save the ocean.

▲ 422 National Organized Coastal Cleanup Adoption Activity

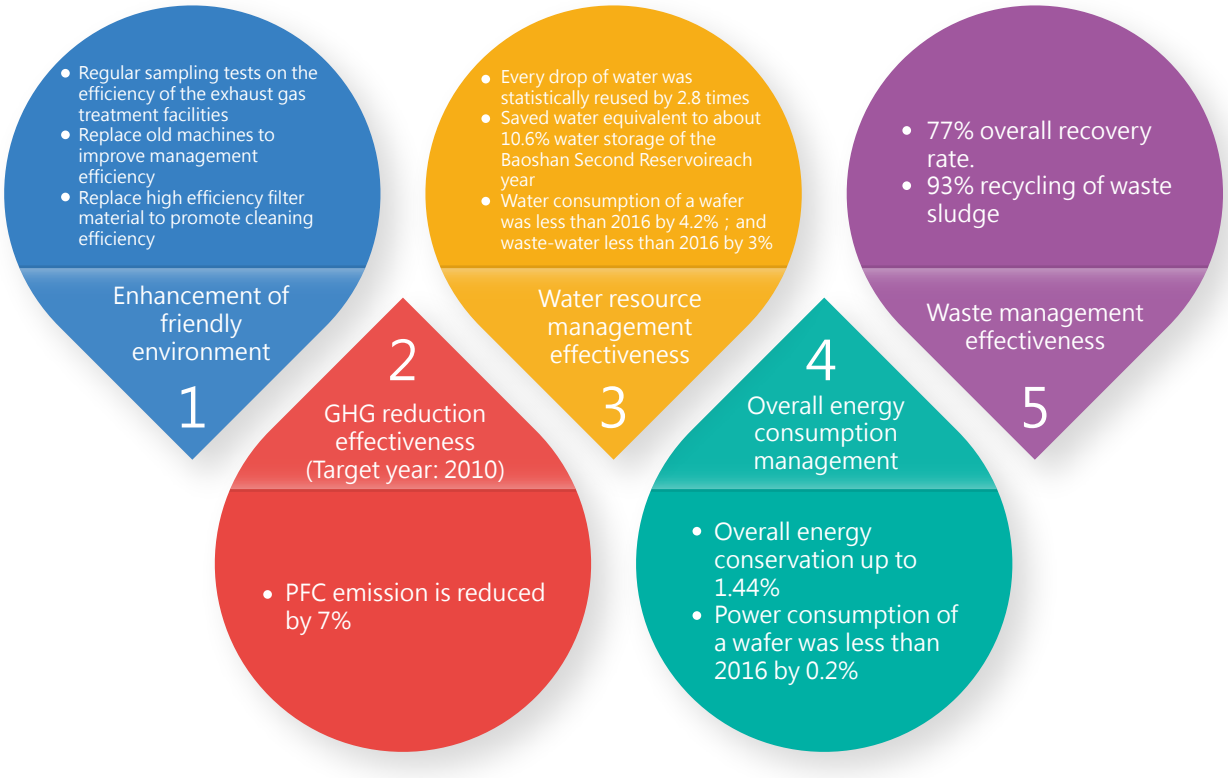
▲ 923 Powerchip Coastal Cleanup Adoption Activity

Ch4 Sustainable Development of the Environment

4.1 Resource Management / 4.2 Greenhouse Gas / 4.3 Air Emission Management / 4.4 Water Resource Management / 4.5 Waste Reduction and Management

Resource shortage and climate change are issues that UN and the government of every nation around the world are most concerned about. Taiwan is a small area with a dense population, and the semi-conductor industry is a typical energy-intensive industry. In accordance with the recent modification of the national environment policy toward more aggressive carbon reduction and environment-friendly measures for carbon e, we not only keep improving the company's energy management and pollutant discharge performance, but also focus on the source management to reduce the emission by minimizing the consumption. We participate in relating discussions held by the government agencies and associations in order to understand the policies and convey our requirements.

By providing internal disseminations and courses on environment, employees understand more about relevant laws and regulation as well as development of the policies. They spontaneously participate in environmental protection activities to promote our environmental protection ideas, and communicate them to the suppliers, contractors, and other partners. This is helpful to encourage participation of the public and help them understand our responsibility for sustainable development, in addition to the quality of our products and services. We have not received any penalties under our good management.



▶ 4.1 Resource Management

4.1.1 Energy management measures

The high-level managers of the company take product resources management seriously and the general manager set more advanced target every year to comply with project proposal reward system and encourage each department give energy conservation plan spontaneously for resource management. We introduced the energy management system (ISO-50001) in 2015 to strengthen internal energy management. The energy saving measures is more sophisticated every year after the system is validated. The investment expenditure of the two factories was 3,7416,000 and the total energy saving achievement ratio was 1.44%. We continued to achieve the target of "annual electricity conservation by 1%" and saved 3,7160,000 recycling fees (the electricity bill and gas bill is estimated to NT$ 2.5/ Kwh and NT$ 9.45 / CBM separately).

- P1 / 2 Fab: The 2017 settlement is listed as following, reducing electricity consumption of 3,514,727.9 Kwh and gas consumption of 1,264,560 CBM. After conversion, the total energy saving achievement ratio was 1.52% compared to the overall fab thermal energy (1,231,324,140.255 MCAL / year < approximately 5,154,140,395 MJ / year>).

Contents Overview	Electricity consumption reduction (kWh / year)	Gas consumption reduction (CBM / year)	Thermal energy reduction (MCAL / year)	Cost Savings (ten thousand / year)	Investment expenditure (ten thousand)	Percentage of the fab's energy saving (%)
P1 condenser of the water chiller unit was washed and maintained annually	200,724.5		415,499.7	50.2	35.5	0.034%
P12 PCDA dryer system backup was turned off to reduce the purge period power consumption of air compressor loading	864,408		1,789,324.6	216.1	0	0.145%
P1 sand filtering pump is turned off to reduce the power consumption	194,687.3		403,002.7	48.7	0	0.033%
CUP 3F frequency converters were mounted to the central control room's air handing unit to improve energy saving	22,173.7		45,899.6	5.5	7	0.004%
CUP 1F EF-9 frequency converters were mounted to the exhaust fans to improve energy saving	186,661.7		386,389.7	46.7	20	0.031%
P1 organic-treated equipment efficiency promotion and improvement		306,600	2,759,400	289.8	200	0.224%
P1 fabLSR_3 phase RO System By Pass T04 Tank To T05 Tank	65,700		135,999	16.4	5	0.011%
P1 fab's cooling water tower&Central scrubber pumps ran in combination	101,616		210,345.1	25.4	10	0.017%

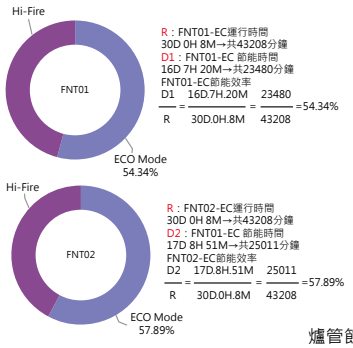
Contents Overview	Electricity consumption reduction (kWh / year)	Gas consumption reduction (CBM / year)	Thermal energy reduction (MCAL / year)	Cost Savings (ten thousand / year)	Investment expenditure (ten thousand)	Percentage of the fab' s energy saving (%)
P1 fab PCW system' s plate heat efficiency was expanded to reduce the pump energy consumption of the ice machine	816,870		1,690,920.9	204.2	360	0.137%
T8 was changed to LED light	489,684		1,013,645.9	122.4	144.3	0.082%
Mercury search light was changed to LED search light	10,512		21,759.8	2.6	7	0.002%
Quartz search light was changed to LED search light	54,312		112,425.8	13.6	59.9	0.009%
Recessed light was changed from PL tube to LED light bulb	16,232		33,600.9	4.1	2.3	0.003%
Dry PUMP Edwards IPX100 was changed to Aclcatel AL100	21,024		43,519.7	5.3	180	0.004%
FC3000 Router PC UPS was turned off	128,666.9		266,340.5	51.5	180	0.022%
Parts Clean machine on standby mode was Power Off	28,394.1		58,775.8	11.4	0	0.005%
PR300 subsidiary machine was Power Off	53,611		110,975.2	21.4	0	0.009%
WKZ02/03 CDS Unit illumination was turned off	737.2		1,525.9	0.3	0	0.000%
Kashiyama Dry Pump Heater 150 degree lowered to 100 degree(Poly Layer)	26,280		54,399.6	6.6	0	0.004%
DAM / DGM machine dry pump installed energy efficient device	37,533.8		77,695	31.1	72.2	0.006%
Furnace tube Scrubber reduced gas consumption		957,960	8,621,640	1738.3	1995.8	0.700%
Watch house search light was changed from LED 250W → 50W	9,636		19,946.5	2.9	2.4	0.002%
50W cup lamp was changed to 5W LED	185,263.2		383,494.8	55.6	11.2	0.031%
Total	3,514,727.9	1,264,560	18,656,526.6	2,970	3,292.6	1.52%

- P3 fab : The 2017 settlement is listed as following, reducing electricity consumption of 2,944,113 Kwh and gas consumption of 9,817 CBM. After conversion, the total energy saving achievement ratio was 1.259% compared to the overall fab thermal energy (491,245,008.511 MCAL / year < approximately 2,056,278,813 MJ / year>).

Contents Overview	Electricity consumption reduction (Kwh / year)	Gas consumption reduction (CBM / year)	Thermal energy reduction (MCAL / year)	Cost Savings (ten thousand / year)	Investment expenditure (ten thousand)	Percentage of the fab's energy conservation (%)
FAB 8F frequency converters were mounted to A/W	217,235		449,677	54.3	50.0	0.092%
The zero air loss steam trap of the CDA air compressor system was improved	414,720		858,470	103.7	160.0	0.175%

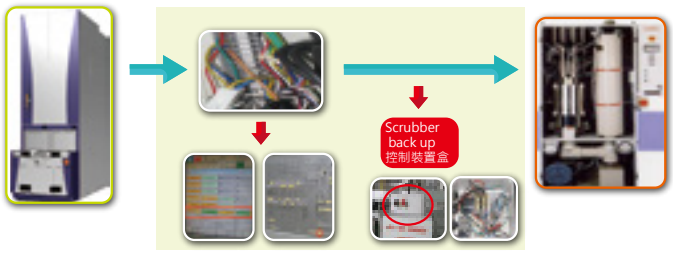
Contents Overview	Electricity consumption reduction (Kwh / year)	Gas consumption reduction (CBM / year)	Thermal energy reduction (MCAL / year)	Cost Savings (ten thousand / year)	Investment expenditure (ten thousand)	Percentage of the fab's energy conservation (%)
32W tube used at general areas was changed to 20W LED	520,128		1,076,665	130.0	108.0	0.219%
CDA-1 ice water pump was turned off three times	30,528		63,194	7.6	0	0.013%
The sand filtering pumps (two pumps) were turned off for 12 hr. per day	257818		533,682	64.5	0	0.109%
25nm 1S.EEC10 CF4 gas emission / energy saving improvement	1,836		3,801	0.5	0	0.001%
25nm SR.EEC10 process power consumption and chemicals usage improvement	180		373	0.0	0	0.000%
MTU Ti chamber routine shutter reduction (2M)	1,809		3,745	0.5	0	0.001%
Local Scrubber operation optimized through program modification		9,817	88,352	9.5	16.4	0.018%
FAB 6F frequency converters were mounted to the air handing unit	145,022		300,196	36.3	115	0.061%
Make-up air unit RAR energy saving	919,380		1,903,117	229.8	0	0.387%
WT Chiller CDA power consumption was adjusted downward	435,456		901,394	108.9	0	0.183%
Total	2,944,113	9,817	6,182,665	746	449	1.259%

- 2017 Two factories' focal point in energy saving : aiming at the program modification of the furnace tube (FUR) Local Scrubber' s gas energy saving. Besides continuing to manage PFC gas during the process operation, we also confirmed the completeness of its controller mechanism in the assessment without resulting in additional safety concern. When the machine is on standby mode, the Local Scrubber is also adjusted to small fire standby mode cooperatively to reduce gas consumption. Related verification is calculated as the chart below (with the device' s photo).



節能管理系統

爐管節能安裝內容說明

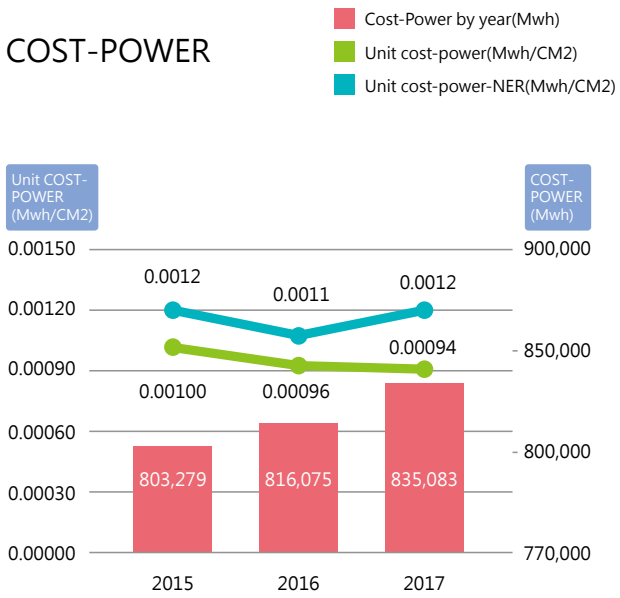


4.1.2 Energy/resource operation status

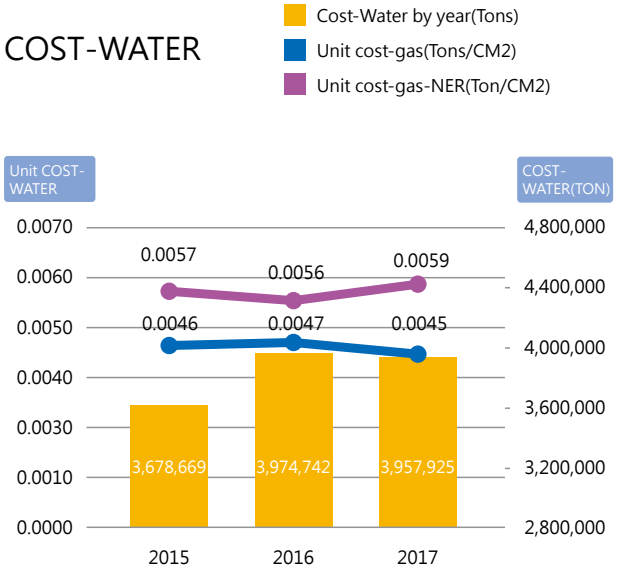
We continue the review and improvement on energy/resource management, increase the energy using efficiency to reduce the cost and establish baselines for the control measures of electricity, water and natural gas through the energy management review meetings held every six months. Though the electricity, water and natural gas consumption has increased over the past 3 years.

Power consumption of a wafer was 0.00094 (MWH / CM2) in 2017 and was less than 2016 by 2%; water consumption of a wafer was 0.0045 (TON / CM2) in 2017 and was less than 2016 by4.2%; gas consumption of a wafer was 0.0103 (NM3 / CM2) in 2017 and consistent with 2016.

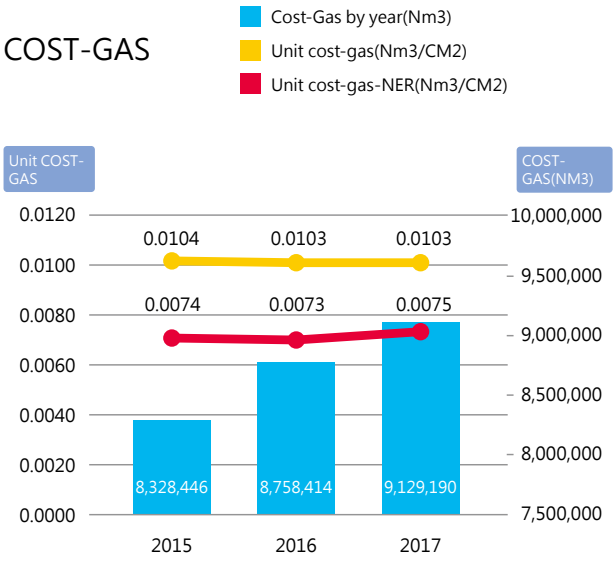
To increase energy / resources using efficiency, the Company compares with Taiwan Semiconductor Industry Association (TSIA) industry average statistics every year. Except that gas consumption was higher than industry average, Powerchip' s water and electricity consumption were both lower than industry average (Fig. 4.1, 4.2, Fig 4.3). The main cause might be the Company' s boiler and air pollution control equipment applied clean energy gas and Fig.4.3 can observed the industry average of the unit wafer gas consumption increased by 2.7% compared to last year and Powerchip' s unit wafer gas consumption has decreased. To adapt to the unit wafer gas consumption which is higher than the industry average, we enhanced the inventory of gas energy saving and drafted exhaust gas treatment system (L / S) improvement plan. Through the verification of the energy management system, we expect to greatly decrease the result in the second half of 2018.



▲ Fig. 4.1 Cost-power



▲ Fig. 4.2 Cost-water



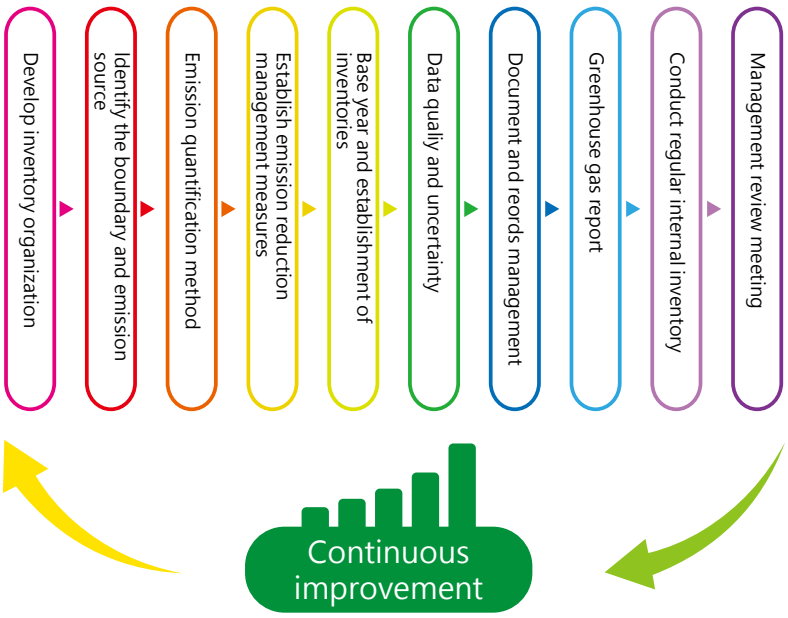
▲ Fig. 4.3 Cost-gas

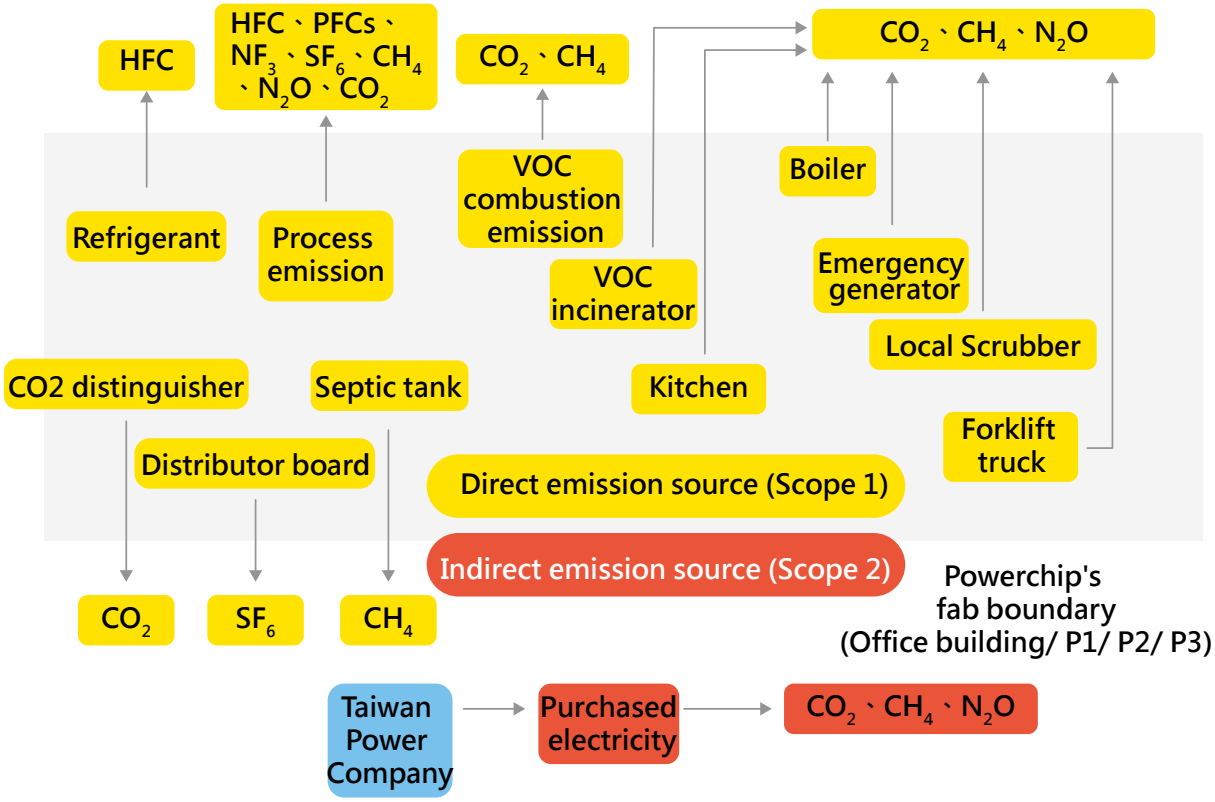
4.2 Greenhouse Gas

4.2.1 Greenhouse gas emission management

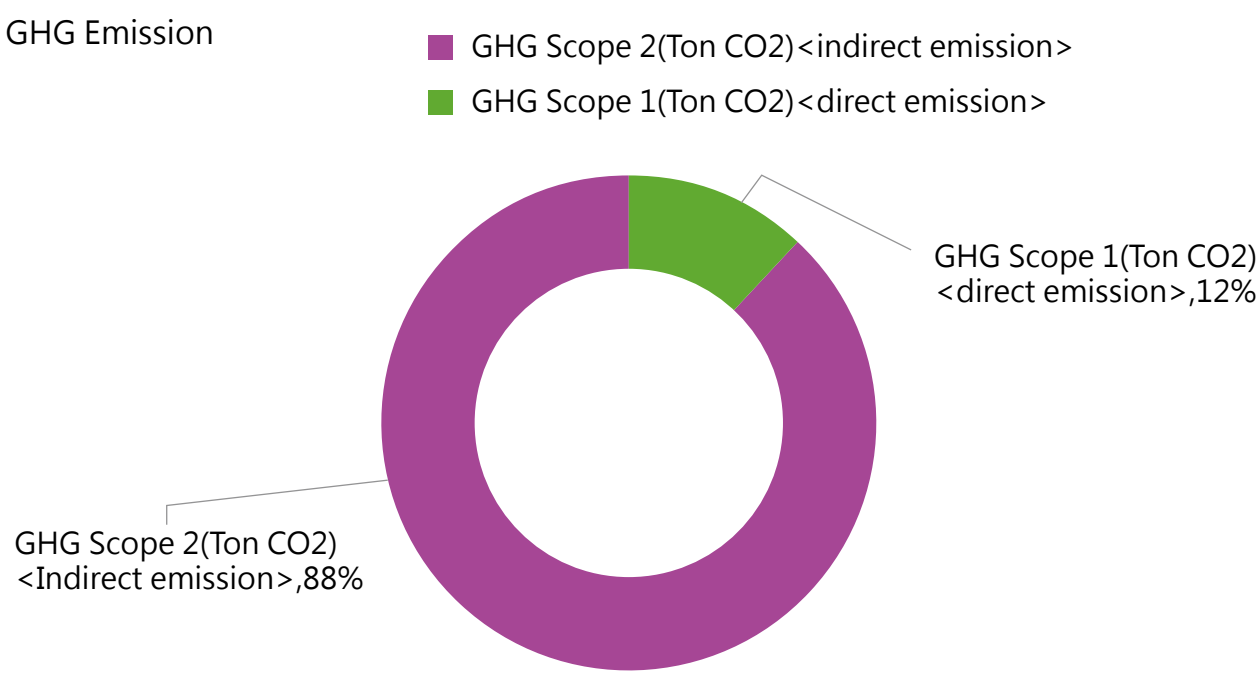
Global warming and climate change have become important issues for sustainability development. As the greenhouse gas increases and the global temperatures rise every year, and this leads to climate change with droughts and floods. The serious impact is predictable especially for Taiwan. The government enacted Greenhouse Emission Reduction and Management Act in July, 2015 and it defines the policy and reduction timetable more clearly. Taiwan Semiconductor Industry Association cooperated with the government agencies and built the inventory structure and procedures in the early stage. It took the first emission source of greenhouse gas as a sample and reduced the emission spontaneously as well as got the 250,000 tons of early emission reduction allowance (Number: A-0000083) before the implement of greenhouse gas reduction regulation.

We have been supported by Industrial Technology Research Institute to develop the structure and procedure for greenhouse gas inventory management since 2000. With the assistance of Taiwan Semiconductor Industry Association (TSIA) in 2006, the top management promised that the company will show its determination and willingness to reduce emission and develop inventory organization in the fab. Besides, the company will also collect data related to greenhouse gas and conduct inventory operation. The boundary of our greenhouse gas inventory organization includes the direct and indirect emission of the P1, P2, P3 semi-conductor factories (Fig. 4.4: Powerchip greenhouse gas inventory boundary).We conducted the inventory and verification operation according to the Greenhouse Gas Emission Reporting and Management Regulations. The operation verified the relevant emission in 2017, the direct emission (scope 1) was about 61,000 tons and the indirect emission (scope 2) was about 462,000 tons. It can be found in the emission analysis of the inventory data in each year that 85% of the greenhouse gas emission come mostly from indirect emission (electricity contribution), and then direct emission sources of PFC gas. The direct emission sources of PFC gas rate has increased, therefore, it is ascertained that the focus for carbon reduction is energy-saving and the increasing replacement of old exhaust gas treatment equipment to promote the PFC gas reduction rate.





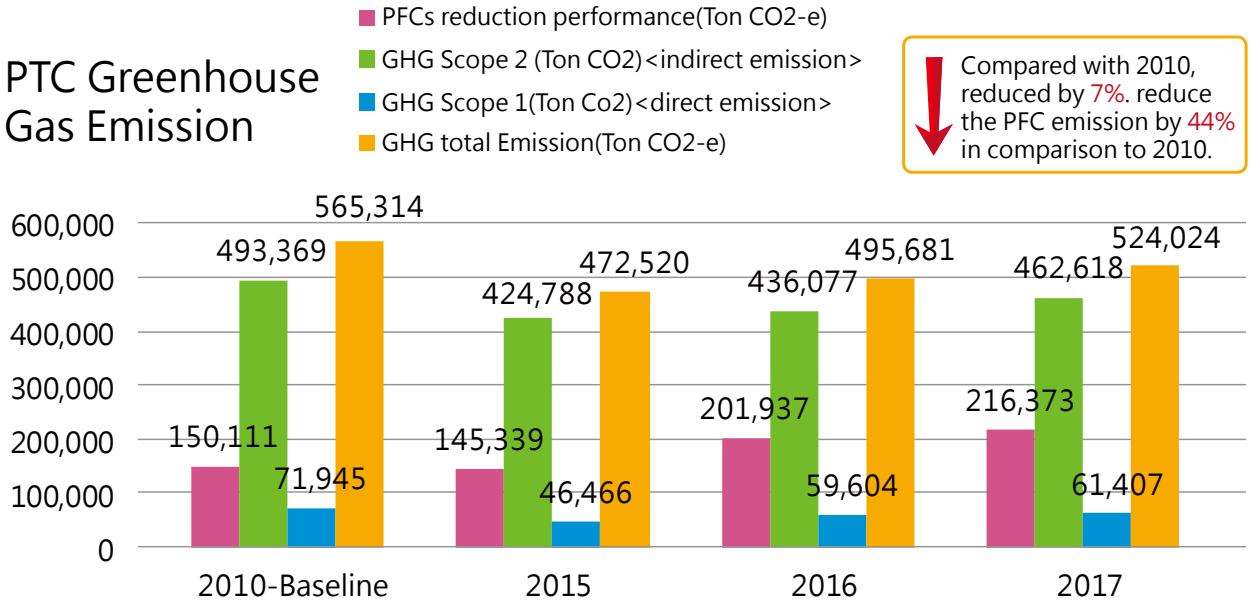
▲ Fig. 4.4: Powerchip greenhouse gas inventory boundary



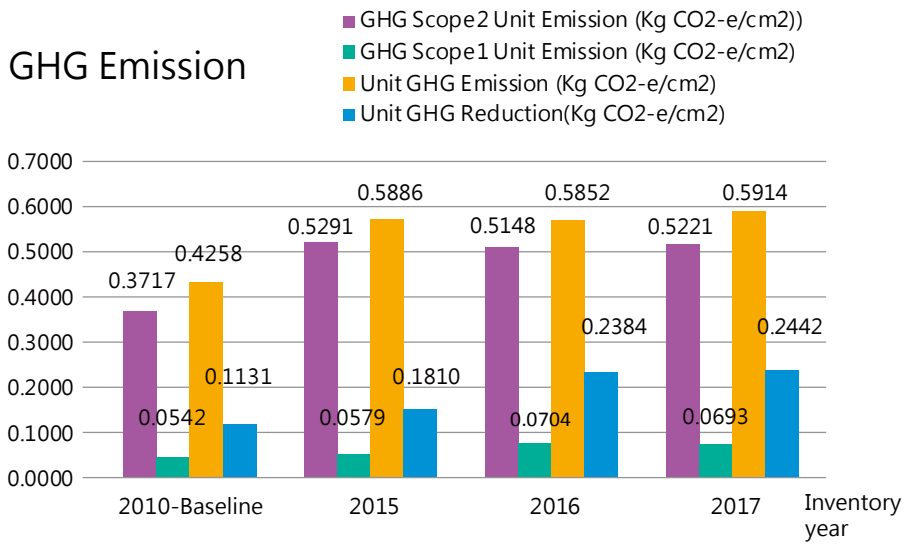
▲ Fig. 4.5: Powerchip greenhouse gas emission proportion

4.2.2 Greenhouse gas reduction

According to the agreement between the TSIA and Semiconductor Industry Association (SIA), emission of the PFC (including NF3 and N2O) in 2020 must be reduced by 10% of the emission in 2010. As a member of the TSIA, we observe this standard to reduce the PFC emission by 44% (about 66,000 tons of CO2-e) (qualified) in 2017, in comparison to 2010 though the capacity was increased. The total GHG emission in 2017 was less than the emission volume in 2010 by 7% (about 41,000 tons of CO2-e). See Fig. 4.6 for more information. In comparison with the previous year, the 2017 emission of a wafer increased by 1% (0.5914 tons of CO2-e/cm2) because TaiPower significantly increased the electricity emission factor by 4.5% in 2017. However, the reduction rate per unit wafer of the Company was increasing every year (by about 2.4% or 0.2442 tons of CO2-e/cm2 in 2017). See Fig. 4.7 for more information. These indicate that we are concerned about the global environment issues and continue to control the carbon emission of the company while seeking for economic development.



▲ Fig. 4.6: Powerchip GHG emission / reduction rate



▲ Fig. 4.7: Unit wafer GHG emission / reduction rate

Except for decreasing electricity consumption, the greenhouse gas reduction strategy of Powerchip is moving toward to the direction for reducing GHG gas emission during the process. Gas reduction is proceeded in these three aspects: 1. Substitute and reduce gas process assessment, 2. Additional PFC exhaust gas treatment equipment, and 3. Replacement of inefficacious exhaust gas treatment equipment. In 2017, in addition to the execution of substitute and reduce gas process cases, we gradually replaced old local scrubber exhaust gas treatment facilities according to its production capacity in the second half of 2016 and have replaced 4 facilities till the end of 2017.

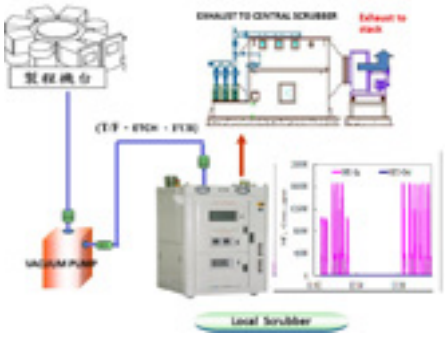
Substitute and reduce gas in the process

Based on the premise to the process stability, we reduced the GHG (CHF3 / CF4) consumption to achieve lower carbon emission effectiveness.

In 2017, the adjustment of specific products ' process parameter (repipe) and testing can reduce per unit of CHF3 and CF4 usage and reduce about 8.46 TON-CO2e emission annually.

New established PFCs / NF3 / N2O exhaust gas treatment equipment

Added the combustion or local scrubber exhaust gas treatment system (L / S) to the scrubber, which can destroy the fluorine gas used in the process at high temperature and the left micro-molecules are captured by washing them off to mitigate the burden of the back-end scrubber.



2017 new established exhaust gas treatment facilities list

Machine Number	L/S processing type	L/S established year and month	Processing gas
DIA14	Burned + washed	2017/11/29	NF3
FNT81	Burned + washed	2017/10/1	N2O
FJT52	Burned + washed	2017/10/1	N2O

Old local scrubber exhaust gas treatment equipment replacement

The analysis report revealed that the destruction efficiency (DRE) of combustion exhaust gas treatment equipment exceeded the local scrubber so we replaced the old exhaust gas treatment equipment and the combustion one is a top priority.

Test	Test Condition (Sample Chamber)	Local Scrubber Condition Fuel/O_2/ Air,lpm	DRE,%			
			NF_3	SiH_4	SiF_4	Unknown
#1	Run Clean Process x 1 chamber(CH B)	15/15/180	>99.9%		99.9%	
#2	Run Clean Process x 1 chamber(CH B)	15/15/180	>99.9%		>99.9%	
#3	Run Clean Process x 1 chamber(CH C)	15/15/180	>99.9%		>99.9%	
#4	Run Clean Process x 1 chamber(CH C)	15/15/180	>99.9%		>99.9%	
#5	Run Clean Process x 2 chamber(CH B + CH C)	15/15/180	>99.9%		>99.9%	
#6	Run Clean Process x 2 chamber(CH B + CH C)	15/15/180	>99.9%		>99.9%	

Replaced four equipment in 2017 and reduced about 3,241.37 CO2e-TON after calculation.

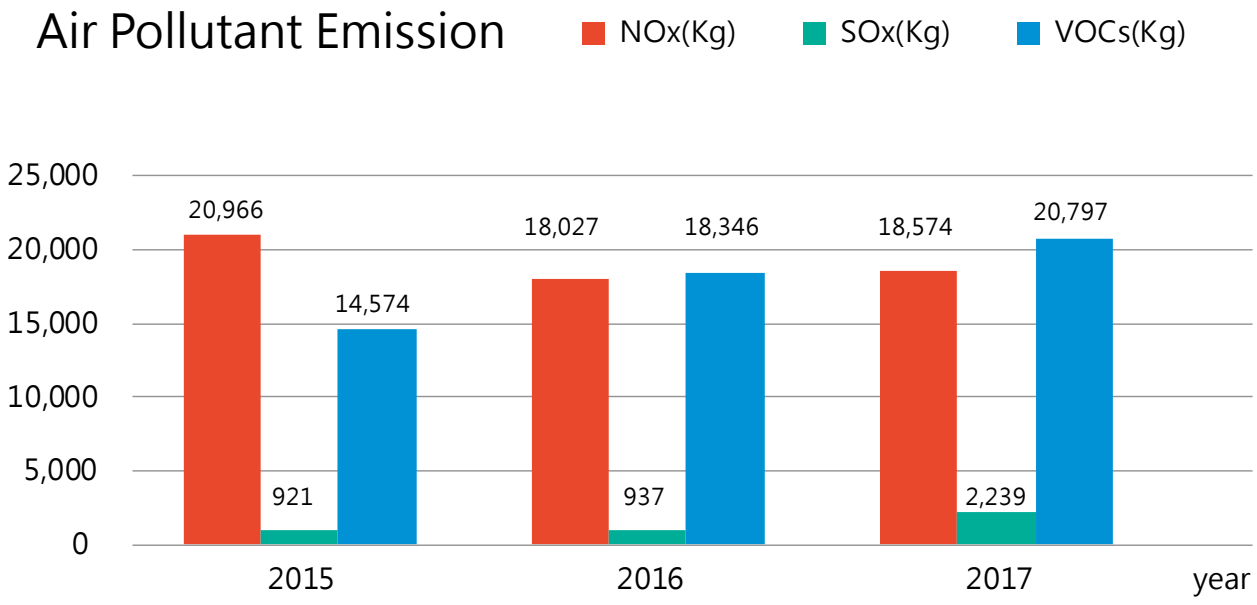
Machine	Improvement	Replacement	Established date
DAM04	Replaced with combustion equipment	Re-equipped	2017/3/28
DGA04	Replaced with combustion equipment	Re-equipped	2017/9/19
DPA02	Replaced with combustion equipment	New brought	2017/12/4
DPA01	Replaced with combustion equipment	New brought	2017/12/19

4.3 Air Pollution Emission Management

4.3.1 Air pollution control

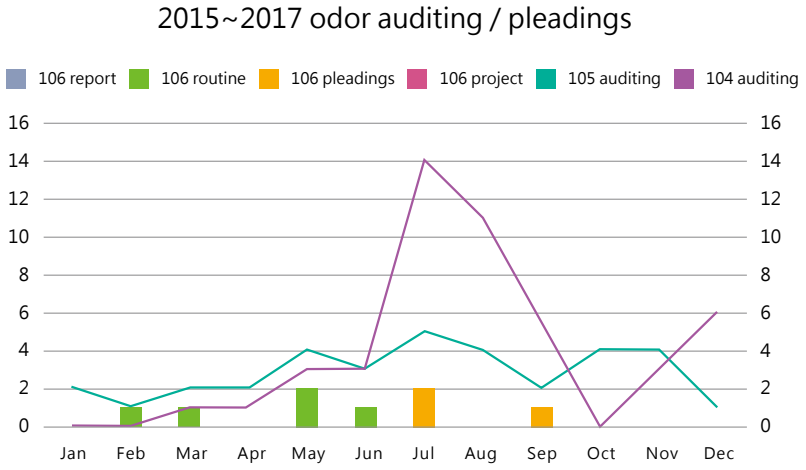
The exhaust gas of the company can be divided into thermal exhaust, acid exhaust, ammonia exhaust and organic exhaust according to its compositions and characteristics. Thermal exhaust is produced by the operating production machines. It does not contain pollutant and can be discharged into the atmosphere directly without treatment. The organic exhaust generated in the process will be concentrated through the zeolite concentration revolver and be desorbed to the burner for incineration. Acid exhaust and ammonia exhaust is discharged after treatment in the wet scrubber.

The auditing and sampling result showed a compliance with regulatory standards in 2017. The major air pollutant emissions were NOx-18,574KG, SOx--2,239KG and VOCs-20,797KG (Fig. 4.8). The NOx emission was increased by 3% compared with the emission volume (18,027KG) in the previous year. The VOC emission increased by 13% compared with the emission volume (18,346KG) in the previous year due to increase of the capacity.



▲ Fig. 4.8 Major air pollutant emission

4.3.2 Surrounding odor management



▲ Fig. 4.9 Odor auditing / pleadings

In 2015, the Management Bureau of Hsinchu Science Park reinforced the odor control and inspection in the area. Lots of complaints were filed for the third phase odor at the surrounding area of our P1/2 fabs. In recent years, we have been positively cooperating with the Management Bureau for air quality improvement. With the collaborative participation and improvement of the surrounding companies, the odor auditing / pleadings has presented a continued decrease tendency as the calculation shown at Fig. 4.9.

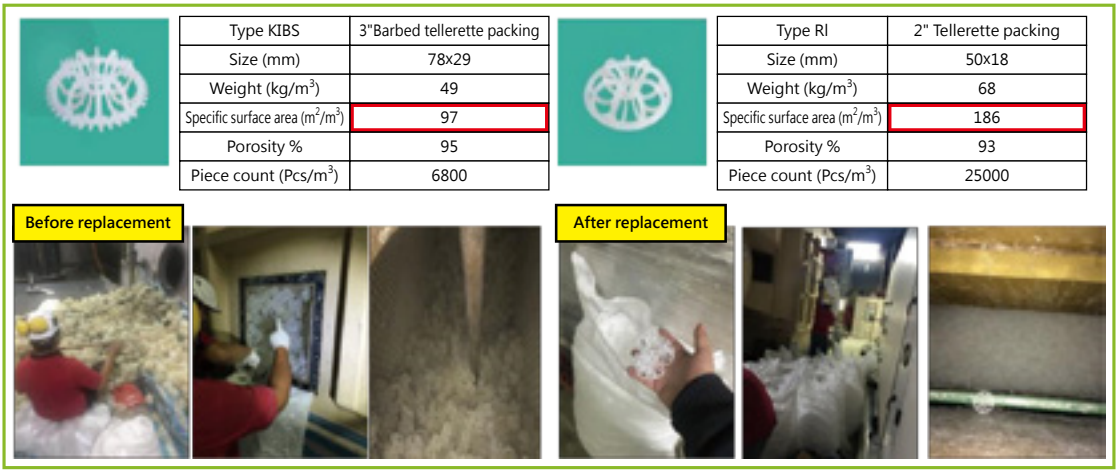
To continue the reduction of pollution emission, Powership set the goal to improve the best available control technology(BACT). For possible pollutants, we continued implement measures for reinforcement of the air pollution control equipment in the plant. Our primary improvements include:

1. Replace old local scrubber exhaust gas treatment facilities with combustion ones: to replace the high processing efficiency that conform to the Company requested standard and increase the removal rate of the fluoride and other acid substances at the front end, we assessed the efficiency of the new combustion exhaust gas treatment equipment and gradually complete the replacement of four old exhaust gas treatment equipment after acquiring the certification form a third party inspection unit (Fig. 4.10).

▲ Fig. 4.10 Old local scrubber exhausts gas treatment facilities replacement assessment and implementation

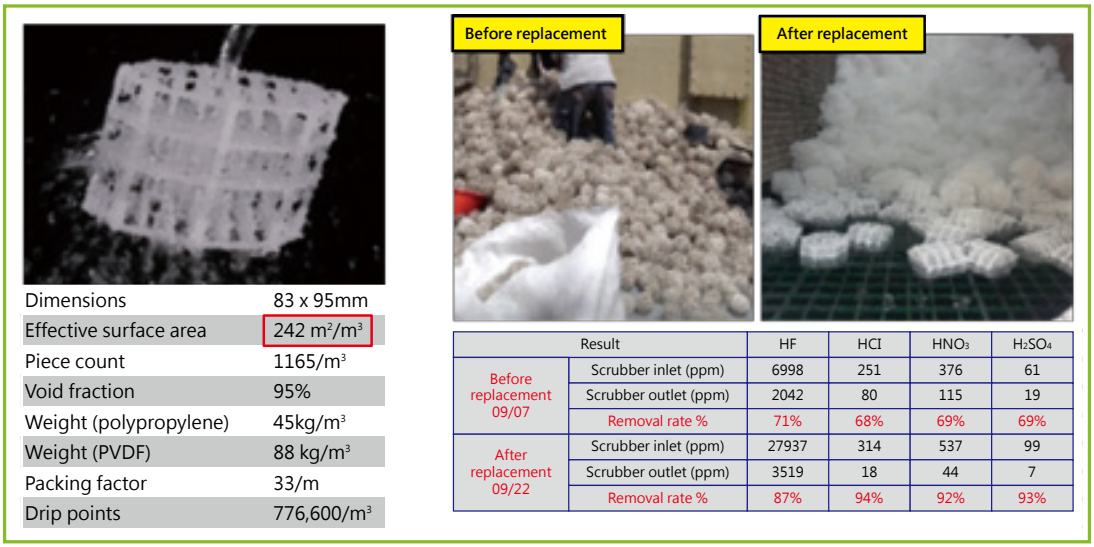
2. Scrubber's internal raschig ring replaced with high efficiency mode:

(1) P1 fab has completed the replacement of A310, A303, A304, A315 and A301 five scrubbers' raschig ring from the original 3" tellerette packing to 2" inch in the first half of 2017 (Fig. 4.11), increasing the specific surface to 186m2/m3, and excelling the regulation required >90m2/m3. This has promoted the specific surface of the acid scrubber packing layer and increased the effective removal surface to decrease emission intensity.



▲ Fig. 4.11 Internal raschig ring replacement of P1 Fab's scrubber to increase specific surface

(2) P2 fab has completed the replacement of A507 scrubbers' raschig ring from the original 3" tellerette packing to 3" very special packing in September 2017, increasing the specific surface to 242m2/m3. After initial sampling of hydrofluoric acid / hydrochloric acid / nitric acid / sulfuric acid, the efficiency for removal increased 16%~26% and the inspection results is displayed in Fig. 4.12.



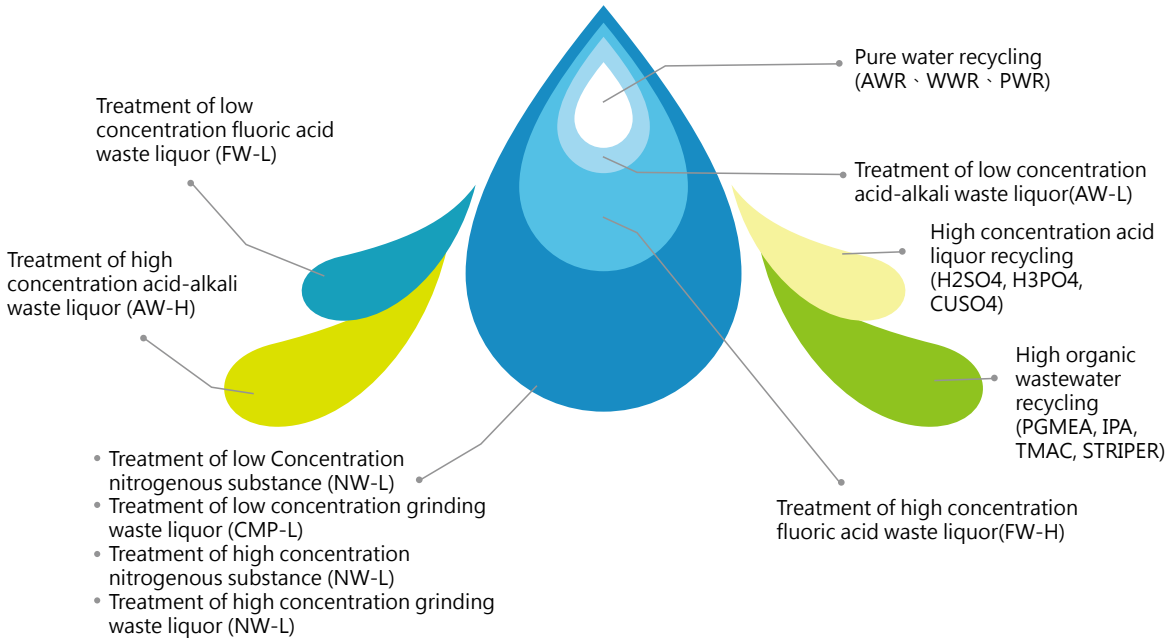
▲ Fig. 4.12 P2 fab scrubber's internal raschig ring replaced with high efficiency mode

4.4 Water Resource Management

We are the first semiconductor plant in the Hsinchu Science Park committed to reach the goal for [85% recovery rate of process water]. From 8A fab (currently Maxchip Electronics Corp.) to P 1/2 and P3 fabs, as well as R1 fab (currently Micron Technology, Inc.), we always follow the great tradition for water conservation. We uphold our mission for water conservation through continuous improvement and investment. To implement the new ammonia-N reduction facilities installed in 2015, we use the rarely applied catalyst method with high safety, no waste and high installation costs as the environmental protection facilities for the reduction of ammonia-N. This method is helpful to reduce the ammonia-N load for the water body. It does not produce sludge, the derivative of sewage treatment, and can minimize the further damage to the environment.

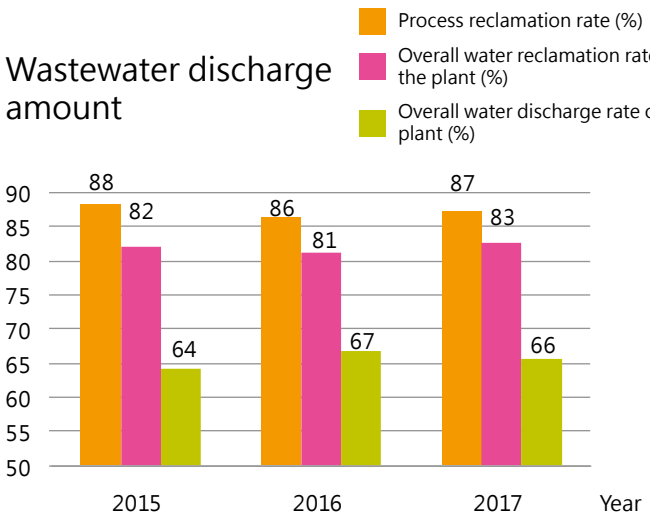
4.4.1 Facilities for sewage pollution control

We are located in the Hsinchu Science Park. After the pretreatment in our plant is carried out for the process water, the sewage is discharged into the sewage treatment plant in Hsinchu Science Park. The treated sewage is discharged into the Keya River. To manage the gradually changing waste problem, when the fab increases new machines /equipment, it is distributed into 19 types of drainage according to the category, concentration and electric conduction discharged from the process (Fig. 4.13). If separately managed according to its characteristics, besides increasing the water recycling rate, parts of waste acid liquor (phosphoric acid / copper sulphate / sulfuric acid / hydrofluoric acid) / organic wastewater (IPA / PGMEA / TMAC) still have economic value due to the high recycling concentration. Thus separately drainage can decrease the wastewater treatment plant' s medication demand and reduce the back-end waste management difficulty.



▲ Fig. 4.13 Drainage distribution overview

4.4.2 Process recovery measures



▲ Fig. 4.14 Process reclamation rate

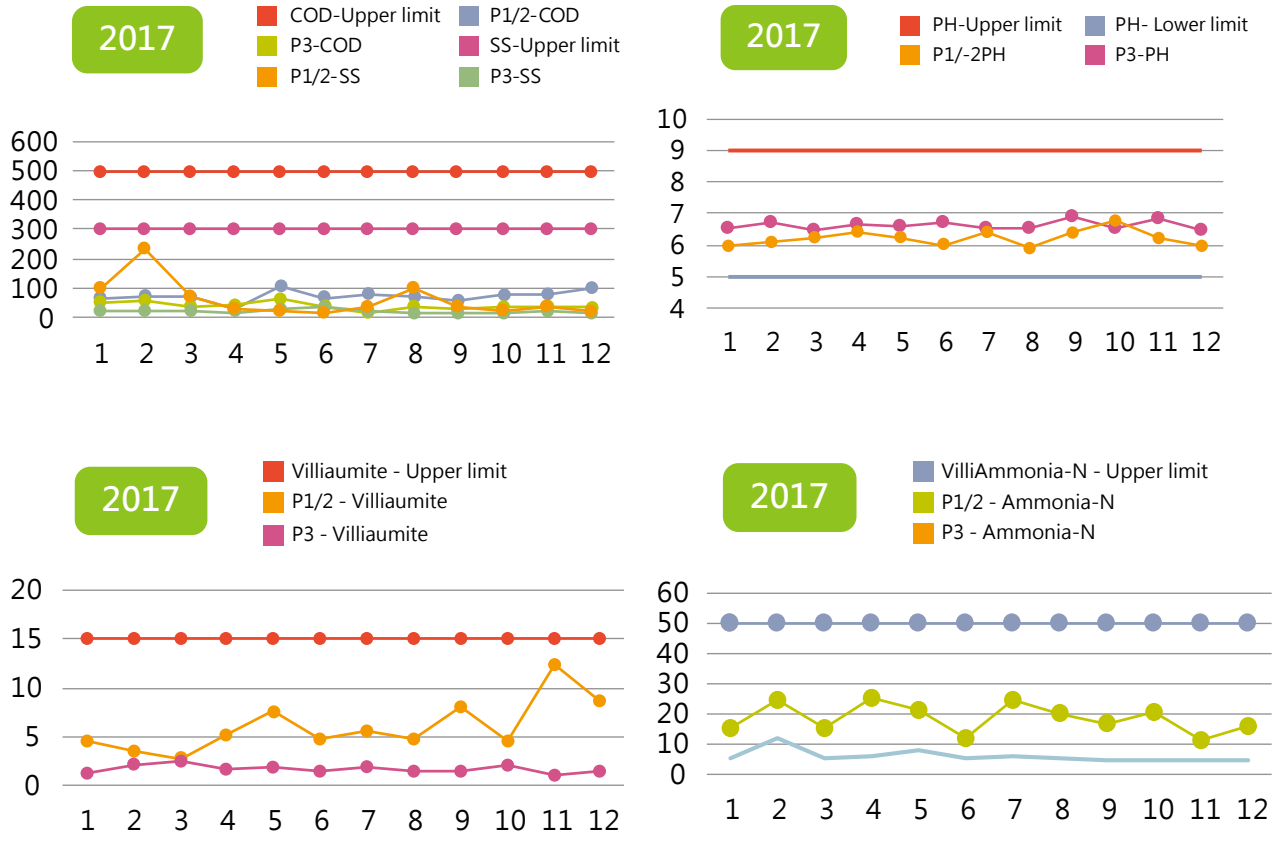
We have been enhancing international competitiveness. Our process development may be fast, however the first problems we encounter are the risk of water shortage and increasing cost of water treatment. Environmental deterioration leads to exhaustion of water resources. Therefore, we always focus on building a stable water supply system. Powerchip always observe the 4R water saving policies: Reduction, Renew, Recycle, and Reuse to optimize the water utilization efficiency. Our water conversation focuses on the water discharged from the process. The water sorting recovery unit is used to assist in identification. The water discharge is carried out for different purposes (such as pure water and coolant) based on the property of water quality for recycling of water resource. As a result, we can reduce the sewage per unit wafer, make efficient use of water resource and ensure that the reclamation for the process per month is above 85%. By emphasizing the water saving awareness, every drop of water was statistically reused by 2.8 times in the plant on average. Powerchip' s raw water source is the Baoshan Second Reservoir. The effective water storage capacity of the reservoir currently in total is 32.18 million tons. The daily water supply in average is about 282 thousand tons. The average water usage per day for the process is about 9,600 tons, which is about 7.38% of daily water usage of the Hsinchu Science Park. The average water recycling rate for the process was about 87 % in 2017. (Fig. 4.14). The amount of reclamation water was approximately 3.44 million tons. About 10.6 % water storage of the Baoshan Second Reservoir was saved in a year.

Table 4.1: Quantity of reclaimed water from various equipment

Water Conservation Project Name	2017 water saving amount (CMD)
Outside air condensate (OAC)	212
Acid discharge and reclamation (AWR)	3,895
LSR wastewater reclamation	3,913
AWL/FWL/O-CMP/IPA-L water reclamation system	2,287
Wastewater reclamation (WWR)	3,594
RO/UF concentrated water reclamation (including ammonia-N)	252

4.4.3 Facilities for sewage pollution control

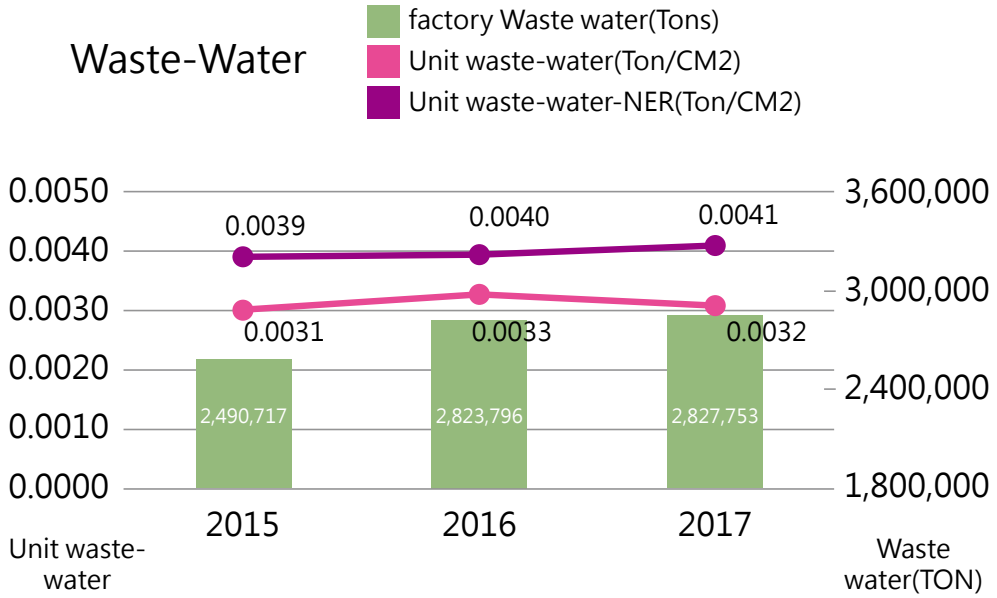
The water that cannot be used any more flows to the pre-treatment facilities of the fab. The water is classified into three types: fluorine wastewater/grinding wastewater, ammonia wastewater and acid-alkali wastewater. The physicochemical treatment is carried out for these three types of water based on the property of water quality. The chemical treatment is adopted for the wastewater containing fluoric acid and the grinding wastewater. We use the dosing method to convert the fluoride in process water to harmless calcium fluoride/inorganic sludge. The efficiency for pollutant removal is up to 99%. The calcium fluoride sludge can be refined to make fluorite that can be used as the steel and iron flux and the inorganic sludge can be used as the additive of cement. The catalyst method is adopted for the ammonia wastewater to oxidize ammonia-N in water to harmless nitrogen and water. The dosing process for acid-base neutralization is adopted for the treatment of acid-alkali wastewater. The discharged wastewater (sewage) is mixed to comply with the discharge criteria for the sewage system of the Hsinchu Science Park. The facilities are maintained on a regular basis and the discharged water is tested in the factory regularly to ensure normal water quality. Fig 4.15 show the tests conducted in each of our fabs in 2017 and no violation is identified. (Fig. 4.15).



▲ Fig. 4.15 Discharged water quality trend

4.4.4 Production of wastewater

The volume of the wastewater under control in 2017 was about 2.82 million tons. The wastewater production volume per unit wafer area was 0.0032 ton/cm2 and decreased by 3% compared with 2016. If compared with the wastewater volume data (0.0041 ton/cm2) of the Taiwan Semiconductor Industry Association (TSIA), this wastewater volume of Powerchip is less than the average wastewater production volume per unit wafer area of the industry. As the statistics in Fig. 4.16 shows, we have maintained a stable level in the wastewater segregation management aspect.

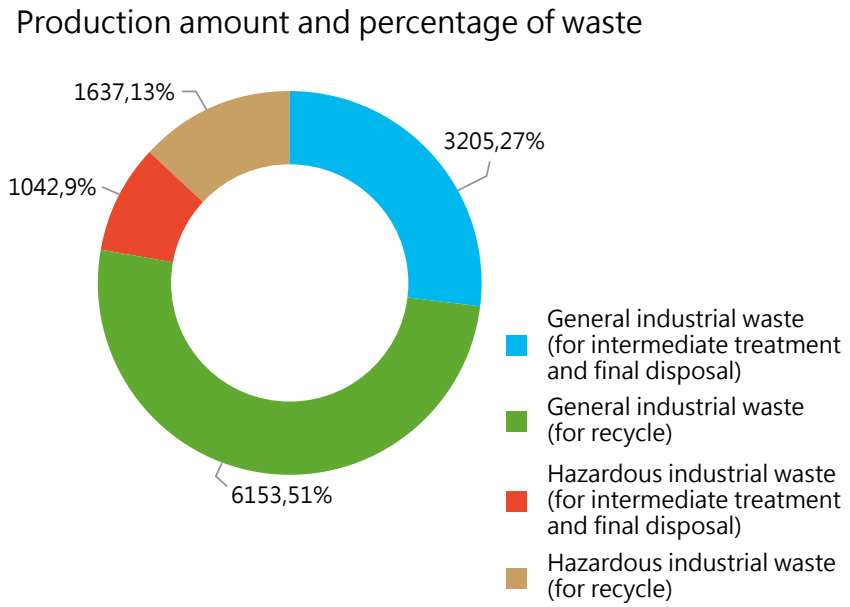


▲ Fig. 4.16 Development trend of discharged water flow

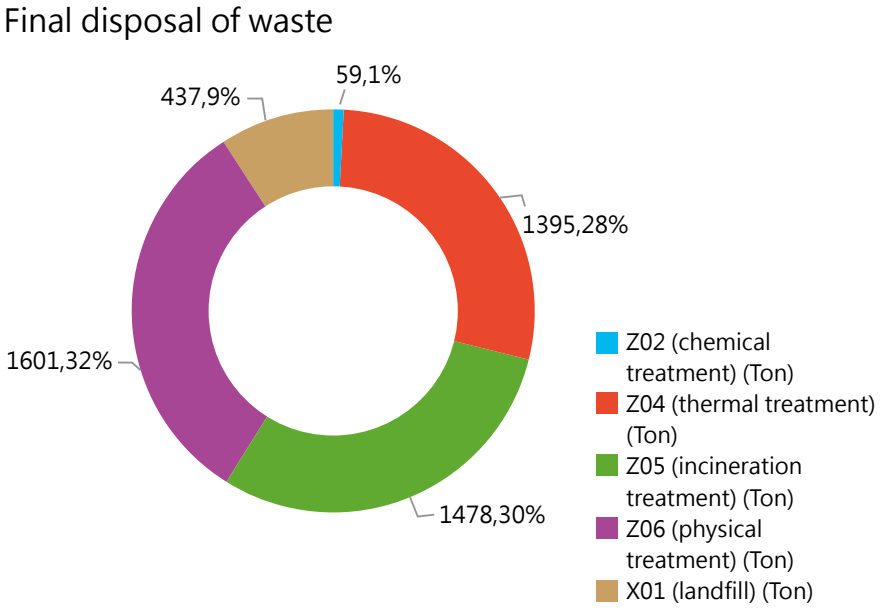
4.5 Waste Reduction and Management

For introducing waste management into the control of life cycle, we keep controlling complete flow of waste management and promoting the management. The goals we keep promoting are (1) enhancing the outcome of source reduction, (2) increasing the recycling value of waste and (3) carrying out proper treatment of the waste and tracking the flow of the waste.

The production volume in 2017 was about 12,037 tons and the harmful waste occupied about 22.2% (61% of the total hazardous industrial wastes were recycled) and the general industrial waste occupied about 77.8% (65.7% of the total general industrial wastes were recycled). Only 1% of the total wastes were land-filled in final disposal.



▲ Fig. 4.17 Production percentage of waste

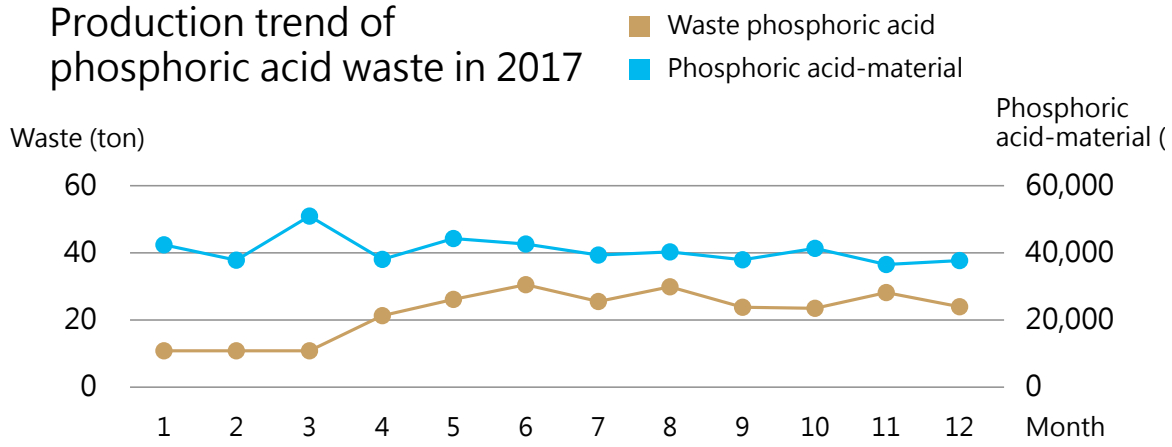


▲ Fig. 4.18 Final disposal of waste

4.5.1 Outcome of source reduction

1. Discharge improvement of phosphoric acid

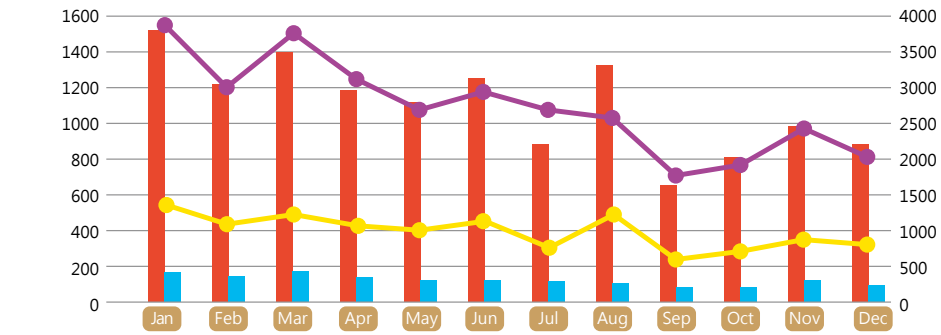
The recycle pipelines of phosphoric acid have been used for a long time. They are somewhat blocked and affect the discharge. Part of the phosphoric acid flows back and discharges in the wastewater treatment plant through an acid-alkali wastewater pipe instead of being collected in the specified tank. Hence, the factory affairs personnel and the unit in the field assess the improvement of the machinery. The volume of the recycled water increased by about 7 tons/month after the pipelines were changed. In addition to reduction of the burden due to use of the agent, this result leads to an increased benefit of about NT$ 28,000/month. As the figure shows, the usage of the phosphoric acid did not increase in April while the more waste phosphoric acid was recycled in percentage. (Fig. 4.18)



▲ Fig. 4.19 Ratio of phosphoric acid material to waste

2. Front end packaging material reduction and management

The department of finished products adopts the common shipment to deliver some products of small quantity with various types to domestic customers. Thanks to the plan of packaging reduction measures, our packaging cost and the packaging waste volume of the suppliers were reduced and the packaging material amounting to about NT$ 2.80 million were saved as shown in Fig. 4.19.

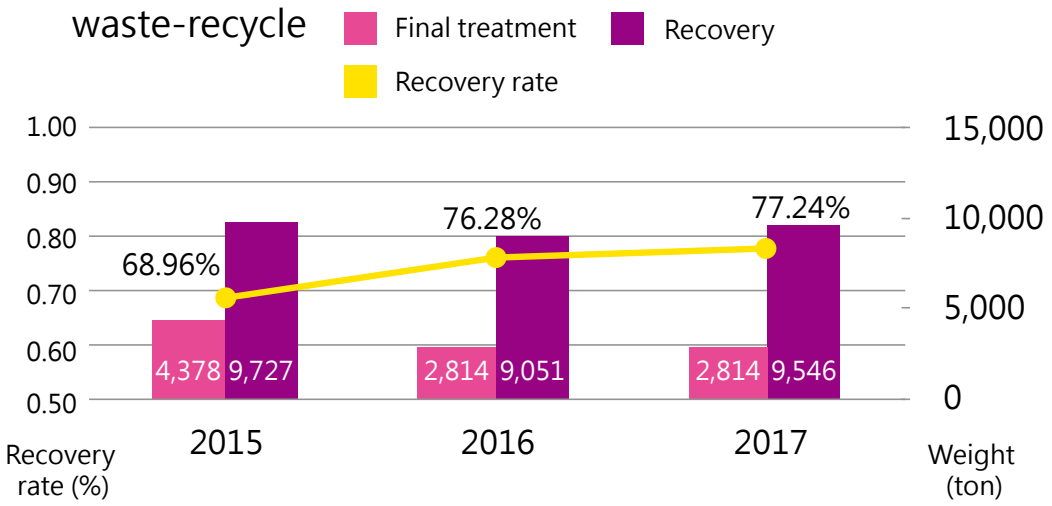


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number of lots before combination	1,521	1,222	1,407	1,188	1,117	1,257	882	1,326	656	811	984	881
Number of lots after combination	172	142	176	140	122	128	118	112	86	84	123	97
Number of saved lots	1,349	1,080	1,231	1,048	995	1,129	764	1,214	570	727	861	784
Number of chips	3,869	2,992	3,774	3,109	2,691	2,934	2,694	2,574	1,770	1,918	2,429	2,023
Saved packaging costs (NT)	$310,270	$248,400	$283,130	$241,040	$228,850	$259,670	$175,720	$279,220	$131,100	$167,210	$198,030	$180,320

▲ Fig. 4.20 Packaging material reduction analysis

4.5.2 Increasing the recycling value of waste

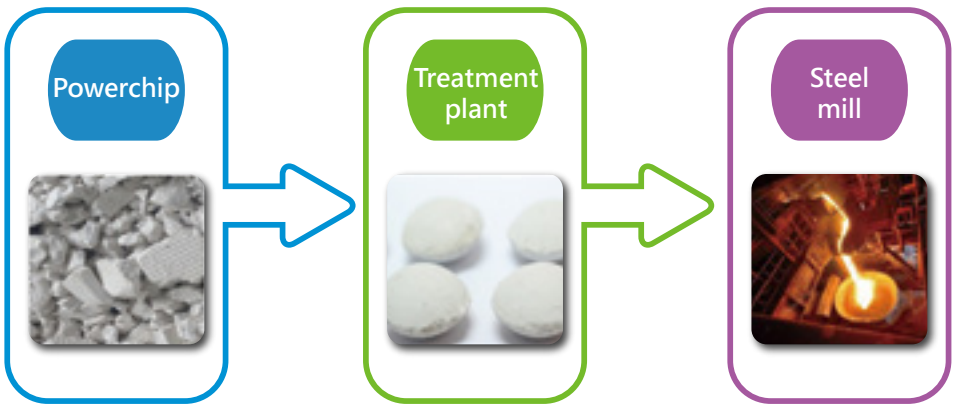
The industrial waste that we produce is mainly the waste solvent, waste acid and sludge. The recovery rate was increased up to 77% in 2017 (Fig. 4.20). The value of the waste was increased continuously by enhancing the classification at the front end. We cooperated with the vendors to assess the feasibility of recycle of the waste to eliminate the concern about its disposal at the backend. The successful instances are described below.



▲ Fig. 4.21 Analytical chart for the recovery rate of business waste

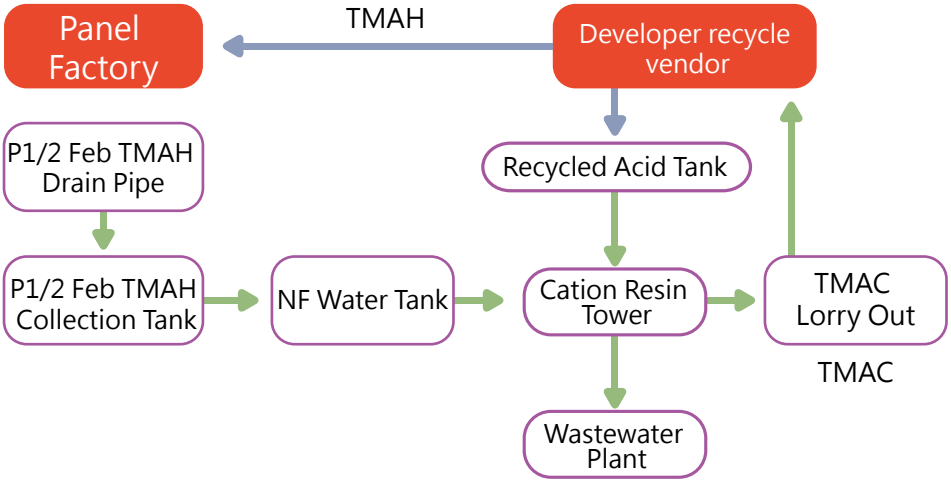
1. We adopted a concept of collecting and treating the fluorine wastewater/grinding wastewater separately when making the plan. The sludge produced from the fluorine wastewater contains high calcium fluoride (>70%), and the recycle vendors that acquires the technique to mitigate the refining difficulty and make artificial fluorite in recent years shows their interest in the cooperation to treat our calcium fluoride sludge. The recovery rates of the calcium fluoride sludge have been 100% since 2016.

》Calcium fluoride sludge：The sludge contains more than 70% of calcium fluoride and calcium oxide. It can be processed to fluorite, a steel and iron flux, to reduce the exploitation of natural fluorite.



2. As the control of ammonia nitrogen in the discharged water becomes stricter, the developer (TMAH) is found one of the sources of the ammonia nitrogen. After discussing with the vendor, factory affairs personnel and the department in charge of the equipment, the developer of simple nature is purified preliminarily in the fab through a special pipe to enhance the willingness of the vendor to recycle the substance, reduce the contribution to the ammonia nitrogen in the water body, and improve the waste recycle effectiveness.

》Developer (TMAH) : Since the nature of the waste liquid is simple, preliminary purification is made in the fab and the purified substance is then delivered to the vendor for refining to increase the recovery rate of the waste.



4.5.3 Proper waste treatment and waste flow tracking

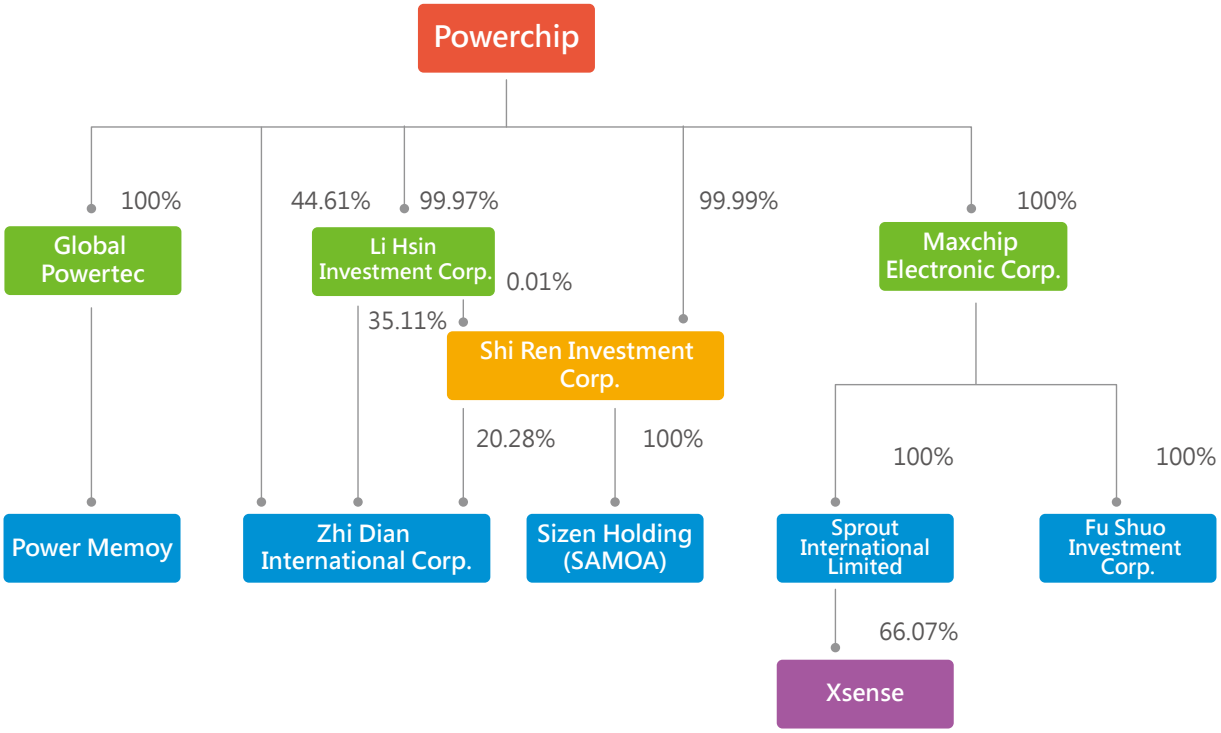
We believe that the earth is owned us by all. In addition to setup of designated function/ person for environmental protection, we implement waste treatment suppliers and execute external audit programs for the environment. Recycling and reuse of resources is the core of waste management. The waste treatment market is assessed for its appropriateness from time to time and the waste is treated appropriately for recycling. We draw up waste treatment supplier audit programs and inspect the suppliers of industrial waste on a regular basis to make sure the appropriateness and legality in terms of removal and treatment of the waste as well its storage and marking. The compliance with relevant laws and regulations is the most important goal of the audit. In 2017, we completed the inspection of 31 waste disposal operators.

Appendix

Appendix 1 Affiliate information

Name	Incorporation Date	Address	Business Item
Li Hsin Investment Corp.	05.26.1998	8F., No.70, Sec. 3, Nanjing E. Rd., Zhongshan Dist., Taipei City	General investment
Shi Ren Investment Corp.	08.27.2001	8F., No.70, Sec. 3, Nanjing E. Rd., Zhongshan Dist., Taipei City	General investment
Zhi Dian International Corp.	08.25.2005	15F., No.68, Sec. 3, Nanjing E. Rd., Zhongshan Dist., Taipei City	Artwork sales
Global Powertec Co., Ltd	04.24.2006	P.O. Box 957, Offshore incorporations Centre, Road Town, Tortola, British Virgin Islands	General investment
Maxchip Electronics Corp.	04.17.2008	18, Li-Hsin 1st Rd. Hsinchu Science Park, Hsinchu, Taiwan, R.O.C.	Electronics
Fu Shuo Investment Corp.	11.26.2008	15F., No.70, Sec. 3, Nanjing E. Rd., Zhongshan Dist., Taipei City	General investment
Sprout International Limited	08.07.2008	P.O. Box 957, Offshore incorporations Centre, Road Town, Tortola, British Virgin Islands	General investment
PowerMemoy Inc.	03.31.2010	6 Chome-21-3 Shinbashi, Minato-ku, Tokyo-to 105-0004	Electronics
Xsense technology corporation	10.13.2014	OMC Chambers, Wickhams Cay1 road town, Tortola ,British Virgin Islands	Electronic components manufacturing

Affiliate organization chart



Appendix 2

GRI G4 Indicator Comparison Table

Consideration	Index No.	Contents	Corresponding Chapter	Page No.	Remarks
		General Criteria			
Strategy and analysis	G4-1	Provide a statement from the most senior decision-maker of the organization	Strategy and Vision	1~2	
	G4-2	Provide a description of key impacts, risks and opportunities	Strategy and Vision	1~3	
Organizational profile	G4-3	Report the name of the organization	2.1 Introduction	4~7	
	G4-4	Report the primary brands, products, and services	2.1.2 Our service	7	
	G4-5	Report the location of the organization's headquarters	2.1.2 Our service	7	
	G4-6	Report the number and names of countries where the organization operates	2.1.2 Our service	7	
	G4-7	Report the nature of ownership and legal form	2.2 Corporate governance	8	
	G4-8	Report the markets served	2.1.2 Our service	7	
	G4-9	Report the scale of the organization	2.1 Introduction	4	
	G4-10	Report the total number of employees by gender	3.4.1 Numbers of employees and expertise	32	
	G4-11	Report the percentage of total employees covered by collective bargaining agreements	3.4.3 Promotion of labor relation	34	No Union
	G4-12	Describe the organization's supply chain	3.1.1 Building a sustainable partnership with the supplier	21	
	G4-13	Report any significant changes during the reporting period regarding the organization's size, structure, ownership or its supply chain	2.1 Introduction	4	No significant change in 2017
	G4-14	Report whether and how the precautionary approach or principle is addressed by the organization	2.3 Business performance	12~13	
	G4-15	List externally developed economic, environmental and social charters, principles, or other initiatives to which the organization subscribes or which it endorses			Powerchip is a TSIA member and carries out relevant decision items accordingly without endorsing any other initiative
	G4-16	List memberships of associations (such as industry associations) and national or international advocacy organizations in which the organization participates	2.2.6 Associations/guilds and (or) national/global reporting initiatives we've joined	12	

Consideration	Index No.	Contents	Corresponding Chapter	Page No.	Remarks
Identified material aspects and boundaries	G4-17	List all entities included in the organization' s consolidated financial statements or equivalent documents	Appendix 1	67	
	G4-18	Explain the process for defining the report content and the Aspect Boundaries	2.4 Stakeholders' identification and communication	14	
	G4-19	List all the material Aspects identified in the process for defining report content	2.5 Material issues	16	
	G4-20	Report the Aspect Boundary within the organization	2.4 Stakeholders' identification and communication	14	
	G4-21	Report the Aspect Boundary outside the organization	2.4 Stakeholders' identification and communication	14	
	G4-22	Report the effect of any restatements of information provided in previous reports, and the reasons for such restatements	Report Scope and Boundary:	I	There is no change of the previous report.
	G4-23	Report significant changes from previous reporting periods in the Scope and Aspect Boundaries	Report Scope and Boundary:	I	There is no change in the previous report.
Stakeholder engagement	G4-24	Provide a list of stakeholder groups engaged by the organization	2.4 Stakeholders' identification and communication	14	
	G4-25	Report the basis for identification and selection of stakeholders with whom to engage	2.4 Stakeholders' identification and communication	14	
	G4-26	Report the organization's approach to stakeholder engagement	2.4 Stakeholders' identification and communication	14	
	G4-27	Report key topics and concerns that have been raised through stakeholder engagement, and how the organization has responded to those key topics and concerns, including through its reporting	2.5 Material issues	14~18	
Report profile	G4-28	Reporting period for information provided	Forewords	I	
	G4-29	Date of most recent previous report (if any)	Forewords	I	
	G4-30	Reporting cycle (such as annual or biennial cycles)	Forewords	I	
	G4-31	Provide the contact point for questions regarding the report or its contents	Forewords	I	
	G4-32	Report the 'in accordance' option the organization has chosen	Forewords	I	
	G4-33	Report the organization' s policy and current practice with regard to seeking external assurance for the report	Forewords	I	

Consideration	Index No.	Contents	Corresponding Chapter	Page No.	Remarks
Governance	G4-34	Report the governance structure of the organization, including committees of the highest governance body. Identify any committees responsible for decision-making on economic, environmental and social impacts	2.2.1 BOD	9	There is no committee responsible for decision-making on economic, environmental or social impacts.
Ethics and integrity	G4-56	Describe the organization's values, principles, standards and norms of behavior such as codes of conduct and codes of ethics	2.2.3 Internal audit 2.2.4 Diligence promotion	10	
	G4-57	Report the internal and external mechanisms for seeking advice on ethical and lawful behavior, and matters related to organizational integrity, such as help lines or advice lines	2.2.4 Diligence promotion	10	
	G4-58	Report the internal and external mechanisms for reporting concerns about unethical or unlawful behavior, and matters related to organizational integrity, such as escalation through line management, whistleblowing mechanisms or hotlines	2.2.4 Diligence promotion	10	
Economy					
Economic performance	G4-EC1	Direct economic value generated and distributed by the organization	2.3 Business Performance	12~13	<Material aspects>
	G4-EC3	Coverage of the organization's defined benefit plan obligations	3.4.2 Selection and retention of talents	32~33	
Market presence	G4-EC6	Proportion of senior management hired from the local community at significant locations of operation	3.4.2 Selection and retention of talents	32~33	
Indirect economic impact	G4-EC7	Development and impact of infrastructure investments and services supported	3.7 Social welfare	44	
Procurement practices	G4-EC9	Proportion of spending on local suppliers at significant locations of operation	3.1.1 Building a sustainable partnership with the supplier	21	
Environment					
Energy	G4-EN3	Energy consumption within the organization	4.1.2 Energy/resource operation status	51	<Material aspect>
	G4-EN5	Energy intensity	4.1.2 Energy/resource operation status	51	
	G4-EN6	Reduction of energy consumption	4.1.1 Energy management measures	48~50	

Consideration	Index No.	Contents	Corresponding Chapter	Page No.	Remarks
Water	G4-EN8	Total water withdrawal by source	4.4.2 Recycled water system	60	
	G4-EN9	Water sources significantly affected by withdrawal of water	-	-	Powerchip participated in the EIA of the Hsinchu Science Park. The result shows that no water source is significantly affected by withdrawal of water.
	G4-EN10	Percentage and total volume of water recycled and reused	4.4.2 Process recovery measures	60	<Material aspect>
Emissions	G4-EN15	Direct greenhouse gas (GHG) emissions (Scope 1)	4.2.1 Greenhouse gas emission management	52~53	<Material aspect>
	G4-EN16	Energy indirect greenhouse gas (GHG) emissions (Scope 2)	4.2.1 Greenhouse gas emission management	52~53	<Material aspect>
	G4-EN18	Greenhouse gas emission intensity	4.2.2 Greenhouse gas reduction	54~55	
	G4-EN19	Reduction of greenhouse gas (GHG) emissions	4.2.2 Greenhouse gas reduction	54~55	
	G4-EN21	NOX, SOX and other significant air emissions	4.3 Air Pollution Control	56	
Effluents and waste	G4-EN22	Total water discharge by quality and destination	4.4 Water resource management	59	<Material aspect>
	G4-EN23	Total weight of waste by type and disposal method	4.5 Waste reduction and management	63	<Material aspect>
	G4-EN24	Total number and volume of significant spills			No significant spills
Products and services	G4-EN27	Extent of impact mitigation of environmental impacts of products and services	3.2.1 Building a green supply chain and Green Product (GP) 4.2.1 Greenhouse gas reduction 4.5 Waste reduction and management	24 52 63	<Material aspect>
Compliance	G4-EN29	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations	Ch. 4 Sustainable Development of the Environment	47	There is no incident of non-compliance with laws and regulations.

Consideration	Index No.	Contents	Corresponding Chapter	Page No.	Remarks
			Society		
Employment relationship	G4-LA1	Total number and rates of new employee hires and employee turnover by age group, gender and region	3.4.1 Numbers of employees and expertise	32	
	G4-LA2	Benefits provided to full-time employees that are not provided to temporary or part-time employees, by significant locations of operation	3.5 Employee welfare system	36	<Material aspect>
	G4-LA3	Return to work and retention rates after parental leave, by gender	3.4.2 Election and retention	32	
Occupational health and safety	G4-LA5	Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on occupational health and safety programs	3.3.1 Safety Health and Environment Committee	28	
	G4-LA6	Planning of the type and frequency of the industrial injury as well as lost day rate and absence rate	3.3.3 Disabling injury	29	<Material aspect>
Training and education	G4-LA9	Average hours of training per employee by gender, and by employee category	3.4.5 Training and development	35	<Material aspect>
Diversity of employees and their fair opportunities	G4-LA12	Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity	3.4.1 Numbers of employees and expertise	32	
Investment	G4-HR2	Total hours of employee training on human rights policies or procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained	3.4.5 Training and development	35	
Non-discrimination	G4-HR3	Total numbers of incidents of discrimination and corrective actions taken			There is no incident of discrimination.
Freedom of association and collective bargaining	G4-HR4	Operations and suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and measures taken to support these rights	3.5 Employee welfare system	36	No violation of freedom of association
Child labor	G4-HR5	Operations and suppliers identified as having significant risk for incidents of child labor and measures taken to contribute to the effective abolition of child labor	3.4.2 Selection and retention of talents 3.1.2 Sustainability regulations for the supply chain	32 22	No operating bases or suppliers having significant risk for incidents of child labor; <Material aspect>

Consideration	Index No.	Contents	Corresponding Chapter	Page No.	Remarks
Forced or compulsory labor	G4-HR6	Operations and suppliers identified as having significant risk for incidents of forced or compulsory labor, and measures to contribute to the elimination of all forms of forced or compulsory labor	3.1.2 Sustainability regulations for the supply chain	22	There is no forced or compulsory labor; <Material aspect>
Supply chain management	G4-HR11	Supply chain vs. human right	3.1.2 Sustainability regulations for the supply chain	22	<Material aspect>
Anti-corruption	G4-SO5	Confirmed incidents of corruption and actions taken			There is no corruption cases <Material aspect>
Compliance	G4-SO8	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations			There is no incident of non-compliance with laws and regulations
Assessment of supplier’ s social impact	G4-SO10	The significant or negative impact on the society and measures that have been taken	3.1.2 Sustainability regulations for the supply chain	22	<Material aspect>
Grievance mechanisms for impacts on society	G4-SO11	Number of grievances about impacts on society filed, addressed, and resolved through formal grievance mechanisms			No incident of grievances against impacts on society has occurred.
Customer health and safety	G4-PR1	Percentage of significant product and service categories for which health and safety impacts are assessed for improvement	3.2 Product service	24	
	G4-PR2	Total number of incidents of non-compliance with regulations and voluntary codes concerning the health and safety impacts of products and services during their life cycle, by type of outcomes	3.2 Product service	24	There is no incident of non-compliance with regulations and voluntary codes
Product and service labeling	G4-PR5	Results of surveys measuring customer satisfaction	3.2.3 Customer/product service and satisfaction tracking	27	<Material aspect>
Compliance	G4-PR9	Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services			There is no incident of non-compliance with laws and regulations

▶ Appendix 3 Certification and Verification

Environmental Management System

ISO 14001

Occupational Safety & Health Management System

OHSAS 18001

Quality Management System

ISO 9001

Greenhouse Gas Inventory System

Energy Management System

Global Automotive Industry Quality Management System Certification

International Electro technical Commission Quality Assessment System for Electronic Components

Electrostatic Discharge Prevention Certification

Sony Green Partner (2018)

Appendix 4 Independent Third Party Verification Statement

INDEPENDENT ASSURANCE OPINION STATEMENT

Powerchip 2017 Corporate Social Responsibility Report

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

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

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

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

Scope

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

1. The assurance scope is consistent with the description of Powerchip Technology Corporation 2017 Corporate Social Responsibility Report.
2. The evaluation of the nature and extent of the Powerchip's adherence to all three AA1000 AccountAbility Principles in this report as conducted in accordance with type 1 of AA1000AS (2008) assurance engagement and therefore, the information/data disclosed in the report is not verified through the verification process.

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

Opinion Statement

We conclude that the Powerchip 2017 Corporate Social Responsibility Report provides a fair view of the Powerchip CSR programmes and performances during 2017. The CSR report subject to assurance is free from material misstatement based upon testing within the limitations of the scope of the assurance, the information and data provided by the Powerchip and the sample taken. We believe that the 2017 economic, social and environmental performance indicators are fairly represented. The CSR performance indicators disclosed in the report demonstrate Powerchip's efforts recognized by its stakeholders.

Our work was carried out by a team of CSR report assurors in accordance with the AA1000 Assurance Standard (2008). We planned and performed this part of our work to obtain the necessary information and explanations we considered to provide sufficient evidence that Powerchip's description of their approach to AA1000 Assurance Standard and their self-declaration of 'in accordance' with the GRI G4 guidelines: the Core option were fairly stated.

Methodology

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

- a top level review of issues raised by external parties that could be relevant to Powerchip's policies to provide a check on the appropriateness of statements made in the report.
- discussion with managers on approach to stakeholder engagement. However, we had no direct contact with external stakeholders.
- 19 interviews with staffs involved in sustainability management, report preparation and provision of report information were carried out.
- review of key organizational developments.
- review of the findings of internal audits.
- review of supporting evidence for claims made in the reports.
- an assessment of the organization's reporting and management processes concerning this reporting against the principles of Inclusivity, Materiality and Responsiveness as described in the AA1000 AccountAbility Principles Standard (2008).

Conclusions

A detailed review against the AA1000 AccountAbility Principles of Inclusivity, Materiality and Responsiveness and the GRI G4 guidelines is set out below:

Inclusivity

This report has reflected a fact that Powerchip has continually made a commitment to its stakeholders, as the participation of stakeholders has been conducted in developing and achieving an accountable and strategic response to sustainability. The reporting systems are being developed to deliver the required information. There are fair reporting and disclosures for economic, social and environmental information in this report, so that appropriate planning and target-setting can be supported. In our professional opinion the report covers the Powerchip's inclusivity issues.

Materiality

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

Responsiveness

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

— Encouraging to work towards a type 2 of AA1000 AS(2008) engagement with a view to providing the reliability of sustainability performance information that stakeholder concerns.

GRI-reporting

Powerchip provided us with their self-declaration of 'in accordance' with the G4 sustainability reporting guidelines: the Core option (at least one Indicator related to each identified material Aspect). Based on our review, we confirm that social responsibility and sustainable development indicators with reference to the GRI Index are reported, partially reported or omitted. In our professional opinion the self-declaration covers the Powerchip's social responsibility and sustainability issues.

Assurance level

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

Responsibility

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

Competency and Independence

The assurance team was composed of Lead Auditors experienced in industrial sector, and trained in a range of sustainability, environmental and social standards including AA1000AS, ISO14001, OHSAS18001, ISO14064 and ISO 9001. BSI is a leading global standards and assessment body founded in 1901. The assurance is carried out in line with the BSI Fair Trading Code of Practice.

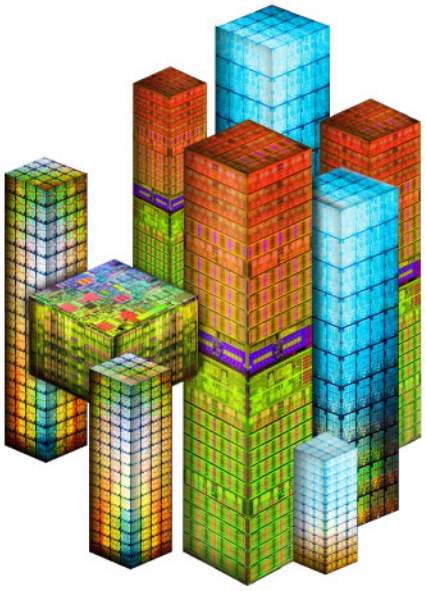
For and on behalf of BSI:

Peter Pu
Managing Director BSI Taiwan
2018-06-25

bsi.

AA1000
Licensed Assurance Provider
000-4

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



Powerchip