Dear friends of UMC sustainability:

With the intensifying US-China trade conflict and volatility in international financial markets, 2018 seemed to be the most turbulent year since the 2008-2009 financial crisis. However, in the face of such a challenging external environment, UMC has continued to achieve breakthroughs in technology, capacity and customer development through the joint efforts of all its employees. We have also reached a record high in annual revenue.

Continuing to uphold our vision of “People-oriented, Environmental Symbiosis, and Social Prosperity,” we have formulated UMC’s mid and long-term goals for sustainable development for 2020 and 2025. We adhere to the standards of the UN Sustainable Development Goals, and are committed to promoting the concept of environmental, social and governance (ESG) sustainability.

In 2018, UMC continued to see improvement in the implementation of its sustainability management strategies. Our performance has been brilliant. In addition to being listed as a constituent stock on the DJSI World Index of the Dow Jones Sustainability Indices (DJSI) for 11 consecutive years, we were named as a constituent stock by the Taiwan ESG Index three times since its launch. Moreover, we continued to receive awards such as the Corporate Social Responsibility Award from Global Views Monthly and the Taiwan Corporate Sustainability Report Award.

To strengthen corporate governance, UMC has four independent committees under the Board of Directors, namely the Remuneration Committee, the Audit Committee, the Capital Budget Committee and Nomination Committee. These committees serve to strengthen the supervisory function of the Board of Directors, ensure the integrity of the company’s operations, and rigorously safeguard stakeholder interests in its corporate governance. In 2018, the DJSI continued to rank UMC’s governance performance at above the average performance of emerging markets within the semiconductor industry. In the corporate governance evaluation conducted by the Taiwan Stock Exchange, UMC has also stood out from others since 2015, and continues to be in the top 5%. We are pleased to be consistently recognized by domestic and foreign investors for our persistence in corporate governance.

In terms of environmental sustainability, we regard climate change, water and energy resource management issues as both corporate challenges and opportunities.

In 2018, by closely integrating with operational development, we successfully achieved our 3-year objectives of the Green 2020 energy saving, water saving and waste reduction plan. Moreover, we are honored to have won the highest Enterprise Environmental Protection Award from Taiwan’s Environmental Protection Administration for 16 consecutive years. UMC’s subsidiary in Singapore has also won the Watermark Award for its contribution and commitment to protecting water source. At the same time, we reached Leadership Level in the international CDP climate change disclosure. Our accomplishments not only reduce the environmental burden of product life cycle, but also fulfill the goal of green design, production and operation. Through our efforts, we have demonstrated to the international community the efforts of Taiwanese companies in promoting environmental sustainability.

In terms of creating social value and participation, UMC has invited suppliers to jointly create a green supply chain through the Triple R League initiative to reduce, reuse and recycle. From waste reduction to circular economy, we have jointly expanded the influence of the overall industry, and enhanced the value of sustainable development. In addition, we have also fulfilled the global partner spirit of the UN Sustainable Development Goals by recruiting like-minded companies to join us in the Eco Echo Award and Energy Saving Service Team.

The Eco Echo Award established by UMC has expanded and strengthened over the past three years. Award prizes have increased yearly, and have supported 14 exceptional ecological conservation programs. It has become a very important force in Taiwan’s environmental protection.

In 2018, more than 20,000 people participated in the Eco Echo Award activities to jointly protect local ecologies. In addition, our environmental charity, the Energy Saving Service Team, has teams both in UMC’s Hsinchu Headquarters and also in Tainan to connect more professional technicians as volunteer partners. By providing services to the disadvantaged, social welfare organizations and schools, the teams contribute directly to society with their core professional abilities.

I wish to thank our customers, suppliers, shareholders and the community for supporting UMC. We have always promoted corporate sustainability and social responsibility, and will continue to do so. In the future, UMC will further strengthen its advantages and cooperate with our global operating partners and stakeholders. We will work together to exert influence, advance forward on the road towards sustainable operations, and contribute our utmost to the positive development of the overall environment, society and economy.

Co-President and CS Committee Chairman

2018 CORPORATE SOCIAL RESPONSIBILITY REPORT
Message from chairman of the Corporate Sustainability Committee
ABOUT THIS REPORT

This report is the 14th Corporate Social Responsibility Report issued by UMC and the 19th consecutive public non-financial annual report. UMC consistently upholds the principles of sincerity, pragmatism, transparency and joint sustainable development, and discloses its corporate sustainability philosophy and approaches to the general public. This report makes public the implementation of the 2018 UMC corporate sustainable development and social responsibility.

SCOPE

Information disclosed in this CSR Report includes various performance metrics and data of environmental protection, corporate governance, and community participation work carried out by UMC from January 1 to December 31, 2018. For the disclosure of major activities, the period was further extended to March 31, 2019. In addition to information about UMC Headquarters and wafer fabs in Taiwan and Singapore, this CSR Report also included information from HeJian Technology (Suzhou) Co., Ltd. (HJTC) and United Semiconductor (Xiamen) Co., Ltd. (USC), which are UMC subsidiaries relevant to the key material topics. For other information of affiliated joint ventures and subsidiaries, please refer to Page 143 in this Report.

REPORTING GUIDELINES AND PRINCIPLES

The content framework in this report is based mainly on major UMC corporate sustainability issues in 2018 and stakeholder concerns, to report on impacts related to specific economic, social, and environmental topics. In addition, this report is compiled according to the GRI standards of the Global Reporting Initiative (GRI) for global sustainability reports, and complies with the AA1000 standards and principles for identifying, implementing and disclosing information pertaining to the implementation of corporate social responsibility. Data from the annual financial report prepared by certified accountants (Ernst & Young Accounting) are used in this report, and data on greenhouse gas emission and reduction are based on ISO 14064-1 standards and verified by DNV GL Business Assurance Co. Ltd. Taiwan. For further details, please refer to Chapter 3.

INTERNAL MANAGEMENT PROCESS AND ISSUING OF THIS REPORT

After being approved by the top management of each department, this report is sent to the Corporate Sustainability Committee for inspection and review. The report is issued after being approved by the chairman of the committee.

DRAFT
Approved by the top management of related departments

COMPILATION
Overall inspection and review by the Corporate Sustainability Committee Office

FINALIZATION
Reviewed and approved by the chairman of the Corporate Sustainability Committee


In support of environmental protection, a paperless, electronic version of this report is posted on the company website.

REPORT ASSURANCE

This report was verified by SGS Taiwan Ltd. in March 2019 according to
GRI Sustainability Reporting Standards Comprehensive option and the Accountability 1000 Assurance Standard TYPE II. The SGS verification report is attached in the appendix of this report.

YOUR FEEDBACK

For any questions or comment about the report content or activity, please contact us at:

United Microelectronics Corp. / GRM & ESH Division
Address: No. 3, Li-Hsin 2nd Road, Hsinchu, Taiwan 300
Phone: + 886-3-5782258 / Fax: + 886-3-5782375
e-mail (UMC CSR mailbox): csr@umc.com / website: www.umc.com
UMC'S IMPORTANT ACHIEVEMENTS AND SUSTAINABLE PERFORMANCE IN 2018

POSITIVE ACCLAIM FOR OUR CORPORATE SUSTAINABILITY

**DOW JONES SUSTAINABILITY INDICES**
Selected as a DJSI global component for the 11th consecutive year.

**FTSE4GOOD EMERGING INDEXES & FTSE4GOOD TIP TAIWAN ESG INDEX**
Selected into the FTSE4Good Emerging Indexes & FTSE4Good TIP Taiwan ESG Index.

**ISS-OEKOM CORPORATE RATING**
Rated "Prime" by ISS-oekom Corporate Rating

**INTERNATIONAL CDP ORGANIZATION**
Climate Change Score Level: Achieved Leadership Level Score of A- for the 3rd consecutive year.

**TAIWAN CORPORATE SUSTAINABILITY AWARDS**
Awarded the Corporate Sustainability Report Awards for 11 consecutive years.

**CSR AWARD FROM GLOBAL VIEWS MONTHLY**
UMC received the '2018 Global Views Magazine CSR Award' - Electronic Technology Group Model award.

**CORPORATE GOVERNANCE ACCREDITATION FOR LISTED COMPANIES**
Top 5% for 4 consecutive years, Corporate Governance Assessment Award of the TWSE

**ENTERPRISES ENVIRONMENTAL PROTECTION AWARD**
For 16 consecutive years, UMC's Taiwan fabs were awarded with the Enterprises Environmental Protection Award by the Environmental Protection Administration.

**WATERMARK AWARD**
UMC Fab 12i Wins Singapore's Watermark Award
**Environment al Performance**

**Energy and Greenhouse Gas Management**

- **57,127 MWh** Power reduction
  The newly added reduction for 2018 was 57,127MWh, which is equivalent to a decrease of 31,648 tons in CO2 emissions and a savings of about NT$ 131 million.

- **2,882 MWh** Natural gas reduction
  The newly added reduction for 2018 was 2,882 MWh, reaching the targeted goal, which is equivalent to a decrease of 567 tons in CO2 emissions and a savings of about NT$ 3,280,000.

**Waste Management**

- **1,790 TONS** of waste reduction
  The newly added reduction for 2018 was 1,790 tons, reaching the targeted goal, which is equivalent to a savings of about NT$ 6.9 million in annual treatment costs.

- **4,265 TONS** of waste sulfuric acid conversion of in-plant resources
  Reduced UMC’s purchases of sulfuric acid by approximately 4,265 metric tons. The total economic benefit was NT$18.60 million.

- **2.8 Million KWh** renewable energy generation
  UMC has completed the installation of a 4,335 KWp solar energy system, which is expected to generate up to 2.8 million KWh of electricity each year. The installation capacity is the highest among Taiwan’s wafer fab industry.

**Water Resource Management**

- **3.15 MILLION TONS** of recycled water usage
  In Singapore, UMC’s use of recycled water (Newater) reached 3.15 million tons, accounting for 94% of Fab12’s total water use of 3.35 million tons, thus reducing the impact on local water resources.

- **228,000 TONS** of reduction in water usage
  The newly added reduction for 2018 was 228,000 tons, reaching the targeted goal, which is equivalent to a savings of about NT$5,700,000.

**Environmental Management**

- **100% Certification**
  - All UMC fabs have passed the ISO 14064-1 greenhouse gas emissions certification, the ISO 14001 environmental management certification, and the QC 080000 Hazardous Substance Process Management Certification.

**Important Achievements and Sustainable Performance in 2018**

- **2.8% OR MORE ammonia and nitrogen concentration reduction for wastewater**
  Owing to ammonia source reduction, ammonia and nitrogen concentration in wastewater was reduced by 28%–63%, which saved annual raw material cost of NT$48 million and annual wastewater treatment cost of approximately NT$180 million.

- **90% Waste Recycling**
  The amount of reused waste was 35,053 metric tons, which is a gain of more than NT$35 million from recycled resources.

- **28 % or more ammonia and nitrogen concentration reduction for wastewater**
  Owing to ammonia source reduction, ammonia and nitrogen concentration in wastewater was reduced by 28%–63%, which saved annual raw material cost of NT$48 million and annual wastewater treatment cost of approximately NT$180 million.

- **3,281 MILLION TONS** of Recovered Water
  Recovered water is equivalent to saving 1.04 of the stored water in No.2 Baoshan Reservoir.

- **3 MILLION total prize money for UMC Eco Echo Award**
  UMC invested NT$3 million in rewarding excellent and innovative eco preservation proposals.

- **3 MILLION total prize money for UMC Eco Echo Award**
  Various projects were successfully completed, totaling more than 20,000 participants in the Eco Echo Award activities.

- **0 Environmental Incidents or Fines**
  In 2018 there were no environmental incidents or fines.
SOCIAL PERFORMANCE

EDUCATION AND TRAINING

94.8% overall satisfaction with the courses
In 2018, a total of 9,071 courses were held that were attended by a total of 342,566 individuals. Overall satisfaction for these training courses was 94.8%, while satisfaction for the lecturer and teaching materials attained 94.6% and 94.6% respectively.

95.0% completion for training courses on The 7 Habits of Highly Effective Managers and Employees
To achieve company core values and attain the spirit and principle of responsibility, 95.0% of employees completed training courses on The 7 Habits of Highly Effective Managers and Employees.

SAFE WORK ENVIRONMENT

63% reduction in workplace accidents
17 fewer accidents compared to the reference basis (the year of 2011) and achieved a saving of NTS 54.06 million in potential asset loss
In 2018, the disabling injury frequency rate was 0.1, and disabling severity rate was 0, which were much lower than the semiconductor industry average.

0 major occupational hazard

BENEFITS SYSTEM

100% Holistic Health Management Program.
- Created a safe working environment, and protected health and work-life balance of employees.
- All fab sites in Taiwan received the “Self-Certification Health Promotion Badge” from Bureau of Health Promotion, Department of Health, Executive Yuan.

95% satisfaction with health promotion activities.
To implement a total of 26 health promotion projects in 2018. The total number of people served was 71,759 and the overall satisfaction rate was 95%.

POSITIVE LABOR RELATIONS

100% communication meetings were completed.
By the end of 2018, a total of 152 sessions of company-wide forums, fab communication meetings, secretary forums, newcomers’ forum, labor-management conferences, and benefits committee meetings were conducted.

0 LABOR DISPUTES
Actively promoted harmonious labor relations to reduce the likelihood of labor conflict. In 2018, there was no case of labor dispute.

PUBLIC SERVICE

7,158 total number of volunteers hours
In 2018, UMC invested a total of 7,158 hours in terms of volunteer work, with more than 26,321 beneficiaries.

26,321 number of beneficiaries

ZERO cases of human rights complaints.
COMPANY PROFILE

United Microelectronics (UMC) is a world leading semiconductor foundry. The company leverages its manufacturing excellence and extensive technology portfolios to produce IC wafers for every major electronics sector. UMC offers comprehensive solutions that give IC design companies a competitive edge through advanced processes and a wide range of specialty technologies, helping customers differentiate their products in the competitive IC market.

FIRM TAIWAN ROOTS, GLOBAL PRESENCE

UMC plays an important role in Taiwan’s semiconductor industry. In addition to being Taiwan’s first wafer fabrication company, it was also Taiwan’s first listed semiconductor corporation. To meet the needs of customers worldwide, UMC has established service locations in Taiwan, Japan, China, Singapore, South Korea, Europe and the United States. UMC will continue to strive to provide its customers with world leading process technologies and a full range of professional foundry solutions so that they may continue to build a competitive advantage in today’s rapidly changing industry.
FOUNDRY MANUFACTURING

UMC is a 300mm manufacturing leader with several advanced 300mm fabs in operation. Fab 12A in Tainan, Taiwan has been in volume production for customer products since 2002 and is currently manufacturing 14nm and 28nm products. The multi-phase complex is actually three separate fabs, consisting of Phases 1&2, 3&4, and 5&6. Fab 12A’s total production capacity is currently over 75,000 wafers month. UMC’s second 300mm fab, Fab 12i, is UMC’s special technology center. With its specialty 12-inch manufacturing processes, it produces ICs that are essential for a wide variety of application products demanded by customers.

United Semiconductor Co., Ltd. (USC) is the first 12-inch IC manufacturing fab in Southern China, which began its commercial operation in late 2016. USC offers an excellent diversity of manufacturing services for local and global IC design companies in the region. It also helps fulfill the tremendous IC manufacturing demand for electronic products in China.

PARTICIPATION IN OUTSIDE ASSOCIATIONS

Besides promoting corporate sustainability related activities within the organization, UMC also actively participates in events that are initiated by outside organizations such as industrial unions and associations. It is hoped that by offering practical experiences and suggestions to the industry, UMC could help government and related authorities to come up with appropriate policies and regulations.

Key UMC Association Involvement

<table>
<thead>
<tr>
<th>Institution</th>
<th>Member fees paid in 2018 (NTD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Association of Industries in Science Parks (ASIP)</td>
<td>1,026,000</td>
</tr>
<tr>
<td>Taiwan Semiconductor Industry Association (TSIA)</td>
<td>900,000</td>
</tr>
<tr>
<td>Semiconductor Equipment and Materials International (SEMI)</td>
<td>677,776</td>
</tr>
<tr>
<td>Responsible Minerals Initiative</td>
<td>453,263</td>
</tr>
<tr>
<td>Taiwan IC Industry &amp; Academia Research Alliance (TIARA)</td>
<td>100,000</td>
</tr>
<tr>
<td>Business Council for Sustainable Development of Taiwan (BCSD-Taiwan)</td>
<td>60,000</td>
</tr>
<tr>
<td>Taiwan Electrical and Electronic Manufacturers’ Association (TEEMA)</td>
<td>42,000</td>
</tr>
<tr>
<td>Chinese Professional Management Association (CPMA)</td>
<td>20,000</td>
</tr>
</tbody>
</table>

The cost of UMC participating in important associations in the past

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost (NTD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>2,048,000</td>
</tr>
<tr>
<td>2016</td>
<td>2,729,000</td>
</tr>
<tr>
<td>2017</td>
<td>2,148,000</td>
</tr>
<tr>
<td>2018</td>
<td>3,279,039</td>
</tr>
</tbody>
</table>
1-1 Sustainable Development Strategy and Organization  
1-2 Communication with Stakeholders

42 SUSTAINABILITY TOPICS  
COLLECT SUSTAINABILITY TOPICS  
Adopt the GRI sustainability reporting standards, ISO 26000  
social responsibility standard guidelines, UN Global Compact  
and domestic and international sustainability assessments as  
basis for topics.

492 COPIES OF QUESTIONNAIRES  
Conduct questionnaire surveys to determine the degree of  
stakeholder concern over the various types of sustainability  
topics so that stakeholders can express their needs.

34 UMC REPORT TASK GROUP MEMBERS  
The Sustainability Report Group analyzes the impact of topics  
on company operations sustainability, and screens for  
materiality topics.

14 MATERIAL TOPICS  
Multiply the score for degree of stakeholder concern over each  
topic and the score for its significant economic, environmental,  
and social impacts. Rank topics for disclosure.

18 CATEGORIES OF SUSTAINABILITY TOPICS  
COMPILATE SUSTAINABILITY TOPICS  
Members of the Corporate Sustainability Committee Report  
Group compile and analyze topics.

34 KPI'S  
Set medium- and long-term management goals for each major  
material topic and conduct effectiveness reviews annually.
SUSTAINABLE DEVELOPMENT STRATEGY AND ORGANIZATION

1-1 COMMITMENT TO SUSTAINABILITY

UMC is committed to the philosophy of “employee care, environmental focus and public service,” and furthering sustainable development, corporate social responsibility and guiding society towards a positive cycle. UMC’s sustainable development is built on the vision of “creating a friendly global ecology where the new value is people orientation, co-existence with the environment and shared social prosperity.” “Customers, shareholders, employees, the environment and society” are the primary focus of the joint pursuit of sustainable growth.

Corporate Social Responsibility Principles

UMC’s Corporate Social Responsibility Principles are used as a reference and guiding rule for fulfilling the company’s corporate social responsibility (CSR), improving the economy, environment, and society, and achieving the goals of sustainable development.

The Corporate Sustainability Committee of UMC shall constantly review the development of relevant CSR guidelines and codes in Taiwan and other countries as well as changes to the business environment in order to review and improve upon the CSR system established in UMC and improve the performance of CSR activities.

Equal Emphasis on Core Competitiveness and Social Responsibility

Based on the four competitive advantages of “Independent R&D capability,” “Excellent manufacturing capability,” “Capable employees” and “Sound financial structure,” as well as the five business cultures of “customer orientation,” “integrity,” “innovation,” “accountability” and “efficiency” that have been deeply rooted in the company’s operations, UMC is able to maintain its position as an industry leader. Combining its competitive advantages, UMC also defines its corporate social responsibility and the three major directions based on its business culture:

**Vision**

Creating a friendly global ecology where the new value is people orientation, co-existence with the environment and shared social prosperity.

**Mission**

Company growth is built on green innovation and corporate social responsibility, and helping customers meet the challenges of sustainable development.

**Economic**

Continue to improve corporate governance

**Social**

Fulfill corporate social responsibilities

**Environment**

Dedicate itself to manufacturing green wafers

UMC CSR Roadmap

01 Corporate Sustainable Development
In its longstanding spirit of focus, cultivation and sustainability, UMC fulfills its corporate governance and corporate social responsibility.

UMC’s sustainable organizational structure includes the Board of Directors, the Corporate Operation Organization and the Corporate Sustainability Committee. From the co-president down through all general managers, UMC thoroughly implements its corporate sustainability policies from the top down, and an audit organization oversees the execution. The Board of Directors has set up the Remuneration Committee, Audit Committee and Capital Budget Committee, and also the Nomination Committee for evaluating the external performance of the Board of Directors. These committees aim to enhance operational supervision and transparency and ensure the interests of all shareholders. Corporate Operations Organization and Corporate Sustainability Committee also set up sub-committees to meet their respective needs and to jointly execute and practice sustainable commitments.

The President is a member of the Board of Directors, and simultaneously serves as the Chair of the Corporate Sustainability Committee.

Corporate Sustainability Committee

The Corporate Sustainability Committee of UMC was established in 2008 and serves as the highest ranking CSR organization in the company. The Committee is responsible for stipulating the direction and goals of CSR and sustainable development. Every 6 months, the Director and member of the Committee shall review the performance and target achievements of sub-committees. The Committee shall also provide annual reports to the Board of Directors on the performance and plans of CSR activities. The Sustainability Office of the Corporate Sustainability Committee will report the yearly CSR promotion results and plans to the committee board. The scope of the report will include the management and review of material issues in the area of economics, environment and society.

In 2018, the Corporate Sustainability Committee reported to and discussed with the Board of Directors important issues and countermeasures pertaining to legal compliance and climate change problems that stakeholders are concerned about.

High level executives such as the Chief Financial Officer and Chief Human Resource Officer form the core members of the committees. Vice Presidents, Assistant Vice Presidents and Senior Division Directors of the functional divisions within the Operations Organization serve as the administrators of the various committees.
The Corporate Sustainability Committee has seven functional committees: Corporate Governance Committee, Customer Relationship Management Committee, Supplier Management Committee, Innovation Technology Committee, Human Rights and Social Participation Committee, Environmental Committee and Green Manufacturing Committee.

Descriptions of Committee Functions

**Corporate Governance Committee**
Help strengthen the function of the Board and shareholder equity, integrate related regulations and policies of relevant departments, and help complete and implement the company’s internal control system to ensure information transparency and disclosure, and compliance with regulations.

**Supplier Management Committee**
To establish a protective environment and emphasize the obligation to society, labor rights, security and health while pursuing the goal of a continuously evolving supply chain, this sub-committee develops long-term partnerships with vendors for quality, cost leadership, delivery, service/ response, and sustainability.

**Human Rights and Social Participation Committee**
Responsible for protecting the basic rights of employees and promoting communication with outside communities and society. Integrate the UMC Cultural and Educational Foundation, and with focus on education, arts, sports, public service and environmental protection, strive to promote technological research and development cooperation, long-term educational assistance, arts and sports activities and other social welfare events.

**Customer Relationship Management Committee**
Refine customer service and quality control, improve service quality and customer satisfaction, and protect customer interests and relevant trade secrets.

**Innovation Technology Committee**
Promote green product research and development and innovations, and lead in cutting-edge green technology.

**Environmental Committee**
Promote company-wide environmental, safety and health, energy, water and greenhouse gas emission management. Establish sustainable supply chains and long-term partnerships with suppliers to enhance sustainable competitiveness.

**Green Manufacturing Committee**
Promote company-wide green processes, such as hazardous materials management and increases in resource productivity.

To maintain and effectively implement UMC’s corporate sustainability promises, UMC’s corporate sustainability committee will adjust the organizational structure in accordance with actual operating results.

**Operation Management Model**

- **Corporate Sustainability Committee**
  - Participant: Corporate Sustainability Committee
  - Management Content: Committee reviews, Operational progress of various functional committees, Review and approve goals and plans, review executive performance

- **Functional Committees**
  - Participant: Chief administrator, Functional committee administrators
  - Management Content: Develop key performance indicators (KPI) to quantify the execution of management performance, Implementation programs, Follow up implementation progress

- **Key Corporate Sustainability Projects**
  - Participant: Functional committee administrators, Members
  - Management Content: Follow up and review based on company project management system, Follow up progress, and present results to the Corporate Sustainability Committee for review

Depending on the communication results with stakeholders and other critical considerations, each functional committee will submit an annual promotion plan to the corporate sustainability committee every year for review and approval. Functional committees follow up and assess the progress of their respective annual plan during quarterly meetings. The Corporate Sustainability Committee follows up and reviews implementation performance every six months.
In 2018, the corporate sustainability committee proposed a total of 46 KPI items. All 46 items were implemented and completed by each and every department within UMC, achieving a completion rate of 100%.

For 2019, 45 KPI items in 5 categories were proposed by the corporate sustainability committee based on UMC’s operational goals and 11 of United Nation’s Sustainability Development Goals (UN SDGs).

**UMC’s Operational Goals**

- Focus on differentiating advanced manufacturing and development of specialty technologies to help customers succeed.
- Continue to strengthen manufacturing capabilities, shorten lead-time, and improve overall quality and productivity.
- Expand marketing and customer management to maintain the company’s leadership in foundry.
- Cultivate employee potential and responsibility, integrate the organization’s operational efficiency, and increase competitiveness in sustainable management.

**Direction**

- International trend/assessment integration
- Ensure completion of Green2020 Plan
- Strengthen the connection with subsidiary/supply chain/customers in terms of CS issues
- Strengthen employee’s CS cognition
- Cultivate volunteer work culture

### The main projects

**GLOBAL PARTNERSHIP**
- UMC 3R League: reduce, reuse, recycle; circular economy collaboration program
- UMC Eco Echo award

**CLIMATE ACTION**
- Greenhouse gas reduction and energy saving
- Green factories and buildings

**RESPONSIBLE CONSUMPTION AND PRODUCTION**
- Clean production promotion
- Green product
- Waste management

**SUSTAINABLE CITIES AND COMMUNITIES**
- Community service participation
- Spreading the Seeds of Hope plan
- Energy saving service team

**REDUCED INEQUALITIES**
- Promotion of UMC volunteer culture
- Ensure labor rights

**GOOD HEALTH AND WELL-BEING**
- Health and Safety Workplace

**QUALITY EDUCATION**
- Environmental Education and Green Concept Promotion
- Talent training
- Campus talent cultivation

**GENDER EQUALITY**
- Ensure labor rights

**CLEAN WATER AND SANITATION**
- Water resources management
- Process water saving
- Water pollution prevention and improvement

**AFFORDABLE AND CLEAN ENERGY**
- Green energy
- Energy resource productivity improvement plan

**INDUSTRY, INNOVATION AND INFRASTRUCTURE**
- Advanced technologies research and development
COMMUNICATION WITH STAKEHOLDERS

To maintain effective stakeholder communication, UMC formulated a management system for the identification of and communication with various stakeholders. This report and the UMC official website were used as a means of disclosing important information.

Principles for Communication with Stakeholders

- Active and timely disclosure
- Providing adequate amounts of information
- Providing suitable and a diverse selection of communication channels

Objectives

- Evaluate and understand the reasonable expectations and requirements of the stakeholders and providing appropriate responses to key corporate social responsibility (CSR) topics that the said stakeholders are concerned with.
- Consider all related CSR topics and analyze the potential impact that each topic may exert upon the environment, society, economy, and business operations.
- Employ a system-based mechanism to continuously review and enhance corporate sustainability.

1-2-1 MECHANISMS FOR STAKEHOLDER COMMUNICATION

- Identified major stakeholder topics and concerns
  Frequency: Annually
  - Integrated and coordinated by the Corporate Sustainability Committee

- Stakeholders communication plan and implementation
  Frequency: According to plan
  - Consultation and communication channels with stakeholders are established by respective sub-committees
  - Designated personnel to receive, record and reply to messages from stakeholders and to come up with appropriate responding measures.

- Assessment of stakeholder communication outcome
  Frequency: Bi-annually
  - Stakeholder communication outcome reported, and key topics reviewed and responded to the Corporate Sustainability Committee.

- Report major stakeholder concerns topics
  Frequency: Annually/Imaginary
  - Regularly report major communication topics to the Board of Directors.
  - Report specific events to the Board of Directors through extraordinary(irregular) meetings.

- Public disclosure
  Frequency: Annually
  - Annual financial reports, corporate social responsibility report, etc.
  - Press Releases
  - UMC official website
  (The Stakeholder Area was established for stakeholder inquiry)

- Press Releases
  Frequency: As Required

1-2-2 PROCEDURE FOR DEFINING REPORT CONTENT

Identify Stakeholders

The UMC referenced the nature of its businesses as well as the 5 key principles of AA1000 SES (Stakeholder Engagement Standard) to identify a total of 7 types of stakeholders.

5 Key Principles of AA1000 SES
- Dependency
- Responsibility
- Influence
- Diverse perspective
- Tension

Major Stakeholders of UMC

- CUSTOMERS
- EMPLOYEES
- SUPPLIERS
- GOVERNMENT AGENCIES
- INVESTORS
- MEDIA
- COMMUNITY/ NON-PROFIT ORGANIZATIONS
Sustainability Topics Identification, Communication and Review

Identifying sustainability topics considered to be relevant to UMC’s operations.

Step 1 Collect sustainability topics
Adopt the GRI sustainability reporting standards, ISO 26000 social responsibility standard guidelines, UN Global Compact and domestic and international sustainability assessments as basis for topics.

Step 2 Compile sustainability topics
Members of the Corporate Sustainability Committee Report Group compile and analyze topics.

Step 3 Survey stakeholders concerns
Conduct questionnaire surveys to determine the degree of stakeholder concern over the various types of sustainability topics so that stakeholders can express their needs.

Step 4 Analyze impact of topics on company operations
The Sustainability Report Group analyzes the impact of topics on company operations sustainability, and screens for materiality topics.

Step 5 Rank materiality topics
Multiply the score for degree of stakeholder concern over each topic and the score for its significant economic, environmental, and social impacts. Rank topics for disclosure.

Step 6 Discussion and review
- Following materiality analysis, the company discusses and decides on the disclosure ranking of sustainability topics.
- The Sustainability Committee shall conduct management review for material topics related to the economy, environment, and society.

Step 7 Management goals
Set medium- and long-term management goals for each major material topic and conduct effectiveness reviews annually.

Major Topic Identification and Management Disclosure

The topics about corporate social responsibility are wide. Based on the company’s materiality analysis results over the last three years, UMC adjusted the survey topics of sustainable development. In addition to sustainable development strategies, governance, risk management, and ethics and integrity already included in the company’s long-term management, UMC will continue to strive forward. Moreover, in 2018, UMC adjusted 42 topics to focus on 18 economic, environmental and social dimensions that are more closely related to the operations of UMC. Surveys and external consultation were used for identification and analysis.

A total of 14 major material topics were identified. In addition to meeting GRI standards by disclosing management guidelines and current practices in this report, long-term management objectives for 2025 have also been developed for each major material topic, totaling 37 key performance indicators.

Ranking the materiality analysis result of sustainability topics

<table>
<thead>
<tr>
<th>The top three material topics</th>
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</thead>
<tbody>
<tr>
<td>Innovation Management</td>
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<tr>
<td>Greenhouse Gas Emissions and Energy Use</td>
</tr>
<tr>
<td>Occupational health and safety</td>
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<tr>
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<tr>
<td>Economic Performance</td>
</tr>
<tr>
<td>Customer service and customer privacy</td>
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<tr>
<td>Procurement and supplier management</td>
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<tr>
<td>Anti-corruption and fair trade</td>
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<td>Water use</td>
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<td>Air pollutants</td>
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<tr>
<td>Waste</td>
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<tr>
<td>Industrial relations and human rights</td>
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<tr>
<td>Talent cultivation</td>
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<tr>
<td>Personnel recruitment and retention</td>
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<table>
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<th>Secondary topics</th>
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<tbody>
<tr>
<td>Product Management</td>
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<tr>
<td>Use of chemical products</td>
</tr>
<tr>
<td>Contribution to and participation in society</td>
</tr>
</tbody>
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<th>Other potential topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public policy</td>
</tr>
</tbody>
</table>

Note 1: Stakeholders scored differently in their degree of concern and influence for each topic (10 points = very concerned, 8 points = concerned, 6 points = somewhat concerned, 4 points = little concerned, 2 points = not concerned)

Note 2: UMC Sustainability Report Group member score for impact of each topic on economic, environmental, & social impacts (5 points = highly impacted, 4 points = impacted, 3 points = moderately impacted, 2 points = not very impacted, 1 point = not impacted)

Note 3: Impact factors includes six dimensions, namely revenue, cost, brand image, environmental impact, customer satisfaction and employee sense of coherence.
### The top three material topics related to UMC

#### Continuous Innovation

**Importance:** Continuous innovation can strengthen UMC's core competitiveness and fulfill sustainable development.

- **Goals for 2020**
  - Complete development of 4 green technology platforms.
  - Complete 3 green chemical developments.
  - Obtain more than 200 patent applications worldwide each year.
  - Achieve 56% in eco-products.

- **Goals for 2025**
  - Obtain more than 20,000 patent applications worldwide.
  - Achieve more than 14,000 patents worldwide.
  - Achieve 60% in eco-products.

#### Greenhouse Gas Emissions and Energy Use

**Importance:** Good greenhouse gas emissions and energy management can improve operational performance and reduce environmental burden.

- **Goals for 2020**
  - Reduce fluorinated greenhouse gas (F-GHG) emissions per unit of product by 36% compared to 2010.
  - Reduce electricity consumption per unit of product by 10% compared to 2015.

- **Goals for 2025**
  - 30% absolute reduction of fluorinated greenhouse gas (F-GHG) emissions compared to 2010.
  - Reduce total greenhouse gas emissions per unit of product by 5% compared to 2010.
  - Reduce Scope 1 greenhouse gas (Scope-1 GHG) emission by 40%.
  - Reduce fluorinated greenhouse gas (F-GHG) emissions per unit of product by 55%.
  - Reduce electricity consumption per unit of product by 15% compared to 2015.

#### Occupational Health and Safety

**Importance:** Maintaining employee safety and health and providing a good working environment for employees is UMC’s basic responsibility.

- **Goals for 2020**
  - Reduce number of incidents by 67% compared to 2011.
  - Perform better than the 3-year average Disabling Frequency Rate (FR) and Disabling Severity Rate (SR) for semiconductor manufacturing.

- **Goals for 2025**
  - Reduce number of incidents by 88% compared to 2011.
  - Perform better than the 3-year average Disabling Frequency Rate (FR) and Disabling Severity Rate (SR) for semiconductor manufacturing and reduce by 25% compared to 2020 goal.

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Note: Please refer to UMC’s website for details on mid and long-term goals/management indicators for 2020 and 2025.

http://www.umc.com/English/CSR/En_6_copy.asp
### Material Topics - Economic Dimension

<table>
<thead>
<tr>
<th>Compliance with Regulations</th>
<th>Importance: Compliance with regulations is UMC’s basic principle for sustainable development.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violation of laws and regulations not only affects corporate image and goodwill, but also brings financial risk as a result of fines.</td>
<td>Through regular education and training, continue to strengthen supervisors’ and employees’ understanding and knowledge of professional ethics.</td>
</tr>
<tr>
<td>Maintain 0 cases of environmental, social and economic regulation violations.</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Economic Performance</th>
<th>Importance: Customer validation can enhance the competitiveness of the company and its customers, and is the key foundation for UMC’s long-term operation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating performance directly affects the company's cost and profitability.</td>
<td>Provide customers with competitive and superior foundry solutions to enhance company competitiveness, customer competitiveness and customer satisfaction.</td>
</tr>
<tr>
<td>Protect security of customer product information and intellectual property rights by increasing employee awareness of customer intellectual property rights, institutional soundness and systems soundness.</td>
<td>Maintain customer satisfaction at 85 points or more.</td>
</tr>
<tr>
<td>100% completion rate in employee education and training on customer intellectual property protection.</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procurement and supplier management</th>
<th>Importance: UMC has numerous upstream and downstream suppliers. Cooperation with global partners can improve sustainability performance in the overall value chain.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A good supply chain can bring stable economic benefits by reducing the risk of operating disruption and impact of cost increase.</td>
<td>Establish a supply chain that protects the environment and values social responsibility, labor and human rights, safety, health and sustainable development. Build long-term partnerships with suppliers.</td>
</tr>
<tr>
<td>GOALS FOR 2020</td>
<td>Supplier Sustainability Management</td>
</tr>
<tr>
<td>I. Supply chain assessment/review/measurement mechanisms are in 100% compliance with the Responsible Business Alliance Code of Conduct (RBA).</td>
<td>Supplier Sustainability Management</td>
</tr>
<tr>
<td>II. 100% of new suppliers sign supplier ethics and code of conduct.</td>
<td>Supplier Sustainability Management</td>
</tr>
<tr>
<td>III. Maintain zero procurement of conflict minerals.</td>
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</tr>
<tr>
<td>IV. Conduct at least 3 sessions of global sustainability briefings for suppliers.</td>
<td>Supplier Sustainability Management</td>
</tr>
<tr>
<td>Establish supply chain risk maps and a real-time reporting mechanism.</td>
<td>Supplier Sustainability Management</td>
</tr>
<tr>
<td>In case of major disasters, supplier response time for starting stock preparation mechanism is expected to decrease by 75%.</td>
<td>Supplier Sustainability Management</td>
</tr>
<tr>
<td>Establish the 3R (Reduce, Reuse, Recycle) DNA in local vendors. Lead suppliers to save energy and reduce carbon emissions, reducing supply chain carbon consumption by 350,000 tons.</td>
<td>Supplier Sustainability Management</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anti-corruption and fair trade</th>
<th>Importance: Integrity management is the operational foundation for building UMC’s sustainable development.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishing good business practices and ethics can ensure UMC’s sustainable operation by avoiding operational risks caused by illegal or illegitimate benefit funneling.</td>
<td>Through regular education and training, continue to strengthen supervisors’ and employees’ understanding and knowledge of professional ethics.</td>
</tr>
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<td>GOALS FOR 2020</td>
<td>Supplier Sustainability Management</td>
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Material Topics - Environmental Dimension

<table>
<thead>
<tr>
<th>Business Impact</th>
<th>Business Strategies</th>
<th>Long-Term Target / KPI(Summary)</th>
<th>GRI Topic Category</th>
<th>Performance in 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water use</td>
<td>Importance: Water is basic to semiconductor production. Effective water resources management can enhance competitiveness.</td>
<td><strong>GOALS FOR 2020</strong></td>
<td>- Introduce water risk management system, develop and adopt diversified water sources. Promote water conservation and maximize water efficiency.</td>
<td>303 Water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Reduce water consumption per unit of product by 10% compared to 2015.</td>
<td></td>
<td>3-3 Water Risk Management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Improve action efficiency and save UPW by 0.3%/year.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>GOALS FOR 2025</strong></td>
<td>- Reduce water consumption per unit of product by 15% compared to 2015.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Improve action efficiency and save UPW by 0.2%/year.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lack of water caused by climate change will increase operating costs, and water restrictions will directly affect production and revenue.</td>
<td>- Introduce and develop eco-friendly technologies to strengthen source reduction and prevent pollution.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Continue to ensure volatile organic gas reduction rate is&gt;92%.</td>
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</tbody>
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Air pollutants
Importance: Good air pollutant emissions management can prevent regulation violations and also enhance corporate image.

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</thead>
<tbody>
<tr>
<td>Waste</td>
<td>Importance: Reducing environmental load at all stages of a product life cycle is an important goal in UMC’s environmental protection promotion.</td>
<td><strong>GOALS FOR 2020</strong></td>
<td>- Improve process technology and source management measures to reduce raw material use and waste output. Cooperate with global operating partners to recycle and reuse waste resources.</td>
<td>306 Effluents and Waste</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Reduce waste per unit of product by 10% compared to 2015.</td>
<td></td>
<td>3-4 Waste Management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Landfill rate of less than 1%.</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Greater than 98% recycling for liquid waste.</td>
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<tr>
<td></td>
<td></td>
<td>- 100% resource recycling for acid-based liquid waste.</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Proper waste management can reduce waste generation and related costs, create revenue value and reduce the environmental impact of operations.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>GOALS FOR 2025</strong></td>
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Material Topics - Social Dimension

### Industrial relations and human rights

**Importance:** Protecting the basic rights and interests of employees and providing a harmonious working atmosphere is UMC’s responsibility.

- **GOALS FOR 2020**
  - 70% coverage in employee engagement surveys.
  - Continue to ensure fair treatment of employees and compliance with laws and regulations.
- **GOALS FOR 2025**
  - 80% coverage in employee engagement surveys.
  - Continue to ensure fair treatment of employees and compliance with laws and regulations.

### Talent cultivation

**Importance:** UMC regards its employees as the most important partners.

- **GOALS FOR 2020**
  - 100% completion rate in improvement programs for low-performance employees.
  - 95% completion rate in annual training programs.
- **GOALS FOR 2025**
  - 100% completion rate in improvement programs for low-performance employees.
  - 100% completion rate in annual training programs.

### Personnel recruitment and retention

**Importance:** Attracting and retaining outstanding employees can improve UMC’s performance.

- **GOALS FOR 2020**
  - Provide comprehensive training program to attract and retain talent. Achieve retention rate of 91.3% for medium and high performing talents.
  - Scores of up to 70% in employee engagement surveys.
  - Improve quality and quantity of human resources supply, develop market competitiveness of talents, and achieve talent fit rate of 80%.
- **GOALS FOR 2025**
  - Provide comprehensive training program to attract and retain talent. Achieve retention rate of 91.5% for medium and high performing talents.
  - Scores of up to 75% in employee engagement surveys.
  - Improve quality and quantity of human resources supply, develop market competitiveness of talents, and achieve talent fit rate of 85%.

Note: Please refer to UMC’s website for details on mid and long-term goals/management indicators for 2020 and 2025.
http://www.umc.com/English/CSR/c_6_copy.asp
Secondary and Other Topics

A total of 3 secondary topics were identified in 2018, which will be highlighted in this report with reference to the GRI topic category. No special response has been made to any remaining general topics.

Special Topics and Expectations

In addition, based on the outcome of the open survey questionnaires and this year’s communication results (excluding the above mentioned topic), stakeholders believe that plastic waste reduction and control, social enterprise support, eco-efficiency and circular economy, and air pollution (PM2.5) are important topics for UMC to further discuss and exert its corporate influence in the sustainable development of the overall society.

- **Current status**
  - UMC’s processes do not use or produce plastic and plastic waste. Only a small amount of plastic waste comes from packaging materials and employee meals. Currently, these are sorted and turned over to a certified removal/treatment and reuse agency for disposal.

- **Responding measures**
  - Compile a special report on plastic hazards through the company’s Safety Committee.
  - Strengthen employee awareness on plastic hazards and incorporate into company-wide education. Gradually change employee habits, and set an example by reducing the generation of waste plastics.
  - In 2018, UMC promoted disposable tableware reduction in the company’s food service, conference rooms and convenience stores to reduce the amount of plastic products used.

- **Current status**
  - UMC is not a social enterprise, but like social enterprises, it is a company that continuously reciprocates society with its achievements. Over the years, UMC has responded to domestic and international trends to actively promote green procurement. However, it does not have a focus in its support of and cooperation with social enterprises.

- **Responding measures**
  - Taiwan's model social enterprise company, Dialogue in the Dark, was invited to give a special speech to enhance employee understanding of social enterprises.
  - In 2018, UMC cooperated with several social enterprises in Taiwan to organize Green Festival and Green Market activities at UMC where employees can purchase social enterprise products.

- **Current status**
  - “Zero Waste” is UMC’s ultimate goal in waste management. In addition, waste total volume reduction and waste reutilization are the strategies taken by UMC. By implementing source management measures such as process improvement and raw material reduction, the amount of waste generated can be reduced, achieving the goal of waste volume reduction.

- **Responding measures**
  - A special project was established to promote a circular economy within the organization. The goal is to convert waste that costs money for treatment into products that can be sold for money.
  - The UMC 3R League will be promoted to expand the collaboration with suppliers in terms of a circular economy.

- **Current status**
  - UMC currently uses only natural gas and low-sulfur diesel as fuel. High performance preventive treatment facilities were also deployed to treat waste gases that include acidic exhaust, basic exhaust, and volatile organic compounds (VOC) exhaust in order to reduce the amount of pollutants entering the atmosphere and ensure that the levels of pollutants in emitted gases are complaint to (or lower than) the limits imposed by the environment protection laws.

- **Responding measures**
  - The company-wide Safety Committee was charged with providing PM2.5 topic reports. Employees in various departments were also given reminders and instructions on how to protect their personal health.
  - Employee cognition on PM2.5 will be strengthened. Knowledge about PM2.5 will be incorporated into factory’s environmental education program.
  - Voluntary measurement on PM2.5 was taken in the demonstration factory. The result showed low PM2.5 concentration, implying no significant risk.
  - Further researched and evaluated the PM2.5 management strengthening measures for production and process exhaust treatment equipment.
Other Opinions and Expectations of Communications with Various Stakeholders

**ECONOMIC DIMENSION**

**Expectations of communication**

- Special attention should be paid to energy consumption. Power and water resources countermeasures should be in place to avoid conflicts with public interest.
- Make timely proposals to the government regarding the rational distribution of power and water resources; improve utilization efficiency and increase resource recycling and reuse.
- Process services should be oriented towards differentiation and diversification to increase competitiveness, such as innovative applications of biomedical wafers.
- Suggestions and expectations for investing more into advancing key talents and maintaining competitiveness.

**Feedback**

- Participate in organizations such as the Business Council for Sustainable Development of Taiwan, The Allied Association for Science Park Industries, and the Taiwan Semiconductor Industry Association and lead and promote activities relevant to environment, safety, health, and corporate sustainability. Serve as a representative in providing advice to advocate sound formulation and development of CSR policies by government and academic institutions.
- Strengthens governance of subsidiaries as well as CSR evaluation of the supply chain; organize sharing and exchange of relevant experiences.
- Promote cooperation between 3R League and suppliers, propose circular economy initiatives, and expand the influence of the value chain.
- Formulate mid and long-term management goals for 2025 to reduce environmental impact and improve the company’s competitiveness.

**ENVIRONMENTAL DIMENSION**

**Expectations of communication**

- Continue to expand involvement in the promotion of environmental conservation and resources.
- Allow more cross-industry participation and observation in the Eco Echo Award initiative to achieve more brilliant results.
- Continue to implement green procurement and green education, and fulfill the company’s corporate social responsibility by contributing to the earth’s preservation.
- Increase concern over relevant topics regarding ecological conservation charity activities.
- Assess publicly disclosed environmental impact from the lifecycle perspective.

**Feedback**

- Conduct Eco Echo Award Partnership briefings, expand the scope of UMC’s Eco Echo Award and increase the grant for excellent ecology conservation ideas to facilitate the promotion of green concepts. In 2018, total cash prize was increased to NT$3 million.
- Organize the Green Festival. Promote environmental protection mentality within the company, and set the annual growth target for green procurement. In 2018, UMC was awarded with the Green Procurement Award by the Environmental Protection Administration.
- Introduce true value assessment methods, conduct evaluation on the indicators of environmental impact and draft management countermeasures.

**SOCIAL DIMENSION**

**Expectations of communication**

- Continue to prioritize and increase employee benefits.
- Education takes time, and UMC expects to keep focusing on and supporting future society and education.
- Through ongoing education, provide a new wave of cultivation activities to inspire disadvantaged families to learn environmental protection technology.

**Feedback**

- In 2018, the Taiwan Labor Standards Act was revised and the number of national holidays was reduced from 19 days to 12 days. However, UMC continues to offer an additional 7 days of flexible special holidays.
- Actively surveys the remuneration adjustments of well-known domestic and foreign enterprises to ensure that the overall remuneration offered by the Company is competitive.
- Through the UMC Technology and Education Foundation, continue to establish and cultivate education in rural areas, and support and help youths in special circumstances.
- Collaborate with external parties through the UMC Fire Brigade and the Energy Saving Service Team and participate in social public welfare through core work competencies.
Stakeholder communication method, key concerns and major outcome for 2018 are compiled as follows:

**Communication Method**

- **Employee**
  - President - employee forums, Secretary forums, Welfare committee meeting, Factory & Division meeting, Employer-employee meeting, Communication platforms
  - eUMC information website for employees, BBS message boards, sexual harassment complaint channel, mailbox for reporting fraud or professional ethics violation, e-suggestion and feedback platform, platform, confidential complaint system, 12885ER help hotline
  - My UMC website, UMC CSR Newsletter
  - Employee satisfaction survey on benefits measures, service satisfaction survey, HR satisfaction surveys, employee recognition survey

- **Customer**
  - Online Service Platform
  - Regular communication and discussion meetings
  - Questionnaire response
  - On-site audit and discussion
  - Voice of Customer (VOC) instant customer online complaint system
  - Customer satisfaction monitoring

- **Investor**
  - General Shareholders:
    - Annual general shareholder meeting
    - Quarterly investor conferences
    - Financial reports
  - Corporate shareholders:
    - Quarterly domestic and overseas investor conferences
    - Domestic and overseas seminars for investing institutions

**Key Concern**

- **Employee**
  - Personnel recruitment and retention
  - Industrial relations and human rights
  - Customer service and customer privacy

- **Customer**
  - Customer service and Customer privacy
  - Compliance with regulations
  - Product Management

- **Investor**
  - Customer service and Customer privacy
  - Air pollutants and Greenhouse Gas Emissions
  - Compliance with regulations

**Key Stakeholder Communication Outcome in 2018**

- **Employee**
  - Continue to promote a comprehensive personnel health management program, which will be focusing on the three aspects of safe working environment, employee health protection and work-life balance.
  - Introduced employee work engagement surveys in 2018 to better understand the real needs of employees and their willingness to remain in their employment.
  - Continue to implement industrial salary surveys and provide competitive performance-based and differentiated remuneration and welfare systems (that include rewards, bonuses, and shares).
  - Continue to enhance the UMC Ice-cream APP welfare information platform to improve accessibility to employee benefits and discounts.
  - Strengthen communication of business strategies and directives and to continue the provision of up-to-date information of corporate performance. A total of 152 communication meetings were held in 2018.
  - The e-suggestion opinion feedback platform received 481 opinions from various employees in 2018; all cases (100%) have been closed.
  - Strengthen the RBA Committee; continue to promote and respect international code and standards of laborers as well as human rights.
  - Conducted sharing activities on sustainability themes to strengthen employee perspectives.

- **Customer**
  - UMC established the "Enterprise Risk Management Committee" to collaborate with key organizations in the company's risk management and control to jointly examine and manage internal and external risks and prioritize risk response strategies for major risk issues across the company. UMC also established the "Corporate Security Division" responsible for the company's information security and physical security planning and related audit matters to further strengthen information security and protect customer assets.
  - Continuous customer services - provide a total of 76 BCM / BCP pieces of risk management data.
  - Continuous customer services - provide a total of 76 BCM / BCP pieces of risk management data.
  - Continued to invest in various semiconductor process R&D. Won numerous domestic and international patents in 2018. Currently, UMC has a total of 12,991 patents.

- **Investor**
  - Continue to hold stockholder’s meetings and seminars
  - Upload multimedia information of the financial and business report in the stockholders’ section of the UMC official website http://www.umc.com/English/Investors/e.asp
  - Participated in 7 seminars held by domestic and international investment institutions
  - Worked with the Financial Supervisory Commission (FSC) to complete corporate governance accreditation
### Supplier Communication Method
- Review reports or meetings
- Health and safety, and corporate social responsibility related management briefings.
- Questionnaires and audit visits
- Jointly implement ESH and corporate social responsibility program with suppliers

### Key Concern
- Compliance with regulations
- Customer service and customer privacy
- Anti-corruption and fair trade
- Industrial relations and human rights
- Occupational Health and Safety

### Key Stakeholder Communication Outcome in 2018
- Promote BCM management amongst suppliers; completed risk assessments for suppliers that constitute 95% of UMC purchases
- Implemented anti-corruption measures and promoted the signing of Agreement on Supplier Code of Ethics and Conduct
- Completed conflict mineral surveys for 2018
- Advocated the UMC 3R League. To promote recycling economy and waste reduction, 2 sharing sessions were organized in 2018 where suppliers were invited to share their experiences and 19 outstanding vendors were recognized.

### Communication Method
- Assigned a department for community communication
- Invite community residents to participate in the company’s Family Day activities
- Participate in community activities or seminars
- Participate in the operations of outside associations

### Key Concern
- Product Management
- Air pollutants and greenhouse gas emissions
- Water use
- Waste
- Contribution to and participation in society

### Key Stakeholder Communication Outcome in 2018
- Organized the 2018 UMC family day activity
- Volunteer work culture was promoted to provide volunteer work opportunities for minority groups. A total of 7,158.5 hours of volunteer work was conducted, which benefited more than 26,000 people (visits).
- Worked with the Society of Wilderness (SOW), an ecological conservation organization, to promote the Sauter's Frog (Ranasauteri) Habitat Conservation Project
- Organized the UMC Eco Echo Award program to offer grants to ecological conservation proposals, totaling more than 30,000 beneficiaries. Invited by Hakka Radio and Voice of Hakka to share the promotion content and experience.
- The UMC Energy Saving Service Team helped 6 organizations in energy saving, water saving and environmental safety improvement.

### Community/Non-profit Organization Communication Method
- Assigned a department for community communication
- Invite community residents to participate in the company’s Family Day activities
- Participate in community activities or seminars
- Participate in the operations of outside associations

### Key Stakeholder Communication Outcome in 2018
- Played the role of coordinator for the Science Industrial Park Union to discuss regularly related laws and regulations and to provide operation experiences and suggestions for draft.
- Participate in the Industrial GHG Voluntary Reduction Information Platform organized by the Industrial Development Bureau, Ministry of Economic Affairs to strengthen exchange on energy conservation and carbon reduction issues.
- The PFASs Evaluation Program and Green 2020 Program were promoted within the organization.
- Participated in the “Occupational Safety and Health and Risk Management Training Program” sponsored by the Hsinchu Science Park Administration Bureau of the Ministry of Science and Technology and provided relevant experiences.
- Serve as a committee member in the Occupational Safety and Health Administration's Taiwan’s Systems for Monitoring and Controlling Exposure to Occupational Improvement Project and provided experience.

### Key Concern
- Water use
- Air pollutants and greenhouse gas emissions
- Energy Use
- Use of chemical products
- Occupational Health and Safety

### Key Stakeholder Communication Outcome in 2018
- Participate in parks and Science Park Administration functional organizations for operations.
- Participate in public hearings and symposiums organized by governmental authorities

### Key Concern
- Economic performance
- Innovation management
- Personnel recruitment and retention
- Compliance with regulations
- Air pollutants and greenhouse gas emissions

### Key Stakeholder Communication Outcome in 2018
- Released 27 press articles on corporate governance and sustainability management
Summary of Outcomes from UMC Partnerships and Feedback

### Customer

Strengthen collaborative efforts for manufacturing processes and expand strategic partnerships
- UMC and Avalanche Technology Partner for MRAM Development and 28nm Production
- Allegro MicroSystems and UMC Sign Long-Term Foundry Agreement

Feedback
“We’re excited to team with a world leader in semiconductor manufacturing such as UMC to bring this outstanding technology to market.”

Petro Estakhri, CEO and co-founder of Avalanche Technology

### Community/Non-Profit Organization

**Community Service Project - “Spreading the Seeds of Hope”**
- Daisy Ho, UMC volunteer
- Hong-Ming Yan, Principal of Chenghjeng High School

Feedback
“We want to thank UMC for your long-standing care for society. The juvenile students at Chenghjeng High School have benefited from your Science and Culture Foundation, and I want to express appreciation on behalf of the students.”

### Supplier

Cooperation in Eco Echo Award Program
- Hwee Tong Lim, RVP & GM of Taiwan Operations Lam Research

Feedback
“Lam Research Corporation is a global supplier of innovative wafer fabrication equipment and services to the semiconductor industry. Our Core Values shape the way we define success in the marketplace as we create solutions for our customers, invest in our employees and incorporate environmental, social, and economic responsibility across our business. We strive to responsibly manage our environmental footprint in terms of energy, waste and water and support our customers in achieving their environmental goals.

In 2018, UMC invited Lam to support the Eco Echo Award, a program designed to recognize the most innovative ecological conservation proposals of the year and to encourage sustainable development of environmental organizations in Taiwan. We are privileged to participate in such meaningful environmental initiative and to promote green awareness, responsible environmental behavior and sustainable practices in the community.”

Chongjie Cheng, Executive Secretary of Wetlands Taiwan

Feedback
For more than a decade, the Wetlands Taiwan and the Maintenance Office, Public Works Bureau of Kaohsiung City have collaborated over the Jhouzai Wetland. Through our joint effort, the Jhouzai Wetland has become a very important habitat for the rare Pheasant-tailed Jacana, a Level 2 protected bird, and many other organisms in Kaohsiung City. In this year’s Eco Echo Award, we are fortunate to have the support of Dr. Lin, Chihao from the Academia Sinica and the Soundscapes Association of Taiwan. We also want to especially thank UMC, Global Views Monthly and many businesses for their support. Jhouzai Wetland has completed its first soundscape monitoring, and has promoted it to the Kaohsiung City public through numerous activities. In the future, the Soundscape Association of Taiwan will continue to monitor and manage the Jhouzai Wetland ecology. We hope that more enterprises will join in the wetland conservation work in Taiwan.

The IUCN has announced that soundscape is the next generation of indicators for environmental health, making the development of sound monitoring imperative.

Chongjie Cheng, President of Wetlands Taiwan

Feedback
“Highlight Tech Corp. (IPO: 6208) is a vacuum system component expert. Its products have passed ISO 9001/ISO 14001/OHSAS 18001 certification. The company has a longstanding commitment to green production and upholds the core value of sustainable operation by promoting circular economy in its manufacturing process. In addition to achieving waste reduction, energy conservation, water conservation and hazardous materials management, Highlight Tech is also recognized by the UMC Triple R League. Through the effort of all its employees and cooperative partners, Highlight Tech expects to cultivate corporate social responsibility into the work and life of all employees, thereby fulfilling its corporate social responsibility and contributing to protecting the ecology of earth.”

Chwung-Shan Kou, President of Highlight Tech Corp.
UMC has developed 22nm process technology and its 28nm high performance compact low power process technology platform (HPCU+). With the same number of mask layers and compatible design criteria as 28nm, the performance of 22nm process technology has been enhanced by 10%, power consumption has been reduced by 20%, and area has been reduced by 10%.

Annual product manufacturing volume of approximately 7,108,000 in term of 8” wafer, with an annual increase rate of 4%.

37 suppliers participated in this cooperation platform, a total reduction of about 175,000 tons of CO₂e.

In 2018, UMC was awarded 423 domestic and foreign patents, totaling 12,991 patents to date.

More than 3000 suppliers joined UMC in committing to sustainable development.
Executive Summary

Establish effective corporate governance framework

Performance in 2018

The Corporate Sustainability Committee reported the promotional outcomes and plans to the Board.

- The performance of the board, sub-committees and individual board members were reviewed and evaluated according to the Rules for Performance Assessment of the Board of Directors.
- Engage an external evaluation institution to conduct evaluations of board performance.
- The 14th Board of Directors is elected according to the operation and system of the Nominating Committee.
- The 4th Audit Committee had been established by the independent members of the 14th Board of Directors.
- The 4th Remuneration Committee members had been decided by the 14th Board of Directors.
- The 2nd Nominating Committee members had been decided by the 14th Board of Directors.

Plans and Objectives for 2019

- The Corporate Sustainability Committee will meet regularly with the Board to report promotional outcomes and plans.
- The Nominating Committee selects and sets up the corporate governance officer and submits it to the board of directors for approval to strengthen competencies of the Board.
- The performance of the board, sub-committees and individual board members will be reviewed and evaluated annually according to the Rules for Performance Assessment of the Board of Directors.
- Build up the skill matrix of board members. Enhance the diversity policy for nomination and election of directors.
- Establish the standardized operating procedures for handling the requests of any board member.

Ensure shareholder equity, strengthen competencies of the Board

- The 2nd Nominating Committee had been decided by the 14th Board of Directors.

Enhance information transparency

- UMC was rated the top 5% of listed companies by the 4th Corporate Governance Evaluation Results in Taiwan.

Continue to promote the effectiveness of the Corporate Governance Evaluation.

The UMC Board of Directors, Audit Committee, Remuneration Committee, Capital Budget Committee and Nominating Committee conduct their duties according to the regulations of “Convention Rules for Meetings of Board of Directors,” “Audit Committee Charter,” “Compensation Committee Charter,” “Capital Budget Committee Charter” and “Nominating Committee Charter.” To implement corporate governance, enhance capability and review performance of the Board, UMC instituted the Rules for Performance Assessment of the Board of Directors to self-assess the performance of the Board, sub-committees and individual board members annually. The evaluation covers the following aspects such as awareness of the duties of directors, the degree of participation in the Company’s operations, understanding of the business and its risks, the improvement of policy decision quality, the composition and structure of the board of directors, the election and continuing professional development of directors, internal control and Audit Committee communications, oversight of the financial reporting process, oversight of the external audit function and so on. In 2018, the self-assessment of the Board of Directors, functional committees and individual board members concluded that the performance was “Excellent,” and the reports were submitted to the Nominating Committee and Board of Directors on March 6, 2019.

Furthermore, the Company’s board performance assessment is conducted by an external independent professional institution or a panel of external experts and scholars at least once every three years.

UMC engaged with Taiwan Corporate Governance Association to conduct an assessment of board performance and efficiency, and completed the evaluation on March 7, 2018. The assessment comprised of 8 scopes and 38 indicators including Composition, Direction, Authorization, Monitoring, Communication, Internal control, Risk management and Discipline of the Board, and was executed through online self-assessment and due diligence.

The report concluded that the discretion of the company's long-term strategy was incorporated into the composition of the Board, and the establishment of the Nominating Committee surpassed governmental regulations; the independent directors with diversified background were devoted to and were fully accountable with regard to their duties of direction and monitoring; the intensive communication between board members and management team ensured timely and sufficient information delivery, thus building an open and transparent culture for the Board. The report also provided recommendations on periodic assessment and human resource development for the company to enhance the efficiency of the Board.

In addition to the annual operational disclosure, the company has a corporate governance section on the UMC website so that stakeholders can easily access UMC corporate governance information to view its Corporate Governance Policy (URL: http://www.umc.com/english/investors/corp_gov.asp).
The UMC Board of Directors comprises of 9 members from different professional backgrounds, and is responsible for company operation and supervision. The diverse academic and industrial experiences of the Board members are an asset to corporate decision-making and long-term strategy planning. Currently, the Board has 4 seats for independent directors and two for outside directors. Two thirds of the director seats are filled by members of outside companies. As of 2018, the average tenure of all directors was 5.9 years. In 2018, a total of 8 board meetings were held; the average attendance rate was 97.14%, which was higher than 80%, the criterion for board performance assessment. The ratio of total remuneration for board directors to company after-tax net income was 4.33% in 2018.

**Board of Directors Structure**

The board was elected on June 12, 2018.

**Directors’ current position at UMC or other company is disclosed on Page 16~17 of the company’s annual report.**

**Policy for Nomination and Election of Directors**

To ensure a fair, just, and open election of directors, the nomination and election procedures of the company’s directors shall comply with the Company Act and all related laws and regulations. The organizational culture, business model and long-term development of UMC shall be taken into consideration to the composition of the Board members. The criteria established to ensure the diversity of the Board members shall include but not be limited to the following three dimensions:

<table>
<thead>
<tr>
<th>BASIC CRITERIA</th>
<th>PROFESSIONALISM</th>
<th>CORPORATE SUSTAINABILITY AND COMMUNAL PARTICIPATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>shared visions, gender, race, nationality, independence and culture etc.</td>
<td>educational background, professional skills and industry experience etc.</td>
<td>corporate governance, environmental sustainability, corporate social responsibility, legal compliance and human rights protection etc.</td>
</tr>
</tbody>
</table>

**UMC Board of Directors**

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Age</th>
<th>Attendance Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair of Board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stan Hung</td>
<td>Male</td>
<td>59</td>
<td>100%</td>
</tr>
<tr>
<td>Director</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jason S. Wang</td>
<td>Male</td>
<td>56</td>
<td>100%</td>
</tr>
<tr>
<td>SC Chien</td>
<td>Male</td>
<td>61</td>
<td>87.50%</td>
</tr>
<tr>
<td>Ting-Yu Lin</td>
<td>Male</td>
<td>57</td>
<td>87.50%</td>
</tr>
<tr>
<td>Capital Budget Committee member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chung Laung Liu</td>
<td>Male</td>
<td>85</td>
<td>100%</td>
</tr>
<tr>
<td>Independent Director</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheng-Li Huang</td>
<td>Male</td>
<td>70</td>
<td>100%</td>
</tr>
<tr>
<td>Wenyi Chu</td>
<td>Female</td>
<td>52</td>
<td>100%</td>
</tr>
<tr>
<td>Lih J. Chen</td>
<td>Male</td>
<td>73</td>
<td>100%</td>
</tr>
<tr>
<td>Jyuo-Min Shyu</td>
<td>Male</td>
<td>65</td>
<td>100%</td>
</tr>
</tbody>
</table>

http://www.umc.com/English/investors/Corp_Gov.asp
Principles for Avoiding Conflict of Interest in Management

Provisions for avoiding conflict of interest are stated in the company's Board Meeting Regulations and Audit Committee Regulations. Directors with vested interest in an agenda, personal or representing organizations should explain the key content of their interest at the meeting. Should that interest undermine company interest, the said directors are not permitted to participate in discussions or votes, must be excused from discussions and decisions, and must not vote on behalf of another director. The name, key content and excuse from participation are recorded in the minutes of the meeting.

The company has formulated the Ethical Corporate Management Best Practice Principles, the Procedure of Transaction with Related Parties, the Code of Ethics for Directors and Officers and the Employee Code of Conduct to avoid conflict of interests. In addition, employee code of conduct implementation is reported to the Audit Committee. Detailed regulations and information on disclosure are available on Stakeholder Engagement of the company website for stakeholder communication. The company has spokespersons and email for handling enquiries and input from various stakeholders.

The Board has 9 seats, of which 4 are occupied by independent directors. The various committees are composed of independent directors and outside directors, and members do not include members who also serve as administrative directors.

Board members are elected by shareholders according to regulations for Director Election during shareholder meetings, and in compliance with the Board of Directors Regulations and company constitution. Jurisdiction for each committee is based on organizational constitution, and committee members are nominated and approved by the Board.

The Board has 9 seats, of which 3 are occupied by members who also serve as administrative directors, namely the President and Chief Strategy Officer.

Each year, UMC arranges for its directors and managers to participate in economic, social and environmental courses in corporate sustainability. Continuing training courses for directors in 2018 is disclosed on pages 52–53 of the company’s annual report.

The Nominating Committee shall perform the duty to supervise the corporate governance system and its execution of the Company and its subsidiaries, in order to protect the interests of stakeholders.

Independent director Cheng-Li Huang, with research expertise of international accounting, green accounting and CSR, attended the Asian Pacific Conference on International Accounting Issues in 2009 and won the Vernon Zimmerman Best Paper Award with his paper on environmental accounting.

To implement corporate governance, enhance capability and review performance of the Board, UMC instituted the Board of Directors' Self-Assessment of Performance in 2015 to assess the performance of the Board annually, and the board performance assessment will be conducted by an external independent professional institution or a panel of external experts and scholars at least once every three years in order to enhance operational efficiency of the Board.

The report concluded that the discretion of the company’s long-term strategy was incorporated into the composition of the Board, and the establishment of the Nominating Committee surpassed governmental regulations; the independent directors with diversified background were devoted to and were fully accountable with regard to their duties of direction and monitoring; the intensive communication between board members and management team ensured timely and sufficient information delivery, thus building an open and transparent culture for the Board. The report also provided recommendations on periodic assessment and human resource development for the company to enhance the efficiency of the Board.

The company engaged with Taiwan Corporate Governance Association to conduct an assessment of board performance and efficiency, and completed the evaluation on March 7, 2018. The assessment comprised of 8 scopes and 38 indicators including Composition, Direction, Authorization, Monitoring, Communication, Internal control, Risk management and Discipline of the Board, and was executed through online self-assessment and due diligence.
The Capital Budget Committee comprises independent directors and outside directors to assist in the company’s long-term development strategy, financial planning and business performance. The committee discusses plan implementations, modifies and follows up on the company’s capital expenditure budget by auditing its cost-effectiveness and tracking its performance.

Effectiveness in 2018
The UMC Capital Budget Committee was established in October 2013. In 2018, the committee met 5 times, audited and approved capital budget expenses of NT $40,326 million.

The Nominating Committee comprises of independent directors to enhance the management mechanism and to improve corporate governance with the company’s sustainable development. The committee reviews the selection and performance assessment of directors and executives, and supervises the issues related to corporate governance.

Effectiveness in 2018
The UMC Nominating Committee was established in December 2017. The first meeting of the committee was convened in March 7, 2018 to review and to propose the candidate list of the directors to the Board, and also reviewed the company’s achievement on corporate sustainability, climate change, corporate governance and ethical management.

According to Regulations Governing the Appointment and Exercise of Powers by the Remuneration Committee of a Company Whose Stock is Listed on the Stock Exchange or Traded Over the Counter Act, UMC established the Remuneration Committee to strengthen corporate and risk management. In addition, to motivate and retain talent, the Committee reviews and supervises the remuneration system of the company’s directors and managers. The committee meets at least twice a year.

Effectiveness in 2018
In 2018, the committee convened meetings in March, July and October.

Please refer to the company’s annual report on page 57 for the actual attendance information.

UMC’s Audit Committee assists in performing its supervision functions. It is also responsible for tasks defined by the Company Act, Securities and Exchange Act and other relevant regulations. Since UMC is listed on the New York Stock Exchange (NYSE), it also has to comply with the U.S. regulations regarding foreign issuers. The UMC Audit Committee is comprised of all independent directors, with two financial experts. According to the terms and responsibilities stated in the company’s Audit Committee Regulations, the Audit Committee shall convene at least four regular meetings per year.

Effectiveness in 2018
In 2018, a total of six meetings were convened; the attendance rate was 100% and good communication channels with the company’s internal auditors, independent auditors and management were maintained.
Remuneration for Executives

Remunerations for UMC directors (including independent directors), presidents and vice presidents include salary, performance bonus, pensions, etc., and will be disclosed regularly in UMC’s annual report. To ensure the steady operating growth and breakthrough innovative power for the company, the compensations for UMC’s management team are primarily divided into two parts: fixed and variable. Furthermore, according to the responsibility and importance of the job, UMC provides fixed compensation, and to fully reflect individual and team performance, UMC provides variable compensation like performance bonus, retention sign-on, employee’s profit sharing bonus and stock options, and so on.

For motivation and talent retention purposes, performance evaluation and salary remuneration policies, system, standards and structure for directors and managers are determined and reviewed by the Remuneration Committee. The committee members include independent directors who can provide suggestions from an external perspective. The committee meets at least twice a year to review and ensure compensations remains competitive.

In addition, in order to promote ethics, honesty and professionalism, UMC established the “Code of Conduct.” UMC believes in being an integrated organization; every employee is obligated to strive for the extension of the company’s interests within legal limits and is responsible for preventing damages or loss of the company’s interests. The violators of the integrity rules will be inflicted, in proportion to the weight of the incident, with difference punishments, including withholding of performance cash award, year-end bonus and profit sharing bonus, demotion, removal from post, and even taking any legal actions. UMC expects all employees, especially Executive Level Managers, to be responsible for management and supervision, and strictly observe the “Code of Conduct” to ensure UMC’s sustainable growth and development.

Executive officers lead the company towards business goals and financial targets, which includes commitment to achieving key performance indicators, profitability, customer satisfaction, innovative product and technology research, development of sustainable environment and talent development and so on. Furthermore, UMC’s executive level managers also maintain high focus on and strong performance linkage with sustainable development indicators. We work diligently in economic, environmental and social development and innovation to create common harmony and prosperity for the corporation and society.

<table>
<thead>
<tr>
<th>TAIWAN</th>
<th>SINGAPORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio of maximum remuneration to median annual remuneration</td>
<td>10.07</td>
</tr>
<tr>
<td>Ratio of % increase in highest total annual remuneration to % increase in median total remuneration</td>
<td>0.61</td>
</tr>
</tbody>
</table>

Personnel with the highest remuneration showed no increase in total income (comparing 2018 with 2017).

In the 2018 UMC Annual General Meeting and First Extraordinary General Meeting, electronic voting accounted for 59.4% and 67.5% of total shares outstanding, and 68.8% and 82.1% of those attending the meeting, respectively. Investors may exercise their voting rights via direct electronic voting, thereby significantly reducing the difficulty of transportation and schedule conflict to attend shareholder meetings. Direct participation of shareholders in decision-making can reduce agency costs and risk, and increase the motivation of shareholders to exercise their voting right.

All admitted bills and motions during UMC shareholder meetings are discussed and voted by meeting attendees, and resulting shareholder support and vetoes for each bill are recorded so that shareholder opinions are fully reflected in the resolutions.

Following the global trend of Shareholder Activism, UMC legally accepted the motions of shareholders holding more than 1% of shares to the regular shareholders’ meeting. Given that activist shareholders pay more attention to financial performance, compensation schemes and corporate governance of the company, the sub-committee of the Board shall assist management with such issues. The Nominating Committee will be responsible to review shareholder’s proposals and to propose responses to the Board for discussion.
UMC has set up internal auditing under the direct jurisdiction of the Board for the following purpose and tasks:

**MAIN PURPOSE**

- Examine and evaluate the effectiveness of the internal control system.
- Evaluate the efficiency and effects of the business operation.
- Ensure reliability, timeliness, transparency and legal compliance of reports.
- Provide timely suggestions for improvement to ensure the sustainability and effective implementation of internal control tasks.

Since UMC is listed on the New York Stock Exchange (NYSE) and subject to US regulations for foreign issuers. Since 2006, UMC has complied with the SOX 404 Act and audited by the independent auditors annually. To date, the independent auditors have issued unqualified audit report for UMC’s internal control design and implementation performance.

**DUTIES AND RESPONSIBILITIES**

- Conduct an annual audit in accordance to the provisions of the Taiwan authorities and in the event of risks.
- Issue audit reports and track improvement.
- Regularly revise internal control system, audit implementation details and annual internal self-assessments.
- Communicate with independent directors, and report to the Audit Committee and Board of Directors.

Through annual internal control and self-assessment, UMC has also conducted a self-review of all fab, department and subsidiary operations, including compliance with laws and regulations, awareness of professional code of conduct and risk assessment. The design and implementation of internal control systems are also adjusted to achieve self-monitoring. In addition, based on the provisions of Taiwan and in the event of risks, the Audit Division has formulated audit plans for relevant reviews, and regularly reports results and follow-up improvements to the Audit Committee and the Board of Directors.

**How We Manage**

- By formulating a management code of practice
- By establishing a thoroughgoing corporate governance organization

**Purposes**

- The establishment of a corporate culture of ethical management and sound development

**Goals and Targets**

- All UMC employees should abide by the company’s ethical standards during their daily work and business operations in order to gain public trust and ensure the company’s sustainable growth and development.

**Relevant Principles**


**Applicable Entities**

- UMC
- HeJian Technology (Suzhou) Co., Ltd. and United Semiconductor (Xiamen) Co., Ltd., which are UMC subsidiaries selling and manufacturing integrated circuits.
UMC has developed relevant principles for all directors, managers and employees to enhance company and employee knowledge of conduct and professional ethics from the top down.

UMC expects all employees to comply with the company’s principles in their daily work and business execution to gain public confidence and ensure sustainable growth and development for the company. By promoting the UMC Code of Conduct (targets include company subsidiaries, joint ventures, suppliers, customers and others entities pertaining to UMC operation and development), it is hoped that joint efforts can be put into fulfilling corporate social responsibility and promoting balanced and sustainable economic, social and environmental development.

UMC encourages open communication with employees and third parties. Questions pertaining to ethical and legal conduct or unequal treatment in the workplace may be referred to the Human Resource Office or Employee Care Office for assistance, and reports may be filed to uncover, stop and prevent major misconduct or violation of government regulations.

UMC provides online self-testing and training courses to help employees clearly understand the concept of appropriate employee conduct. In addition, the employee code of conduct is posted on the company’s intranet for employee reference. Employees may refer relevant questions to the Human Resource Office for inquiry and assistance in implementing the code of conduct in their daily work and tasks. In 2018, 100% of employees completed and passed the online employee code of conduct training and self-testing course.

Through annual internal control and self-assessment, UMC has also conducted a self-review of all fab, department and subsidiary operations, including compliance with laws and regulations, awareness of professional code of conduct and risk assessment. The design and implementation of internal control systems are also adjusted to achieve self-monitoring. In addition, based on the provisions of Taiwan and in the event of risks, the Audit Division has formulated audit plans for relevant reviews, and regularly reports results and follow-up improvements to the Audit Committee and the Board of Directors.

### 2-1-6 LEGAL COMPLIANCE

UMC’s customers are located around the world, and its operations are distributed over several countries. To ensure that operations are in compliance with the laws and regulations of each country, thereby avoiding losses due to legal violations or avoiding profit loss due to fines, UMC has consistently paid close attention to all changes in policies or laws that might impact the company’s business or finances.

#### How We Manage

- By dedicating a legal department to serve as a legal platform to offer legal advice and assistance to each department.
- By arranging training programs and courses on legal compliance to familiarize employees with updated regulations.

#### Purposes

- Ensure that the company keeps its commitment to comply with the law to realize its core values of integrity and honesty

#### Goals and Targets

- Company employees carrying out their work should always adhere to the relevant laws and regulations.
- No major violation of Corporate Social Responsibility*

#### Relevant Principles


#### Applicable Entities

- UMC
- HeJian Technology (Suzhou) Co., Ltd. and United Semiconductor (Xiamen) Co., Ltd., which are UMC subsidiaries selling and manufacturing integrated circuits

N.B.: Refers to a single incident with a fine of more than NTD 1 million.
All UMC departments must comply with relevant laws and regulations. The company has a dedicated legal department serving as a legal platform to offer legal advice and assistance to each department. UMC and its employees are required to comply with relevant business laws and regulations. The company arranges training programs and courses on legal compliance to familiarize employees with updated regulations. Prompt updates allow employees to implement job regulations into their daily management, thereby ensuring that the company complies with the law.

**UMC Training Courses for Legal Compliance**

**Online Courses**
- Allow employees to learn at any time, and strengthen awareness of the latest laws, and offer online testing, review and correction of employees' legal knowledge. Other related online courses or tests include: Fair Trade Law (antitrust law), import and export control.

**Classroom Courses**
- Classroom instruction on important policy or statutes, including fair trade, insider trading, classified information protection, high-tech export controls, intellectual property protection and personal data protection are offered.

**Seminar Courses**
- Outside legal professionals and experts are invited to lecture on the latest legal trends and information, and exchange ideas.

**Outsourced Courses**
- Arrangements are made for legal staff to attend outside training to update their knowledge of amendments and latest news and details to ensure compliance with latest requirements.

Employees can obtain training course information and promotional information from the company’s internal intranet site. Information updates, internal reviews, regulation amendments and implementation ensure our compliance with legal standards.

### Examples of UMC Legal Compliance:

#### PERSONAL DATA PROTECTION LAW
In response to Taiwan’s newly issued Personal Data Protection Act, Taiwan’s UMC inventoried its personal data on file and established appropriate information protection mechanisms to prevent information theft, tampering, damage, loss or disclosure. Regular education and training enhanced the basic knowledge of employees to help them understand the restrictions for handling personal data, restrictions on storing personal data, alert and reporting mechanisms.

#### CLASSIFIED INFORMATION PROTECTION
UMC signed non-disclosure agreements with both its vendors and customers to require mutual protection of classified information. UMC has also set an internal system for classified information/data management so that customer information is handled by a designated unit to avoid inappropriate disclosure.

#### INTELLECTUAL PROPERTY RIGHTS
Courses on intellectual property protection laws and regulations are provided to new employees, and in 2018, a total of 1,333 employees were trained.

#### TRADE SECRET PROTECTION
In 2017, UMC was accused by Micron corporation, alleging that its business secrets were infringed. UMC has denied this in its press releases, and the matter is currently in litigation. Prior to this, every employee of the company had trained to protect business secrets during the training of newcomers. To this end, in response to the protection of business secrets, the company specifically asked employees to refresh such training. As of the end of February 2019, 8,650 people had received training courses. In addition, a new course was introduced on basic legal and risk awareness of foreign documents to improve employees’ risk management awareness of foreign documents, and then to avoid the violation of other people’s business secrets. Currently, 9,923 people have received this training.

#### FAIR TRADE LAW
In 2011, UMC formulated and announced its fair trade policy, and required employee compliance. The company also conducted education and training for its directors and employees to prevent legal violation. Every year, additional training courses will also be held for new employees who have not attended the educational training program, hoping that all employees will have a basic knowledge about the fair trade policy.

#### HIGH TECHNOLOGY EXPORT CONTROL
To ensure that UMC export controls meet international requirements, the company has long since implemented internal controls for review and feedback, and has simultaneously introduced the Internal Control Program (ICP) in Taiwan and Singapore. For overall control of the export process, the company requires customers to provide necessary information for a series of self-examination and screening from beginning Customer Inquiry to Order Processing to Shipping, and outlines clear control procedures to its various departments.

With government certification, UMC customers can now enjoy preferential export licensing and reduce operation time.

#### CONFLICT MINERALS
In compliance with the US Securities and Exchange Commission, UMC confirmed in its August 22, 2012 Conflict Minerals Regulations Disclosure that its suppliers did not supply conflict minerals to the company. At the same time, in accordance with US Securities and Exchange Commission regulations, the company also submits an annual Special Report to the Commission.

#### FAIR TRADE LAW
In 2018, no penalty cases with regard to violation of company governance, anti-corruption, or fair trade were observed and no cases of insider trading from the management personnel were found. For other violations and fines amounting to less than NT$100,000, company employees that were involved were punished according to company rules and corrective improvement measures implemented. Please refer to the company’s annual report on page 92 for details.
End-user electronic products are becoming more functional, lightweight, energy saving and carbon reducing. In recent years, the incorporation of concepts such as artificial intelligence, deep learning and voice control have also influenced the direction of wafer design. Therefore, in view of factors such as functional integration, increased performance and low power consumption, chip design has become increasingly complex. Moreover, for production efficiency, semiconductor manufacturing technology must continue to miniaturize, and wafer surface area must increase in diameter. Hence, given these two major trends, the threshold for semiconductor manufacturing is increasing, and investment cost is rising rapidly. UMC continues to be involved in new research and development to strengthen corporate competitiveness and to help the company create profits.

**Future Business Opportunities in the Semiconductor Market**

The four types of traditional IC products are computers, communication, consumer and automotive. Electronic products are already more compact, save more power and are interconnected. For example, notebooks and tablets have longer operating times, and cell phones can be connected to laptops and tablets via wireless networks. In addition, significant improvement in the bandwidth of broadband networks has facilitated the combination of the Internet and smart TV. Through information reading, transmission and processing, objects are linked into a large network, and the many derivative breakthrough applications will result in huge business opportunities. In the future, key technologies in smart phones, wearable electronics, virtual reality / augmented reality, self-driving / electric vehicles, artificial intelligence / deep learning, voice controlled products and Internet of Everything are expected to be constantly adopted and commercialized. Hence wafer manufacturing services must develop corresponding processes and silicon intellectual property as soon as possible to meet the variety of customer needs in Internet of Everything applications.

**How We Manage**

- Through commitment to promoting the development of advanced production process technologies
- By paying attention to the arrangement and distribution of patents to protect technical intellectual property rights
- Through active independent research and development, and the establishment of proprietary technology

**Purposes**

- To uphold the philosophy that the customers’ needs come first, and to provide silicon wafer fabrication solutions that meet market trends and customer demand

**Goals and Targets**

- Effective expansion and control of costs, the development of product technologies, product structure improvement, and continued raising of profits

**Applicable Entities**

- UMC
- HeJian Technology (Suzhou) Co., Ltd. and United Semiconductor (Xiamen) Co., Ltd. which are UMC subsidiaries selling and manufacturing integrated circuits
- Customers
Innovative Products and Technologies

The UMC R&D team is committed to developing advanced manufacturing technology, and upholds the philosophy of offering foundry solutions that are consistent with market trends and customer needs, such as world class advanced manufacturing technology, customer support and production.

Innovative Development of Advanced Technologies

In the face of intense technological competition, besides significantly increasing its key technology capabilities, UMC is also focused on patent distribution to protect its intellectual property rights, and has seen steady growth in its number of patents.

In 2018, numerous domestic and foreign patents were awarded. To date, UMC has a total of 12,991 patents that provide our manufacturing process with comprehensive and powerful barriers to protect its intellectual property. To remain competitive, UMC has also significantly increased the patent quality of its key technologies, and continues to strengthen its customer service and competitive advantage, while generating profits for the corporation.

Total Number of Patents

<table>
<thead>
<tr>
<th>Year</th>
<th>Patents</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>10,797</td>
</tr>
<tr>
<td>2015</td>
<td>11,274</td>
</tr>
<tr>
<td>2016</td>
<td>11,963</td>
</tr>
<tr>
<td>2017</td>
<td>12,568</td>
</tr>
<tr>
<td>2018</td>
<td>12,991</td>
</tr>
</tbody>
</table>

Successful Development of Technology or Products in 2018

Successful development of 22nm ultra-low power (uLP) / ultra-low leakage (uLL) HK / MG process to provide customers chips with faster speed, better cost efficiency and improved power saving to meet future demands from IoT, automotive electronics, industrial electronics, and various wearable product applications.

UMC developed a new 14nm FinFET platform process (14FFC), with yield for the 128Mb SRAM on this process having reached industry competitive levels. 14FCC also passed process and product reliability verification to officially enter the pilot production stage for customer chips.

UMC partnered with the leader in next generation STT-MRAM, USA-based Avalanche, to jointly develop and produce MRAM.
2018 Environmental and Social Benefit R&D Progress

In addition to continuing to develop technologies that reduce power consumption, UMC also develops processes for energy management, body sensor and medical, mobile communications, imaging sensors and displays to reduce the environmental impact of end product use, promote social communication and enable health care and safety.

**22NM ULTRA-LOW POWER / ULTRA-LOW LEAKAGE PROCESS TECHNOLOGY**

UMC has developed 22nm process technology and its 28nm high performance compact low power process technology platform (HPC′+). With the same number of mask layers and compatible design criteria as 28nm, the performance of 22nm process technology has been enhanced by 10%, power consumption has been reduced by 20%, and area has been reduced by 10%. Therefore, the cost competitiveness of 22nm technology has been greatly improved to provide customers with more process options. 22nm ultra-low power/ ultra-low leakage technologies are suitable for IoT, automotive electronics, industrial applications, and various wearable products that utilize analog, mixed signal, RF, and other relevant technologies. The introduction of 22nm by UMC has maximized the value of the company's 28nm process, with IP verification from 28nm directly converting to 22nm due to the use of compatible design specifications. UMC's 22 nm process is expected to be completed in the middle of 2019 and introduced to customers for pilot production.

**POWER MANAGEMENT PROCESS TECHNOLOGY**

As for the demands for various power management applications (PMIC), UMC's super high voltage (5V and 30V in coordination with 300V, 500V or 700V) processes have entered the mass production stage. This technology is suitable for special applications such as power charger, LED bulb, power amplifier, AC/DC converter, and motor driver and can meet industry demand for higher voltage and reduce the energy consumption during voltage conversion in order to save energy. As for customers with demands for highly integrated power management, UMC can provide a complete silicon IP platform compatible with the standard logic process, and various 0.5, 0.35, 0.25, 0.18, and 0.11 micron process technologies that integrate world-class, third generation low conduction resistance/high sustained voltage (5V~200V) devices that can be used for cell phone, tablet PC, appliance, vehicle applications, etc. UMC has also begun developing a BCD+NVM technology platform, and adopted a 12-inch 55nm copper process for PMIC as a complete SoC solution for green energy demands.

**MBEDDED MRAM**

For future market demands related to advanced IoT, automotive electronics, wearable products, and cloud applications, conventional embedded non-volatile flash memory based on eFlash is gradually showing an imbalance between cost and performance. In light of this, UMC invested in the R&D of eMRAM in 2018. For this R&D plan, UMC has integrated all existing machines in the company while drawing upon its mass production experience for previous generations of eFlash memory (55nm/40nm). It is expected that this technology can be incorporated into 28/22nm to be used by customers in 2021.

**DISPLAY DRIVER IC PROCESS TECHNOLOGY**

This technology includes displays for smart phones, portable telephones / personal digital assistants (PDAs), computer screens, touch screens, tablets, eBooks, televisions, digital cameras, car screens and wearable displays. UMC's High Voltage Technology has led the development of various voltages to meet the required specifications of various market applications.

**CMOS IMAGE SENSOR (CIS).**

For CMOS image sensor technology development, UMC's 65nm process has been verified to enter the mass production stage. The new processes, such as backside-illuminated sensor (BIS) and 55nm CIS process technologies, have entered the verification stage. This technology is expected to provide higher sensing resolution to meet product upgrade requirements.

**MICRO-ELECTROMECHANICAL SYSTEMS**

With the rising popularity of MEMS sensor applications, the demand for CMOS-MEMS pure-play foundry service has also increased. UMC's MEMS microphone process platform can help many customers shorten their design process flow. UMCs total shipments for MEMS microphone products in 2018 exceeded 400 million units.
Industry Specific Key Performance Indicators in 2018

**Profitability**

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on assets</td>
<td>2.73%</td>
<td>3.21%</td>
<td>2.47%</td>
</tr>
<tr>
<td>Return on equity</td>
<td>3.75%</td>
<td>4.48%</td>
<td>3.37%</td>
</tr>
<tr>
<td>Pre-tax income to paid-in capital</td>
<td>7.14%</td>
<td>8.26%</td>
<td>5.00%</td>
</tr>
<tr>
<td>Net profit margin</td>
<td>6.13%</td>
<td>7.28%</td>
<td>5.32%</td>
</tr>
<tr>
<td>Earnings per share</td>
<td>0.68</td>
<td>0.79</td>
<td>0.58</td>
</tr>
</tbody>
</table>

**Continual Growth in Advanced Processes**

In recent years, UMC has continued to invest in advanced process and R&D equipment. The benefits generated in 2018 are as follows:

- **Proportion of advanced process capacity for 40nm or below has reached 35%**
- **Compared to the previous year, the proportion of advanced manufacturing capacity for 28nm or below has increased by 13%**

**Operating Revenues** (in NT$10 millions)

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Revenues</td>
<td>12,062</td>
<td>13,069</td>
<td>13,559</td>
<td>13,218</td>
<td>13,283</td>
</tr>
</tbody>
</table>

**Total Assets** (in NT$10 millions)

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Assets</td>
<td>29,785</td>
<td>32,580</td>
<td>32,705</td>
<td>32,199</td>
<td>29,919</td>
</tr>
</tbody>
</table>

**Total equity** (in NT$10 millions)

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total equity</td>
<td>22,116</td>
<td>22,679</td>
<td>21,658</td>
<td>21,308</td>
<td>20,607</td>
</tr>
</tbody>
</table>

Note: The above entity financial information is based on the Executive Yuan Financial Supervisory Commission approved international financial reporting guidelines. For consolidated information, please refer to page 184 of the company’s 2018 Annual Report.
Income Tax (in NT$10 millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Income Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>24</td>
</tr>
<tr>
<td>2015</td>
<td>215</td>
</tr>
<tr>
<td>2016</td>
<td>192</td>
</tr>
<tr>
<td>2017</td>
<td>136</td>
</tr>
<tr>
<td>2018</td>
<td>57</td>
</tr>
</tbody>
</table>

Employee Benefit Expenses (NT$1,000)

<table>
<thead>
<tr>
<th>Year</th>
<th>Salaries</th>
<th>Labor and health insurance</th>
<th>Pension</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>17,016,610</td>
<td>868,668</td>
<td>223,463</td>
<td>19,07</td>
</tr>
<tr>
<td>2015</td>
<td>18,051,386</td>
<td>920,758</td>
<td>266,713</td>
<td>20,252,910</td>
</tr>
<tr>
<td>2016</td>
<td>20,353,529</td>
<td>942,025</td>
<td>941,521</td>
<td>23,268,452</td>
</tr>
<tr>
<td>2017</td>
<td>22,082,431</td>
<td>956,617</td>
<td>1,113,765</td>
<td>25,353,529</td>
</tr>
<tr>
<td>2018</td>
<td>23,268,452</td>
<td>952,273</td>
<td>1,134,567</td>
<td>25,532,290</td>
</tr>
</tbody>
</table>

Marketing and Sales Overview

Being highly recognized by customers, UMC's customer base includes major vendors in different regions. Asia Pacific and North America account for most of the product sales, where respective total sales in 2018 were 50% and 38%, while Europe and Japan accounted for 12% of the company's total revenue. UMC will continue to strengthen cooperation with world class customers, and is committed to developing high level customer products to ensure long-term stable growth.

Export Ratio

- Asia Pacific: 50%
- North America: 38%
- Europe and Japan: 12%

2-2-3 Investment to Enhance Competitiveness

UMC's R&D team is committed to promoting the development of advanced manufacturing technology, and upholds the philosophy of foundry solutions that are consistent with market trends and customer needs, including world class advanced manufacturing technology, customer technical support and production. With the expansion of the Southern Taiwan Science Park, the company continues to employ a large number of R&D personnel, and spares no effort in recruiting and nurturing R&D talent.

China has the world's highest domestic demand for semiconductors, and recently, the Chinese government has supported the semiconductor industry through different approaches. Since 2015, UMC and its subsidiaries have a plan to invest about US$1.35 billion over the subsequent 5 years to better approach the market and meet the needs of local IC design industries. Capital was invested into United Semi's 12-inch fab in Xiamen according to this investment schedule to provide 28nm and 55nm wafer processing services and further the development of the Group.
Moreover, in recent years, energy conservation and carbon reduction have become important administrative goals in major advanced and developing countries to cope with energy shortage and the potential crisis of environmental changes. Therefore, UMC established the UMC New Business Investment Corp in 2009. Since then, through strategic investments, the company has channeled its existing technological talents and resources into solar energy, LED and other green industries. In addition, with the benefit of global growth in smart phone shipments and extensive construction of wireless communication stations by emerging markets, UMC continues to focus and invest in pure gallium arsenide wafer foundry service related industries. Recently, the solar energy and LED industries have undergone a round of industrial phase-out, reorganization and consolidation, but market conditions continue to slump. However, UMC will strive to increase the operational efficiency and reduce the costs of its new investments, and is committed to assisting its investment companies to grow and the parent company to profit.

R&D Expenses for the Past 5 Years

<table>
<thead>
<tr>
<th>Year</th>
<th>R&amp;D Expenses (in NT$10 millions)</th>
<th>R&amp;D expenses as a percentage of net operating revenues (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>1,304</td>
<td>10.81%</td>
</tr>
<tr>
<td>2015</td>
<td>1,164</td>
<td>8.90%</td>
</tr>
<tr>
<td>2016</td>
<td>1,261</td>
<td>9.30%</td>
</tr>
<tr>
<td>2017</td>
<td>1,214</td>
<td>9.18%</td>
</tr>
<tr>
<td>2018</td>
<td>1,113</td>
<td>8.38%</td>
</tr>
</tbody>
</table>

Note 1: The R&D expense is in accordance with the Executive Yuan Financial Supervisory Commission approved international financial reporting guidelines.

Note 2: The above information is UMC’s financial information. For consolidated information, please refer to page 122 of the company’s 2018 Annual Report.

2-2-4 MEASUREMENT AND EVALUATION OF TRUE VALUE

UMC considers issues of interests to stakeholders, and plans to evaluate the environmental and social externalities generated by the entire value chain in the course of operations in stages according to the types of issues and attributes. At the same time, UMC uses true value assessment methods developed by KPMG to monetize various external costs and impacts to enable companies to conduct comprehensive business opportunity evaluations and risk assessments. Subsequently, the company will step up and quantifiably manage the issues related to sustainability, making them important pieces of reference information when making relevant decisions.

Schematic Diagram of True Value Measurement and Evaluation Steps

Scope of Evaluation:

In the face of expanding global climate change and increasing shortages of energy and resources, UMC endeavors to give priority to evaluating significant environmental issues and indicators commonly used in industries. In the future, UMC plans to gradually expand into the assessment of other issues and indicators.
2. Aside from UMC, the scope of this evaluation includes upstream and downstream value chains; content and description of relevant indicators are shown in the table below.

### ENVIRONMENT
- **Greenhouse gas emissions**
  - Greenhouse gas emissions of scopes 1, 2, 3
  - Description of external factors: Carbon emissions have an additional social cost due to impact on agriculture, human health, and climate systems
- **Use of renewable energy**
  - Solar generated electricity
  - Description of external factors: Renewable energy can prevent the social costs incurred by carbon emissions
- **Use of water resources**
  - Amount of water used
  - Description of external factors: The extent of the lack of water resources reflects the social costs that we are required to pay
- **Recycled water**
  - 1. Amount of recovered condensed water and rainwater
  - 2. Amount of recycled water in the entire fab (manufacturing process/ equipment)
  - Description of external factors: Recycling of water can prevent the social costs of water consumption
- **Waste material handling**
  - Amount of waste materials landfilled and incinerated
  - Description of external factors: Air pollution emissions and bad odors from landfilled or incinerated waste materials result in additional social costs

### ECONOMY
- **Employee salary and benefits**
  - Salary, labor and health insurance, pension, and other employee benefits
  - Description of external factors: Salary and benefits are the labor costs incurred by the company in the process of creating economic value
- **Public expenditures**
  - Income tax paid, government subsidies related to asset acquisition
  - Description of external factors: Public expenditures paid by companies is one of the major sources of the country's infrastructure
- **Work injuries and accidents**
  - Direct company financial loss, financial loss of injured person, money given by the Bureau of Labor Insurance and insurance company
  - Description of external factors: Work accidents have corresponding social costs for employees, businesses and the society

### SOCIETY

### 2018 Project Implementation Outcome

1. In 2018, UMC implemented a special project to conduct the first assessment of various 2017 indicators. Analysis indicate that in 2017, overall external benefits increased by NT$13.1 billion compared to traditional financial performance, which is about a 24% increase.

2. Greenhouse gas emissions and use of water resources are still the most important external costs in the overall assessment. As UMC has continued to promote a number of GHG scope 1 and scope 2 reduction plans over the years, the external cost of scope 3 is greater than the costs of scopes 1 and 2. On the other hand, the impact of the use of water resources accounts for a significant proportion, which means, in addition to reduction done at the source, efforts can be made toward water recycling to reduce the overall impact.

### External Costs and Benefit Evaluation Results

<table>
<thead>
<tr>
<th>Description</th>
<th>2017</th>
<th>2018</th>
<th>YOY</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBITDA Employee benefits and expenditures</td>
<td>100%</td>
<td>+40%</td>
<td>+2%</td>
</tr>
<tr>
<td>Public expenditures</td>
<td>-</td>
<td>+6%</td>
<td>-7%</td>
</tr>
<tr>
<td>Work injury and accident</td>
<td>-</td>
<td>-16%</td>
<td>+10%</td>
</tr>
<tr>
<td>Greenhouse gas emissions of scope 1, 2</td>
<td>-</td>
<td>-</td>
<td>+24%</td>
</tr>
<tr>
<td>Renewable energy</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Greenhouse gas emissions of scope 3</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Water recycling</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Handling of waste materials</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>True value</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2018 Corporate Social Responsibility Report

**Positive Benefit**
- Employee benefits and expenditures (NT$1000)
  - 23,268,452
  - +5%
- Water recycling (M³)
  - 22,082,431
  - +2%

**Negative Impact**
- Greenhouse gas emissions of scope 1, 2 (t CO2e)
  - 1,980,524
  - +0.01%
- Greenhouse gas emissions of scope 3 (t CO2e)
  - 1,960,437
  - -1.3%
- Use of water resources (M³) Municipal water usage
  - 1,967,773
  - -11.3%

**Future Promotion Focus**

**Reduce negative impact**
- Actively carry out in-fab regenerative energy installation, list solar energy system as a new fab standard design and build project, and expand the promotion of greenhouse gas reduction plan, including reduction in major subsidiaries, procurement of green products, localization of procurement, and change of transportation methods, etc. to reduce overall greenhouse gas emissions.
- The company continues internal promotion of the Green 2020 program, to reduce power usage, greenhouse gas emissions.
- Promote the security mindset 4.0 program and reinforce the prevention and management of accidents.

**Promote increase of positive benefits**
- Through education, training and social participation, the company will expand the holding of the Eco Echo award program and support the Energy Saving Service Team as well as the Spreading the Seeds of Hope Project, creating social value.
- Promoting a circular economy – The 3R League plans to work with suppliers to Reuse, Recycle, and Reduce (waste material energy and resource reduction) and increase the value of the environmental aspect.

Note 1: For emissions and reductions of greenhouse gases and water resources, please refer to Chapter 3-2 on Carbon Asset Management as well as Chapter 3-3 on Water Risk Management.
Note 2: EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization)
Note 3: The impact of public expenditure, use of renewable energy, work injury and accident and waste disposal costs is less than (+/-) 3%
In the spirit of UMC’s philosophy of towards sustainable development, we believe sustainable economic development requires stability and growth in business performance, respect for customer feedback, customer demand, customer recognition and customer long-term support. While striving to strengthen operational performance, the company’s economic growth and business sustainability is facilitated by a virtuous cycle that can only be truly created by investing and giving back to society, so that mutual benefits can be realized.

UMC is a leader in the semiconductor foundry industry. It provides advanced process technology and foundry services, and is a major wafer manufacturer for various application products in the IC industry. UMC is committed to meeting customer product demand, and emphasizes customer orientation and professional support. The company thinks from the customers’ perspective, and based on their needs, provides a full range of services to achieve customer satisfaction and business sustainability.

The UMC intellectual property (IP) protection policy is based on the following three principles:

**INTEGRITY**
Uphold integrity toward self and customers.

**PARTNERSHIP**
Through respect and mutual support, maintain positive long-term partnership to ensure maximum success.

**COMMITMENT**
UMC is committed to ensuring the success of our partners, which marks our success in our objectives.

We carefully explain the UMC policy and principles on IP protection mentioned above to demonstrate our commitment to ensuring the important IP security of our customers. UMC is fully convinced that our philosophy of operation has not only helped us and our customers achieve today's growth and prosperity, but is also the best guarantee for achieving long-term success in the future.
UMC satisfies customer needs by helping manufacturers systematically develop, design and manufacture reliable and safe products that comply with international standards. In 2014, UMC began pushing for International Organization for Standardization (ISO 15408) certification. In addition, its Fab 12A fab was awarded ISO 15408 Level EAL6 safety certification by the Germany Federal Office for Information Security, becoming the first wafer foundry in Taiwan to win such a certification and possessing manufacturing conditions that comply with the ISO 15408 Common Criteria. In addition to the comprehensive increase in the security of company and customer assets, customers are not required to verify wafer fabrication safety in their future applications for product safety certification, thereby reducing their costs in time and resources, and accelerating their product entry into the market.

Protecting Customer Assets - Customer Property (physical + information + data) Confidentiality (diagram)

In addition, the IT department also received ISO 27001 certification and established a complete information security management system (ISMS). Through the process of certification, IT security policies and management procedures are implemented and employees' information security is improved. Furthermore, through regular reviews conducted on security KPIs and implementation of information security audits, UMC reduced the information security threat to the company from the technical and procedural aspects. The benefits achieved include strengthening internal security controls, enhancing the security, trust, and satisfaction of external customers' intellectual property rights, as well as reducing the customer's own repeated requests for UMC information security audits.

In 2018, UMC established the "Corporate Security Division," responsible for the company's information security and physical security planning and related audit matters, and working together with the "Information Technology Division" to further strengthen information security.

UMC’s information security policy is based on the guiding principle

- To establish Information Security Management rules in accordance to regulations and customer's requirement.
- To reach a consensus that information security is everyone's responsibility through full awareness.
- To protect information Confidentiality, Integrity, Availability for the Company and Customer.
- To provide a safe production environment to ensure sustainable operation of the company's business.

The major information security objectives are aimed at antivirus, anti-intrusion and anti-leakage through the building of multiple internal controls such as firewall, intrusion detection and antivirus systems to enhance the company's ability to defend against external attacks. Also, with the support of top management and through regular education and training programs, security operation/awareness is tightly involved and seamlessly integrated into every employee's daily work.
Since the beginning of its operations, UMC has been committed to customer satisfaction as its duty and long-term objective. This customer-centric mentality became the core value of the company. Customer-oriented products and services are our priorities, and overall solutions for fulfilling demands are based from a customer perspective. UMC has introduced the My UMC, My HJTC (reserved for HJTC customers) and MyUSC (reserved for USC customers) online service platforms to provide customers with complete and immediate online supply chain information, including production status of orders, shipping date inquiry, and product quality data and status. At the same time, the website also offers an Engineering Data Analysis feature which provides an easy engineering analysis function for customers. Moreover, the Voice of Customer (VOC) instant online complaint system allows customers to request UMC products or services, or offer comments or suggestions. Designated employees are responsible for distributing the feedback and managing and responding to customers, who may make online enquiries about the progress at any time. For UMC, understanding customer needs through the VOC, and transforming these requests into practical action enhance the company’s service quality and competitiveness, and ultimately achieves customer satisfaction.

UMC’s (including its subsidiaries HJTC and USC) utilization of scorecards to determine customer needs and satisfaction allows for more immediate knowledge of customer needs. In addition, UMC also responds to customer needs through meetings, and ensures that their needs receive proper attention. At the same time, the company lists product quality and timeliness as key indicators of the company’s internal performance to further enhance customer satisfaction and create a win-win business. Customer scorecard ratings show that customer satisfaction towards UMC (and its subsidiaries HJTC and USC) has been maintaining steady levels. At the same time, UMC's overall performance over the years has also received customer approval and awards, thereby indicating customer endorsement of UMC's product and service quality, and demonstrating the positive interaction and cooperation between UMC and its customers.

Customer Ratings

<table>
<thead>
<tr>
<th>Year</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>86.5</td>
</tr>
<tr>
<td>2015</td>
<td>86.4</td>
</tr>
<tr>
<td>2016</td>
<td>86.6</td>
</tr>
<tr>
<td>2017</td>
<td>86.9</td>
</tr>
<tr>
<td>2018</td>
<td>86.8</td>
</tr>
</tbody>
</table>
Risk and Crisis Management

The ultimate direction of UMC’s business operations is sustainable development, sound risk management and appropriate crisis management to ensure sustainable operations. To reduce accidents and their subsequent negative impact and losses, UMC is diligent in its crisis response, crisis prevention and drills in order to maintain its company image and protect the interests of stakeholders.

2-4-1 Risk Management Organization and System

Risk Management History

The Enterprise Risk Management (ERM) Committee was established in the second half of 2018 to strengthen the identification and management of critical risks. In 2019, based on the risk database co-developed with Mash Risk Consulting, the senior representatives of ERM organization will review and identify risk items, then evaluate the impact and draw the risk map. In addition, critical risks will be managed with high priority, and corresponding response strategies will be addressed, including the emerging risks that may occur in the next 3-5 years.

How We Manage

- Financial and Operational Risks Management
- Response to the new and global risks in the semiconductor industry
- Hazard Risk Control

Purposes

- With sustainable business as the ultimate focus of our operations, and using comprehensive risk management and timely crisis handling, the company actively implements crisis response, pre-crisis prevention, and disaster drills.

Goals and Targets

- Pursue sustainable business operations.
- Provide customers with wafer manufacturing that is diverse, uninterrupted, and of good quality.

Relevant Policy

- Business Continuity Management Policy.

Applicable Entities

- UMC
- HeJian Technology (Suzhou) Co., Ltd. and United Semiconductor (Xiamen) Co., Ltd., which are UMC subsidiaries selling and manufacturing integrated circuits.

Enterprise Risk Management Organization

The Enterprise Risk Management Committee coordinates key risk management departments within the company to jointly examine internal and external risks of the company, organize major risk issues and the responding action plans of the company, and discuss the results with the company’s operation management team to reach consensus in risk management goals and structure. In addition, risk management strategies are carried out and implemented, and the corresponding plans and implementation results are reported to the board of directors on a regular basis. Furthermore, internal audit and control are incorporated to ensure that the risks associated with operations are properly managed.
Establishment of Risk Management System

The Enterprise Risk Management Committee organized risk items that have been identified in categories such as strategy, operation, finance, hazard, etc., and evaluated the likelihood as well as the severity of their occurrences to determine their corresponding priority and risk level, and to adopt appropriate risk management plans. In addition, the Committee reviews the time-dependent possibility as well as the severity of risk occurrence regularly to ensure the effectiveness of risk management plans and related control measures.

2-4-2 FINANCIAL AND OPERATIONAL RISKS

Analysis of the impact to financial performance indicates the following financial risks for UMC:

LIQUIDITY RISK
The semiconductor industry requires intensive capital. If adequate cash cannot be maintained, the company may face liquidity risk for its short-term financial needs.

Risk Strategy
To continue operations in emergency situations, UMC maintains a cash reserve equivalent of about three months of operational revenue to cope with operational needs under various situations. In addition, UMC maintains cash balance and bank facilities of no less than the amount of monthly revenue to ensure liquidity.

CURRENCY INTEREST RATE RISK
Revenue and capital expenditure in the semiconductor industry is mainly calculated in currencies other than NT, and hence fluctuates with exchange rates. However, due to large exposure of deposits and loans in the semiconductor industry, changes in interest rates could result in deviations from expected financial performance.

Risk Strategy
UMC balances foreign currency assets and liabilities by natural hedging. In addition, appropriate management of debt period and fixed or floating interest rate structure reduces interest rate risk.

CREDIT RISK
Due to financial deterioration or other factors, customers may be unable to fulfill their contractual obligations, resulting in risk of loss from default.

Risk Strategy
UMC's Credit Management Department controls customer credit amount according to the company's credit policies and customers' financial conditions.

PROPERTY AND OPERATIONAL DISRUPTION RISK
Natural disasters or accidents may result in risk of property or operational loss.

Risk Strategy
UMC mitigates natural or man-made disaster risks through property damage and business interruption insurance policies. The insurance scheme balances risk management costs, insurance premiums and risk retention capacity.
Taiwan’s semiconductor industry growth outpaces the global average. Driven by factors such as advanced process technology R&D, peripheral equipment and material cluster effect and the characteristics of emerging markets, the competitive advantage and growth potential of Taiwan’s semiconductor industry is optimistic. Although the semiconductor market is expanding, the trend is expected to slow compared to the highly complex growth of past demand cycles. Moreover, the impact of Mainland China’s national support strategies for its semiconductor industry in recent years cannot be ignored.

UMC assessment of possible emerging risks and countermeasures in the semiconductor industry.

Risk Description
China and the USA are engaged in a trade war as each country continues to dispute tariffs placed on goods traded between them. In April 2018, USA filed a request for consultation to the WTO in regard to concerns that China was violating intellectual property rights. Because of the long-term trade deficit between the United States and China, and the US’s doubts about China’s invasion of intellectual property rights and trade secrets, coupled with China’s challenge to the US-led world political and economic order. This trade war should be difficult to end in the near future, and may even evolve into a long-lasting confrontation pattern.

Impact on Operations
It will impact UMC’s business or investment /cooperation project engaged with China companies due to US/China trade dispute

Countermeasures
- Besides cautiously facing business from USA and China, UMC also aggressively expands its business from Europe, Japan and other Asian countries.
- In response to business uncertainty for server, automotive and industrial applications that originally enjoyed high growth, UMC also tries to expand its opportunities in IoT, AI, etc.
- UMC has also suspended any large-scale investment /cooperation projects. For possible investment /cooperation projects in the future, UMC will maintain a more cautious attitude and action plan in order to protect intellectual property and national security and to have prior inquiry and avoidance.

Risk Description
UMC has received from time-to-time communications from third parties asserting that its technologies, its manufacturing processes, or the use of those semiconductors by its customers may infringe upon their patents or other intellectual property rights. These assertions have at times resulted in litigation by or against the Company. In the past decade, there has been a notable increase in the number of assertions made and lawsuits initiated by certain litigious, non-practicing entities and these litigious, non-practicing entities are also becoming more aggressive in their monetary demands and requests for court-issued injunctions.

Impact on Operations
Such lawsuits or assertions may increase UMC’s cost of doing business and pay huge fees in litigation cases and may potentially be extremely disruptive if these non-practicing entities succeed in blocking the trade of products and services offered by UMC. Such activities will also affect company revenue, delay new product development or harm company reputation.

Countermeasures
- Due to the high degree of competition in the semiconductor industry, patent technology is regarded as an important cornerstone. In the past decade, the number of lawsuits has grown exponentially. UMC acknowledges the importance of patent protection, so it is listed as an emerging risk of key management. UMC has taken related measures to minimize potential loss from intellectual property claims and litigation filed against the Company. These measures include: strategically obtaining licenses from certain semiconductors as needed; continued strength of its intellectual property portfolio; timely securing intellectual property rights for defensive and/or offensive protection of UMC technology and business; and collaboration of internal lawyers and external law consultants to aggressively defend against baseless litigation; and continuously strengthen the basic legal awareness of employees through training programs.

2-4-3 EMERGING SEMICONDUCTOR RISKS AND GLOBAL RISK TRENDS

As a link in the supply chain, UMC remains aware of both emerging industry risks and the trend in global risks. Based on the Global Risk Report released each year by the World Economic Forum (WEF), UMC discerns risk trends and formulates early countermeasures for reducing risks.

- **Extreme weather event**
  UMC Countermeasures
  Refer to 2-4-5 for disaster and risk control.

- **Natural catastrophes**
  UMC Countermeasures
  Refer to 2-4-5 for disaster and risk control.

- **Water crises**
  UMC Countermeasures
  - Establish UMC water risk management tools for early warning and develop coping strategies.
  - Strengthen Fab 12A flood control capacity, and complete the installation of flood gates and drills at specific entrances to prevent direct losses caused by floods.

- **Cyberattacks**
  UMC Countermeasures
  - Install online defensive systems such as NG IPS, Anti-APT and WAF, and the SIEM information security management system to strengthen defense capability against attacks.

- **Data fraud or theft**
  UMC Countermeasures
  - Install encryption mechanisms for computer systems to reduce the risk of information leak due to laptop loss or inappropriate use.
  - Install computer endpoint protection mechanisms for recording data output to reduce the risk of information leaks due to inappropriate use.

Refer to 2-4-5 for disaster and risk control.
With rising global risk, UMC recognizes the issue of business continuity, which means providing uninterrupted services to strategic customers and key relationships, and upholding customer diversity, sound quality and uninterrupted foundry manufacturing as the highest mission for business continuity management. Since 2002, UMC has established the Business Continuity Plan (BCP) for its fabs, and became a leader in the industry in 2013 when the Hsinchu headquarters and Fab 12A were awarded the ISO 22301 Business Continuity Management System Certificate by SGS Taiwan Ltd. Under such an operation and maintenance mechanism, continuous and sophisticated evaluation ensures that in the event of a disaster or impact, the highest operational goals can be fully maintained and recovered, thereby protecting the maximum interest of customers and stakeholders. At the 2018 BCMs manager reviewing meetings, the committee approved that 8-inch fabs should gradually upgrade their site-level BCP to the ISO 22301 BCM framework to enhance automotive customer’s confidence of the wafer fabrication supply chain’s stability. BCMs’ framework has been completely introduced into Fab 8A and 8E in 2018. Per the PDCA (Plan, Do, Check, Action) continuously improving and monitoring procedure, our customers’ confidence in emergency response and disaster recovery of UMC will be further improved.

UMC Business Continuity Management Organization

The UMC business continuity management system comprises of the Business Continuity Management executive representative who is responsible for promoting management matters. The executive director periodically reviews management performance and makes decisions on business continuity management policies1.

System Operation Goals

2018

- Develop BCMS framework for 8” fabs (two 8” fabs completed)
- Deploy Earthquake Early Warning System pilot for Fab 12A
- Establish supply chain risk map

2018 System Operation Goals: Achievements

- Introduced BCM framework into two 8-inch fabs (8A&8E) successfully. Exercise has been done and countermeasures were developed for top risk.
- Completed functional test between Earthquake Early Warning System (EEWS) and specific production tools.
- Achieved 100% production information collection of material suppliers and backup suppliers.

2019

- Enhance the information security index by 7%2
- Increase Furnace quartz inventory rate up to 88% for 8 inch Fabs&98% for Fab12A3
- No major deficiencies are found in the annual ISO 22301 BCMs third-party audit.

2020

- Identify crisis events that will have a major impact through the business continuity management system (ISO22301)
- All countermeasures are in place and drills conducted as planned.

Note1: Please refer to the Risk Management section of the company website for information on policies and organization. http://www.umc.com/English/CSR/index_1.asp
Note2: Increase score from 3.67 to 3.93 to meet well managed definition.
Note3: Backup inventory rate higher than the requirement of MBO (Minimum Business Continuity Objective).
2-4-5 HAZARD RISK CONTROL

UMC fully recognizes the impact and influence of natural and man-made disasters on production and operation. Hence the company has consistently adopted an active attitude toward preventive disaster risk management, and seeks to achieve the highest standard of semiconductor industrial safety through rigorous risk engineer controls and implementation of safety regulations and norms.

Disaster Risk Management Objectives

EQUIPMENT SAFETY
The Environmental Health and Safety Standards (SEMI-S2) for semiconductor manufacturing equipment is the primary international standard adopted by UMC for reviewing newly procured fab tools, and is the company standard. When introducing the Equipment ESH Purchasing Specifications into its procurement activities, equipment must conform to review standards before being brought into the fab and conform to inspection after installation for effective equipment safety control.

FIRE SAFETY
UMC incorporated the international standards of the US Factory Mutual Insurance Company (FM), Underwriters Laboratories Inc. (UL), the US National Fire Protection Association (NFPA), the Semiconductor Equipment and Materials International (SEMI) and other international standards into its building construction, equipment, engineering controls and risk assessment, and formulated relevant company regulations for additional requirements. UMC is the only one in the semiconductor industry company equipped with a professional fire brigade. In addition to government level fire trucks and rescue equipment, all firefighters perform professional fire disaster training regularly and possess the ability to rescue.

EARTHQUAKE PROTECTION
UMC actively plans and establishes sound disaster risk management and response procedures, and collaborates with internationally renowned structural consultants JENSEN HUGHES. At the beginning of the construction stage, earthquake-resistant requirements are integrated into the design concept of buildings, facilities, pipelines and production equipment. For those fabs built before 2000, continuous improvements are scheduled. The magnitude 6.6 Meinong earthquake hit Taiwan on 6 February 2016, with UMC’s Fab 12A in Tainan Science Park experiencing an intensity of around 6.0. However, the damage was less than peer companies, proving the effectiveness of the anti-seismic design in UMC. Furthermore, new anti-seismic techniques such as seismic isolation platforms for production equipment and Earthquake Early Warning System (EEWS) are imported to UMC to further ensure personnel safety and reduce the potential loss of process tools and auxiliary equipment.

Triple-Star Rating system
Since 1998, UMC has introduced the Triple-Star Rating System. The international insurance company AIG has been invited to conduct audits every year, thereby continuously upgrading risk protection levels to comply with UMC’s commitment of Highly Protected Risk to customers and the insurance market. The ratings of all UMC fabs are maintained at the highest score except for parts of old fabs. The major improvement plans in 2018 include: retrofitting of corrosive outdoor facilities and conducting flow tests for sprinkler heads that have been in service for more than 20 years to verify functionality.
UMC implements responsibility and sustainability, the key factors of corporate social responsibility, through the promotion of sustainable supply chain management. The core value of UMC’s sustainable supply chain is “Sustainability and Mutual-Development”. UMC pursues sustainable operation by partnering with its supply chain to achieve mutual growth. In addition to improving the value of the supply chain and building an upgraded green supply chain, we care more about creating positive influence and accelerating the development of sustainable supply chain management. The promotion and implementation of sustainable supply chain is the responsibility of the Supply Chain Management Committee which is under the Corporate Sustainability Committee. UMC requires its suppliers to follow related social responsibilities.
New Supplier Evaluation: UMC evaluates new suppliers rigorously and cautiously. Therefore, only suppliers with estimated annual transaction value greater than 1 million NTD are considered for sustainability evaluation.

The localization strategy is a key value for fulfilling corporate sustainable development and is a part of corporate social responsibility. Through local production, UMC also provided job opportunities and promoted local socio-economic development indirectly. UMC believes that a procurement with local suppliers, UMC hoped suppliers would provide services more efficiently, shorten delivery time and reduce carbon footprints of raw materials required.

Procurement localization became a key strategy adopted by UMC when looking for potential partners and suppliers. In addition to enhancing close partnerships with local suppliers, UMC hoped suppliers would provide services more efficiently, shorten delivery time and reduce carbon footprints of raw materials required through local production. UMC also provided job opportunities and promoted local socio-economic development indirectly. UMC believes that a procurement localization strategy is a key value for fulfilling corporate sustainable development and is a part of corporate social responsibility.

UMC's supplier management strategy: 2018 Supply Chain Risk

- Establish risk database
- Complete the supply chain risk database and earthquake spare parts (quartz, fragile parts) management process for 2000 key raw materials (covered around 100 suppliers).
- Completed the investigation of backup production fab of each supplier, and differentiation of risk type of all production areas.
- Furnace quarts preparation (To reach MOL 54%)
- Completed 87% earthquake spare parts preparation

Suppliers sustainability questionnaires and assessment percentage

- Complete ESG evaluation for raw material supplier from 100% of the procurement.
- Complete ESG evaluation for equipment and facility supplier from 80% of the procurement.
- Overall ESG evaluation for more than 600 suppliers.
- New suppliers' main evaluation criteria is based on estimated procurement amount above NTD one million, and suppliers who are highly related to environmental and manpower service.

Quantity of supplier sustainability (ESG) audit

- Complete ESG on-site audit for more than 120 suppliers
- Complete ESG on-site audit for 198 suppliers; 5 suppliers failed the ESG audit, and they will be monitored for improvement.

Quantity of supplier continual management (BCM) audit

- Complete the supplier BCM management promotion; performed the ongoing risk evaluation for suppliers that accounted for 95% of procurement.
- Complete on-site audit of 26 suppliers

Conflict mineral management

- Conflict mineral investigation report
- On-site audit for 3 suppliers
- Completed the 2018 conflict mineral investigation report (no conflict mineral were found in 13 suppliers, 9 contractors and 16 affiliated companies).
- Completed on-site audit for 4 suppliers, and no misconduct was found.

New Supplier Evaluation: UMC evaluates new suppliers rigorously and cautiously. Therefore, only suppliers with estimated annual transaction value greater than 1 million NTD are considered for sustainability evaluation.

The scope of the 2019 sustainability evaluation will be extended to all material suppliers who support production. All suppliers with annual transactions of over 2 million NTD (excluding one-time transaction suppliers) are subject to the evaluation process to implement 100% the sustainability evaluation.

The proportion of all suppliers in UMC Taiwan

- Equipment: 20%
- Raw material: 5%
- Facility: 5%
- Spare parts: 15%
- Wafer and mask: 6%
- Other items including cost expenditure: 48%

When corporate social responsibility becomes the key to business continuity, UMC must fulfill increasing international expectations towards business standards in Taiwan. In 2018, UMC, including subsidiary HeJian Technology (Suzhou) Co., Ltd., and United Semiconductor (Xiamen) Co. Ltd., cooperated with more than 4,100 suppliers worldwide. The proportion of all suppliers in UMC Taiwan is as follows.

Procurement localization became a key strategy adopted by UMC when looking for potential partners and suppliers. In addition to enhancing close partnerships with local suppliers, UMC hoped suppliers would provide services more efficiently, shorten delivery time and reduce carbon footprints of raw materials required through local production. UMC also provided job opportunities and promoted local socio-economic development indirectly. UMC believes that a procurement localization strategy is a key value for fulfilling corporate sustainable development and is a part of corporate social responsibility.
UMC's Management Policy

RAISE COST-LEADING ABILITY
Integrate UMC group resources to gain the most competitive supply chain value by strategic cooperation.

ESTABLISH SUSTAINABLE SUPPLY CHAINABILITY
Motivate vendors to raise performance in the aspects of economy, society and environment.

ENHANCE SUPPLY-CHAIN SUPPLY ABILITY
Continuously advise vendors about diversified supply through local sources.

BUILDING A GREEN SUPPLY CHAIN
Promoting suppliers about energy conservation and carbon reduction towards a circular economy

CONSIDER ECO-FRIENDLY
Actively implement green procurement, pursue economic benefits and consider environmental friendliness

NO COMPROMISE ON CONFLICT MINERALS
Ensure products and supply chain use conflict-free minerals

IMPLEMENT SUSTAINABLE RISK MANAGEMENT
Focus on suppliers' energy resource use and water resources management to respond to the impact of extreme climate change on the supply chain

FOCUS ON ENVIRONMENTAL ISSUES
Strengthening the recycling of waste resources and working to reduce the impact of environmental pollution

UMC’s commitment is disclosed on UMC’s website. Please visit: http://www.umc.com/English/CSR/c_3.asp
Supplier Sustainability Management Capability Evaluation

UMC upholds the supplier policy of “treating suppliers as partners and guiding suppliers for long-term cooperation” to plan a comprehensive management system for suppliers. The following five standards were adopted to regulate and guide suppliers, hoping to establish a supply chain management system with sustainable development.

Five Principles of Supplier Sustainability Evaluation

**EXECUTION**

**Policy**
- 1. "UMC Supplier and Employee Professional Ethics Agreement" & "UMC’s Supplier Code of Conduct"

**Standards**
- 1. All suppliers need to commit and sign (Remark A)
- 2. All suppliers are responsible for requiring next-tier suppliers to commit and sign

**RISK EXPOSURE & MEASURES**

**Policy**
- Using "UMC’s Supplier Sustainability Evaluating Mechanism” to define risk level of sustainability

**Standards**
- Formal risk identification processes are
  - 1. UMC issues ESG questionnaire to all critical suppliers (procurement amount is over 80%), including equipment suppliers, facility suppliers, spare parts suppliers and raw material suppliers etc. annually.
  - 2. ESG score below 80, we considered the suppliers to be high-risk
  - 3. Suppliers’ flaw found under audit or with on-going purchase orders, we considered the suppliers to be medium risk
  - 4. We also randomly selected 30% of critical suppliers, and considered the suppliers with potential risk

**RISK MANAGEMENT**

**Policy**
- "UMC’s Supplier Sustainability Evaluating Mechanism”

**Standards**
- 1. Domestic Suppliers audited by UMC audit team
- 2. Worldwide suppliers audited through Third-parties authorized by UMC (Remark A)

**COUNSEL & TRACK**

**Policy**
- "UMC’s Supplier Sustainability Evaluating Mechanism"

**Standards**
- 1. Counseling during the audit
- 2. Issue audit report with flaws and improvement plan
- 3. Suppliers are consulted and need to be continuously observed in the following year.
- 4. The supplier fails to improve any flaws: UMC will reduce the business amount or even terminate the business relationship

**SUPPLIERS TRAINING**

- Constantly offer supplier training courses
- Gradually and continuously communicate with suppliers about the direction of UMC’s supply chain management

Note: With annual procurement value of greater than 1 million NTD, Environmental or manpower-based suppliers are subject to evaluation with environment/social aspect as the major evaluation criteria. The suppliers should accept the “Supplier Code of Conduct” and sign the “Employee Code of Ethics” in order to become a supplier.

Supplier Sustainability Evaluation - New Suppliers Selection Criteria

Currently, criteria for selecting new suppliers include

- status on the Dow Jones Sustainability Index
- compliance with UMC Supplier and Employee Professional Ethics and Code of Conduct
- compliance with principles of open and fair competition.

Prior to 2016 (including 2016), UMC focused on the Dow Jones Sustainability Index for the production of raw materials and spare parts.

Beginning in 2017, we continued to include key equipment, facility, engineering and labor service suppliers as well as new suppliers.

In 2018, all critical suppliers supporting production-related materials were included in the evaluation.
In 2018, there were 2,376 vendors in Taiwan, and a total of 618 were evaluated as critical suppliers. As a result of the assessment, all suppliers in the environmental sector agreed to work with UMC to improve environmental protection measures such as energy, waste, hydropower resources and greenhouse gas emissions reduction. Some of the social suppliers in risk management have realized the possibility of risk management affecting the company’s operations. In 2018, there were 203 new suppliers in UMC, including 13 that were evaluated by ESG (new suppliers accounted for 6% in 2018). UMC requires suppliers to comply with the company’s requirements for labor, health and safety, the environment, business ethics and management systems, and fully comply with the laws and regulations of the countries in which they operate.

In 2018, 100% of the new suppliers have signed the abovementioned Codes of Ethics required by UMC. In 2018, UMC started to require its suppliers to disclose their tier-1 suppliers’ information; a total of 61 suppliers were revealed. In 2019, UMC further required its suppliers to sign the code of ethics with their tier-1 suppliers and to conduct supply chain evaluations for joint promotion of corporate social responsibility.

**Supplier Sustainability Evaluation- Supplier Risk Management Evaluation**

UMC attaches great importance to the sustainable management of suppliers. For the requirements of sustainability, we focus on the environmental, social and corporate governance requirements of suppliers. In response to the supplier’s sustainable management, UMC established the “Supply Chain Management Committee” and formulated the “Supplier Evaluation Mechanism” (or the Dow Jones Sustainability Index Selection Mechanism) to regularly manage and evaluate the improvement and tracking of vendors.

The Supplier Evaluation Mechanism is managed by critical suppliers that support production, including equipment suppliers, raw material suppliers, factory engineering suppliers, consumables and component suppliers. Each year, Q (Quality), C (Cost/Financial), D (Delivery), S (Service), S (Sustainability) are evaluated.

The “Supplier Evaluation System” set the “Evaluation Level and Response Measures” (Note 1), and incorporated the items required for sustainability management (Note 2) into the evaluation criteria according to the degree of importance. Questionnaires are sent to the suppliers annually. The responses are collected and further categorized according to the characteristics and risk of the suppliers in order to improve the guiding process.

Supplier management performance was included as an indicator item in supplier evaluations conducted by UMC. UMC requires all its suppliers to sign the “Supplier and Employee Professional Ethics Agreement,” asking its suppliers to strictly follow the Codes of Conduct and social responsibility related regulations. Also, suppliers should require their own suppliers, contractors and service providers to adopt the above regulations. Suppliers should assess their supply chain regularly. The extent of suppliers’ obligation will be a condition when procurement strategy is conducted. Suppliers having certifications related to environmental protection or hazardous substance management (ISO 14001, TS 16949, or QC080000) or can demonstrate capabilities in fulfilling the requirements of the EICC Code of Conduct may be provided with additional points. This incentive was provided to help guide and encourage suppliers to comply with these standards.
Supplier Sustainability Evaluation – On-Site Audit/Improvement Guidance and Follow-Up

UMC has a supplier lack of improvement management mechanism. According to the UMC supplier risk assessment mechanism (Note 3), the company will conduct on-site audits and propose solutions for suppliers with scores that are too low and suppliers failing to fulfill contractual obligations. Following UMC’s assistance and consulting, suppliers are expected to complete improvements. If the manufacturer fails to improve, UMC will continue to provide guidance while evaluating short-term suspension of the supplier or termination based on supply chain risk. Suppliers that are still unable to improve within two years will face reduced purchasing amount, suspended purchasing or cancellation as a qualified supplier according to the degree of risk of the supplier (Note 4).

**Sustainable Supplier’s Risk Evaluation (Note 3)**

<table>
<thead>
<tr>
<th>Supplier’s Risk Evaluation</th>
<th>High-Risk Supplier Risk Evaluation/Audit</th>
<th>Potential / Flexible Risk Evaluation</th>
</tr>
</thead>
</table>
| **Method:** UMC ESG risk evaluation questionnaire | **Method:** On-site audit, review flawed items  
- Request improvement proof within the prescribed time limit  
- Check result of improvement and continuously observe | **Method:** On-site audit, review flawed items  
- Request improvement proof within limit period  
- Check result of improvement and continuous observation |
| **Target:** Fulfill supply chain management, focusing on sustainable business plan | **Target:** Fulfill supply chain management | **Target:** Ensure suppliers’ quality, delivery, service and sustainability |
| Applies to: Tier 1 Supplier  
All Tier 1 suppliers who supporting production related materials | Applies to: High-Risk Supplier  
Suppliers who failed in on-site audit | Applies to: All Suppliers  
- 1. Flaw found under audit or with ongoing purchase orders  
- Randomly selected 30% from Tier 1 suppliers |
| Frequency: Annually | Frequency: Periodically | Frequency: Periodically |
Supplier Educational Training

In order to strengthen the capacity of the supply chain, UMC continued to guide the suppliers in establishing diversified and local supply capability, creating a sustainable supply chain for the suppliers. For more information on the guiding and training materials, please refer to “Creating a Sustainable Supply Chain” in this chapter.

In 2018, UMC Taiwan conducted an evaluation on its qualified diversified suppliers including suppliers for raw material, equipment, facility and spare parts and excluded suppliers with single transactions at UMC.

In 2018, the scope of supplier questionnaire evaluation included HeJian Technology and United Semi for the first time. In Taiwan, we increased the number of suppliers for on-site audits; the number of suppliers audited has increased by 8% compared to 2017. As a result, the critical suppliers of UMC who voluntarily disclosed their suppliers (tier-2 suppliers) in 2018 increased by multiples over 2017. The disclosure of critical non-tier 1(tier-2) suppliers is for UMC’s operations in Taiwan only. From 2019 onwards, the disclosure of critical non-tier 1(tier-2) suppliers will include HeJian Technology, United Semi, and UMC Singapore. Starting from 2019, to strengthen the supply chain management, UMC requires its suppliers to ensure their suppliers comply with the code of ethics and implement supply chain management actions for their critical suppliers.

Overseas subsidiaries of UMC including HeJian Technology, United Semi and UMC Singapore.

In addition to establishing a stable sustainable supply chain with suppliers, UMC further grasps the risk management capability of the suppliers to conduct supplier evaluation on sustainable items for critical suppliers. By taking into account the interests of suppliers of different scales and the effectiveness of risk management, UMC has designed two supplier evaluation questionnaires for critical suppliers. For the top 80% of the critical suppliers, UMC uses a higher standard to inspect and determine whether it is necessary to implement BCP management and training, and to decide whether it is necessary to extend the implementation of BCP for their suppliers. We hope to continue the core value of UMC in promoting sustainable supply chain - Sustainability and Mutual-Development, triggering suppliers to voluntarily bring their suppliers to join the group for sustainability.

In 2018, UMC conducted on-site audit for suppliers on the 2017 improvement-needed list, unqualified suppliers based on the response of the 2018 questionnaire, and suppliers randomly selected from the qualified supplier list based on the response of the questionnaire. A total of 198 suppliers were audited. From the audit results, the suppliers on the 2017 improvement-needed list have all met the requirements of UMC. In 2018, only five suppliers failed to meet expectations, and guidance will be conducted for improvement.

The supplier evaluation system was applied to all UMC’s overseas subsidiaries in 2018, with a total of 195 suppliers evaluated. Among the 30 new suppliers who have been selected for sustainability evaluation, only one supplier was rated as “Need Improvement.” On-site audit and guidance will be conducted for improvement.

618 critical suppliers accounted for over 80% of UMC’s procurement volume.

513 suppliers

75 suppliers

9 suppliers

and 21 of them failed the evaluation in the aspects of economy, environment and society, receiving a score of less than 70 on the responding questionnaires.
In the evaluation of sustainable suppliers, UMC not only performed evaluation on sustainability items but also carried out on-site audit, guiding suppliers to correct their faults and ensuring suppliers' risk management capabilities. Furthermore, we hope to utilize the impact of the extended supply chain to continue the core value of UMC in promoting sustainable supply chain - Sustainability and Mutual-Development, triggering suppliers to voluntarily bring their own suppliers to join the group for sustainability. The number of suppliers audited in 2018 includes suppliers on the 2017 improvement-needed list. These suppliers were audited again and their shortcomings were completely resolved. Through the implementation of supplier evaluation, the risk of suppliers can be effectively reduced, which can in turn improve the competitiveness of the suppliers.

**Statistics of suppliers’ evaluation questionnaire and number of on-site audit in 2018**

<table>
<thead>
<tr>
<th>Supplier</th>
<th>2018 Tier-2 Suppliers</th>
<th>2017 Tier-2 Suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>HeJian Technology (Suzhou)</td>
<td>61</td>
<td>19</td>
</tr>
<tr>
<td>United Semiconductor (Xiamen)</td>
<td>66</td>
<td>0</td>
</tr>
<tr>
<td>UMC Singapore</td>
<td>49</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Number of Evaluation Questionnaires</th>
<th>Number of On-site Audit Suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>HeJian Technology (Suzhou)</td>
<td>618</td>
<td>198</td>
</tr>
<tr>
<td>United Semiconductor (Xiamen)</td>
<td>80</td>
<td>0</td>
</tr>
<tr>
<td>UMC Singapore</td>
<td>66</td>
<td>1</td>
</tr>
<tr>
<td>UMC Taiwan</td>
<td>49</td>
<td>0</td>
</tr>
</tbody>
</table>

The number of ESG evaluations (supplier questionnaire-based evaluation) conducted from 2016 to 2018 is as follows. Since 2017, UMC has extended the types of suppliers who are subject to ESG evaluation from the original raw material suppliers to equipment suppliers, facility suppliers, and consumable and component parts suppliers. The percentage of suppliers that underwent on-site audit has increased from 9% from 2016 to 32% in 2018. It is estimated that the percentage of suppliers audited each year will reach our goal of 30%. The number of suppliers that have audited for UMC in Taiwan will continue to grow.

The number of suppliers on-site audited in 2018 includes suppliers on the 2017 improvement-needed list. These suppliers were audited again and their shortcomings were completely resolved. Through the implementation of supplier evaluation, the risk of suppliers can be effectively reduced, which can in turn improve the competitiveness of the suppliers.

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Number of suppliers on-site audited in 2018</th>
</tr>
</thead>
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<tr>
<td>HeJian Technology (Suzhou)</td>
<td>198</td>
</tr>
<tr>
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<td>0</td>
</tr>
<tr>
<td>UMC Singapore</td>
<td>1</td>
</tr>
<tr>
<td>UMC Taiwan</td>
<td>0</td>
</tr>
</tbody>
</table>

**Critical Supplier**

80% of UMC’s procurement amount

**Mechanism for Supplier Evaluation**

- Review suppliers’ dimensions of quality/finance/price/delivery/service/sustainability
- Require environment or hazardous substance management
- Request suppliers to operate RBA
- Review past audit weakness record and PO execution weakness record

**On-Site Audit Target**

- Audit every three years
- Former audit result less than 70 points needs to be audit

Note: Since 2019, Tier-2 suppliers disclosure scope will include HeJian Technology (Suzhou), United Semiconductor (Xiamen) and UMC Singapore.
Focusing on 5 suppliers with flaws from on-site audit, the summary of flaws is as below. UMC continues to carry out suppliers’ improvement plans to make sure the suppliers’ competitiveness will be raised.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Audit Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material delivery/Inventory management</td>
<td>- Level of safe inventory should be established</td>
</tr>
<tr>
<td>Business Continuity Management (BCM)</td>
<td>- Partial suppliers have no financial risk evaluation for Tier 2 supplier</td>
</tr>
<tr>
<td>Conflict Minerals</td>
<td>- Lack of critical spare parts management</td>
</tr>
<tr>
<td>- Lack of Tier 2 supplier management in BCM</td>
<td></td>
</tr>
<tr>
<td>- Lack of real-time detection of conflict minerals or alternative mechanism</td>
<td></td>
</tr>
<tr>
<td>Environmental management</td>
<td>- Environmental resource inventory result and establishment of administration regulations are needed</td>
</tr>
<tr>
<td>- Greenhouse gas reduction and environmental issues aren’t listed; occupational safety instructional meetings are needed</td>
<td></td>
</tr>
<tr>
<td>- Greenhouse gas management</td>
<td>- Occupational safety and health regulations should be reviewed; cross-functional meeting is needed and communication for risk</td>
</tr>
<tr>
<td>- Safety and health management</td>
<td>- Implement of periodical business impact analysis is needed</td>
</tr>
<tr>
<td>- Business Continuity Management (BCM)</td>
<td>- Identify critical business event and bottleneck of resource items</td>
</tr>
<tr>
<td>- Friendly workplace</td>
<td>- Information of appeal channel for employees should be publicly disclosed</td>
</tr>
<tr>
<td>- Human rights compliance</td>
<td>- SA8000 certification is needed</td>
</tr>
<tr>
<td>- Employee’s ethics policy and regulation</td>
<td>- Code of conduct should be implemented for complying with RBA</td>
</tr>
<tr>
<td>- Sustainability and CSR</td>
<td>- Internal audit should include labor-related and ethics-related issues</td>
</tr>
<tr>
<td>- Corporate sustainability report (CSR report) should be publicly</td>
<td>- Management of continuous improvement for environmental influence, employees’ health and safety and ethical business practices is needed</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### ACTION

- **UMC held 1 sharing event of supply chain sustainability for suppliers.** Suppliers were required for fulfilling ESG, RBA, and risk management. A new challenge to the sustainable supply chain was also introduced during the event. 1 event will be held in Singapore in 2019.

- **For safety training,** a total of 54 joint conferences of suppliers and contractors were held in 2018. UMC ensures that the contractor has sufficient knowledge of environmental safety.

- **In 2018,** a total of 24 contractor-aligned meetings were held, which carried out safety management announcements and accident advocacy for each site.

- **Targeting at specific suppliers,** UMC continuously performs ESG evaluation counselling.

- **ESG/ BCP notions are communicated with suppliers by UMC’s ESG evaluation**
Establishing Sustainable Supply Chain

The core value of UMC’s sustainable supply chain is “Sustainability and Mutual-Development.” UMC pursues sustainable operations by partnering with its supply chain to achieve mutual growth. In addition to the existing environmental training for the suppliers, UMC extended its supply chain management in 2018 to implement initiatives for sustainability, strengthening the guidance for local suppliers to establish sustainable supply chain capability. In order to strengthen the capacity of the supply chain, UMC continued to guide suppliers in establishing diversified and local supplying capability. To enhance the awareness of procurement personnel on sustainability initiatives and effectively implement the sustainable supply chain management, UMC held a number of educational training courses in 2018 to accelerate the development of sustainable supply chain management.

<table>
<thead>
<tr>
<th>Project</th>
<th>Strategy</th>
<th>Activity</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment, safety and health education training plan for suppliers and contractors</td>
<td>To ensure that the contractor has sufficient knowledge of environmental safety</td>
<td>Training for suppliers and contractors with safety work-related rules</td>
<td>• Accumulated 54 training sessions held in 2018 &lt;br&gt; • Accumulated attendees were 3,960 in 2018 &lt;br&gt; • Accumulated hours for training were 7,920 in 2018</td>
</tr>
<tr>
<td>Contractor-aligned meeting</td>
<td>To make sure contractors are conscious of workplace safety</td>
<td>Routine meeting for safety management announcements and accident advocacy for each site.</td>
<td>• Accumulated 24 training sessions in 2018 &lt;br&gt; • Accumulated attendees were 2,076 in 2018 &lt;br&gt; • Accumulated hours for training were 2,076 in 2018</td>
</tr>
<tr>
<td>Sustainable supply chain sharing session</td>
<td>Themed with “Sustainability &amp; Co-prosperity,” advocate the concept of sustainable development to suppliers</td>
<td>• Advocate UMC’s human-oriented sustainable conduct and co-prosperity in society &lt;br&gt; • Continue promoting supply chain to respond to ESG requirements &lt;br&gt; • Continue promoting supply chain to respond to RBA requirements &lt;br&gt; • Continue promoting supply chain to respond to risk management requirements &lt;br&gt; • New challenge to sustainable supply chain</td>
<td>• Accumulated 1 sharing session held in 2018. 40 suppliers attended, including equipment suppliers, raw materials suppliers, parts and components suppliers and facility suppliers &lt;br&gt; • 1 sharing session for UMC Singapore in 2019, 1 sharing session for USCMX in 2020</td>
</tr>
<tr>
<td>Sustainable supply chain management training for buyers</td>
<td>Promote sustainable advocacy to be carried out for routine procurement operation. To understand the trend of global business sustainable development</td>
<td>• Internal employee training curriculums: &lt;br&gt; • Buyer’s knowledge-RBA execution &lt;br&gt; • Supply chain management of green procurement &lt;br&gt; • Business Continuity Planning (BCP) of supply chain management &lt;br&gt; • How ESG responds to DJSI requirement &lt;br&gt; • Conflict mineral management &lt;br&gt; • Supplier audit experience sharing</td>
<td>• Accumulated 6 training curriculums held in 2018: rate of attainment was 100% &lt;br&gt; • 1 curriculum-Editing CSR report with “GRI Standards Guideline” in 2019</td>
</tr>
<tr>
<td>Counseling local suppliers to improve</td>
<td>Enhance suppliers’ abilities and productivity, lower workplace safety accidents</td>
<td>• Modify bypass installation (Focus on: poor tool uptime) &lt;br&gt; • Improve inside components (Focus on: Corrosion issue) &lt;br&gt; • Expand production line (Focus on: capacity shortage)</td>
<td>• A total of 3 suppliers were counselled in 2018 (2 for parts and components, 1 for accessory tool) &lt;br&gt; • Uptime exceeded 99% &lt;br&gt; • Workplace safety accident decreased &lt;br&gt; • Capacity of these suppliers increased by 5 times</td>
</tr>
<tr>
<td>Suppliers localization</td>
<td>Create local employment opportunities to promote local prosperity</td>
<td>• Expand production line in Taiwan</td>
<td>• A total of 2 suppliers expanded production lines in 2018; 19 job opportunities were created &lt;br&gt; • 1 supplier plans to expand production lines in 2019 and create 20 job opportunities</td>
</tr>
<tr>
<td>Second source implementation</td>
<td>Lower risk of raw material shortage</td>
<td>• Evaluate and select qualified suppliers</td>
<td>• 6 new suppliers were implemented in 2018</td>
</tr>
</tbody>
</table>

Building Green Supply Chain and Promoting Circular Economy

UMC believes that green supply chain is an important part of the implementation of the corporate sustainability blueprint. We continue to make good use of UMC’s influence as the leader in business to urge suppliers in joining the circular economy. The circular economy project includes four sub-projects (see the following table). In 2017, UMC took the initiative to launch the Triple R Major League project. In 2018, the number of suppliers participating in the Triple R Major –League projects has increased by 30% as compared with that in 2017. This suggests that the influence of UMC on suppliers in discussion and activity promotion is quite significant, bringing more suppliers to join the development of green supply chain. The circular economy is an industrial economy which is friendly to the environment. While UMC continues to take sustainability initiatives for its suppliers, internal self-development was also emphasized by UMC. In 2018, the benefits of UMC’s precious material waste recycling project reached a new high of 130 million NTD, and the percentage of reclaimed wafer usage was increased to 52.4% from 51.7% in 2017. Moreover, the total amount of oxide slurry (Oxide Slurry S225) recycled has reached 1,290 tons.
Fulfill Social Responsibility, Develop UMC’s Influence

Consider Eco-friendliness With The Supply Chain

Project

Project: Triple R league
Propose: Through quantifiable target set by suppliers, to promote energy saving and circular economy execution and upgrade the green supply chain.
Activity: • Suppliers set quantifiable targets; UMC checks the targets through scoring
• Hold sharing sessions for different sectors to exchange knowledge
• Hold annual award ceremony to encourage excellent suppliers

Result: • First-year award ceremony held in 2018 (for 2017), 26 suppliers were awarded
• 37 suppliers joined in 2018, an increase of 11 suppliers over 2017
• Carbon emission saving was 175,000 tons in 2018
• Sewage sludge saving was 50.6 tons in 2018
• For more details about UMC’s Triple R League project please visit http://www.umc.com/English/CSR/c_3.asp
• Target to drive suppliers to achieve a 350,000 ton reduction in carbon emission -- 2020

Project: Precious material waste recycling
Propose: Sell leftovers and scraps to reuse/recycle businesses to decrease waste and reuse resources effectively
Activity: • Evaluate licensed waste disposal contractor
• By systematization control of recycling, collect the waste in volume to sell to qualified contractors
• Reach an accumulated NT 100M annually from the recycling of precious material waste since 2013
• In 2018, the benefits of UMC’s precious material waste recycling projects reached a new high of 130 million NTD, due to rising wafer unit price and strong NTD appreciation
• Reach an accumulated NT 100M from the recycling of precious material waste in 2020
• Reach an accumulated NT 600M from the recycling of precious material waste in 2025

Project: Reclaim wafer reuse
Propose: The more that UMC uses reclaimed wafers and recycles, the less likely UMC purchases dummy wafers
Activity: • Evaluate licensed waste disposal contractor
• Authorize suppliers to process reclaimed wafers to ensure dummy wafers reach the best condition to be reused in UMC

Result: • Accumulated reclaimed wafer procurement quantity was 392,798 pcs in 2018
• Wafer usage was increased to 52.4% from 51.7% in 2018

Project: Oxide Slurry SS25 recycling
Propose: Reuse slurry and decrease waste water treatment
Activity: Through a slurry recycle system to collect used slurry, UMC authorized suppliers to formulate and reuse during the manufacturing process

Result: • The total amount of oxide slurry (Oxide Slurry S225) recycled reach 1,290 tons

Consider Eco-friendliness With The Supply Chain

Project: Eco Echo award (supplier’s response)
Propose: As a driving force for ecological environmental conservation, UMC rewards excellent conservation plans through its Eco Echo award. UMC appeals to suppliers to sponsor this project
Activity: • Select from an open audition of domestic green groups to encourage excellent conservation plans by providing cash prizes
• Appeal to suppliers with the same concept to sponsor this activity

Result: • Raised NTD 3 million for the award in 2018
• 9 suppliers sponsored in 2018, including Lam Research, 3M, BASF, Hermes Epitek, Unimicron, Hueng Luei Process, Edwards, Faraday, Wholtech
• 5 winners won the Eco Echo award in 2018; for details please visit http://www.umc.com/chinese/news/2018/20181221.asp

Project: Green procurement
Propose: Targeted at green products, UMC promotes green procurement from the origin of the product to conserve resources and protect the environment
Activity: Green procurement index:
• Domestic: Category no. 1 to no. 3 green-marked products, including Energy Label, Water Label, Green Building Material, Carbon Footprint Label, Carbon Label
• Foreign: green-marked products originated from countries having agreement with Taiwan, Energy Star, FSC, PEFC

Result: • An accumulated amount of NT 100 million in 2018
• An accumulated amount targeting NT 100 million in 2019
• Awarded for green procurement in 2018 (from Environmental Protection Administration, Executive Yuan)
• Awarded for green procurement in 2018 (from Hsinchu City government)
• Awarded for green procurement in 2018 (from Tainan City government)

Fulfill Social Responsibility, Develop UMC’s Influence

Project: Tier 2 critical supplier management
Propose: Critical supplier (which is UMC’s Tier 2 suppliers) are required to sign the Supplier Code of Conduct and to be subject to supply chain management
Activity: • Announcement was disclosed through the e-Procurement platform (platform for suppliers):
• Required critical suppliers (UMC’s Tier 2 supplier) to sign the Supplier Code of Conduct
• Required critical suppliers (UMC’s Tier 2 suppliers) to be subject to supply chain management

Result: In 2025:
• 80% of critical suppliers (UMC’s Tier 2 supplier) are required to sign the Supplier Code of Conduct
• 30% of critical suppliers (UMC’s Tier 2 supplier) need to be managed by supply chain management

Project: Support seminar of “Corporate Social Responsibility Link With Trade”
Propose: Promote concept of corporate social responsibility to more businesses and apply to sustainable supply chain management
Activity: UMC presented in the seminar:
• UMC’s CSR idea and promotion status
• UMC’s practice of sustainable supply chain management

Result: • Attended to seminar of “Corporate Social Responsibility Link With Trade” held by Bureau of Foreign Trade in 2018, shared UMC’s experience with different sectors
In its conflict minerals management, UMC has been conducting supplier evaluation and obtaining supplier signatures since 2009 to guarantee non-conflict minerals and ensure that products from suppliers are not in violation of conflict minerals guidelines. To date, all suppliers have returned assurances of non-conflict minerals in all of their products.

According to the finalized statutes and provisions in Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act enacted by the US Securities and Exchange Commission on August 22, 2012, Specialized Disclosure Reports must be completed every May.

In 2018, UMC conducted a survey for suppliers whose products contain 3T1G. Investigations on conflict minerals were carried out for a total of 38 suppliers, including 13 suppliers, 9 contractors (suppliers providing packaging and testing services), and 16 UMC subsidiaries.

Results of Recent Surveys
Conflict Minerals

<table>
<thead>
<tr>
<th>Year</th>
<th>Supplier</th>
<th>Affiliated Corporation</th>
<th>Subcontractors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>13</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>2017</td>
<td>13</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>2016</td>
<td>13</td>
<td>16</td>
<td>8</td>
</tr>
</tbody>
</table>

UMC has followed the Code of Conduct - Responsible Business Alliance, RBA Version 6.0. Besides self-evaluation, UMC also requested its suppliers to comply with EICC regulations via the Supplier & Employee Professional Ethics Agreement. The purpose of the Agreement is not only to allow suppliers to understand clearly UMC’s requirements regarding code of conduct, but also to deliver the message that suppliers should obey EICC as well as local laws. Furthermore, the agreement also ensures that the operation of suppliers and their upstream partners must comply with the intention and spirit of the EICC.

For further information about RBA, please refer to http://www.responsiblebusiness.org/

UMC expects every business in the supply chain to uphold these principles. Clear objectives have been established with relevant guidelines and tools to help suppliers enhance the effectiveness of their efforts in improving the society and the environment. UMC also collaborated with other companies in the industry to promote various projects, encouraging employees to incorporate corporate social responsibility into procurement decisions as well as supplier management procedures. In addition, UMC also voluntarily applied to join CFSI (Conflict-Free Sourcing Initiative) in Q1 of 2016. Suppliers were also requested to actively monitor foundries and mines that were lacking relevant certification to undergo Conflict-Free Smelter Program (CFSP) or other equivalent and independent third party’s audit program inspections. To ensure transparency in the entire supply chain, UMC also voluntarily performed on-site audit of 3 suppliers for their origin of supplies, making sure that the supply chain does not contain conflict mineral supplies in 2017.

In 2017, the results of the use of tin, tantalum and tungsten (3TG) in UMC’s various fabs did not result in any minerals sourced from conflict areas or countries. In order to comply with the US Dodd-Frank Act and to implement corporate social responsibility, UMC added a “conflict-free mineral” label on its product packaging to declare that its products did not using conflict minerals, effective from April 1, 2018. Other sites (USCM/HeJjian/Fab 12i) will be announced separately. UMC issued an official statement on the My UMC website on March 1, 2018.
3.15 MILLION TONS OF RECYCLED WATER USAGE
In Singapore, UMC’s use of recycled water (Newater) reached 3.15 million tons, accounting for 94% of Fab12i’s total water use of 3.35 million tons, thus reducing the impact on local water resources.

51% REDUCTION IN UNITS OF FLUORINATED GREENHOUSE GAS EMISSIONS.
Achieved the objective for reducing emissions by 51%. Reductions in fluorinated greenhouse gas emissions were equivalent to 1,285,000 tons of CO2e. Gas replacement measures also achieved savings in raw material procurements of over NT$20 million.

2.8 MILLION KWH RENEWABLE ENERGY GENERATION
UMC has completed the installation of a 4,335 kWp solar energy system, which is expected to generate up to 2.8 million kWh of electricity each year. The installation capacity is the highest among Taiwan’s wafer fab industry.

100% CERTIFICATION
All UMC fabs have passed the ISO 14064-1 greenhouse gas emissions certification, the ISO 14001 environmental management certification, and the QC 080000 Hazardous Substance Process Management Certification.

90% WASTE RECYCLING
The amount of reused waste was 35,053 metric tons, which is a gain of more than NT$35 million from recycled resources.

3 MILLION TOTAL PRIZE MONEY FOR UMC ECO ECHO AWARD
UMC invested NT$3 million in rewarding excellent and innovative eco preservation proposals. Various projects were successfully completed, totaling more than 20,000 participants in the Eco Echo Award activities.
## Major Material Environmental Topics

There were three major categories of material environmental topics in 2018: (1) Greenhouse Gas Emissions and Energy Use (2) Water use (3) Waste

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2018 Goal</th>
<th>Compliance for 2018</th>
<th>2019 Goal</th>
<th>Long-Term Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GREENHOUSE GAS EMISSIONS AND ENERGY USE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Greenhouse Gas Emissions | • Reduce fluorinated greenhouse gas emission intensity by >40% | • Fluorinated greenhouse gas emission intensity was reduced by 51% | • Reduce fluorinated greenhouse gas emission intensity by >51% | Goals for 2025  
  • 30% absolute reduction of fluorinated greenhouse gas emissions compared to 2010  
  • Reduce fluorinated greenhouse gas emissions per unit of product by 55%  
  • Reduce total greenhouse gas emissions per unit of product by 5% compared to 2010. |
| Electricity consumption | • Promote Green2020 Reduction Plan to reduce electricity consumption of each unit by 6% | • Additional reduction of 57,127 Mwh of electricity consumption for the year, reaching the annual targeted goal. | • Promote Green2020 Reduction Plan to reduce electricity consumption volume of each unit by 8%. | Goal for 2025  
  • Reduce electricity consumption per unit of product by 15% compared to 2015. |
| **WATER USE** | | | | |
| Water consumption | • Promote Green2020 Reduction Plan to reduce water consumption of each unit by 6% | • Additional reduction of 228,000 tons of water consumption for the year, reaching the annual targeted goal. | • Promote Green2020 Reduction Plan to reduce water consumption of each unit by 8% | Goal for 2025  
  • Reduce water consumption per unit of product by 15% compared to 2015. |
| **WASTE** | | | | |
| Waste generation | • Promote Green2020 Reduction Plan to reduce waste production volume of each unit by 6% | • Additional reduction of 1,790 tons of waste generation for the year, reaching the annual targeted goal. | • Promote Green2020 Reduction Plan to reduce waste production volume of each unit by 8% | Goal for 2020  
  • Reduce waste per unit of product by 10% compared to 2015. |

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Note 1: The various annual indicators are included in the company’s and Corporate Sustainability Committee’s KPI (Key Performance Indicator) and policy development, integrated with major company policies, and continually reviewed and improved.

Note 2: Green2020 Reduction Plan uses 2015 as the base year. The calculation was conducted by using the statistical data of 2015 as the basis.

Note 3: The target scope for waste disposal are the fabs in Taiwan. Currently, the fab in Singapore is limited by local regulations and the local processing plant, and targets cannot be set according to Taiwan's fabs.
Environmental Information

The summary information disclosed in this section includes UMC Headquarters and wafer fabs in Taiwan and Singapore.

### Energy
- **Total Energy Consumption**
  - Electricity: 2,738 GWh
  - Renewable Energy: 2,534 GWh
  - Natural Gas: 201 GWh

### Materials
- **Raw Materials**
  - 81,000 ton

### Paper
- **Paper Consumption**
  - 0.03 ton

### Environmental Protection Capital and Expense Cost
- **Expense cost**
  - 3,669 million
- **Capital cost**
  - 653 million

### Fuel
- **Natural Gas**
  - 29,092 m³
- **Diesel**
  - 0.41 m³
- **Coal**
  - 0.00 m³

### Water
- **Total Water Usage**
  - 48,623 m³
- **Total Water Intake**
  - 15,818 m³
- **Surface Freshwater**
  - 0.00 m³
- **Underground Water**
  - 0.00 m³
- **Salt Water**
  - 0.00 m³
- **Tap water**
  - 14,907 m³
- **Rain/Condensate Water**
  - 911 m³
- **Purified Water**
  - 17,189 m³
- **Water consumed per unit of production**
  - 78.6 m³/wafer-m²

### Greenhouse Gas Emission
- **Scope 1 /Direct Greenhouse Gas Emissions**
  - 0.5 ton CO₂
- **Scope 2 /Indirect Greenhouse Gas Emissions**
  - 158.5 ton CO₂
- **Scope 3 Greenhouse Gas Emissions**
  - 69.4 ton CO₂

### Waste Water
- **Total Waste Water Discharge**
  - 10,821 ton
- **Chemical Oxygen Demand (COD)**
  - 1.79 ton

### Environmental Protection Capital and Expense Cost
- **Expenses cost**
  - 0.27 million

### Spills of hazardous materials
- **Number of spills**
  - 0
- **Amount of spills**
  - 0.00 ton

### Fines
- **Number of environmental fines paid**
  - 0
- **Total amount of fines paid**
  - 0.00 million
To realize the company’s commitment to environmental sustainability, we continue to bring in various management systems and accreditations that are relevant to the environment. We also reduce implementation risks through standardization and promote the introduction of cleaner production and green buildings to reduce negative impact to the environment.

Currently, environmental issues are a major issue of business sustainability among stakeholders. To alleviate ecological deterioration, reduce the greenhouse effect and slow global warming, UMC’s environmental protection policies aim to minimize the consumption of resources and create minimum waste. Therefore, the company continues to enhance its technology, self-regulate and introduce high-performance pollution control technology and equipment to achieve environmental symbiosis, shared prosperity and sustainable global development.

To realize the company’s commitment to environmental sustainability, we continue to bring in various management systems and accreditations that are relevant to the environment. We also reduce implementation risks through standardization and promote the introduction of cleaner production and green buildings to reduce negative impact to the environment.

**ENVIRONMENTAL MANAGEMENT SYSTEM**
- ISO 14001 Environmental Management System
  - Issuing Agency: DNV-GL
  - Range: Entire UMC and its subsidiaries HJTC and USC

**BUSINESS CONTINUITY MANAGEMENT SYSTEM**
- ISO 22301 Business Continuity Management System
  - Issuing Agency: SGS
  - Range: UMC Headquarters, Fab 12A and Fab 12i

**GREEN PRODUCT CERTIFICATIONS**
- IECQ HSPM QC 080000
  - Issuing Agency: DQS-UL
  - Range: Entire UMC and its subsidiaries HJTC and USC
- Sony Green Partner
  - Issuing Agency: Sony
  - Range: Entire UMC and its subsidiary HJTC and USC
- Environmental Production Declaration
  - Issuing Agency: DNV-GL
  - Range: UMC Fab 12A and Fab 8A
- Carbon Footprint Verification on Integrated Circuit Wafers
  - Issuing Agency: DNV-GL
  - Range: UMC Fab 12A, Fab 8A and Fab 8E
- ISO 14046 Water Footprint Verification on Integrated Circuit Wafers
  - Issuing Agency: DNV-GL
  - Range: UMC fabs in Taiwan
- ISO 14051 Material Flow Cost Accounting Verification
  - Issuing Agency: DNV-GL
  - Range: UMC Fab 8A

**GREENHOUSE GAS EMISSIONS VERIFICATION**
- ISO 14064-1 Greenhouse Gas Emissions Verification
  - Issuing Agency: DNV-GL, SGS
  - Range: Entire UMC and its subsidiary HJTC

**Goals and Targets**
- Obtain relevant environmental management accreditation for all fabs, maximizing utilization of resources
- Continue to reduce negative impact of production on the ecological environment, maintaining zero environmental accidents
- Increase employees’ knowledge of environmental protection and “green living”

**Purposes**
- Minimize resource and energy consumption in product lifecycle

**Applicable Entities**
- 1. UMC
- 2. HeJian Technology (Suzhou) Co., Ltd. and United Semiconductor (Xiamen) Co., Ltd., which are UMC subsidiaries selling and manufacturing integrated circuits

**Relevant Policy**
- Environmental Protection Policy

**3-1-1 GREEN FACTORIES AND BUILDINGS**

Using past promotional experience and success of its departments in source reduction, recycling and reuse, UMC employs outside green building and ecology experts and collaborates with relevant academic programs to plan and construct green buildings that are consistent with the US LEED and domestic EEWH standards. In 2010, the company participated in the Green Factory Promotion Alliance, which integrates industrial, governmental and academic forces, to help the government formulate a green building and clean production evaluation system for developing Green Factory standards for Taiwan. In 2012, the company's new fab in Tainan Science Park and over 17-year old Fab 8A in Hsinchu Science Park were awarded the 1st Green Factory logo by the Industrial Development Bureau. Moreover, Fab 8A was the first 8-inch foundry facility in the nation to receive the award.

**UMC Future Plans for Green Building and Green Fab**
- Designs for new fabs will adhere to green building, green factory and smart building principles.
- Existing fabs will undergo green building and green factory assessments, and green design and construction will be gradually incorporated.
Status of UMC’s fabs

LEED OF THE UNITED STATES
- Gold Level
  - Fab 12A P3&4
  - USC

SMART ARCHITECTURE OF INDUSTRIAL DEVELOPMENT BUREAU, MINISTRY OF ECONOMIC AFFAIRS
- Diamond Level
  - Fab 12A P5&6
  - Fab 12A P5&6 Office Building

EEWH-GREEN ARCHITECTURE OF INDUSTRIAL DEVELOPMENT BUREAU, MINISTRY OF ECONOMIC AFFAIRS
- Gold
  - Fab 12A P3&4
- Diamond Level
  - Fab 12A P5&6
- Qualified Level
  - Fab 8A, Fab 8F, Fab 8S

GREEN FACTORY OF INDUSTRIAL DEVELOPMENT BUREAU, MINISTRY OF ECONOMIC AFFAIRS
- Fab 12A P3&4
- Fab 8A
- Fab 8S

CLEAN MANUFACTURING ASSESSMENT SYSTEM CERTIFICATION OF INDUSTRIAL DEVELOPMENT BUREAU, MINISTRY OF ECONOMIC AFFAIRS
- All 200mm fabs and Fab 12A in Taiwan

In 2019, Fab 12A II (the new plant) will apply for clean manufacturing assessment system certification and green factory.

Note: In 2018, the Fab 12A P5&6 GB Building (Office Building) was nominated for Smart Building by the Ministry of the Interior.

3-1-2 ENERGY RESOURCE PRODUCTIVITY IMPROVEMENT PLAN

To improve energy resource productivity and reduce greenhouse gas emissions, UMC recently promoted various reduction measures and set targets for each stage.

UMC Energy Resource Improvement Status

333 REDUCTION PLAN (Base Year—2009)
- Electricity Usage: 3% reduction
- Fluorinated greenhouse gas emissions intensity: 33% reduction

GREEN 2020 REDUCTION PLAN (Base Year—2015)
- Electricity Usage: 10% reduction
- Water Usage: 10% reduction
- Waste Generation: 10% reduction

369+ REDUCTION PLAN (Base Year—2009)
- Electricity Usage: 3% reduction
- Water Usage: 6% reduction
- Waste Generation: 9% reduction
- Fluorinated greenhouse gas emissions intensity: 36% reduction

In 2020, the 40th anniversary UMC, a 10% reduction in water consumption, power consumption and waste production is anticipated.

In 2020, UMC aims to surpass the fluorinated greenhouse gas emissions intensity reduction goal of 30% suggested by the World Semiconductor Association.

Status of UMC’s “Green 2020 Reduction Plan”

ELECTRICITY USAGE

2018 Goal
- Cumulative 6% reduction
2018 Implementation Status
- Annual goal achieved
Reduction Measures
- Smart Optimization (Innovation): Optimize operation of the Industrial 4.0 Chiller.
- Performance improvement: Replace industrial water tower, replace yellow light tube area with LED and IE4 motors.
- Optimize supply conditions: CDA inverter air compressor, HV inverter control, MAU outlet temperature reduction.

WATER USAGE

2018 Goal
- Cumulative 6% reduction
2018 Implementation Status
- Annual goal achieved
Reduction Measures
- CMP & ALK water recycling.
- Install SAC processing flow to LDI production water (additional RO unit).

WASTE GENERATION

2018 Goal
- Cumulative 6% reduction
2018 Implementation Status
- Annual goal achieved
Reduction Measures
- Reduction of waste sulfuric acid and waste phosphoric acid (through source reduction or as a pollution control equipment agent)
- Reduction of waste solvents (through lifetime extension)
- Reduce calcium fluoride / calcium phosphate sludge (expand dryer, waste phosphoric acid outsourcing treatment).

Note: In 2018, the Fab 12A P5&6 GB Building (Office Building) was nominated for Smart Building by the Ministry of the Interior.

Note: The reduction goal of 2018 is determined based on the statistical data of 2015.
Note 1: In 2018, the Company's subsidiary HJTC reduced power by an additional 2,213 MWh, and the subsidiary USC reduced power by an additional 1,148 MWh.

Note 2: In 2018, the Company's subsidiary HJTC reduced water by an additional 76,591 tons.

Note 3: In 2018, the Company's subsidiary HJTC reduced waste by an additional 95 tons, and the subsidiary USC reduced waste by an additional 717 tons.

2018 Results

• Economic Benefits

- Water consumption reduction
  - Savings of NT$ 5.7 million
- Power consumption reduction
  - Savings of NT$ 131.39 million
- Waste reduction
  - Savings of NT$ 6.9 million

Environmental Benefits

- Water consumption reduction
  - Additional water savings: 228,000 tons
- Power consumption reduction
  - Additional power savings: 57,127 MWh
  - Additional CO2e: 31,648 tons
- Waste reduction
  - Additional waste reduction: 1,790 tons

3-1-3 Air Pollution Control

UMC air pollution control strategies involve using high-performance equipment to treat exhaust gas from rational contaminants to reduce the emission of air pollutants to a level that complies with (or less than) the government’s environmental stipulations. Test results over the years showed that UMC air pollutant emission is less than the emission standard set by the EPA. UMC categorizes waste gas from manufacturing processes into acidic exhaust, alkaline exhaust, volatile organic exhaust and general exhaust.

Total Hydrocarbon Reduction

In 2018, the efficiency of UMC’s volatile organic compounds (VOC) treatment was maintained at an average of 94.6%, which exceeded the 90% legal standard. Total emission of hydrocarbon pollutants was 47.3 tons/year, which was a reduction of 836 tons/year. The emission per production capacity was 0.235 kg/wafer-m².

UMC Volatile Organic Compounds Emissions

Acidic and alkaline exhaust

- Stage 1: Installed abatement equipment on tools to treat toxic, flammable, and fluorinated greenhouse gases.
- Stage 2: After end treatment by a central exhaust treatment system, gas is released into the atmosphere via a stack.

Volatile organic compounds

- Volatile organic compounds exhaust (Solvent Exhaust) is treated using VOC Zeolite carousel wheels, which treat and release gases using low temperature adsorption and high temperature desorption.

Other Air Pollutant Emissions

UMC uses natural gas and only a small amount of low sulfur diesel fuel. Based on regular stack inspection and air pollution expense calculation, estimated nitrogen oxide (NOx) and sulfur oxide (SOx) emissions in 2018 are listed in the table below.

<table>
<thead>
<tr>
<th></th>
<th>UMC</th>
<th>HJTC</th>
<th>USC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOx (kg)</td>
<td>9</td>
<td>405</td>
<td>57</td>
</tr>
<tr>
<td>NOx (ton)</td>
<td>105.6</td>
<td>1.1</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Note 1: In 2018, the emission for HJTC was 6.38 tons/year.
Note 2: In 2018, the emission for USC was 0.21 tons/year.
Every year, UMC organizes the Environmental Protection Festival and promotes green concepts within the company. The theme for the 2018 UMC Green Festival was Green Life. Through various types of green activities, UMC hopes to enhance green awareness among its employees and inspire them to incorporate green awareness into their daily life. In addition, elements of the UMC Eco Echo Award were integrated into the event. On April 27th, during the week of 422 World Earth Day, UMC launched the Green Market and 3rd Eco Echo Award Ceremony. Events on that day included premiering the ECO ECHO Corporate Sustainability Documentary, the Triple-R Grand Alliance Excellent Supplier Award Ceremony and eco conservation lectures. In addition, green vendors and NGOs were invited to set up stalls at the daily life green market hosted at UMC headquarters for employees to practice green life by purchasing green products. In addition to environmental promotion activities during the Environmental Protection Festival, the theme of green living was incorporated into this year’s environmental education curriculum, including waste sorting, green diet and green transportation. Physical and online audio-visual teaching modes were used to promote green concepts to every UMC employee.

Summary of activities and achievements during the Environmental Protection Festival.

**EARTH DAY EVENT CSR FILM PREMIERE**

UMC’s latest 2018CSR film was premiered on Earth Day for participants to appreciate UMC’s past journey in corporate social responsibility. In addition, in line with the Green Living theme in the Environmental Protection Festival, green products were made available to employees for purchase. The event attracted about 900 participants.

**GREEN THUMB**

Horticultural experts were invited to teach employees about pot planting. The indoor plants are like a natural air purifier. They are not only beautiful, but also greenify the offices, save energy and reduce carbon. A total of 118 employees participated in the activity.

**ECO-TOUR: JHUBEILANTHUA TEMPLE WETLAND; CHANGHUA COUNTY DAYOU COMMUNITY**

In collaboration with the Society of Wilderness, which won the 2nd Eco Echo Award, and the Changhua County Dayou Community Development Association, tours were conducted respectively at the JhubeiLianhua Temple Wetland and the Changhua County Dayou Community. Professional guides and introduction of the Eco Echo Award winning project helped participating employees understand local ecology and the eco-protection concepts in the Eco Echo Award-winning project, thereby increasing their awareness of environmental protection. A total of 55 employees participated in the event.

**COFFEE CUP REDUCTION ACTIVITIES**

A survey showed that coffee products were the most frequently purchased items by employees. However, every daily cup of coffee means another single use waste. To encourage employees to reduce single use garbage output, this event encouraged employees to use eco-cups for their drinks by giving lottery tickets to those who use eco-cups. The event totaled 3,200 participants.

**GREEN SUSTAINABILITY FORUM**

Lecturers from the Society of Wilderness were invited to speak on Energy Saving Green Life and Green Living Map to help employees select energy-saving items in daily life, cultivate energy-saving perspective and actions, and understand the eco-related ecology, culture and facilities in their hometown. About 128 participated in the activity.

**ENVIRONMENT PROTECTION KNOWLEDGE COMPETITION**

The competition was centered on two major themes, UMC Environmental Protection Knowledge and General Environmental Protection Knowledge. The fun competitions helped employees increase their correct knowledge of environmental protection, gain a deeper understanding of the company’s environmental actions, and apply environmental education to their daily life. A total of 18 teams competed, totaling 72 participants.
Eco Echo Award Program

In response to environmental issues that concern the public, UMC began organizing the UMC Eco Echo Award in 2016. Through the Eco Echo Award program, UMC expands partnerships and media cooperation, discusses needs with communities and non-profit organizations, and encourages ecology protection organizations to propose specific environmental sustainability and groundbreaking programs for the purpose of supporting local green and land sustainability action plans in Taiwan.

Implementation Outcome of Winning Projects in the Second Eco Echo Award Program

In the 2018 Eco Echo Award program, the joint focus of participating organizations and UMC employees influenced issues of concern and helped protect local ecologies in Taiwan.

Conservation, survey, environmental education and promotion of carnivorous plants in Taiwan (Society of Wilderness)

For many years, the Society of Wilderness has engaged in the conservation of carnivorous plants in Jhubei Lotus Temple Wetland, and promoted carnivorous plant awareness. Through the Eco Echo Award program, more than 40 distribution points in Taiwan for carnivorous plants were surveyed. About 706 participants were involved in improving and maintaining the original habitat. Collaborating with the UMC Environmental Protection Festivalevents, the Society also conducted 10 educational sessions in elementary and middle schools in Hsinchu County, and conducted 21 sessions on the conservation of Taiwan's native carnivorous plants so that the public can learn about Taiwan's native carnivorous plants and habitats, and understand the importance of biodiversity.

Environmental Education Program on Campus Tessaratoma papillosa Control (Wild Bird Society of Keelung)

The Wild Bird Society of Keelung committed to environmental education in all schools and communities in Keelung. To protect Taiwan Golden-rain trees in Keelung school campuses from the parasitic Tessaratoma papillosas and their threat to school children, the Society implemented the Tessaratoma papillosa Control educational project through the Eco Echo Award program. In addition, lecturer training was conducted on campuses, resulting in 16 seed instructors. Another 60 sessions of environmental education promotion activities were also conducted, totaling 19,254 participants.

Tales of Fishermen Along Provincial Highway 6 (Taiwan Cetacean Society)

In the Tales of Fishermen Along Provincial Highway 6 project, stories along the coast of Taitung were collected. Six local fishermen were interviewed, 10 fish markets surveyed, and 11 stories were written. With the ocean in Cheng Kung as the educational base, a workshop for job stories was conducted and 4 picture books were completed. In addition, 14 sessions of promotional activities were held to dialogue with local residents, totaling about 2,644 participants.

Voice of the Wetland-Chouchai Wetland Sound Monitoring and Education Project (Wetlands Taiwan)

As announced by IUCN, soundscape is the next generation of environmental health indicator. Therefore, through the Eco Echo Awards program, soundscape monitoring for winter, spring and summer was conducted to understand the impact of human noise on wetland organisms and the relationship between soundscape and environmental changes. In addition, biological indicators were combined with soundscape indicators to provide practical information for environmental monitoring and materials for environmental education. Two sessions of soundscape education and experiential activities were conducted, totaling about 50 participants. Understanding the recent or immediate natural soundscape of wetlands or recordings of extreme soundscape helped strengthen public participation in and bring attention to the conservation of the Chouchai Wetland.

Dayou Biochar -Green Farming Village (Changhua Ta-Yu Community Development Association)

Dayou Community is committed to environmental education, friendly farming and its community-based industry, Golden Biochar Rice. Through the Eco Echo Award program, Dayou promoted three key themes: friendly use of natural materials for friendly farming, environmental education with the elderly as teachers, and low carbon mileage food farming education. The community has also produced 566 kg of biochar, and conducted 28 sessions of forums totaling 1,345 participants. In addition, 10 elderly residents have been trained as lecturers, and food farming environment education was conducted in 2 elementary and middle schools, totaling about 6,280 participants. 14 food farming experience camps were organized, totaling about 459 participants. The community also collaborated with UMC and participated in the Environmental Protection Festival events.

Various projects were successfully completed, totaling more than 20,000 participants in the Eco Echo Award activities.
The 3rd Eco Echo Award Entries

In the 2018 Third Eco Echo Award, a total of 19 groups submitted entries. 41,000 votes were cast online, and 5 groups were selected. (The 2nd Eco Echo Award had 14 entries and over 30,000 votes cast)

Widespread Impact

Participating groups and projects

The award has increased over the years, from NT$1 million in the first year to NT$3.25 million to enable more excellent ecological conservation projects to be realized.
Energy use not only consumes the earth’s resources, but also produces carbon dioxide that causes greenhouse gas emissions. In recent years, temperature rise in the earth’s surface has caused the melting of polar ice, rising sea level and decreasing land. The frequency and intensity of abnormal climate changes such as changing ocean current patterns, changing rainfall patterns, floods, droughts and storms have increased. These climate changes caused by global warming have directly or indirectly impacted natural ecosystems. In the face of global climate change and dramatic changes in the ecological environment, UMC has been actively drafting environmental protection goals in various stages in recent years to respond to energy and greenhouse gas management issues. The company has set specific implementation plans and gradually promoted them.

Goals and Targets
- Improve efficiency in energy use, reduce electricity consumption per unit of product by 10% in 2020, by 15% in 2025 (with 2015 as the base year).
- Implementation of the Fluorinated Greenhouse Gas Reduction Program, emissions intensity reduction by 36% in 2020 and by 55% in 2025 (with 2010 as the base year).
- Reduce total greenhouse gas emissions per unit of product by 5% in 2025 (with 2010 as the base year).

UMC is actively attuned to the risks and new impact that climate change may bring. UMC has constructed the UMC Climate Change Risk Assessment based on multiple data points: the Fifth Assessment Report (AR5) published by the Intergovernmental Panel on Climate Change (IPCC), the government’s downscaling scenario projection for identifying potential physical hazards caused by climate change, the ISO 14090 Adaptation to Climate Change and the assessment procedure in the UK Climate Impact Programme (UKCIP).

Based on policies and regulations, market and technological changes, reputation, and physical risks, UMC also conducts climate change risk analysis and develops response practices to reduce the potential impact.

How We Manage
- Low-carbon design process
- Energy efficiency optimization
- Installing high efficiency fluorinated greenhouse gas abatement capabilities in new tools
- Adopting green building standard for new buildings
- Carbon partnerships with customers and suppliers
- Complete carbon footprint inventory for all fabs
- Investing in green technology industry

UMC Climate Change Policy,
Environmental Protection Policy

Applicable Entities
- 1. UMC
- 2. HeJian Technology (Suzhou) Co., Ltd. and United Semiconductor (Xiamen) Co., Ltd., which are UMC subsidiaries selling and manufacturing integrated circuits
- 3. UMC’s supply chain

Purposes
- Climate change mitigation and adaptation

Relevant policies

UMC Climate Change Policy,
Environmental Protection Policy

3-2-1 RISKS AND OPPORTUNITIES

Scenarios are collected from IPCC-AR5 and corresponding data simulated by government.

The ISO 14090 and the assessment procedure in the UK Climate Impact Programme (UKCIP) were used as reference for constructing the assessment tool.

Convene relevant department supervisors for risk assessment and ranking.

UMC Climate Change Risk Assessment
Based on the assessment outcome, risks and opportunities were identified and made adaptation or monitoring accordingly.
Risk Dimension:

POLICY AND LEGAL
Potential Risks
- Carbon tax, energy tax
- Product labeling and disclosure
- Greenhouse gas emissions permit and reporting, cap and trade schemes.

UMC’s Response
- Lower carbon emission voluntarily (As of 2017, UMC has 3.023 million tons of reduction credits approved by the EPA)
- Continue to inventory greenhouse gas emissions and product carbon footprint.

TECHNOLOGY
Potential Risks
- Need for low carbon products and services
- Commitment to investment in new technology

UMC’s Response
- New fab meets IEEE (Institute of Electrical and Electronics Engineers) requirements

MARKET
Potential Risks
- Products that are less eco-friendly will be eliminated because of changing consumer demands.

UMC’s Response
- Promoting the product life-cycle analysis and certification. (UMC has passed carbon footprint / water footprint certification, and participated in the LCA to go project to help customers acquire information on their products’ carbon footprint with minimal time and resources)

REPUTATION
Potential Risks
- Changes in customer preferences
- Bad reputation brings about negative feedback

UMC’s Response
- According to UMC’s current status, the company proceeds with current greenhouse gas responses (no significant risks).

SHORT-TERM
Potential Risks
- The intensity and frequency of natural disasters caused by typhoons and torrential rain prevent employees from going to work, may cause damage to fab facilities, and may disrupt energy supply.

UMC’s Response
- Incorporate wind loads standard into fab specifications. Wind resistance design of the fab must be 120% of local highest wind speed.
- Install flood gates for specific entrances and exits in Tainan Fab 12A, which is in a flood potential area, and upgrade protection level to the 500-year flood control standard. In the new Fab 12A_II buildings, the base of the 1st floor is more than 2 meters higher than the perimeter roads to fully protect against flooding risk.
- Promoting business continuity management system. Strengthen resilience and adaptability in climate-related and natural disasters.
- Globalize fabs and supply chains.
  Establish supplier risk map, decentralized raw material procurement and a 2-month inventory mechanism to avoid material interruption crisis.

LONG-TERM
Potential Risks
- Rising sea level from global warming may lead to inland flooding, resulting in reduced clean water sources, water shortages and abnormal infrastructure damage to fab facilities.

UMC’s Response
- Incorporate location considerations into future site selection. (UMC fabs are not located on coastal areas. The Hsinchu fabs are located on a hilly area with a higher terrain and no flood risk).
- Implementing effective water-saving measures.
  Expanding water recycling and reuse to lower the demand for water.
  Establish a water contingency plan. Implement water conservation and water truck schedule operations according to the extent of water limitation in the Science Park.
On the other hand, UMC also takes into account its core technology and human resources when seeking opportunities to enhance its operational competitiveness in terms of resource efficiency, energy sources, products/services, markets and goodwill.

**UMC Responses**

### RESOURCE EFFICIENCY
- Respond to government-promoted policies to reduce and increase the operational efficiency of tools, equipment and fabs as a whole.
- In addition to promoting the voluntary Green2020 program to conserve energy and reduce carbon emissions, UMC also participates in the Industrial Development Bureau’s voluntary greenhouse gas reduction information platform to exchange innovative practices with the industry and seek management and technological methods for reducing cost, improving efficiency and optimizing process.
- UMC plans to apply for GHG Offset Project in 2019, according to Taiwan’s voluntary GHG reduction incentive program to apply for carbon credits.

### ENERGY SOURCE
- Layout green energy industry and add business models.
- In addition to investing in the green energy industry, UMC has applied to change its to include advising and consultation services for energy and energy conservation technologies to further expand operation and increase profit source.
- Install solar power systems and apply for renewable energy certification.
- In addition to continuous energy efficiency improvement, UMC also responds actively to governmental renewable energy policies by implementing renewable energy in its fabs. The company has also listed solar power systems as a standard design in new fab construction. As of 2018, a 4,335 KWP capacity solar power system has been constructed, and is expected to generate up to 2.8 million KWh per year. Application for renewable energy certification has been submitted in 2018.

### PRODUCT / SERVICE
- Promote LCA project to reduce carbon in the overall supply chain
- More and more customers are concerned about problems caused by climate change and are making specific requests. In addition to annual GHG emissions and carbon footprint inventory, UMC has participated in the EU LCA To Go project to provide customers with a tool to quickly and easily access carbon footprint information. Using product life cycle assessment, more reduction opportunities are identified to create expert wafer solutions that meet market trends and customer green product design needs, thereby enhancing the competitiveness of UMC and its customers.
- Introduce business continuity management plan and verification
- Customers are gradually emphasizing the climate resilience capability of suppliers. UMC promotes business continuity plans in its fabs and has implemented the ISO 22301 business continuity management system verification to ensure that in case of a disaster, UMC has recovery and resilience capability for meeting and restoring the highest operational targets, thereby providing uninterrupted service to customers.
- Continue innovation to develop advanced technologies, providing customers with chips that are faster and more energy efficient
- In upcoming years, UMC will continue to develop advanced process technologies with lower power consumption, including 22nm technology that exhibits a 20% power reduction and 14nm technology with 50% power reduction. In addition, UMC also provides ultra-low power consumption of 55/40 nanotechnology to provide future ultra-low power uLP eNVM and MRAM technology in response to future IoT, Wearable Devices and Cloud Applications. Automotive Electronics, which are expected to be effectively delivered to innovative green and energy efficient product applications, will contribute 60% revenue share in the next 3 years.

### MARKET
- Obtain energy conservasion, high efficiency and low carbon patents
- To date, UMC has a total of 12,991 patents that provide UMC’s manufacturing process with comprehensive and powerful barriers to protect its intellectual property. Of the 12,991 patents, which contain multiple items related to energy-saving, high-efficiency, low carbon patents, UMC has also significantly increased the patent quality of its key technologies to stay competitive. We continue to strengthening customer service and our competitive advantage, while generating profits for the corporation.

### REPUTATION
- Fulfill corporate social responsibility, cooperate with governments, the public and global operating partners to realize the commitment to environmental sustainability
- Currently, UMC is actively cooperating with suppliers to promote the 3R League Project and the Green Awards initiative for resource recovery, reuse and reduction. The company also conducts external promotions in GHG reduction and ecological conservation.
- In addition to meeting customer requirements for product manufacturing, UMC also participates in the initiatives of industrial unions and associations. By offering its practical industrial experience and feedback, UMC hopes to facilitate the development of sound and feasible policies and regulations by the government and relevant institutions.

### Carbon Disclosure and Communication

Apart from representing the TSIA (Taiwan Semiconductor Industry Association) in the discussion meeting of the WSC (World Semiconductor Conference) every year, UMC also actively participates in various types of domestic and international discussions and exchanges, sharing experiences in carbon management. UMC has been invited to participate in the carbon disclosure project of the international CDP organization since 2006, now going strong for 13 consecutive years. Furthermore, it has worked on the disclosure of the above-mentioned results on carbon risks and opportunities and management-related information to the public. In 2018, UMC’s carbon exposure was awarded the Level 4 Leadership (A-) score; and has received this leadership performance award for 3 consecutive years since 2016.

### Yearly Progress in CDP Evaluation

<table>
<thead>
<tr>
<th>Year</th>
<th>Leadership Index</th>
<th>Climate Disclosure Leadership Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>91A</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>96B</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td>Awarded the highest Carbon Disclosure Score among Taiwan semiconductor companies.</td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td>99A−</td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td></td>
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</tbody>
</table>
Carbon Assets and Carbon Trading

From 2013 to 2014, UMC supported the EPA early reduction project and acquired a carbon reduction allowance of 3.02 million tons. In 2014, a 2 million ton carbon trading deal was signed with Dragon Steel. This was the first carbon trading transaction recognized by the EPA and marked an important milestone for the carbon trading market in Taiwan. Revenue obtained from this carbon trading transaction was wholly used by UMC to establish the UMC Eco-Echo Ecological Conservation Hope Project that was exclusively dedicated to environmental protection, promoting environmental protection measures, and contributing towards environmental sustainability.

In 2018, UMC’s application for Emission Reduction Methodology for Semiconductor Industry Fluorinated Greenhouse Gases and N2O Abatement Technology was reviewed and approved by the Environmental Protection Administration and published on Taiwan’s Greenhouse Gas Registry (platform). At this stage, UMC has also planned to apply for GHG Offset Project in 2019, according to Taiwan’s voluntary GHG reduction incentive program to apply for carbon credits. UMC estimates it can build 10 years of carbon assets totaling more than 1.5 million tons.

Internal Carbon Pricing

UMC has a state-of-the-art 12-inch wafer fab in Singapore. The Singapore government announced that it will introduce a carbon tax from 2019 onwards, making it the first country in Southeast Asia to promote this measure.

In Taiwan, there are additional sub-laws to the Greenhouse Gas Reduction and Management Act and a revised draft of the Renewable Energy Development Act that stipulate fines for GHG emissions exceeding the total controlled amount, and either mandatory green electricity certification purchase or payment for inadequate proportion of green electricity use.

At present, UMC has transformed the carbon emissions into potential carbon costs based on the analysis of the carbon risk scenarios of each fab, and has actively carried out a phased greenhouse gas reduction plan. The measures for the use of clean energy include the reduction of raw materials, setting of high-efficiency greenhouse gas breakdown equipment, etc., and building solar energy systems. The company takes an aggressive stance in reducing the impact of carbon emissions and taxes, enhancing its operational competitive advantage. In addition, UMC has organized inter-fab competitions such as the Green Fab Award and the Green Innovation Award to encourage plants to implement energy-saving and carbon reduction measures. Bonus incentives are available to business units and individuals which have achieved good results in reducing carbon emissions.

### 3-2-2 GREENHOUSE GAS INVENTORY

In accordance with inventory guidelines defined by domestic and international organizations such as the ISO14064-1 and GHG Protocol, UMC established its greenhouse gas inventory standard mechanism. The company regularly inventories the greenhouse gas emissions of all its fabs each year to fully determine the status of its greenhouse gases and verify the effectiveness of their reduction.

**SCOPE 1 DIRECT GHG EMISSIONS**
- Direct GHG emissions occurring from sources that are owned or controlled by the company (i.e., sources within the organizational boundary). For example, emissions from combustion of fuel in owned or controlled vehicles.

**SCOPE 2 ENERGY INDIRECT GHG EMISSIONS**
- Indirect GHG emissions occurring from the generation of purchased electricity (heat/cool, steam and fossil fuel derived energy products) consumed by the company.

**SCOPE 3 OTHER INDIRECT GHG EMISSIONS**
- Other indirect GHG emissions occurring as a consequence of the activities of the company, but generated from sources not owned or controlled by the company.
### Scope 3 (Other Indirect Greenhouse Gas Emissions)

In 2015, UMC began referencing carbon footprint calculation methods and technical documents provided by WRI and WBCSD for inventory checks, in order to estimate scope 3 GHG emissions listed in the following. UMC also passed DNV-GL verification, making us the first semiconductor company in Taiwan to complete scope 3 GHG emission verification.

#### UMC's Primary Sources of Greenhouse Gas Emissions

<table>
<thead>
<tr>
<th>Description</th>
<th>Year 2017</th>
<th>Year 2018</th>
<th>YoY %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purchased Goods and Services</strong></td>
<td></td>
<td></td>
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<tr>
<td>Boundary: Upstream (cradle-to-gate) emissions of 85% (by weight) of purchased goods</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>651,779</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>651,388</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fuel-and-Energy-Related Activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary: Upstream emissions of purchased fuels (diesel and NG) and electricity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>361,671</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>303,390</td>
<td></td>
<td></td>
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<tr>
<td><strong>Waste Generated in Operations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary: Transportation of 85% (by weight) of purchased goods</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>215,991</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>205,697</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Waste Generated in Operations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary: Transportation and disposal or treatment of waste.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>872</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>726</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Business Travel</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Boundary: Transportation of employees for business-related activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>521</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>728</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Employee Commuting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary: Transportation of employees (in vehicles operated by the Company and employees)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>14,733</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>14,515</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Downstream Transportation and Distribution</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary: Transportation of products sold by the Company</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>2,594</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>3,202</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Downstream Leased Assets</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary: Operation of assets owned by the Company</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>0</td>
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<td></td>
</tr>
<tr>
<td><strong>Investments</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>506,564</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>544,478</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Capital Goods</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Boundary: Upstream (cradle-to-gate) emissions of 85% (by weight) of purchased goods</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>463,374</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>243,649</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>2,218,099</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>1,967,773</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GHG Emissions (t CO₂e)

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
<th>YoY %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>2,218,099</td>
<td>YoY</td>
</tr>
<tr>
<td>2018</td>
<td>1,967,773</td>
<td>-11.3%</td>
</tr>
</tbody>
</table>

### 3-2-3 Greenhouse Gas Reduction and Energy Management

Results of UMC’s carbon footprint and greenhouse gas inventory found that carbon emissions from manufacturing is the primary source of carbon footprint, and that the main sources of the process emission are fluorinated greenhouse gases (F-GHGs) and electricity, which account for about 90% of UMC overall greenhouse gas emissions. Therefore, F-GHGs and electricity reduction are UMC’s priority.

#### UMC’s Primary Sources of Greenhouse Gas Emissions

Greenhouse gases from electricity providers during the generation of electricity for the company’s operations.

- CO₂
- C₂F₆
- C₃F₇
- C₅F₈
- CF₄
- C₆F₆
- C₂F₆
- C₄F₆
- SF₆
- NF₃
- CHF₃ etc.
Fluorinated Greenhouse Gas Reduction

In addition to carbon reduction each year, UMC established the Fluorinated Greenhouse Gas Reduction Taskforce in 1999 to promote greenhouse gas reduction. Moreover, the company set greenhouse gas reduction goals for the various phases of the program, and currently, the reduction program is in Stage 3. UMC shall continue to implement F-GHGs reduction projects. F-GHGs reduction in 2018 reached 1.28 million tons, which was a 51% reduction compared to 2010. Such results showed that UMC managed to achieve Phase 3 objectives ahead of schedule. UMC has already attained the reduction goal for 2020, which is 30% lower than 2010 levels, as stipulated by the World Semiconductor Council. At this stage, UMC has integrated with international trends and has cooperated with national policies to formulate reduction goals for 2025.

### Reduction Plans and Objectives for Each Phase for F-GHGs

<table>
<thead>
<tr>
<th>Phase</th>
<th>Objectives</th>
<th>Achieved/Attained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Comply with TSIA commitments</td>
<td></td>
</tr>
<tr>
<td>Phase 2</td>
<td>UMC’s voluntary reduction plan</td>
<td>Compared to 2009, reduce F GHGs emissions per unit of product by 33% in 2012. Achieved target</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Surpass WSC reduction objectives</td>
<td>Compared to 2010, reduce F-GHGs emissions per unit of product by 36% in 2020. Goal attained successfully ahead of schedule</td>
</tr>
<tr>
<td>New objective</td>
<td></td>
<td>• Compared to 2010, reduce F-GHGs emissions per unit of product by 55% in 2025. (Compared to 2010, reduce scope-1 GHG emissions per unit of product by 40% in 2025) • 30% absolute reduction of F-GHG emissions compared to 2010.</td>
</tr>
</tbody>
</table>

### Long term Goal

- **Compared to 2010, reduce unit fluorinated greenhouse gas emissions by 36% in 2020.**
- **Compared to 2010, reduce unit fluorinated greenhouse gas emissions by 55% in 2025.**
- **Compared to 2010, 30% absolute reduction of fluorinated greenhouse gas emissions in 2025. (Production capacity increased by 1.36 fold)**

### 2018 Actual Reduction

- **51%**

### F-GHGs Reduction Results

<table>
<thead>
<tr>
<th>Year</th>
<th>UMC (t CO2e)</th>
<th>HJTC (t CO2e)</th>
<th>UMC Emissions per production capacity (t CO2e/Wafer-m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>443,895</td>
<td>143,586</td>
<td>2.22</td>
</tr>
<tr>
<td>2015</td>
<td>434,642</td>
<td>128,151</td>
<td>2.33</td>
</tr>
<tr>
<td>2016</td>
<td>420,467</td>
<td>98,797</td>
<td>2.42</td>
</tr>
<tr>
<td>2017</td>
<td>404,482</td>
<td>114,069</td>
<td>2.11</td>
</tr>
<tr>
<td>2018</td>
<td>394,313</td>
<td>117,540</td>
<td>1.96</td>
</tr>
</tbody>
</table>

Note: In 2018, the scope-1 GHG emissions per unit of product were down about 42.9% compared to 2010.
F-GHGs reduction in 12-inch fabs

All UMC’s 12-inch fabs, including Fab 12A, Fab 12A’s new phases, Fab 12i and the fab of subsidiary USC have adhered to UMC’s F-GHGs reduction practices. Based on the Institute of Electrical and Electronics Engineers (IEEE) 1680.1:2018 standard, the total F-GHGs reduction rate for entire fabs has exceeded the required 75%.

Energy Management

Currently, to conserve energy, UMC is targeting electricity and natural gas, and promotes the implementation of energy management in its offices and public areas with promotional activities, education and training to cultivate a mindset and habit of energy conservation and greenhouse gas emission reduction among its employees.

**Vision**

Enhance energy efficiency to minimize impact on the earth as a result of energy use.

**Organization**

Through the CS Committee’s company-wide carbon reduction goals and development plans, coordinate/integrate departmental energy saving and carbon reduction strategies and programs. Hold regular committee meetings to review the implementation outcome, and continue to introduce energy conservation technologies and implement energy efficiency improvement programs in relevant facilities.

**Measures**

Fab 8A introduced ISO 50001 management system standards with systematic procedures and PDCA-based continuous improvement approaches. This model was promoted in other fab sites as well.

**Goal**

Electricity consumption reduction goal: Reduce electricity consumption per unit of product by 10% in 2020 and by 15% in 2025

Natural gas consumption reduction goal: A reduction of 5.5% in 2019

**Results**

Reduced electricity consumption by 2.24% in 2018

Natural gas reduction by 1.14% in 2018

(Using 2015 as the base year)
Major Energy Conservation Measures in 2018

- **Change online UPS to offline UPS**
  - Implementing Fab: 12A,12B,8A, 8D, 8E,USC, HJTC

- **Illumination energy saving**
  - Implementing Fab: 12A, 12A II, 12B, 8A, 8D, 8F, HJTC, USC

- **Make-up Air Unit energy conservation**
  - Implementing Fab: 12A, 12A II, 12B, 8F, USC

- **Compressed gas energy conservation**
  - Implementing Fab: 12A, 12A II, 12B, 8D, 8E, 8F, 8S, USC

- **Cold water system energy conservation**
  - Implementing Fab: 12A, 12A II, 12B, 8A, 8D, 8F, 8S

- **Process cooling water energy conservation**
  - Implementing Fab: 12A, 8E

- **Production machine energy conservation**
  - Implementing Fab: 12A, 12A II, 12B, 8A, 8D, 8E, 8F, 8S, HJTC

- **Energy saving measures for water treatment systems**
  - Implementing Fab: 12A, 8E

- **Add high temperature heat pumps**
  - Implementing Fab: 12A/8A

- **L/S TPU modifies to ULF**
  - Rising Heat Pump efficiency
  - VOC operating parameters adjusted for optimization
  - Implementing Fab: 12A

**Total energy conservation in 2018**

<table>
<thead>
<tr>
<th>Year</th>
<th>Electricity</th>
<th>Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>57,127 MWh</td>
<td>31,648 TON</td>
</tr>
<tr>
<td>2011</td>
<td>57,127 MWh</td>
<td>31,648 TON</td>
</tr>
<tr>
<td>2012</td>
<td>33,800 MWh</td>
<td>21,627.1 TON</td>
</tr>
<tr>
<td>2013</td>
<td>33,500 MWh</td>
<td>21,627.1 TON</td>
</tr>
<tr>
<td>2014</td>
<td>29,470 MWh</td>
<td>21,627.1 TON</td>
</tr>
<tr>
<td>2015</td>
<td>51,900 MWh</td>
<td>31,648 TON</td>
</tr>
<tr>
<td>2016</td>
<td>50,500 MWh</td>
<td>31,648 TON</td>
</tr>
<tr>
<td>2017</td>
<td>57,100 MWh</td>
<td>31,648 TON</td>
</tr>
<tr>
<td>2018</td>
<td>57,100 MWh</td>
<td>31,648 TON</td>
</tr>
</tbody>
</table>

---

1. CO2 emissions are calculated using the electricity coefficient of 0.554 Kg CO2e / KWh.
2. The information above does not include energy savings for HJTC and USC.
3. For newly added improvements, performance was only calculated for 12 months.
4. The gas conservation amount estimated by the energy conservation measure is a theoretical amount. The CO2 emission coefficient of the 2006 IPCC fixed and mobile resource (gas) and gas caloric value from the various local fabs are also incorporated into the carbon emission calculation.
5. The gas carbon equivalent for Taiwan’s fabs = 1.879 KgCO2/M3.
Promotion of Renewable Energy

Aside from UMC’s ongoing energy efficiency improvement efforts, it is also actively setting up renewable energy sources in the fab, and has listed solar energy systems as a new fab standard design and construction project.

UMC has completed the installation of the 4,335 KWP solar energy system, which is expected to generate up to 2.8 million KWh of electricity each year. The installation capacity is the highest among Taiwan’s wafer industry, thereby fully demonstrating UMC’s commitment to green energy and full support for clean energy.

In October 2018, UMC’s two solar power generators in Fab 12A, installed in cooperation with the government’s renewable energy policy, were reviewed and approved by government and third-party power survey agencies. UMC continues to pursue renewable energy certifications, and obtained 31 such certifications between October and December 2018.

Newly Installed Solar Energy System in Recent Years

<table>
<thead>
<tr>
<th>Year</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>Fab 12i in Singapore</td>
</tr>
<tr>
<td>2016</td>
<td>Subsidiary HJTC in China</td>
</tr>
<tr>
<td>2017</td>
<td>Fab 12A in Taiwan</td>
</tr>
<tr>
<td>2018</td>
<td>Subsidiary USC in China</td>
</tr>
</tbody>
</table>

Total installed capacity of Solar Energy System

Solar Energy Output in Recent Years
UMC Statistics on Natural Gas Consumption over the Years

<table>
<thead>
<tr>
<th>Year</th>
<th>UMC (MWh)</th>
<th>HJTC (MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>235,993</td>
<td>20,661</td>
</tr>
<tr>
<td>2015</td>
<td>232,677</td>
<td>20,746</td>
</tr>
<tr>
<td>2016</td>
<td>221,602</td>
<td>22,841</td>
</tr>
<tr>
<td>2017</td>
<td>206,235</td>
<td>17,133</td>
</tr>
<tr>
<td>2018</td>
<td>201,124</td>
<td>17,340</td>
</tr>
</tbody>
</table>

Note: In 2018, the overall energy intensity for UMC and its subsidiary HJTC was 0.95 MWh/Wafer-m². (The unit gas calorific conversion coefficient is calculated according to the caloric value provided by the local gas suppliers of each fab.)

UMC Statistics on Electricity Consumption over the Years

<table>
<thead>
<tr>
<th>Year</th>
<th>UMC (MWh)</th>
<th>HJTC (MWh)</th>
<th>USC (MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2,337,513</td>
<td>172,141</td>
<td>2,305,685</td>
</tr>
<tr>
<td>2015</td>
<td>2,305,685</td>
<td>182,090</td>
<td>2,290,119</td>
</tr>
<tr>
<td>2016</td>
<td>2,541,762</td>
<td>186,084</td>
<td>2,534,456</td>
</tr>
<tr>
<td>2017</td>
<td>2,058,65</td>
<td>195,199</td>
<td>2,015,403</td>
</tr>
<tr>
<td>2018</td>
<td>2,44,203</td>
<td>201,504</td>
<td>2,01,124</td>
</tr>
</tbody>
</table>

Note: In 2018, the overall energy intensity for UMC and its subsidiary HJTC was 12.53 MWh/Wafer-m².

UMC’s Historical Natural Gas Saving Performance Statistics

<table>
<thead>
<tr>
<th>Year</th>
<th>Saving Performance(MWh)</th>
<th>CO₂ reduced (tons)</th>
<th>% conservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2.159</td>
<td>10,979</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>2.292</td>
<td>11,652</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>15.628</td>
<td>2,159</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>2,98</td>
<td>1,485</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>2,882</td>
<td>567</td>
<td></td>
</tr>
</tbody>
</table>

1. In 2018, the overall energy intensity for UMC and its subsidiary HJTC +USC was 12.53 MWh/Wafer-m².
Energy Conservation Plans for 2019

Energy saving plans shall cover about 306 energy saving measures such as the complete introduction of equipment energy saving features, provision of inverters, replacing online uninterruptible power supplies (UPS) with offline UPS systems, and ice water system energy saving measures. Reduction goals for 2019 are 47,000 MWh, which would be equivalent to carbon dioxide emission reductions of about 26,038 t CO2e.

UMC shall continue to promote heat recycling and energy saving projects for high temperature heat pumps, which are expected to reduce nature gas consumption by 13,992 MWh, equivalent to carbon dioxide emission reductions of about 2,752 t CO2e.
Recent climate changes have led to severe fluctuations in precipitation with more frequent floods and droughts. External stakeholders are also increasingly concerned about issues related to water resources. To respond to complex water resource issues on a timely basis and effectively integrate prevention steps, consumption reduction, contingency response, and other management concepts, UMC has successfully completed water risk factor identification and response measures. The UMC Water Resource Management Policy and Commitment was announced in 2015 to serve as our highest guiding principles for water resource management.

**Goals and Targets**

Improve water efficiency; reduce water consumption per unit of product by 10% in 2020, by 15% in 2025. (With 2015 as the base year)

**Purposes**

Maximize water efficiency, increase ability of valuable downstream chains to withstand water risk, and promote the importance of water resources and conservation.

**Potential Risks**

- Regulations and control for wastewater quality / water discharge quantity
- Water charges

**UMC’s Response**

- Participate in government, unions and association seminars to share practical experience and advice
- Implement wastewater source diversion to enhance quality of wastewater
- Continue to assess new wastewater treatment technology
- Upgrade production efficiency to reduce water consumption and improve water recovery

**Potential Risks**

- Commitment for new technology investment
- Consumers, customers, investors and other parties of interest require companies to provide green products and expand their influence through the supply chain to indirectly eliminate excessive water-consuming commodities.

**UMC’s Response**

- Promote analysis and certification of environmental impact on product lifecycle as well as promote source reduction.
  (UMC has passed water footprint certification and continues to promote water saving projects)
- Changes in customer preferences
- Bad reputation brings about negative feedback

**UMC’s Response**

- Will continue to proceed according to UMC's current direction for water risk response (No significant risk)

**Potential Risks**

- The intensity and frequency of natural disasters caused by typhoons may prevent employees from going to work, may cause damage to fab facilities, and may disrupt energy and raw materials supply.
- Change of water source resulting in the change of water quality.

**UMC’s Response**

- Improve flood potential and risk assessments
- Promoting business continuity management system
- Globalize fabs and supply chain
- Assess suppliers’ water risk
- Water quality risk assessment was conducted

**Potential Risks**

- Rising sea level from global warming may lead to inland flooding, resulting in reduced clean water sources, water shortages and abnormal infrastructure damage to fab facilities.

**UMC’s Response**

- Reduce pressure of water demand by increasing water recovery and reuse
- Use limited water resources efficiently
- Evaluate and introduce new water sources
- Water Risk Management Tool Development
- Incorporate location considerations into future site selection.
- Establish a water contingency plan

**Applicable Entities**

- 1. UMC
- 2. HeJian Technology (Suzhou) Co., Ltd.
- and United Semiconductor (Xiamen) Co., Ltd., which are UMC subsidiaries selling and manufacturing integrated circuits
Water disclosure and communication

Since 2017, UMC has been invited to participate in the CDP water disclosure project. To date, the company has been awarded the highest rating for Taiwan's enterprises for two consecutive years, with (A-) rating in 2017 and (B) rating in 2018.

Water Risk Management Tool Development

With regard to the water resource issue, besides the continuous implementation of water saving measures, UMC has collaborated with the Department of Bioenvironmental Systems Engineering, National Taiwan University in 2015–2016 to develop the “Water Shortage Warning and Decision Support System for UMC's Fabs in Hsinchu Science Park and Southern Science Industrial Park.” A seasonal (3 months) water shortage warning system was established to simulate the warning system used in the Water Resources Agency, MOEA. In addition, the seasonal broadcasting data from the Central Weather Bureau was incorporated into the system to offer water supply predictions. With this tool, UMC’s fabs will know in advance about any possible water shortages. By combining with UMC’s water shortage response measures, operation risk can be significantly reduced.

System Framework

Water Resources Sharing and Social Participation

In addition to internal water resource assessment and management and active promotion of water conservation, UMC also serves as a representative in industrial unions/associations. The company cooperates with the government and industrial peers in water resources communication and exchange counseling through the following mechanisms:

- Water resources communication meetings convened by the Water Resources Agency and manufacturer’s associations.
- Increased water resources adjustment and coordination by manufacturers and the Water Resources Agency during dry season.
- In cooperation with the Water Resources Agency’s promotion of reclaimed water construction, UMC plans to use reclaimed water.
- Establish a communication platform meeting with the Water Resources Agency to meet future water supply and demand.

Exchange and Counseling with Industry Peers

UMC has participated in the establishment of water conservation coaching in the Science Park annually since 2002. As of 2018, it has conducted a total of 189 cases and coached more than 80 companies, sharing the company’s valuable experience in water conservation with industry peers to reduce the demand for water resources. For example, in 2018, the potential quantity of water saved after coaching was 290,000 tons/year. In 2017, UMC carried out water conservation coaching and tracked the performance of 10 companies, realizing savings of 82,000 tons of water.

UMC’s Main Water Source for Each Fab

<table>
<thead>
<tr>
<th>Fab Water Source</th>
<th>WATER SCARCITY (NOTE1) – LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSINCHU SCIENCE PARK</td>
<td>BA, BD, BE, BF, BS</td>
</tr>
<tr>
<td>Water Source</td>
<td>Baoshan Reservoir/Baoshan II Reservoir/Longen Dam</td>
</tr>
<tr>
<td>In addition to the existing water supply, the Shimen Reservoir and Yonghe Mountain Reservoir provide support mechanisms. Each year before the dry season, the Water Resources Agency convenes meetings to discuss the coming water risk to minimize the risk of water shortage.</td>
<td></td>
</tr>
</tbody>
</table>

| CHINA SUZHOU | Subsidiary JHTC |
| Water Source | Jialing River/Tingsi Reservoir |
| The Jialing River has a water volume of 446 cubic meters per second, and the Tingsi Reservoir has a storage capacity of 48.45 million cubic meters; these abundant water resources ensure a stable water supply. |

| CHINA XIAMEN | Subsidiary USC |
| Water Source | Jialing River/Tingsi Reservoir |
| The Jialing River has a water volume of 446 cubic meters per second, and the Tingsi Reservoir has a storage capacity of 48.45 million cubic meters; these abundant water resources ensure a stable water supply. |

| SINGAPORE | 12i |
| Water Source | Singapore Newater reclaimed water |
| Newater recovers and treats public waste water for reuse, and hence has a more stable source of water supply with lower risk. |

Note 1: The WRI (Water Resource Institute) Aqueduct Tool is used to assess water risk.
Note 2: The WRI (Water Resource Institute) Aqueduct Tool is used to confirm that Singapore is categorized as moderate water scarcity. Analysis shows Fab 12i plant derives 54% of its total water from Newater’s recycled water, so water risk has been modified to low level.
Using Recycled Water

When Fab 12i in Singapore was being built, recycled water (Newater) was introduced in the production of 12-inch wafers (non-livelihood water). The fab used more stable recycled water (Newater), and increased its HF treatment system for discharge quality of fluoride ions < 15ppm, at the same time strengthening the classification management of the source of the machine, and controlled sulfates to <1000ppm. On the other hand, the status of using recycled water has been evaluated in UMC's Taiwan fabs in areas where water resources are relatively depleted.

In 2018, the company's use of recycled water reached 3.15 million tons, accounting for 94% of Fab 12i's total water use of 3.35 million tons. In the future, the fab in the Southern Taiwan Science Park will work in conjunction with the completion of the 3.35 million tons, accounting for 94% of Fab 12i's total water use of 3.35 million tons. In the future, the fab in the Southern Taiwan Science Park will work in conjunction with the completion of the government's recycling system, performing incremental testing before full utilization, to increase the amount of recycled water used and reduce the impact on local water resources.

Total water withdrawal of UMC is broken down below

<table>
<thead>
<tr>
<th>Region</th>
<th>Water Consumption (Mm³)</th>
<th>Recycled Water (Mm³)</th>
<th>Impact of UMC on Total Volume of Water Recycled and Reused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hsinchu Park</td>
<td>0.54</td>
<td>0.51</td>
<td>0.51%</td>
</tr>
<tr>
<td>Tainan Park</td>
<td>0.82</td>
<td>0.86</td>
<td>0.86%</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.45</td>
<td>0.51</td>
<td>0.51%</td>
</tr>
</tbody>
</table>

Note 1: Fab in Hsinchu Science Park, Tainan Science Park, China Suzhou provided by water company, Singapore fab provided by PUB website information.

Note 2: Water meter readings are recorded daily, and based on average monthly water usage, annual water consumption is calculated.

Water Quality Risk Control

Before entering the fabs, water is first tested with pH devices and continuously monitored with a conductivity meter to ensure stable quality. During the pure water production process, each unit of the water production facility is equipped with an inspection instrument which is connected to SPC in order to ensure the quality of the water.

Review and analysis showed that UMC and Subsidiary fabs use less than 5% of the water in their respective regions, and hence have no significant impact on water resources.

Percentage and Total Volume of Water Recycled and Reused

According to the continuous improvement of the new Green 2020 water-saving plan, the water saving capacity was 228,000 tons in 2018 (accounting for 1.5% of municipal water usage in 2018), which is equivalent to saving benefits of NTD 5.7 million for that year. For subsidiary HJT, water saving capacity was at 76,000 tons in 2018, translating to benefits of approximately RMB 28,000, accounting for 3.7% of municipal water usage in 2018.

As shown in the diagram below, in 2018, UMC company wide recovered water totaled 32.8 million tons, which is equivalent to conserving 1.04 of Baoshan II Reservoir:

UMC and its Subsidiaries HJT/USC Water Conservation in the Last 5 Years

Note 1: In 2018, total recycled water of UMC, including its subsidiary HJT and USC was equivalent to conserving 1.24 of Baoshan II Reservoir.

Note 2: In 2018, Fab 8N and Fab 12X overall recycled water amounted to 5.36 million tons, which was equivalent to 0.17 of Baoshan II Reservoir.

Note 3: Baoshan II Reservoir is the main water source for the Science Park. Its full water storage capacity is 31,471,800 tons (Source: Ministry of Economic Affairs Water Resources Agency February 2018 Water Storage Report).
Due to its past promotion of water conservation, reduction and recycling measures, and its high recovery rate in the manufacturing process, UMC’s current water recovery has exceeded the newly increased total water withdrawal. Total water recovery and reuse could reach more than 200% of water withdrawal.

### Percentage of Water Recovery and Reuse to Total Water Withdrawal

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Water Withdrawal (Million m³)</th>
<th>Total Recovered Water (Million m³)</th>
<th>Ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>180</td>
<td>14.70</td>
<td>8.17</td>
</tr>
<tr>
<td>2015</td>
<td>188</td>
<td>14.46</td>
<td>7.74</td>
</tr>
<tr>
<td>2016</td>
<td>194</td>
<td>14.34</td>
<td>7.39</td>
</tr>
<tr>
<td>2017</td>
<td>205</td>
<td>15.68</td>
<td>7.65</td>
</tr>
<tr>
<td>2018</td>
<td>207</td>
<td>15.82</td>
<td>7.64</td>
</tr>
</tbody>
</table>

Note 1: Amount of recovered water is calculated using cumulative flow meter or floating flow meter.

Note 2: Total water withdrawal includes municipal water + condensate water and rainwater.

Municipal water: Water meter readings are recorded daily, and based on average monthly water usage, annual water amount is calculated.

Condensate water and rainwater: Annual water amount is calculated using flow meters and estimates.

Note 3: The information above includes Fab 12A’s second plant since 2017.

### New Improvement Measures and Outcomes in 2018

<table>
<thead>
<tr>
<th>Measure</th>
<th>Implementing Fab</th>
<th>Amount of Conserved Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMP AND ALKALINE DRAIN WATER REUSE</td>
<td>subsidiary HJTC</td>
<td>76,591 tons</td>
</tr>
<tr>
<td>LOW CONDUCTIVITY DRAIN INCREASE RO MEMBRANE</td>
<td>12A</td>
<td>57,809 tons</td>
</tr>
<tr>
<td>INCREASE ACID WASTE RECLAIM SYSTEM (PLANT 2)</td>
<td>12A</td>
<td>35,011 tons</td>
</tr>
<tr>
<td>LOW CONDUCTIVITY DISCHARGE, CONCENTRATE RECYCLE BY RO MEMBRANE</td>
<td>12A II</td>
<td>21,900 tons</td>
</tr>
<tr>
<td>PURIFY CMP RECLAIM SYSTEM</td>
<td>8D</td>
<td>15,982 tons</td>
</tr>
<tr>
<td>REUSE MMF BACK WASH WATER</td>
<td>12A II</td>
<td>11,016 tons</td>
</tr>
<tr>
<td>CMP RECLAIM WATER REUSE TO CENTRAL SCRUBBER</td>
<td>8S</td>
<td>9,955 tons</td>
</tr>
<tr>
<td>INCREASE BACK SIDE GRADE SYSTEM</td>
<td>12A II</td>
<td>9,855 tons</td>
</tr>
<tr>
<td>UPGRADE CONDUCTIVITY BASE OF AWR SYSTEM FOR INCREASE QUANTITY</td>
<td>12A II</td>
<td>7,300 tons</td>
</tr>
<tr>
<td>ALKALINE RESIN BED RINSE WATER REUSE</td>
<td>12A</td>
<td>6,420 tons</td>
</tr>
<tr>
<td>PH METER SAMPLING WATER RESUSE OF CATION RINSE BED</td>
<td>12A II</td>
<td>3,087 tons</td>
</tr>
<tr>
<td>OTHERS</td>
<td></td>
<td>49,933 tons</td>
</tr>
</tbody>
</table>

Note: Only 12 months of performance are included for the new improvement items. Only outcomes from 2018 are included in multi-year plans.
UMC and its Subsidiaries HJTC/USC Total Water Withdrawal in the Last 5 Years.

UMC: Total water withdrawal(Mm³)
HJTC+USC: Total water withdrawal(Mm³)

Note 1: In 2018, the overall water withdrawal per wafer area for UMC and its subsidiaries HJTC /USC was 82.1 m³/Wafer-m².

Note 2: 2018 UMC municipal water consumption: 14,907,000 tons; condensate water and rainwater: 911,000 tons.

Note 3: 2018 HJTC and USC municipal water consumption: 3,674,000 tons; condensate water and rainwater: 91,000 tons.

**A breakdown of total water withdrawal of UMC in 2018**

<table>
<thead>
<tr>
<th>Source of Water Withdrawal</th>
<th>All areas</th>
<th>Areas with water stress (fabs in Tainan Science Park)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface water + Groundwater + Seawater + Produced water (total)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Condensate water and Rainwater (total)</td>
<td>911</td>
<td>322</td>
</tr>
<tr>
<td>Third-party water (total)</td>
<td>14,907</td>
<td>5,712</td>
</tr>
<tr>
<td>Freshwater (&lt;1,000 mg/L Total Dissolved Solids)</td>
<td>14,907</td>
<td>5,712</td>
</tr>
<tr>
<td>Other water (&gt;1,000 mg/L Total Dissolved Solids)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total third-party water withdrawal by withdrawal source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface water</td>
<td>14,907</td>
<td>5,712</td>
</tr>
<tr>
<td>Groundwater + Seawater + Produced water (total)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**TOTAL WATER WITHDRAWAL (MEGALITERS)**

15,818 | 6,034

Note: The source of third-party water all came from surface water which was provided by a water company.
Condensate Water and Rainwater

Condensate water and rainwater are precious natural water sources, but are easily subjected to seasonal climate changes, and therefore account for only 5% of total water consumption. If efficiency can be improved, the environmental impact on water sources can be reduced.

**UMC Condensate Water and Rainwater Recovery in the Last Five Years**

<table>
<thead>
<tr>
<th>Year</th>
<th>Water Withdrawal (megaliters)</th>
<th>Water Consumption (megaliters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>669,513</td>
<td>911,311</td>
</tr>
<tr>
<td>2015</td>
<td>624,826</td>
<td>4,996</td>
</tr>
<tr>
<td>2016</td>
<td>670,526</td>
<td>15,818</td>
</tr>
<tr>
<td>2017</td>
<td>781,619</td>
<td>2,076</td>
</tr>
<tr>
<td>2018</td>
<td>911,311</td>
<td>85.3</td>
</tr>
</tbody>
</table>

Note: The information above includes Fab 12A's second plant since 2017.

**UMC and Its Subsidiaries HJTC/USC Deionized Water Consumption in the Last 5 Years.**

<table>
<thead>
<tr>
<th>Year</th>
<th>UMC - All areas</th>
<th>HJTC</th>
<th>USC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>14.69</td>
<td>1.59</td>
<td>6.034</td>
</tr>
<tr>
<td>2015</td>
<td>14.82</td>
<td>1.80</td>
<td>3.19</td>
</tr>
<tr>
<td>2016</td>
<td>15.21</td>
<td>1.99</td>
<td>3.46</td>
</tr>
<tr>
<td>2017</td>
<td>16.81</td>
<td>3.19</td>
<td>2,174</td>
</tr>
<tr>
<td>2018</td>
<td>17.17</td>
<td>3.46</td>
<td>455</td>
</tr>
</tbody>
</table>

Note 1: The information above includes Fab 12A's second plant since 2017.
Note 2: In 2018, the overall deionized water consumption per wafer area for UMC and its subsidiaries HJTC/USC was 86.7 m³/Wafer-m².

## Water Consumption

**UMC and its Subsidiaries HJTC/USC Water Withdrawal and Consumption in 2018 (megaliters)**

**UMC - All areas**

- 15.818 Surface water + Groundwater + Seawater + Produced water (total)
- 4.996 Third-party water (total)
- 2,044 Condensate water and Rainwater (total)

**HJTC**

- 2.076 Total water withdrawal
- 284 Water consumption

**USC**

- 1.627 Total water withdrawal
- 455 Water consumption

The total water withdrawal and water consumption of facilities in areas with water stress in 2018.

(Fabs in Tainan Science Park)

<table>
<thead>
<tr>
<th>Water withdrawal</th>
<th>Process related Facilities</th>
<th>Living related Facilities</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface water + Groundwater + Seawater + Produced water (total)</td>
<td>0</td>
<td>199</td>
<td>5,712</td>
</tr>
<tr>
<td>Third-party water (total)</td>
<td>5,513</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condensate water and Rainwater (total)</td>
<td>322</td>
<td>0</td>
<td>322</td>
</tr>
</tbody>
</table>

Total water consumption:

2,044 130 2,174

Note: Water consumption = Total water withdrawal - Total water discharge
Company-wide Recovery Rate and Process Recovery Rate

Despite the various operation schedules of UMC’s fabs, the water recovery rate still outperformed the standard regulated by the Science Park.

<table>
<thead>
<tr>
<th>Company-wide recovery rate</th>
<th>Manufacturing recovery rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>8A</td>
<td>≥70% 81.3%</td>
</tr>
<tr>
<td>8D</td>
<td>≥70% 84.0%</td>
</tr>
<tr>
<td>8E</td>
<td>≥70% 90.6%</td>
</tr>
<tr>
<td>8F</td>
<td>≥70% 86.3%</td>
</tr>
<tr>
<td>8S</td>
<td>≥70% 88.8%</td>
</tr>
<tr>
<td>12A</td>
<td>≥75% 87.3%</td>
</tr>
<tr>
<td>12AII</td>
<td>≥75% 85.7%</td>
</tr>
<tr>
<td>12I</td>
<td>NA 71.8%</td>
</tr>
<tr>
<td>HJTC</td>
<td>NA 56.5%</td>
</tr>
<tr>
<td>USC</td>
<td>65% 70.8%</td>
</tr>
</tbody>
</table>

Note: When no local standard is available (NA), fabs will be installed with basic recycling equipment.

Water Conservation Improvement for 2019

<table>
<thead>
<tr>
<th>Reduce water consumption of cooling tower</th>
<th>W-SOL drain reclaim to Cu CMP system</th>
<th>Increase performance of CMP reclaim</th>
<th>Machine discharge to 30% reclaim system</th>
<th>Improve loading of waste HF treatment system by reverse membrane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planned Amount of Conserved Water (ton)</td>
<td>49,275</td>
<td>21,900</td>
<td>18,250</td>
<td>14,965</td>
</tr>
<tr>
<td>Sum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3-3-4 WATER POLLUTION CONTROL

Among process reduction, waste diversion and categorization, the priority in UMC’s water pollution control strategies are process source reduction, waste liquid diversion, followed by categorization. In its new fab areas, there are up to 27 categories of wastewater diversion, which are further divided into solvent-based and high or low flash point for resource recovery or incineration while inorganic acids are reused. For multiple re-use, wastewater is categorized according to characteristics to maximize water resource efficiency and simplify wastewater composition. Finally, wastewater is treated in the fab’s wastewater treatment facilities according to the control standards of the Science Park Administration before being discharged into the science park sewage systems. For real-time monitoring and response, equipment for continuous monitoring of water quality (pH, fluoride ion concentration) and water quantity are installed, and SPC management is adopted for self and early prevention to ensure that the quality of water discharged into park sewage complies with control regulations. In addition, the Science Park Administration conducts monthly unscheduled and random quality inspection of water discharged by the different companies to reaffirm the quality of discharged water.
Wastewater Treatment

To fulfill our corporate social responsibilities, UMC has continued to invest in the R&D of wastewater treatment technologies. In recent years, we introduced advanced ammonia nitrogen wastewater treatment techniques to reduce pollution burdens of water bodies.

Nitrogen wastewater treatment techniques' setup status of each fab

- **Setup Year : 2018**
  - Site: 8A/8D
  - Technologies: Stripping + Sulfate scrubber
    - Final product: Ammonium sulfate

- **Setup Year : 2017**
  - Site: 8F/8S
  - Technologies: Electrolysis
    - Final product: Nitrogen gas & Hydrogen gas

- **Setup Year : 2016**
  - Site: 12A
  - Technologies: Thin film separation + Sulfate scrubber
    - Final product: Ammonium sulfate

- **Setup Year : 2016**
  - Site: 12A II / USC
  - Technologies: Catalyst dissociation
    - Final product: Nitrogen gas

- **Setup Year : 2006**
  - Site: HJTC
  - Technologies: Stripping + Sulfate scrubber
    - Final product: Ammonium sulfate

UMC and its subsidiaries HJTC/USC Wastewater Discharge

### Location

<table>
<thead>
<tr>
<th>Location</th>
<th>Discharge Amount (10,000 tons/day)</th>
<th>Treatment Department</th>
<th>Current Treatment Amount (10,000 tons/day)</th>
<th>Discharged into drainage area</th>
<th>Impact (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HSINCHU SCIENCE PARK</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8A/8D/8E/8F/8S</td>
<td>1.17</td>
<td>Hsinchu Science Park Administration sewage treatment plant</td>
<td>10.7</td>
<td>Ke-Ya River</td>
<td>10.9%</td>
</tr>
<tr>
<td><strong>TAINAN SCIENCE PARK</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12A II</td>
<td>1.06</td>
<td>Tainan Science Park Administration sewage treatment plant</td>
<td>9.25</td>
<td>Yanshuei River</td>
<td>11.4%</td>
</tr>
<tr>
<td><strong>SINGAPORE - INDUSTRIAL RE-USE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12i</td>
<td>0.73</td>
<td>Public Utilities Board (PUB)</td>
<td>80</td>
<td>South China Sea</td>
<td>0.91%</td>
</tr>
<tr>
<td><strong>CHINA SUZHOU</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HJTC</td>
<td>0.49</td>
<td>Suzhou Industrial Park, Hua Yan Water Ltd.</td>
<td>90</td>
<td>Wusong River</td>
<td>0.54%</td>
</tr>
<tr>
<td><strong>CHINA XIAMEN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USC</td>
<td>0.32</td>
<td>Xiamen City, Xiang-an (Ma Xin) sewage treatment plant</td>
<td>5</td>
<td>Dongkeng Bay</td>
<td>6.4%</td>
</tr>
</tbody>
</table>

Note 1: Hsinchu Science Park fabs, Tainan Science Park fabs, HJTC and USC: Water meter readings are recorded daily, and based on average monthly water usage, annual water consumption is calculated.

Note 2: Singapore fab: Based on daily record & accumulation

Note 3: Hsinchu Science Park fabs, Tainan Science Park fabs: Ministry of Science and Technology Statistics and Data Bank

Note 4: Singapore fab: Based on PUB website information

Note 5: HJTC: Suzhou Industrial Park, Hua Yan Water Ltd. sewage treatment plant

Note 6: USC: Xiamen City, Xiang-an (Ma Xin) sewage treatment plant
Ammonia Wastewater Improvement

In responding to the addition of new wastewater pollutants, namely ammonia and Tetramethylammonium Hydroxide (TMAH), for regulation by the Science Industrial Park Administration Bureau, UMC from 2013 to 2015 has promoted the reduction of ammonia and source materials containing TMAH developer in Hsinchu and Tainan fab areas. In 2018, each fab continued to implement the target items of various projects. Based on the amount used in 2012, the reduction rate was more than 50%. UMC's fabs in Southern Science Industrial Park installed ammonia wastewater treatment system in 2015. As a result, the ammonia concentration in discharged water passed the sewage pollutant regulating standard of the Science Industrial Park.

The breakdown of the water discharged to all areas and to all areas with water stress in 2018.

### UMC Water Discharge (megaliters)

<table>
<thead>
<tr>
<th>Year</th>
<th>All areas</th>
<th>Areas with water stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>10.1</td>
<td>0</td>
</tr>
<tr>
<td>2015</td>
<td>9.8</td>
<td>1.7</td>
</tr>
<tr>
<td>2016</td>
<td>9.9</td>
<td>1.8</td>
</tr>
<tr>
<td>2017</td>
<td>10.9</td>
<td>1.8</td>
</tr>
<tr>
<td>2018</td>
<td>10.8</td>
<td>1.8</td>
</tr>
</tbody>
</table>

### Economic Benefit:
Annual operating cost is reduced by about NT$48 million in cost of nitrogen raw materials. After 2018, wastewater charges paid to the Science Park Administration can be reduced by about NT$180 million per year.

### Environmental Benefit:
Through ammonia source reduction, ammonia concentration in the wastewater is reduced by 28% to 63%.

### Current Status and Future Goals:
After reduction at the source, UMC has also added a wastewater ammonia nitrogen treatment system to improve Stage Two ammonia nitrogen wastewater. With the addition, it is expected that all fabs will no longer need to pay an ammonia nitrogen wastewater treatment fee. In 2018, the installation was completed in Fab 8A and Fab 8D in Hsinchu Science Park, and a higher economic and environmental performance is expected.
Waste Management

The problem of waste has become a heavy burden on the environment in recent years. It also poses a threat to the environmental hygiene of our daily lives, and it represents huge costs to enterprise, government, and society in general in terms of clean-up treatment. If not managed properly, as soon as there are costs to pay for damage arising from environmental pollution, the costs of recovery are even greater. To deal with waste management issues, UMC has been vigorously planning implementation programs of various orientations in recent years which are progressively being promoted.

UMC’s ultimate waste management goal is zero waste using the strategy of total waste reduction and waste-to-resource. By improving process technology, raw material source reduction and other source management measures, waste output is reduced to achieve waste reduction.

In 2018, UMC’s total waste output was 38,826 metric tons (not including routine office waste), and waste output per unit production capacity was 193 kg/m², which is a reduction of 7.5% compared to 2017.

In 2018, UMC’s overall production of hazardous waste amounted to 22,966 metric tons, and the per unit production capacity of hazardous waste output was 114 kg/m², representing a decrease of 5.4% from 2017.

In 2018, UMC’s reduction plans and measures resulted in a total waste reduction of 1,790 metric tons, as shown in the table below.

### 2018 Waste Reduction Measures and Performances

| Reduction of waste sulfuric acid and waste phosphoric acid (through source reduction or as an pollution control equipment agent) | Reduction of calcium fluoride / calcium phosphate sludge (expand dryer, waste phosphoric acid outsourcing treatment) | Reduction of waste solvents (through lifetime extension) | Reduction of BOE (replaced by DHF) | Other reductions (reduce VOC cleaning waste, reduce grinding empty drums and residual liquid, photore sist and targets) |
| 11,285 TONS | 315 TONS | 111 TONS | 34 TONS | 80 TONS |

### TOTAL AMOUNT OF REDUCTION

1,790 TONS
With regard to waste reduction in the Green2020 Reduction Plan, the waste production volume per unit of all UMC’s 8” fabs (including HJTC) was 101.3kg/m², which is a reduction of 18.2% compared with 2015 (123.9 kg/m²). The waste production volume per unit of all UMC’s 12” fabs was 250.0kg/m², which is a reduction of 15.3% compared with 2015 (295.2 kg/m²).

Continuous reduction of IPA and NMP sources to reduce waste solvent output.

The newly installed ammonia nitrogen wastewater treatment equipment replaces purchased industrial grade waste sulfuric acid with waste sulfuric acid to reduce waste sulfuric acid output.

Optimize ammonia nitrogen treatment system to reduce ammonium sulfate production.

Extend the life of spare parts to reduce scrap output.

Waste reduction measures expected to be promoted in 2019

2014-2018 Total Waste Generation

<table>
<thead>
<tr>
<th>Year</th>
<th>UMC (ton)</th>
<th>HJTC (ton)</th>
<th>USC (ton)</th>
<th>UMC(Kg/Wafer-m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>160</td>
<td>2,639</td>
<td>27,003</td>
<td>194</td>
</tr>
<tr>
<td>2015</td>
<td>2,914</td>
<td>33,563</td>
<td>35,746</td>
<td>205</td>
</tr>
<tr>
<td>2016</td>
<td>3,006</td>
<td>39,994</td>
<td>38,826</td>
<td>208</td>
</tr>
<tr>
<td>2017</td>
<td>5,921</td>
<td>5,793</td>
<td>5,793</td>
<td>193</td>
</tr>
</tbody>
</table>

Note: In 2018, the overall waste generation per wafer area of UMC and its subsidiaries HJTC/USC was 200 Kg/Wafer-m²

2014-2018 Hazardous Waste Generation

<table>
<thead>
<tr>
<th>Year</th>
<th>UMC (ton)</th>
<th>HJTC (ton)</th>
<th>USC (ton)</th>
<th>UMC(Kg/Wafer-m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>103</td>
<td>1,448</td>
<td>17,280</td>
<td>103</td>
</tr>
<tr>
<td>2015</td>
<td>119</td>
<td>1,740</td>
<td>20,607</td>
<td>119</td>
</tr>
<tr>
<td>2016</td>
<td>123</td>
<td>1,785</td>
<td>21,469</td>
<td>123</td>
</tr>
<tr>
<td>2017</td>
<td>121</td>
<td>1,764</td>
<td>23,141</td>
<td>121</td>
</tr>
<tr>
<td>2018</td>
<td>114</td>
<td>1,703</td>
<td>22,966</td>
<td>114</td>
</tr>
</tbody>
</table>

Note: In 2018, the overall hazardous waste generation per wafer area of UMC and its subsidiaries HJTC/USC was 123 Kg/Wafer-m²

3-4-2 Promotions of the Circular Economy

In addition to reducing waste from the manufacturing source, UMC continues to promote recycling and reuse in place of existing end-of-pipe control to turn waste into resources, subsequently creating three advantages: waste reduction, waste disposal energy and cost reduction, creating a positive waste-to-resource ratio.

Conversion of In-Plant Resources

In 2018, UMC promoted the in-fab use of waste diluted sulfuric acid as an ammonia-nitrogen wastewater treatment or air pollution prevention and control equipment agent, after the acid has had its hydrogen peroxide removed from it. In this way, we reduced our total production output of waste sulfuric acid by approximately 4,265 metric tons, and also reduced our purchases of industrial-grade sulfuric acid by approximately 4,265 metric tons. The total economic benefit was NT$18.60 million.

Conversion of Off-Site Resources

The amount of off-site waste recycled by UMC in 2018 was 35,053 metric tons, and waste re-usage for the year reached 90%. Hazardous waste reused amounted to 21,833 metric tons, a hazardous waste re-usage rate of 95%. Revenue from the recycling of renewable resources in 2018 (fabs in Taiwan) was approximately NT$35 million.

Basel Convention hazardous wastes definition: All UMC waste is treated domestically.

In the future, UMC will continue to actively collaborate with waste management companies/raw material suppliers to research and develop new waste recycling methods and goals.
List of major waste recycling resource in 2018

- **Receptacle**: Cleaned by recyclers for re-use.
- **Solvent**: Converted to chemical grade raw material through distillation / extraction by chemical factories.
- **Sulfuric Acid**: Collected by recyclers and diluted into industrial grade sulfuric acid, or re-made into poly aluminum chloride or sulfate.
- **Calcium fluoride sludge**: Supply to cement companies as cement additive.
- **Copper sulfate**: Collected by recycler and used electrolysis to recover copper, which is re-made into copper plates, copper sulfide or copper sulfite.
- **Phosphate**: Collected by recyclers and re-made into industrial grade phosphonic acid or biological nutrients.
- **Mixed Hardware**: Collected by recyclers to extract the heavy metals or recover other metals.
- **Photo Mask**: Collected by recyclers, cleaned to remove patterns, and renewed as photo masks or made into optical materials.
- **Lead Acid Battery**: Collected by waste disposal vendors to recover raw lead and waste plastic materials.
- **Recycling Category**: Scrap paper, scrap aluminum, aluminum foil, plastic bottles and scrap plastics are collected by recyclers for re-use.
- **Resin**: Collected by recyclers, classified and cleaned and used as second grade resin for ion exchange.
- **Fluorescent Lamp**: Collected by recyclers for reusable fluorescent powder and metals.
- **Wood**: Recycled as raw material for wood products.
- **Waste solvent**: Collected by the supplier to be remade into coating thinners or banana oil mixtures.
- **Ammonium sulfate**: Collected by the supplier to be remade into industrial grade ammonium sulfate that could be used as welding flux, leather goods, electroplating solutions, and dyes.

**UMC Waste Recycling Trend**

<table>
<thead>
<tr>
<th>Year</th>
<th>Material recycling</th>
<th>Energy recovery</th>
<th>Incineration</th>
<th>andfill</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>79%</td>
<td>12%</td>
<td>0%</td>
<td>0%</td>
<td>91%</td>
</tr>
<tr>
<td>2015</td>
<td>80%</td>
<td>11%</td>
<td>0%</td>
<td>0%</td>
<td>91%</td>
</tr>
<tr>
<td>2016</td>
<td>79%</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
<td>91%</td>
</tr>
<tr>
<td>2017</td>
<td>80%</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
<td>91%</td>
</tr>
<tr>
<td>2018</td>
<td>82%</td>
<td>8%</td>
<td>0%</td>
<td>0%</td>
<td>91%</td>
</tr>
</tbody>
</table>

Note: Other waste recycling methods include solidification, overseas treatment and chemical treatment.

Note: Energy Recovery means that waste solvent or waste wood were recycled as an auxiliary fuel.

**2014-2018 Hazardous Material Recycling Status**

<table>
<thead>
<tr>
<th>Year</th>
<th>UMC(ton)</th>
<th>HJTC(ton)</th>
<th>USC(ton)</th>
<th>Recycling rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>15,896</td>
<td>270</td>
<td></td>
<td>92%</td>
</tr>
<tr>
<td>2015</td>
<td>19,268</td>
<td>304</td>
<td></td>
<td>94%</td>
</tr>
<tr>
<td>2016</td>
<td>20,269</td>
<td>322</td>
<td></td>
<td>94%</td>
</tr>
<tr>
<td>2017</td>
<td>22,131</td>
<td>876</td>
<td>1,269</td>
<td>96%</td>
</tr>
<tr>
<td>2018</td>
<td>21,833</td>
<td>1,125</td>
<td>2,170</td>
<td>95%</td>
</tr>
</tbody>
</table>

Note: In 2017, the overall recycling rate of UMC and its subsidiaries HJTC / USC was 86%.

**2014-2018 Recycling Status**

<table>
<thead>
<tr>
<th>Year</th>
<th>UMC(ton)</th>
<th>HJTC(ton)</th>
<th>USC(ton)</th>
<th>UMC Recycling rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2,457</td>
<td>1,032</td>
<td></td>
<td>91%</td>
</tr>
<tr>
<td>2015</td>
<td>30,361</td>
<td>957</td>
<td></td>
<td>90%</td>
</tr>
<tr>
<td>2016</td>
<td>31,754</td>
<td>1,025</td>
<td></td>
<td>89%</td>
</tr>
<tr>
<td>2017</td>
<td>35,998</td>
<td>3,219</td>
<td>2,082</td>
<td>90%</td>
</tr>
<tr>
<td>2018</td>
<td>35,053</td>
<td>3,271</td>
<td>1,668</td>
<td>90%</td>
</tr>
</tbody>
</table>

Note: In 2018, the overall recycling rate of UMC and its subsidiaries HJTC / USC was 84%.

Receptacle
- Cleaned by recyclers for re-use.

Solvent
- Converted to chemical grade raw material through distillation / extraction by chemical factories.

Sulfuric Acid
- Collected by recyclers and diluted into industrial grade sulfuric acid, or re-made into poly aluminum chloride or sulfate.

Calcium fluoride sludge
- Supply to cement companies as cement additive.

Copper sulfate
- Collected by recycler and used electrolysis to recover copper, which is re-made into copper plates, copper sulfide or copper sulfite.

Phosphate
- Collected by recyclers and re-made into industrial grade phosphonic acid or biological nutrients.

Mixed Hardware
- Collected by recyclers to extract the heavy metals or recover other metals.

Photo Mask
- Collected by recyclers, cleaned to remove patterns, and renewed as photo masks or made into optical materials.

Lead Acid Battery
- Collected by waste disposal vendors to recover raw lead and waste plastic materials.

Recycling Category
- Scrap paper, scrap aluminum, aluminum foil, plastic bottles and scrap plastics are collected by recyclers for re-use.

Resin
- Collected by recyclers, classified and cleaned and used as second grade resin for ion exchange.

Fluorescent Lamp
- Collected by recyclers for reusable fluorescent powder and metals.

Wood
- Recycled as raw material for wood products.

Waste solvent
- Collected by the supplier to be remade into coating thinners or banana oil mixtures.

Ammonium sulfate
- Collected by the supplier to be remade into industrial grade ammonium sulfate that could be used as welding flux, leather goods, electroplating solutions, and dyes.
UMC conducts on-site audit of its waste clearance/disposal/reuse vendors mainly to inspect their management, storage areas, treatment facilities management and pollution control, site safety management and operating conditions (including sales flow of recycled products). Based on the evaluation result, the company determines whether to maintain cooperation or increase the frequency of audits. The table below shows the results of the audit and subsequent follow-up:

In 2018, UMC completed audit of 71 waste manufacturers. Audit results show that except for one vendor rating Inadequate (already counseled and improved) and one rating Unsatisfactory (already terminated partnership), all other vendors rated Excellent or above.

Established the UMC Waste Removal and Transportation GPS virtual vehicle fleet monitoring system

UMC has reinforced the management and control of commissioned waste disposal processes to ensure that waste is properly delivered to the relevant disposal or reuse organizations. We cooperated with a GPS system manufacturer to develop UMC’s waste disposal and transportation GPS virtual vehicle fleet monitoring system. In 2017, priority was given to introducing clean-up and transportation vehicles dealing with waste of concern (including waste solvents, waste sulfuric acid, waste effluent sludge, waste phosphoric acid, copper sulfate, ammonium sulfate, waste containers, and so on) into the system to carry out monitoring and management of removal and transportation processes.

Suppliers offering waste processing and recycling services were encouraged to retain proper records for the overall process for final accountability of waste processing and recycling procedures. These records could then be provided to source customers or government agencies to conduct effective inspection and prevent any case of intentional violations or environmental pollution. In 2016, UMC participated in the “High-Tech Industry Waste Cleaning Supplier Assessment Project” held by TSIA and TTLA and shared the results of the assessment. Those suppliers with outstanding performance were announced on the Industry Association website. In 2017, UMC signed the Self-regulation Convention on the Clean-up and Reuse of Waste in the High-tech Industry initiated by the Taiwan Semiconductor Industry Association. In the same year, we cooperated with the association to arrange a visit to UMC to verify that the waste management operations in our fabs were in compliance with the self-regulation convention. As part of the 2018 TSIA, TTLA and TOSIA Vendor Waste Cleanup Vendor Evaluation Team, the Industrial Technology Research Institute served as 3rd party consultant. Together with source manufacturers, on-site assessment and guidance were conducted on 22 waste disposal reuse organizations for evaluation and certification.
In addition to our dedication in providing core products with market competitiveness to meet our customers’ demands, as a citizen of the Earth, UMC has also taken on the responsibility of developing green products with efforts in cherishing resources and protecting the environment starting from the source. In addition to reducing resource consumption and unnecessary pollution during the production process, we have gone one step further to acquire green factory certification to be a good green role model.

**How We Manage**

- In addition to complying with all applicable laws, regulations and standards, we have applied even higher standards for ourselves with the priority of replacing hazardous substances.
- We will promote green purchasing with proper management of hazardous substances within the production process starting from the source.
- Independent Green Chemical Product Research and Development
- Our product designs are heading towards slim and compact sizes to reduce material consumption, yet they also feature high performance and low power consumption.
- We will promote reduction of greenhouse gas emissions, saving of energy and resources, and reduction of waste generated during the production process.
- We will promote the recycling and reuse of raw materials and product packaging materials.

**Purposes**

Providing green products that are hazardous substance free with low environmental impact

**Goals and Targets**

Continuously promote the plan of hazardous substance replacement, energy reduction and environmental impact assessment.

**Applicable Entities**

- 1. UMC
- 2. HJTC, USC, which are UMC subsidiaries selling and manufacturing integrated circuits

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**Green product considerations at each stage**

**Choice of raw materials or components**

Implementation plan

Putting recycled materials to use, promoting the reuse of raw materials used in production processes, and independently developing green chemicals to promote chemical products that contain no harmful substances and are recyclable.

**Implementation in 2018**

Significant amount of reclaimed wafers were used. In 2018, 52.4% of the dummy wafers used were replaced by reclaimed wafers. In 2018, reutilization of slurry particle was promoted to recycle 1,518 tons of slurry particles. In 2018, the first green chemical product independently researched and developed by UMC officially came on production lines in Fab 12i, resulting in cost savings of approximately NT$40 million.

**Direct Operations, Production & Manufacturing**

Implementation plan

Promote clean production, reduce the use of hazardous substances.

**Implementation in 2018**

The Green 2020 Reduction Plan was promoted to reduce water consumption, electricity consumption and waste generation.

(Please refer to the Clean Production Section for more details on performances and achievements)

**Distribution, Storage and Transportation**

Implementation plan

Reuse the package materials from raw materials and some products in order to reduce the demand for such materials and the generation of waste.

**Implementation in 2018**

In 2018, the recyclable package materials used reached 79,200 kgs.

**Use Phase – Operation and Servicing/Maintenance**

Implementation plan

Develop environmentally friendly, low power consumption advanced process chips

**Implementation in 2018**

UMC applied its 28nm process to produce energy efficient and IoT application ICs. Its 14nm process was adopted in 2017 for mass production.

**End of Life Management**

Implementation plan

Maintain the uniformity of ICs and products

**Implementation in 2018**

UMC is a wafer foundry and not an end product manufacturing company. Wafers are mainly made of silicon material, which is homogeneous. Therefore, the material can be easily recycled and disposed of.
Through the QC 080000 Hazardous Substance Management System, UMC ensures that its products not only comply with the EU list of controlled substances (such as the EU RoHS) and global chemical regulations and standards, but also meet customer needs. Several years ago, UMC established the inter-departmental Hazardous Substances Process Management committee (HSPM committee) to enhance the effectiveness of green product management.

**HAZARDOUS SUBSTANCE FREE POLICY**

By instilling employee awareness and ensuring control and technological upgrades in design and production, the company produces Hazardous Substances Free Control products that meet regulations and customer demands, thereby fulfilling its duty as a global citizen to protect the environment and human health and safety.

**HAZARDOUS SUBSTANCE FREE GOALS**

1. No products were disposed of as a result of regulation violation or customer demand.
2. Zero VOC and zero violation.

### Hazardous Substances Process Management Committee Organizational Chart

**UMC Response to Global Standards and Trends on Hazardous Substance Management**

- **EU Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Directives (EU RoHS)**
  - Able to comply with the requirements

- **Halogen-free Requirement**
  - Able to comply with the requirements

- **EU Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (EU REACH)**
  - Able to comply with the requirements

- **EU Waste of electrical and electronic equipment (WEEE)**
  - These regulations do not directly apply to UMC as UMC manufactures semiconductor chips which are not end products.
  - The end product dealer is the one responsible for recycling end products containing semiconductor components which are discarded as waste after use.

- **Persistent Organic Pollutants, POPs**
  - UMC led the industry to achieve the elimination of PFOS, PFOA and PFOA-related chemicals.

### UMC Hazardous Substances Management

- **Constructed a system for evaluating raw materials**
- **Established a procedure for procuring green raw materials**
- **About 400 controlled chemical substances listed**
- **Dedicated to green supply chain promotion**
- **Impartial third party laboratory regularly tests products for hazardous substance content**
- **The world’s first foundry to achieve international QC080000 IECQ HSPM certification**
- **Hazardous Substances Process Management committee**
Hazardous substance replacement plan

Usage reduction project and objectives for PFOS, PFOA, and PFOA related chemicals

In response to domestic and international concerns regarding persistent organic pollutants (POPs) such as PFOS, PFOA, PFOA related substances, etc., an autonomous replacement plan was reached in December 2017. UMC led the industry to achieve PFOA-related free operations. At present, UMC has taken a more active attitude to expand the inventory of less hazardous short-chain PFASs, and also banned the use of short-chain PFASs for new raw materials, while further evaluating the replacement project of existing materials.

Green Chemical Product R&D Program

Many of the special cleaning chemicals required for semiconductor manufacturing processes are designed and imported from large foreign companies. Due to the restrictions of trade secrets, it is difficult for users to understand the whole picture, and this leads to a degree of difficulty whether to reduce the usage amount or to recycle. Plus, these cleaning chemicals contain more than a few harmful substances; the impact they have on the environment and safety is in dire need of improvement. Therefore, several years ago, UMC started to work on a serious of green chemical research and development programs. Given the premise of environmental friendliness, we have directly designed new green chemical products to replace these imported chemical products, thus achieving not only consumption reduction, recycling and reuse, and environmental friendliness, but also strong R&D capability.

After years of hard work, we have finally obtained excellent results. In 2018, UMC was successful in developing a completely new type of green chemical using a biodegradable and friendly chemical substance, which not only saves on consumption, but also greatly reduces harmful substances, thereby achieving not only consumption reduction, recycling and reuse, and environmental friendliness, but also strong R&D capability.

In the future, UMC will continue to develop green chemical research and development programs, researching and developing new green chemicals in new processes to achieve the goals of consumption reduction, recycling and reuse, and environmental friendliness. It is expected that in 2019, research and development of a new green chemical product that can be recycled and reused will be completed, and that in 2020, the research and development of a number of new green chemical products will be able to be completed.
Since 2005, UMC has fully implemented LCA in all its fabs. Comprehensive cradle-to-gate (UMC shipment) inventoried items include energy, raw materials and environmental pollutant emissions. Using the Simapro software, results of the entire supply chain and manufacturing inventory are analyzed for environmental impact. Attention is kept on the environmental impact of the company’s products, and improvements in management of the environmental management system are made accordingly. The results of the 2018 UMC Environmental Impact Assessment include 11 indicators of carcinogen, respiratory organism, respiratory inorganic substance, climate change, radiation, ozone layer, ecotoxicity, acidification/eutrophication, land use, mines, and fossil fuel. Among them, there are 2 indicators in which the environmental impact at the production stage is greater than the raw material stage. This will serve as the reference for constant improvement of the environmental management system of our company.

Diagram of Semiconductor Product Lifecycle Concept

### Results of 2018 Environmental Impact Assessment (8-inch representative fab)

<table>
<thead>
<tr>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinogen</td>
</tr>
<tr>
<td>Respiratory Organism</td>
</tr>
<tr>
<td>Respiratory Inorganic Substance</td>
</tr>
<tr>
<td>Climate Change</td>
</tr>
<tr>
<td>Radiation</td>
</tr>
<tr>
<td>Ozone Layer</td>
</tr>
<tr>
<td>Ecotoxicity</td>
</tr>
<tr>
<td>Acidification/Eutrophication</td>
</tr>
<tr>
<td>Land use</td>
</tr>
<tr>
<td>Mines</td>
</tr>
<tr>
<td>Fossil fuel</td>
</tr>
</tbody>
</table>

- Raw material stage
- Production Stage
Carbon Footprint

As an upstream industry, providing customers with quality environmentally friendly products that comply with environmental protection regulations has always been one of the most important UMC operational philosophies. UMC strives to implement a comprehensive carbon management plan. In addition to its internal greenhouse gas emissions inventory and verification, the company also promotes the carbon footprint inventory program.

In 2009, we delivered the world’s first certified carbon footprint wafer product; completed Type III Product Environmental Labels and Declarations verification.

UMC participated in the EU Seventh Framework Programme (FP7) from 2011 to 2014 and worked with both private industries and academia to research and develop approaches and tools for a Simplified Life Cycle Assessment (SLCA) system, allowing our customers to quickly and conveniently predict product carbon footprints.

In 2018, the carbon footprint was promoted according to the UMC LCA-to-go Project implementation content.

Water Footprint

UMC recognized the importance of water as a natural resource very early on. Water resources are particularly important in Taiwan due to its mountainous topography, heavy rainfall along the mountain slopes, dense population, and extensive industrial and commercial developments. UMC complies with the Business Water Footprint Accounting standards developed by Water Footprint Network, an international NGO. In 2010, we completed business water footprint verification for our 8-inch and 12-inch wafer fabs and identified that water usage during direct processing was greater than that of the indirect supply chain. Blue water and gray water were the main sources of water used. In 2015, UMC began working with our suppliers to complete ISO 14046: Water Footprint Assessments of various products manufactured by UMC plants. In 2018, the water footprint inventory was launched throughout the company in accordance with the new standard, and third-party verification was implemented in the representative fab.

**THE RESULT OF 2018 INVENTORY**

- Water usage / wastewater generation of UMC 90%, while suppliers were responsible 10%.

**FUTURE DIRECTIVES**

- Continue to improve water usage efficiency (WUE) within the fabs, and reduce both water usage / wastewater generation to directly reduce water footprint of our products.
- Work with suppliers to improve overall WUE of the entire supply chain to achieve joint water conservation and protect our planet.

Note: Green Water: Rain and condensates are water sources that can be directly used.
Blue Water: Surface or underground fresh water source
Gray Water: Dilute contaminated production gray water to a level exceeding water quality standards.
4-1 Labor Rights

100% HOLISTIC HEALTH MANAGEMENT PROGRAM.
Created a safe working environment, and protected health and work-life balance of employees.
All fab sites in Taiwan received the “Self-Certification Health Promotion Badge” from Bureau of Health Promotion, Department of Health, Executive Yuan.

4-2 Recruitment and Cultivation

<5 ON THE ANNUAL EICC LABOR / ETHICS RISK INDEX.
In 2018, the EICC labor / ethics risk index was less than 5.

4-3 Health and Safety Workplace

56% REDUCTION IN WORKPLACE ACCIDENTS
17 fewer accidents compared to the reference basis (the year of 2011) and achieved a savings of NT$ 54.06 million in potential asset loss.
In 2018, the disabling injury frequency rate was 0.1, and disabling severity rate was 0, which were much lower than the semiconductor industry average.

4-4 Community Service

95% SATISFACTION WITH HEALTH PROMOTION ACTIVITIES.
To implementa total of 26 health promotion projects in 2018. The total number of people served was 71,759 and the overall satisfaction rate was 95%.

0 LABOR DISPUTES
Actively promoted harmonious labor relations to reduce the likelihood of labor conflict. In 2018, there was no case of labor dispute.

26,321 NUMBER OF BENEFICIARIES
In 2018, UMC invested a total of 7,158 hours in terms of volunteer work, with more than 26,321 beneficiaries.
**Major Material Social Topics**

There were three major categories of material social topics in 2018: (1) Occupational Safety and Health (2) Employment (3) Training and Education

### Indicator | 2018 Goal | Compliance for 2018 | 2019 Goal | Long-Term Goal
---|---|---|---|---
**OCCUPATIONAL SAFETY AND HEALTH**

| Number of incidents company-wide | • 0 major or serious incidents | • ≤ 13 minor incidents | • 0 major incidents, 1 serious incident (UMC had an electrical related incident. The company has strengthened the implementation of workplace hazard notification and agreement for contractors; UMC will continue to propose countermeasures to prevent the recurrence of related types of accidents in 2019.) | • 0 major or serious incidents | • ≤ 11 minor incidents |

| Disabling Frequency Rate (FR) | • Perform better than the 3-year average Disabling Frequency Rate (FR) for semiconductor manufacturing. | • Perform better than the 3-year average Disabling Frequency Rate (FR) for semiconductor manufacturing. | • UMC’s Disabling Frequency Rate (FR) was 0.13, which is far below the 3-year average of the semiconductor industry (0.58). UMC’s Severity Rate (SR) was 0, which is far below the 3-year average of the semiconductor industry (0.3). | • Perform better than the 3-year average Disabling Frequency Rate (FR) for semiconductor manufacturing. | • Perform better than the 3-year average Disabling Severity Rate (SR) for semiconductor manufacturing. |

| Disabling Severity Rate (SR) | • Perform better than the 3-year average Disabling Severity Rate (SR) for semiconductor manufacturing. | | • UMC’s Disabling Severity Rate (SR) was 0.13, which is far below the 3-year average of the semiconductor industry (0.3). | | |

**EMPLOYMENT**

| Organizational identity and cohesion | • Strengthen employee activity and cohesion. Introduce employee engagement survey. The coverage rate in the first year of the survey was 70%. | • Achieved 80.8% coverage in employee engagement surveys. | • Strengthen company cohesion and identity. | • Achieved 70% coverage in employee engagement surveys. |

| Strengthen diversity of communication mechanisms to ensure harmonious labor relations. | • 100% achievement in communication | • Annual targeted goal was reached. Each health occupational index was implemented. We were awarded the ‘2018 Global Views Magazine CSR Award’ - Electronic Technology Group Model award. Listed as DJSI global component for 11 consecutive years. | • 100% achievement in communication. | • Maintaining 100% achievement in communication. |

| Ensure compliance with the spirit and standards of international human rights. | • Full implementation of the Labor Standards Act and compliance with the RBA Code of Conduct to ensure adherence to the spirit of international human rights standards. | • A dedicated RBA organization has continued to support the spirit and conventions for human rights. Results of quarterly reviews showed zero incidents of ethical violations. 100% achievement in RBA labor/code of conduct training. | • Ensure compliance with the spirit and standards of international human rights. | • Continue to review compliance with relevant labor laws each quarter. |

**TRAINING AND EDUCATION**

| Training for professionals with potential. | • 94% completion rate in annual training programs. | • Achieved 94.3% completion rate in annual training programs. | • 94.5% completion rate in annual training programs. | • 100% completion rate in annual training programs. |

| Quality improvement and Innovation team(QIT) Independent goal achievement rate by each Fab/Division | • Achievement rate >90% for goals independently set by each Fab/Division | • Achieved 102.6% achievement rate for goals independently set by each Fab/Division.* | • Achievement rate >90% for goals independently set by each Fab/Division, | • Maintaining achievement rate >90% for goals independently set by each Fab/Division.* |

| Knowledge Management (KM) | • 90% achievement in reading penetration. 70% achievement in writing penetration. 20% achievement in three-star KM document* | • Achieved 91.8% in reading penetration. Achieved 73% in writing penetration. Achieved 23.3% in three-star KM document*. | • 90% achievement in reading penetration. | • 90% achievement in reading penetration, writing penetration and 3-star KM document ratio. | **Goal for 2025**

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Note 1: Three-star KM document: Refers to KM document with large contribution and approved for inter-department sharing.

Note 2: The various annual indicators are included in the company’s and Corporate Sustainability Committee’s KPI (Key Performance Indicator) and policy development, integrated with major company policies, and continually reviewed and improved.
**4-1 LABOR RIGHTS**

Given the trend in internationalization, enterprises should not only protect the basic employment and labor rights of workers, but should also strengthen the relationship among employees with diverse backgrounds and avoid differential treatment.

UMC supports and respects relevant international labor and human rights standards. Through cooperation with suppliers and customers, the company promotes relevant standards in international human rights, and hopes that the overall supply chain can create a harmonious and inclusive working environment to enhance competitiveness and promote economic development.

**How We Manage**

- Establish the RBA Committee, develop relevant policies and performance goals, follow up on implementation, and conduct regular assessments and reviews.
- Establish labor communication and complaint channels, and conduct engagement surveys to understand employee needs.
- Survey of suppliers’ degree of compliance in execution of RBA code, and on-site auditing.

**Goals and Targets**

**2020**

- Each fab completes and scores more than 90 points on the Responsible Business Alliance Code of Conduct assessment survey.
- 70% coverage in employee engagement surveys.
- Continue to ensure fair treatment of employees and compliance with laws and regulations.

**2025**

- Each fab completes and scores more than 90 points on the Responsible Business Alliance Code of Conduct assessment survey.
- 80% coverage in employee engagement surveys.
- Continue to ensure fair treatment of employees and compliance with laws and regulations.

**Purposes**

- Comply with international regulations and standards to protect employee rights.
- Ensure that various systems are set and implemented so that there is no differential treatment on account of gender, race, religion, political position or marital status.
- Ensure that the employment and labor rights of employees are protected, and create harmonious and inclusive operational benefits to enhance the competitiveness of UMC.

**Applicable Entities**

- UMC
- HeJian Technology (Suzhou) Co., Ltd. and United Semiconductor (Xiamen) Co., Ltd., which are UMC subsidiaries selling and manufacturing integrated circuits

**4-1-1 HUMAN RIGHTS**

UMC supports and respects the standards of international labor rights, and in light of this spirit, UMC has developed the UMC Code of Conduct. All employees are expected to comply with this code in their daily tasks and operations to ensure the sustainable growth and development of the Company. Subsidiaries, joint ventures, suppliers, customers and other entities with operational and development partnerships with UMC are expected to jointly fulfill their corporate social responsibilities and promote economic, social, environmental and ecological balance and sustainable development.

**UMC Code of Conduct follows:**

- Responsible Business Alliance, RBA
- The OECD Guidelines for Multinational Enterprises
- International Labor Office Tripartite Declaration of Principles
- UN Universal Declaration of Human Rights
- The UN Global Compact
RBA Committee

To ensure a safe working environment and the basic labor rights of supply chain enterprises in the global electronics industry, UMC established the RBA Committee in 2013 to address issues pertaining to labor, health and safety, environment, ethics and management systems. The RBA Committee defines the tasks, authority and responsibilities of its members, develops relevant policies and performance goals, follows up on implementation, and conducts regular assessments and reviews. The committee also initiates annual review of internal systems to ensure compliance with the latest RBA guidelines and thorough implementation of the Code of Conduct for the electronics industry. Furthermore, through the RBA-Online official website, further risk assessments of fabs are conducted to avoid potential risks.

In addition to the internal self-inspection mechanism, UMC also accepts Validated Assessment Process (VAP) by a third party RBA commissioned by customers. Through the perspective of an external audit, further improvement for the management system can be identified. In 2018, UMC continued to improve its VAP results. We strengthened our current internal operation processes and integrated our RBA management system while conducting RBA internal audits and make a corrective action plan according to the findings in order to achieve full VAP scores. At the same time, UMC’s spirit of compliance with the RBA can be conveyed to subsidiary groups to jointly protect human rights and ensure corporate social responsibility. UMC conducts an annual RBA Compliance Survey and field audits for suppliers. Suppliers are required to comply with RBA standards on labor, health and safety, environment, ethics, management systems, and other measures. Instruction is offered on RBA concepts, and programs for a relevant management system are formulated. Furthermore, to enhance employee knowledge of RBA standards, UMC has incorporated RBA guidelines into the training courses for new employees. Online self-test training is also conducted annually for all employees, and as of 2018, training and relevant tests have been completed in Taiwan and Singapore. At the same time, UMC will promote the spirit of compliance with RBA to its subsidiaries, including HeJian and United Semi, review compliance and issue a statement, and focus on establishing further management plans to protect human rights and ensure corporate social responsibility.

Note 1: Safety Risk Threat Index = Self-Rating Outcome Level (1-5) x Self-assessment Possibility Level (1-5); Higher scores on the index indicate higher risk.

Note: Please refer to the ISO 14001 & OHSAS 18001 management systems and the UMC Environmental Safety and Health Management Committee operations for environment, health and safety.
UMC's Focus in Core Human Rights Issues and Management

Core Issues (Risk Assessment)
- Human Rights (High)
- Anti-discrimination (Low)
- Equality (Medium)
- Forced Labor (Low)
- Child Labor (Low)
- Health and Safety (Low)

Impact Assessment
- Establishment of an RBA committee within the Human Rights Commission to regularly review human rights-related issues.
- Through internal auditing, management procedures prohibiting forced labor and review of complaints channels.
- Regular online testing of human rights/ethics issues through the RBA Committee.
- Regular announcement of such measures as gender equality and sexual harassment prevention on the company's homepage.
- Promotion and implementation of internal control procedures that demonstrate principles of non-discrimination in the Company's personnel appointment procedures.
- Utilization of management procedures prohibiting forced labor, supervision that various procedures are in accordance with standards during appointment periods, and establishment of a zero-tolerance policy for forced labor.

Management Objectives for 2018
- Regular online testing of human rights/ethics issues through the RBA Committee.
- Regular announcement of such measures as gender equality and sexual harassment prevention on the company's homepage.
- Promotion and implementation of internal control procedures that demonstrate principles of non-discrimination in the Company's personnel appointment procedures.
- Utilization of management procedures prohibiting forced labor, supervision that various procedures are in accordance with standards during appointment periods, and establishment of a zero-tolerance policy for forced labor.

Management Objectives Set for 2019
- To increase the number of suppliers subject to on-site auditing by 10%.
- To require that Tier 2 suppliers be in compliance UMC’s code of conduct.

Actual Circumstances Achieved in 2018
- Completed the 2018 conflict mineral investigation report (no conflict mineral were found in 13 suppliers, 9 contractors and 16 affiliated companies.
- 100% of suppliers confirmed that no child labor was used.
- 100% of suppliers established complete work regulations in accordance with RBA.
- 100% (30 companies) completing high-risk supplier auditing.

Management Objectives Set for 2019
- To increase the number of suppliers subject to on-site auditing by 10%.
- To require that Tier 2 suppliers be in compliance UMC’s code of conduct.

Human Rights Promotion
UMC places great emphasis on promoting RBA labor and business ethics policies. Through the company employee handbook and regular employee compliance inspections, the core content of labor, ethics and integrity, child labor, labor relations, forced labor, working hours and non-discrimination principles are emphasized. To protect labor rights and ensure that each employee receives fair humane treatment and respect, the "Complaints and Disciplinary Measures for Workplace Sexual Harassment Prevention" is compiled to provide a complaint channel and safeguard the rights and interests of women employees. In 2018, 100% of employees had a total of 8,524.5 hours of training in human rights.

In addition to protecting basic labor rights, UMC implements major operational changes in accordance with relevant regulations such as Taiwan's Labor Standards Act, Singapore’s Employment Act and China's Labor Contract Law.

<table>
<thead>
<tr>
<th>Human Rights Issues</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAQ</td>
<td>VAP</td>
<td>SAQ</td>
</tr>
<tr>
<td>Fab 12A</td>
<td>94.0</td>
<td>178.2</td>
</tr>
<tr>
<td>Fab 12i</td>
<td>92.3</td>
<td>149</td>
</tr>
<tr>
<td>Fab 8A</td>
<td>92.8</td>
<td>91.0</td>
</tr>
<tr>
<td>Fab 8C</td>
<td>92.6</td>
<td>93.6</td>
</tr>
<tr>
<td>Fab 8D</td>
<td>93.0</td>
<td>92.5</td>
</tr>
<tr>
<td>Fab 8E</td>
<td>92.6</td>
<td>92.2</td>
</tr>
</tbody>
</table>

SAQ Full Score is 100
VAP Full Score is 200

<table>
<thead>
<tr>
<th>Human Rights Issues</th>
<th>Low Risk</th>
<th>Medium Risk</th>
<th>High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥85</td>
<td>&gt;65 ≤85</td>
<td>&lt;65</td>
<td></td>
</tr>
</tbody>
</table>

Actual Circumstances Achieved in 2018
- Completed the 2018 conflict mineral investigation report (no conflict mineral were found in 13 suppliers, 9 contractors and 16 affiliated companies.
- 100% of suppliers confirmed that no child labor was used.
- 100% of suppliers established complete work regulations in accordance with RBA.
- 100% (30 companies) completing high-risk supplier auditing.

Management Objectives Set for 2019
- To increase the number of suppliers subject to on-site auditing by 10%.
- To require that Tier 2 suppliers be in compliance UMC’s code of conduct.
# UMC’s Focus in Core Human Rights Issues and Management

## Customers

### Core Issues (Risk Assessment)
- Privacy (Medium)

### Impact Assessment
- Regularly receive customer ratings of degree of satisfaction

### Management Objectives for 2018
- Cooperating suppliers and clients should sign confidentiality contracts requiring mutual protection of confidential information.
- UMC internally formulates confidential information/data management methods, and customer information is handled by specially dedicated units.

### Actual Circumstances Achieved in 2018
- Cooperating suppliers and clients have now all signed confidentiality contracts requiring mutual protection of confidential information.
- All confidential information/data management has regulations and actual management methods; all customer information is now handled by specially dedicated units.

### Management Objectives Set for 2019
- All employees, suppliers and clients will need to sign confidentiality contracts requiring mutual protection of confidential information.
- UMC will internally formulate confidential information/data management methods; all customer information will be handled by specially dedicated units.

## Entire workforce

### Core Issues (Risk Assessment)
- Ethics and integrity (High)

### Impact Assessment
- Carrying out compliance with laws and regulations and risk assessment of business ethics standards, through annual self-evaluation operations.

### Management Objectives for 2018
- Regularly checking compliance with HR-related laws and regulations, to ensure that we are meeting legal requirements.
- Using regular education and training to continue enhancing evidence of occupational ethics cognition and learning among both directors and employees.

### Actual Circumstances Achieved in 2018
- Beginning in 2018, regular quarterly checking of compliance with HR-related laws and regulations was carried out.
- 100% of employees’ occupational ethics and regulatory compliance education and training for the year was carried out.

### Management Objectives Set for 2019
- To maintain regular quarterly checking of compliance with HR-related laws.
- To maintain annual employee occupational ethics and regulatory compliance education and training at 100%.

## Community Residents & Indigenous people

### Core Issues (Risk Assessment)
- No core issue (The fabs are located in technology industrial parks with no community Residents/Indigenous people within the proximity)

### Impact Assessment
- No core issue (The fabs are located in technology industrial parks with no community Residents/Indigenous people within the proximity)

## Entire workforce

### Core Issues (Risk Assessment)
- Industrial relations (Low)

### Impact Assessment
- Utilize quarterly labor meetings, quarterly company-wide forums and reviews of various complaints channels.

### Management Objectives for 2018
- Convening regular, quarterly labor-relations meetings, and quarterly pan-Company forums.
- Processing and closing 100% of appeal cases.

### Actual Circumstances Achieved in 2018
- 36 labor relations committee meetings and four Company forums were held in 2018.
- 100% of appeal cases were processed and closed.

### Management Objectives Set for 2019
- To convene regular quarterly labor relations committee meetings and quarterly pan-Company forums.
- To process and close 100% of appeal cases.
- To introduce company-wide degree of engagement surveys.

## Entire workforce

### Core Issues (Risk Assessment)
- Working hours (Medium)

### Impact Assessment
- Construct a sound control system of working hours.

### Management Objectives for 2018
- Company regulations clearly specifying that overtime must not be worked.
- Taking the initiative to set monthly reminders of the function of holiday time in the attendance system, and carrying out regular checks and controls.

### Actual Circumstances Achieved in 2018
- Advocacy of management of overtime working hours was made in secretarial forums and labor-relations committee meetings.
- Directors were proactively reminded each month to carry out management of employees’ holiday time.

### Management Objectives Set for 2019
- To continue to improve working-hour management, regular inspection and active care of employees.

---

For relevant information, please refer to the UMC Code of Conduct on the company website

http://www.umc.com/English/CSR/c_4.asp
Channels of Communication

Employee compensation and welfare have always been a top priority of UMC. UMC takes an active role in the training of skilled professionals, fulfilling labor laws, protecting the rights and interests of UMC employees, and building a transparent and enjoyable work environment. Communication channels such as employer-employee meetings, departmental meetings, conferences (management conferences and colleague conferences) as well as mail boxes were employed to achieve the goals of providing extensive communication channels to effectively solve any problem that may arise. The employees’ rights to freedom of association shall be based upon those prescribed by local laws. UMC respects the right of employees to choose whether or not to exercise rights without intervention or interference. HeJian Technology Company (HJTC) also established a comprehensive and diverse selection of communication channels in order to respond immediately, properly and positively to employee requests.

Important UMC Communication and Complaint Channels:

- President staff meeting
- Company-wide Forums
- eUMC Two-way Communication
- Human Resource Director Mailbox
- Top-down Communication
- HR and PT Supervisor Meeting
- Communication
- Secretarial Forum
- Fab Daily meeting
- Fabrication
- Public Bulletin Board
- BBS
- Notes BBS
- Telephone/Email Feedback
- UMC Employee Website
- President lunch / tea time
- President Message
- Factory & Division meeting

Number and Frequency of Communication Channels

<table>
<thead>
<tr>
<th>Communication Channel</th>
<th>Quantity 2016</th>
<th>Quantity 2017</th>
<th>Quantity 2018</th>
<th>Details</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UMC</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company-wide conferences</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>Interactive, videoconference for 6 sites spanning multiple countries and regions hosted by the President himself, allowing UMC colleagues and external parties to review the latest company policies, directives, and performance.</td>
<td>On every quarter. Implemented after the investor conference.</td>
</tr>
<tr>
<td>Fab and Departmental communication meetings (including Singapore)</td>
<td>63</td>
<td>69</td>
<td>69</td>
<td>Share overall operational performance as well as developmental highlights of the fabs and departments with all employees.</td>
<td>Held every 6 months by each fab and department.</td>
</tr>
<tr>
<td>Secretary Conference</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>The HR department shall delegate colleagues and employees familiar with relevant regulations to organize and assemble a multi-departmental and multi-functional inquiry team. The team shall follow-up on specified meeting topics and facilitate subsequent improvements for building harmonious employer-employee relationships.</td>
<td>Hsinchu Science Park / Southern Taiwan Science Park Secretariat Conference (4 times each).</td>
</tr>
<tr>
<td>Employer-employee meeting</td>
<td>32</td>
<td>36</td>
<td>36</td>
<td>The Human Resource (HR) department shall collect key topics and discuss them with the Secretariat. The Secretariat shall then discuss key issues of the meeting with fellow employees to achieve bidirectional communication.</td>
<td>Once per quarter; held in 9 fabs.</td>
</tr>
<tr>
<td>Welfare committee meeting</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>The employee welfare activities as well as the usage of welfare funds shall be described to the welfare committee member delegated by each fab / site in the meeting every quarter.</td>
<td>Once per quarter.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>HeJian Technology (HJTC)</strong></th>
<th>Details</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee conference</td>
<td>12</td>
<td>Any problems encountered by the employee such as questions during work or challenges in the work place may be raised in the meeting. The supervisor or responsible owner shall provide an answer for the employee.</td>
</tr>
<tr>
<td>Union-employee conference</td>
<td>12</td>
<td>Communication and discussions with union members on employee welfare and employer-employee topics.</td>
</tr>
<tr>
<td>Newcomers Forum</td>
<td>Non-conducted</td>
<td>One month after new employees are hired, a Newcomers Forum is held by the General Manager to increase communication and interaction among new employees.</td>
</tr>
</tbody>
</table>

To optimize and expand the advantages of real-time communication, UMC integrated and established the Communication Area—a platform dedicated to employee communication. The site content includes the Human Resource Director Mailbox, fraud and sexual harassment complaints, e-Suggestions for feedback, company-wide information forum, BBS message boards, IT information service mailbox, industrial safety mailbox, all kinds of forums, and UMC’s website so that the various communication channels in the various operational bases can be integrated into a single platform for effective communication and promoting harmonious employer-employee relations. To protect the human rights of fellow employees, UMC also takes measures to protect the identity of employees who raised complaints or were affected by various issues to ensure the freedom and confidentiality of employees who submitted petitions. Among the various communication channels, the e-Suggestion feedback platform is most frequently used, and in 2018, 481 employee comments were received with 100% of the feedback responded to and resolved.
The “UMCWe Website” is an external website (internet) platform freely accessible to employees. Through this interactive communication platform, families, prospective employees, integrated benefits, associations and participating businesses are linked to strengthen the interaction between the organization and employees.

Employee work engagement, satisfaction and activity cohesion surveys

UMC has always adhered to a people-oriented spirit by regarding UMC employees as the company’s most important asset. Therefore, caring about employees, listening to their feedback and making corresponding improvements are important to the company. In the past, UMC has analyzed employee satisfaction. However, in line with international trends, UMC has decided to collaborate with experts and consultants and introduced the Employee Work Engagement Survey at the end of 2018. The survey was administered to all UMC employees in Taiwan and Singapore, and targeted coverage rate was set at 70%. The survey outcome was reported in early 2019. Results indicate a coverage rate of 80.8% and an employee work engagement rate of 75.1%. The target coverage rate for 2020 has been increased to 80%.

Based on the survey outcome report, actual employee needs and willingness to remain are better understood.

Description of work engagement survey

This questionnaire contains 5 major categories measuring 9 dimensions of job satisfaction and 1 dimension of employee commitment, totaling 64 question items.

<table>
<thead>
<tr>
<th>Category</th>
<th>Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Content</td>
<td>The work itself 8</td>
</tr>
<tr>
<td></td>
<td>Work environment 4</td>
</tr>
<tr>
<td>Work Condition</td>
<td>Job remuneration and reward 7</td>
</tr>
<tr>
<td></td>
<td>Assessment and promotion 4</td>
</tr>
<tr>
<td></td>
<td>Learning and growth 4</td>
</tr>
<tr>
<td>Work Relationship</td>
<td>Cooperation with colleagues 5</td>
</tr>
<tr>
<td></td>
<td>Relationship with leadership 8</td>
</tr>
<tr>
<td>Organizational Factors</td>
<td>Company culture 5</td>
</tr>
<tr>
<td></td>
<td>Company management 5</td>
</tr>
<tr>
<td></td>
<td>Employee Commitment 15</td>
</tr>
</tbody>
</table>

Work engagement survey outcome

Survey Coverage Rate

<table>
<thead>
<tr>
<th>Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>70%</td>
<td>80.8%</td>
</tr>
</tbody>
</table>

Work Engagement Index

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>75.6</td>
<td>74.5</td>
<td>75.1</td>
</tr>
</tbody>
</table>

Surveys utilized by UMC can be largely divided into regular surveys, project-focused surveys, or targeted surveys designed for specific issues. The current survey system employed by UMC is relatively diverse and targets different goals and objectives. Specialized survey systems were employed to ensure that authentic responses from the employees could be collected to initiate effective improvements.

Category of surveys

Regular
- HR satisfaction surveys & work engagement surveys (once every year), health check-up satisfaction survey.

Project-focused
- Team cohesion project satisfaction survey, communication (and communication platform) satisfaction survey, and organizational climate surveys designed and implemented for targeted organizations.

Specific events
- Event / topic-based surveys: Family Day, Parent-Child Day, and Art Season satisfaction surveys, activity cohesion surveys, training and development satisfaction surveys, and plant site affairs satisfaction surveys designed for various administrative and supporting services.

The opinions and feedback obtained through the different types of surveys mentioned above enable managers to accurately determine areas for improvement and effective solutions to employee issues.

HR satisfaction surveys were also used in project investigations that cover the aspects of employee hiring, remuneration and welfare, employee relations, fab site services and safety, HR services, training and development, logistics and commercial services. Semi-open questionnaires were used to collect survey responses from the entire employee population. Questionnaire items included quantified assessments as well as open-ended Q&A where employees can provide their own responses. Establishing a diverse selection of communication channels will help UMC to ensure the rights of employees to express their own opinions while ensuring the successful communication of internal feedback and opinions. Employees may also select their preferred mode of communication to express their views and ideas, thereby achieving the ultimate objective of communication.
Comprehensive Appeal and Employee Support Systems and Channels

To achieve effective communication and resolution of issues between UMC and its fellow employees, UMC established the aforementioned communication platforms as well as the following channels and systems for employee appeals. Employees are allowed to independently decide whether or not to exercise employee rights prescribed by statutory regulations. UMC does not intervene or interfere with employees’ freedom of association.

Appeal systems and channels provided by UMC include:

- **Report of sexual harassment and unfair treatment:** 31995
- **CHO E-mail:** (Send an email report directly to CHO)
- **Employee Relationship (ER Service) Hotline:** 12885
- **Fraud and Ethics Violation Reporting:** whistleblower@umc.com
  
  This e-mail will automatically forward messages to ADT Division Director, HR Division Director, IPLA Director, and Audit Committee. External reporting hotline: 0800-024-399 (toll free number)
- **Whistleblower Hot Lines:** 03-5782258 • EXT 31425
- **Information Security and Confidentiality Protection Complaint:** Infosec@umc.com

In addition to establishing a comprehensive set of communication channels and platforms, UMC shall continue to improve upon the effectiveness of communication channels and carry out projects to enhance communication of key topics and information throughout the company, ensure the comprehensiveness and depth of communications, and strengthen global communication capacities for every employee. A total of 152 formal and large scale conferences were held in 2018 to effectively communicate key topics involving UMC’s business. The diverse and comprehensive selection of UMC’s communication systems were used to effectively assess employees’ voice and handle employee issues. Although Taiwan’s laws stipulated the rights of employees to freely organize themselves into unions, no requests to organize unions have been received by UMC as a result of the aforementioned measures. However, unions have been established in HJTC. Conferences, departmental meetings, and opinion mail boxes were also used as a means to communicate with fellow employees. UMC did not receive any formal charges related to labor affairs in 2018.

**Number of Grievances Received in 2018**

<table>
<thead>
<tr>
<th>Channel</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human rights issues</strong></td>
<td>9</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td><strong>Labor affairs</strong></td>
<td>15</td>
<td>22</td>
<td>14</td>
</tr>
</tbody>
</table>

The number of grievances that were addressed

<table>
<thead>
<tr>
<th>Channel</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human rights issues</strong></td>
<td>9</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td><strong>Labor affairs</strong></td>
<td>15</td>
<td>22</td>
<td>14</td>
</tr>
</tbody>
</table>

The number of grievances that were reviewed

<table>
<thead>
<tr>
<th>Channel</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human rights issues</strong></td>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Labor affairs</strong></td>
<td>12</td>
<td>11</td>
<td>14</td>
</tr>
</tbody>
</table>

The number of grievances that were officially undergoing judiciary proceedings

<table>
<thead>
<tr>
<th>Channel</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human rights issues</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Labor affairs</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The number of grievances that were resolved

<table>
<thead>
<tr>
<th>Channel</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human rights issues</strong></td>
<td>9</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Labor affairs</strong></td>
<td>15</td>
<td>21</td>
<td>14</td>
</tr>
</tbody>
</table>

Note 1: Scope of human rights: includes issues such as sexual harassment, illegal violations, and forced labor.

Note 2: Scope of labor affairs: includes issues such as hourly wage & salary, occupational safety, educational training and promotion/benefits.
How We Manage

- Provision of excellent working environments and competitive overall salaries and benefits
- Formulation of a complete education and training system and organization providing comprehensive and diverse learning environments
- Carrying out industry-academia cooperation programs and campus talent cultivation

Goals and Targets

**Goals for 2020**
- 95% completion rate in annual training programs.
- Provide comprehensive training program to attract and retain talents. Achieve retention rate of 91.3% for medium and high performing talents.
- Improve quality and quantity of human resources supply, develop market competitiveness of talents, and achieve talent fit rate of 80%.
- 100% completion rate in improvement programs for low-performance employees.

**Goals for 2025**
- 100% completion rate in annual training programs.
- Provide comprehensive training program to attract and retain talent. Achieve retention rate of 91.5% for medium and high performing talents.
- Improve quality and quantity of human resources supply, develop market competitiveness of talents, and achieve talent fit rate of 85%.
- 100% completion rate in improvement programs for low-performance employees.

Purposes

- Attracting, retaining, and motivating outstanding employees
- Carrying out a full range of course training that improves the skills and expertise of employees and dovetails with employee career planning
- Raising the quality and effectiveness of training, cultivating talent that meets the developmental needs of the organization, thereby ensuring the sustainable growth of the Company

Applicable Entities

- UMC
- HeJian Technology (Suzhou) Co., Ltd. and United Semiconductor (Xiamen) Co., Ltd., which are UMC subsidiaries selling and manufacturing integrated circuits

Human Resource Distribution

By the end of 2018, the total number of formal employees at UMC, including China subsidiaries HJTC and USC was 18,929. This figure included 1,958 supervisors, 9,316 engineers, 544 managers, 7,105 technicians, and 6 administrators. The working population within the company can be divided into 2 categories by type of employment, namely formal employees (98.5%) and non-formal employees, which include contract personnel as well as dispatched personnel delegated by external vendors to provide services in UMC (1.5%). Formal employees can be further subdivided according to the type of their contracts, namely non-regular contracts (94.9%) and periodic contracts (about 5.1%) (NOTE: periodic contracts refer to labor contracts for foreign technicians). Non-formal employees include contract personnel (39.7%) and dispatched personnel delegated by external vendors to provide services in UMC (60.3%). Non-formal positions were offered to temporarily stand in for employees taking maternity / paternity leaves. These positions will be kept open for the said employees when they return to UMC. For work area distribution, almost 73.0% of employees work in the primary business location in Taiwan. For age distribution, 68.0% of the total employee population within the company was between 30 and 50 years of age. The overall average age was 35.5 years old.
### Trend of Total Formal Employees in UMC Including China Subsidiaries HJTC and USC during 2015-2018


**Table: Job Category**

<table>
<thead>
<tr>
<th>Job Category</th>
<th>Male No. of People (Percentage)</th>
<th>Female No. of People (Percentage)</th>
<th>Total No. of People (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering staff</td>
<td>7,413 (79.6%)</td>
<td>1,903 (20.4%)</td>
<td>9,316 (49.2%)</td>
</tr>
<tr>
<td>Executive staff</td>
<td>1,717 (87.7%)</td>
<td>241 (12.3%)</td>
<td>1,958 (10.3%)</td>
</tr>
<tr>
<td>Technicians</td>
<td>1,331 (18.7%)</td>
<td>5,774 (81.3%)</td>
<td>7,105 (37.5%)</td>
</tr>
<tr>
<td>Office staff</td>
<td>3 (50.0%)</td>
<td>3 (50.0%)</td>
<td>6 (0.0%)</td>
</tr>
<tr>
<td>Managerial staff</td>
<td>99 (18.2%)</td>
<td>445 (81.8%)</td>
<td>544 (2.9%)</td>
</tr>
</tbody>
</table>

**Table: Type of Employment**

<table>
<thead>
<tr>
<th>Type of Employment</th>
<th>Male No. of People (Percentage)</th>
<th>Female No. of People (Percentage)</th>
<th>Total No. of People (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal employees</td>
<td>10,563 (55.8%)</td>
<td>8,366 (44.2%)</td>
<td>18,929 (98.5%)</td>
</tr>
<tr>
<td>Contract or temporary staff</td>
<td>83 (71.6%)</td>
<td>33 (28.4%)</td>
<td>116 (0.6%)</td>
</tr>
<tr>
<td>Dispatched staff</td>
<td>41 (23.3%)</td>
<td>135 (76.7%)</td>
<td>176 (0.9%)</td>
</tr>
</tbody>
</table>

**Table: Job Site**

<table>
<thead>
<tr>
<th>Job Site</th>
<th>Male No. of People (Percentage)</th>
<th>Female No. of People (Percentage)</th>
<th>Total No. of People (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taiwan</td>
<td>7,719 (55.5%)</td>
<td>6,179 (44.5%)</td>
<td>13,898 (73.4%)</td>
</tr>
<tr>
<td>Singapore</td>
<td>1,068 (64.6%)</td>
<td>586 (35.4%)</td>
<td>1,654 (8.7%)</td>
</tr>
<tr>
<td>China</td>
<td>1,776 (52.6%)</td>
<td>1,601 (47.4%)</td>
<td>3,377 (17.8%)</td>
</tr>
</tbody>
</table>

**Table: Age**

<table>
<thead>
<tr>
<th>Age</th>
<th>Male No. of People (Percentage)</th>
<th>Female No. of People (Percentage)</th>
<th>Total No. of People (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>2,869 (57.3%)</td>
<td>2,141 (42.7%)</td>
<td>5,010 (26.5%)</td>
</tr>
<tr>
<td>30-50</td>
<td>7,044 (54.7%)</td>
<td>5,833 (45.3%)</td>
<td>12,877 (68.0%)</td>
</tr>
<tr>
<td>Above 50</td>
<td>650 (62.4%)</td>
<td>392 (37.6%)</td>
<td>1,042 (5.5%)</td>
</tr>
</tbody>
</table>

**Note:** Job Category, Job Site and Age are formal employees, while the category of Type of employment is all working population.

**Note 2:** Ratio of male and female is calculated by the same type, while the total ratio is calculated by type.
**New Employee**

In 2018, the company hired a total of 3,347 new employees. The gender, region and age distributions are shown below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of new employees in Taiwan</th>
<th>Number of new employees in Singapore</th>
<th>Number of new employees in China</th>
<th>Hiring rate in UMC (including China subsidiaries HJTC and USC)</th>
<th>Hiring rate in UMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1,141</td>
<td>463</td>
<td>2674</td>
<td>21.5%</td>
<td>22.0%</td>
</tr>
<tr>
<td>2016</td>
<td>1,362</td>
<td>258</td>
<td>2,468</td>
<td>18.2%</td>
<td>17.7%</td>
</tr>
<tr>
<td>2017</td>
<td>1,459</td>
<td>407</td>
<td>2,352</td>
<td>17.7%</td>
<td>17.7%</td>
</tr>
<tr>
<td>2018</td>
<td>1,353</td>
<td>391</td>
<td>1,603</td>
<td>18.0%</td>
<td>18.0%</td>
</tr>
</tbody>
</table>

**Note:** Annual employee hiring rate refers to the total number of newly hired employees / average number of existing employees (sum of employees from the previous December and at the end of each month in the current year / 13).

---

**New Formal Employees - Gender**

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>53.3%</td>
<td>46.7%</td>
</tr>
<tr>
<td>2016</td>
<td>49.2%</td>
<td>50.8%</td>
</tr>
<tr>
<td>2017</td>
<td>46.8%</td>
<td>53.2%</td>
</tr>
<tr>
<td>2018</td>
<td>51.8%</td>
<td>48.2%</td>
</tr>
</tbody>
</table>

**New Formal Employees - Region**

<table>
<thead>
<tr>
<th>Year</th>
<th>Taiwan</th>
<th>Singapore</th>
<th>China</th>
<th>SE Asia (not including Singapore)</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>92.85%</td>
<td>7.03%</td>
<td>0.02%</td>
<td>0.07%</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>11.25%</td>
<td>43.17%</td>
<td>23.70%</td>
<td>21.83%</td>
<td>0.06%</td>
</tr>
<tr>
<td>2017</td>
<td>11.25%</td>
<td>43.17%</td>
<td>23.70%</td>
<td>21.83%</td>
<td>0.06%</td>
</tr>
<tr>
<td>2018</td>
<td>11.25%</td>
<td>43.17%</td>
<td>23.70%</td>
<td>21.83%</td>
<td>0.06%</td>
</tr>
</tbody>
</table>

---

**New Formal Employees - Age**

<table>
<thead>
<tr>
<th>Year</th>
<th>Under 30 years old</th>
<th>30-50 years old</th>
<th>Above 50 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>74.9%</td>
<td>24.8%</td>
<td>0.2%</td>
</tr>
<tr>
<td>2016</td>
<td>78.5%</td>
<td>21.0%</td>
<td>0.5%</td>
</tr>
<tr>
<td>2017</td>
<td>70.2%</td>
<td>28.9%</td>
<td>0.8%</td>
</tr>
<tr>
<td>2018</td>
<td>72.3%</td>
<td>27.2%</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

---

**Local Employment**

To fulfill social responsibility and create sufficient jobs for local residents, the staff at UMC’s headquarters in Taiwan comprised of 92.9% local employees as of 2018, and among these, 99.3% of the high level management is locally hired. Since Singapore is ethnically diverse, 23.7% of the employees and 40.0% of the high level management are locally hired, while in the semiconductor wafer fab in China, 92.9% of the staff and 4.0% of the high level management are locally hired.
Hiring of Aboriginal

UMC respects the unique culture of minorities and gives aboriginal employees a ceremonial leave for eight hours a year which could be flexibly used as their own leave hours. By the end of 2018, UMC’s headquarters in Taiwan had a total of 73 aboriginal employees. In terms of gender, 27.4% are males and 72.6% are females. In terms of age, 31.5% are under 30 years old, while 68.5% are 30-50 years old.

Hiring of Aborigines - Gender

<table>
<thead>
<tr>
<th>Year</th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>68%</td>
<td>29.4%</td>
<td>73</td>
</tr>
<tr>
<td>2017</td>
<td>71.2%</td>
<td>28.8%</td>
<td>73</td>
</tr>
<tr>
<td>2018</td>
<td>72.6%</td>
<td>27.4%</td>
<td>73</td>
</tr>
</tbody>
</table>

Hiring of Aborigines - Age

<table>
<thead>
<tr>
<th>Year</th>
<th>Under 30</th>
<th>30-50</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>33.8%</td>
<td>66.2%</td>
<td>73</td>
</tr>
<tr>
<td>2017</td>
<td>28.8%</td>
<td>71.2%</td>
<td>73</td>
</tr>
<tr>
<td>2018</td>
<td>31.5%</td>
<td>68.5%</td>
<td>73</td>
</tr>
</tbody>
</table>

Female Workers in UMC

All percentage of females in management positions increased in 2018 compared to the previous year, mainly because UMC also pays attention to female workers’ promotion and development. In view of the characteristics of the semiconductor industry, there are more male managers and professional engineers in UMC. Meanwhile, managerial staff and technicians are mainly females.

Note: Junior management positions include first line manager; top management positions include two levels away from the President.
Employment of People with Disabilities

UMC’s headquarters in Taiwan supports the employment of people with disabilities, and has established channels for hiring people with disabilities. Through the Student Ambassador Project, people with disabilities such as physical handicap, visual impairment, hearing impairment, functional loss in vital organs and chromosomal abnormalities are hired. By the end of 2018, UMC headquarters in Taiwan employed a total of 139 employees with disabilities. In terms of Taiwan’s hiring laws, the company continues to actively evaluate its internal job expansion and strives toward hiring people with disabilities adequately.

UMC Disability Hiring

Employee Turnover Rate

In 2013, the HJTC semiconductor wafer fab in China joined UMC as a subsidiary. In 2015, United Semiconductor in China also joined as a subsidiary. From 2015-2018, UMC, including China subsidiaries HJTC and USC, has an employee turnover rate of 16.8% due to the higher turnover rate of direct labor in China (UMC parent’s turnover rate was 11.2%). When employees apply for resignation, they are individually interviewed by their director and Human Resource Department to understand their reason(s) for resignation. In addition, through assessment of their individual expertise and offers of adjustment in work content, workplace location or internal transfer, attempts are made to retain employees. Human Resource Department also maintains regular contact with employees who have resigned, and opportunities are provided for those who wish to return to their employment.

Employee turnover rate in UMC (including China subsidiaries HJTC and USC)

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
<td>16.3%</td>
<td>18.8%</td>
<td>16.4%</td>
<td>15.4%</td>
</tr>
</tbody>
</table>

Total Employee turnover rate in UMC

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
<td>11.2%</td>
<td>11.1%</td>
<td>11.9%</td>
<td>10.9%</td>
</tr>
</tbody>
</table>

Voluntary employee turnover rate in UMC

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
<td>11.1%</td>
<td>11.0%</td>
<td>11.8%</td>
<td>10.8%</td>
</tr>
</tbody>
</table>

Note: Annual employee turnover rate refers to the total number of employees who resigned / average number of existing employees (sum of employees from the previous December and at the end of each month in the current year / 13).
Parenting Leave

In 2018, a total of 399 female employees applied for maternity leave in UMC (including China subsidiaries HJTC and USC). Of these, 97.2% returned to their original positions after their leave while those who did not return voluntarily resigned to take care of family needs. In addition, 523 male employees applied for paternity leave in accordance to the Act of Gender Equality in Employment, and of these, 99.4% returned to their original positions after their leave.

In Taiwan, according to the Act of Gender Equality in Employment, employees may apply for parenting leave without pay. When their contract expired in 2018, a total of 94 female employees returned to their positions, indicating a return rate of 74.0% after parental leave. 22 male employees returned to their positions, indicating a return rate of 75.9% after parental leave. The work situation of those who returned after unpaid parenting leave expired was observed, while those who did not return after their unpaid parenting leave expired had continuing family needs that required them to voluntarily resign. From 2017-2018, 93.7% of female employees and 90.0% of male employees that took unpaid parenting leave returned to work.

2018 Maternity Leave

<table>
<thead>
<tr>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>399</td>
<td>523</td>
<td>922</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>97.2%</td>
<td>99.4%</td>
<td>98.5%</td>
</tr>
</tbody>
</table>

Note: Maternity Leave includes Taiwan, Singapore, and China.
UMC has always regarded its employees as an important asset, and hopes that by providing a competitive overall compensation and benefit package, excellent talent will be attracted to join the UMC team and work together to achieve operational goals and contribute to UMC profits.

Compensation and Benefit Policy

UMC’s employee compensation is based on educational level, performance and market value. Employees are not subjected to differential treatment because of gender, race, religion, political position or marital status. UMC employees worldwide enjoy the compensation and benefits which are in line with or superior than all applicable local laws and regulations which include minimum wage, overtime, social insurances, pension regulation and other mandatory benefits.

Performance-oriented Remuneration System

UMC offers salary adjustment, differentiated bonus / employee compensation system (Note) and stock remuneration (employee stock option certificate and treasury shares) based on individual performance, job responsibilities and future development potential to attract, keep and motivate outstanding employees. The company also actively joins remuneration surveys of well-known worldwide enterprises to ensure that the overall remuneration offered by UMC is competitive in the market.

Note: Please refer to the Company Constitution for the Employee Remuneration System

Basic Salary and Annual Total Compensation for Male and Female Employees

<table>
<thead>
<tr>
<th>Base Salary</th>
<th>Annual Total Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management level</td>
<td>Non-management level</td>
</tr>
<tr>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Singapore</td>
</tr>
</tbody>
</table>

Note 1: The data for non-management level is calculated on the basis of the engineer category.
Note 2: Technicians shall be calculated on the basis of the local technicians.

UMC employees in Taiwan enjoy additional flexible leaves, and there are gentle reminders regularly to encourage employees to enjoy their leave time to achieve a better work-life balance. Special leave issued for contract employees are based upon the requirements of the Labor Standards Act. UMC encourages fellow employees to actively contribute towards public charity, and has established the UMC Science and Culture Foundation. Employees can make use of volunteer leave and participate in the company’s charity activities during working hours. In 2018, the Taiwan Labor Standards Act was revised and the number of national holidays was reduced from 19 days to 12 days. However, UMC continues to offer an additional 7 days of special holidays.

According to law, maternity leave will be provided at half-pay if the employee’s period of service is less than 6 months. To provide better care to newly hired female employees, UMC instead gives full-pay for the said employees.

To provide support to fellow employees, UMC offers funeral leave welfare that is superior to that prescribed by the Labor Standards Act. Colleagues whose great grandparents, great grandparents-in-law, or grandparents-in-law have passed away shall be given a funeral leave of 24 hours at full-pay.

Overseas semiconductor foundry plants, such as the China subsidiaries HJTC and USC, are also provided with paid annual leave that are superior to those prescribed in the local Regulations of Paid Annual Leave of Employees. UMC Singapore provides newly hired employees with 14 days of leave in their first year which is better welfare compared to the minimum length of 7 days prescribed by the Singaporean government. Contract or temporary staff who have worked in UMC for 3 months shall also be entitled to these types of leave by the proportion of their length of services.
Comprehensive Insurance and Retirement Policy

UMC provides insurance coverage that is consistent with local laws and regulations to ensure the basic rights and interests of employees. In accordance with the law, the company headquarters in Taiwan also provides labor insurance (including Employment Insurance) and national health insurance. In addition, UMC provides employees with additional group insurance, including life insurance, major illness insurance, health insurance, accident insurance, cancer insurance, and travel insurance for overseas business trips to ensure the work and life security for its employees. The company also provides a selection of group insurance for employee families so that employees can work with peace of mind.

Over 50% of fellow employees chose to include their spouse and family members into UMC’s group insurance to provide their family an additional layer of protection with more economical expenses. UMC also provides an insurance company service office inside the company, allowing colleagues to make inquiries on insurance services and apply for claims. Furthermore, the company regularly posts e-newsletters on insurance benefits, and introduces information on insurance and compensation rights so that employees are clearly aware of their actual insurance content and benefits.

Retirement Benefits Plan

UMC complies with local statutory regulations and systems related to retirement to safeguard the retirement rights of our employees. In Taiwan, the Labor Standards Act was used as the basis to stipulate regulations for the calculations and payment rules of retirement pensions. Every regular employee in Taiwan participates in the relevant pension plans. Following the old pension system under the Labor Standards Law, the employer is required to deduct at least 2% of a worker’s total monthly wage and set aside this amount as a reserve fund for said worker’s pension payments. In addition, at the end of each year, a review of pension allocation will be conducted to estimate the amount of pension that will be paid by those eligible for retirement by December 31 of the following year to ensure that the balance of the special account is sufficient to pay. For the provision of post-retirement welfare and expenses, please refer to the company’s annual report of 2018 on page 255.

Since July 1, 2005, the Labor Pension Act was effective and it is a defined contribution plan. According to the regulations, the company has to contribute a certain percentage of salary to an individual labor pension account. Employees may select to keep applying the pension regulations prescribed by the Labor Standards Act or switching to the new pension systems applicable to the Labor Pension Act while also maintaining their previous pension seniority. For the provision of post-retirement welfare and expenses, please refer to the company’s annual report of 2018 on page 255.

When employees apply for retirement, the company not only provides pension application service, but also awards a medal to show appreciation for their long term effort and contribution. In addition, they are also awarded “UMC Lifetime Membership,” which offers a selection of healthful and interesting activities for retirement living.

In order to facilitate retired or terminated employees to obtain great help resources, UMC provides exit interviews to ensure that they can access appropriate care and a clear channel to receive assistance smoothly. In addition, the company provides severance pay for dismissed employees in accordance with local laws and regulations, and also related employment service channel information.

Education and Training Committee

In order to earnestly implement the policies of education and training, UMC has established a company-wide “Education and Training Committee” composed of education and training officers from various departments to improve the quality of training for all employees of the company. In line with corporate policy, the company conducts a company-wide training needs survey every year and creates an annual training plan for the competency analysis of supervisors and associates. The Education and Training Committee holds conferences to review training operations every quarter.

To encourage colleagues to serve as lecturers, the committee conducts selection activities of outstanding company-wide instructors each September. Through the improvement of the Education and Training Committee system, we will implement the company’s principles and talent training to achieve effective company training system compliance.
In terms of professional training, we offer complete technical training curriculum. For managerial training, different training programs are designed for different levels of directors. For language, language proficiency tests and courses are offered according to job descriptions and positions. In terms of departmental and inter-departmental On-the-Job Training (OJT), the Education and Training Committee's downward education and training orientation allows department directors and their employees to fully participate in the planning, implementation and learning assessment. Moreover, the diversity of self-learning and development channels, such as e-Learning, creates an atmosphere of mutual peer learning, development and team cooperation, thereby forming a comprehensive environment for learning, sharing and innovation.

In 2018, UMC organized up to 9,071 training courses, with a total number of 381,421 training (persons) hours and 342,566 participants. The total cost of training was NT$55,869,585, and satisfaction level with the various courses was more than 94%, gradually increasing with each year.

### Course Satisfaction

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of courses</td>
<td>9,859</td>
<td>9,703</td>
<td>9,071</td>
</tr>
<tr>
<td>Total number of participants</td>
<td>272,098</td>
<td>260,802</td>
<td>342,566</td>
</tr>
</tbody>
</table>

### Average Value

- **Training Satisfaction - Overall Satisfaction**: 93.3% | 93.9% | 94.8%
- **Training Satisfaction - Satisfaction with Instructor**: 93.3% | 93.4% | 94.6%
- **Training Satisfaction - Satisfaction with teaching materials**: 93.2% | 93.7% | 94.6%
- **Training Satisfaction - Beneficial to work**: 93.5% | 94.1% | 94.6%

In terms of average education and training hours for the various job levels, comprehensive education and training are provided for different categories of job responsibilities and levels of employees.

UMC & its China subsidiaries: HJTC and USC
In terms of personnel training and development, UMC defines the managerial competency required for the various levels of directors. Core and professional competencies are also defined for general employees so that they clearly understand the required core competencies for each level of job responsibility. To design the internal training curriculum, UMC conducts a company-wide training needs survey in the fourth quarter of each year, and plans corresponding development courses based on the professional needs of supervisors and employees. In addition to required training to help employees achieve job performance, employees can also prepare for their career planning and development by participating in other training courses based on their personal needs and future development plans.

Furthermore, to fulfill the company’s core values, the philosophy and spirit of “accountability” is thoroughly instilled. UMC first introduced the course titled “The 7 Habits of Highly Effective Managers” in 2011. In 2012, this course was further expanded to include “The 7 Habits of Highly Effective Employees.” Course contents are constantly promoted and established so that the 7 Effective Habits have become a common language between UMC managers and employees. All supervisors and employees recruited in 2017 completed these courses in the 1st Quarter of 2018 in order to benefit from course-related data. From 2016 to 2018, the overall training completion rate improved steadily and the standard was maintained. In 2018, a new version of the 7 Effective Habits posters was printed and posted in all department offices to promote and cultivate the 7 Habits throughout the Company. Descriptions of the courses are as follow.

For gender issues, UMC upholds the principles of gender equality and offers equal training opportunities with the purpose of providing professional training for each job grade and function. Most direct employees are women so their training would be largely focused upon technical courses such as machine operation. Hence, average training hours for female employees in UMC are slightly shorter than that of male employees. -

Other types of courses for continuing personnel cultivation and training are based on company guidelines and operational plans.

### UMC Average Training Hours for Various Job Levels

<table>
<thead>
<tr>
<th>Training Time (Hours)</th>
<th>Number of Participants (Persons)</th>
<th>Average Training Time (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIRECTOR LEVEL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36,599</td>
<td>1,707</td>
<td>21.4</td>
</tr>
<tr>
<td><strong>INDIRECT LABOR (NON-DIRECTOR LEVEL)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>328,409</td>
<td>8,376</td>
<td>39.2</td>
</tr>
<tr>
<td><strong>DIRECT LABOR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64,901</td>
<td>5,469</td>
<td>11.9</td>
</tr>
</tbody>
</table>

### Average Employee Training Hours

- UMC
- UMC & its China subsidiaries

### Average Gender Equality Training Time

<table>
<thead>
<tr>
<th>Training Time (Hours)</th>
<th>Number of Participants (Persons)</th>
<th>Average Training Time (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male Employees</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>307,707</td>
<td>8,787</td>
<td>35.0</td>
</tr>
<tr>
<td><strong>Female Employees</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>125,441</td>
<td>6,765</td>
<td>18.5</td>
</tr>
</tbody>
</table>

For gender issues, UMC upholds the principles of gender equality and offers equal training opportunities with the purpose of providing professional training for each job grade and function. Most direct employees are women so their training would be largely focused upon technical courses such as machine operation. Hence, average training hours for female employees in UMC are slightly shorter than that of male employees. -

Other types of courses for continuing personnel cultivation and training are based on company guidelines and operational plans.

### Management Competence Training - Development Plans for Supervisors of Various Levels

In terms of personnel training and development, UMC defines the managerial competency required for the various levels of directors. Core and professional competencies are also defined for general employees so that they clearly understand the required core competencies for each level of job responsibility. To design the internal training curriculum, UMC conducts a company-wide training needs survey in the fourth quarter of each year, and plans corresponding development courses based on the professional needs of supervisors and employees. In addition to required training to help employees achieve job performance, employees can also prepare for their career planning and development by participating in other training courses based on their personal needs and future development plans.

Furthermore, to fulfill the company’s core values, the philosophy and spirit of “accountability” is thoroughly instilled. UMC first introduced the course titled “The 7 Habits of Highly Effective Managers” in 2011. In 2012, this course was further expanded to include “The 7 Habits of Highly Effective Employees.” Course contents are constantly promoted and established so that the 7 Effective Habits have become a common language between UMC managers and employees. All supervisors and employees recruited in 2017 completed these courses in the 1st Quarter of 2018 in order to benefit from course-related data. From 2016 to 2018, the overall training completion rate improved steadily and the standard was maintained. In 2018, a new version of the 7 Effective Habits posters was printed and posted in all department offices to promote and cultivate the 7 Habits throughout the Company. Descriptions of the courses are as follow.
Technical Training for Engineers

UMC fully realizes that outstanding technicians are the key to enhancing advanced technology and sustaining a company’s growth. Therefore, based on the professional needs and competency inventory of the various engineering departments, technical training curriculum are planned, and through a solid system of technical training, the overall professional standard of our engineers and quality of engineering manufacturing are enhanced.

Based on the job need of each employee, learning maps are formulated. Through the control and statistics mechanism in the training system, the training courses and hours required by each employee are ensured for specific training effectiveness. To provide more learning resources for each employee, blended professional courses were designed in 2018. New versions of online courses were also created to provide more interactive learning resources for employees.

<table>
<thead>
<tr>
<th>Function Category</th>
<th>PE</th>
<th>EQ</th>
<th>PEI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3 MONTHS</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20 MONTHS</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1 MONTHS</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Learning from case examples</td>
<td>Improvement</td>
<td>Advanced professional skills</td>
<td></td>
</tr>
<tr>
<td>Product integrity and abnormality management</td>
<td>Basic professional and shift planning skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic theory and manufacturing process summary</td>
<td>Basic skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semiconductor manufacturing technology summary</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Training Poster

2016-2018 completion rates for “The 7 Habits of Highly Effective Managers” and “The 7 Habits of Highly Effective Employees” courses
Convenient e-Learning Platform

In addition to the various professional skills and management courses, UMC has set up an e-Learning platform to provide employees with a convenient and easy environment for spontaneous learning. Information channels allow for convenient lesson preview and review, and together with effective and diverse in-class learning, the cultivation of knowledge and skills is steady and in-depth, thereby sustaining learning interest and exploration of new knowledge.

Learning Platform

Technical Skills Inventory

UMC is a world-class corporation, and in line with international trends, has established a basic and rigorous system for both qualitative and quantitative skills assessment. In terms of strengthening English ability, demand for quality manufacturing, and increasing the professional knowledge of engineers, both internal and external evaluations such as TOEIC English assessment, Technical Skill Inventory and Statistical Process Control (SPC) are used to effectively evaluate the required core competencies of employees and increase production quality to meet and satisfy various customer needs worldwide. For example, in the 3-6-9 SPC Principle, those who fail assessments are not allowed to operate machinery, and are affected in other matters such as promotion.

Assessments for engineers

Assessment System

SPC Assessment
In line with fab demand for manufacturing quality, engineers’ understanding of SPC is emphasized

English Assessment
In line with the company’s international orientation, the strengthening of employee English competency is emphasized

Professional Skills Assessment
Professional skills assessment system is used for determining the professional competency of engineers

Courses (Knowledge)
New employees must complete SPC training courses within 3 months

Test (Knowledge)
New employees must complete the SPC written test within 6 months

Practice (Application)
New employees must complete SPC practice within 9 months

SPC: 3-6-9 SPC Principle

- Within 3 months
  - 7-10: Instructor
  - 5-6: Independent operation
  - 3-4: Completion of task through telephone instruction
  - 0-2: Continuing learning required

- Within 6 months
  - SPC assessment

- Within 9 months
  - SPC practice
To help new employees quickly integrate and shorten learning time, the learning organization particularly emphasizes new employee training to highlight the goals of “Recruit Talent, Cultivate Talent, Retain Talent” in education and training. In particular, “the involvement and support of department directors is the only way to motivate successful education and training.” Each director is committed to enhancing the employment and development of new employees, and through the comprehensive UMC new employee training program supplemented by a mentor system, new employees quickly acquire professional skills and develop an appropriate work attitude. In addition to completing required courses, new employees also participate in the orientation program for new employees. The program integrates the organizational characteristic of team building, namely capability and agility. Classes pertaining to company vision, strategies and competiveness are personally taught by high level executives, and workplace stress management and positive thinking courses are also provided to help new employees quickly integrate into the corporate culture.

**Training for Diverse Cultures**

Since employees from different countries are employed, training courses have been provided using different languages to help employees quickly settle into the UMC culture and gain familiarity of corporate policy and systems. Additionally, cultural descriptions and festivities are also regularly provided when celebrating traditional Chinese holidays to help foreign employees enjoy local festivities. To improve linguistic skills of foreign employees, routine language courses are directly offered at UMC, along with regular language skills tests and bonus policies.

**Introduction for Newly Hired Staff**

To help newly hired employees quickly settle into UMC’s environment, gain familiarity in corporate policy and regulations, and shorten learning time, senior personnel or supervisors are appointed as employee mentors when newly hired staff report to their posts. Training is given directly at the job posting to achieve effective on-the-job training (OJT). These instructions also cover routine activities and various specialized fields. A Newly Hired Staff Instructor System was established throughout the entire company. This system includes a training schedule, discussion forms with various supervisors, and feedback surveys. Instructors must complete all instruction procedures within 3 months after newly hired employees report to their post.

**Corporate Culture Orientation Program for New Employees**

To help new employees quickly integrate and shorten learning time, the learning organization particularly emphasizes new employee training to highlight the goals of “Recruit Talent, Cultivate Talent, Retain Talent” in education and training. In particular, “the involvement and support of department directors is the only way to motivate successful education and training.” Each director is committed to enhancing the employment and development of new employees, and through the comprehensive UMC new employee training program supplemented by a mentor system, new employees quickly acquire professional skills and develop an appropriate work attitude. In addition to completing required courses, new employees also participate in the orientation program for new employees. The program integrates the organizational characteristic of team building, namely capability and agility. Classes pertaining to company vision, strategies and competiveness are personally taught by high level executives, and workplace stress management and positive thinking courses are also provided to help new employees quickly integrate into the corporate culture.

In 2018, 13 sessions of the new employee orientation program were conducted, and a total of 602 new employees completed training. (The above figures refer to indirect labor in Taiwan, and include formal employees and dispatched staff).

**Transition Assistance Program for Employees who are Retiring or Leaving**

To ensure good channels for assistance, the Company interviews employees who are retiring or leaving employment to provide appropriate care and specific channels to facilitate assistance. In addition, the Company provides laid-off employees with severance pay and employment service information in accordance with the Labor Standard Acts.

**UMC Training Effectiveness**

To ensure training effectiveness, UMC has set training performance indicators such as course completion rate, annual program completion rate, SPC implementation success rate, key talent retention rate, per capita output value and other values. These values are converted into UMC’s standard scores to represent training outcome. The UMC training results are 79.5 points in 2016, 81.1 points in 2017 and 84.8 points in 2018. The goal is 88 points for 2020 and 95 points for 2025.

**UMC Training Effectiveness - Learning Assessment Model and Item Comparison**

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In 2018, 13 sessions of the new employee orientation program were conducted, and a total of 602 new employees completed training. (The above figures refer to indirect labor in Taiwan, and include formal employees and dispatched staff).
Quality Improvement & Innovation Team (QIT)

To achieve departmental goals, fulfill Company policies and strengthen daily management, the Company conducted QIT activities. 142 improvement teams were established in 2016, 92 teams in 2017, and 116 teams in 2018. The training activities are aimed at helping employees find solutions to problems and enhancing innovative breakthroughs and teamwork ability.

Knowledge Management (KM)

To promote knowledge management, retain UMC’s core knowledge and cultivate a knowledge sharing team and learning environment, the company has established a knowledge bank sharing platform. Taking into account both knowledge and confidentiality protection, accessibility control is implemented according to the level of confidentiality.

Knowledge documents are categorized as one star, two stars, three stars or four stars according to their level of comprehensiveness and contribution.

2016

In 2016, UMC’s KM read rate was 89%, writing penetration rate was 72.5% and KM re-use efficiency was NT$ 850,397,456

2017

In 2017, UMC’s KM read rate was 90%, writing penetration rate was 73% and KM re-use efficiency was NT$1,382,323,493

2018

In 2018, UMC’s KM read rate was 91.8%, writing penetration rate was 73% and KM re-use efficiency was NT$725,470,616

indicating steady growth in overall indicators and maintenance at the upper-middle level.

4-2-4 CULTIVATING PROSPECTIVE TALENTS

To fulfill the ideal of promoting semiconductor research and technical development, and strengthening UMC’s global competitiveness by providing the corporation with a source of outstanding and quality talent, UMC is committed to maintaining forward-looking collegiate relationships. In 2018, UMC focused on 2 major orientations in its collegiate relationships: (1) Positioning outstanding R&D talent, and (2) In-depth development of talent from technical colleges. In addition, university-industry collaboration and prospective talent programs are two major directions of development.

UMC continued to strengthen business-education partnerships in 2018. In addition to existing practical programs for semiconductor technologies in key institutions, a collaboration project was also implemented to sponsor full-time instructors for the MS Degree Program and credit courses on Nano-Integrated Circuit Engineering offered by National Cheng Kung University (NCKU). A series of brand image development activities such as paper discussions, career sharing, practical collaborations, and exhibits of semiconductor products were scheduled, with more than 3,500 individuals participating in paper discussions in 2018. These measures enhanced the academia’s support and recognition of UMC and gave a comprehensive demonstration of a successful business-education partnership.

In terms of campus talent cultivation, the Prospective Talent Program (PTP) has been expanded to increase the cultivation of talent on campuses. Since 2013, a total of 4,140 candidates have been recruited, of which 1,934 are still in school. In 2018, Advanced Intelligent Elite Development Program (AIED) has been launched, and 1,149 students have participated in this program.

Through a series of activities and courses, close interaction is maintained with prospective collegiate talent to promote their identification with UMC. By establishing a close relationship and pre-appointments, the program effectively connects UMC with target students. At the same time, the PTP also effectively markets the corporate image of UMC and exerts considerable influence on campuses and communities, thereby ensuring future R&D prospects for UMC in advance.
UMC Prospective Talent Program methods

**DOMESTIC AND OVERSEAS SUMMER INTERNSHIP PROGRAMS**

In 2018, a total of 32 interns were recruited. The program continues to select high-quality talent to intern at major departments in domestic and overseas UMC facilities. The interns are guided by designated instructors so that through actual practice and involvement in existing UMC projects, they can experience the workplace culture. At the same time, this program effectively allows for closer interaction between prospective collegiate talents and UMC teams, thereby enabling mutual learning and growth through these close exchanges.

**COLLEGIATE TALENT DEVELOPMENT PROGRAMS**

Exclusively designated for students, this program offers forums, internships and corporate mentoring to help students gain awareness and sensitivity toward the semiconductor industry. In addition, participation in UMC benefit events allows students to visit the fabs and provides opportunities to advance their understanding of UMC’s global operations, corporate culture and a healthy workplace.

In 2018, Advanced Intelligent Elite Development Program (AIED) has been launched, and 1,149 students has participated this program. (PTP) has been expanded to increase the cultivation of talent on campuses. Since 2013, a total of 4,140 candidates have been recruited, of which 1,934 are still in school.

**COLLEGIATE CAREER PLANNING FORUM / INSTRUCTOR PROGRAM**

UMC has conducted career planning seminars and career coaching programs in its recent collaboration with key schools. Based on professional insight of future trends and career instructor’s assessment of student characteristics and knowledge, career plans are recommended to help students find suitable career paths. With National Cheng Kung University as an example, 7 career coaching programs have already been implemented. Each batch has over 200 participants from the university and the program still continues to this day. In addition, practical resume writing advice is offered to help new graduates highlight and market themselves, and capture the attention of companies and executives.

**VISIT BY FACULTY AND STUDENTS FROM TARGET DEPARTMENTS**

In 2018, about 1,347 faculty and students from target schools visited UMC so that students could gain an early understanding of the semiconductor industry work environment. Interaction and exchanges with employees also allow students to better understand the direction of their future learning and employability.

**Furthering vocational and technological universities - Industry-university collaboration for engineers**

**CORPORATE INTERNSHIP PROGRAM**

UMC collaborates with vocational and technical universities by providing lecturers to share their practical knowledge to reduce the gap between academic and practice. The program also offers career counseling seminars for many vocational and technological college students and provides them with career planning recommendations.

**GUIDANCE BY INDUSTRY EXPERTS**

This program offers 1-year internships for students going into their senior year in collaborating colleges. In addition to facilitating the absorption of theoretical knowledge, the program trains students in actual industrial settings, thereby increasing their competitiveness. From 2013-2018, 176 interns were accepted.

**Experience Sharing**

**Former Equipment Intern & Current UMC Employee - Wei, Chia-hao**

When I was a freshman, I always dreamed of interning at UMC. Thus motivated, I fought hard for the opportunity, and eventually my dream came true. I was accepted as an intern! I felt very fortunate to be one step ahead of others in having contact with the industry while I was still a student.

Since my home is in Malaysia and I am alone in Taiwan, it is inevitable that I was unfamiliar with the life here. However, my department supervisor and colleagues took very good care of me, and made me feel welcomed and cared for.

I am now an engineer, and an indispensable IT talent in the department. For all this, I am very grateful to UMC for nurturing and cultivating me!

If Supervisor Huang had not given me the opportunity at that time, I would not have the achievements I have today.

**Former PTP member & current UMC employee - Huang Ya-hsin**

First of all, I want to thank UMC for giving me the opportunity to become a part of this big family and experience its unity, warmth, enthusiasm and passion.

The knowledge in the semiconductor industry is diverse and complex, and not always easily understood from books or the news. When I was a student, I learned about the development in the industry through various lectures conducted by UMC’s PTP. I learned about the Company operations through instructor-student discussions, and better understood the value that the company placed on employees through conversations with my instructors.

Moreover, from the lectures and events during the PTP Certificate Awards Ceremony, I saw the passion of the company. These activities guided me to toward specific workplace orientations.

As a new graduate, I was somewhat anxious. However, I am thankful that when I was still in school, UMC maintained close contact with the campus, which reduced my fears and helped me make the necessary preparations for transitioning into the workplace. For students who want to become familiar with the workplace environment in advance, the PTP is truly a beneficial channel.
Stress-free Workplace: Focusing on Work Environment Safety

In 2018, UMC continued its efforts to build a safe and stress-free work environment and was planning and implementing a series of measures that were either compliant or superior to statutory regulations governing employee welfare, education, training, retirement, and other employer-employee issues. Management systems and safe environments were established to eliminate all risk factors in the workplace to achieve the Safe UMC objective in a comprehensive manner.

Comprehensive Health Care Program

UMC believes that healthy employees are an important cornerstone for the success of the company and pays close attention to the physical and mental health of its workers and their families. Its “Comprehensive Health Care Program” continued to broaden in 2018. To ensure employee health and prevent occupational diseases, the 2018 Health Service Management Plan was formulated according to the Enforcement Rules of the Occupational Safety and Health Act and the 2017 FHV Health Management Plan Effectiveness and Review.

Moreover, these activities and measures create a high-quality workplace and foster a spirit of camaraderie among the workers. UMC continues to work towards making the work environment safe, protecting the health of its workers, and furthering work-life balance.

In addition to dedicated efforts in building a quality and engaging workplace, UMC also referenced the latest amendments to the Occupational Safety and Health Act to initiate a series of activities to promote and improve upon ergonomic factors, health protection for female workers, and overwork-related conditions to protect and support our fellow employees. Extensive planning and preventive surveys were carried out to assess employee requirements, physical health, and mental states from multiple perspectives. Efforts for promoting Healthy Workplace concepts were aimed at improving support and recognition from employees and external agencies as well as encouraging the recruitment and retention of skilled professionals to achieve the final goal of enhancing personal and corporate performance.

Preventing Overwork

To achieve a LOHAS workplace and provide a well-proportioned work-life balance, UMC adopted the Occupational Safety and Health Act in 2015 by taking the initiative to identify and assess the issue of overwork. To prevent employee overwork, the labor contract between each UMC employee and the Company is in accordance with local laws and regulations. The contract stipulates that employee overtime must be voluntary, and the company stipulates that excessive work hours are not permitted.

Overwork Prevention Items

Based on the outcome of the overwork questionnaire, psychological stress questionnaire and other surveys, initiative is taken to address employee physical and mental health.

- A survey on overwork issues was initiated in 2018, and at the same time, relevant plans were discussed and developed with on-site physicians.
- Health guidance and follow-up management are arranged for those at risk for overwork.
- On-site physicians provide guidance and conduct health education.
- Automated leave management: Using the automated system, an effective alert mechanism was installed to control work hours and excessive overtime. Overtime alert systems are set at a more stringent limit than required by existing regulations. When overtime hours approach the limit set by the Company, the alert mechanism is activated. A reminder is simultaneously sent to the supervisor and employee so that reasonable human resource and work arrangements can be made.
- Since 2010, monthly reminders are sent to employees who have unused vacation hours, and supervisors are urged to schedule leave for their subordinates.
- In 2018, 7 days of special flexible vacation time continue to be given beyond the requirements of the Labor Standards Act.
- Advocated through labor-employee meetings, secretarial forums and other large scale meetings.
- Conducted a series of lectures on overwork, and incorporated it into annual key tasks.
- Provided exclusive supporting measures for UMC Recreation Center, UMC Institute Activity Center and LM dormitory.
- Organized activities such as trips, inter-factory fun, sports and massage services by visually impaired massage therapists.
- In 2018, 12,021 employees in UMC fabs in Hsinchu Science Park and Southern Taiwan Science Park received health checkup and completed a workload survey.
- In 2018, healthy diet lectures, departmental group education lectures, 3-high metabolic syndrome prevention lectures and abnormal case management were implemented. Employees at high risk are followed up on and educated individually. Participation rate is 100% for Fab 8E and Fab 8F; 82% for Southern Taiwan Science Park; and 60% for UT, Fab 8C and Fab 8D.
Measures for a Safe Workplace

Healthy Workplace: Safeguarding Employee Physical and Mental Health

Employee Health Promotion

To ensure that employees receive the multiple health services provided by the health team from the Company’s Health Center, various channels are used. These include medical staff consultations, referrals, questionnaires, risk assessments for middle aged and older executives, health checkup items superior to mandatory ones, out-of-pocket checkup items with partnering hospitals, and injury management procedure for employees and outsourced personnel. A health information portal is made available to all workers to safeguard their health. The range of health services provided are:

Health checkup
- New employee physical examination, annual health checkup and special occupation health checkup.

Health management
- Follow-up on reports showing abnormal findings, management for special cases, maternal protection, middle and high-risk employee care and on-site physician consultation services.

Health promotion
- Analyze epidemiological and health checkup data of all employees, provide relevant cancer screening for women, stool screening for colorectal cancer, abdominal ultrasound examination, breast ultrasound, Pap smear, tobacco hazard prevention and control, weight loss activities, physical fitness tests, influenza vaccination, epidemic prevention and education, mental health education and numerous other out-of-pocket exams.

Employees are the most valuable of company assets. Therefore it is very important for the Health Center to promote the prevention, early detection and early treatment of diseases. Every year, health promoting and occupational safety and health plans are formulated, and the implementation and effectiveness tracked using a Gantt chart. The goal is to strengthen employee health awareness and promote health, and subsequently prevent occupational disease and improve health to enhance well-being and quality of life. By achieving such health goals, employee work confidence and productivity can be enhanced, thereby creating a win-win outcome.

Health promotion is a process of cultivating self-growth, facilitating individual autonomy over personal health and improving health. It is a primary prevention in preventive medicine, which focuses on positive and active health. It is a healthy belief model that changes the health behaviors, habits, attitudes and beliefs of individuals, and increases their correct health knowledge and health self-efficacy, thereby motivating them to make healthy decisions and actions.

To help employees access these services, employees are educated through various media, such as the Safety Committee, the Occupational Safety Committee meeting, secretarial forums, e-news, posters and website platform. Employees are also kept informed of all activities, such as lectures, health checkups, testing, healthcare, self-weight management, first aid training and mental health services.

In addition, to strengthen correct health perspective and knowledge in employees, activity participation plays a vital role. Therefore quiz competitions and incentives are designed to attract employee participation in health promoting activities and achieve the ultimate goal of a healthy lifestyle.
As a benchmark company, UMC shoulders the important responsibility of national science and technology development in a highly competitive and rapidly changing industrial environment. While pursuing profit, we also deeply believe that “only through the dedication of employees can UMC sustain development, and only happy and healthy employees can create UMC vitality.” According to the Enforcement Rules of the Occupational Safety and Health Act and the 2017 Fab Health Management Plan Effectiveness and Review, UMC formulated the 2018 Stable Profit at No Loss Health Investment Self-Management Plan as the key focus for the year. As many as 26 projects were planned, including annual health promoting events, themed lectures, annual health checkups, various tests, stress management and consultation activities. Different themes and educational focus in each quarter, such as maternal protection, healthy weight, stress management and improving unfavorable test outcomes, coupled with the abnormal workload and over-fatigue prevention in the Occupational Safety and Health Act, are implemented to protect employee health. Moreover, in 2018, Fab BAB, Fab 8S and the Southern Taiwan Science Park Fab were awarded healthy workplace certification.

**Focus and key outcomes in the 2018 Stable Profit at No Loss Health Investment Self-Management Plan health promotion events.**

### Q1: Maternal Protection
To increase maternity registration rate, mothers may present their Maternal Care Handbook at the Health Center to receive a small gift. From January to June, a Parental Toolkit platform is released each month to provide pregnancy, postpartum and childcare information. 

**Key Outcome**
- Received a total of 325 Likes and 15,898 Reads from employees in UMC fabs in Hsinchu and Southern Taiwan Science Parks.
- A total of 15,898 from UMC fabs in Hsinchu and Southern Taiwan Science Parks participated. Overall average satisfaction was 97.5%, which achieved the targeted goal and showed an increase of 1.8% compared with 95.7% in the previous year.

### Q2: Self-Weight Loss
Provide the latest weight loss information. Designed weight loss Monopoly games to encourage daily weight loss goals, exercise habits and healthy eating habits.

**Key Outcome**
- A total of 73 participated in the weight loss program.
- Satisfaction was 96.2%.

### Q3: Stress and Overfatigue Prevention
The excessive workload group showed a high Framingham Risk Score and high stress and fatigue index. Life guidance was provided to cultivate positive habits to reduce the Framingham Risk Score.

**Key Outcome**
- A total of 1977 participated. Satisfaction was 95.53%.

### Q4: Improving Unfavorable Test Findings in 3-High Risk Groups
An Individualized Healthcare program was established for employees with abnormal test findings to help them better understand their own physical condition. Relevant information on the abnormal findings were provided through consultation with in-house physicians, return clinic visits, seminars and personal feedback.

**Key Outcome**
- A total of 73 participated.
- Satisfaction was 96.2%.

In 2003, UMC introduced the “Employee Assistance Program” (EAP) to provide free counseling services to help employees relieve physical and psychological stress. Individual counseling and confidentiality mechanisms are provided to help employees resolve physical and psychological issues. Each employee has access to 6 free sessions per year, paid for by the company, and for those with special needs, additional assistance is provided by the company’s professional counseling group.
(2) Active prevention and outreach:

Psychological education and training for the Employee Relations Department, Human Resource Service (Account) Department and supervisors.

- Established the Employee Relations Department and Human Resource Service (Account) Department.
- The Human Resource Department has established the Employee Relations Department and Employee Human Resource Service (Account) Department to actively reach out to employees and intervene in case of abnormal situations.
- Employee Care Seed Training: Continued to plan and organize education and training courses in “Employee Psychological Care—Assistance, Management and Practice for the Manager” to enhance the sensitivity of supervisors toward the psychological condition of employees.
- The company integrated a mechanism for employee care.

In recent years, we have been diligently integrating and reconstructing the mechanism to help employees return to their job after recovering from physical or mental illness or injury. With cooperation between professionals and relevant departments, methods and supporting measures, employees are provided with a more worry-free workplace where they are given attentive care and necessary assistance.

(3) Relaxation Platform

The company’s internal website has a support platform offering employees diverse channels for relieving stress and providing counseling and information, such as Call IN I Hear You, Hot Let’s Talk, Reassurance e-Newsletter, Relaxation Shopping, and Discovery of the Heart.

From time to time, meditative articles, book and movie reviews, and essays are posted to help employees relax during their free time so that they can calmly deal with the challenges from work, interpersonal relationships, parenting and family life. In 2018, we continued to optimize the health center platform to provide employees with services such as activity registration, health information, relaxation corner, self-assessments and health activities.

Expanding Health Concept, Outreach to Employee Dependents.

UMC conducts annual health examinations, and offers check-up items that exceed government regulations. UMC also has a Health Self-Management Program that is tailored for employees. Professionals are designated to follow-up with employees with health abnormalities, including arranging for regular follow-up appointments and providing health education information. Comprehensive records of employee health indicators are kept, and health examination results are categorized and managed for healthcare follow-up. To help employees manage their health history, the company’s eHR system was integrated in 2010 to construct an electronic health examination management platform and database where employees can assess their health examination results and compare their health history. The system also provides relevant health education materials for employees to learn to self-manage their health. As of 2018, UMC’s information divisions integrated their existing systems to establish a new Healthcare System exclusively for employees. Employees can immediately check their health checkup report and medical staff consultation information online. The new system improved the medical team’s daily care list and care rate to create a comprehensive healthy workplace.

Employees who are special operations inspectors are assigned for case management and tracking. In addition, health promotion activities targeting common health abnormalities are organized to provide care and safeguard employee health. UMC also hires on-site doctors to provide health consulting services for employees. Preventive services such as special examinations and out-of-pocket vaccinations are also offered to help employees take initiative in creating a healthy lifestyle. Moreover, UMC also safeguards the health of employees’ families and organizes annual health examinations and massage services for them. Such health care services for both employees and their household create a win-win situation of a harmonious society and family.

In 2018, a total of 12,021 employees received medical examinations, and satisfaction was 93.4%. To provide convenient and quality services for employee families, hospital checkups were made available for families. The program was well received and will continue to be implemented.

Note: Satisfaction rate was determined through a five-point scale questionnaire (very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, and very dissatisfied). It is calculated by dividing the number of people who checked satisfied or above by the total number of respondents.
Maternity Health Protection

UMC places great importance on motherly care and breastfeeding, and has implemented extensive measures to provide breastfeeding mothers with a safe and comfortable environment. Breast pumping rooms were also established in various fabs for female employees.

Establishing a Comprehensive Healthy Workplace

The UMC Health Center implemented a total of 26 health promotion projects in 2018. The total number of people served was 71,759 and the overall satisfaction rate was 95%.

Injury and Illness Care

Employee physical and psychological well-being and those involved in traffic incidents are followed up by telephone and e-mail contacts from a nurse from the health center, and appointments with house doctors are arranged if necessary. Continuing care and psychological support is provided to help employees return to work as soon as possible, and psychological support is strengthened for unclosed cases from 2011—2014. In terms of return to work following physical or psychological injuries and illnesses, support mechanism and case management procedures are formulated, and with the assistance of house doctors and nurses, relevant department directors, and personnel and legal departments, recovery/work distribution is facilitated to return physically or psychologically disabled employees to the workplace.

Number of injury and illness cases and frequency of support provided in 2015-2018

According to the number of people participating in the health promotion activities at health centers from 2016 to 2018, various activities such as the annual medical examination and massages by the visually impaired showed high participation levels, indicating that workers have more health awareness and are making it more of a priority. These efforts have also been widely acknowledged by the general public. In 2018, Global Views Monthly awarded UMC the Vision Model Award for the Electronics Group for UMC’s CSR Survey. Moreover, all UMC fabs obtained the “self-certified health promotion badge” from the Health Promotion Administration, Ministry of Health and Welfare. These recognitions represent UMC’s efforts in creating a healthy workplace for everyone.

Key Results of Health Promotion Activities from 2016 to 2018

According to the number of people participating in the health promotion activities at health centers from 2016 to 2018, various activities such as the annual medical examination and massages by the visually impaired showed high participation levels, indicating that workers have more health awareness and are making it more of a priority. These efforts have also been widely acknowledged by the general public. In 2018, Global Views Monthly awarded UMC the Vision Model Award for the Electronics Group for UMC’s CSR Survey. Moreover, all UMC fabs obtained the “self-certified health promotion badge” from the Health Promotion Administration, Ministry of Health and Welfare. These recognitions represent UMC’s efforts in creating a healthy workplace for everyone.
Dedication to Public Charity and Social Responsibility

UMC is also dedicated to charity activities, and introduced massage services provided by those with visual impairments in both Hsinchu Science Park (HSP) and Southern Taiwan Science Park (STSP). These services not only provide employment opportunities for the disabled, but also professional massage services to help ease discomfort and improve physical and mental health of fellow employees. UMC employees also support blood donation drives held multiple times every year, helping to save the lives of other people.

In 2018, UMC organized a total of 14 blood drives which had more than 914 employee participants, collecting and donating about 1427 bags of blood.

LOHAS Workplace: Emphasis on Work-Life Balance

UMC believes that employees are its most important asset, and that having healthy and happy employees is key to high productivity in a corporation. In addition to providing a safe and healthy working environment, an employee oriented LOHAS workplace that integrates benefits, vitality and public service is created. Through a diversity of activities, creativity and vitality are nurtured in the work and lives of employees.

Site Events for Building Team Identities

UMC held a series of activities to celebrate its anniversary in 2018. Nintendo Switch races and team competitions were organized. It is hoped that the Switch Mario Kart racing, which is currently most popular with engineers, can add elements of fun and celebration. Inter-fab team competitions will continue to be held. It is hoped that positive competition between different fab sites will help build employee identity and cohesiveness, reduce opposition to new internal measures, and create high performing and effective teams.

Family Cohesion

UMC emphasizes work-life balance, and in addition to focusing on employees, UMC also reaches out to their families. UMC arranges activities within specific themes which are appropriate for employees and their families to participate in. In 2018, the scale of Family Day was expanded to enhance non-financial incentives and achieve a sense of welfare. For the first time, Family Day was held at a park so that employees and their families can enjoy a different fun UMC atmosphere. Planning family day activities effectively promotes team spirit and reinforces company recognition by family members. A monthly movie is selected by employees for family movie time where movies are shown in the fab after work, and art festivals are held that are open to employee families. UMC hopes to support employees as well as their families to relieve employee stress and ensure their physical and mental health. At the same time, employee families may also become involved with UMC, get to know UMC and continue to support the employees in their diligent contributions toward the company.
Club Activities

Content | 2018 Performance
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**UMC Club events**
- UMC clubs can generally be classified into 6 types, namely ball games, sports, public service, music and dance, arts, and business investment.
- Through the club assessment system, clubs with excellent performance receive subsidies for their operating expenses.
- 27 clubs (Taiwan)
- 2 rounds of selection - a total of 15 excellent social groups will be provided with support in each round.
- 2,239 club members (Note)

**UMC recreational facilities and services**
- Quality Recreation Center in Hsinchu for employees and their families.
- Dormitory in Tainan with integrated recreational facilities.
- Each site (8E, 8F, 8S, 12A) provides fitness equipment for employees.
- Recreation Center in Hsinchu: 220 thousand visitors in 2018
- The UMC recreation centers serve over 636 people per day.

**Diversity of employee activities**
- Organized regular Easy Travel, Family Day, and Art Festival.
- “Theme Park” Family Day was held in 2018.
- Routine screening and playing of popular movies every month
- 568 people participated in the Easy Travel program
- 19,000 people participated in UMC Family Day
- 2,241 people participated in the Art Festival

Note: Does not include one-time or temporary club members
In terms of arts and culture activities, UMC’s "2018 UMC Art Fest" was the company’s most important arts and culture event of the year. Art is drawn closer into the lives of employees through 3 events held respectively in July through September 2018. The respective event themes were Performing Arts, Theme Lectures and Life and Culture. In addition to inviting well-known performers, writers and lecturers, other activities such as movie appreciation, travel sharing, coffee time and handicraft courses were organized for employees to experience life aesthetics. Large scale art performances were also brought in to provide UMC employees with different artistic horizons and peer sharing. The activities encourage employees to experience diverse art forms and incorporate them in their daily lives. Not only does this enhance the quality of life, but it also achieves the ideal of “Work-Life Balance.”

Events planned for 2018 were designed to highlight the core value of Customer (and Employee) Focus upheld by UMC. Activities were also based upon UMC Extreme Art organized in previous years. 2018 UMC Extreme Art included a total of 14 art events which were attended by about 2241 individuals. The choice of activities were based upon recommendations from fellow employees and proved to be both enriching and well-received by the entire company.

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<tbody>
<tr>
<td>Any form of safety or health risk may result in serious economic and social losses for the company, compromising its competitiveness. Consequently, UMC aims for zero disaster and is committed to the company's steady development while making safety a priority.</td>
</tr>
</tbody>
</table>

**How We Manage**
- Meet or exceed the requirements of industry safety laws, aiming for zero disaster.
- Promote the safety and health management system to ensure safety and health performance.
- Use advanced safety and health technologies to improve safety.
- Implement prevention management and auditing systems to ensure the safety of the work environment and operations.
- Make it a responsibility for personnel of all levels to prevent accidents.
- Conduct safety and health education and advocacy; encourage active participation in safety and health activities.

**Goals and Targets**
- **2018 Goal:** ≤13 minor incidents.
- **2020 Goal:** Reduce number of incidents by 67% compared to 2011. Perform better than the 3-year average Disabling. Frequency Rate (FR) or semiconductor manufacturing. Perform better than the 3-year average Disabling Severity Rate (SR) for semiconductor manufacturing.
- **2025 Goal:** Reduce number of incidents by 88% compared to 2011. Perform better than the 3-year average Disabling Frequency Rate (FR) for semiconductor manufacturing, and reduce by 25% compared to 2020 goal. Perform better than the 3-year average Disabling Severity Rate (SR) for semiconductor manufacturing, and reduce by 25% compared to 2020 goal.

**Applicable Entities:**
- UMC
- HJTC (HeJian Technology (Suzhou) Co., Ltd.) and USC (United Semiconductor (Xiamen) Co., Ltd.), which are UMC subsidiaries selling and manufacturing integrated circuits
- All workers whose work and/or workplace is controlled by UMC, HJTC or USC.
Safety and Health Organization

UMC in Taiwan has a company-wide safety and health committee that meets every quarter, chaired by the Associate Vice President. The Board comprises a total of 9 labor representatives elected from respective fabs, who account for 33% of the 27-member committee. Each fab also has its respective safety and health committee. In the Singapore fab, the safety and health committee is set up in accordance to local regulations, and in compliance with the law, its number of employee representatives is greater than the number of director representatives. The company’s subsidiaries HJTC and USC have both established a safety and health committee that meets every quarter.

Safety and Health Management Focus

The Company’s safety and health management framework is based on the management spirit of the Occupational Health and Safety Assessment Series, hereinafter referred to as OHSAS 18001. The Plan-Do-Check-Action framework is incorporated into the health and safety management system for activities, products and services of the company’s fabs in Taiwan and branch in Singapore. The same health and safety management system is also instituted in the company’s subsidiaries, HJTC and USC. The key health and safety management focus in the Company’s OHSAS 18001 Certificate is available on UMC’s website:

Creating a corporate culture of occupational safety for everyone

Any safety and health risks could result in major economic or reputational loss for a company, and undermine its competitiveness. UMC builds its safety and health management on inherent safety, and actively establishes a corporate culture of mutual assistance to create “work safety for everyone.” It is hoped that the result of safety and health management promotion can be reflected in the operating outcome.

In 2018, the key implementation projects include the

“SAFETY PRIORITY” CULTURE PROMOTION

The company president personally pledged: “Safety first. Safety is above production.” Senior executives signed environmental safety and safety policies and commitments to consolidate consensus. Level Two equipment and fab supervisors are required to increase weekly on-site management to reinforce workers’ safety knowledge and awareness. Level Three supervisors are required to focus on the integrity and compliance of high-impact operations procedures / regulations through smart monitoring approaches such as closed-circuit television (CCTV) and issue early warning and correction to non-complying employees. These measures are instituted to incorporate Safety First into every item of production, construction and operations to ensure that employees do not neglect safety for speed. The ultimate goal is for employees to be Safe at Work, Return Home Happy and continue to reduce disabling injury frequency rate (FR) and Disabling Injury Severity Rate (SR).

Hazard Identification and Risk Assessment

UMC conducts hazard identification and risk assessment for routine and non-routine operations, including:

- Hazardous workplace assessment
  UMC’s fabs are inspected according to Hazardous Workplace Review and Inspection Rules as category A workplaces. The hazardous workplaces are evaluated by process safety assessment personnel who are trained and qualified in safety and health.

- Process and activity safety and health risk assessment
  The safety and health risks of processes and activities are evaluated by personnel who are trained and qualified in safety and health identification. The personnel assess the severity and frequency of risks, calculate safety and health risk indicators, and compile a list of major safety and health risks for improvement.

- Identifying engineering risk using FMEA
  Using Failure Mode & Effect analysis (FMEA), engineering risks are identified before construction and communicated with relevant personnel.

The Company also has a category of Extraordinary Operations that includes operations that are unanticipated, special, not implemented for over a year, or have no specified procedures. Before implementing an extraordinary operation, FMEA must first be conducted to systematically review any problems that may arise during the execution of the extraordinary operation. Through the risk assessment, preventive countermeasures are formulated and reported to the fab manager before the operation can proceed. During the construction, the construction authority must lead the site control, with the safety personnel assisting with management and supervision.
Consultation and communication with employees

UMC values employee communication and participation. The safety and health labor representatives approach in Taiwan’s Occupational Safety and Health Act authorizes employees to select labor representatives approved by the labor-management meeting. The representatives may participate in quarterly Occupationally Safety Committee meetings, revision of work safety and health code, investigation of incidents, monitoring of operations environment, and decisions on safety and health issues. Penalties for employee violations and the procedure for nominating labor representatives are jointly discussed in labor-management meetings. Any safety and health related issues are also discussed in the labor-management meetings to achieve consensus.

The company also actively communicates with other non-employee workers. In addition to assessing qualified contractors and formulating the Environmental Safety and Health Contract for contractors to sign, the contract provides contractors with information pertaining to their working environment, hazard factors and relevant safety and health regulations. All incoming construction workers are also required to receive UMC’s Environmental Safety and Health Education and Training for Contractors and all incoming contractors are required to complete the Contractor Workplace Hazard Notification and Agreement Meeting.

Moreover, a comprehensive e-application system for construction has been installed for effective control of construction applications and management before, during and after a project. In addition to assigning on-site overseers and conducting a daily toolbox talk, contractors are also required to have their responsible departments conduct on-site supervision and their occupational safety personnel conduct inspection from time to time during the construction to ensure that all operations are in compliance with safety regulations.

Hazard notification

To prevent accidents, UMC uses routine inspection systems to detect anomalies early, prevent potential hazards in the operating environment, and enhance the safety and health of the operating environment. All hazards found during inspections are recorded in the computerized inspection and reporting system, and are classified and managed according to occupational safety personnel. Improvement tracking is performed by the computer system. In case of any immediate workplace danger, workers can call the emergency contact person to notify the occupational safety personnel. Without jeopardizing the safety of other employees, workers can stop their operations and retreat to a safe place, and will not be penalized by the company.

High-risk job and occupational disease management

Local regulations in Taiwan, mainland China and Singapore stipulate that employees in identified high risk equipment and factory operations, such as those exposed to noise, ionizing radiation, dust, organic solvents, and specific chemical substances must undergo special health check-ups and health management based on a health check grading system. In 2018, the outcome of a required special health check showed no Level 4 work related cases. UMC provides health check-up items and check-up targets above and beyond those stipulated to fulfill the company’s responsibility toward its employees. Through a comprehensive health risk grading management system and early discovery in high-incidence groups, the two-pronged approach of improvement at the source and health care at the end has created a healthier and more comfortable working environment.

An occupational health care mechanism is developed for employees ill from suspected work-related problems. A health care team comprising of labor health physicians, the Health Development Section of the Human Resources Division and the Risk Management and Health and Safety Department is formed to determine cause and propose improvement measures. As of 2018, there were 5 such cases (an increase of 1 case in 2018).

UMC is committed to protecting employee health, and has also established 3 lines of defense to protect the confidentiality of personal health-related information:

I. The company's medical staff is licensed in medical care and subject to the laws and regulations for medical personnel.

II. Contracts with partner hospitals clearly stipulate the confidentiality obligations of both parties.

III. The company has formulated the Potential Workplace Related Chronic Injury Notification and Investigation Regulations to protect employee privacy. Therefore, all documents pertaining to the Potential Workplace Related Chronic Injury Notification are classified as Confidential.

UMC encourages workers to effectively and promptly report suspected workplace related illness so that relevant departments can take immediate improvement and preventive measures against occupational diseases. Such employees will not be subjected to any favorable or unfavorable treatment.
Safety and health education and training

To enhance worker safety awareness and prevent disasters, the UMC provides ongoing education, training, and promotion. By cultivating their emergency response ability and safety knowledge, and strengthening their competence, accidents from unsafe behavior are reduced. The company includes contingency response, required certifications, safety and health management system maintenance, special operations safety, and overseers into annual training plans.

In addition to planned training courses, other education and training are arranged according to specific incidents or major failings. For example, an E-learning course is also provided so that workers can acquire safety and health knowledge without being limited by the course schedule of physical classes.

UMC sets annual education and training plans according to key needs. Overall consideration is given to general training and specific issues pertaining to occupational hazards, dangerous activities, or dangerous situations.

At the same time, in the event of accidents and outside incidents, announcements or lectures are immediately arranged to help employees understand their rights and protect themselves. Lectures on safety management and the role of supervisors are also conducted to help supervisors understand their responsibility for employee safety. Hence the foundation of the education and training is to jointly improve safety.

Accident investigation and analysis

UMC underscores the importance of immediate notification, rigorous investigation and recurrence prevention of each accident. Therefore, the company has formulated the Accident Notification and Investigation Regulations to govern the procedures for accident notification, investigation, and improvement. In addition, for systematic records and efficient control of accident notification/investigation/improvement, a computer system for accident notification and investigation has been installed to achieve instant transmission and storage of accident information. After each accident, based on the accident cause and improvement measures proposed by the fab in which the accident occurred, in-plant inspections are conducted in all fabs to prevent a recurrence.

The company also conducts a comprehensive assessment of the accident according to 8 dimensions, and quantifies the accident into major, severe, minor, false alarm or abnormal categories for more objective evaluation of the accident management performance.

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In 2018, the Safety Mindset 4.0 Course was added to enhance the company’s behavior-based safety (BBS) culture. A total of 2,063 classes were taught 2018, and 101,739 participants were trained.

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<table>
<thead>
<tr>
<th>ACCIDENT OCCURRENCE</th>
</tr>
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<table>
<thead>
<tr>
<th>GENERAL ASSESSMENT OF THE ACCIDENT BASED ON 8 DIMENSIONS</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>1. PERSONNEL INJURY</th>
<th>2. IMPACT ON PRODUCTION</th>
<th>3. PROPERTY LOSS</th>
<th>4. CHEMICAL RELATED ACCIDENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>![CO2]</td>
<td>![Fire]</td>
<td>![Liquid]</td>
<td>![Labs]</td>
</tr>
</tbody>
</table>

| 5. SCOPE OF IMPACT OF GAS SUBSTANCE | 6. FIRE | 7. SCOPE OF IMPACT OF LIQUID SUBSTANCE | 8. BEHAVIORAL DIMENSION |

**FURTHER ASSESSMENT OF EACH DIMENSION, CATEGORIZATE THE ACCIDENT ACCORDING TO SCORES AND ASSIGN A LEVEL.**

<table>
<thead>
<tr>
<th>ABNORMAL</th>
<th>FALSE ALARM</th>
<th>MINOR</th>
<th>SEVERE</th>
<th>MAJOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10 points</td>
<td>10 points or above</td>
<td>20 points or above</td>
<td>60 points or above</td>
<td>100 points or above</td>
</tr>
</tbody>
</table>
Accident Management

UMC remains committed to reducing the number of industrial accidents. In 2018, the goal was to reduce the number of accidents by 30% (compared with 2012), and reduce the number minor accidents to \( \leq 13 \).

To effectively achieve the accident management objectives, the main focus is Safety First. At the beginning of the year, each fab proposes a prevention plan and continues to undertake the 2017 Safety Mindset 4.0 activities. A specific theme is formulated for employee e-learning promotion throughout the company. In addition, the causes of accidents are dynamically analyzed at different time points during the year, and countermeasures proposed. Examples of these countermeasures include Comprehensive Tank Car Hazard Prevention, Safety First Posters & Banners, Zero Accident Awards Announcement, Changes in the Contractor Hazard Notification & Agreement, Introducing Safety Supervision and Auditing for Full-time Outsourced Human Resource and ESH Inspection for Key High-risk Operations.

In 2018, the reduction goal was achieved, with 10 counts of minor accidents. Analysis showed that of these accidents, 3 were chemical contact related, 2 were impact related, 2 were cut related, 2 were fire related, and 1 was electric shock related. Analysis of injuries in 2015-2018 indicates that the two main causes of accidents at UMC were walking and chemical contact related. Therefore in 2019, the company will continue to focus on Safety First and promote Walking Safety and Chemical Operation Safety in its Behavior-Based Safety (BBS) culture. Furthermore, the company has set a mid and long-term accident management target of reducing the number of accidents by 88% in 2025 compared with 2011, and continue working toward zero accident.

Accident Cases from 2014 to 2018

![Accident Cases Chart]

Note: UMC scores and classifies accidents according to injuries cause by people, production impact, financial loss and involvement of chemical substances, range of impact, fire, or problems due to employee behavior. Not all accidents result in human injury.

Occupational Disaster Management

In 2018, UMC’s Disabling Frequency Rate (FR) was 0.13 and Severity Rate (SR) was 0, which are far below the 3-year average of the semiconductor industry (according to data provided by the Department of Statistics of the Ministry of Labor). UMC will continue to promote disaster reduction programs and move towards zero disasters.

Disabling Frequency Rate (FR)

![Disabling Frequency Rate Chart]

Disabling Severity Rate (SR)

![Disabling Severity Rate Chart]
Definition of Terms

- **Non-employee workers**: Refers to non-employees whose work and/or workplace is controlled by the company. The daily average number of such workers in the fabs is calculated by dividing the total number of workers in the year by 365.

- **Third party**: Refers to non-employees or contracted personnel.

- **Work Hours**: Refers to the actual number of work hours put in by current employees or non-employees. The number of hours worked by non-employee workers is calculated at eight hours per person per day.

- **Number of people with disabling injuries**: Refers to the number of deaths, permanent disability, permanent total or partial disability or temporary total disability due to occupational injuries.

- **Number of lost days due to disability**: Refers to the total number of days lost as the result of injury from a single accident. Calculated as the number of days when the injured person is temporarily (or permanently) unable to resume work, but excludes the day of injury or the day when work is resumed. Includes the number of days elapsed (including Sundays, holidays or company rest days) and the number of inability to work days following return to work as a result of the injury.

- **Number of reportable injuries**: Refers to the number of work related injuries that resulted in death, job loss, impairment or transfer, emergency treatment or more, loss of consciousness, or major diagnosis by a physician.

**FR** = Number of people with disabling injuries x 1,000,000 / Total number of work hours (per million work hours).

**SR** = Number of lost day due to disability x 1,000,000 / Total number of work hours (per million work hours).

**ODR** = Total number of occupational diseases x 200,000 / Total number of work hours (per 200,000 work hours).

**IR** = Number of reportable injuries x 200,000 / Total number of work hours (per 200,000 work hours).

**LDR** = Number of lost days due to disabling injuries x 200,000 / Total number of work hours (per 200,000 work hours).

Other prevention measures and safety and health impact pertinent to company operations, products or services.

Through procurement management and management of changes, UMC further eliminates hazards and reduces health and safety risks, thereby preventing safety and health impact on the company’s operations, products or services.

UMC’s procurement safety and health regulations are incorporated into the operational specifications of the Procurement Department. In addition to requiring material vendors to comply with domestic regulations on labeling, production and shipping, the company also regularly audits suppliers to prevent abnormal supply due to safety and health incidents.

To avoid safety and health risks and environmental impact from changes in personnel, machinery, materials, methods and environment, UMC has established management measures for changes. Measures such as formal application procedure, approval procedure, implementation of necessary safety assessments, relevant personnel notification/training, and necessary technology information are in place to reduce potential risks.

### Other Prevention Measures and Safety and Health Impact Pertinent to Company Operations, Products or Services

<table>
<thead>
<tr>
<th>Region</th>
<th>UMC Employees</th>
<th>Non-employee Workers</th>
<th>UMC Employees</th>
<th>Non-employee Workers</th>
<th>Subsidiary HJTC Employees</th>
<th>Non-employee Workers</th>
<th>Subsidiary USC Employees</th>
<th>Non-employee Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taiwan</td>
<td>13,061</td>
<td>1,495</td>
<td>1,711</td>
<td>645</td>
<td>2,219</td>
<td>393</td>
<td>1,114</td>
<td>491</td>
</tr>
<tr>
<td>Singapore</td>
<td>25,235,917</td>
<td>4,365,296</td>
<td>3,745,107</td>
<td>1,884,728</td>
<td>4,334,556</td>
<td>1,147,752</td>
<td>2,355,450</td>
<td>1,432,720</td>
</tr>
<tr>
<td>China (HJTC)</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>China (USC)</td>
<td>11,14</td>
<td>491</td>
<td>360</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Subsidiary</td>
<td>365</td>
<td>726</td>
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<tr>
<td>Singapore</td>
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<tr>
<td>China (HJTC)</td>
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<td>0</td>
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<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>China (USC)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: There were no third party illnesses, injuries, disabilities or deaths caused by UMC operations.

Note: There were no third party illnesses, injuries, disabilities or deaths caused by HJTC operations.

Note: There were no third party illnesses, injuries, disabilities or deaths caused by USC operations.

**No. of people**: The number of people in the fab is calculated by dividing the total number of workers in the year by 365.

**Total No. of work hours**: The total number of work hours is calculated as the number of days worked by non-employee workers at eight hours per person per day.

**No. of people with disabling injuries**: The number of deaths, permanent disability, permanent total or partial disability or temporary total disability due to occupational injuries is calculated.

**No. of lost days due to disability**: The number of days lost due to injury is calculated as the number of days when the injured person is temporarily (or permanently) unable to resume work, but excludes the day of injury or the day work is resumed. Includes the number of days elapsed (including Sundays, holidays or company rest days) and the number of inability to work days following return to work as a result of the injury.

**No. of reportable injuries**: The number of work related injuries that resulted in death, job loss, impairment or transfer, emergency treatment or more, loss of consciousness, or major diagnosis by a physician is calculated.

### Procurement Management

UMC's procurement safety and health regulations are incorporated into the operational specifications of the Procurement Department. In addition to requiring material vendors to comply with domestic regulations on labeling, production and shipping, the company also regularly audits suppliers to prevent abnormal supply due to safety and health incidents.

### Change Management

To avoid safety and health risks and environmental impact from changes in personnel, machinery, materials, methods and environment, UMC has established management measures for changes. Measures such as formal application procedure, approval procedure, implementation of necessary safety assessments, relevant personnel notification/training, and necessary technology information are in place to reduce potential risks.
Professional Skill Training

Professional firefighting training: Training themes focus on basic orientation training for new recruits which would then be followed by strategy and tactical training. Every new member must undergo professional disaster relief training and examination which would include professional disaster rescue for simulated fires and response skills to oxidation disasters. In order to improve and maintain firefighting skills and professional competencies of Brigade members, practical training and exercises were carried out regularly every month in order to improve disaster response abilities. During their term in the UMC Fire Brigade, members will participate in both organizational and external rescue missions.

Emergency response training for fellow employees: UMC also organizes emergency response training for the entire company to educate and improve employees’ knowledge of safety, protection, and emergency response skills. Practical exercises and examinations including various training courses, building safety evacuation drills, and unannounced day-time / night-time / theme-based fire drills were implemented to establish the concepts of fire prevention, fire safety, and disaster response within the minds of every employee, at the same time employees can gain valuable experience.

In addition, the Company organizes an ERT Competition from time to time to enhance employee contingency response ability through positive exchanges and competitions.
In addition to the Spreading the Seeds of Hope Project that was initiated in 2005, UMC also mobilized other agencies such as the UMC Science and Culture Foundation, UMC LOHAS Education Foundation, UMC Fire Brigade, and employee societies and clubs in 2018, using their different skills to target and identify the best means of investing in community services.

In 2018, UMC employees provided a total of 7158.5 volunteer hours. Charitable donations and the number of beneficiaries also grew significantly and the latter grew to over 26,321 individuals. These results demonstrate continued growth of human resources and kindness of UMC volunteers offering services to the needy throughout Taiwan.

are the most important elements of UMC’s vision in sustainability policies. UMC upholds the spirit of social co-prosperity and shall contribute its fair share towards social development. Under the leadership of UMC Science and Culture Foundation, more and more employees have started to take notice of the importance of community services, and have begun to take an active role in volunteer activities which initiated positive development within UMC. Our growing positive influence would help external agencies recognize UMC while providing assistance to more of those who need help, generating a growing positive feedback cycle that expands from within.

LBG Model

To effectively quantify the benefits brought about by community services, UMC referred to the community investment assessment system established by London Benchmark Group (LBG). Investment time, cost, material donations, and management expenses were carefully recorded to evaluate the positive benefits brought about by these investments. Outputs of community services include reductions in cost, generation of benefits, and intangible influences such as positive corporate image, becoming a benchmark of corporate social responsibility (CSR), establishing positive value systems amongst school children, and helping to compensate for the inadequacy of educational resources for school children living in remote areas.

In addition to the Spreading the Seeds of Hope Project that was initiated in 2005, UMC also mobilized other agencies such as the UMC Science and Culture Foundation, UMC LOHAS Education Foundation, UMC Fire Brigade, and employee societies and clubs in 2018, using their different skills to target and identify the best means of investing in community services. In 2018, UMC employees provided a total of 7158.5 volunteer hours. Charitable donations and the number of beneficiaries also grew significantly and the latter grew to over 26,321 individuals. These results demonstrate continued growth of human resources and kindness of UMC volunteers offering services to the needy throughout Taiwan.
UMC Community Service Participation and Number of Beneficiaries

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charitable Donations Note 1</td>
<td>More than NT$36 million</td>
<td>More than NT$44 million</td>
<td>More than NT$32 million</td>
</tr>
<tr>
<td>No. of beneficiaries</td>
<td>More than 16,142 people</td>
<td>More than 27,161 people</td>
<td>More than 26,321 people</td>
</tr>
<tr>
<td>Total employee volunteer hours Note 2</td>
<td>More than 9,220 hours</td>
<td>More than 9,220 hours</td>
<td>More than 7158.5 hours</td>
</tr>
</tbody>
</table>

Note 1: This table only includes projects carried out by the Science and Culture Foundation, UMC LOHAS Education Foundation, and societies and clubs as well as employee donations.

Note 2: Includes volunteer leave and holiday service hours.

UMC Community Service Department

The UMC Science and Culture Foundation and the UMC LOHAS Education Foundation are UMC’s two major foundations. In addition, UMC has also instituted the UMC Fire Brigade. All social involvement and actions are mutually supporting, forming the major force behind UMC’s social citizenship in caring for the disadvantaged. Through the integration of UMC resources, employees contribute diligently to society to create a more secure and warmer community.

In 2018, more and more societies and clubs in UMC took the initiative to be a part of community services, including musical groups such as and Ukulele Club, UMC Hsinchu Science Park Drum Team, sports category Tai-chi Club, service category Candlelight Club, Energy Conservation Club and others. The efforts of these groups are growing to become a positive and significant force in promoting community services.

Three Major Social Welfare Groups in UMC

- **UMC Science and Culture Foundation**
  - Develop education for the disadvantaged - “Spreading the Seeds of Hope Project”
  - Life education - “Love Storyteller Club”
  - Parent Child Education - sponsorship for Whatever Makes Sense for Voice of IC Teacher Hung Lan

- **UMC Fire Brigade**
  - Assist in industrial park and community disaster rescue
  - Promote fire safety in elementary schools

- **UMC LOHAS Education Foundation**
  - Promote sports – Open the UMC Park Activity Center to disadvantaged groups
  - Provide UMC tours to university students
  - Education for the disadvantaged – Provide basic literacy skill training for new residents (foreign spouses) and expatriates

Since 2005, the company has allocated NT$160 million to tutoring programs for school children from disadvantaged families, and with the support of UMC, more than 6,100 school children have continued in their studies, thereby fulfilling the mission of “Spreading the Seeds of Hope.”

In 2018, in addition to investing in the “Seeds of Hope” educational assistance project for disadvantaged school children, the program also focused on cultivating “Life Education”, “Reading Promotion”, “Green Energy” and “Basic Science and Technology Talent” to promote a new wave of nurturing that is founded on spiritual, learning, environmental and basic technological perspectives. In addition, the company also realizes that corporate social responsibility cannot be fulfilled only by the company itself, but should involve the joint efforts of employees. It is only through practical personal involvement that individual efforts can unite into a significant strength that becomes a new momentum for Taiwan’s growth.

Community Service Project - “Spreading the Seeds of Hope”

UMC is committed to enhancing the education of school children from disadvantaged families, and has continued implementing the “Spreading the Seeds of Hope” educational assistance program for school children from disadvantaged families. We hope that corporate strength can be used to remedy the imbalance in educational resources.
**UMC Community Service Participation and Number of Beneficiaries**

<table>
<thead>
<tr>
<th>Implementation</th>
<th>Results in 2018</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEEDS OF HOPE - EDUCATIONAL ASSISTANCE FOR CHILDREN FROM DISADVANTAGED FAMILIES</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| - After-school counseling  
- Reading class  
- Ethics class  
- Long-term care  
- Organizing festivals and events | - 3590 service hours at the UMC Afterschool Center, National University of Tainan  
- Sponsored the Nantou Karate Association  
- Served 103 disadvantaged children | - Volunteers would help provide children with correct perspectives to prevent delinquency, using quality education to bring them out of their impoverished background.  
- Sponsorship is provided to Nantou Karate Association to train karate students, helping underprivileged students to regain confidence and become aware of their strengths. |
| **SEEDS OF LIFE EDUCATION - PROMOTING LIFE EDUCATION** | | |
| - Assembling Life Education Volunteer Team  
- Regular visits to remote villages and juvenile delinquents | - Organized 2 sessions of Traffic Safety Seminar activities at the House of Miracles.  
- Sponsored the Whatever Makes Sense show provided by Voice of IC Dr. Hung Lan.  
- Provided a total of 11 Ukulele community service performances by the Ukulele Society.  
- Regular visit youths at Chengcheng High School for 10 times. | - Made regular visits to youths living in remote villages to convey the message of positive life education in order to help them realize the truth meaning of the living and the purpose of life.  
- Interacting with youths living in the House of Miracle to build a correct system of values. |
| **SEEDS OF READ - NATIONAL READING MOVEMENT** | | |
| - Reading seminars  
- Reading promotion | - Organized 4 reading seminar courses to train storytelling volunteers.  
- Storytelling volunteers visited remote villages and support school children there.  
- Sponsored newspaper reading education of Mandarin Daily News for schools that lack resources.  
- Organized 10 reading events in remote elementary schools to benefit a total of 500 schoolchildren. | - School children appreciating the fun of learning through various activities. |
| **SEEDS OF GREENENERGY - PROMOTING ENVIRONMENTAL EDUCATION AND CULTIVATING GREENENERGY TECHNOLOGY TALENTS** | | |
| - Implementing environmental conservation activities | - Investedin the UMC Eco-Echo Conservation Project.  
- Organized seminars and green market events to promote the concepts of earth friendliness.  
- In 2016, started the Green Award program with Global Views Monthly; the program will continue annually. | - Improve awareness for the importance of environmental protection amongst fellow employees and students, and promote the concept of environmental protection to more individuals so that it becomes the responsibility and way of life of every individual. |
| **SEEDS OF SEMICONDUCTOR KNOWLEDGE - CULTIVATING HIGH TECHNOLOGY TALENTS IN TAIWAN** | | |
| - Industry-academia classes for the semiconductor industry  
- Creative R&D projects  
- Other business-education partnerships  
- Campus Cultivation Project | - Industry-academia classes for the semiconductor industry jointly run by the company and 3 universities.  
- Initiated multiple R&D projects in multiple universities and secured relevant patents.  
- Opened industry-academia classes attended by a total of 408 students. | - Cultivated future talent in the semiconductor industry so that young students could achieve in-depth understanding of semiconductor-related knowledge and technology during their school years. |

**Cultivation and Training of Professionals with Management Potential**

In addition to supporting training efforts for high tech professionals, UMC is also leading the way in supporting professionals with management potential. The UMC Business Management Thesis Award was established in 2010 and started offering monetary donations to the Award in 2011 to help further training programs for potential management professionals, encourage academia and industry exchange, achieve effective integration of management practice and theory, and contribute towards sustainable corporate management. In 2018, a sum of NT$3 million was invested into the award.
Volunteer Services

While focusing upon business growth, UMC is also actively contributing towards community work and social participation. To encourage fellow employees to participate in community service, employees are allowed to apply for official leave and partake in various volunteer services. Under the guidance of the UMC Science and Culture Foundation, the spirit of voluntarism in UMC has begun to spread beyond volunteer teams to include the entire employee population.

Active donations and participation in community services by UMC employees demonstrate their initiative, kindness, and selfless contributions as well as the importance that UMC places upon building a volunteer culture.

To provide employees with greater freedom, UMC not only encouraged employees to participate in various community work and social activities, but also employed comprehensive social group assessment systems to encourage company societies to engage in charity work as well. Societies that attained excellent results were provided with additional funding to support both social group activities as well as community participation.

During annual scheduling of events, social groups would be invited to provide support according to the nature and purpose of the event. Many activities were made possible through the assistance and participation of social group members, and these measures help create an inseparable link among community work, corporate-wide event planning and social groups to encourage employees to engage in social work.

The following provides details of the events performed by various societies within UMC:

**Services provided by various societies in 2018**

**Volunteer Services**

- **Candlelight Club**
  - Offering companionship at the House of Miracles
  - Services provided at Ren’ai Children’s Home
  - Services in remote villages initiating love charity drives
  - Charity sales activities jointly held with the foundation

- **Energy Conservation Service Team**
  - To assist social welfare agencies with energy conservation and carbon reduction.

- **Ukelele Club**
  - Services for children living in remote areas
  - Ukelele instructions for children living in remote areas
  - Charity performances

- **UMC Hsinchu Science Park Drum Team**
  - Charity performances

- **Tai Chi Club**
  - Donation and care activities at a senior home center

**Beneficiaries**

- **Sessions held**
  - UMC Love in HwaGuang charity drive: 24 employees donated a total of NT$37,600.

**PARTNERS**


Hsinchu Veterans Home; Hsinchu JiaiGong Community, No. 16 Park; 4 Villages of Erfin; Changle Home for the Disabled in Xinhua, Taipan; Ahheng Training Center for Mental Retardation—Man Fair Sheltered Workshop in Hsinchu; Hualien Mennonite Hospital; Hualien Prison; Hsiangyuan Home; Dahu Elementary School; Hsinchu Huashan Middle School; St. Joseph Social Welfare Foundation; Shih Guang Home in Xinpu; Eden Social Welfare Foundation; Child Welfare League Foundation; HwaGuang Home for Development Disabilities; Chang’an Senior Center; Ren’ai Workshop; Ahheng Sheltered Workshop; Good Shepherd Social Welfare Foundation; Yellow Ribbon, Guide Dog Association; etc.

Service Reflection

**UMC Tai Chi Club President Kelvin Fu**

The body ages over time, just like leaves turn yellow and fall. Those with physical and mental disabilities are more prone to aging, and they are slower than the average person. In addition to cultivating healthy habits among its members, the Tai-chi Club is also fully committed to helping disadvantaged populations. The Club committee launched the UMC Love in HwaGuang charity drive, where 24 employees donated a total of NT$37,600. Through UMC’s donation to HwaGuang Home, we hope that disadvantaged populations everywhere can also feel the warmth. Together, let us take the lead in public welfare and put corporate social responsibility into concrete actions.
The UMC Science and Culture Foundation continues to promote community service, and currently, its focus is on long-term educational assistance. Promoting the “Spreading the Seeds of Hope Program,” the Foundation funds the company’s collaboration with universities in Hsinchu and Tainan. The universities provide classrooms and employ part-time instructors to provide free remedial tutoring to students who are economically disadvantaged.

In 2013, in response to the diversified learning needs of the newly instituted 12 year education policy, the Foundation integrated with community resources to establish the “UMC Sacred Heart Learning Center” in Hsinchu. To date, more than 40 professionals comprising of teachers and students from National Tsing Hua University and National Chiao Tung University, engineers from the Hsinchu Science Park and professionals from various disciplines have joined the tutoring and volunteer team. In addition to supporting the existing remedial tutoring, they also help students develop a positive learning attitude and appropriate values.

Since 2013, the Foundation has supported Tainan remedial classes with the National University of Tainan. Efforts have been further expanded to include elementary schools in remote villages in order to provide services for underprivileged children living there. Teaching development projects with National University of Tainan have been initiated to help train more teachers capable of providing teaching services for underprivileged children living in remote locations.

### Other community services by the Foundation are listed below:

<table>
<thead>
<tr>
<th>Program</th>
<th>Activity Content</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spreading the Seeds of Hope</strong></td>
<td>The “Spreading the Seeds of Hope—Educational Assistance for Children from Disadvantaged Families” program was launched during UMC’s 25th Anniversary Celebration to commit corporate resources to improve the education of school children from disadvantaged families. The program offers tutoring to school children from disadvantaged families in Hsinchu and Tainan.</td>
<td>Provided a total of 750 hours of remedial classes to 120 students in 2018.</td>
</tr>
<tr>
<td><strong>UMC Love Storyteller Club</strong></td>
<td>After the 2009 Typhoon Morakot Disaster, UMC sent 600 people to help clean up disaster areas in Pingtung. In the days following the disaster, employees formed the “UMC Love Storyteller Club” to harness their strength, and gave musical performances in Pingtung, Hsinchu, Tainan and other areas.</td>
<td>Gave 68 performances in 10 years. Through the performances, life education messages were delivered to a total audience of more than 20,000 people.</td>
</tr>
<tr>
<td><strong>UMC Drum Club</strong></td>
<td>UMC’s former CEO Yen mobilized employees in Hsinchu and Southern Taiwan to form the Drum Club to reciprocate to society through the theme of “Make Friends Through Drums, Move Through Love.” In addition, the personal involvement of the CEO helped motivate a spirit of volunteerism.</td>
<td>A total of 35 moving charity performances were given to 25,000 audiences in the last 2 years.</td>
</tr>
<tr>
<td><strong>Storytelling volunteers</strong></td>
<td>Encouraged employees to become storytellers and lead reading activities in Bao Shih elementary school in Hsinchu County. Through a diversity of themes and mediums, extra-curricular cultural materials are used to motivate children to read.</td>
<td>A total of 18 sessions were conducted, totaling about 300 participants</td>
</tr>
<tr>
<td><strong>Letter Writing Volunteers</strong></td>
<td>The Children and Families Fund adopted school children on behalf of the Foundation. In addition, employees volunteered to write letters to the adopted children to reach out and give encouragement. Such a simple friendship links the chain of love and hope.</td>
<td>A total of 110 children were adopted through Children and Families Fund.</td>
</tr>
</tbody>
</table>
The UMC Fire Brigade offered to join government fire rescue units in fire rescue efforts and provide professional assistance so that disasters could be handled smoothly to minimize property loss and environmental impact. In 2018, we were also invited by different government departments to participate in large-scale drills in Hsinchu and Tainan to gain training experience and teach participating members advanced response skills when responding to toxic chemical disasters and industrial fires. In addition, UMC Fire Brigade coordinated with the UMC Culture and Education Foundation to conduct safety education in elementary schools to instill a sense of disaster prevention into the community’s consciousness and practices. The brigade also worked with the company’s energy conservation and safety teams to conduct fire safety consultation and inspection.

Community Fire Education

Provided fire safety education to elementary school students

Disaster Support and Rescue

Assisted with accident response and rescue in Hsinchu/Tainan Science Parks and their nearby communities.

The “Energy Saving Service Team” was established in 2016. With the parent company as the core platform, UMC works together with the “value chain” (subsidiaries, vendors, and subcontractors). As of 2018, it has provided assistance to dozens of social welfare organizations for the disadvantaged, hoping to make them sustainable for a better society and to help these organizations conserve energy and reduce carbon emissions. The services include energy conservation and safety counseling, technical information on energy resources and engineering improvement so that disadvantaged populations may also enjoy living a life of energy conservation and carbon reduction.
Looking at the contributions made by the volunteers of the energy conservation team from 2016 through 2018 in terms of manpower, time, and infrastructure, UMC estimates that the overall economic value generated in the society and the environment reached NT$9 million, while CO2 emissions were reduced by approximately 370 tons.

**Implementation Results of the UMC Energy Conservation Team**

**INVESTMENT**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor Cost</td>
<td>NT$663,750</td>
</tr>
<tr>
<td>Construction Cost</td>
<td>NT$1,949,479</td>
</tr>
<tr>
<td>Total</td>
<td>NT$2,613,229</td>
</tr>
</tbody>
</table>

**OUTPUT**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic benefit</td>
<td>NT$9,127,435</td>
</tr>
<tr>
<td>Environmental and social benefits</td>
<td>-370 Tons CO₂</td>
</tr>
<tr>
<td>Total</td>
<td>NT$9,127,435</td>
</tr>
</tbody>
</table>

**Other Reports:**

- Staff from Mennonite Hospital visiting UMC
- Helping to diagnose boiler energy conservation at Hualien Prison
- Helping Hsiangyuan with electrical safety

**Good deeds from UMC:**

- UMC’s professional help in Mennonite Hospital development
- Over-heating: Hualien Prison sought UMC’s assistance

**Domestic Assessment for Aging, Disability, and Hearing Impaired**

- Improve the work quality of social welfare providers
- Provided energy-saving counseling to welfare institutions to promote sustainable operations so that the money saved may be used for workplace improvement and service capability of the workers.

- Improve the living environment of care recipients
- Provided infrastructure counseling and improvement (water, electricity, fire prevention) to improve the living environment of care recipients and ensure fire safety.

**Clean Water and Sanitation**

- Provided water management technology to improve water conservation and water sanitation.
- Assisted with maintenance to improve environmental comfort and health.

**Statistical Scope:** Service Involvement and Output of the Energy Conservation Service Team from 2016 to 2018.

- Labor cost: Cost of volunteer participation (NT$500 / hour).
- Construction cost: Cost of improving hardware.
- Economic benefit: Cost of energy saved in operations.

**The Paris Agreement**

- Help mitigate climate change
  - Shared energy-saving experience, and introduced green energy environmental technology to help welfare institutions reduce energy consumption and greenhouse gas emissions.

- Assist with adaptation to climate change
  - Exchanged energy-saving knowledge to increase resource management capability. Assisted with improving engineering hardware or energy management tools to enhance adaptability to environmental changes.
APPENDIX I: JOINT VENTURES AND SUBSIDIARIES

The ventures of the company and its affiliated enterprises include wafer manufacturing, electronics, optoelectronics industry, investment, insurance and trading industries. In 2018, over 95% of revenue was generated by UMC’s integrated semiconductor manufacturing operations, and the remainder generated by the new business department for research and manufacturing of solar energy and new generation light-emitting diodes.

This report is based on the results of the differentiation between each of Chapter One’s substantive sustainability topics, and provides the following separate descriptions based on the category of the subsidiary company and the nature of its industry.

The two sales and production entities of HeJian Technology (Suzhou) Co., Ltd. and United Semiconductor(Xiamen) Co., Ltd. are both integrated circuit manufacturing and sales subsidiaries of UMC, and their relevant information is disclosed together with information on UMC in each chapter. The two manufacturing category subsidiary companies of Wavetek and NexPower have promoted management of various sustainable issues in accordance with the UMC Code of Conduct. In 2018, there were no significant fines for violating relevant laws and regulations for either company, nor was there any forced labor, human rights complaints or incidents of corruption. Please refer to the following websites for relevant environmental management system certification promotion circumstances.

For information on the economic performance and financial affairs of each subsidiary and for information on other subsidiaries, please refer to the relevant information on affiliated enterprise organizations on page 166 of our 2018 Annual Report.

APPENDIX II: UNITED NATION GLOBAL COMPACT COMPARISON TABLE

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<th>10 Principles</th>
<th>Related CSR Report Section</th>
<th>Page(s)</th>
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<tr>
<td>Human Rights</td>
<td>Businesses should support and respect the protection of internationally proclaimed human rights. Make sure that they are not complicit in human rights abuses.</td>
<td>4-1 Labor Rights</td>
<td>p100</td>
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<td></td>
<td></td>
<td>2-5 Sustainable Supply Chain Management</td>
<td>p48</td>
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<tr>
<td></td>
<td></td>
<td>4-1 Labor Rights</td>
<td>p100</td>
</tr>
<tr>
<td>Labor</td>
<td>Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining. The elimination of all forms of forced and compulsory labor. The effective abolition of child labor. The elimination of discrimination in respect of employment and occupation.</td>
<td>4-1 Labor Rights</td>
<td>p100</td>
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<td>4-1 Labor Rights</td>
<td>p100</td>
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<tr>
<td></td>
<td></td>
<td>4-1 Labor Rights</td>
<td>p100</td>
</tr>
<tr>
<td>Environment</td>
<td>Businesses should support a precautionary approach to environmental challenges. Undertake initiatives to promote greater environmental responsibility. Encourage the development and diffusion of environmentally friendly technologies.</td>
<td>3 Environmentally Friendly Management</td>
<td>p60</td>
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<td></td>
<td></td>
<td>3 Environmentally Friendly Management</td>
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<td>2-2 Innovation Management</td>
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<td>3-Green Product</td>
<td>p93</td>
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<tr>
<td>Anti-Corruption</td>
<td>Businesses should work against corruption in all its forms, including extortion and bribery.</td>
<td>2-1-5 Code of Ethics and Anti-Corruption</td>
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### General Disclosures

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<td>102-1 Name of the organization</td>
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<td>102-2 Activities, brands, products, and services</td>
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<td>102-6 Markets served</td>
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<td>102-7 Scale of the organization</td>
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<td>For more information, please refer to the 2018 Annual Report (page 166).</td>
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<td>102-8 Information on employees and other workers</td>
<td>2-2-1 Human Resource</td>
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<td>102-9 Supply chain</td>
<td>2-5 Sustainable Supply Chain Management</td>
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<tr>
<td>102-10 Significant changes to the organization and its supply chain</td>
<td>2-5 Sustainable Supply Chain Management</td>
<td>p48</td>
<td>No significant changes occurred during the reporting period.</td>
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<td>102-11 Precautionary Principle or approach</td>
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<td>About UMC</td>
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### Strategy

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<td>102-14 Statement from senior decision-maker</td>
<td>Message from chairman of the Corporate Sustainability Committee</td>
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<td>102-16 Values, principles, standards, and norms of behavior</td>
<td>2-1-5 Code of Ethics and Anti-Corruption</td>
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<td>102-17 Mechanisms for advice and concerns about ethics</td>
<td>2-1-5 Code of Ethics and Anti-Corruption</td>
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### Governance

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<td>1-1 Sustainable Development Strategy and Organization</td>
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<td>102-19 Delegating authority</td>
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<td>102-20 Executive-level responsibility for economic, environmental, and social topics</td>
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<td>102-21 Consulting stakeholders on economic, environmental, and social topics</td>
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<td>102-23 Chair of the highest governance body</td>
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<td>102-24 Nominating and selecting the highest governance body</td>
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<td>102-25 Conflicts of interest</td>
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<td>102-26 Role of highest governance body in setting purpose, values, and strategy</td>
<td>1-1 Sustainable Development Strategy and Organization</td>
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<td>102-27 Collective knowledge of highest governance body</td>
<td>2-1 Company Governance</td>
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<td>102-28 Evaluating the highest governance body’s performance</td>
<td>1-1 Sustainable Development Strategy and Organization</td>
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<td>102-30 Effectiveness of risk management processes</td>
<td>1-1 Sustainable Development Strategy and Organization</td>
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<td>102-31 Review of economic, environmental, and social topics</td>
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<td>102-32 Highest governance body’s role in sustainability reporting</td>
<td>1-1 Sustainable Development Strategy and Organization</td>
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<td>About This Report</td>
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<td>102-33 Communicating critical concerns</td>
<td>1-1 Sustainable Development Strategy and Organization</td>
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<td>102-34 Nature and total number of critical concerns</td>
<td>1-1 Sustainable Development Strategy and Organization</td>
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<td>102-35 Remuneration policies</td>
<td>2-1-2 UMC Functional Committee</td>
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<td>102-36 Process for determining remuneration</td>
<td>2-1-2 UMC Functional Committee</td>
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<td>102-37 Stakeholders’ involvement in remuneration</td>
<td>2-1-2 UMC Functional Committee</td>
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<td>4-2-2 Compensation and Benefits</td>
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<td>102-38 Annual total compensation ratio</td>
<td>2-1-2 UMC Functional Committee</td>
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<td>102-39 Percentage increase in annual total compensation ratio</td>
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### Stakeholder engagement

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<td>102-40 List of stakeholder groups</td>
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<td>102-41 Collective bargaining agreements</td>
<td>4-1 Labor Rights</td>
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<td>102-42 Identifying and selecting stakeholders</td>
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<td>102-43 Approach to stakeholder engagement</td>
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<td>102-44 Key topics and concerns raised</td>
<td>1-2 Communication with Stakeholders</td>
<td>p13</td>
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</tbody>
</table>

No employee labor unions were formed before the end of the reporting period. No employee to sign a collective agreement.
### Reporting practice

<table>
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<tr>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>102-45 Entities included in the consolidated financial statements</td>
<td>About UMC: Joint Ventures and Subsidiaries p6</td>
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### Material Topic

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<tr>
<td>2-1-5 Code of Ethics and Anti-Corruption</td>
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<td>UMC has established the ‘Code of Ethics for Directors and Officers’ as basis for their compliance. Training is also planned for each period of directorship.</td>
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<td>407-1 Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk</td>
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There is no case of legally defined occupational disease during the reporting period. For the number of cases of mental and physical health related problems in employees, please refer to the Section 4-3-1 of the Healthy Workplace chapter.
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<td>412-3 Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening</td>
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<td>No significant investment agreements and contracts were signed during the reporting period.</td>
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<td>414-1 New suppliers that were screened using social criteria</td>
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<td>418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data</td>
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<td>There were no cases during the reporting period.</td>
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<td>413-1 Operations with local community engagement, impact assessments, and development programs</td>
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<td>413-2 Operations with significant actual and potential negative impacts on local communities</td>
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| Human Rights              | Due diligence                          | 2-5 Sustainable Supply Chain Management | p48, p100 |
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|                           | Human rights risk situations            | 2-5 Sustainable Supply Chain Management | p48, p100 |
|                           |                                        | 4-1-1 Human Rights                     | p48, p100 |
|                           | Avoidance of complicity                | 2-1 Corporate Governance               | p25, p100 |
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|                           | Discrimination and vulnerable groups    | 4-1-1 Human Rights                     | p100, p104 |
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|                           | Civil and political rights             | 4-1-1 Human Rights                     | p100, p136 |
|                           | Economic, social and cultural rights   | 4-4 Community Service                  | p100, p136 |
|                           | Fundamental principles and rights at work | 4-1 Labor Rights                        | p100     |

| Labor Practices           | Employment and employment relationships | 4-2 Recruitment and Cultivation | p107 |
|                          | Conditions of work and social protection | 4-1-1 Human Rights               | p100, p122 |
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|                          |                                           | 4-3-2 Safe Work Environment        | p129     |
|                          | Human development and training in the workplace | 4-2-3 Education and Training | p114     |

### 416 Customer Health and Safety

- **416-1 Assessment of the health and safety impacts of product and service categories**
  - Located in 3-5-1 Hazardous Substance Management on page 94
- **416-2 Incidents of non-compliance concerning the health and safety impacts of products and services**
  - Located in 2-1-6 Legal Compliance on page 31
  - No non-compliance with laws and regulations occurred during the reporting period.

### Others: Customer Service

- Improving Service Quality and Customer Satisfaction
  - Located in 2-3 Customer Service on page 42

### Others: Chemical Use

- Hazardous substance management and reduction outcome
  - Located in 3-5-1 Hazardous Substance Management on page 94

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APPENDIX V: ASSURANCE STATEMENT

ASSURANCE STATEMENT

SGS TAIWAN LTD.’S REPORT ON SUSTAINABILITY ACTIVITIES IN THE UNITED MICROELECTRONICS CORPORATION’S CORPORATE SOCIAL RESPONSIBILITY REPORT FOR 2019

NATURE AND SCOPE OF THE ASSURANCE/VERIFICATION

SGS Taiwan Ltd, hereafter referred to as SGS, was commissioned by UNITED MICROELECTRONICS CORPORATION (hereafter referred to as UMC) to conduct an independent assurance of the Corporate Social Responsibility Report for 2018 (hereafter referred to as the CSR Report). The scope of the assurance, based on the SGS Sustainability Report Assurance Methodology, included the text and data in accompanying tables, contained in this report.

The information in the UMC’s CSR Report of 2018 and its presentation are the responsibility of the management of UMC. SGS has not been involved in the preparation of any of the material included in UMC’s CSR Report of 2018.

Consistency testing is to express an opinion on the data, graphs and statements within the scope of verification with the intention to inform UMC's stakeholders.

The SGS protocols are based upon internationally recognized guidelines, including the Principles contained within the Global Reporting Initiative Sustainability Reporting Standards (GRI Standards) 101: Foundation 2016 for accuracy and reliability and the guidance on levels of assurance contained within the AICPA-series of standards and guidance for Assurance Providers.

This report has been assured using our protocols for:

- evaluation of content to verify the sustainability performance information based on the materiality determination at a high level of accuracy for UMC and moderate level of accuracy for stakeholders, joint ventures, and applicable content boundaries outside of the organization covered by this report;
- AICPA Assurance Standard (2003) Type 2 evaluation of the report content and supporting management systems against the AICPA Accountability Principles (2002) and
- evaluation of the report against the requirements of Global Reporting Initiative Sustainability Reporting Standards (GRI) for any and all content issues as material and in accordance with GRI.

The assurance comprised a combination of pre-assurance research, interviews with relevant employees, supervisors, CSR committee members and the senior management in Taiwan, documentation and record review and validation with annual reports and other publications to ensure SGS affirms its independence from UMC. Being free from bias and conflicts of interest with the organization, its stakeholders and shareholders.

STATEMENT OF INDEPENDENCE AND COMPETENCE

The SGS Group of Companies is the world leader in inspection, testing and verification, operating in more than 40 countries and providing services including management systems and service certification; quality, environmental, social and ethical auditing and testing; environmental, social and sustainability report assurance. SGS affirms its independence from UMC, being free from bias and conflicts of interest with the organization, its stakeholders and shareholders.

The assurance team was assembled based on their knowledge, experience and qualifications for this assignment and comprised assurance registered with ISO 26000, ISO 27001, ISO 22301, IFSM, IFSR, GCMS, IFSM, SMS, IFSM, GCMS, IFSM, WEF, WEF, Certification and WEF’s Validation Lead Auditors and expertise on the SGS Assurance service provider.

VERIFICATION ASSURANCE OPINION

On the basis of the methodology described and the verification work performed, we are satisfied that the information and data contained within UMC’s CSR Report of 2018 verified is accurate and reliable and presents a fair and balanced representation of UMC’s sustainability activities in 2018.

We believe that UMC has chosen an appropriate level of assurance for this stage in their reporting. In our opinion, the contents of the report meet the requirements of GRI Standards in accordance with Comprehensive Option and AICPA Assurance Standard (2003) Type 2, High-level assurance.

AA1000 ACCOUNTABILITY PRINCIPLES (2009) CONCLUSIONS, FINDINGS AND RECOMMENDATIONS

Integrity

UMC has demonstrated a good commitment to stakeholder value and stakeholder engagement. A variety of engagement efforts such as survey and communication to employees, customers, investors, suppliers, governments, and other stakeholders are implemented to understand the organization’s understanding of stakeholders concerns. For future reporting, UMC may proactively consider having more direct multi-stakeholder involvement of stakeholders during future engagement.

Materiality

UMC has established an effective process for determining criteria that material matters to the business. Formal reviews have identified stakeholders and those issues that are material to each group and the report addresses these in an appropriate level to reflect their importance and priority to these stakeholders.

Responsiveness

The report indicates coverage given to stakeholder engagement and it is clear for stakeholder feedback.

GLOBAL REPORTING INITIATIVE REPORTING STANDARDS CONCLUSIONS, FINDINGS AND RECOMMENDATIONS

The report, UMC’s CSR Report of 2018, is adequately in line with the GRI Standards in accordance with Comprehensive Option. The material topics and their boundaries within and outside of the organization are properly defined in accordance with GRI’s Reporting Principles for Defining Report Content. Disclosures of identified material topics and boundaries, and stakeholder engagement, GRI 102-40 to GRI 102-47, are correctly located in content index and report. Regarding the tone of anti-corruption, it is suggested to provide more meaningful assurance in UMC’s governance body members. UMC has demonstrated the best practice on consulting stakeholders on economic, environmental, and social topics. For future reporting, more descriptions of UMC’s actions and the outcomes of sustainability issues are expected.

Signed:

For and on behalf of SGS Taiwan Ltd.

David Huang
Senior Director
Taipei, Taiwan
14 May, 2019
www.sgs.com
CORPORATE SOCIAL RESPONSIBILITY REPORT

United Microelectronics Corporation
Address: No. 3 Li-Hsin Road II, Hsinchu Science Park, Hsinchu City, Taiwan, Republic of China
Site: http://www.umc.com
E-mail: csr@umc.com