

TAIEX: 3711
NYSE: ASX



2020

ASE TECHNOLOGY HOLDING
CORPORATE SUSTAINABILITY REPORT



ASE TECHNOLOGY
HOLDING CO., LTD.

As a global service provider of semiconductor assembly and testing, ASE Technology Holding Co., Ltd. and its subsidiaries (collectively "ASEH") is fully committed to building its core business and, strengthening research and development to maintain its leadership. The company continues to advance its corporate sustainability through a sustainability development framework that comprises of four strategic pillars - Low Carbon, Circular, Inclusive and Collaborative directions. The framework forms the basis for formulating innovative business models and best practices in key areas such as Low-carbon Transformation and Sphere of Influence, Smart Factory and Automation, Bottom-up Profit Sharing Scheme and Supply Chain Management. ASEH is rapidly evolving to respond proactively to industry trends and stay abreast of social changes. It is the company's responsibility to sow the seeds of a sustainability value and culture that will contribute to positive social and environmental impacts.

The cover design of this edition of the CSR Report was inspired by the color green, a symbol of sustainability and vitality. Against the backdrop of a constellation map, ASEH stands out as the most lustrous star, signifying our vision as a benchmark of sustainability in the industry. Surrounded by light rays resembling IC circuitry, the image evokes ASEH's circular sustainability pledge while remaining focused on its core technology business.

Low-carbon Transformation and Sphere of Influence

ASEH is highly committed to net-zero carbon emission and climate change mitigation through meaningful actions and programs including the research and development of low-carbon energy sources, smart grid and high-tech management systems. As of 2020, 11 of ASEH's plants worldwide purchased 100% of its electricity from renewable sources with REC certifications, accounting for 18% of all electricity consumed by the company. In the same year, we implemented over 300 carbon emissions reduction projects, resulting in a 38% decrease in total greenhouse gas emissions compared with the base year 2015. Social responsibility begins at home, and ASEH hopes to extend its influence globally by sharing our experience and technologies with the entire industry chain and society at large. In 2020, the ASE Environmental Protection and Sustainability Foundation rolled out a program to deploy smart grid technologies in rural schools that include the installation of solar power and energy storage infrastructure, facilitating their transformation into sustainable, low-carbon campuses. We also took the opportunity to introduce environmental education in the school curriculum to raise eco-awareness.

Smart Factory and Automation

In 2015, Advanced Semiconductor Engineering, Inc. began the development of lights-out factories and the application of automation, heterogeneous machine integration and heterogeneous system-in-package integration concepts to drive smart factory deployment and digital transformation. Our strong foundation in automation coupled with the successful integration of upstream and downstream partners in the use of digital technologies have resulted in greater customer trust. In 2020 alone, we completed 18 smart factories, trained over 500 automation engineers and executed more than 45 industry-academia projects. We hope to lead the change in the acceleration of digital transformation and to enable assembly and test technologies to play a key role in achieving 'more than Moore'.





Bottom-up Profit Sharing Scheme

Talent is a company's most valuable asset and the key force that drives organizational growth and sustainability. For this reason, ASEH established a monthly, bottom-up profit-sharing scheme that fosters a unique empowerment and communication culture, organization agility and employee participation in the company's growth journey. The scheme encourages greater employee identification with company goals and increases the sense of belonging that result in the creation of a motivated, dynamic and agile workforce with unlimited growth potential.

Supply Chain Management

To build a tight-knit supply chain and encourage suppliers to invest in sustainable management, ASEH began presenting the Supplier Sustainability Awards in 2017 to commend suppliers with outstanding performances in sustainability. In 2020, we augmented the awards with a new incentive program where suppliers were encouraged to submit proposals for sustainability collaboration of between 1–3 years in duration. The objective of the awards is to help ASEH cultivate a sustainable supply chain and the costs of the program will be sponsored by the ASE Environmental Protection and Sustainability Foundation. We hope that such collaborations would enhance the industry's positive influence and encourage more suppliers to take an active stance on sustainable behavior and help build a sustainable future for the semiconductor industry.

Committed to a Win-Win Sustainable Future

Low Carbon

Circular

Inclusive

Collaborative



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Key Highlights In this report, we discuss our sustainability activities in 2020.

Strategies for the Implementation of the UN Sustainable Development Goals (SDGs)

Beginning in 2019, ASEH has analyzed and identified six major SDGs as benchmarks for the company and its value chain. We have set relevant 2025 performance targets in five major sustainability aspects for incorporation into core operations, allowing SDGs to become a part of our regular assessment and management strategy. In 2020, we expanded sustainability value assessment beyond the company to gain further insight into the environmental, social, economic and tax impact of external business activities, that will provide ASEH Corporate Sustainability Committee with an indicator for strategizing value creation. Sustainability value results were also reviewed to formulate improvement plans that will reduce the impact of potential risks and realize the vision of using ASEH's core capabilities to carry out the 2030 UN SDGs.

Investments in Renewable Energy

ASEH actively develops clean and diverse energy sources through installing its own green energy facilities, and purchasing green electricity and certificates from external sources. We conduct various carbon reduction projects through research and development, and also support industry-academia collaborations to mitigate climate change and achieve net-zero targets. In 2020, purchased renewable energy or certificates accounted for 18% of ASEH's total electricity use, showing an increase of total amount of approximately 38% compared with that of 2019, while renewable energy accounted for 100% of the energy used by ASEH's 11 facilities worldwide.

Supplier Sustainability Awards

In 2020, ASEH launched the first Supplier Sustainability Awards with a focus on two of our four major sustainability strategies- Low Carbon and Circular. Suppliers were encouraged to submit proposals for sustainability partnership projects of one to three years in length for selection by a committee comprising of senior executives and independent directors of ASEH and its subsidiaries, and sustainability experts. The project from the winning selection would be funded by ASE Environmental Protection and Sustainability Foundation, and executed together with ASEH to deliver positive impact on environmental sustainability.

Science Based Targets Initiative, (SBTi)

In 2020, ASEH passed its Science-Based Targets and plans for achieving net-zero emissions target by 2050. We have identified the sources of Scope 1, 2 and 3 emissions and phased in methods and scheduling for carbon reduction. With each passing year, we have not only improved renewable energy usage rate by implementing energy resource efficiency and carbon reduction plans internally and externally, but also worked alongside professional units to research and develop low-carbon technologies, and collaborate with relevant government and industry organizations to achieve the targets.

Social Welfare

ASEH collaborates with its USR partners to promote rural education and sustainable environmental development. In 2020, the ASE Happy Learning Summer Camp held in Shanlin District, Kaohsiung, organized a variety of unique courses including Sustainability in English, Science and Media Production to over 60 students, that provided knowledge on environmental sustainability concepts and elevating interest in English and Science. ASEH and ASE Environmental Protection and Sustainability Foundation have also helped the Kaohsiung Municipal Shanlin Junior High School to build a smart grid. The project facilitated the school's low-carbon transition by providing renewable energy and storage. In the event of emergencies, uninterrupted power will continue to be supplied to the school and its surrounding areas. The school will also incorporate sustainability into the curriculum to educate students about renewable energy and smart grids, raising greater awareness on energy saving and carbon reduction. ASEH continues to channel its resources and expertise to contribute to environmental sustainability and support the needs of communities in rural areas.

Social Investment Performance Evaluation System

The Social Investment Performance Evaluation System applies the concept of corporate investment rates to assess its social welfare investments and outputs in aspects such as environment and society, in which investment and output results are expressed in monetary terms. The innovative management system integrates the major issues of the UN sustainable development goals, S&P Dow Jones Sustainability Indices and SASB standards to optimize the results and efficiency produced by social participation actions and conforming to international sustainable development trends. The system generates SROI scores that enable us to determine the investment returns of all projects in advance, allowing us to better manage, control, and optimize our social participation projects.



2020 Awards and Recognitions

Member of
Dow Jones Sustainability Indices
Powered by the S&P Global CSA

Industry Leader

Named Industry Leader in the 2016-2020 Dow Jones Sustainability Indices, and listed as a constituent of the Dow Jones Sustainability World Index and Emerging Markets Index



Top 1% SAM Gold Class

Listed on the RobecoSAM Sustainability Yearbook 2017- 2021, and awarded the "Gold Class" for five consecutive years (within 1% of top performing company's score under the Semiconductors and Semiconductor Equipment Industry Group)



4 Times on the CDP A List

Named on the 2020 CDP A List for tackling climate change, as well as acting to protect water security, and the Leader Board for Supply Chain Engagement. ASEH is the only Taiwanese company to have made the CDP's climate change A List 4 times as well as scored double As on both the climate change and water security list



9 Awards

Received 2020 Taiwan Corporate Sustainability Awards (TCSA) : Top 10 Domestic Companies Sustainability Model Award (Manufacturing Industry), Growth through Innovation Award, Supply Chain Management Award, Social Inclusion Award, Climate Leadership Award, Circular Economy Leadership Award, Information Security Award, Corporate Sustainability Report Award (Platinum) and CSR English Report Award (Gold)



6 Years in A Row

Included in the FTSE4GOOD Emerging Markets Index for six years in a row (2015-2020)



3 Consecutive Years

Listed on the 2018-2020 FTSE4Good TIP Taiwan ESG Index [The index has been developed in partnership with Taiwan Stock Exchange's ("TWSE") wholly-owned subsidiary, Taiwan Index Plus Corp. ("TIP")]



Awarded Twice

Received the 2020 Asia Responsible Enterprise Awards - Green Leadership hosted by Enterprise Asia, as the only company in the Asian semiconductor industry to leverage green bonds for advancing sustainability

ABOUT OUR REPORTING

This is our 3rd CSR Report for ASEH, where we are disclosing SASB Standards in the report for the first time this year. The report is prepared in accordance with GRI and SASB Standards. ASEH Corporate CSR Division is in charge of data gathering, compiling and editing. This report is available in both Chinese and English. The complete electronic version can be downloaded from our website.
<https://www.aseglobal.com/csr-download>

If you have any comment or suggestion, please contact us at:

**Corporate CSR Division,
ASE Technology Holding**

Address: No.26, Chin 3rd Rd., Nanzih Dist.,
Kaohsiung, Taiwan

Tel: +886-7-361-7131

Email: ASEH_CSR@aseglobal.com

Report Boundary

The report discloses the economic, environmental and social performance of the ASE (Advanced Semiconductor Engineering, Inc. and its subsidiaries), SPIL (Siliconware Precision Industries Co., Ltd. and its subsidiaries), and USI (USI Inc. and its subsidiaries). The scope of this report includes :

ASE Facilities : Kaohsiung, Chungli, Suzhou, Weihai, Wuxi, Shanghai (A&T), Shanghai (Material), ISE labs China, Kunshan, Japan, Korea, Singapore, Malaysia and ISE Labs

SPIL Facilities : Da Fong, Chung Shan, Zhong Ke, Hsinchu, Changhua and Suzhou

USI Facilities : Taiwan, Zhangjiang, Kunshan, Jinqiao, Shenzhen and Mexico

Any boundary adjustment of the data will be separately explained in the text of the report. Financial figures in this report are prepared in accordance with the International Financial Reporting Standards as issued by the International Accounting Standards Board, audited by Deloitte & Touche, and expressed in US dollars unless otherwise specified.

ASE Kaohsiung

ASE Chungli

ASE Japan

ASE Korea

ASE Singapore

ASE Malaysia

ASE Kunshan
ASE Suzhou
ASE Weihai
ASE Shanghai (A&T)
ASE Shanghai (Material)
ISE Labs China
ASE Wuxi

SPIL Da Fong
SPIL Chung Shan
SPIL Zhong Ke
SPIL Hsinchu
SPIL Changhua

SPIL Suzhou

ASE Cultural & Educational Foundation
ASE Charitable Foundation
ASE Environmental Protection and Sustainability Foundation
Chang Yao Hong-Ying Social Welfare & Charity Foundation

USI Taiwan

USI Zhangjiang
USI Kunshan
USI Jinqiao
USI Shenzhen
USI Mexico

ISE Labs



ASE Kaohsiung · Sustainability Report



SPIL · CSR Report



USI · Sustainability Report

Internal Review and Approval

The disclosed information and data in this report were initially verified by the relevant managers of the data/information providers. The initial draft was compiled by the Corporate CSR Division. After being reviewed by the Corporate Finance and Regulatory Compliance Departments, the final report was approved and authorized for issue by the Chairman of Corporate Sustainability Committee.

Other CSR Reports in ASEH

Within the ASEH, we have also published three separate CSR/Sustainability reports providing more detailed sustainability information of our ASE Kaohsiung Facilities (ASEKH) in Taiwan, SPIL and USI. The complete electronic version can be downloaded from <https://www.aseglobal.com/csr-download>

External Assurance

ASEH engaged Deloitte & Touche to perform an independent limited assurance in accordance with ISAE 3000 Revised for this report. The independent assurance statement can be found at the end of this report.

All ASEH sites have acquired certifications in environmental, social, information security and other relevant fields. The company's conformity with international standards ensures complete regulatory compliance in our management and control measures, and operating procedures. For more information please refer to the chart on next page:



Facility \ Certification	ISO 14001 Environmental Management Systems	ISO 50001 Energy Management Systems	ISO 14067 Carbon Footprint	ISO 14045 Eco-efficiency Assessment of Product Systems	ISO 14064-1 Greenhouse Gases	QC 080000 Hazardous Substance Process Management System	OHS Occupational Health and Safety Management Systems ¹	ISO/IEC 27001 Information Security Management Systems
ASE Kaohsiung	●	●	●	●	●	●	●	●
ASE Chungli	●	●			●	●	●	●
ASE Suzhou	●	●			●	●	●	
ASE Weihai	●				●	●	●	
ASE Wuxi	●				●		●	
ASE Shanghai (Material)	●				●	●	●	
ASE Shanghai (A&T)	●				●	●	●	
ISE Labs China					●			
ASE Kunshan	●				●	●	●	
ASE Japan	●				●	●		
ASE Korea	●				●	●	●	
ASE Singapore	●				●	●	●	
ASE Malaysia	●				●	●		
ISE Labs ²	●		N/A	N/A	●	N/A		
SPIL Da Fong	●	●			●	●	●	●
SPIL Chung Shan	●	●			●	●	●	●
SPIL Zhong Ke	●	●			●	●	●	●
SPIL Hsinchu	●	●			●	●	●	
SPIL Changhua	●	●	●	●	●	●	●	
SPIL Suzhou	●	●			●	●	●	
USI Taiwan	●	●	●		●	●	●	●
USI Zhangjiang	●	●	●		●	●	●	●
USI Kunshan	●	●			●	●	●	●
USI Jinqiao	●	●			●	●	●	●
USI Shenzhen	●	●	●		●	●	●	●
USI Mexico	●	●			●	●	●	●

¹ OHS Certification includes ISO 45001 or OHSAS 18001.
² QC 080000, ISO 14067 and ISO 14045 certifications are not applicable to ISE Labs as it is not a manufacturing facility.

Letter from the Chairman

Leading Change in the World

2016~2020 ASEH has been named an Industry Leader in the Dow Jones Sustainability Indices - Semiconductors and Semiconductor Equipment Industry for five consecutive years.

CDP A List

The only company from Taiwan to be listed four times on the CDP Climate Change A List.

The only semiconductor company from Taiwan to be listed simultaneously on both the CDP Climate Change and Water Security A List.

The managing of corporate sustainability is constantly evolving with the increasing complexity and sophistication of business challenges in the digital age. Today, businesses need to demonstrate their contribution to sustainability through measurable environmental, social and governance (ESG) metrics. The pandemic which began in early 2020 has further disrupted the global economy and entire supply chains. However, it has also pushed technology into the forefront where it has transformed how the world operates from remote work arrangements to the use of high performance computing, healthcare applications and more.

At ASEH, we will continue to play a key role in strengthening our innovation capabilities and technologies in heterogeneous integration. We will also lead the change with a strategic focus on ESG in our sustainability development that will enable us to continue our growth trajectory and to contribute to the greater good.

Smart Technologies, Smarter Solutions

Smart factories represent the next big leap in ASEH's Industry 4.0 transition, providing a distinct advantage for the company. By enabling everything smart through automation, heterogeneous machine integration and heterogeneous system-in-package integration, we are capable of building a world class manufacturing operation that can independently 'think', 'detect', 'learn' and 'adjust'. Since 2011, we have been investing in resources to convert our operations into smart factories. As of today, we have successfully established 18 smart factories at ASE Kaohsiung, and we are on our way to achieving our goal of 25 smart factories by 2021.

In 2020, we launched the world's first 5G smart factory at ASE Kaohsiung, powered by a 5G mmWave network. 5G wireless technology delivers superfast data speeds, ultra-low latency and higher reliability which enables ASEH to implement use cases including the AI-powered Automatic Guided Vehicles and AR Remote Maintenance Assistance. These 5G use cases have helped to demonstrate the scalability of smart factories and automation in terms of scope and sophistication for the future. We see digital transformation as a means to assist customers in product innovations, and leverage on exponential opportunities in automotive, mobile communications, smart healthcare and a diverse array of 5G applications, to develop higher value, advanced technologies and better quality products and services.

Green Energy and a Climate-resilient Infrastructure

Global warming and climate change are contributing to extreme weather patterns and causing more stress to the environment. As a global citizen, ASEH is taking measurable actions to support and promote environmental sustainability. We have signed up with a major customer's 'Supplier Clean Energy Program' to increase our energy efficiency and transition to clean and

renewable electricity. We have also established a clear set of goals by working with the Science Based Targets initiative (SBTi) to reduce greenhouse gas emissions. At the same time, ASEH is committed to net-zero GHG emissions for all offices by 2030 and all manufacturing facilities by 2050. In Taiwan, ASEH has joined the Taiwan Institute for Sustainable Energy's Net-zero Emission Alliance in pledging commitment to Net-zero 2030/2050, to build a supply chain that is resilient, transformative and progressive.

In 2020, 11 of our global facilities obtain 100% of their electricity from renewable sources including RECs. Our renewable electricity usage recorded an increase of 38% compared to the previous year and accounted for 18% of total energy consumption. We have also executed 300 energy saving projects that resulted in a carbon reduction of 585,744 tCO₂e. Our future plans include the completion of Scope 3 GHG assessment focusing on the emission hot spots from our procurement and supply chain logistics activities at all facilities worldwide.

ASEH operates one of the industry's largest water recycling facility in Taiwan, allowing us to reuse each drop of water more than three times and avoid disruptions caused by water shortages. Our total accumulated water savings have recently reached 20 million tons and the water use intensity per unit revenue have decreased by 30% since 2015, surpassing the goal of a 1% reduction annually. Our 8 main facilities in Taiwan are also tapping on scientific data from the World Resources Institute (WRI) to conduct climate risk assessments and develop robust water risk management strategies. These actions will enable the company to respond effectively to climate change in the next decade.

Employee Care and Digital Transformation

At the onset of the Covid-19 pandemic, we established a class 100K mask manufacturing facility to produce

medical grade disposable masks for distribution to 60,000 employees in Taiwan. The health and safety of our employees will always remain our top priority and we will continue to extend more support during this pandemic to protect them further.

We promote diversity across 26 operations in 8 countries, hiring individuals from 21 different nationalities. Most of our employees have a background in science and engineering. 49% of our employees are female with more than 5,800 of them in STEM positions, accounting for 17% of total STEM jobs within the company. In line with our commitment to promote gender equality in management across the organization, our proportion of female employees who hold management positions has increased to 24%.

Innovation and creativity are hallmarks of diversity and are important to organizations undergoing digital transformation. As I recall 11 years ago, 4 like-minded engineers got together to generate ideas for developing a smart factory and today, we have over 500 engineers trained in this field. Employees from different backgrounds, education, gender and geographical regions open up opportunities for digital transformation. We are preparing our people for the workplace of the future that will upgrade their job roles and allow the company to nurture a new generation of innovative and forward looking managers.

Sharing and Influencing Social Values

From 2015 to 2020, we invested a total of US\$37.32 million on projects that brought about substantial and meaningful impacts on social and environmental issues. In 2020, we established the ASE Environmental Protection and Sustainability Foundation to execute programs from the NT\$100 million (US\$3.6 million) annual environmental fund. We also formulated a Social Investment Performance Evaluation System to manage and monitor the social performance and impact of the programs.

We were also able to extend our digital transformation at our smart factories to the realm of public environmental

education by establishing the AR Experience @ASE Green Technology Center. Using AR technology powered by a fast 5G mmWave network, the center aims to provide visitors an immersive learning experience of ASEH's water recycling and water resource management. By leveraging on 5G and the use of AR apps, we hope to share our concepts of water and environment protection and deepen the public's understanding of sustainability.

Between 2015-2020, we collaborated on a total of 62 environmental technology projects with universities and research institutions in Taiwan. These projects were instrumental in promoting the development of environmental technology and the eco-performance of manufacturing processes. The results of our collaboration in green technologies were also shared with 11 other industry peers. We pledge that by 2025, our industry-academia collaboration projects would surpass 100, and we would continue to expand knowledge sharing with the industry and the development of sustainable solutions.

Looking Ahead

For the fifth consecutive year, we have been named the **Industry Leader on the Dow Jones Sustainability Indices - Semiconductors and Semiconductor Equipment**. As we continue to gain insights into global sustainability trends and challenges, we are simultaneously driving all business units towards implementing ESG action plans in support of our Integrate, Expand, and Innovate strategy. We remain committed to leading the charge in improving the quality of life in a smart world, and creating a better future for all.



Jason C.S. Chang
Chairman and CEO

Richard H.P. Chang
Vice Chairman and President

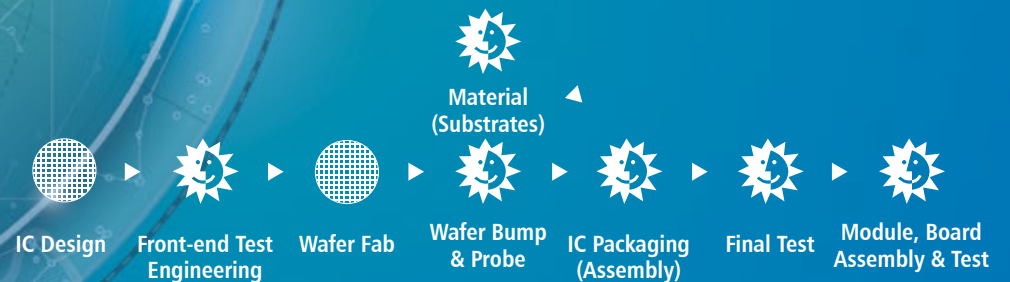
1 OPERATING MODEL

1.1 Company Profile

ASE Technology Holding Co., Ltd. (TAIEX: 3711; NYSE: ASX), established in April 2018 and its subsidiaries include ASE, SPIL and USI. ASEH's mission is to create a business model that combines the strengths of member companies to enhance research and development, increase the level of competitiveness, develop an integrated supply chain and expand our global market footprint. Our structure enables us to innovate and develop miniaturized, high performance and highly integrated services for customers to increase the speed to market for their next-generation products and solutions. By integrating the group's resources, we can continue to explore strategic opportunities with industry partners to strengthen technology innovation and reduce risks, and to create a sustainable future for the industry. For details, please visit www.aseglobal.com

Service Scope

ASEH is the leading provider of semiconductor manufacturing services in assembly and test. The company offers complete turnkey solutions covering front-end engineering test, wafer probing and final test, IC packaging, materials and electronic manufacturing services and develops leading edge technologies to serve the semiconductor, electronics and digital technology market.



Global Operation

Headquartered in Taiwan, ASEH's sales and manufacturing facilities are strategically located globally in Taiwan, China/Hong Kong, South Korea, Japan, Singapore, Malaysia, Mexico, U.S.A., Poland and European countries. ASEH has a worldwide headcount of over 92,000 employees (as of December 2020).



● IC Services ● System Services ● Service Centers ● Sales and Representative Offices

1.2 Mission and Vision

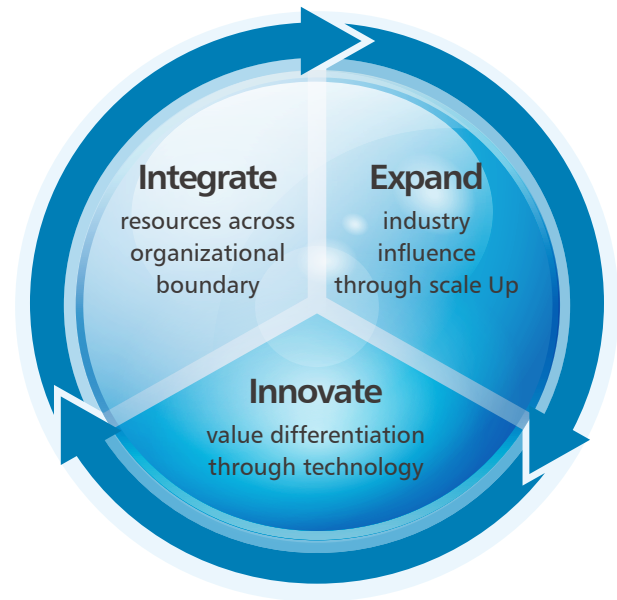
ASEH offers the best manufacturing services in semiconductor packaging/testing, substrates, and systems. We act as an extension of our customers' own operations, helping them achieve maximum success through efficient resource utilization and our extensive manufacturing chain. To stay ahead of the semiconductor technology curve, ASEH builds a highly experienced and skilled engineering team that continually innovates and develops the most advanced semiconductor technologies.

ASEH adheres to the highest corporate governance standards and transforms business philosophies into sustainable actions. As a major player of the global semiconductor chain, we carefully strategize according to industry development and trends, and seek talent and resources worldwide. We form strategic alliances with the government, industry, academia and business partners to keep innovating and create a mutually beneficial business environment. These alliances help support our sustainable development goals to achieve the betterment of mankind and ecological conservation.

ASEH Value Creation Model

In alignment with our mission and vision, and to maintain industry innovation and leadership, we incorporated future industry trends together with the feedback from our senior management and operating units on the indicators about corporate sustainability to establish the ASEH Value Creation Model.

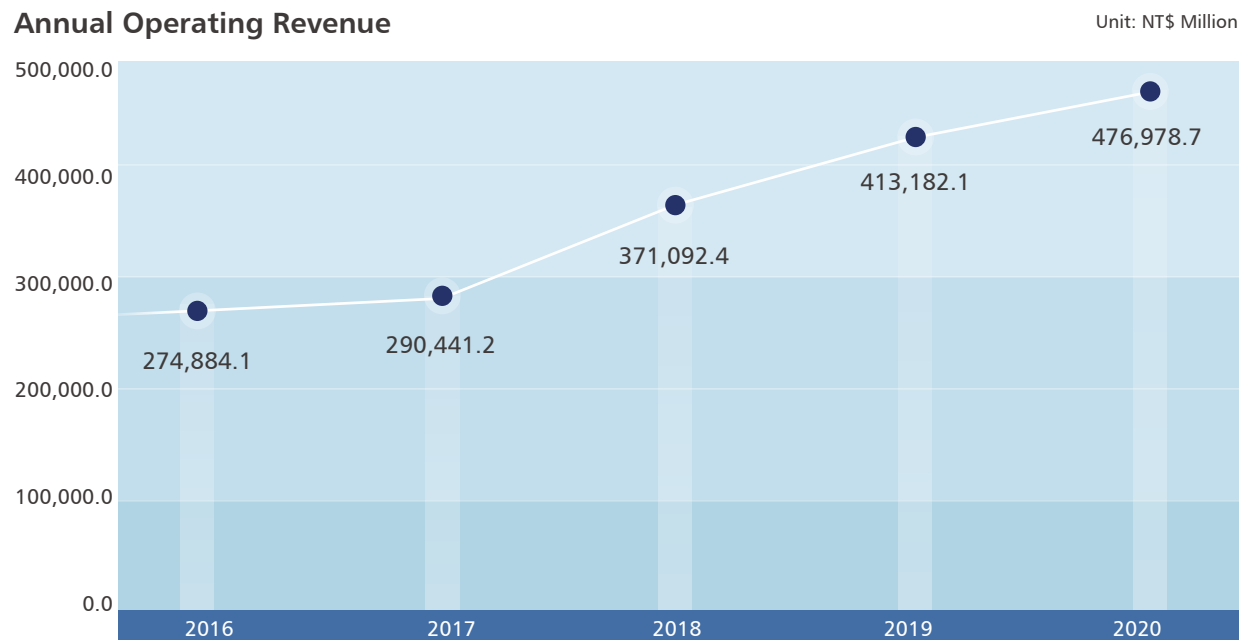
Our value creation model consists of three strategies - Integrate, Expand, Innovate. The model enables ASEH to respond to future challenges and more importantly, it forms the basis of ASEH's foundation in integrating sustainability into our business strategy.



1.3 Financial Performance¹

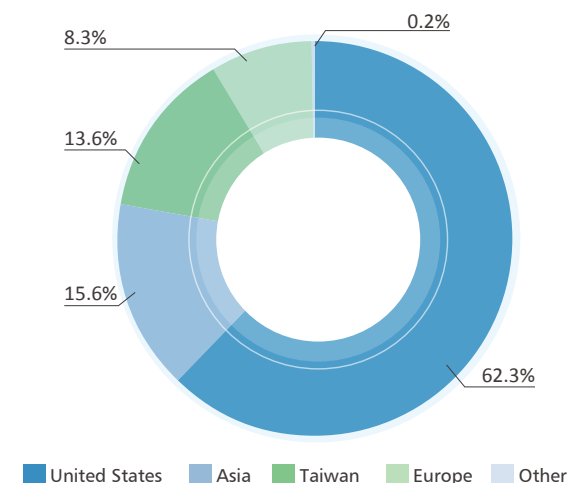
ASEH's consolidated revenue in 2020 amounted to NT\$477 billion, an increase of approximately \$63.8 billion over 2019, with an annual growth of 15.4%. In terms of the semiconductor packaging and testing business (excluding substrate, inter-segment and real estate revenue), the consolidated revenue in 2020 was approximately NT\$265.9 billion, increasing \$24.4 billion over 2019, with an annual growth of 10.1%. In addition, as of the Electronic Manufacturing Services (EMS), the consolidated revenue in 2020 reached NT\$204.7 billion, an increase of approximately \$38.9 billion over 2019, with an annual growth of about 23.5%. It was a commendable achievement that our overall financials grown significantly as compared with 2019, especially under the circumstance of restriction on the exports and the large fluctuations in exchange rates.

Annual Operating Revenue



2020 Revenue

We categorize our operating revenues geographically based on the headquarters in which customers are located.



¹ For further details on financial performance, please refer to our consolidated financial report: https://ir.aseglobal.com/html/ir_financial.php



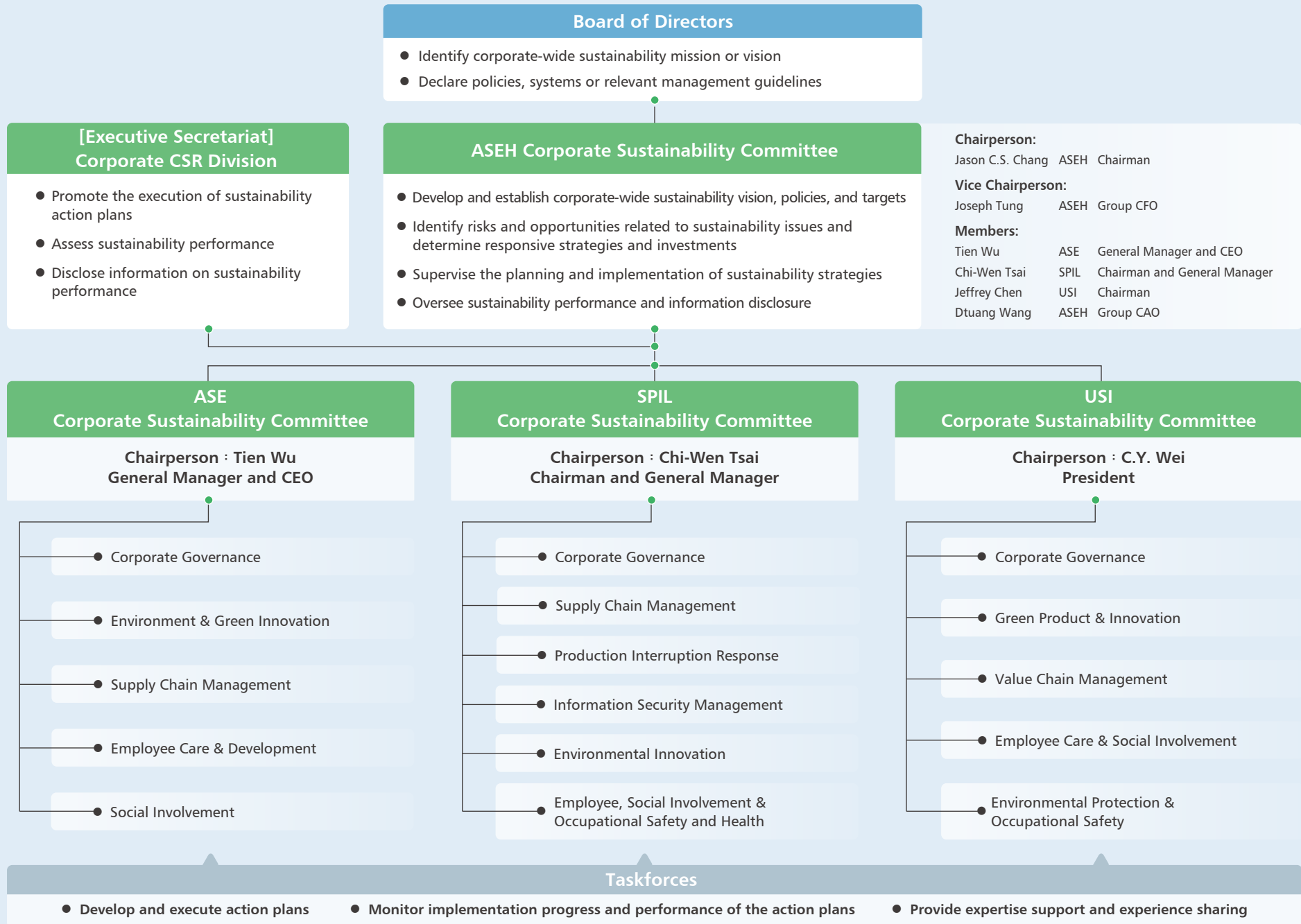
2 SUSTAINABLE GOVERNANCE

2.1 Organization and Structure

The Corporate Sustainability Committee (CSC) was formed by the company to serve as the highest level of authority in the planning and supervision of sustainability-related strategies, and facilitating the accomplishment of sustainability management policies and goals of the 3 key member companies of ASEH. The CSC comprises ASEH's directors and top management executives and is headed by the chairman of ASEH, who oversees the committee's performance and reports the progress to the board of directors. While the management continues to set the company on a growth trajectory, it remains equally focused on creating positive social and environmental impacts.

The Corporate CSR Division was established to serve as the executive secretariat of the CSC. The Corporate CSR Division supports the resource integration and site expertise across all 3 member companies to formulate top-down and horizontal promotional strategies. At the same time, each member company - ASE, SPIL and USI, has a Corporate Sustainability Committee established at the corporate level with multiple taskforces. The committee, headed by a senior level executive, is tasked with identifying key issues for discussion, annual presentation of performance and results, and reviewing the progress of meeting various short, medium and long-term sustainability objectives.

In the 2020 CSC annual meeting, the CSC formulated short, medium and long-term goals that helps the company better respond to the evolving industry landscape and global developments in sustainability trends. For more information, please refer to the relevant chapters.



2020 Key Sustainability Projects

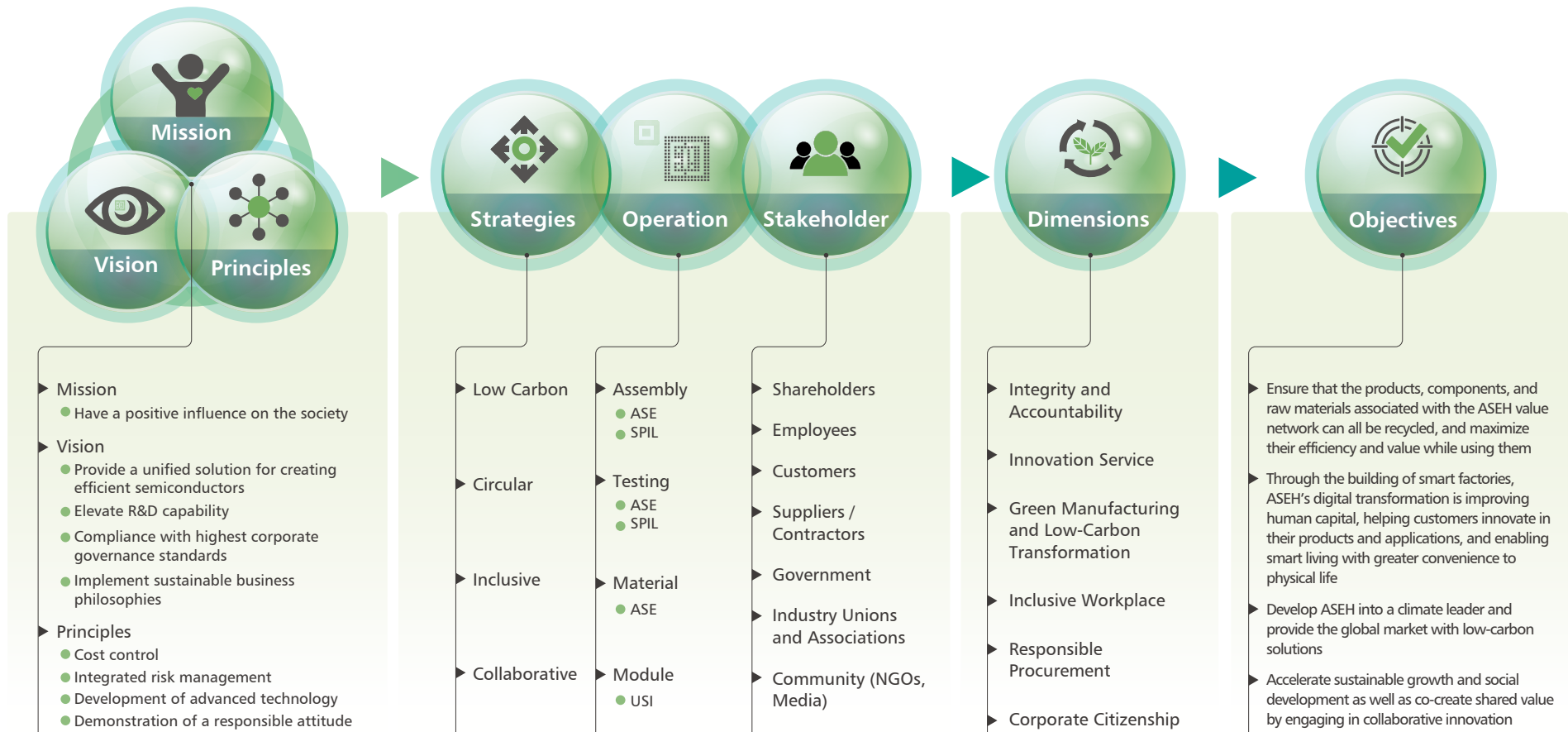
Dimensions	2020 Key Projects	Partners	Positive Changes
Environmental	Deploying or Procuring Renewable Energy	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Energy Transformation • Mitigation of Extreme Climate Change
	Promoting a Circular Economy within Our Value Chain	<ul style="list-style-type: none"> • Academic and Research Institutions • External Professional Institutions • Suppliers 	<ul style="list-style-type: none"> • Reducing Waste Production • Increasing the Circular of Energy Resource and the Eco-Efficiency of Manufacturing Processes
	Expanding the Scope of Implementation of Innovative Technologies	<ul style="list-style-type: none"> • External Consultants • Academic and Research Institutions 	<ul style="list-style-type: none"> • Improving the Positive Impact of Value Chain Activities
Social	Establishing a Social Investment Performance Evaluation System	<ul style="list-style-type: none"> • External Consultants • Academic and Research Institutions 	<ul style="list-style-type: none"> • Perfecting Social and Charitable Performance Evaluations
	'Blessed and Joyful Learning' Holistic Health Care and Education Program (for Senior Citizens)	<ul style="list-style-type: none"> • Academic and Research Institutions 	<ul style="list-style-type: none"> • Development of Local Communities
	ASE Happy Learning Summer Camp	<ul style="list-style-type: none"> • Academic and Research Institutions 	<ul style="list-style-type: none"> • Assisting Educational Development in Rural Areas
	Shanlin Junior High School Smart Microgrid Installation Project	<ul style="list-style-type: none"> • External Professional Institutions • Academic and Research Institutions 	<ul style="list-style-type: none"> • Assisting the Development of Local Communities and Environmental Sustainability in Rural Areas
	Key Talent Retention Management Mechanism	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Strengthen Employee Recruitment and Retention
	Human Rights Strategies and Risk Assessment	<ul style="list-style-type: none"> • External Consultants 	<ul style="list-style-type: none"> • Fortifying Human Rights Management
Governance	ASEH Supplier Sustainability Awards	<ul style="list-style-type: none"> • External Consultants • Auditing Organizations • Suppliers • External Experts and Scholars 	<ul style="list-style-type: none"> • Promoting Sustainable Collaboration and Cultivating Sustainable Suppliers
	Conflict Minerals Management	<ul style="list-style-type: none"> • External Auditing Organizations • Authorities 	<ul style="list-style-type: none"> • Implementing Conflict-Free Sourcing
	Corporate Governance Evaluation System	<ul style="list-style-type: none"> • Authorities 	<ul style="list-style-type: none"> • Enhancement of Corporate Governance Mechanisms
	Performance Evaluations for the Board of Directors and Its Subordinate Functional Committees	<ul style="list-style-type: none"> • Authorities 	<ul style="list-style-type: none"> • Enhancing the Functions of the Board of Directors
	Information Security Management	<ul style="list-style-type: none"> • External Consultants • External Professional Institutions • Suppliers 	<ul style="list-style-type: none"> • Improving Information Security Capacity • Minimizing Operating Risks

Sustainable Management Framework

We have established our sustainable management framework in accordance with our Corporate Social Responsibility Best Practice Principles and Corporate Sustainability and Citizenship Policy. We have also identified sustainable development opportunities through risk identification and close collaboration with our partners and stakeholders. ASEH works with external parties to implement its goals and targets in sustainable development, strengthen the company's business decision-making process, and create a sustainable business model.

ASEH Sustainable Management Framework

Corporate Social Responsibility Best Practice Principles
 Corporate Sustainability and Citizenship Policy



Enriching and Promoting Sustainable Culture

While we continue to strengthen our competitive position, we are also actively fulfilling our corporate social responsibility through multi-faceted sustainability programs. The spirit of CSR is firmly embedded into our corporate culture and forms a significant part of our employees' everyday lives. We connect with external stakeholders to form an ever-expanding virtuous cycle that helps our business partners understand the culture of sustainability at ASEH. We have set a 30-year time frame to advance our sustainability development and continually examine the innovativeness of our plans throughout the process. The core values of ASEH's social responsibility are predicated upon these integrated efforts that achieve maximum synergy and keep pace with the times.



2020 Activities to Cultivate Sustainable Culture at ASEH

Dimensions	Activities	Impact of Cultivating Culture
Environmental	<p>In 2020, we adopted approximately 18 hectares of public land to promote forest and environmental resource restoration. ASEH continues to collaborate with academic institutions on various research projects in water, waste, air and noise pollution, as well as advocate innovation and smart transformation. Our actions in environmental protection have created a positive impact to our business growth.</p>	<ul style="list-style-type: none"> ● Ecological Conservation ● Environmental Technology Development ● Talent Development
Social	<p>Since 2019, we have been organizing the 'Blessed and Joyful Learning' holistic health care and education program for seniors residing in the vicinity of ASE Chungli and USI facilities in Taiwan. The program has attracted about 240 participants. Moreover, to provide students living in rural areas with diversified learning opportunities, we have organized a series of educational programs under the 'ASE Happy Learning Summer Camp' in Kaohsiung. Students and teachers toured the ASE Green Technology Educational Center to learn about water resources and recycling. During the summer holidays, we expanded our activities to include courses such as English, broadcast and media training, science and creativity to enrich students' experience in various domains.</p>	<ul style="list-style-type: none"> ● Elevating Life Quality of Senior Citizens ● Narrowing Education Gap between Cities and Rural Areas
Economic	<p>On a regular basis, we conduct supply chain meetings on sustainability at our major operating locations where we evaluate our suppliers' SDGs performance. We have also created the ASEH Supplier Sustainability Awards to raise the standards of our suppliers in sustainability development and build sustainable partnerships. Through collaborative programs and co-funding incentives, ASEH aims to strengthen supplier partnerships and promote a low-carbon and circular economy.</p>	<ul style="list-style-type: none"> ● Enhancing Perception of SDGs ● Reducing Social Cost of Carbon



ASEH CSC Annual Meeting



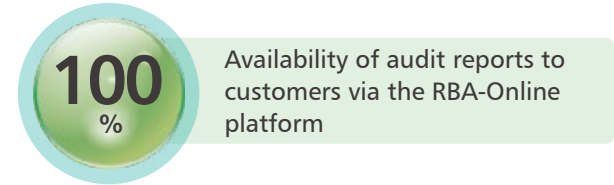
ASE CSC Annual Meeting



USI Senior Managers Sustainability Forum

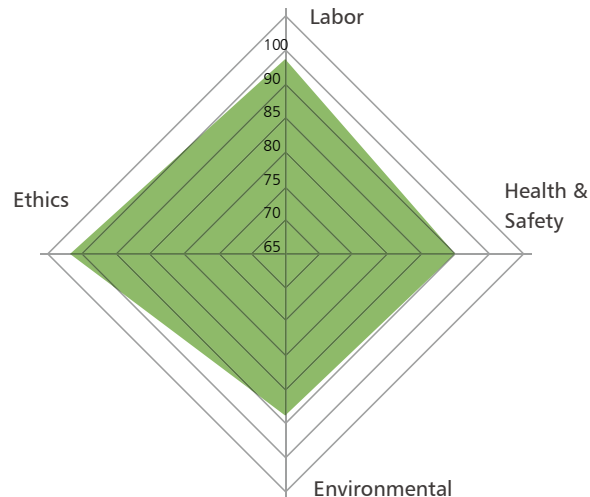
As a global leader in semiconductor packaging and testing, and system integration, ASEH is committed to environmental protection and compliance to the highest ethical standards. We shall maintain a safe working environment that ensures respect and dignity for all employees at the company and along the supply chain. ASEH takes the initiative to join the Responsible Business Alliance (RBA) as a member. We require all the manufacturing facilities of our subsidiaries to complete the annual RBA self-assessment questionnaire¹ (SAQ) in order to identify any potential labor, environmental or ethical risks in their operations. In parallel, ASEH adopted the RBA Validated Assessment Program (VAP) to audit the environmental and social aspects of sustainable management at these facilities, including the implementation of management systems and their performance. In 2017, we mandated that all ASEH manufacturing facilities worldwide need to implement the RBA VAP. Audits of these facilities conducted by independent third-party auditors serve as the basis for future improvements and effectively reduce operational risks.

Our global locations include Taiwan, China, Japan, South Korea, Singapore, Malaysia, the United States and Mexico. As of 2020, 24 of our facilities have received the RBA VAP certification, and the audit reports are available to customers via the "RBA-Online" platform. In addition, all of our facilities around the world conduct the RBA Self-Assessment Questionnaire (SAQ) on an annual basis, with an average score of 90 and above. The adoption of RBA standards at all our facilities is a key driving force for promoting sustainability management.

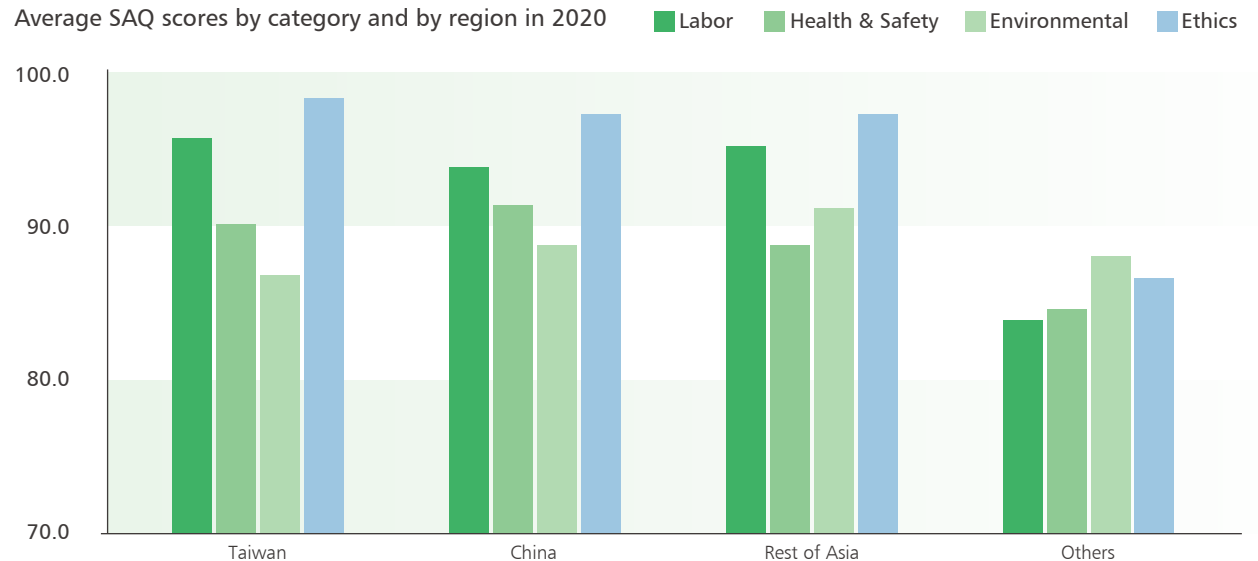


2020 RBA Facility SAQ

Average SAQ scores by category in 2020



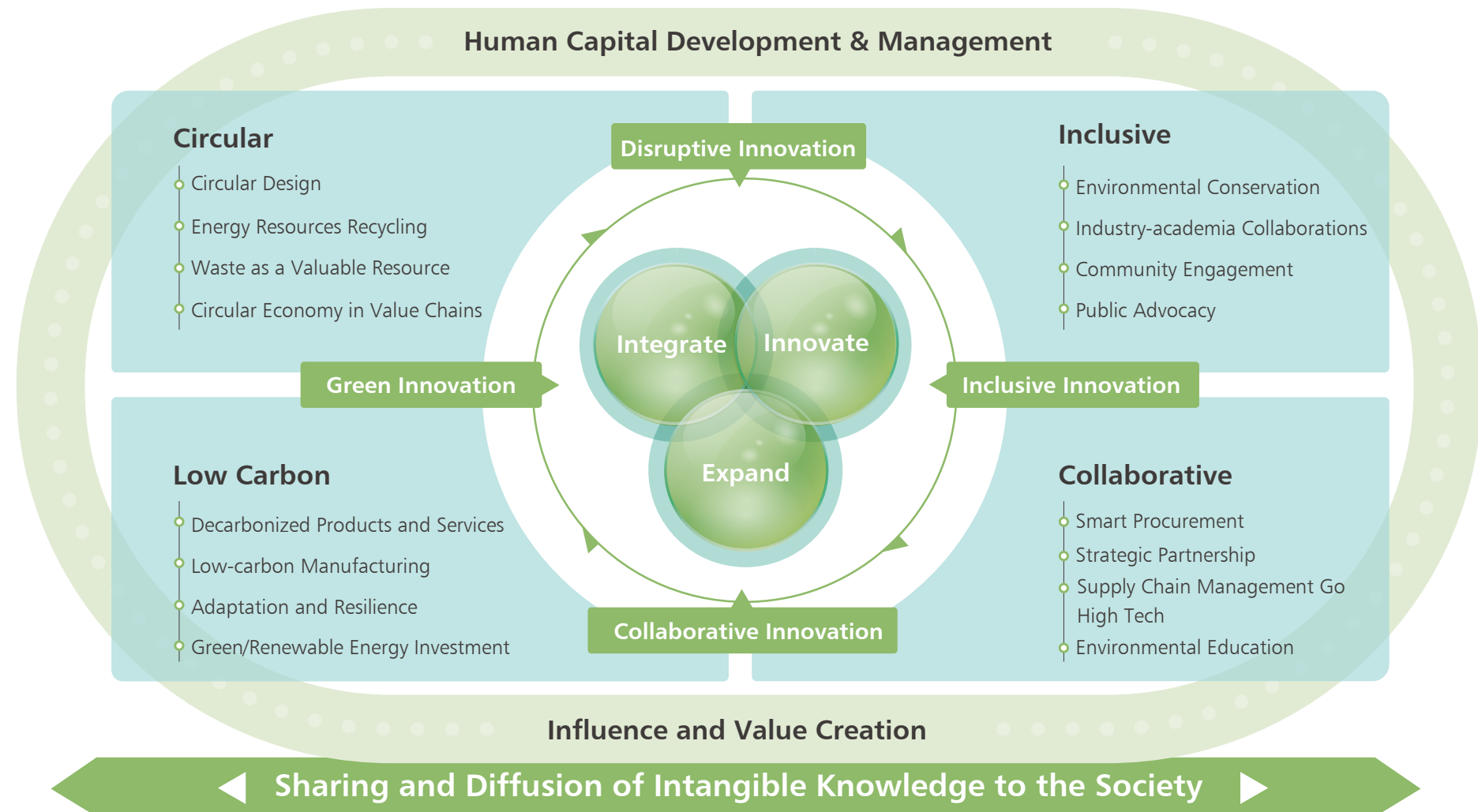
Average SAQ scores by category and by region in 2020



¹ ISE Labs China is expected to join the RBA SAQ assessment in 2021.

2.2 Sustainability Strategies

Strategy-setting is the key to achieving long-term sustainability targets that tackle global climate challenges, uncertainties in the energy supply, and risks related to supply shortages of water, raw materials and other resources faced by businesses. To that end, ASEH has established four strategic sustainability pillars: Low Carbon, Circular, Inclusive and Collaborative, to help identify opportunities and growth drivers. We are committed to the creation of sustainable value and, to extending our strategic influence through external stakeholder communication and joint efforts with various interest groups to achieve a virtuous cycle of sustainability.





Sustainability Vision

In our annual CSC Meeting, we review the achievement rates of our sustainability goals, and disclose the progress toward goals and the status of projects, providing visibility to employees, partners, customers and the general public. In 2020, we established our long-term sustainability targets for 2025 based on major sustainability topics and their relative importance to our business operations. These targets serve to strengthen the correlation between the SDGs and our sustainability strategies, leading to the ultimate fulfillment of ASEH's commitment to corporate social responsibility.

Strategic Approach and Goals of Key Issues



On Schedule








Room for Improvement

Dimensions	Key Issues	Business Impact on ASEH	Strategic Approach	2025 Target	Progress/Status
Integrity and Accountability	Regulatory Compliance	Ensuring corporate compliance with all applicable laws is an important aspect of sustainability management. Operational and financial risks can be mitigated through a robust system of preventive measures.	Implementing effective regulatory compliance system: Strengthen the process for identification of regulatory requirements and reinforcing education to increase employee awareness of regulatory requirements.	<ul style="list-style-type: none"> Cases involving violations by ASEH: 0 Major cases involving violations by ASEH subsidiaries: 0 	
	Business Ethics	Establishing norms of business conduct and ethics, and creating an honest and responsible culture are key to our long-term business success.	Implement business conduct and ethics-related policies and regulations: Continue to promote education and training, commit to comply with ethical standards in all ASEH business activities, and ensure the effectiveness of reporting systems by audit.	<ul style="list-style-type: none"> Employee training coverage: 100% Subsidiary roll-out coverage: 100% 	
	Information Security Management	Ensure the confidentiality, integrity and reliability of the company's information assets and compliance with relevant laws and regulations in order to further gain customers' trust, elevate the company's competitive advantage and ensure the stability of sustainable business operations	Enhance information security governance: Identify internal and external information security management risks, prevent or mitigate the business impact of information security incidents, provide regular employee education and training, and raise employee awareness to improve the security of business operations.	<ul style="list-style-type: none"> Major information security incidents: 0 NIST CSF information security maturity assessment coverage rate: 100% Percentage of employees receiving information security education and training: 100% 	
Innovation Service	Innovation Management and Sustainable Manufacturing	Continuous innovation of technologies lower costs, improve efficiency, thereby reducing resource consumption and energy consumption. In addition, business model innovation on the value chain can increase ASEH's core competitiveness and enable expansion capacity.	<ul style="list-style-type: none"> Set up a patent reward program to encourage patent applications, that will strengthen the company's operations and IP portfolio. Establish patent applications as the Key Performance Indicator of the Annual Objective Deployment (AOD). 	<ul style="list-style-type: none"> 9,000 patents granted¹ 	
	Customer Relationship Management	Good customer relationship management helps to improve our customers' satisfaction and loyalty, thereby increasing our profit and core competitiveness.	Continuously enhance customer communication: Providing diverse communications channels to enable instant interaction and communication with customers; enhance information security management to ensure the confidentiality and integrity of customer proprietary information.	<ul style="list-style-type: none"> Customer satisfaction: 90% 	

¹ The number of approved patents includes the number of abandoned patents and expired patents.



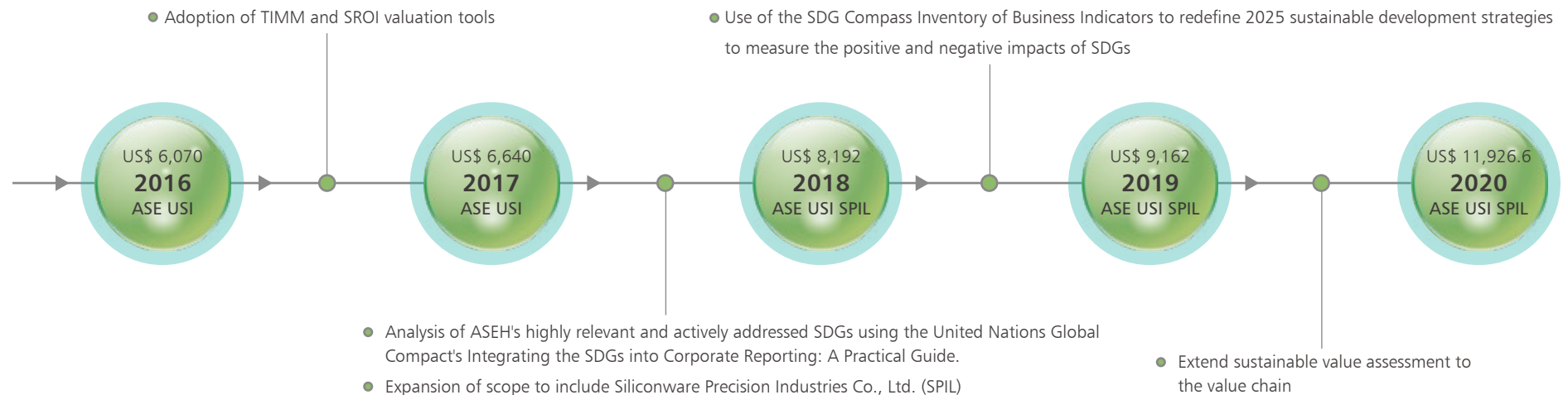
Dimensions	Key Issues	Business Impact on ASEH	Strategic Approach	2025 Target	Progress/Status
Green Manufacturing and Low-carbon Transformation	Energy Management	Having an effective energy management system helps to increase our energy efficiency and lower our energy costs, thereby reducing our energy consumption and GHG emissions.	Continue to improve energy management: Establish standardized management systems through ISO 50001, improve energy efficiency through PDCA improvement method, and build smart energy management systems to facilitate precise control and lower standby mode energy consumption.	<ul style="list-style-type: none"> Adopting an energy saving plan to decrease annual power consumption by more than 2%. Renewable energy to account for 27% of total energy consumption by 2025. 	
	Climate Change	Climate change is now regarded as the major global environmental issue. As ASEH continues to expand, the company becomes increasingly energy-dependent and faces growing pressure from customers, government and other stakeholders to shift to renewable energy.	Reduce GHG emissions & provide green manufacturing services: Green facilities (efficient building designs), energy conservation, efficient use of natural resource, adopting renewable energy (such as solar installations and green power purchases), and green product design.	<ul style="list-style-type: none"> GHG emissions inventory coverage of the manufacturing facilities: 100% GHG intensity (GHG emissions per revenue): achieve 10% reduction from 2015 to 2025. Commitment to net-zero emissions by 2030 for all ASEH offices and 2050 for all manufacturing facilities. 	
	Water Resource Management	Efficient management and use of water resources to alleviate local water stress, increase climate resilience and boost the company's competitive strength.	Establish sustainable water recycling system: Set up ASEH water management objective and strategy based upon integrated circular thinking.	<ul style="list-style-type: none"> Day(s) of production shutdown in Taiwan facilities due to phase 3 water rationing (30% volume reduction of water supply): 0 Water use intensity (water use per revenue): achieve 10% reduction from 2015 to 2025. 	
	Waste and Circular	Improving material utilization rate to reduce waste production and lessen the environmental impact of the company's operations.	Enhancing source reduction in waste management: Identify recyclable raw materials and moving towards minimizing waste through a circular model.	<ul style="list-style-type: none"> General waste recycling rate: >90% Hazardous waste intensity (hazardous waste generated per revenue): achieve 10% reduction from 2015 to 2025. 	
Inclusive Workplace	Talent Attraction and Retention	Good labor relations promote organizational harmony and improve organizational competitiveness.	Implement employee engagement survey and feedback mechanisms: Encourage employees to actively participate in company activities, solicit for feedback using our employee engagement survey, and offer competitive compensation and benefit programs.	<ul style="list-style-type: none"> Deployment of employee engagement survey every 2 years: <ul style="list-style-type: none"> > Employee engagement: >85% > Survey response rate: >95% Overall turnover rate: <20% Female employee in top management positions: 15% 	

Dimensions	Key Issues	Business Impact on ASEH	Strategic Approach	2025 Target	Progress/Status
Inclusive Workplace	Talent Development	Good training and development programs help attract and retain talents, and create a pleasant working environment, thereby enhancing corporate productivity, strengthening innovation and enhancing profitability.	Enhance talent development and training effectiveness: Provide challenging and valuable professional career for employees by offering training and promotion opportunities within the company.	<ul style="list-style-type: none"> Percentage of management vacancies filled through internal promotion: >75% 	
	Human Rights	Upholding fundamental rights of employees as well as creating an environment that guarantees human rights are essential for a sustainable business.	Protection of human rights: Prohibition of forced labor, child labor, discrimination and harassment; ensuring rights of freedom of association and privacy; provision of reasonable working hours and appropriate compensation and benefits.	<ul style="list-style-type: none"> Major regulatory violations: 0 	
	Occupational Health and Safety	Having an advanced and proactive health and safety management system is conducive to reducing absenteeism and improving productivity and quality.	Continuously improve health and safety management system: Make all reasonable efforts to prevent accidents and promote health.	<ul style="list-style-type: none"> Disabling Frequency Rate (F.R.): <0.5 Disabling Severity Rate (S.R.): <9 Major injury and occupational disease: 0 case 	
Responsible Procurement	Sustainable Supply Chain	Establishing a sustainable supply chain is a win-win strategy that strengthens the protection of our suppliers' employees and assets and indirectly improves our competitiveness.	Ensure supply chain's sustainable development: Establish partnerships with our suppliers to ensure that they provide a safe working environment, their employees are respected and dignified, and their operations are ethical and environmentally friendly.	<ul style="list-style-type: none"> Signing of Code of Conduct Agreement and completion of sustainability risk self-assessment: <ul style="list-style-type: none"> > 100% for new suppliers. Completion of sustainability risk survey: <ul style="list-style-type: none"> > 100% for all first-tier suppliers. > Over 50% for non-first-tier suppliers. Completion of sustainability audits conducted: <ul style="list-style-type: none"> > 100 first-tier suppliers. > 100% for high-risk first-tier suppliers. 	
Corporate Citizenship	Social Involvement	Active community development through strategic charitable and educational programs, and social work helps to build positive and constructive relationships at the local level, strengthen our social license to operate and create a well-educated workforce for future recruitment.	Social involvement strategies: Environmental Conservation, Industry-academia Collaborations, Community Engagement and Public Advocacy.	<ul style="list-style-type: none"> Over 100 industry-academia collaboration projects on environmental technology. Organizing semiconductor courses for 500+ students. Over 1,500 disadvantaged students attending the after school program. Offering financial aid to 70,000+ school children from underprivileged families. Advocating 15+ semiconductor industry-related regulatory initiatives. 	

2.3 UN Sustainable Development Goals and Sustainable Values Assessment

ASEH is building upon its technology leadership to steer the semiconductor industry towards greater sustainability. Since 2017, we have adopted the Total Impact Measurement and Management (TIMM) framework and Social Return on Investment (SROI) analysis to assess the social impacts and operational risks of the company's business activities using monetary valuation tools. In 2018, we began referencing the United Nation's Integrating the SDGs into Corporate Reporting: A Practical Guide to map out sustainable development goals (SDG) and sub-targets that need to be actively addressed. In 2019, we used the SDG Compass Inventory of Business Indicators to examine the positive and negative impacts of our four major SDGs and the outcomes of our actions. In 2020, we applied sustainable value assessment used internally to the value chain so as to understand and analyze the impact of value chain activities on the environment and society. This information will then be provided to the CSC to serve as references for the performing of weighing and comparisons in the value creation decision-making process. By examining and analyzing the sustainability outcomes of actions by ASEH subsidiaries, we have been able to develop action plans and policies for improvements and reduce the impact of potential risks. As such, we are able to fulfill our vision of promoting the United Nations' 2030 SDGs via our own core competencies.

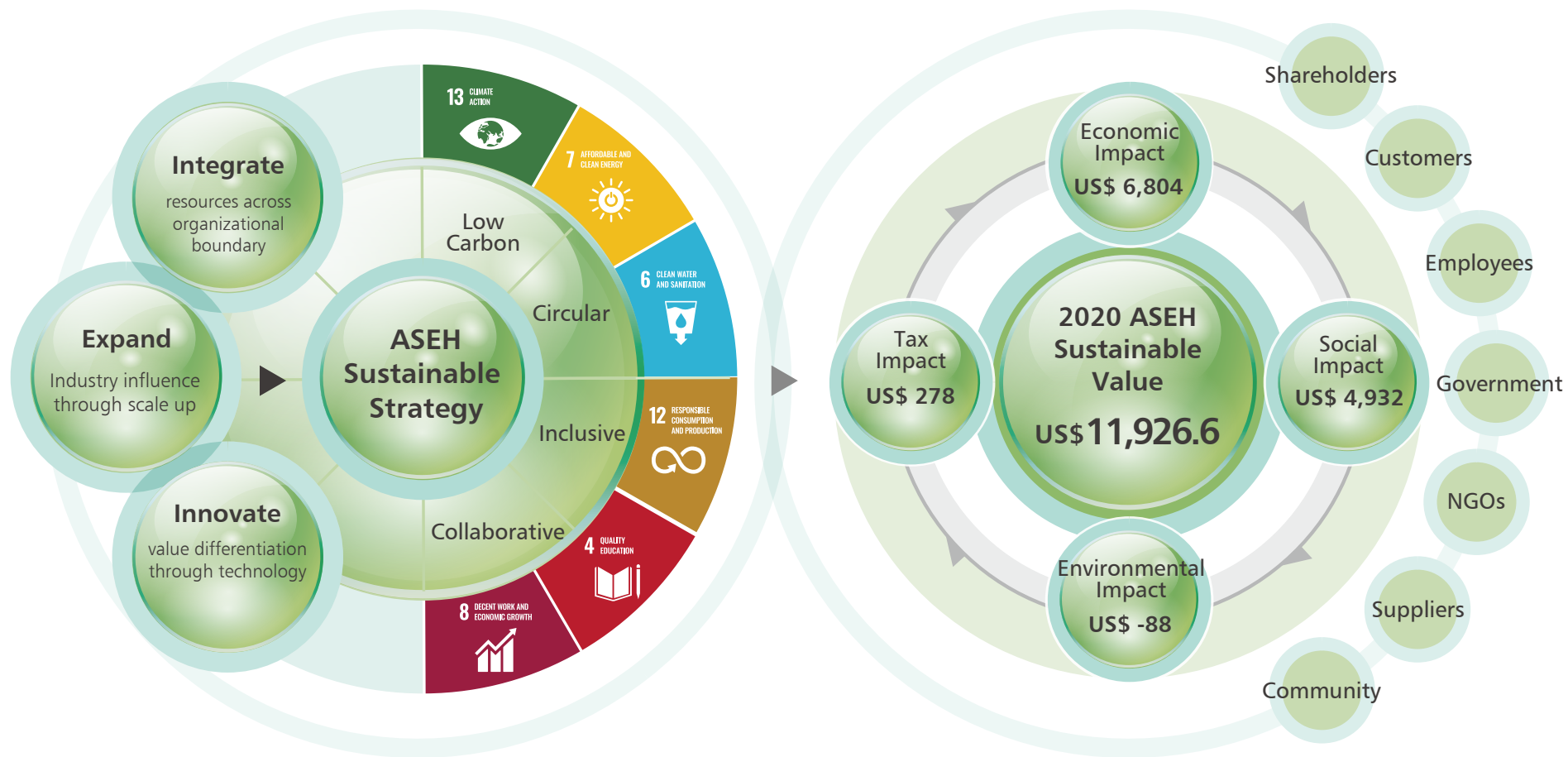
Major ASEH Valuation Milestones



Unit: US\$ million

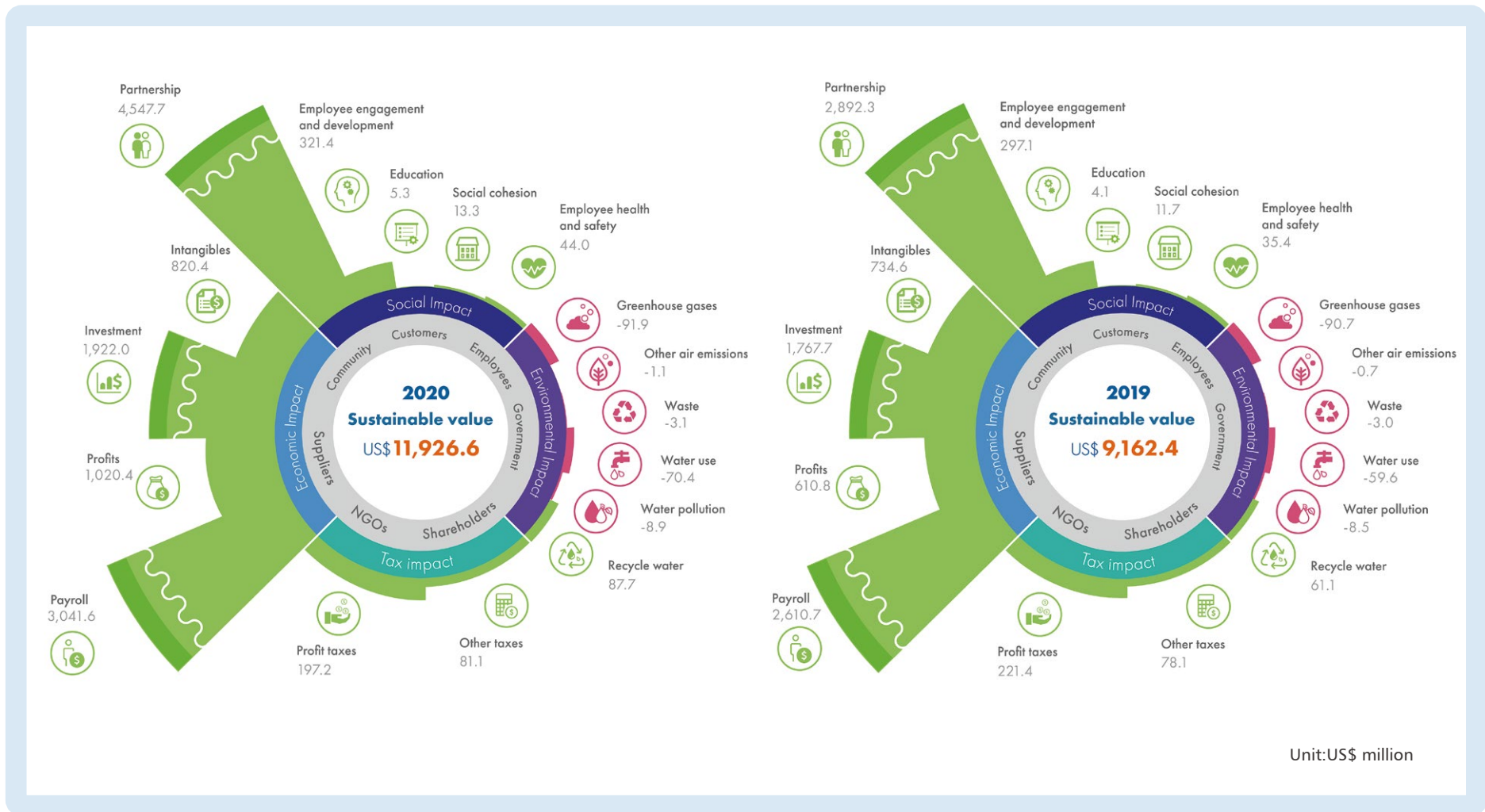


ASEH Valuation Model



Contributions to Global SDGs

In 2020, we adopted sustainability management measures for prioritized SDGs (decent work and economic growth, quality education, and responsible consumption and production) to generate more positive impacts and contributions. Our business activities help boost GDP and local economies while at the same time, our business returns are invested into employee benefits, social welfare and renewable energy to give back to society. Demands on environmental resources in our business operations can result in negative impacts on the SDGs of affordable and clean energy, responsible consumption and production, climate action, and decent work and economic growth. We have therefore committed ourselves to mitigating these impacts by focusing on sustainability programs through our Low Carbon and Circular strategies. In 2020, we are refining our goals for 2025 based on our four major sustainability strategies, so as to fulfill our commitment toward realizing these SDGs.



Sustainability Value and Impacts

ASEH adopted the TIMM framework for sustainability valuation to quantify the sustainable value of the company's impacts in the economic, tax, environmental and social dimensions. In 2020, ASEH generated US\$11,926.6 million worth of sustainable value for stakeholders, which is 30% higher than in 2019. The sustainable value of positive impacts increased by US\$2,764 million.

Economic and tax dimensions: The digital transformation triggered by the pandemic in 2020 made it possible for ASEH's operations to progress by a large margin and bring in substantial profits. The value created in 2020 increased by 18% due to revenue growth that has benefited from a stay-at-home economy and correspondingly brought about an increase in employee remuneration. There was also an increase in employee headcount and conversion of employee stock options. Our strategy is to continue investments in capital equipment and plant expansions to build up capacity,

and in R&D to acquire more patents. These investments maximize our organizational synergy and will allow us to capture future business opportunities as well as strengthen our competitiveness.

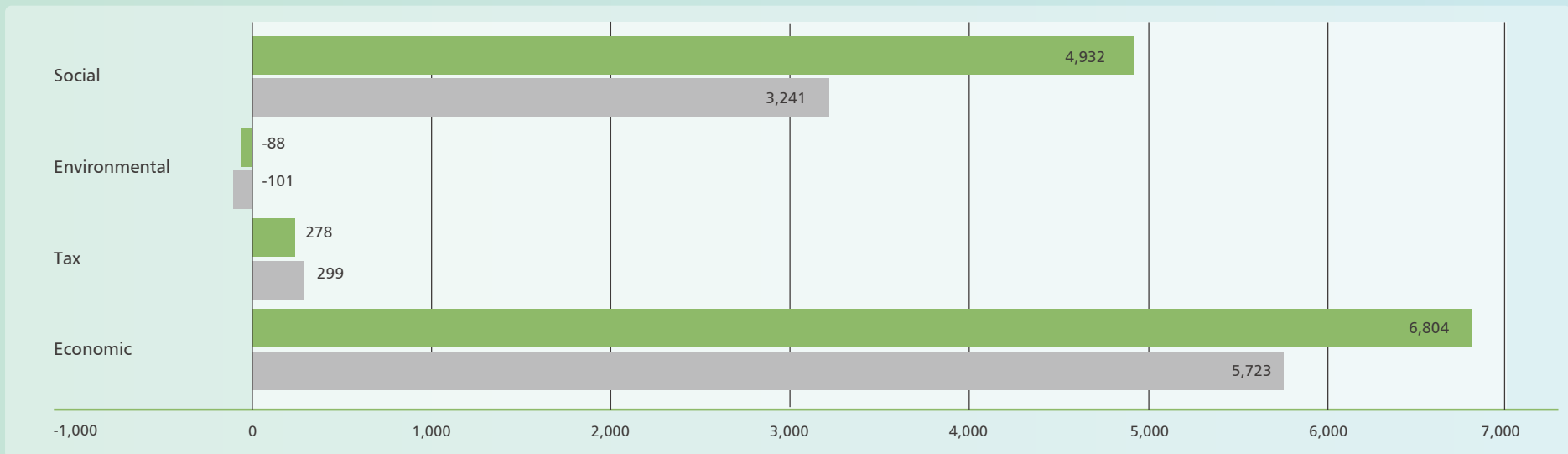
Environmental dimension: Since the two main sources of environmental impacts were water resource consumption during the production process and greenhouse gasses emitted from the use of electricity, we continued to increase our renewable energy usage, which reached 18% of the total electricity consumption in 2020. On the other hand, we adopted the three major strategies of reduction, reuse, and recycling in the consumption of water resources. Investments were made in every plant to improve water recycling, thereby reducing environmental impacts caused by water consumption and increasing economic benefits. In 2020, the positive effects created from recycled water usage grew by 44%, while the overall environmental impact of our operations decreased by 13% compared to 2019.

In the future, we will actively invest in environmental protection and fulfill our pledge to use the proceeds raised through our green bonds to construct green facilities and establish water recycling plants, water treatment plants, and a real-time waste water monitoring system that would mitigate environmental impacts and promote human health.

Social dimension: The primary outcomes are the establishment of supplier partnerships and, employee development and support. The value of social impacts in 2020 increased by 52% compared to 2019. The difference in value stemmed from an increase in local procurement by 57% in 2020, which increased the assessed value of local employment and economic prosperity. The total resources invested in community and education rose by 28% and 27% respectively in 2020 compared to the year prior. We have been participating in social welfare through various ways to improve the well-being of the community and the people and maintain environmental resources.

2019-2020 ASEH Sustainable Values

2020 2019 Unit: USD million



Environmental Impact

In 2020, ASEH's overall environmental impact of US\$-88 million is mainly attributed to resource consumption and environmental emissions from its business activities. We have paid close attention to the energy and resource efficiency of our facilities and put in place environmental programs to generate positive impacts and mitigate the external cost on the environment. Compared to 2019, the monetized value of the environment impact of our operations decreased by 13% in 2020. In particular, the positive impact of water recycling increased significantly. Meanwhile, emissions of greenhouse gasses, generation of hazardous and non-hazardous waste, and water pollution all increased slightly, while water resource consumption and air pollutant emissions remained significant sources of environmental impacts. For this reason, we continued to increase our green power usage, install air pollution control equipment, improve the utilization rate of water resources and material recycling so as to reduce our environmental footprint, expand the scope of our environmental impact management to reach our sustainable development goals of low-carbon emissions and recycling. This year, we will apply the sustainable value assessment method used internally to the value chain. In 2020, the monetized value of the environmental impact of our greenhouse gas emissions amounted to US\$-1,110 million. The main sources of impact included product and service procurement, upstream transportation and distribution, and external influence of capital goods.

Assessment of Environmental Impacts in 2020¹

Input

As we progress into the digital era with the help of technology, ASEH continues to play a leading role in pushing the envelope of semiconductor innovations. In 2020, overall capacity demand increased 20%, and our manufacturing operations are spread across 8 regions including Taiwan, China, Korea, Japan, Singapore, Malaysia, United States and Mexico. ASEH maintains 20² semiconductor assembly and test, and 6 electronic manufacturing facilities in these regions. The energy resource demands for our manufacturing operations are as follows:

Resource Demand	2019	2020	
Water resource consumption (megaliters)	24,177	24,961	↗
Non-renewable energy (MWh)	3,076,829	3,194,810	↗
Renewable energy (MWh)	512,067	706,105	↗
Environmental protection investments (US\$ million)	30	36.3	↗

Notes : ↘ decrease; ↗ increase

Output

Our operational coverage continued to expand in 2020 and so did our overall production capacity. This has led to a rise in our energy resource demand and proportionally increased the impact of some environmental indicators. We are continuing to increase investment in environmental protection, with a focus on the improvement of resource utilization efficiency and conversion rate. The emission intensity of volatile organic compounds per unit of revenue has been decreasing in the past four years, and the water intensity of per unit revenue is 16% lower than the previous year. The water recycling facilities at ASE Kaohsiung and ASE Chungli support their water resource demands and help to reduce wastewater by 70%. The environmental impact of our operations is as follows:

Impact items	2019	2020	
Greenhouse Gas Emissions ³	Scope 1 emissions (tCO ₂ e)	98,880	93,996 ↘
	Scope 2 emissions (tCO ₂ e)	1,695,223	1,658,606 ↘
	Scope 3 emissions (tCO ₂ e)	--	21,179,759 --
Air Pollutant Emissions ⁴	Volatile organic compound, sulfur oxide, nitrogen oxide and particulate matter emissions (tons)	255	279 ↗
	Waste Disposal	Hazardous Waste Disposal (tons)	11,850
Non-hazardous Waste Disposal (tons)		3,098	2,884 ↘
Wastewater Discharge ⁵	Wastewater Discharge (megaliters)	18,778	19,454 ↗

¹ For more information on ASEH's sustainable values, please refer to ASEH's Total Impact Measurement and Management Report 2020.

² ISE Labs China was included in the 2020 scope of coverage for ASEH's manufacturing operations.

³ In 2019, Scope 3 greenhouse gas emissions have not been fully verified and therefore not measured in monetary values. In 2020, it was fully included in the inventory and measured in monetary values.

⁴ In 2019 we reported air pollutant emissions based on declaration value. In 2020, we reported actual value of air pollutant emissions.

⁵ Waste water pollutants include phenols, oils (extracted with n-hexane), cadmium, lead, total chromium, hexavalent chromium, copper, zinc, nickel, arsenic, silver and orthophosphate.

External Impact

Unit: US\$ thousand

Environmental Impact		2019	2020	
Greenhouse gas emissions	ASEH operations	-90,697	-91,864	↘
	Products and services	--	-1,110,158	--
Air pollution		-750	-1,097	↘
Waste		-3,038	-3,098	↘
Water resource consumption		-59,560	-70,443	↘
Water pollution		-8,454	-8,897	↘
Water recycling		61,076	87,657	↗

Notes : ↘ decrease; ↗ increase

- ASEH's overall environmental impact totaled US\$-88 million. Assessed external impacts include employee and public health, property damage, financial losses, impacts to ecosystems, and natural capital losses and other impact pathways. The major SDGs affected by negative external impacts are SDG 6 clean water and sanitation, SDG 7 affordable and clean energy, SDG 12 responsible consumption and production, and SDG 13 climate action.
- The overall positive environmental impact totaled US\$87.7 million, which is 43% higher than that of 2019. Major corrective actions taken included the use of pollution prevention and control technologies to mitigate impacts due to waste water discharge. The adoption of a water recycling management system for our manufacturing processes resulted in the recycling of a total of 34,438 megaliters of waste water. These measures resulted in positive contributions to the SDG 6 clean water and sanitation and SDG 12 responsible consumption and production.
- The value of the negative impact on the environment amounted to US\$175.4 million, an increase of 8% compared to 2019, mainly due to the addition of new plants and an increase in production capacity.
- ASEH's major policy initiative to invest in sustainable energy resulted in a 38% increase in sustainable energy purchases compared to 2019, which resulted in a positive contribution of US\$28 million.
- The monetized value of the indirect environmental impact of value chain greenhouse gas emissions amounted to US\$-1,110 million. The main sources of impact included product and service procurement, upstream transportation and distribution, and external influence of capital goods, in response to which we used the strategies of purchasing low-carbon raw materials and equipment, building low-carbon factories, and adopting green transportation to reduce impacts.

Social Impact

Social impact assessment allows ASEH to manage the sustainability values generated in areas including supplier partnerships, employee engagement and development, employee health and safety, and education and community cohesion. In 2020, ASEH's overall social impact totaled US\$4,932 million, with US\$4,916 million directly resulting from the company's operations¹. The value is mainly attributable to supplier partnerships and human capital development and support, and has resulted in positive impacts on quality education, decent work and economic growth, and responsible consumption and production.

Assessment of social impacts in 2020

Input	Output	External Impact
<p>Direct operations: Inputs directly related to the operations of ASEH and its subsidiaries include:</p> <ul style="list-style-type: none"> • Organization of educational training for suppliers to enhance suppliers' capabilities • Sustainability audits of 103 raw materials suppliers² • Procurement of 48% of raw materials from local suppliers³ • Comprehensive employee engagement survey • Regular risk assessment and continuous improvement of occupational health and safety • Investment of approximately US\$4 million in employee health checkups • Investment of approximately US\$2 million in industry-academia occupational training 	<p>Supplier partnerships:</p> <ul style="list-style-type: none"> • Supplier audit results showed that 38% were related to labor, 37% of nonconformities were related to occupational health and safety, 12% were related to management systems, 10% were related to environment, and 3% were related to ethics • 181 suppliers participated in supplier educational training <p>Employee engagement and development:</p> <ul style="list-style-type: none"> • Employee engagement surveys showed an engagement rate of 83% with a response rate of 82% <p>Employee health and safety:</p> <ul style="list-style-type: none"> • 112 occupational injuries to employees and supplier • 55,094 employees participated in health checkups <p>Education:</p> <ul style="list-style-type: none"> • Conducted a total of 92 industry-academia projects on innovative semiconductor research and development 	<p>Social impact resulting directly from operations totaled US\$4,916 million. Substantial outcomes include:</p> <ul style="list-style-type: none"> • Supplier partnerships: We used the cost approach valuation and contingent valuation methods to assess that the value generated totaled US\$4,548 million. Over 90% of our suppliers have shown improved competitiveness and business expansion through educational training. • Employee engagement and development: Survey results showed that investment in human capital builds a sense of achievement and belonging in the workforce and improves employee competitiveness and management capabilities. Based on the degree of these outcomes, it was estimated that the social value generated was US\$321 million. • Employee health and safety: We used the cost approach valuation to assess the positive and negative impacts of healthier work environments and occupational injury incidents. Positive impacts included the increased chance of disease recovery and reduced financial stress from medical costs due to employee health checkups, which were assessed at a value of US\$44 million. Negative impacts included harm to employees' physical, mental, and spiritual well-being to occupational injury incidents, which were assessed at a negative value US\$400,000. • Education: We used the value transfer method to assess the social value of industry-academia occupational training related to business activities, which totaled US\$3 million. The major outcome was the increased operational efficiency achieved by the acquisition of technological advantages and industry talent through the various R&D projects and teaching programs conducted via industry-academia collaborations with multiple colleges and universities.
<p>Indirect operations:</p> <ul style="list-style-type: none"> • To promote social cohesion, ASEH and its subsidiaries organized public welfare activities and invested a total of approximately US\$3 million in seven categories: community development, community care, care for disadvantaged families, healthcare sponsorships, arts and culture sponsorships, sports sponsorships, and reforestation. • Investment of US\$1 million in education, including environmental education. Investment of US\$0.1 million in other education 	<ul style="list-style-type: none"> • A total of 240 outputs in social cohesion activities, including 13 in public development, 126 in community care, 60 in care for disadvantaged families, 4 in healthcare sponsorships, 24 in arts and culture sponsorships, 11 in sports sponsorships, and 2 in reforestation • A total of 31 outputs in education, including 21 in environmental education and 10 in other categories 	<ul style="list-style-type: none"> • We used the value transfer method to assess the social value of public welfare activities that promote social cohesion, which totaled US\$13 million. Of these activities, arts and culture sponsorships accounted for the largest percentage at 25%, and care for disadvantaged families accounts for 22%. The third is the reforestation, which accounts for 19%. The three major outcomes promotion of improvement of local water quality through environmental protection, artistic literacy among the general public and improved efficiency of local community resource have improved the well-being of the residents of local communities. • We used the value transfer method to assess the social value of environmental education, which was estimated to be US\$3 million. The major outcome was improved environmental awareness in the general public and their ability to incorporate eco-friendly actions and behavior into everyday activities.

¹ The value of social impacts resulting directly from the company's operations is calculated by monetizing social impacts. The calculations therefore excluded public welfare activities and non-industry-academia educational projects.

² Please refer to Chapter 7.3 of this report (Supply Chain Sustainability Management)

³ Please refer to Chapter 7.1 of this report (Supply Chain Overview)

2.4 Materiality Assessment and Stakeholder Communication

Materiality Assessment

ASEH adopts GRI Standards, AA 1000 Stakeholder Engagement Standard (SES) and AA1000 AccountAbility Principles as the benchmark for developing the materiality analyses framework, and identifies major sustainability issues. In addition to applying these principles to compile non-financial reports, they are also used as a basis for ASEH to formulate long-term sustainability objectives and strategies. For the 2020 Corporate Social Responsibility Report, we collected the feedback of 2,139 stakeholders to gain insight into their level of attention to our efforts in addressing sustainability issues. To measure the effects that sustainability issues have on our company operations, our CEO led our senior executives and CSC members (totaling 81 members) in identifying the importance of each sustainability issue with regard to our company operations. We selected 15 major issues to be prioritized in driving corporate sustainability and setting long-term sustainability targets.

Step 1 Inclusiveness

To identify relevant and important issues, ASEH referenced international standards & regulations, sustainable investment ratings and industry peers as well as stakeholder communications. We collected and organized 17 issues that are related to ASEH's sustainability issues. Compared with the previous year, we added "Information Security Management" issue and changed "Innovation and R&D" to "Innovation Management and Sustainable Manufacturing."

6 Economic Issues

5 Environmental Issues

6 Social Issues

- International standards and regulations : GRI Standards, SASB, SDGs, RBA.
- Sustainability Investment Assessment : DJSI, CDP, MSCI ESG Index, FTSE4Good Emerging Index.
- Global semiconductor industry : Benchmarking sustainability policies and practices from semiconductor companies listed on the DJSI index.
- Stakeholder Engagement : Analysis of online media reports and regular/occasional stakeholder communication to evaluate stakeholders' perception on sustainability issues.

Step 2 Materiality

We follow guidelines from GRI Standards to rate the importance of issues based on the level of stakeholder concern and the effect on the operations of the organization. ASEH collects stakeholder concerns through its routine communication and the use of questionnaires. Senior management are empowered to determine the level of importance and relevance of these findings based on the respective impact to their organizations.

2,139 Stakeholders

The degree of concern from stakeholders is a key factor in determining the significance of a particular issue. ASEH has designed a questionnaire on sustainability that drew a total of 2,139 stakeholders' responses. Respondents include employees (1,257), customers (56), shareholders (18), suppliers/contractors (567), government (69), industry unions/associations (10), and community (NGOs, Media) (162).

81 CSC Members

Integrating ESG (environmental, social and governance) into the company's core operations is a key driver for ASEH's corporate sustainability. A 81-member team of senior management leaders and CSC members participate actively in evaluating the impact of each sustainability topic on the company's revenues, risks and customer satisfaction, and ranking the level of each topic's importance according to the impact.

Step 3 Responsiveness

According to our materiality analysis results, the use of GRI themes and indicators as a basis allowed us to determine our stakeholders' needs and disclosure preferences in regard to sustainability information. Additionally, we made efforts to enhance the transparency of sustainability issues (in relation to their policies, organization, practice, results and objectives, etc.) on different communication platforms (e.g., non-financial reports, annual reports, and websites).

15 Key Issues

The CSC initially identified 15 material issues that are of importance to stakeholders and of impact to the company's sustainable development. After further deliberation, the assessment ultimately yielded 15 issues of materiality that form the basis for the disclosures in the 2020 CSR report and formulating internal sustainable management goals.

21 Sub-topics

A further 21 sub-topics (19 GRI-specific and 2 ASEH-specific) for disclosures were derived from the 15 issues. Other topics of lower priority will also be concurrently disclosed in the report.

Step 4 Impact

Commitment is key to demonstrating influence in corporate sustainability. As such, we have set long-term sustainability goals, and are monitoring and measuring the completion rates of such goals at regular intervals.

37 Long-term Goals

To elevate the impact of corporate sustainability, we have made commitments to various major issues and formulated 37 long-term sustainability goals for 2025. In addition, we have promoted and implemented various projects at our factories worldwide year by year.

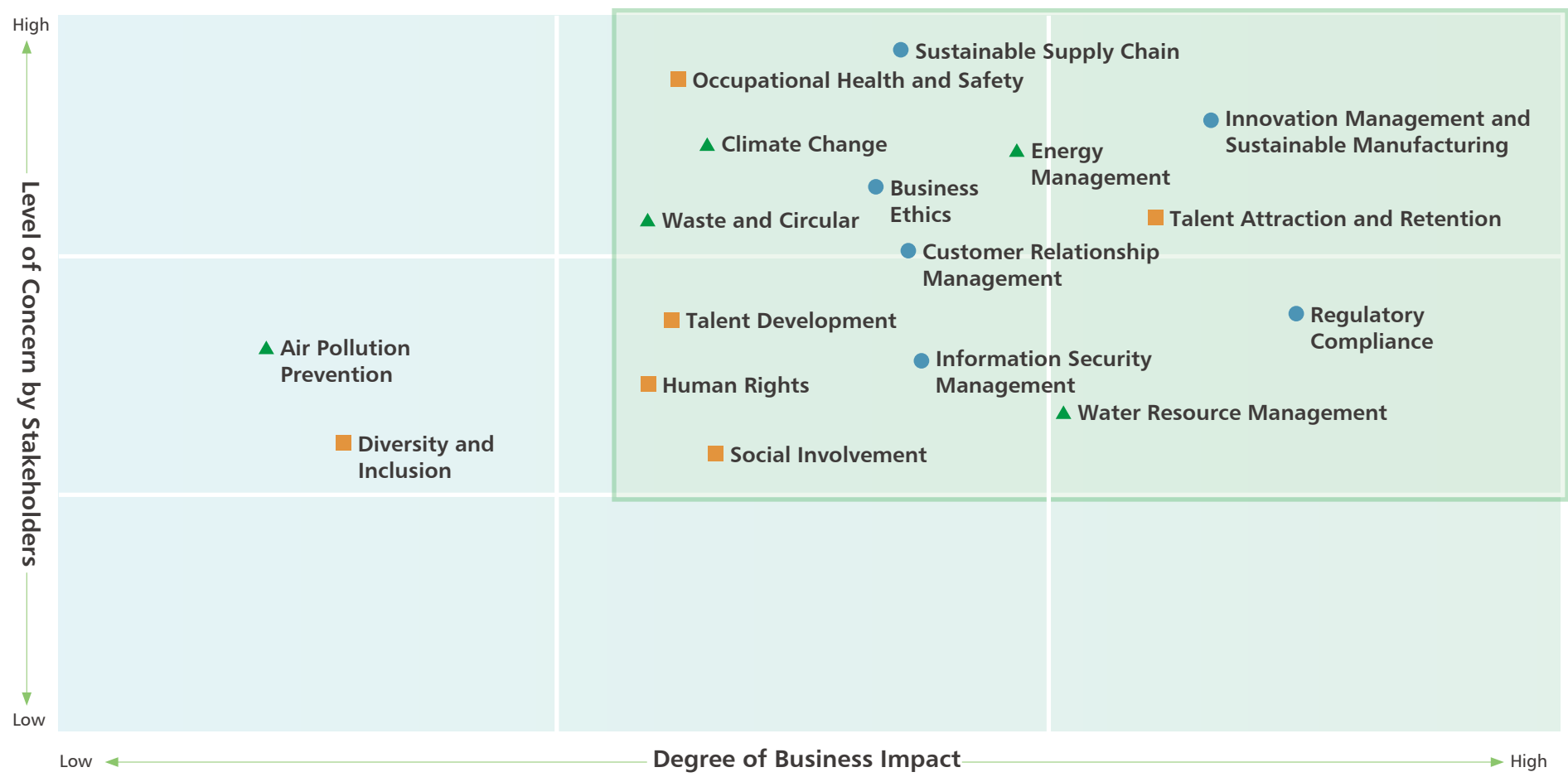
4 Committees

Every year, the CSC assesses the progress of goal completion via the reports presented by colleagues from relevant business units. On a regular basis, our three major subsidiaries hold internal CSCs to manage and track the progress and sustainability trends.



Results of Materiality Assessment

● Economic ▲ Environmental ■ Social



Material issue, GRI material topic and involvement with the impact

Material Issue Group	GRI Material Topic	Where the Impact Occurs			Our Involvement with the Impacts		
		Procurement	Manufacturing Facilities	Communities	Direct	Indirect	Business
Economic	Regulatory Compliance	Environmental Compliance, Socioeconomic Compliance	✓	✓		○	
	Innovation Management and Sustainable Manufacturing	Innovation Management and Sustainable Manufacturing ¹		✓		○	
	Business Ethics	Anti-corruption, Anti-competitive Behavior	✓	✓		○	
	Sustainable Supply Chain	Procurement Practices, Supplier Environmental Assessment, Supplier Social Assessment	✓				○
	Customer Relationship Management	Customer Privacy		✓			○
	Information Security Management	Information Security Management ¹		✓			
Environmental	Water Resource Management	Water, Effluents and Waste		✓		○	
	Energy Management	Energy		✓		○	
	Climate Change	Emissions		✓		○	
	Waste and Circular	Effluents and Waste		✓		○	
Social	Talent Attraction and Retention	Employment, Labor/Management Relations		✓		○	
	Talent Development	Training and Education		✓		○	
	Human Rights	Human Rights Assessment, Forced or Compulsory Labor, Supplier Social Assessment	✓	✓		○	○
	Occupational Health and Safety	Occupational Health and Safety		✓		○	
	Social Involvement	Local Community			✓		○

¹ Issues important to ASEH but not included under the GRI standards.

Stakeholder Communication

We define stakeholders as a group or an organization that can affect or be affected by ASEH. Based on the 5 major principles (dependency, responsibility, influence, diverse perspective, tension) of the AA1000 Stakeholder Engagement Standard (SES), we have identified 7 major categories of stakeholders. They are categorized into two groups based on whether the impact is direct or indirect. Our direct stakeholders include shareholders, employees, customers, and suppliers/contractors; our indirect stakeholders include community (NGOs, media), government, industry unions and associations.

We engage with our stakeholders through a variety of means, depending on the nature of the relationship. The methods of engagement will vary depending on the stakeholders, the issues of concern and the purpose of engagement. We regularly report the stakeholder communication status to the board of directors every year.

Stakeholder	Communication Mechanisms ¹	2020 Issues of Concerns ²	2020 Communication Key Outcome ³
Customers	<ul style="list-style-type: none"> Customer quarterly business review meeting Customer audits Customer service platform Technical forums 	<ul style="list-style-type: none"> Innovation Management and Sustainable Manufacturing Sustainable Supply Chain Business Ethics Customer Relationship Management Information Security Management 	<ul style="list-style-type: none"> Satisfied customer percentage is 94% in 2020, which exceeded our "90% satisfied customer" target.
Employees	<ul style="list-style-type: none"> GM and plant manager's mailbox Intranet web site, bulletin board and display wall Employee engagement survey Service and complaint hotline 	<ul style="list-style-type: none"> Occupational Health and Safety Human Rights Talent Development Talent Attraction and Retention Information Security Management 	<ul style="list-style-type: none"> In 2020, more than 490 discussion meetings were held for new employees, 568 workshops for foreign workers, and 614 opinion exchange meetings for regular employees. The number of internal employee complaints and communication cases amounted to 915, all of which have been closed satisfactorily.
Shareholders	<ul style="list-style-type: none"> Annual and quarterly financial reports Quarterly earnings conference Annual shareholders' meeting Quarterly institutional investors' conference 	<ul style="list-style-type: none"> Business Performance Talent Attraction and Retention Energy Management Innovation Management and Sustainable Manufacturing 	<ul style="list-style-type: none"> In 2020, we held an annual shareholders meeting, 4 quarterly earnings calls, and attended 11 institutional investor conferences to communicate economic, environmental, and social issues to our shareholders. In 2020, our consolidated operating revenues were NT\$ 477.7 billion, representing an increase of approximately NT\$ 63.8 billion, or 15.4% as compared with 2019.
Suppliers / Contractors	<ul style="list-style-type: none"> Supplier questionnaire survey Supplier on-site audits Annual supplier forum and supplier sustainability awards Supplier capacity-building activities 	<ul style="list-style-type: none"> Occupational Health and Safety Business Ethics Human Rights Sustainable Supply Chain Information Security Management 	<ul style="list-style-type: none"> More than 700 suppliers completed the survey, while 103 suppliers have on-site audits/remote audits or RBA VAP. 181 suppliers participated in sustainability forums and training workshops. We extended invitations to the suppliers of our three key subsidiaries to participate in the ASEH Supplier Sustainability Awards and selected 1 winner for the "Low Carbon" award and 2 winners for the "Circular" award.
Government	<ul style="list-style-type: none"> Communication meetings, conferences, forums or seminars held by government authorities Proactive dialogue with government authorities Reporting through government portal 	<ul style="list-style-type: none"> Regulatory Compliance Water Resource Management Climate Change Occupational Health and Safety 	<ul style="list-style-type: none"> We co-established the Package Testing Environment, Safety, and Health Committee with other companies in the same industry to find solutions for relevant occupational safety and environmental protection issues in Taiwan and assist the government in making or adjusting policies governing semiconductor package testing while helping competent authorities formulate regulations that keep up with industry and social trends.
Community (NGOs, Media)	<ul style="list-style-type: none"> Community perception surveys and needs assessments Communication meetings, forums, seminars or workshops held by NGOs Volunteer activity cooperation with NGOs Press releases Spokesperson interviews Company's website 	<ul style="list-style-type: none"> Social Involvement Waste and Circular Regulatory Compliance Water Resource Management 	<ul style="list-style-type: none"> We held a press event for media and non-profit foundations, and organized forums and facility visits for concerned professionals to learn about the technologies behind semiconductor manufacturing and ASEH's achievements in environmental protection. We contributed approximately US\$ 1.7 million in support of environmental conservation programs, charitable activities and civic educational programs through collaboration with 50 NGOs.
Industry Unions and Associations	<ul style="list-style-type: none"> Organizational member conference Technology forums held by industry unions/associations 	<ul style="list-style-type: none"> Regulatory Compliance Business Ethics Waste and Circular Energy Management 	<ul style="list-style-type: none"> We engaged over 140 external organizations and contributed approximately US\$ 0.63 million in public policy and industry development. We co-organized the TASS 2020 Asia Sustainable Supply and Circular Economy Conference, which featured 10 professional seminars on environmental technology research, circular economy, and renewable energy; 80 sustainable energy business opportunity matchmaking sessions, and more than 350 exhibits held by businesses. With an attendance of over 10,000 professionals, the conference has become the best platform for exchanging information about circular economy and related industries.

¹ We communicate with each stakeholder at irregular intervals unless otherwise indicated.

² Issues of concerns were selected from the results of our survey and other forms of communication.

³ For more information, please see relevant chapters and sections of this report.



3 INTEGRITY AND ACCOUNTABILITY



ASEH commits to constructing sound corporate governance, conducting business ethically and complying with all laws and applicable regulations where we operate.

ASEH strives to establish an organizational culture of integrity and accountability, maintain high standards of ethics, effective corporate governance and accountability mechanisms in every aspect of its business, as well as conduct business based on the principle of social responsibility and business ethics to serve both the company's and shareholders' long-term interests.



2020 • Key Performance



Continuous Education
for the Board Members



Performance Assessment
of the Board and the
Functional Committees



Continued listing on the TWSE
Corporate Governance 100 Index
(TWSE CG100 Index)

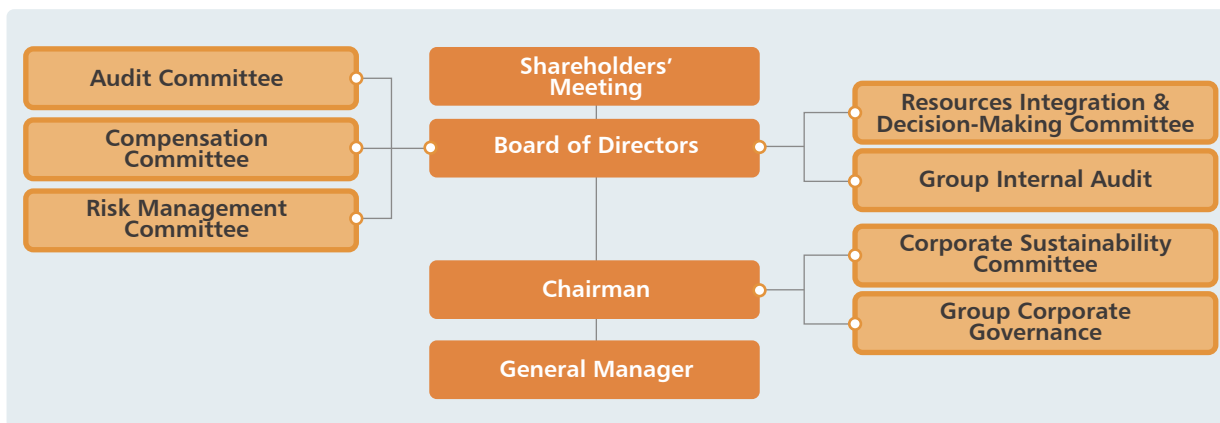
ASEH proactively reviews its corporate governance practices and effectiveness in implementation using the Corporate Governance Evaluation System launched by the Financial Supervisory Commission ("FSC"). A self-assessment process increases top management executives' awareness in strengthening corporate governance policies, and will help raise the standards of ASEH's corporate governance.

In 2020, ASEH was among the top 20% best performing listed companies with better ratings in the categories of "Enhancing Board Composition and Operation" and "Putting Corporate Social Responsibility into Practice".

In 2020, ASEH was again selected to be a constituent stock of the "TWSE Corporate Governance 100 Index (TWSE CG100 Index)" based on the 2019 assessment of our corporate governance, liquidity tests and financial indicators. To achieve good corporate governance, we will continue to focus on strengthening the structure and operations of the board, protecting the rights and ensuring fair treatment of shareholders, and incorporating sustainable practices into corporate governance.

3.1 Board of Directors

The ASEH board of directors (the “Board”) established the “Audit Committee”, “Compensation Committee” and “Risk Management Committee”¹, to convene meetings and perform duties as prescribed in the charters and/or within applicable laws and regulations. The committees also submit proposals for Board resolution, and report the status of matters relating to their respective functions to the Board. In parallel, the Group Internal Audit Department conducts periodical audits and presents audit results to the Audit Committee and the Board. In 2019, Du-Tsuen Uang, Group Chief Administration Officer, was appointed as the Corporate Governance Officer to facilitate the operation of the Board². In addition, the Resource Integration and Decision-Making Committee was established to strengthen resource integration and decision-making efficiency across all subsidiaries, with the goal of maximizing shareholder and stakeholder value.



Structure and Responsibilities of the Board of Directors

The Board is the highest governing body of ASEH. Jason Chang has served as Chairman and Chief Executive Officer of ASEH since its founding on April 30, 2018. He is also Chairman of Advanced Semiconductor Engineering Inc. (“ASE”) since ASE’s listing on the Taiwan Stock Exchange in 1989, and concurrently, the Chief Executive Officer since 2003. As a strategic leader, the Chairman has led the company through consolidating core businesses, tackling challenges, and creating new business opportunities, to achieve market leadership in the semiconductor assembly and test industry. ASEH has developed a management succession plan and regularly evaluates the succession planning progress to ensure the company’s sustainability³.

The second Board consists of thirteen members, each serving a three-year term. Three of the members are independent directors⁴. In addition to the scope of authorities and duties granted by or in accordance with the Taiwan’s Company Act and ASEH’s Articles of Incorporation on Shareholders Resolutions, the Board is actively engaged in the supervision of the overall operations of the company, business strategy formulation and development, risk identification in operation, finance, taxation, and overseeing, planning and implementation of ASEH’s corporate sustainability.

In 2020, a total of eleven Board meetings were convened and attended by at least two independent Board members in their supervisory capacity. The average Board meeting attendance rate was 94%. To manage and avoid conflicts of interest, directors or the corporates they represent involving conflicts of interest which may jeopardize the interest of the company, are not allowed to participate in the discussions, exercise their votes, nor vote on behalf of other directors⁵.

Diversity of the Board of Directors

ASEH’s Corporate Governance Best Practice Principles lists the guidelines, management objectives and goals for selecting the Board⁶ and takes into account diverse and complementary factors such as: gender, age, nationality, culture, professional background and industry experience⁷. Members of the Board come from different professional backgrounds with global market perspectives and possess the abilities to conduct risk oversight.

¹ For further details on the composition and responsibilities of the Audit Committee, Compensation Committee and Risk Management Committee, please refer to our 2020 Annual Report English version and Form 20-F “Item 6” at https://ir.aseglobal.com/html/ir_reports.php or ASEH’s company website at https://ir.aseglobal.com/html/ir_committees.php

² For more details on the execution of corporate governance affairs and training status, please refer to ASEH’s company website at http://cms.ase.todayir.com.tw/html/client_tw/ase/attachment/20210621143729241098080_en.pdf

³ For further details on succession planning, please refer to ASEH’s company website at https://www.aseglobal.com/content/en/csr_succession_planning.html

⁴ Independent directors are as defined in Rule 10A-3 under the U.S.A. Securities Exchange Act of 1934 as well as defined by the Regulations Governing Appointment of Independent Directors and Compliance Matters for Public Companies by Taiwan FSC.

⁵ For further details on directors’ attendance of meetings and information regarding conflict of interest, please refer to our 2020 Annual Report English version.

⁶ For further details on the status of directors’ diversity and management objectives and goals achieved, please refer to ASEH’s company website at http://cms.ase.todayir.com.tw/html/client_tw/ase/attachment/20210803141539224323567_en.pdf

⁷ For further details on the composition of the Board, and professional backgrounds and industry experiences of Board members, please refer to 2020 Annual Report English version “Ch. 3. Corporate Governance Report” or 2020 Form 20-F “Item 6”.

Continuous Education for Board Members

To expand the knowledge and competencies of our board members to effectively respond to evolving global and domestic corporate governance and sustainability challenges, a robust board education program was put in place. Based on industry requirements, educational and experience background of board members as well as the results from the performance evaluation of the Board, we facilitate the board members with the course planning and activities. From time to time, board members attend courses organized by external parties according to their needs. ASEH board members have continued to participate in continuous education on corporate governance and sustainability during their tenure, averaging more than the regulatory requirement of 6 hours per director per year¹.

Board Participation in Sustainability Governance

The Board of Directors directly supervises and manages the company's economic, environmental and social performance, and makes the final decisions. In 2020, the Board passed a resolution to donate NT\$100 million to environmental causes² in Taiwan, appointed two independent directors to serve on the final selection committee for the ASE Supplier Sustainability Award³, and approved amendments to multiple policy documents pertaining to corporate governance, ethical management and risk management. The Corporate Governance Officer is responsible for consolidating and reporting to the Board the latest implementation status of all corporate governance efforts pertaining to stakeholder communication, ethics, risk, information security and intellectual property management by the company and all its major subsidiaries. Five out of the six members of the company's CSC are Board members (including the Chairman of the Board), who attend the annual CSC meeting to preside over the discussion of annual implementation results, potential risks and opportunities and roadmaps for the company's environmental, social and corporate governance plans.

Board Performance and Compensation

We have formulated compensation policies for our top management to support strategy of sustainable business. The compensation of the CEO and other top management is approved by the Board. In addition to individual performance, the compensation of top management is also determined based on the achievement of the company's financial and relative financial⁴ performance targets. In 2021, ASEH will begin to issue restricted stock awards as part of the top management's variable compensation package based on the integration of ESG metrics in greenhouse gas emission and water withdrawal intensity with the company's financial performance (consolidated operating revenue, consolidated gross profit and gross profit margin, consolidated operating profit and operating profit margin). Adopting an incentive plan that links ESG to financial results demonstrates ASEH's commitment to sustainable actions and results, while pursuing strategic business goals.

To enhance overall efficiency of the Board and to measure the performance of the Board and individual members with respect to leading and supervising the company's performance, we established an evaluation system that incorporates non-financial indicators as well as sustainability-related elements. The regulations governing the evaluation of Board of Directors performance were amended in 2020, and the internal performance evaluations for individual directors, functional committees and the Board as a whole for the same year were also completed, with relevant proposals. Such performance evaluation not only helps to enhance the Board's oversight functions and operational efficiency, but may also serve as a reference for directors' remuneration standards. The evaluation results were also publicly disclosed on the company's website⁵.

Compensation for top management includes both cash and stock options. The characteristics of the industry and the nature of the company's business are taken into consideration when determining the ratio of bonus payout based on the short-term performance of top management and the time for payment of the variable

part of compensation. Furthermore, we believe that the ownership of company shares by the directors who hold senior management positions help align their interests and actions with the interests of ASEH's shareholders; therefore, in 2018, we formulated "Stock Ownership Guidelines". To enhance corporate governance and ensure the accountability of financial results, in 2018, we also formulated "Clawback Policy" to reserve the right to cancel and require reimbursement of any variable compensation received by the CEO and CFO to the extent permitted by applicable laws. These two important documents were publicly disclosed in ASEH website⁶.

Information Transparency

We place great emphasis on the stakeholders' right to know, and faithfully comply with applicable regulations regarding information disclosure in order to provide them with regular and timely information on company financial conditions and business operations, major internal documents, and corporate governance status, etc. through diversified channels. These channels include the company website, Market Observation Post System (MOPS), annual report, SEC Filing Form 20-F, corporate sustainability report, quarterly earnings release, press conference and annual shareholders' meeting. To treat stakeholders equally, we concurrently disclose the information of the preceding matters in both Chinese and English.

¹ For more detail on continuous education for board members, please refer to 2020 Annual Report English version "Ch. 3. Corporate Governance Report".

² Since 2014, ASE has donated NT\$100 million annually and the program continue after the establishment of ASEH.

³ ASE has organized the Supplier Sustainability Award every year since 2017 and continue to do so after the establishment of ASEH.

⁴ such as revenue growth rate, etc.

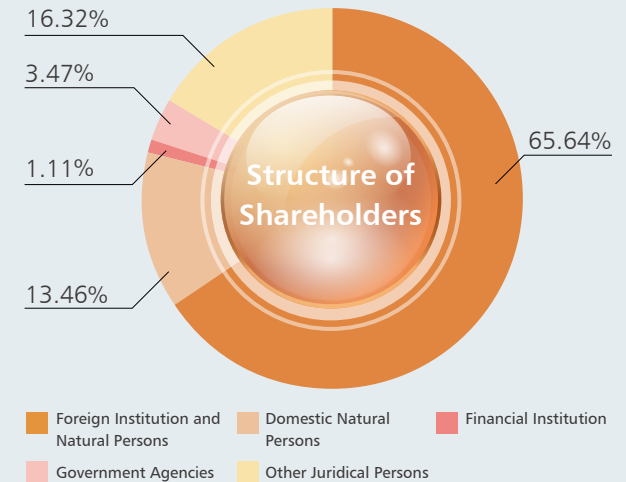
⁵ For further details on 2020 Board Performance Evaluation Results, please refer to ASEH's company website at https://cms.ase.todayir.com.tw/html/client_tw/ase/attachment/20210702182719231774611_en.pdf

⁶ For more important documents related to ASEH, please refer to ASEH's company website at https://ir.aseglobal.com/html/ir_doc.php

Shareholder Rights and Interests

To ensure shareholders' rights of being fully informed of, participating in and making decisions over important matters of the company, we have actively responded to TWSE's promotion of corporate governance related measures. These measures include a candidate nomination system for Board member elections¹, an electronic voting system, case-by-case voting at shareholder meetings, and the disclosure of voting results on a case-by-case basis. The shareholders' meetings are held in an effective, legal and convenient way for shareholders to exercise their shareholders' rights, encouraging shareholders participation in corporate governance and thereby leading to improved attendance at shareholders' meetings.

¹ The independent directors were elected in accordance with the candidate nomination system set out in the amended ASEH's "Articles of Incorporation" at the extraordinary general shareholders' meeting on June 21, 2018. Then the shareholders' meeting approved to amend ASEH's "Articles of Incorporation" regarding candidate nomination system for all of the board member elections on June 27, 2019.



3.2 Economic Performance and Tax Governance

ASEH Tax Policy

ASEH believes that being an honest and responsible taxpayer will help foster economic growth, contribute to business sustainability, reinforce our business value and positively affect our business partners.

ASEH is committed to:

1

Complying not only with tax laws and regulations, but also the spirit of the law, including the relevant international standards as well as duly completing accurate tax filings and complying with all tax payments in all the countries in which we operate.

2

Accounting for short-term and long-term tax influences in business decisions-making process.

3

Being transparent and disclosing tax information in accordance with applicable regulations and reporting requirements.

4

Complying with relevant tax payment on all profits earned from business activities conducted in relevant jurisdictions and ensuring intra-group transactions are conducted at arm's length.

5

Not relying on tax havens or exploiting tax structures as a method of tax avoidance and aggressive tax planning.

6

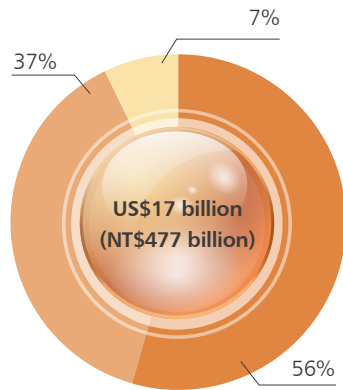
Constructing an appropriate mechanism to assess tax-related risks and potential impacts connected to our global operations and constantly enhancing our tax governance activities.

7

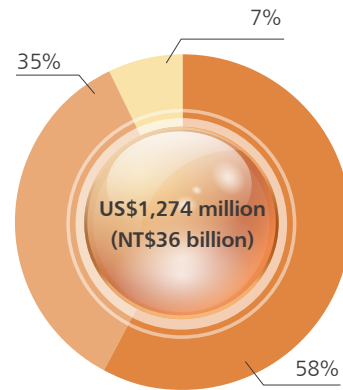
Developing mutually trustful and respectful relationships with tax authorities and having open and honest channels of communication.

Our principal executive offices and facilities are located in Taiwan and China/Hong Kong. More than 90% of our operating revenues, profit (loss) before tax, income tax accrued for current year, and income tax paid is accounted by business activities conducted in Taiwan and China/Hong Kong and not more than 5% of our operating revenues, profit (loss) before tax, income tax accrued for current year, and income tax paid expense is accounted by business activities conducted in the rest of each individual country. Please refer to the chart below for 2020 operating revenue, profit (loss) before tax, income tax accrued, and income tax paid by country.

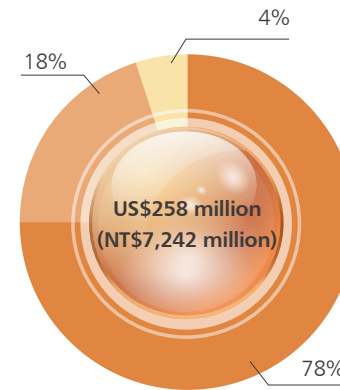
Operating Revenue



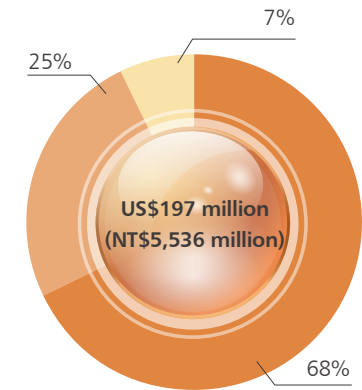
Profit (Loss) before Tax



Income Tax Accrued



Income Tax Paid



Legend: Taiwan (Dark Orange), China/Hong Kong (Light Orange), Others (Yellow)

¹ Others include South Korea, Singapore, Malaysia, Japan, U.S.A, Mexico and European countries, etc.

Our effective tax rate and cash tax rate were 19.9% and 15.5%, respectively, both of which are higher than the industry average tax rate of 15.26% and the industry average cash tax rate of 14.12% based on SAM CSA Companion in "Semiconductors and Semiconductor Equipment" industry group. The statutory tax rates in Taiwan and China are 20% and 25%, respectively. But most of our China subsidiaries qualified as High and New technology enterprises were entitled to a reduced income tax rate of 15% and were eligible for super deduction for qualified research and development expenses. Additionally, some of our China subsidiaries utilized loss carry-forward to reduce their tax payments

resulting in lower tax contribution in China/ Hong Kong.

Consistent with our core values, ASEH is committed to fully meeting tax obligations while also being financially responsible for the potential effects that tax payments might have on our business activities and being supportive of corporate innovation, research and development, reinvestment and sustainable investment initiatives in accordance to government policy. As a multinational corporation, ASEH's tax contribution is international in scope and covers a wide range of public tax systems around the world.

In view of the sophisticated nature of tax matters and the global scale that ASEH operates on, we continuously monitor and assess changes in relevant tax laws and regulations and implement internal training to ensure that employees have the necessary level of skill and awareness for tax issues. In addition to the internal training and guidance, we also have external tax advisors dedicated to advising us on material transactions and providing us with the foresight to mitigate the potential tax-associated risks. In addition to income tax, ASEH also contributes numerous other taxes including property tax, environmental tax and employment tax.

3.3 Business Ethics

Policies and Specifications

The Board has successively approved and published ethical corporate management related regulations which clearly specify the policies and specification, behavior guidelines, operational procedures and grievance systems to prevent unethical behaviors. These policies aim to shape ASEH's culture of honesty and responsibility and to realize its commitment of compliance to the highest ethical standards in ASEH's overall business activities.

★ Ethical Related Regulations



Organization and Authority

As the highest governance body of ASEH's business conduct and ethics, the CSC coordinates and supervises the establishment and implementation of the ethical corporate management policies and specifications. The CSC periodically reviews the promotion of business conduct and ethics and the compliance of policies and specifications, and reports to the Board on a yearly basis. The Corporate Governance Taskforce under the CSC of the three major subsidiaries is established to promote ethical policies and specifications to our global manufacturing sites and assists in managing and adopting appropriate policies and specifications to ensure ethical management in compliance with the requirements of local laws and regulations. Global manufacturing sites are responsible for planning the internal organization, structure, and allocation of responsibilities, formulating standard operating procedures and conduct guidelines in accordance with corporate policies and specifications, and promoting awareness and educational activities with respect to ethics policy in internal management and in daily operation. The Group Internal Audit is in charge of supervision to ensure the operating effectiveness of reporting system.

Education and Promotion

To guide ASEH Members¹ and the company's stakeholders to better understand ASEH's business ethics standards, we set up "Code of Business Conduct and Ethics" area of the company website and disseminate our ethical related policies, guidelines, practices, and implementation status of the Board and management levels within the company. We also communicate ASEH's concept of business ethics and company's specific practices through education, promotion and online training and various methods.

We require all suppliers to abide by the ASEH Code of Business Conduct and Ethics and Supplier Code of Conduct. In addition to the "ASEH Supplier Code of Conduct Commitment Letter" signed by new suppliers, relevant guidelines and regulations are written in our procurement documents and announced on E-Hub, an electronic information exchange platform for suppliers, to ensure that all suppliers acknowledge the policies in all their transactions with ASEH. Over the years, we have organized annual supplier conferences and periodic workshops, forums, training sessions and monthly/quarterly/yearly appraisals to communicate with suppliers on our Supplier Code of Conduct, to ensure proper alignment in values and ethics.

2020 Programs and Implementation

- Education and training programs

1. Among the board, eleven board members (accounted 85%) attended a course on 'How Directors and Supervisors Oversee the Company to Conduct Fraud Detection and Prevention and Establish a Whistleblowing Mechanism to Enhance Corporate Governance.' The course

includes information on regulations governing stakeholder and insider transactions .

2. We rely on email communication to senior executives at our business locations worldwide to communicate fraud reporting status. This enables prompt review and strengthens our risk management in fraud prevention, control and detection. We also conduct in-person and online meetings on anti-fraud management that includes the handling, reporting and processing of fraudulent activities. We encourage employees to be proactive in fraud disclosure to further strengthen the identification and prevention measures.
3. ASEH's business locations around the globe have conducted business practices and ethics-related training to all employees through in-person, online and e-mail communication, as well as announcement and dynamic advocacy to conduct, with the topics covered including the following:
 - (1) Business conduct and ethics-related issues² such as ethical management, anti-corruption, avoidance insider trading, fair competition and antitrust, respect intellectual property, regulatory compliance, and information security (174,542 participants clocked a total of 75,821 hours on the course).
 - (2) RBA Code of Conduct (56,630 participants clocked a total of 75,597 hours on the course).
 - (3) Employee Code of Conduct at all business locations (10,872 participants clocked a total of 3,795 hours on the course).

- Risk assessment: All of our sites around the world have conducted business ethics risk assessment, in which no major business ethics risks have been identified.

Consultation and Report

We have established channel of consultation for ASEH Members and various internal and external reporting channels³. ASEH Members or any third party may report to the internal or external channels, either using their own identity or anonymously. Investigation and improvements were made according to related reported issues, emphasizing on the importance of business ethics and integrity by providing educational training (such as e-mail advocacy and online quizzes). We are committed to keeping the whistleblower's identity and reporting contents confidential, and protecting him/her from any unfair treatment or retaliation as a result of the violation reporting.

ASEH received a total of 9 complaints in 2020, of which 6 were employee-related complaints that have been forwarded to the HR department to follow up. The remaining 3 complaints were related to unethical business behavior. For the past 3 years, the Company investigated all complaints and recorded no violations.

For the purpose to reinforce the whistle-blowing mechanism, ASEH has appointed an independent third party to assist in handling any reporting regarding insiders' misconducts and provide legal services in the subsequent investigation since 2018.

¹ "ASEH Members" includes all employees, officers, supervisors and directors of ASEH, its subsidiaries and joint ventures.

² Details on the training of human rights please refer to Chapter 3.5 Human Rights Management.

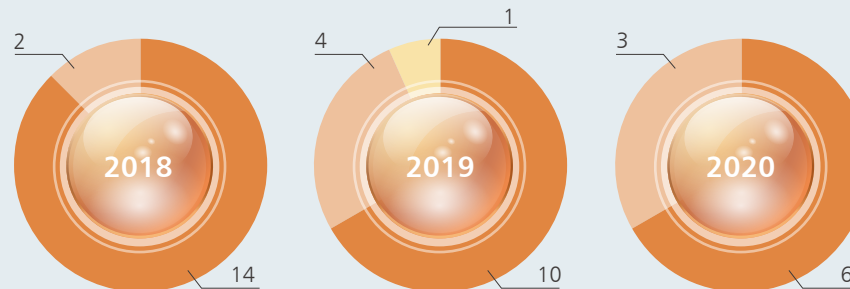
³ For further details on internal and external report channels, please refer to ASEH's website <https://www.aseglobal.com/csr/sustainability-governance/business-conduct-ethics>

Cases Received by Code of Conduct Compliance Reporting System

	2018	2019	2020
Number of cases received by Code of Conduct Compliance Reporting System	16	15	9
Not accepted (number of cases lack sufficient information to conduct further investigation)			
Not related to ethics matters (number of cases involved employees' personal complaints and were forwarded to the HR department to handle)	14	10	6
Related to ethics matters	2	5	3
Fraud	2 ¹	4 ²	3
Conflicts of interest	0	1	0
Insider trading	0	0	0
Fair competition and antitrust	0	0	0
Confidential information	0	0	0
Privacy or personal information protection	0	0	0
Number of breaches (number of breaches confirmed related to ethics matters after investigation)	0	0	0

¹ The 2 cases contain the same allegations.
² Of them, 2 cases contain the same allegations from 2018.

- Fraud
- Conflicts of interest
- Insider trading
- Fair competition and antitrust
- Confidential information
- Privacy or personal information protection
- Not accepted or Not related to ethics matters



Processing Procedures for Violation Reporting



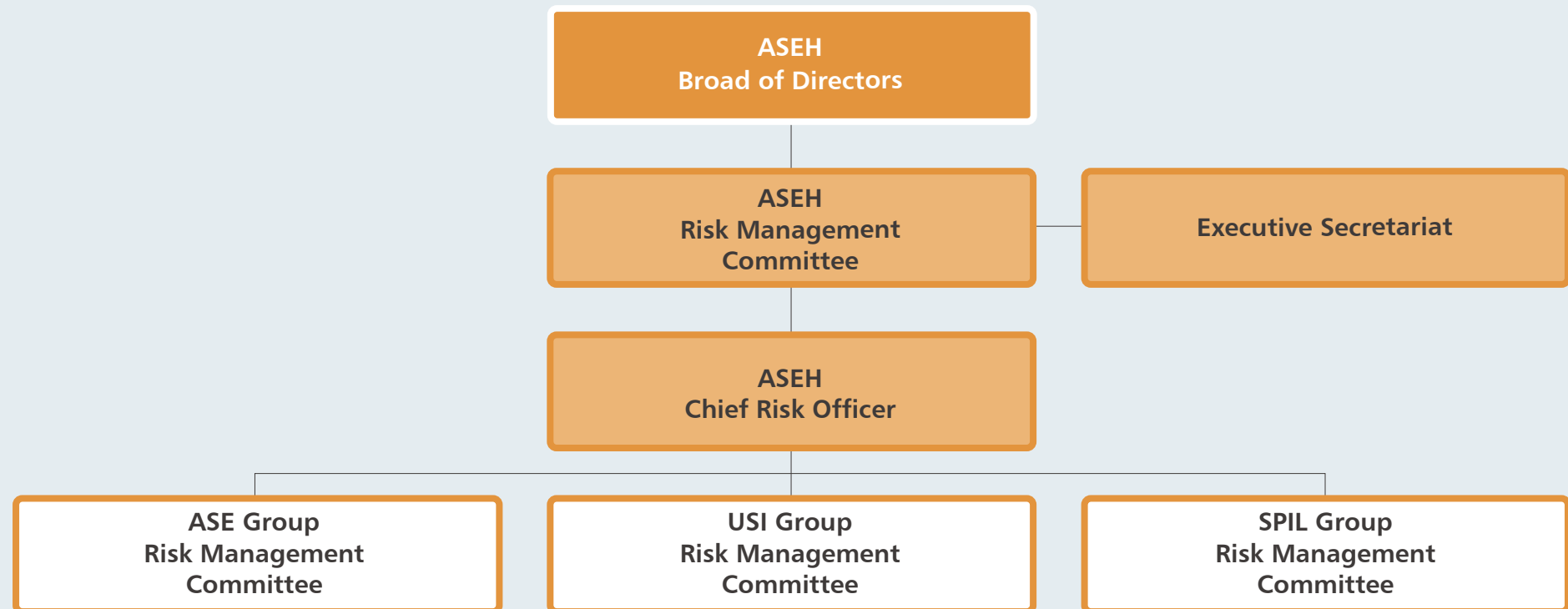
3.4 Risk Management

The ability to detect internal and external operational risks in advance, and to properly assess and process these risks, is important to effectively prevent and reduce loss exposures. In December 2019, ASEH’s board of directors established a Risk Management Committee, and in accordance with its Charter, appointed two independent directors and one member to the committee for assisting the board of directors in risk management. The board of directors is the highest level decision-making body for risk management and endorses major risk management decisions based on corporate strategies and changing business landscapes. The Committee shall manage the company’s overall risk management, implement

the decisions of the board of directors in connection to risk management, coordinate and promote cross-organization risk management plans, supervise and manage overall risk control and remedial mechanisms of the company and its subsidiaries, review and integrate all risk control reports. The Committee submits an annual report to the board and updates them periodically on matters related to risk management implementation and recommendations for improvements. ASEH’s subsidiaries are also required to establish corporate risk management teams responsible for each subsidiary company’s risk management and accountable to the board’s risk management committee.

In light of recent emerging risk factors such as COVID-19, U.S export controls, renewable energy use, water shortage and energy conservation, companies that are able to effectively manage risks will be resilient enough to avoid disruptions and even fulfill sustainable development goals. Dtuang Wang(Du-Tsuen Uang), ASEH Chief Administration Officer, was appointed the Chief Risk Officer to synergize the subsidiary companies’ risk management with the goals of the Risk Management Committee. At the working level, the Risk Management Committee secretariat will work with each subsidiary company to implement risk management activities.

Organization Chart of Risk Management Committee



Risk Management Policies and Procedures

ASEH approved the 'Risk Management Policies and Procedures' in 2020 as the ultimate guiding principle of risk management. ASEH shall possess the awareness in risk management forms an integral part of ASEH management, and incorporate the risk management into the company's business strategies and organizational cultures. ASEH conducts risk assessments on an annual basis. For major risks, ASEH formulates and implements completely specific management plans which mainly cover management goals, organizational structures and divisions of authority and responsibility, and risk management procedures. The implementation of the risk management plans enables ASEH to recognize, examine, monitor and control various risk exposures effectively. Hence, risks that arise from the company's business activities shall be controlled accordingly within an acceptable range.

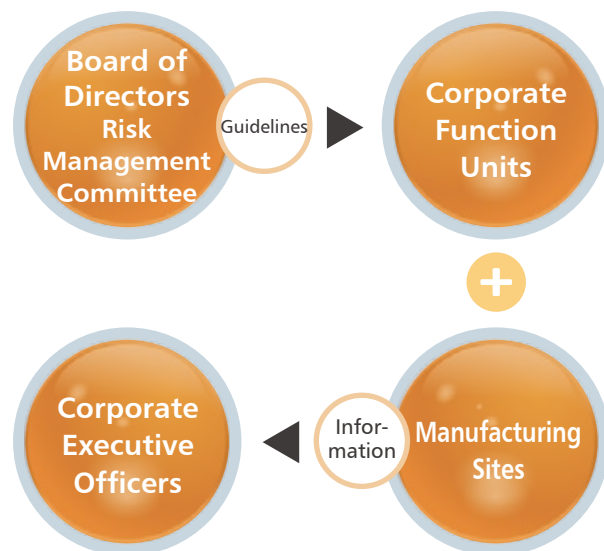
We manage risks through designated departments and functions ("risk functions") across all of our organizations. In addition, we have Enterprise Risk Management ("ERM") programs implemented in our major manufacturing sites (i.e., Kaohsiung, Chungli, Shanghai (Material), Kunshan, Suzhou facilities, Real Estate Group as well as the USI Group). Risks or events that might have an influence on our business objectives are identified and evaluated, in order to decide on appropriate responses. In addition, the identification and management of long-term emerging risks¹ are embedded into our ERM program. We have established the mechanism of prevention, early warning, emergency response, crisis management and business continuity plans that mitigate, transfer or avoid risks. We are confident that by having a sound management program, ASE has effectively kept the respective risk scenarios under control.

We had introduced a top-down ERM approach to connect the top management with the rest of the organization on risk matters and ensure sound management of corporate-wide risks. Specifically, our top management are invited to identify key risks that are "top of mind" for the company. These top-down identified risks are then reviewed through our current ERM process, enhancing the efficiency and effectiveness of the decision-making process across the organization.

In our ERM program, corporate level and operational level risks are identified, prioritized and reported within risk registers. The risk registers include a description of the overall risk, characteristics (scenario and impact) of the risk; and current risk management activities

¹ We define an emerging risk as: an issue that is perceived to be potentially significant in future but do not currently exists, or a previously known issue that is evolving in unexpected ways with unanticipated.

Risk Management Organization Scheme



Risk Management Process



including mitigation strategy/control measures. The identified risks are assessed in terms of likelihood and impact to determine their risk level, and then mapped onto a Risk Map according to their risk level and control effectiveness. Further risk mitigation plans are defined to reduce the residual risk if judged necessary. Major risks, together with suitable risk response plans, were reported to top management and the progress will be monitored periodically.

Implementation

ASEH actively promotes the implementation of risk management mechanisms and reports the status to the Board of Directors on a yearly basis. In 2020, the company has completed the following:

- Issued the 'Risk Management Policies and Procedures'.

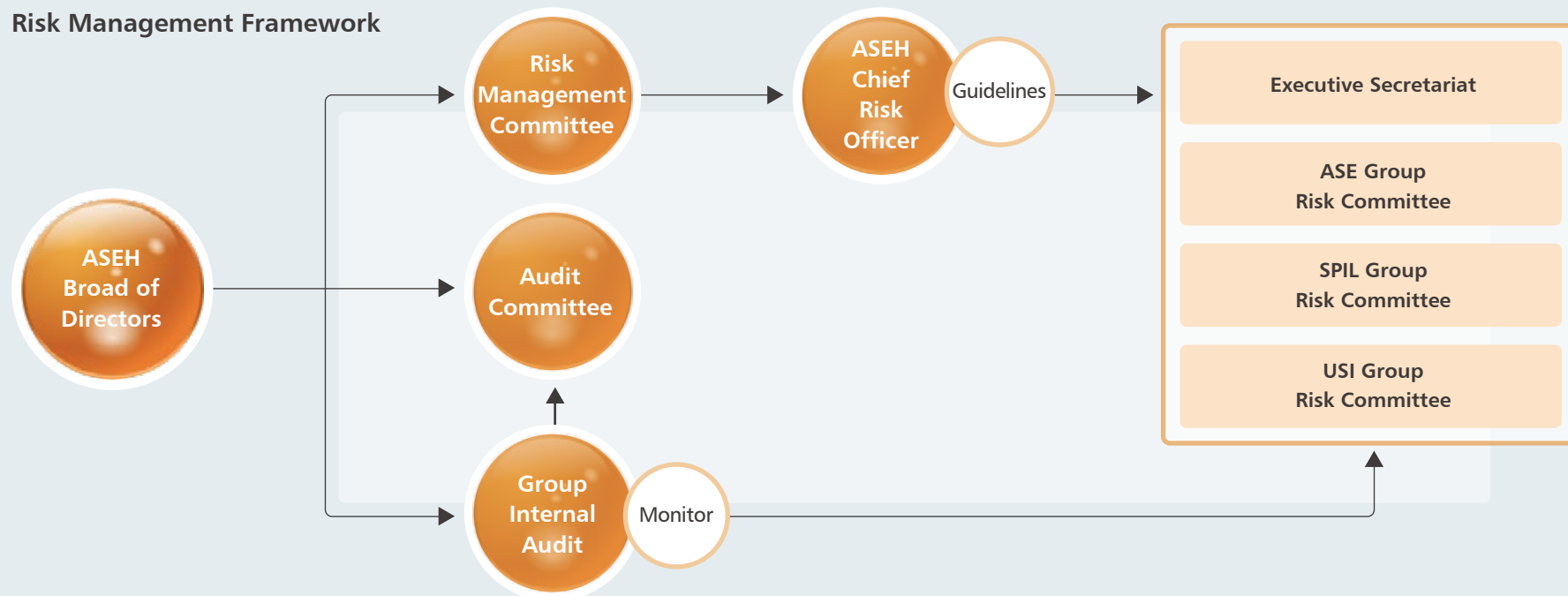
- Conducted the first Risk Management Committee meeting to report on the status and measures of COVID-19 prevention at each major ASEH subsidiary. The meeting aims to enhance the internal control systems and raise the awareness of epidemic prevention at ASEH and its major subsidiaries.
- Conducted the second Risk Management Committee meeting to explain the risks, and ensure compliance by ASEH and all subsidiaries with regard to the latest U.S. Export Administration Regulations (EAR).

Risk Management Integrated with Internal Controls and Internal Audits

We view internal controls as an important part of ERM. ERM is more effective with internal controls that cover risk

responses and other ERM processes in place. We identify and document all of our major risks together with related controls. The effectiveness of controls are reviewed in the annual Control Self-Assessment. In addition, we redesigned our risk assessment system and linked our current internal control activities to corresponding risk scenarios such that a complete list of internal control measures can be pre-defined in the system to help our risk functions to more accurately assess the effectiveness of risk control. Finally, our internal audit system carries out independent appraisals of the implementation of key risk mitigation plans by our risk functions thereby ensuring that risks are properly managed.

Risk Management Framework



We identify and analyze possible risks for our business, operation, and provide corresponding monitoring measures and control mechanisms for those risks that are of high impact.

Long-Term Emerging Risks

Energy resource management and renewable energy

Risk description:

The risks related to energy resources and renewable energy have intensified due to many factors including the effects of climate change and global pressure on greenhouse gas reduction and carbon neutrality. Many countries have also enacted carbon tax laws that require businesses to pay carbon fees or, reduce emissions through carbon trading or renewable energy.

Potential Impact

1. With many countries regulating emissions and the use of renewable energy, businesses must ensure that they comply with these regulations. In January 2021, Taiwan passed a regulation requiring business facilities with power contracts exceeding 5,000 kW to increase their use of renewable energy by 10% within five years. Alternatively, they may install energy storage facilities, purchase Taiwan Renewable Energy Certificates (T-RECs) or pay cash in lieu in accordance with the law.
2. Apart from regulatory requirements, some customers may require businesses to commit to the use of renewable energy in the manufacturing of their products. If customers' requirements cannot be fulfilled in the future, operational risks will arise.
3. The investment community and civil society are increasing their focus on the use of renewable energy by companies and this has a substantive impact to corporate sustainability

Response Strategies

1. In response to energy resource management and renewable energy risks, many of ASEH's factories have installed solar roof panels. The Company

has also purchased green electricity and green energy certificates as risk mitigation measures. ASEH's facilities in China have been purchasing a substantive quantity of green certificates since 2017.

2. In response to Taiwan's new energy regulation targeting businesses with high power consumption, a taskforce comprising of all ASEH's Taiwan subsidiaries was formed to evaluate the purchase of renewable energy, and engage in negotiations with solar photovoltaic, hydropower, land-based wind power and offshore wind power suppliers.
3. ASEH's Sustainability Committee has decided to give priority to full compliance with laws and customer requirements and to continue working towards sustainability.

Information security management risks

Risk description:

The rise of remote work trends and smart factories in countries highlights the importance of cyber security. If the inherent risks associated with information security management are not managed properly, it will endanger business operation.

Potential Impact

1. The rise of the smart factory have also brought about cybersecurity risks due to the increasing use of the internet and mobile devices in manufacturing. Cyberattacks pose huge risks to productivity and operations. Should there be any loss of confidential data, there is an additional risk of losing customer's trust and jeopardizing the competitiveness of the company.
2. In recent years, cyberattacks and ransomware have grown in frequency and sophistication. Should ASEH be unable to preempt attacks or recover its IT systems quickly and ensure the security of its network, the company may suffer negative impacts and incur financial losses.

Response Strategies

1. Strengthen defensive deployment in the early identification, protection and detection stage

and conduct education and training to improve technical capabilities.

2. In the mid and late response and recovery stages, strengthen response mechanisms and conduct regular disaster recovery exercises to ensure crisis readiness and maintain an uninterrupted information system in critical situations.
3. To enhance the company's defense capabilities, it is extending the adoption of ISO27001 standards across all factories worldwide and introducing education and training on IEC62443 standards (industrial communication networks - IT security for networks and systems).

Key talent management risks

Risk description:

Employee poaching is a serious concern for businesses as it often results in a company's core technology and company secrets falling into the hands of competitors. Employees especially key talents, are a company's prime asset and contribute to business growth. The COVID-19 pandemic has disrupted the global economy and reshaped work experiences that included work from home and split operations. Companies find themselves facing challenges in manpower utilization, an intense competitive global environment, succession planning and executive recruitment, demonstrating the importance of key talents to a company's sustainability.

Potential Impact

1. Key employee talents are hard to replace because of their value. The company risks losing key talents and its competitiveness if it fails to implement key talent identification and management measures, retain or replace the key talents.
2. Key employee talents possess industry and technology know-how developed over the years with the company and the company's growth may be adversely affected should the employee(s) leave.

Response Strategies:

1. Establishing a comprehensive talent database and effective management system, as well as introducing relevant evaluation procedures, that will allow the company to improve the management of job rotations and reduce turnover rates.
2. Formulating an exit interview mechanism that enables the company to persuade the employee to stay, and if this fails, allow the company to place safeguards to prevent any removal of company secrets and core information due to the resignation.

Financial Risk

Interest Rate Changes:

Except a portion of long-term borrowings and bonds payable at fixed interest rates, we were exposed to interest rate risk because group entities borrowed funds at floating interest rates. Changes in market interest rates led to variances in effective interest rates of borrowings from which the future cash flow fluctuations arise. We utilized financing instruments with low interest rates and favorable terms to maintain low financing cost, adequate banking facilities, as well as to hedge interest rate risk.

Exchange Rate Changes:

We are mainly subject to the impact from the exchange rate fluctuation in US\$, JPY and HKD against NT\$ or RMB. To minimize the fluctuations of assets and liabilities denominated in foreign currencies, we entered into a variety of derivative financial instruments, such as forward exchange contracts and swap contracts, to hedge foreign currency exchange rate risk. In addition, we also lift borrowings denominated in foreign currencies to avoid exchange rate exposure from its investments in equity instruments denominated in foreign currencies.

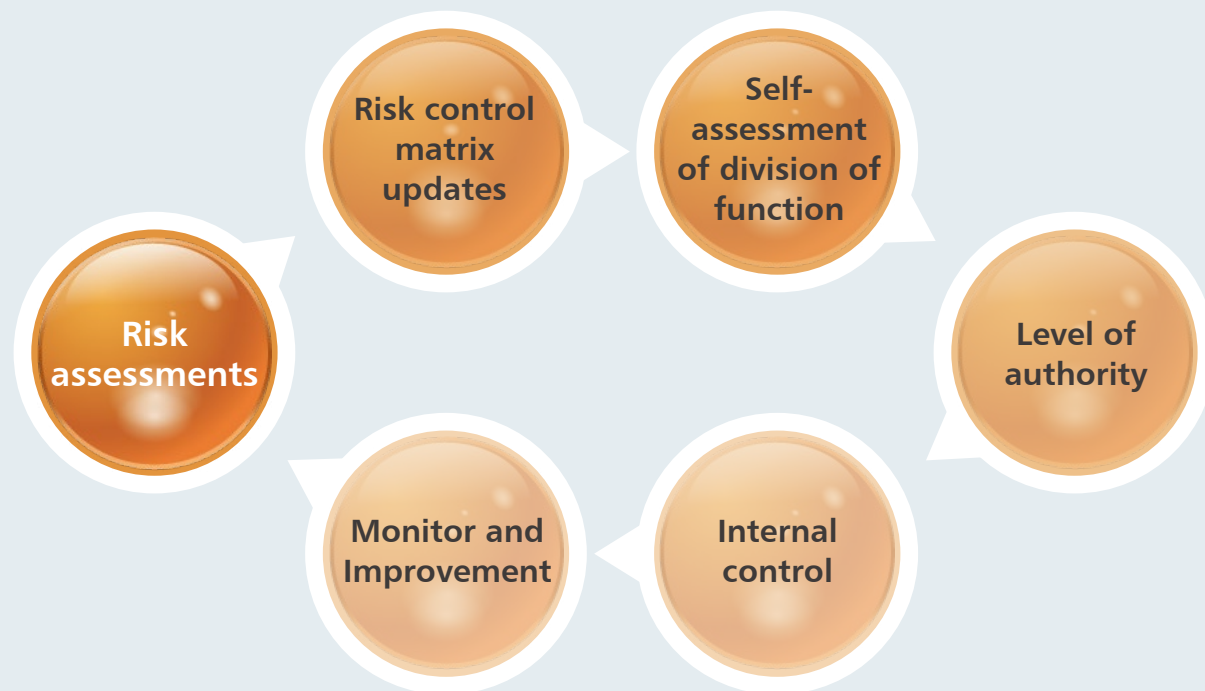
Internal Control and Auditing

Internal Control

Our internal control policies are based on the Regulations Governing Establishment of Internal Control Systems by Public Companies established by the FSC and relevant regulations established by the U.S.A. Securities and Exchange Commission. The policies take into account our actual operational activities, are designed and approved by our managers and the board, and are implemented and managed by our managers, the board, and other employees. The policies include Entity level and Activity level; the objectives of these policies are to define the scope and standards of the internal control system for our business units and subsidiaries, ensure the effectiveness of internal control design and implementation, facilitate sound company operations, and achieve the following goals:

- Operational effectiveness and efficiency
- Reliable, timely, transparent reports in compliance with relevant regulations
- Compliance with relevant laws and regulations

ASEH Internal Control Management Process



Every year, all of our subsidiaries conduct internal control self-assessments. The scope of the assessments covers the design and implementation of the company's internal control systems (e.g., Segregation of Duties Assessment, system authority management, chart of Authority Management, and Sarbanes-Oxley internal control assessment). The purpose is to implement a self-supervisory mechanism that allows a rapid response to environmental changes, based on which we can adjust the design and implementation of internal control systems, and improve the quality and efficiency of internal control. In order to strengthen the supervision and management of ASEH subsidiaries, the Group's internal control standardization design structure was extended to all major subsidiaries of the group, including ASE¹ Group, USI² Group and SPIL³ Group, and its internal control document structure was effectively linked with the organizational structure design and operation process.

We conduct regular internal control education and training for our subsidiaries, and develop risk radar charts from self-assessment results, internal and external audit feedback; to be used as indicators for internal control improvement. We have also set up an e-platform for employees to gain access to information on internal control processes, management methods, legal policies, education and training and organization, that will help strengthen their awareness of internal control. Senior management from our subsidiaries were often invited to engage in indepth discussions on areas of concern for tone at the Top and, determine the key to communicating and implementing effective internal control.

With the advent of the Industry 4.0, in a highly information-based environment, the trading system models are becoming increasingly complex, and operating activities are constantly changing. In order to strengthen the risk control and management benefits, promote the establishment of key risk intelligent dashboards and utilize the digital tool

technology to analyse big data that quickly emphasize the key risks and promptly report deviating abnormal behaviours or transactions to the superior of the operating unit for evaluation, and expeditiously review the effectiveness of internal control design through a continuous monitoring mechanism to reduce the occurrence and expansion of potential risks.

Internal Audit

The Group Internal Audit ("GIA") was established under the board of directors to assist the board of directors and management in inspecting and evaluating the effectiveness of the internal control system, assessing the effectiveness and efficiency of the company's operations; the reliability, timeliness and transparency of reports; and the compliance with applicable laws and regulations, as well as making timely recommendations for improvements to reasonably ensure the continuous operating effectiveness of the internal control system and to serve as the basis to review and revise the internal control system.

GIA comprises an internal audit officer and appropriate number of qualified, dedicated internal auditors, as required by business scale, business condition, management needs, and the provisions of other applicable laws and regulations to provide independent, objective assurance activities. The competencies of internal auditor comply with the provisions stipulated by the competent authorities. Internal auditors are required to improve internal audit quality and to enhance their competencies through continuing professional education on an annual basis. In order to improve internal audit efficiency and effectiveness, we dedicated to continuously improve audit programs, procedures and techniques through the use of computer-assisted audit techniques.

GIA establishes a risk-based internal audit approach and performs internal audit activities in accordance with the annual audit plan approved by the board of directors, and the scope of internal audit includes

internal control systems of the company and its subsidiaries.

The internal control self-assessment reports, prepared by the company and its subsidiaries and reviewed by GIA on an annual basis, along with audit reports on findings of internal control system identified by GIA serve as the primary basis for the board of directors and general manager to assess the overall effectiveness of the internal control system and to produce internal control system statements.

GIA submits the audit reports and audit follow-up reports by e-mail to the Audit Committee on a monthly basis. The internal audit officer presents and communicates the audit results to the audit committee in the direct communication or other meetings, as well as reports internal audit activity reports to the board of directors on a quarterly basis. The internal audit officer will immediately report via mobile phone or e-mail to the independent directors any material matters as necessary; and there were no aforementioned material matters during 2020. The communication channel between the independent directors and the internal audit officer functioned well.

Throughout 2020, we have completed the system design and development for the new SOX control self-assessment, continuously optimized the group audit management system, and committed to elevating the ability of internal audit data analytics, coordinating the internal audit resources of the group, and strengthening the content and quality of audit reports and working papers, as well as completed the remote audits for overseas subsidiaries under the influence of COVID-19. In addition, we have completed the job time report system development and implementation to effectively record the manpower input of internal auditors on different engagements and jobs to serve as a basis for planning and performance appraisal.

¹ Including Taiwan and China facilities of ASE.

² Including Taiwan and China facilities of USI.

³ Including Taiwan and China facilities of SPIL.

Internal Audit Management Process



Promote and Enhance Risk Culture Measures

In order to embed risk management into ASEH's corporate culture, the Company formulated financial incentives that relate to its risk management KPIs. In addition to adding various risk management KPIs to general management performance goals, in May 2021, the company's board of directors resolved to add ESG risk management goals to the conditions for issuing restricted stock units. ASEH has been conducting key internal education and training classes that include ERM and BCM working forums to strengthen risk awareness at management level, and courses for all employees to promote the importance of risk management, with full participation from all employees. ASEH also incorporates risk management standards into the human resource review process for employee evaluation and establishes measures for individual employees to proactively identify and report potential risks across the organization. Employees are encouraged to participate in a structured feedback process to continuously improve the risk management practices. ASEH also incorporates risk criteria into product development or the approval process, extending risk measurement across the organization.

3.5 Human Rights Management

Human Rights Policy

ASEH and its subsidiaries are committed to safeguarding the human rights of employees and value chain partners (including customers, suppliers/distributors, agents, joint ventures and consortia partners and local communities) and promoting the sustainable development of the environment, society and economy. ASEH's approach is designed in support of the United Nations Universal Declaration of Human Rights, the UN Global Compact, the UN Guiding Principles on Business and Human Rights and the International Labor Organization's Declaration on Fundamental Principles and Rights at Work. ASEH is also committed to upholding local laws and regulations in the countries where ASEH operates, and reviewing the implementation of its human rights policies on a regular basis through membership on the RBA.

Principle

- **Protect and Respect:** ASEH commits to creating an environment conducive to human rights protection and avoids any actions that may infringe or have a negative impact on human rights.
- **Appeal and Remedy Process:** ASEH prevents infringement of human rights, protects ASEH employees and value chain partners, and mitigates any adverse human rights impacts, ASEH has put in place formal processes for appeal and remedy.
- **Management Principles:** ASEH seeks to continuously improve human rights governance and keep in lockstep with business development trends. In order to yield positive results in the management of human rights, ASEH shall adopt the following principles: education and training, due diligence and feedback mechanism.

Human Rights Governance

In order to adequately manage human rights issues that arise from operating a global business, ASEH implements risk management at all facilities, collates and reports the information to the ASEH CSC and top management at regular meetings.

Human Rights Due Diligence:

Target	Responsible	Management Mechanism
Employee and Operation	Subsidiaries' "Employee Care and Development Taskforce"	RBA management
Community and Environment	Each facility	Environmental monitoring and survey community feedback locally
Supplier/Contractor	Subsidiaries' "Supply Chain Management Taskforce"	Supplier sustainability assessments survey and audits annually

Human Rights Management

ASEH has adopted human rights management practices that follow PDCA procedures and include risk identification, assessment, monitoring, control, and disclosure. In a reflection of the different roles played by ASEH, we focused our human rights management efforts on our employees, suppliers, and local communities, performing due diligence with each group and providing whistle-blowing channels to prevent any human rights violations.

The human rights risks of our manufacturing and business activities are mainly related to employee and local community interest groups. We used the RBA Self-Assessment Questionnaire (SAQ) and Validated Audit Process (VAP) to perform risk management at our facilities worldwide. By examining the results of our human rights risk assessments of the past three

years, we were able to identify issues and interest groups that were vulnerable to human rights risks and prepare corresponding mitigation and compensation measures.

According to the assessment results, potential human rights risk issues include working hours, emergency preparedness, occupational safety, emergency preparedness, occupational injury and illness, sexual harassment, freely chosen employment and wages and benefits. Each year, we have drawn up mitigation measures, which include raising human rights awareness via human rights training, ensuring sufficient manpower, management of working hours, improving occupational safety, and preventing occupational hazards. For more information, please refer to Chapter 6.3: Occupational Safety and Health of this report.

We assessed human rights risks associated with the company's suppliers using supplier sustainability risk assessment questionnaires and the RBA SAQ. The company performed sustainability risk assessments on all tier-1 suppliers and conducted risk identification through the RBA VAP, which includes an audit of human rights issues. Based on the assessment results, we identified working hours, compensation and benefits, occupational safety, emergency preparedness, and responsible mineral sourcing as major human rights risks. We then identified potential high-risk suppliers and adopted measures to verify and lower any risks. For more information, please refer to Chapter 7: Responsible Procurement of this report.

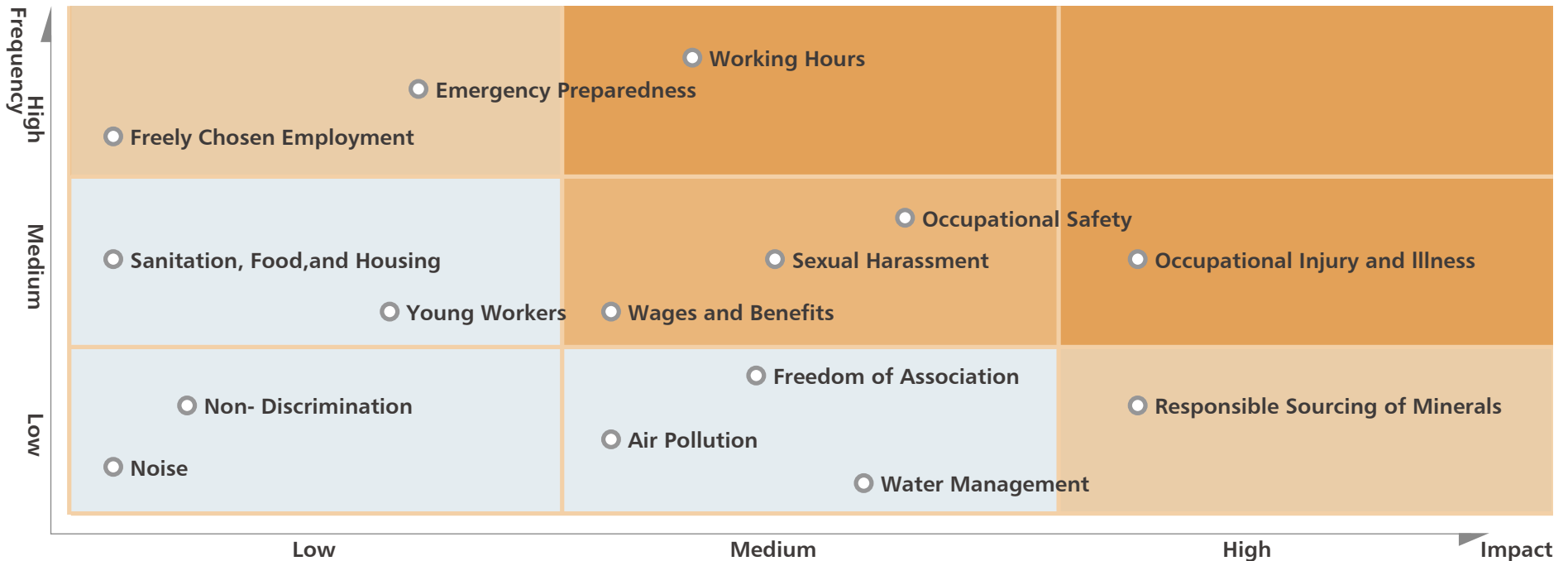


ASEH as a/an	Policy	Target	Human Rights Issues	Due Diligence	Complaint Mechanism
Employer	ASEH Human Rights Policy Statement	<ul style="list-style-type: none"> All Employees Foreign Employees Female Employees Child Laborers 	Freely Chosen Employment, Working Hours, Wages and Benefits, Non-Discrimination, Sexual Harassment, Occupational Safety, Emergency Preparedness, Occupational Injury and Illness Young Workers	RBA SAQ and VAP	1. Internal whistle-blowing channels: the internal whistle-blowing channels of subsidiary companies 2. External reporting channel: Code of Conduct Compliance Reporting System https://www.aseglobal.com/antifraud/en.asp
Purchaser	ASEH Supplier Code of Conduct	<ul style="list-style-type: none"> All Suppliers/ Contractors 	Freely Chosen Employment, Young Workers, Working Hours, Wages and Benefits, Occupational Safety, Emergency Preparedness, Responsible Sourcing of Minerals	Supplier sustainability questionnaires/ RBA SAQ, on-site audits, and RBA VAP	
Contributor to Community Development	ASEH Corporate Social Responsibility Best Practice Principles	<ul style="list-style-type: none"> Local Communities 	Water Management, Noise, Air Pollution	Monitoring of noise, effluent, and emissions sources at ASEH facilities	

Human rights management standards and regulations:

1. "ASEH Corporation Human Rights Policy Statement", <https://www.aseglobal.com/en/pdf/human-rights-policy-en.pdf>
2. "ASEH Corporate Social Responsibility Best Practice Principles", https://media-aseholdco.todayir.com/20180713163117124148942_en.pdf
3. "ASEH Code of Business Conduct and Ethics", https://media-aseholdco.todayir.com/20180622151727139618980_en.pdf
4. "ASEH Supplier Code of Conduct", https://www.aseglobal.com/en/pdf/ase_holding_supplier_coc_en_2018.pdf

ASEH Human Rights Risk Matrix



Mitigation Measures for Human Rights Risks

Target	Employee		Supplier/Contractor		
	Labor	Health and Safety	Labor	Health and Safety	Ethics
Risk Issues	<ul style="list-style-type: none"> • Freely Chosen Employment • Working Hours • Wages and Benefits • Sexual Harassment 	<ul style="list-style-type: none"> • Occupational Safety • Emergency Preparedness • Occupational Injury and Illness 	<ul style="list-style-type: none"> • Freely Chosen Employment • Working Hours • Wages and Benefits 	<ul style="list-style-type: none"> • Occupational Safety • Emergency Preparedness 	<ul style="list-style-type: none"> • Responsible Sourcing of Minerals
Mitigation Measures	<ul style="list-style-type: none"> • Employment of sufficient manpower to meet manufacturing capacity and prevent manpower shortages and overtime. • Develop a in-house working hours management and control system to help supervisors manage their subordinates' working hours, send SMS or email alerts to employees working longer hours • Periodically adjust salary and benefit packages based on industry standards • Organization of human rights training courses and implementing thorough complaint and processing procedures • Compliance with local laws and regulations; regular review and revision of employee handbooks and regulations 	<ul style="list-style-type: none"> • Establishment of occupational injury and incident reporting and investigation procedures. Followed and reported to local authorities in accordance with the management policy and local regulations, while injury incidents are reviewed regularly to improve preventive measures • Public fire safety measures in accordance with the recommendations of the National Fire Protection Association; enhanced training in disaster preparedness and safety education • For more information, please refer to Chapter 6.3: Occupational Safety and Health 	<ul style="list-style-type: none"> • Annual audits or RBA VAP to assess suppliers' human rights risks through company subsidiaries in order to mitigate risks. • Requiring suppliers to adopt corrective measures for human rights risks and conduct follow-up on implementation. • For more information, please refer to Chapter 7.3: Supply Chain Sustainability Management-Supplier Sustainability Audit Mechanisms of this report. 		
Remediation Measures	<ul style="list-style-type: none"> • Establishment of overtime management and tracking mechanism to prevent employees from working for seven or more consecutive days. • Establishment of monthly cash incentive bonuses and annual profit-sharing bonuses. In addition, employees with outstanding performance are awarded company stock options. • Disbursement of unpaid wages to terminated employees within the specified period of time set forth in local laws and regulations. • Each case shall be reviewed to determine its cause, and offenders shall be tracked to ensure the effectiveness of the disciplinary or counseling measures. The results of such processes will then be used as a reference for making adjustments to workplace environment and regulations 	<ul style="list-style-type: none"> • Health assessments performed by professional physicians in medical consultation to help employees with self-health management. • Assistance with medical insurance claims • Regular emergency evacuation drills for fire, earthquake, and composite disasters; review and improvement of warning and prevention measures. 	<ul style="list-style-type: none"> • Requiring suppliers to provide guidance or financial compensation, or to implement policy changes or other compensatory measures for employees whose human rights have been violated. • For more information, please refer to Chapter 7.3: Supply Chain Sustainability Management-Supplier Sustainability Audit Mechanisms of this report. 		

Protection of Privacy and Personal Data

Policies and Goals

ASEH values and cares about the importance of privacy and personal data protection. Accordingly, we have adopted a corporate policy on the protection of privacy and personal data and established relevant internal management measures; and requested our subsidiaries and their respective suppliers to collect, process, use, retain and disclose the personal data in compliance with the Personal Data Protection Act of Taiwan, EU General Data Protection Regulation (GDPR) and applicable laws and regulations on the protection of privacy and personal data in other countries or areas where they operate, ensuring the compliant operations and cooperating to protect the privacy and personal data and secure the rights and interests of data subject. Our corporate policy (<https://www.aseglobal.com/en/pdf/privacy-policy-en.pdf>) sets forth clear guidelines and compliance requirement on the use and protection of personal data. We, our subsidiaries and their respective suppliers shall commit to collect, process, and use personal data to the extent not exceeding the necessary and minimal scope of specific purposes, and take appropriate and secure protection measures.

Advocacy and Implementation

To continue to enhance our employees' awareness of personal data protection compliance and ensure the compliance management and implementation, we regularly provide internal training course and important updates on relevant laws and regulations on the protection of personal data and compliance guidance. We also review the status of personal data security, assess any potential non-compliance risk our daily operations may be subject to and establish relevant management plans and measures in accordance with the results of assessment.

Use of Personal Data and Compliant

We have designated a department responsible for matters on the compliance with privacy and personal data protection and a hotline mechanism is also provided for our employees and external personnel to make inquiry or request about personal data based on his/her legal rights. We continue to monitor our use of personal data and throughout year 2020, we did not use collected personal data for any secondary purposes other than the specific purposes for which the personal data was first collected.

Our employees and external personnel may file complaint or report on the personal data matters via our reporting channels. Throughout year 2020, we did not receive any compliant or penalty related to personal data.

Source Type	Government Agency	Individuals or Other Parties
Compliant	none	none
Penalty	none	

3.6 Regulatory Compliance

We conduct all our business activities in strict compliance with relevant laws. To ensure legal compliance, ASEH maintains regular updates on domestic and foreign laws and policies that affect its operations, and prioritizes regulatory compliance at all of its business locations.

ASEH's Corporate Governance Officer and Regulatory Compliance Department assist board directors with overall regulatory compliance and to ensure that activities at ASEH's subsidiaries are performed in compliance with relevant laws and regulations. The checking, updating, identification and compliance reviews of regulations continue to form the core of ASEH's regulatory compliance program. With the program in place, ASEH was able to ensure continuous and effective compliance as well as apply risk control mechanisms to assess potential risk exposures. ASEH's subsidiary companies are required to report all incidences of non-compliance that resulted in penalties, without delay. The responsible subsidiary shall propose immediate improvement plans and both the regulatory compliance department and audit department shall supervise and ensure that corrective actions are taken and completed.

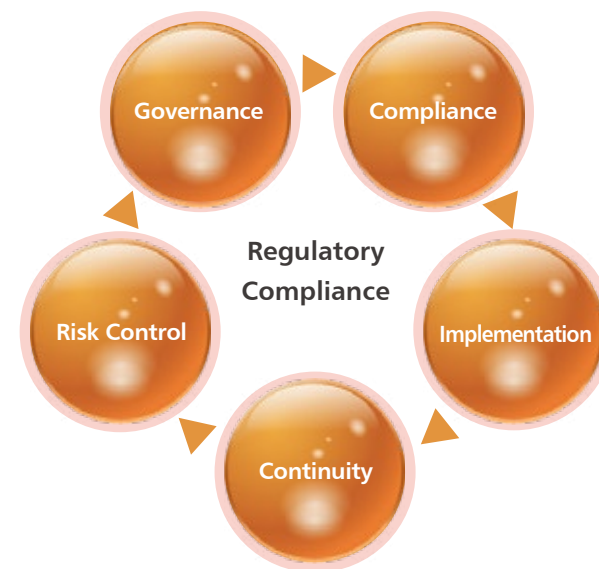
In addition to regular corporate audits on compliance throughout 2020, ASEH has also increased the frequency of audits and contracted consultants to conduct independent checks at subsidiaries that are exposed to higher levels of environmental and workplace safety risks. These actions were taken to further strengthen the regulatory compliance mechanisms at all ASEH subsidiaries.

Developments in the United States' EAR (Export Administration Regulations), which impacts the technology sector, are of particular significance to ASEH, and thus classified as a key focus for all subsidiaries' regulatory compliance. Within Taiwan, we focus primarily on Taiwan's Securities and

Exchange Act, Securities Investor and Futures Trader Protection Act, Labor Standards Act, Enforcement Rules of the Occupational Safety and Health Act, Regulations on Occupational Safety and Health, Air Pollution Control Act Enforcement Rules and Trade Secrets Act. We continuously adapt and modify our internal framework, conduct trainings and disseminate information to educate and communicate the importance of regulatory compliance to the board of directors, management and all employees.

In 2020, ASEH remained in resolute compliance with all major laws and regulations governing public listed companies in Taiwan, including the Company Act, Fair Trade Act, Securities and Exchange Act. ASEH is committed to pursue a perfect record in legal compliance for all of our business activities.

Regulatory Compliance Process



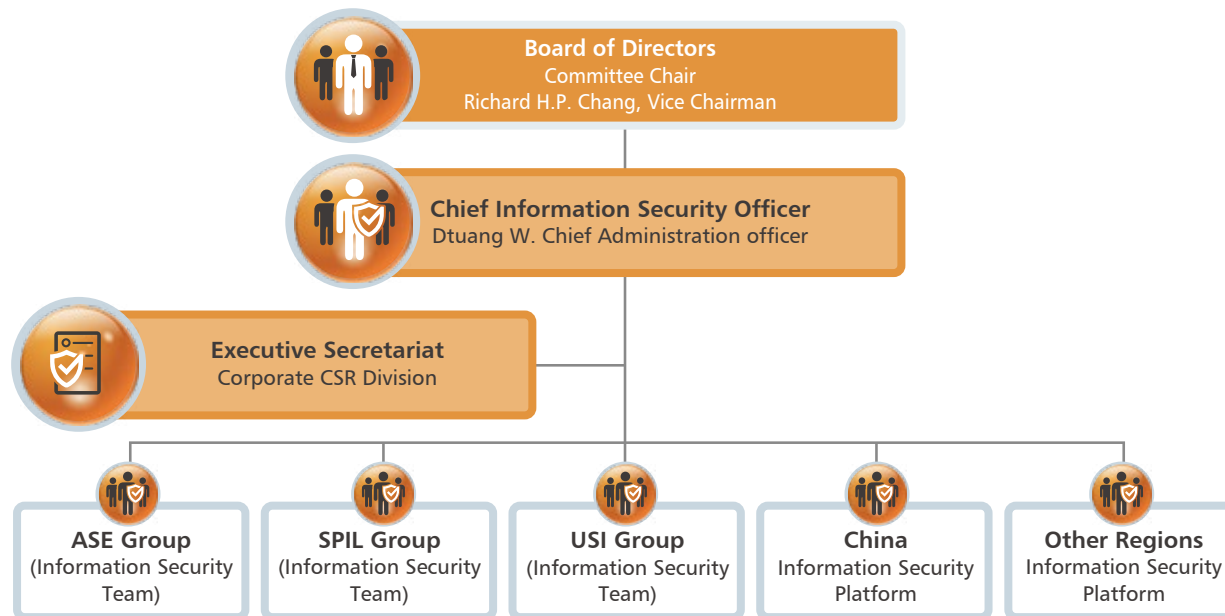
3.7 Information Security Management

Information Security Policy, Organization and Targets

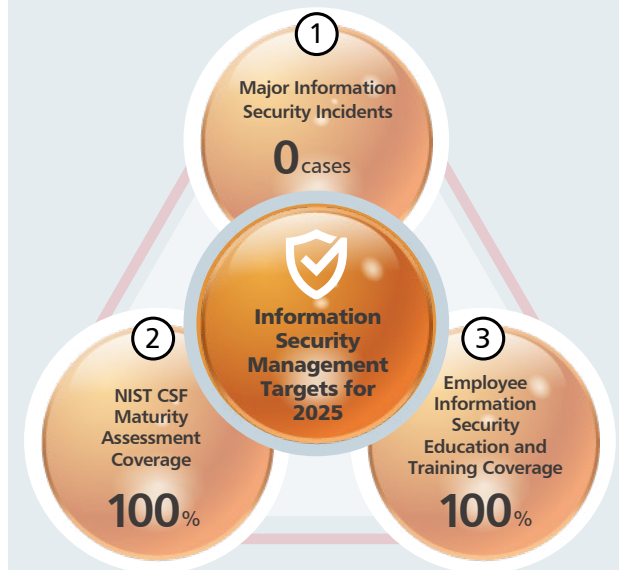
Rapid adoption of digital technologies at ASEH is driving an increased need to strengthen the protection of information assets. To that end, ASEH’s Information Security Policy is designed to safeguard the confidentiality and maintain the integrity and availability of all information assets in accordance with applicable laws and regulations that will result in increasing customer confidence, raising the company’s competitiveness and preventing operational disruptions. Information security risks are assessed in accordance with applicable laws and regulations, and operational objectives, and reported to senior management and the Board of Directors on a regular basis to help set guidelines, strategies and targets.

The Information Security Management Committee, responsible for overall information security across all subsidiaries, was established by the CSC to develop strategic plans, establish benchmarks for information security maturity assessments and coordinate all internal and external technical resources and information. Richard H.P. Chang, Vice Chairman of ASEH has been appointed the chair of the committee. The committee’s Chief Information Security Officer assumes responsibility for the establishment of the information security management framework that includes regular reviews with all ASEH subsidiaries and implementing incident response plans. The committee provides a status report to the Board of Directors in the last quarter of each fiscal year.

ASEH Information Security Management Committee



As our business continues to grow, the amount of information generated have also increased exponentially. Safeguarding the confidentiality, integrity and availability of information forms the cornerstone of ASEH’s information security management. Besides identifying internal and external information security risks and formulating countermeasures, we implemented the NIST CSF maturity assessment in all facilities in 2019. Our cybersecurity policies are formulated to ensure the highest level of network and system protection and mitigation of impacts from any disruption. At the same time, education and training are actively conducted to enhance employee awareness on the importance of information security and prevent major data breaches. Building resilience through a robust information security management system is key to corporate sustainability and will greatly boost stakeholder satisfaction.



For more details on ASEH Information Security Policy, please refer to the link below: https://www.aseglobal.com/en/pdf/2020_aseth_ismp_en.pdf

Information Security Assessment and Maturity

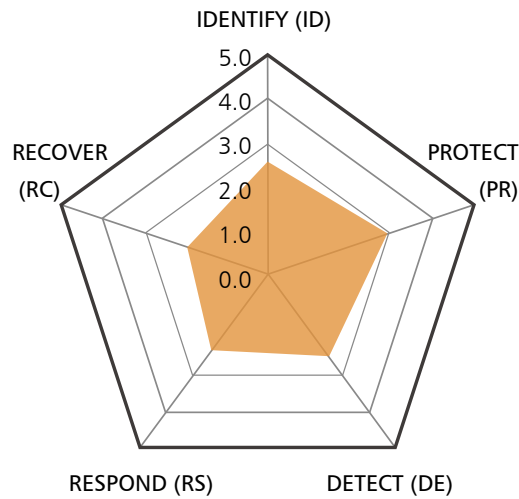
As a multi-national company with leading edge IC assembly, testing and material technologies, it is critical for ASEH to adopt a highly integrative, compatible and flexible information security maturity assessment model. In 2019, ASEH, working with external consultants, formally adopted the NIST CSF maturity assessment tool, with the first year’s target of benchmarking against the semiconductor industry standards. The target for 2020 was set to refine and enhance various information security requirements. ASEH and its facilities tailor the improvements of their own information security system according to the results and recommendations from the maturity assessments. ASEH takes a step further to adjust its

resources and guidance by studying the information security risks of different regions, countries and operations.

The NIST CSF combines industry standards and best practices to create a management framework for organizations to manage their cybersecurity risks. The framework applies five key functions - identify, protect, detect, respond and recover, to assess an organization’s information security maturity for the purpose of establishing an information security management cycle through comprehensive cybersecurity planning and executing regular improvement plans.

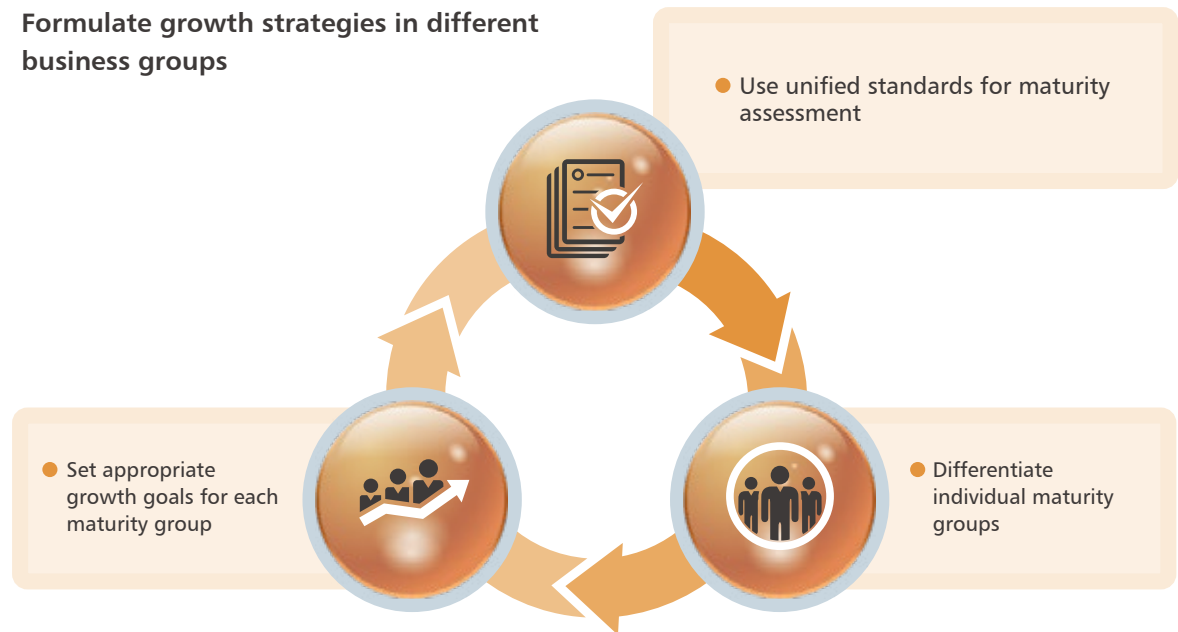
ASEH adopts internationally recognized information security standards to continuously evaluate and improve workflows and management measures. ASE Kaohsiung, ASE Chungli, SPIL and USI have each obtained the ISMS (information security management systems) ISO 27001 certification. ASE Kaohsiung and SPIL have also successively obtained the BCMS (business continuity management system) ISO22301 certification to strengthen crisis management and disaster response. ASEH will continue to adopt efficient, risk-based and systematic approaches to build a comprehensive information security management system.

Cyber Security Resiliency



ASEH Summary Scores

Formulate growth strategies in different business groups



Information Security Implementation and Safeguards

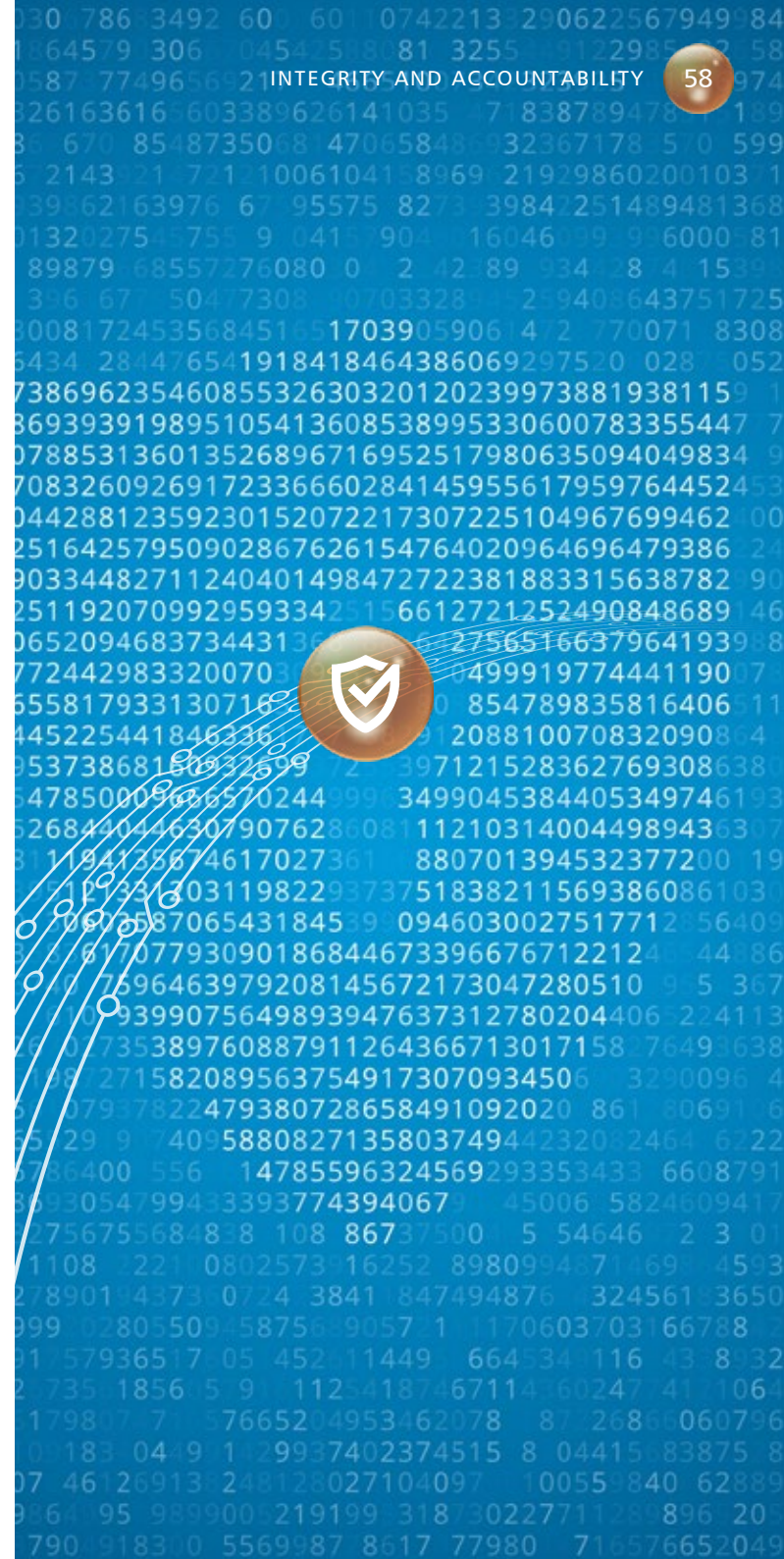
As part of the company's business continuity management, ASEH conducts two disaster recovery drills per year to assure that the organization can effectively respond to an actual disaster and minimize the impact on business operations. The elements of the drill plan include the drill organization chart, scope, timing, critical information systems, participating departments, participating personnel and roles, recovery personnel, steps and procedures, resources, risk management, and post-mortem. Drill plans prepare the company to promptly respond to emergencies and reinstate information systems to normal or acceptable levels, ensuring the effectiveness of the recovery mechanism.

ASEH has had no major information security incidents in the past three years. Besides formulating relevant procedures for the timely reporting and handling of information security incidents and to lower the scope of damage, we commissioned a third-party auditor to conduct annual audits and reviews of our information security performance. The audits help to ensure that the company's information systems and network environment are compliant with the information security management standards. The strict enforcement of information security and privacy policies provide an effective layer of security to safeguard trade secrets and protect customer data.

In the event of a cyber-attack, the information security management team will immediately trigger the exchange of technical information and synchronize updates and responses through a extensive information sharing network.

All ASEH employees participate in the company's annual Proprietary Information Protection (PIP) training course which covers information security policy, management framework and control measures. In 2020, 44,419 employees attended the PIP training course clocking in a total of 32,568 training hours. We have also conducted social engineering email drills to strengthen employee awareness and deployed a mechanism that integrates relevant information security areas like participation, education and training, abnormal incident management, confidentiality classification and antivirus/software security as part of employees' KPI performance. The wide scope of coverage across all organizational levels reduces the company's exposure to potential penalties and legal liabilities and lessens impacts on business operations.

ASEH is committed to enhancing its information security technologies and capabilities as well as investing in the training of information security talent. Over the course of 2020, we maintained close communication with government agencies and local/international information security organizations to keep up with the latest trends, regulations and standards to strengthen and improve our information security management. As we advance our operations into industry 4.0, our competitive edge comes from recognizing the importance of establishing a robust information security management framework that will safeguard the company's interest and that of our business partners and stakeholders.





INNOVATION SERVICE

Innovation is the key to sustainable human development. Through innovation, ASEH improves product value, makes human lives easier in a smart era and elevates social well-being. We take into careful consideration regarding sustainability in manufacturing - integrating environmental protection and social innovation at a product's design stage. As a result, ASEH has produced more efficient products and helped customers lower their power consumption when using our products, contributing to a reduction in greenhouse gas emissions. The effects of product usage on human health were also considered and efforts have been made to manufacture products with non-hazardous materials.

ASEH is committed to improving and protecting the environment by enhancing raw material usage efficiency, recycling resources, reducing wastewater discharge and greenhouse gas emissions, and reducing waste generation and chemical use. We strive to develop and promote comprehensive, environmentally friendly services and manufacturing processes that consider the environmental impact at various stages of the product lifecycle including raw material procurement, design & development, manufacturing, product use, and product disposal. This has enabled ASEH to provide the most environmentally friendly, green manufacturing services.

4.1 R&D and Innovation

ASEH continuously invests in advanced semiconductor packaging technology research and development ("R&D") and cultivates experienced and skilled engineering teams to meet customers' needs for product performance enhancement and cost reduction. By identifying key R&D directions based on future industry needs as well as technology trends, we have developed a strategic technology roadmap for the next 10 years to grasp business opportunities, build patent portfolios and implement sustainable development. Our R&D expense increased 4.9% to NT\$19,302.4 million (US\$687 million) in 2020, compared to NT\$18,395.3 million in 2019, accounting for 4.5% and 4.0% of operating revenues in 2019 and 2020, respectively. As of December 31, 2020, we had a research and development team of 10,890 employees, an increase of 1.1% compared with 10,768 R&D employees at the end of 2019.

Smart manufacturing is entering a new phase, driven by the 5G wave that allows high-speed transmission and low latency, and the rapid developments in AI, the Internet of Things and autonomous driving. The electronics industry continue to seek lower cost, multi-functional, high performance and highly integrated designs for its products. As such, the semiconductor industry strives to move towards a higher system integration level, demonstrating the importance of heterogeneous integration (HI) – a process that enhances functional integration and miniaturization. HI has greatly enabled the development of highly efficient smart communication environments and devices that improve our lives.

Key products and technologies successfully developed in 2020 are as follows:

(1) Flip Chip Packaging (FCP): certified for 7 nano and 10 nano IC chips, 14 nano and 16 nano copper-electroplating process/Low-K dielectric FCP application, hybrid flip chip ball grid array packages with silver-alloy wires.

(2) Wire-bond Packaging: development of second generation advanced embedded component packaging, copper/gold wire bonding with ultra-fine spacing and wire diameter, Mobile DRAM, and wafer-level fan-out RDL wire bond packaging.

(3) Wafer Level Packaging: DBG (Dicing before grinding) process to achieve 30um chip thickness for Fan Out packaging, CPD wafer with 8 Hi HBM Grinding Technology (high precision of +/- 2um), Silicon Photonic component technology, Through-Wafer Via, glass substrate panel packaging, six-sided protection technology for Wafer Level Chip Scale Packaging (WLCSP), Fan-Out PoP development, and die-to-wafer bonding process.

(4) Advanced packaging modules: low power consumption antenna-in-package (AiP) design, flexible substrate panel and packaging, dual side thinning wireless communication modules and 5G antenna-in-package.

(5) Panel-level packaging: Dynamic compensation technology for Fan-Out lithography for used in Panel-level packaging.

Our research and development teams work closely with our supply chain partners including material and equipment suppliers to maximize scale and efficiency in technology development. We also work closely with key customers on new product and manufacturing collaborations. In addition, we collaborate with academic and industry organizations such as the National Sun Yat-Sen University, National Cheng Kung University, National Taiwan University, Tsing Hua University, and ITRI on advanced packaging and testing technology development.

Technology Platforms

R&D is costly and time-consuming, and selecting the right products/technologies in the early stages reduces

the risk level. To address this, ASEH has established a market analysis taskforce consisting of an internal team of R&D staff, research institutions, suppliers, equipment manufacturers and customers. Through the taskforce, the Company is able to regularly exchange views on the latest market developments with players in the industry, focus on new product/technology development to meet emerging market demand, set short, medium and long-term R&D targets, and concentrate its resources on priority projects. In 2020, we held 75 seminars with research institutions, 120 workshops with suppliers and equipment manufacturers, and 90 technology blueprint alignment meetings with customers.

ASEH has formed a Technology Board consisting of experts from a wide range of professional disciplines to achieve horizontal integration and effective technology development through the integration of technology and knowledge sharing, and the creation of a platform for in depth analysis and discussions. Furthermore, we have set up a Knowledge Management (KM) platform that can be accessed globally to encourage employees to share innovative engineering technologies regularly. As of 2020, a total of 20 manufacturing sites and more than 6,000 employees had registered on the KM platform. The platform featured five categories, namely: e-OJT, Technology Board, BKM (Best Known Method), Green Innovation/Climate Change, and Customers/Competitors/Suppliers/External Consultants/Seminar Materials; and contained more than 7,500 technology related data records that had been viewed more than 30,000 times. ASEH will continue to improve the KM platform functions and strengthen the development of its core technology to increase the company's competitiveness and growth potential.

Smart Factories

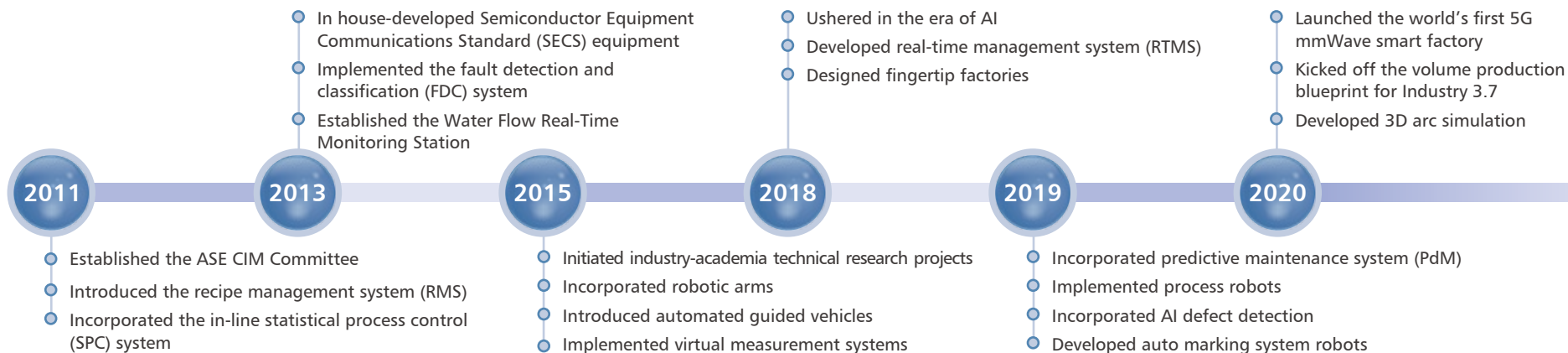
To enhance factory efficiency, improve manufacturing process quality and meet customer delivery time demands, ASEH began to invest in automated, lights-out factories in 2015. Automation, heterogeneous integration in machine and production systems, and heterogeneous integration in systems-in-package (SiP) are 3 major forces driving smart factories and digital transformation at ASEH. In 2011, ASE established the ASE CIM Committee comprising of automation teams from various business units (lead frame packaging, ball-grid array packaging, flip chip packaging, wafer-level packaging, SiP packaging and test services) and the Information Management Center. By 2020, the company has 18 lights-out factories in operation, with more than 500 automation engineers trained, and over 45 industry-academia research projects developed.



Innovative and Breakthrough Methods Adopted in the Creation of Smart Factories

Challenge	Problems encountered	Solution
Inadequate equipment connectivity	<ul style="list-style-type: none"> To meet the needs of smart factories, production equipment information must be collected and stored in a central database so that real-time analyses and management can be conducted In the early days, due to the dearth of OSAT industry production equipment that met Semiconductor Equipment Communication Standards (SECS), equipment connectivity was the top challenge to be overcome 	<ul style="list-style-type: none"> Step 1: Collaborate with procurement units to conduct negotiations with equipment suppliers and request that new production equipment meet SECS standards. Step 2: Perform research on existing production equipment to find ways to achieve automatic connection and convert into compatible SECS formats. After years of development, ASEH's production equipment now meets SECS standards.
High complexity of product tracking	<ul style="list-style-type: none"> Automotive customers require strict records of the production history of all automotive chips to facilitate tracking when problems occur In semiconductor chip manufacturing, product tracking begins at the wafer fabrication stage. The wafers will then proceed to the next process stage. Once the wafer is cut into individual dies for packaging, the dies do not have any markings for identification and tracking 	<ul style="list-style-type: none"> Use 2D codes and RFID technology to accurately record the individual wafer and the location on the wafer that each die originated from, the location on the substrate and the locations on the die carrier and substrates All the location information are stored in the map system database that can be accessed any time. Customers are able to check production history, while our engineering teams can use the data to perform quality and yield analyses.
Lack of local automated equipment supply chains	<ul style="list-style-type: none"> In the early stages, most automated equipment suppliers were large foreign suppliers that commanded high prices, were inflexible and provided long lead times. As a result, we faced delays in project completion and unsatisfactory outcomes. 	<ul style="list-style-type: none"> Actively look for local suppliers of automated equipment including automated guided vehicles, automatic storage and robotic arms, etc. In recent years, we have established business relationships with approximately 30 automation suppliers, strengthening the local automation industry chain in Taiwan.
Lack of qualified personnel	<ul style="list-style-type: none"> At the time when the ASE CIM Committee was established, there were only 30 engineers who qualified to manage the automation process. 	<ul style="list-style-type: none"> More than 500 smart factory automation engineers have been trained through the establishment of automation and AI academies as well as industry-academia research programs.

1st light-out factor ▶ 18th light-out factory

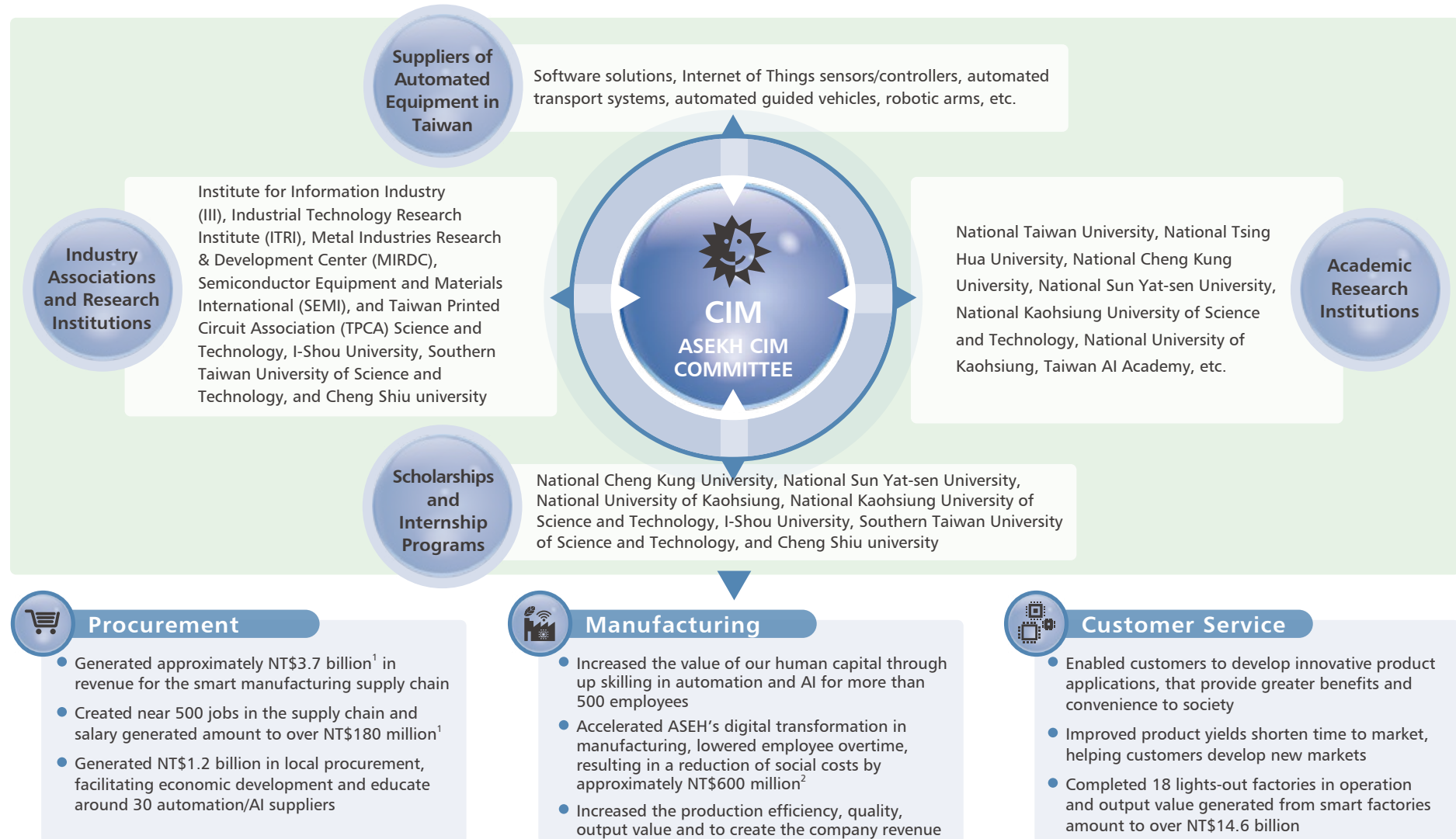


Smart Factory Milestones

2011	Introduced the recipe management system (RMS)	As a control measure before mass production, the EAP transfers data to equipment through SECS/GEM, ensuring data validity and improving overall equipment efficiency (OEE).
2013	In house-developed Semiconductor Equipment Communications Standard (SECS) equipment automation program (EAP)	To overcome challenges in equipment connection program development, we designed a development platform for standardized equipment connection programs, solving process design problems, lowering program development complexity, and increasing human-machine ratios and operation time.
	Implemented the fault detection and classification (FDC) system	By collecting equipment production parameters in real-time, systems are able to report equipment status immediately and check formal functions automatically so that warning signals are issued when malfunctions occur, thereby preventing the repeated manufacturing of defective products and ensuring that reporting mechanisms are in place to detect malfunctions in real time.
2015	Introduced robotic arms and automated guided vehicles (AGVs)	AGVs and robotic arms were integrated to introduce the autonomous mobile robot (AMR) that can support transport operations, thus reducing manpower on the floor and maximizing packaging capacity.
2018	Ushering in the era of AI	Applying AI powered detection technology to identify and intercept any malfunctioning equipment that may compromise information security and prevent any information security incidents. The in house-developed technology helps mitigate information security risks and reduce investment costs.
2019	Incorporated the predictive maintenance system (PdM) (Predictive Maintenance, PdM)	A predictive maintenance system helps determine equipment that is likely to require maintenance and predicts equipment component failures and malfunctions in advance. The system allows early notification of maintenance personnel to service the equipment, thereby lowering equipment failure time.
2020	Launched the world's first 5G mmWave smart factory	The 5G mmWave smart factory was a collaborative effort between ASE, Chunghwa Telecom and Qualcomm, showcasing the future of automation and smart factories. 3 use cases were developed to demonstrate the use of 5G mmWave in smart factories - automated production line inspection using AI+AGV, remote AR maintenance and the AR experience at the ASE green technology center.

Sustainable Impact of Smart Factories

Our smart factory concept began with a strong foundation in automation, and the heterogeneous integration of customers, suppliers and production processes, to drive the semiconductor industry onto a higher value chain and accelerate technology advancements. Smart factories represent the next leap for the semiconductor packaging and test industry to play an enabling role beyond More than Moore.



¹ The amount of revenue generated and the number of jobs created in the supply chain were calculated using input-output analysis (IOA). In our calculation, we used the data from the OECD Input-Output Tables and the EXIOBASE 2 database as references and assumed that all suppliers are based in Taiwan.

² Employee overtime was calculated using accumulated data since the adoption of digital transformation until the end of 2020. We referenced data from the Eco-costs database to analyze the reduction in risks to health damage due to a reduction in overtime and work hours from the implementation of factory automation. The data was converted into monetary value according to OECD (Organization for Economic Co-operation and Development, 2012) guidelines.

Automation technologies introduced in 2020:

Technology	Challenge	Solution
Real-time monitoring of key manufacturing data from production lines	To monitor real-time manufacturing data across all production lines	In collaboration with the sensors installed on all our manufacturing equipment for collecting real-time manufacturing data as well as the set up of an automated optical inspection (AOI) system for automatically detecting defective inventory, our manufacturing execution system (MES) can track and document all of the key data of the work in progress. This enables us to obtain and analyse data real-time and raises productivity immensely.
Using robots to automate mold cleaning	In the past, operators had to endure prolonged periods of heat to clean encapsulating molds.	We have independently developed an automation technology that combines automated guided vehicles (AGVs) with robotic arms capable of handling the mold cleaning process. The automation has helped to dramatically reduce work-related injuries. In addition, we introduced a real-time dispatching system to streamline the cleaning process and integrate the operation of the process equipment with the AGVs to drastically improve mold cleaning efficiency.
Smart Control Center for immediate troubleshooting	To reduce manpower and costs, and minimize disruptions due to machine malfunctions and production halts	Our Smart Control Center monitors our automated production lines in real time and allows us to manage equipment across various production lines in a centralized manner. The control center is equipped with a Robotic Process Automation (RPA) system that enables engineers to re-configure machine software, perform automatic troubleshooting, identify and fix any equipment issues remotely through the use of live video feeds.
5G mmWave Smart Factory	To adapt the technology in smart factories that integrates analysis, detection, machine learning and optimization.	<p>(1) Powered by 5G wireless networks, the introduction of remote augmented reality (AR) maintenance assistance allows our equipment engineers to conduct machine diagnosis and maintenance from a centralized control room. With AR assistance, the engineers can synchronize with other colleagues from different locations, to service the equipment and hardware, and troubleshoot any problems. The low latency and high speed features of 5G network allow the simultaneous transmission of high-resolution images captured during the maintenance process for back-end analysis. The ability to make real time adjustments significantly increase the efficiency in equipment maintenance.</p> <p>(2) Automatic inspection of production lines is accomplished via AI and Automated Guided Vehicles (AGV). With 5G, cameras embedded in smart unmanned vehicles and AI-enhanced big data analysis enable routine inspection and surveillance on the production floor. The tasks performed autonomously reduce manpower burden, detect problems immediately and ensure workplace safety.</p>

Intellectual Property Management

Intellectual property (IP) rights are important achievements in research and development, and a key aspect of innovation management. Effective IP management helps to maintain ASEH's leading position in corporate innovation.

ASEH has established an IP policy that serves to protect the company's technological innovations and its global leading position. In addition to continuously striving towards R&D innovation and developing IP management strategies that conform with the company's development trends, ASEH's IP management also helps to generate commercial benefits for the company.

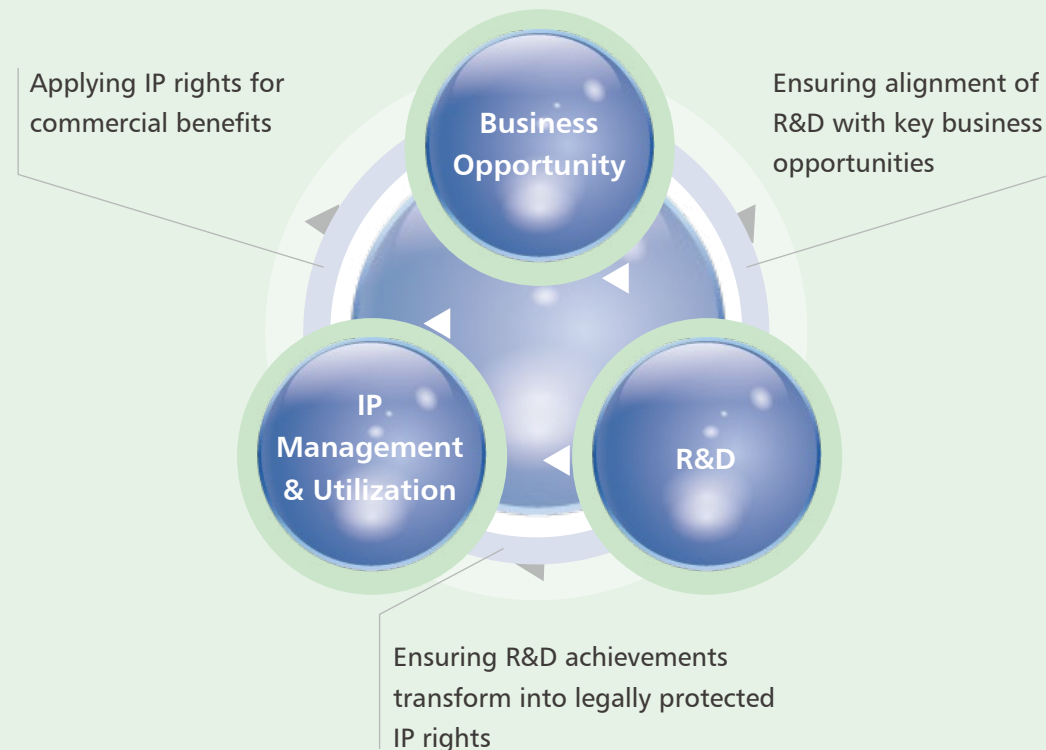
ASEH's IP management is tightly embedded into the company's business operation blueprint, forming a continuous innovation cycle that encompasses business opportunities and R&D, to IP management and utilization that includes the following three phases:

- 1) To maintain ASEH's technology leadership and to better respond to future market needs, the company invests aggressively in research and development, aligns R&D with key future business opportunities and invests heavily in talent development and R&D resources.
- 2) Our robust IP application system and tools ensure that R&D achievements are transformed accurately, thoroughly and effectively into legally protected intellectual property rights. To ensure comprehensive protection for key technologies and strengthen patent quality, ASEH adopts a 3-pronged approach: developing a comprehensive portfolio, re-assessing patents to identify those of value and, revitalization to increase the value.

Patents must also provide business value in order to maximize R&D investment returns. ASEH puts in place a system of measures to protect the company's trade secrets and maintain its unique competitive advantage, including information security systems, employee awareness training and education and systematic management. Where appropriate, the company will enforce applicable laws and regulations to prevent improper use, leakage or misappropriation of the company's intangible assets by others to ensure that ASE's investments, rights and interests are duly protected.

- 3) High-value IP helps to facilitate business success, obtain customer orders and develop more business opportunities, thereby creating a positive sustainable cycle. Our robust IP management prevents unauthorized use of ASEH's technologies by others and helps to defend against any threats from competitors.

ASEH Intellectual Property Management



ASEH's patent portfolios comprise a variety of technologies related to semiconductor packaging and test, and electronics manufacturing. As of January 31, 2021, the company has a total of 6,038 patents, of which 2,473 were filed in Taiwan, 1,836 in the US, 1,695 in the People's Republic of China, 9 in Europe, and 25 in other countries. There are a total of 1,631 pending patent applications including 175 filed in Taiwan, 572 in the US, 852 in the People's Republic of China, 15 in Europe, and 17 in other countries.

Three phases to generating patent value

Comprehensive Portfolio

Early and indepth deployment of patents according to market and technology developments

Patent Valuation

As market conditions and patent functions become clearer, re-assess the quality and value of patents in the portfolio

Value-Added Revitalization

Promoting the patent value and strengthening the patent portfolio to revitalize patents and increase their value



4.2 Sustainable Manufacturing

ASEH applies its four major sustainable manufacturing principles and the key concept of “doing more with less” to improve the value of products to customers and reduce the impact to the environment. Hazardous substance management is a crucial aspect within a sustainable manufacturing process, and we are managing it through the optimization of the green product management system (GPMS), establishing of substance databases, and compliance with the EU RoHS Directive, REACH regulations, Energy Star and

the Energy-related Products (ErP) directives, in addition to customer requirements. On top of formulating hazardous substance guidelines and ecological product designs, our management of such standards are much stricter than prevailing laws and regulations.

We increased control measures for chemicals that cause health hazards and increase environmental load risks, including bioaccumulation, persistent pollutants, and materials that are carcinogenic, mutagenic and

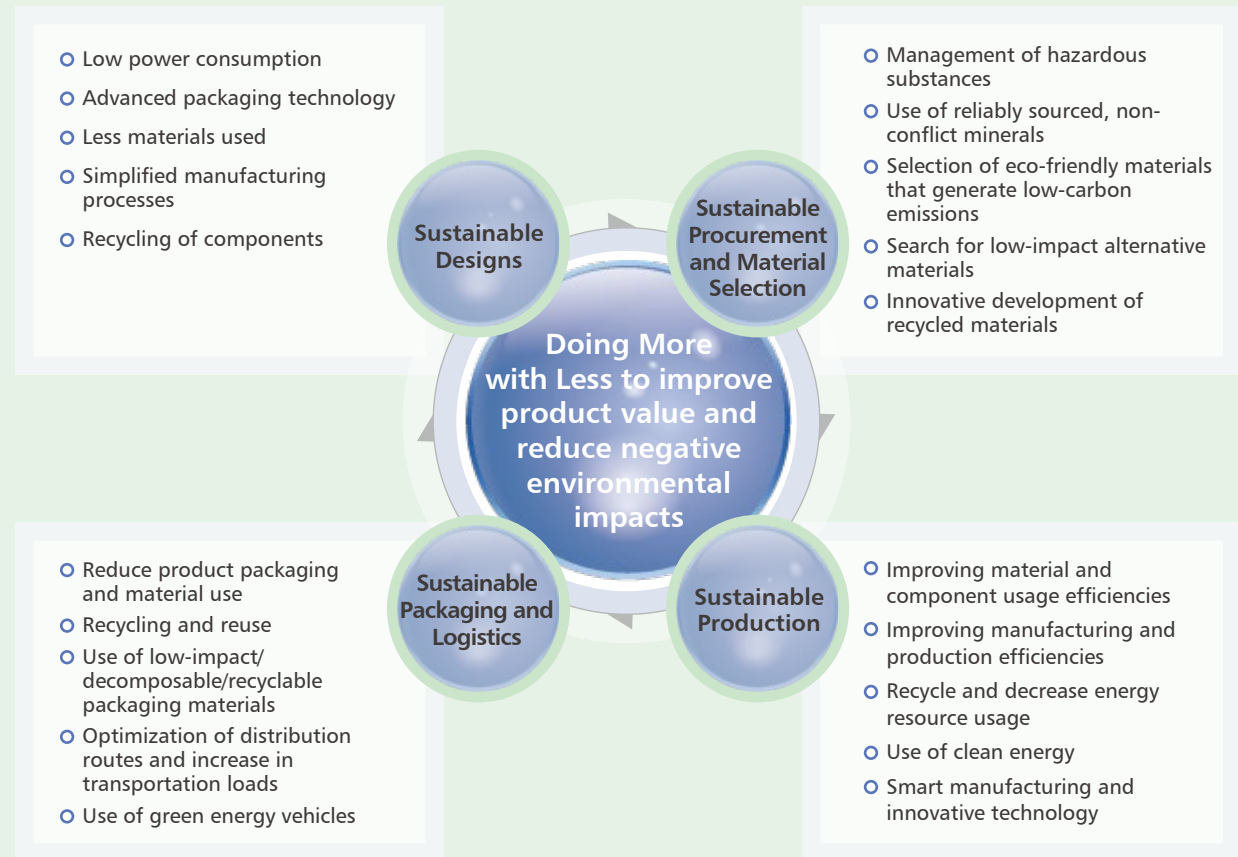
toxicity to reproduction. In addition to regulating the chemical substances in products, any newly introduced chemical material during the manufacturing process that falls within the scope of customer restrictions or the EU REACH Restricted Substances List will be entirely prohibited for use and further to promote replacement plans for existing substances. Employee health and safety is a priority at ASEH and we will continue to ensure an environmental-friendly manufacturing workplace.

Production Commitments

- Compliance with all applicable laws and regulations
- Management of hazardous substances in components and raw materials used in manufacturing
- Solutions for the design of lightweight, thin, small and energy-efficient products
- Reducing the environmental impact from manufacturing, packaging, and transportation

Green Laboratory

- Evaluation and development of green materials: Non-toxic/mildly toxic raw materials and chemical products
- Development of environmental testing technology: Establish monitoring technology, mechanisms and standards in compliance with global environmental regulations
- Developments in green manufacturing: Evaluate the technologies in recycling, reduction, and reuse of materials and waste
- Development of environmental-friendly packaging: Develop bio-composite material packaging



Product Lifecycle Assessments

We have incorporated the ISO 14067 product carbon footprint and ISO 14045 eco-efficiency assessments into our operations and have completed the inventory and evaluation of our five major packaging product series (i.e., BGA, Lead Frame, CSP, Flip Chip, Bumping). We have also extended the analyses of key “substrates” and conducted environmental impact analysis of product life cycles. In addition, we have established databases and incorporated simulation algorithms for product research and development to increase product value while elevating ecological efficiency. We provide our customers a complete suite of manufacturing services as well as the development of energy-saving products such as wireless communication modules, POS machines, ATX power supplies that connect to multiple desktop outputs, motherboards, smart handheld devices, NAS systems, SSDs and server systems.

Smart Manufacturing

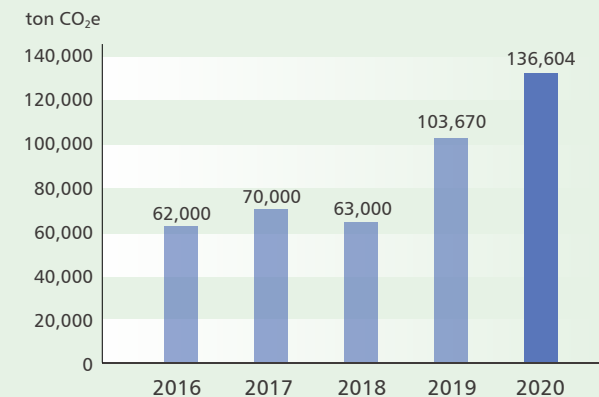
ASEH is looking to increase its product value while lessening environmental impacts.

$$\text{Eco efficiency } \uparrow = \frac{\text{Product or service value } \uparrow}{\text{Impact on the environment } \downarrow}$$

Strategic Plans:

- Lower material intensity
- Decrease energy intensity
- Diminish the spread of toxic substances
- Improve recyclability
- Enhance product durability
- Elevate service intensity

Reduction Assessment of Product Usage Stage



Product Lifecycle Assessments

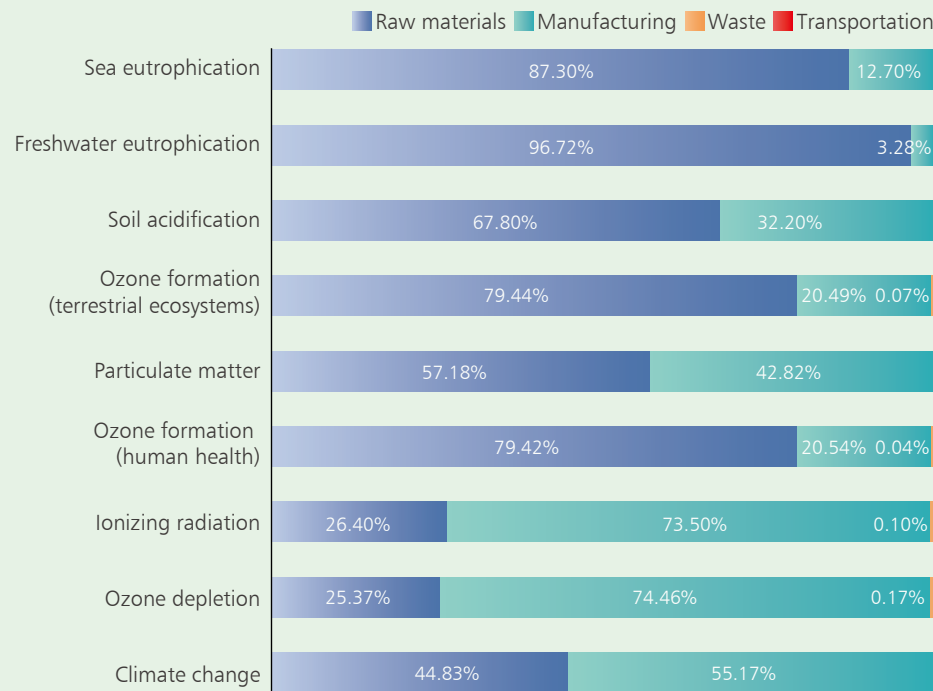
● Completed ▲ Being implemented ★ Items completed in 2020

Category	Product Series	Carbon Footprint	Eco-efficiency Assessment/ Environmental Footprint	Improvement Strategies and Actions
Assembly	BGA	●	●	Design <ul style="list-style-type: none"> ■ Consider factors such as product lifecycle, circulation and eco-efficiency during the design stage ■ Develop a new generation of energy efficient products Example: The QFN products used in current smart TVs show an electrical property improvement of 25% and lower power consumption compared with those of previous generations ■ Upgrade technology, strengthen product functions, and reduce material inputs Example: The reduced sizes of ICS wireless products led to a decrease in material usage by 30% Procurement and materials <ul style="list-style-type: none"> ■ Select environmentally compatible materials that generate low-carbon emissions Examples: Copper wires are used as a replacement of gold wires, lowering product carbon emissions ■ Utilize environmentally friendly alternative materials Examples: Use of boron-free developers, non-reproductive toxic photoresist stripping solutions, halogen-free materials ■ Research and develop recycled materials or extend product service life Production <ul style="list-style-type: none"> ■ Introduce smart system controls to improve efficiency energy utilization ■ Enhance manufacturing process equipment or components to increase product lifecycles ■ Value chain cooperation and material recycling Examples: Organic compound cyclopentanone, acetone recycling, plastic carbonization application Packaging and logistics <ul style="list-style-type: none"> ■ Material recycling Examples: Recycling of buffer materials, pallets and logistics boxes ■ Avoid the use of foams with a substantially negative impact on the environment ■ Promote low-carbon transportation Examples: Switch from air freight to sea freight, use green energy vehicles
	Lead Frame	●	●	
	CSP	●	●	
	Flip Chip	●	●	
	Bumping	●	●	
	SIP Technology	★	★	
Substrates	●	●		
Test	●	●		
Electronic Manufacturing Services,EMS	4G dual frequency communication module	●	●	
	XnBay smart storage server	●	●	
	Printer head	▲	▲	

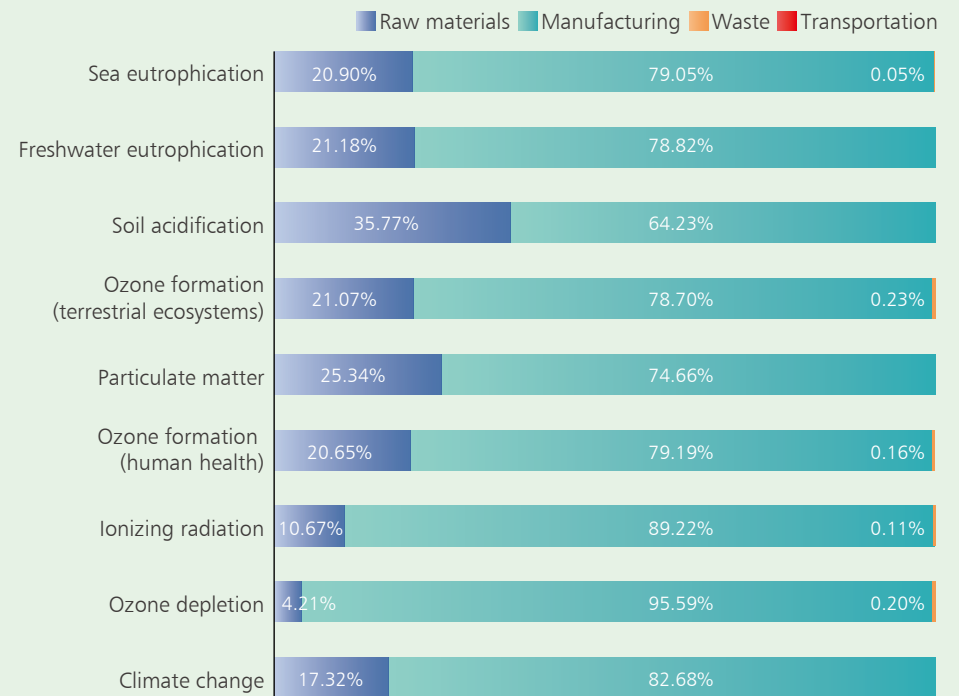
We continue to expand our product life cycle evaluations and are working with experts to utilize evaluation software - SimaPro and the ReCiPe 2016 Midpoint(H) methodology to explore our products' environmental impact across 18 aspects. For example, in flip chip packaging, we analyzed the degree of impact of using different wire materials in regard to each environmental aspect and found that products containing gold wires had a considerably significant environmental impact during the manufacturing stage. Therefore, we have begun to gradually replace gold wires with copper wires, and are looking into the development of non-wire bonding and other more advanced IC packaging technologies in order to help minimize environmental impact.

Product Life Cycle Assessment Results

Flip Chip (Au)



Flip Chip (Cu)



4.3 Products and Services

ASEH provides the design, manufacturing and enabling of many electronic end products, including smartphones, PCs, tablets, game consoles, security chip cards, automotive sensors, entertainment systems and many more. We offer a broad range of advanced and legacy semiconductor packaging and testing services as well as electronic manufacturing services. The semiconductors we package are used in a wide range of end-use applications, including communications, computing, and consumer electronics, industrial, automotive and other applications. Our testing services include front-end engineering testing, wafer probe, final testing and other related semiconductor testing services. Our electronics manufacturing services are used for various applications, including computers, peripherals, communications, industrial applications, automotive electronics, and storage and server applications.

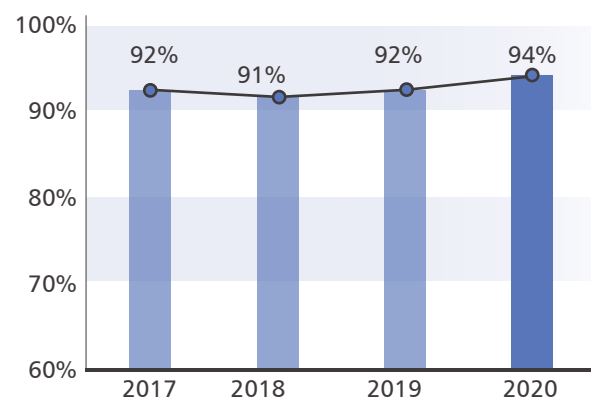
Customer Service

Our key customers typically operate in the semiconductor and electronics industries. Our five largest customers together accounted for approximately 46.2% , 51.1% and 54.5% of our operating revenues in 2018, 2019 and 2020 respectively. To achieve total customer satisfaction, we uphold world-class quality and reliability for our products and services through thoughtfully defined quality assurance methodologies. Our quality assurance systems impose strict process controls, statistical in-line monitors, supplier control, data review and management, quality controls and corrective action systems. There were no product recalls (arising from health or safety concerns) issued by customers in 2020.

To ensure that customer suggestions are properly processed, we have a dedicated team in place for reporting feedback and managing customer communication. We have designed multiple communication channels with customers which include technical forums, and regular email updates on significant events, milestones and business highlights. In addition, we actively participate in various technology forums to promote our advanced manufacturing processes and innovative technologies.

In order to provide the best customer service, we reach out to our customers through various means and at different intervals, including monthly/quarterly customer surveys for evaluating quality, cost, delivery, technology, and service/sustainability, customer surveys, annual/quarterly/monthly meetings and the supplier award program. We have also set our annual customer satisfaction target at 90% (i.e. at least 90 of our top 100 customers remain satisfied.) We continue to focus deeply on improving customer satisfaction to establish trust and value for our customers.

Key Customer¹ Satisfaction Trend



¹ Key customer: ASEH's top 100 customers account for > 95% of the company's revenues in 2020





5 GREEN MANUFACTURING AND LOW-CARBON TRANSFORMATION

ASEH is committed to improving our eco-efficiency and protecting the environment by continuously enhancing resources recycling, and reducing greenhouse gas emissions, waste generation, wastewater effluent, and chemical usage.

ASEH strives to develop and promote a environmental friendly manufacturing and service concept in all facets of its enterprise. From material procurement, design, manufacturing, product use and disposal, we conscientiously incorporate environmental impact factors at all stages of life cycle to provide green and low-carbon manufacturing services.

2020 • Key Performance



Received an 'A' score from the evaluation results of the CDP Water Security Questionnaire



Recognized on the CDP Climate A list for the fourth time



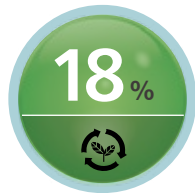
Listed on the CDP Supplier Engagement Leader Board for 3 consecutive years



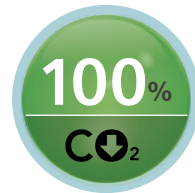
Climate change transitions and concrete risk scenario analyses



Computation of the financial implications of climate risks



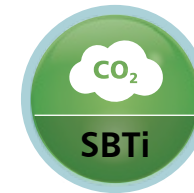
18% of total energy consumption achieved through renewable energy or green certificates



100% coverage rate for greenhouse gas verifications and climate change risk assessments



300 energy saving and carbon reduction initiatives that reduced energy consumption by 16.8%



Passed a compliance review by the Science Based Targets initiative



28 green certifications and 12 green factories

SDGs	Business Actions and Contributions	2020 Key Aspects	KPI	2020 Target	Status	2020 Performance	2021 Target	2025 Target
6 CLEAN WATER AND SANITATION	<ul style="list-style-type: none"> Develop and implement holistic water strategies within the scope of our business and supply chain operations that are socially equitable, environmentally sustainable and economically beneficial Protect and/or restore water-based ecosystems across our operation and supply chain 	Water Resource Management	Water withdrawal intensity (water withdrawn/revenue)	5% reduction compared to 2015	Achieved	30% reduction compared to 2015	6% reduction compared to 2015	10% reduction compared to 2015
			Days of production shutdown caused by phase 3 water rationing in Taiwan (water supply reduced by 30%)	0 days	Achieved	0 days	0 days	0 days
7 AFFORDABLE AND CLEAN ENERGY	Significantly increase energy efficiency, obtain remaining energy needs from renewable sources, and leverage support from suppliers to promote the similar actions across our supply chain Develop and implement business models that deliver sustainable energy and energy efficiency technologies to new markets and communities	Energy Management	Energy saving rate achieved through energy saving and carbon reduction projects	Equivalent to 2% of the electricity demand in 2020	Achieved	Equivalent to 16.8% of the electricity demand in 2020	Equivalent to 2% of the electricity demand in 2021	Equivalent to 2% of the electricity demand in 2025
			Renewable energy ratio	Renewable energy consumption accounts for 12% of total electricity consumption	Achieved	Renewable energy consumption accounts for 18% of total electricity consumption	Renewable energy consumption accounts for 15% of total electricity consumption	Renewable energy consumption accounts for 27% of total electricity consumption in 2025
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	<ul style="list-style-type: none"> Design and adopt a responsible, circular business model Shift to a portfolio of goods and services that requires less resources and produces less waste 	Waste and Recycling	Non-hazardous waste recycling rate	90%	Achieved	94%	90%	90%
			Hazardous-waste intensity (hazardous waste output/revenue)	5% reduction compared to 2015	Achieved	30.8% reduction compared to 2015	6% reduction compared to 2015	10% reduction compared to 2015
13 CLIMATE ACTION	Align with science-based climate targets to substantially reduce emissions associated with our business and supply chain operations	Climate Change	GHG intensity (scope 1 & 2 emission/revenue)	5% reduction compared to 2015	Achieved	38% reduction compared to 2015	6% reduction compared to 2015	10% reduction compared to 2015
			GHG emission verification	100% of facilities	Achieved	100% of facilities	100% of facilities	100% of facilities

The intensification of climate change is ushering in the dawn of a low-carbon and circular economy, and is fundamentally transforming the pursuit of environmental sustainability and green initiatives by businesses to stand out in a fiercely competitive market. Capital markets are playing a big role in boosting sustainable investments, customers are also starting to require their suppliers to demonstrate a bigger commitment to decarbonization, and governments are continuously enacting new regulations to shift businesses towards a low-carbon future. The increasing attention from various stakeholders on natural resource and climate issues is accelerating ASEH's pace to minimize climate change through mitigation and adaptation. The company's climate leadership is built upon a framework that combines the support from corporate governance levels with participation from all levels of employees. The creation of the TCFD (Task Force on Climate-related Financial Disclosures) has given rise to a global climate-related financial market and ASEH's participation in the disclosure has gained increased recognition from the investment community. In 2020, ASEH was the only semiconductor company worldwide to score a double 'A' on the CDP Climate and Water Lists, the gold standards for measuring sustainability achievements.

The Environment & Green Innovation Taskforce under the ASEH Corporate Sustainability Committee adopts a flexible management approach in its role as a coordinator. In order to track the progress of targets, an environment performance dashboard is used to dynamically track data on electricity consumption, water withdrawals and waste production and other parameters. We have also created a 'Green Solutions Sharing Platform' to promote sustainable design in the new product development process, including material usage minimization, selection and R&D of low-carbon footprint materials, hazardous material management systems, and process designs with higher energy and water efficiency. The sharing platform and the organizing of technical exchange seminars on the environment will allow ASEH to build consensus and facilitate technology exchange. Going forward, we will mobilize teams of experts to provide consultation services, recommendations for improvement and various support measures including mentorship for larger facilities to guide smaller facilities. These actions will induce continuous growth of ASEH's overall eco-efficiency.



A Double **A** for Global Climate and Water Stewardship

5.1 Climate Leadership

Transitioning towards Low-Carbon Resilience

For four years in a row, ASEH has been on the CDP climate A list, a world leading environmental standard. To gradually transition towards a low-carbon future and build climate resilience, ASEH adopts a four-prong approach through low-carbon strategies, a comprehensive management framework, socially responsible actions and performance-oriented results. We begin by establishing a clear-cut strategic axis for low-carbon transition and then applying international management standards to strengthen internal systems and taking responsible actions to improve production models and create green value with our value chain partners. We would subsequently track and evaluate the results of our performance. Climate change and energy resource management present a host of challenges and opportunities for ASEH as developments relating to government policies, technology and decarbonization as well as natural disasters can drastically impact ASEH's operations. ASEH views challenges as opportunities and in response to climate change, we plan to share our low-carbon solutions with the global market to demonstrate our leadership in sustainability and to meet stakeholder expectations.

Four Major Milestones	Principal Methodology
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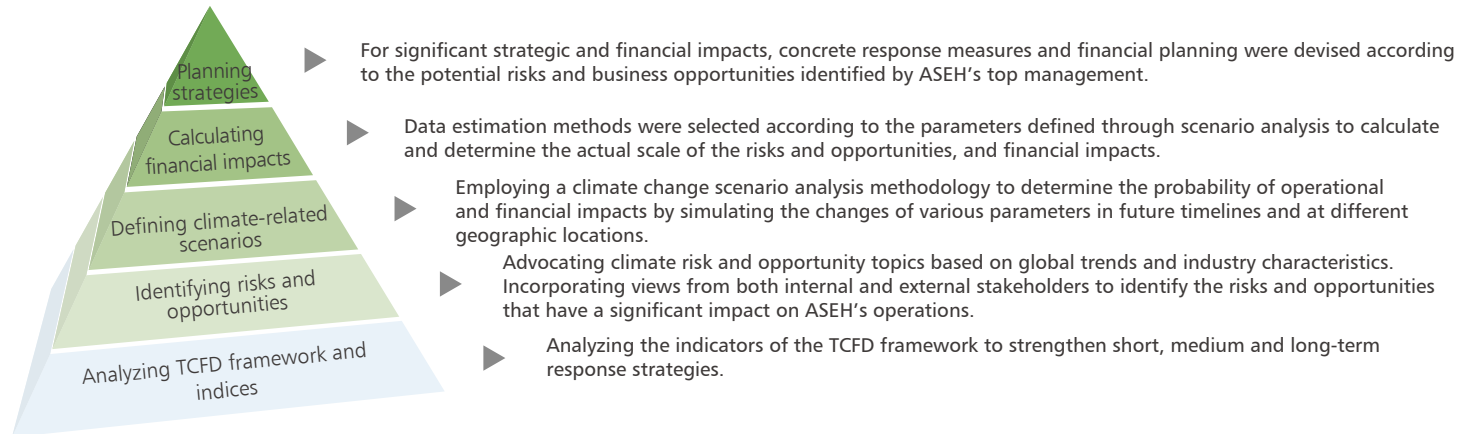
1 Low-carbon strategies

- ✓ Integrated carbon management: promoting low-carbon development through energy saving, green energy and energy storage
- ✓ Low-carbon energy investments: investing in green and renewable energy sources to lower environmental and external social costs
- ✓ Climate solutions: providing the global market with feasible low-carbon solutions
- ✓ Sustainable lifestyle: promoting and internalizing a sustainable way of life by fostering a low-carbon culture internally and contributing low-carbon solutions externally

2 Comprehensive management framework

Managing climate-related risks and opportunities within ASEH’s enterprise risk management (ERM) framework by adopting the recommendations issued by the Task Force on Climate-related Financial Disclosures (TCFD, formed by the Financial Stability Board) yearly. Through the combination of scenario analysis, possible outcomes can be simulated from various uncertainties in climate change so as to control risks within acceptable parameters, thereby protecting and advancing the company’s overall interests.

3 Socially responsible actions



4 Performance-oriented results

Adaptation:

- ✓ Maintaining oversight of the risk analysis and adaptation planning of facilities worldwide
- ✓ Deploying a Business Continuity Management (BCM) plan to strengthen the analysis of potential risks and emergency response measures
- ✓ Adopting smart grid technologies to facilitate deployment of electricity and optimize power consumption to prevent disruptions caused by power shortage
- ✓ Conducting risk assessments, green procurement and material recycling through sustainable supply chain management

Mitigation:

- ✓ Building green facilities and adopting renewable energy
- ✓ Committing to Science-Based Targets and net-zero emission targets
- ✓ Increasing energy efficiency, promoting circular economy and expanding water reuse
- ✓ Promoting material recycling and assisting suppliers in the recycling efforts

Strategic and Financial Planning:

- ✓ Continuous assessment of financial impacts from climate risks and opportunities and participation in DJSI and CDP disclosures
- ✓ Development of a long-term blueprint for value chain partners, participation in customer’s Supplier Clean Energy Program and producing low-carbon products
- ✓ Launching two green bonds totaling US\$600 million with proceeds used on green projects
- ✓ Demonstrating commitment to net-zero emission targets and exerting positive social influence

Task Force on Climate-Related Financial Disclosures (TCFD) Framework

Governance

The CSC is ASEH's highest-level organization and is comprised of top management executives who also serve as members of the board of directors. The Committee supervises and makes decisions on the implementation of sustainability projects on a quarterly basis, and reports directly to the board of directors. The Environment and Green Innovation Taskforce under the CSC is responsible for environmental protection and climate change-related issues. (Please refer to 2.1 Organization and Structure for details)

Strategy

- a. According to our internal goal management timeline, short-term is defined as less than three years; mid-term three to five years; and long-term more than five years. Short-term risks mainly come from raw material costs, renewable energy regulations and occurrence of extreme weather events. Mid-term risks include GHG emissions costs, low-carbon technology transitions and changes in customer preferences. Lastly, sector stigmatization, low-carbon market demands and incremental changes in climate parameters are classified as long-term risks.
- b. Impacts on operations include products, services, supply chain, customers, research and development, and adaptation and mitigation measures. Impacts on strategy include using limited resources and searching for strategic sustainability partners to create optimum semiconductor industry value. Financial impacts include revenues, management costs, capital acquisitions, and assets and liabilities.
- c. Conducting simulation analyses on climate risks in transition and physical contexts.

Risk Management

- a. Formulating climate risk and opportunity assessment forms and documents and conduct regular risk assessments each year.
- b. Presenting the results of the assessments on risk and opportunity identification at the CSC meeting for committee and taskforces members to work out response measures for major risks.
- c. Integrating climate change and various operational risks into the ERM system so as to identify, evaluate and manage according to standard operating procedures.

Metrics and Objectives

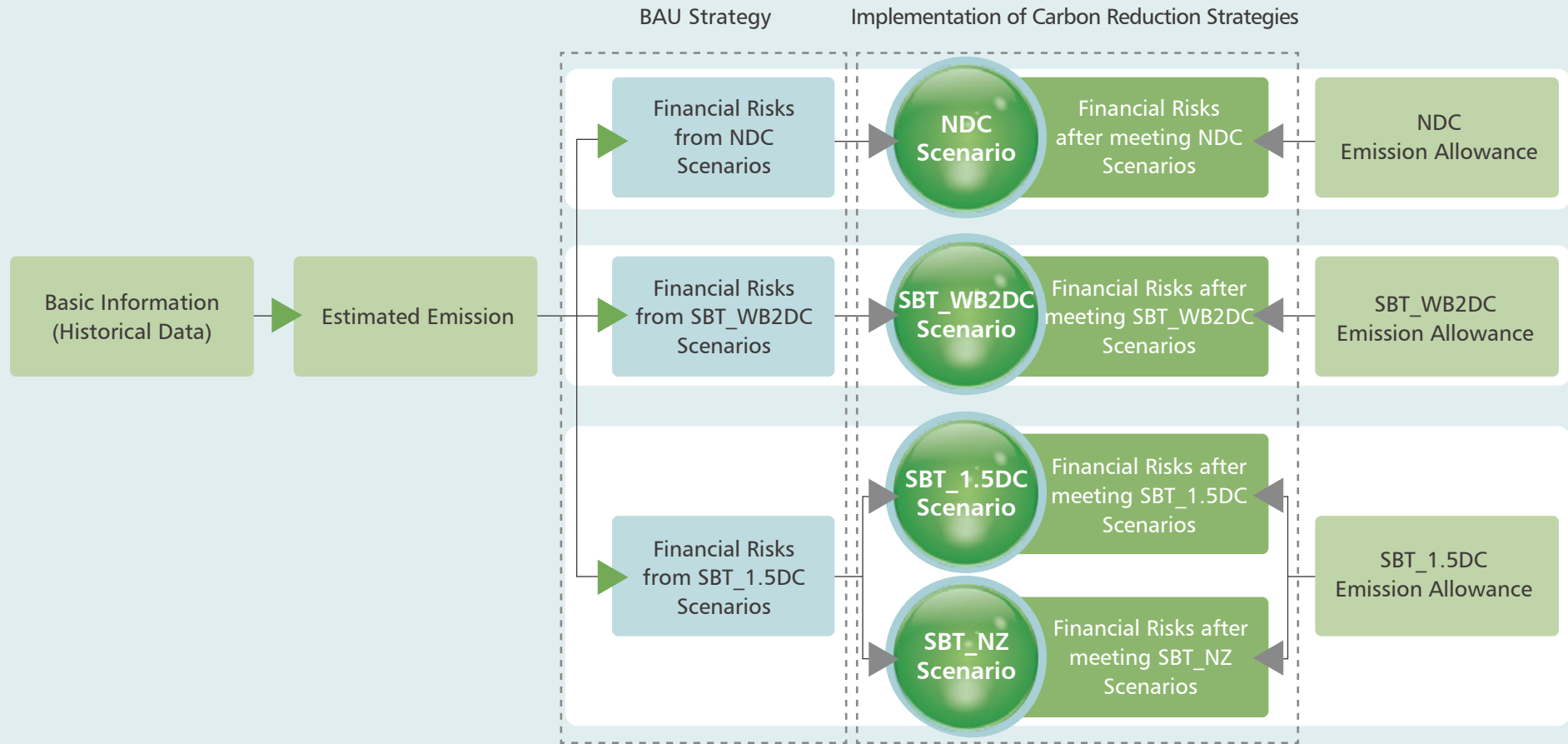
- a. Calculating greenhouse gas emissions, energy sources used and waste produced per unit of revenue generated to help the company assess risks and impacts, the feasibility of using internal carbon pricing to evaluate the cost of reduction.
- b. Direct energy emission risks come from regulatory fees and taxes imposed on fossil fuels. Indirect energy emission risks come from the cost incurred from the proportional increase in renewable energy usage. For other indirect upstream/downstream emission risks, existing controls limit the ability to reduce emissions, thus making it difficult to reduce the carbon footprint of products.
- c. Formulating reduction targets in greenhouse gas emissions, energy sources, water resources and waste, increasing renewable energy use and designing higher-efficiency products to achieve a low-carbon economy.

Climate Scenario Analysis

Rigorous procedures and methodologies are essential for transparency in climate-related financial disclosures and to that end, ASEH has classified climate scenarios into transition risks and physical risks. Transition scenarios include NDC, SBT¹ well-below 2°C (WB2DC), and SBT 1.5°C (1.5DC) and are based on risk conditions including government regulatory, market and business reputation. In tandem, we also take into consideration net-zero emission targets (SBT_NZ) to estimate financial impacts until 2050. When analyzing physical risks, we use government-published temperature and rainfall forecasts under RCP2.6², RCP4.5, RCP6.0, and RCP8.5 scenarios with data categorized according to the north, central, south regions and all of Taiwan, to simulate how physical changes in weather impact our operations or financial performance. RCP2.6 is a scenario that aims to slow down global warming by limiting temperature rise to not exceed 2°C. RCP4.5 and RCP6.0 are intermediate scenarios, with the difference in the concentration of greenhouse gas emissions between the 2 scenarios. Meanwhile, RCP8.5 represents the worst-case climate change scenario, demonstrating high levels of greenhouse gas emissions, high temperature rises and extreme climate changes. ASEH not only conducts risk assessments on our own facilities and assets, but also incorporates our supply chain and customers into the scope of assessments. We identify potential climate risk impacts on our supply chain through supplier surveys and simultaneously invests in new product and service developments according to customers' low-carbon needs.

¹ Science-based targets (SBTs) are targets that are set five to fifteen years into the future and that meet the criteria and recommendations of the SBTi.

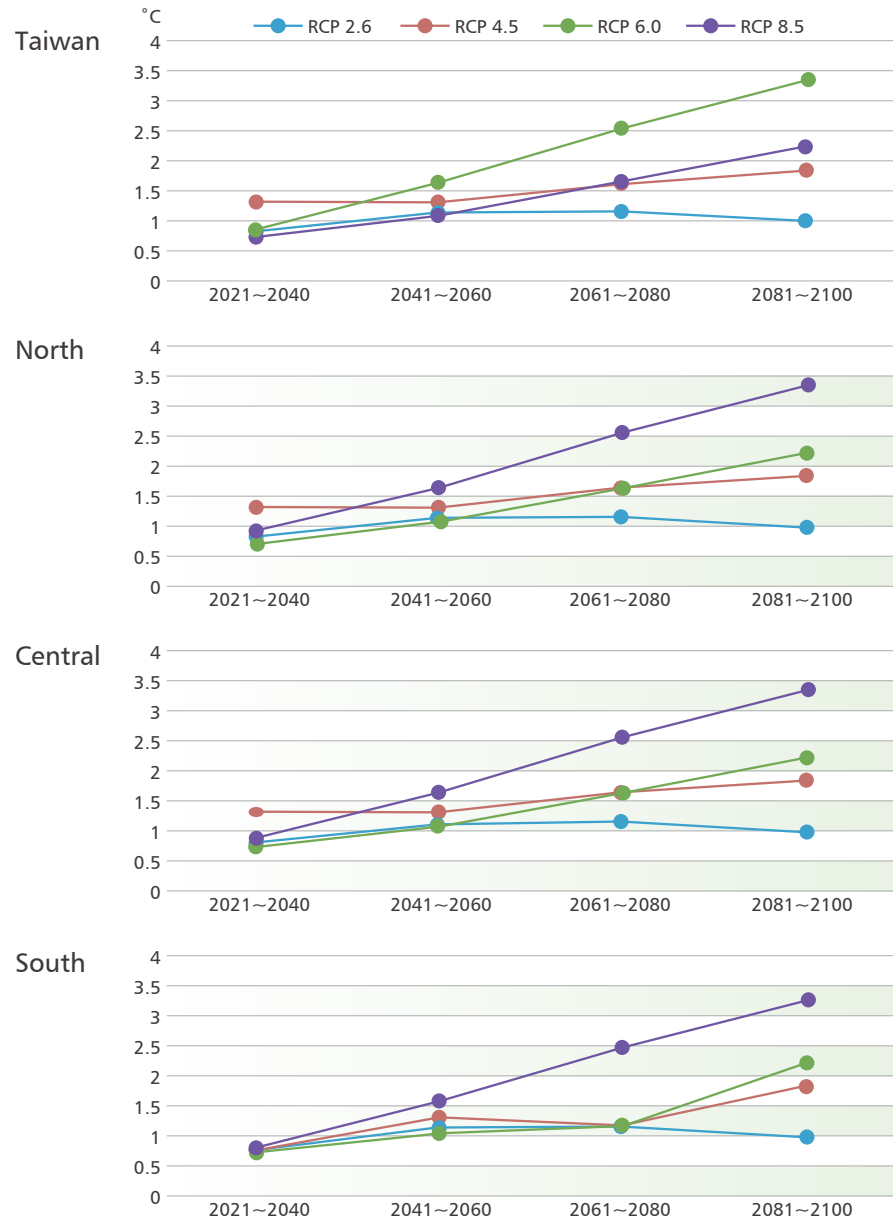
² The four Representative Concentration Pathways (RCPs) range from very high (RCP8.5) through to very low (RCP2.6) future concentrations. The numerical values of the RCPs (2.6, 4.5, 6.0 and 8.5) refer to the concentrations in 2100 (IPCC, AR5).



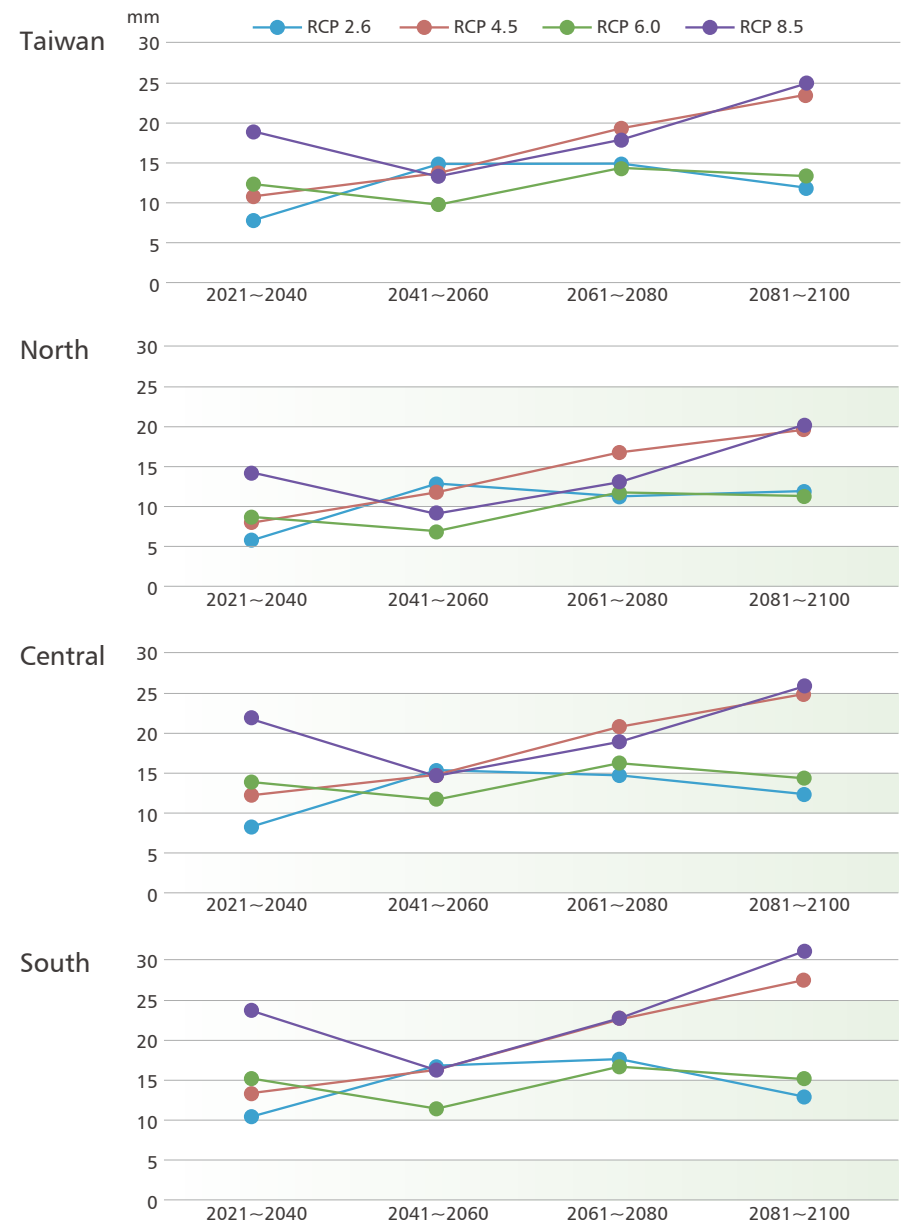
Transition Risk Scenarios	Description	Range	Risk Assessment	Emission Source
NDC	Assessed based on the current NDC targets proposed by the Taiwanese government	Taiwan	<ul style="list-style-type: none"> • Legal risks • Market risks • Business reputation risks 	Scope 1+Scope 2
SBT_WB2DC	Assessed based on the achievement of the SBT WB2DC condition	Worldwide		Scope 1+Scope 2
SBT_1.5DC	Assessed based on the achievement of the SBT 1.5DC condition	Worldwide		Scope 1+Scope 2

Transition Risk Factors		Transition Scenario Analysis Assumptions
Regulations	Carbon Tax	The unit carbon tax rates under the 3 scenarios: 1. NDC: 3USD/tCO ₂ e 2. SBT_WB2DC: 10USD/tCO ₂ e 3. SBT_1.5DC: 127USD/tCO ₂ e
	Total Emission Limits and Carbon Penalties (Fines)	Imposition of fines on excess carbon emissions according to analysis conducted using different total emission limits. Emission limits are designed separately in each of the 3 scenarios: 1. NDC: 3USD/tCO ₂ e 2. SBT_WB2DC: 10USD/tCO ₂ e 3. SBT_1.5DC: 127USD/tCO ₂ e
	Obligatory Renewable Energy Capacity (Taiwan)	The 'Regulations for the Management of Setting up Renewable Energy Power Generation Equipment of Power Users Above a Certain Contract Capacity' enacted by the Ministry allows businesses to fulfill their obligations through: 1. Installation of renewable energy power generation equipment: 10% of the chartered capacity. 2. Purchase of renewable energy and certificates: (compulsory installed capacity) x (electricity generated per kW for the selected category of renewable energy) 3. Installation of energy storage facilities: (compulsory installed capacity) x (minimum power supply time of two hours) 4. Pay monetary substitution: (obligatory capacity) x (2,500 kWh/kW) x (monetary substitution about 112 USD/kWh)
Technology	Renewable Energy Construction Costs	The annual amortized costs of installing renewable energy power generation equipments. Since the current equipment capacity is still small, it will not be included in the calculations.
	Renewable Energy Transfer Costs	Additional costs incurred from the renewable energy supplies through power purchase agreements (PPAs) with renewable energy providers.
	Renewable Energy Certificate Costs	Costs from purchasing renewable energy certificates
	Energy Saving Costs	Cost of investments on energy saving, about 28 USD/kWh
	Energy Saving Benefits	Energy saving benefits, about 70 USD/kWh
Business Reputation	Market Loss	Loss from product and service replacements that do not meet green requirements. Loss of business reputation due to transition failure which results in the drop in investor confidence and declining stock price. 1. NDC: 1% drop in stock price every year 2. SBT_WB2DC: 2.5% drop in stock price every year 3. SBT_1.5DC: 5% drop in stock price every year
Market	Green Products	Loss from product and service replacements that do not meet green requirements. 1. NDC: Decrease of 0.1% each year 2. SBT_WB2DC: Loss of 50% of green products 3. SBT_1.5DC: Loss of all green products

Estimated Annual Temperature Change (°C/yr)



Estimated Daily Rainfall Change (mm/day)



Data source: Taiwan Climate Change Projection Information and Adaptation Knowledge Platform

Financial Impact Estimation

On the financial impact of physical risks, the average daily revenue loss from disruptions in production due to disasters was estimated at US\$ 46.5 million. On the financial impact of transition risks, we assumed a scope 1 and 2 GHG emissions growth rate of 7% in a basic operating scenario. The simulation of electricity emission coefficients is estimated for main regions – Taiwan which forms the bulk of total emissions at 66.5%; China at 22.5%; and approximately 11% from the rest of the regions. We have estimated the GHG emissions until 2040 and the permissible level of emissions under three transition scenarios with various assumptions. Results from analyses showed that ASEH will face various external physical and transition pressures if scenarios are not properly managed and financial impacts will include capital expenditure, operational expenses, loss of revenue and loss of market value.

Unit: US\$ million

Cost Category	Scenario Risk	Year	NDC			SBT_WB2DC			SBT_1.5DC		
			2025	2030	2040	2025	2030	2040	2025	2030	2040
Capital Expenditure	Regulation_Obligatory Capacity Installation Fees		0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Operational Expenses	Regulation_Obligatory Capacity Operational Fees		0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
	Regulation_Obligatory Capacity Energy Saving Benefits		-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67
	Regulation_Carbon Tax		5.94	6.66	6.90	26.37	30.66	33.90	334.87	389.36	430.58
	Regulation_Carbon Penalty		9.47	14.09	18.65	29.89	47.45	68.23	69.61	112.93	170.90
Revenue Loss	Market_Low-Carbon Products		4.29	6.90	17.90	2,143	3,451	8,951	4,286	6,902	17,903
Market Value Loss	Business Reputation		1,084	1,939	3,524	2,610	4,502	7,638	4,907	7,987	12,214

Physical Risk Adaptation

As an example, ASE Kaohsiung has a current water storage capacity of 45.6 thousand tons and its average daily consumption is 13-16 thousand tons. In the absence of external water supply, the facility's water storage tanks can support water demand for about 3 days, and its water recycling system is able to recycle up to 14 thousand tons of water every day. Thought the evaluation of the water recycling system as an adaptation measure and combined with the water storage tanks, ASE Kaohsiung demonstrated an adaptation capability of between 3-9 days during dry seasons (January-June). The current adaptation is sufficient enough to cope with the external impacts from climate change for at least 10 years.



Water shortage during standard dry seasons

able to maintain a certain level of normal operation under the Stage 3 Water Restrictions (suspending water supply twice per week).



In the case of extreme rainfall

able to extend operating days through water recycling.



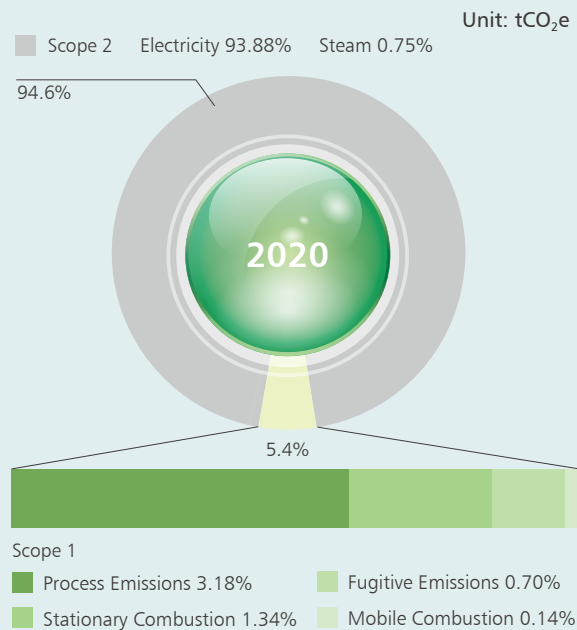
Under RCP8.5 scenarios

the current water resource carrying capacity is fully capable of adaptation before 2050.

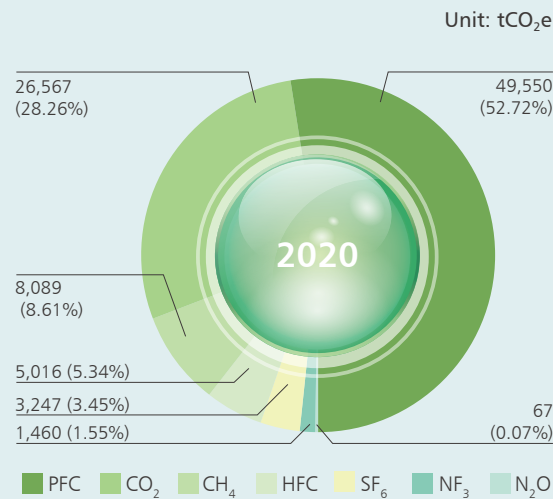
Greenhouse Gas Emissions Management

ASEH has deployed Scope 3 emission reporting, passed the Science-Based Target¹ and increased the use of renewable energy to reach net zero emissions. In 2020, all ASEH facilities followed the ISO 14064-1 guidelines for GHG quantification and reporting, and according to market-based calculations, emitted a total of 1.75 million tCO₂e² Scope 1 and Scope 2 emissions³, reaching our goal of reducing GHG emission intensity by 38% compared to the base year 2015. Moving forward, ASEH will continue to promote reduction projects, so as to reduce 2020 GHG emissions in Scope 1 by 5.4% compared to the previous year. Due to the nature of the industry, the majority of emissions come from electricity usage and our reduction projects focus on low-carbon transformation and efficiency management. In 2020, 15 facilities passed the ISO 50001 certification, reaching a coverage rate of 59%.

Scope 1 & 2 Emission Category and Ratio



Scope 1 GHGs Emission Ratio



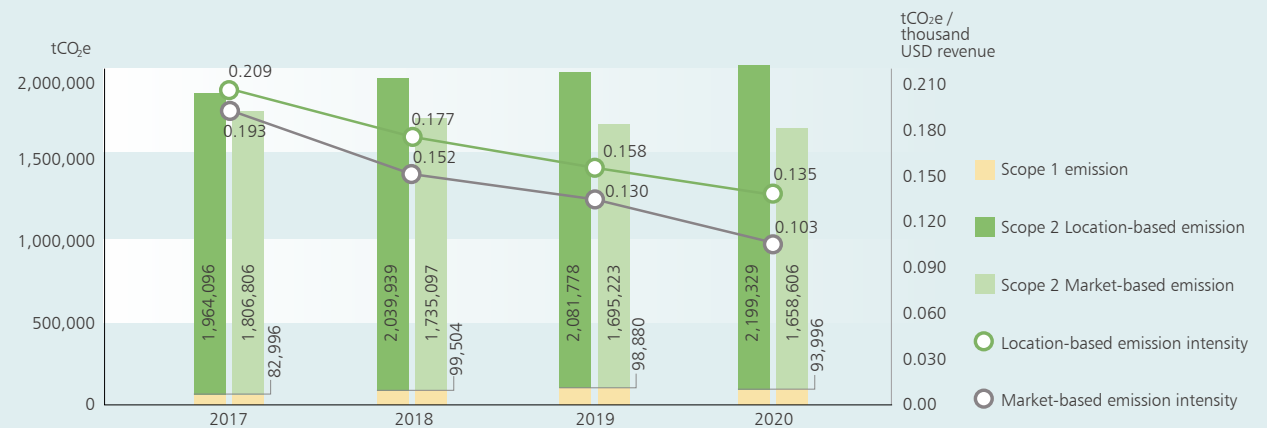
¹ The Science Based Targets initiative (SBTi) was launched by the CDP, the United Nations Global Compact, the World Resources Institute (WRI), and other organizations. Science-based targets are set on the basis of controlling total carbon emissions to achieve the goal of limiting global warming to below 2°C.

² The emission scopes of the GHG inventory are disclosed under operation control; Global Warming Potentials (GWP) are cited from the IPCC 5th Assessment Report.

³ Coefficients for electricity emissions were calculated by using the local electricity emission coefficients of facilities.

	Emissions (tCO ₂ e)	Means of Reduction
Scope 1	93,996	<ul style="list-style-type: none"> Optimizing the use of process gasses and installing removal device (including PFCs) Searching for low-carbon substitute
Scope2 (market-based)	1,658,606	<ul style="list-style-type: none"> Low-carbon energy transformation: renewable energy or certificates ratio: 18% Implementing carbon reduction projects: 300 projects carried out in 2020 and energy saving rate is 16.8%
Scope 3	21,179,759	<ul style="list-style-type: none"> Collaborating with value chains to reduce carbon Promoting low-carbon transportation

Greenhouse Gas Emissions and Intensities¹



¹ This data includes ASE, SPIL and USI for 2017-2020.

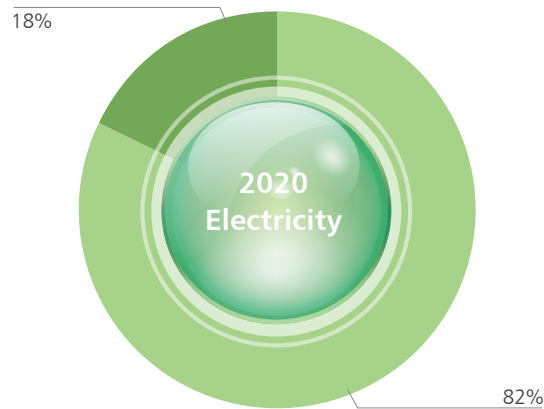
In 2020, all global facilities completed Scope 3 reporting which focused on GHG reductions in the areas of goods and services purchased as well as upstream transportation and distribution, accounting for 89% of emissions. We proactively collaborated with our value chain on carbon reduction programs including technology sharing, cross-industry cooperation, infrastructure assistance. Regardless of regulatory requirements, ASEH plans mid/long-term absolute carbon reduction goals in advance. Using 2016 as the base year for the completion of Scopes 1 and 2 verification, we plan to reduce absolute Scope 1 and 2 GHG emissions 35% by 2030 and commit to reduce absolute Scope 3 GHG emissions 15% by 2030 from a 2020 base year, and to achieve net-zero emissions for offices by 2030 and in manufacturing locations by 2050.

2020 Scope 3 Emissions

Emission Source	Emission (tCO ₂ e)	Reduction Courses of Action
Purchased goods and services	14,542,373	Prioritize the purchase of low-carbon materials
Capital goods	1,181,139	Prioritize the purchase of low-carbon equipments and build low-carbon facilities
Fuel- and energy-related activities	558,348	Progressively increase the use of clean energies and renewable energies
Upstream transportation and distribution	4,363,492	Implement green distribution and simplify logistics packaging
Downstream transportation and distribution	255,580	
Waste generated in operations	22,064	Promote circular economy and increase the resource recycling rate
Business travel	670	Rationalize business travels
Employee commuting	168,198	Promote public transportation
Upstream leased assets	6,245	Improve energy efficiency
Downstream leased assets	332	
Investments	81,318	Invest in sustainable industries
Total	21,179,759	

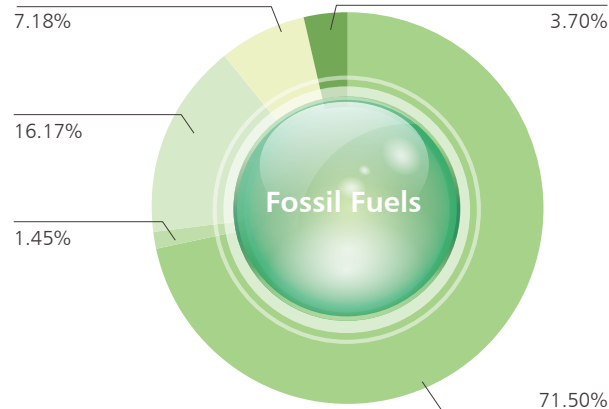


Energy Resource Management



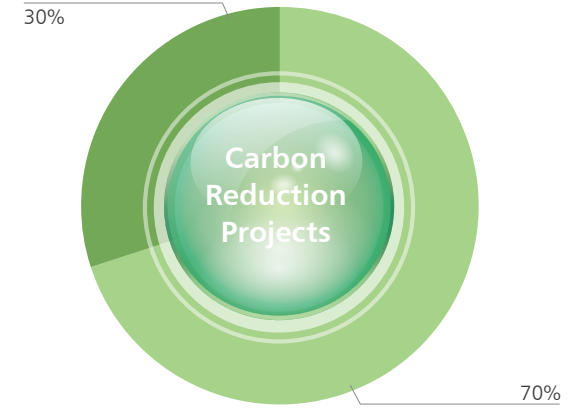
■ Renewable Energy ■ Non-renewable Energy

Electricity	MWh
Electricity Consumption	3,900,915
Non-renewable Electricity	3,194,810
Renewable Electricity	706,105



■ Liquefied Petroleum Gas ■ Liquefied Natural Gas
 ■ Gasoline ■ Diesel
 ■ Heavy Oil

Petrochemicals (Non-renewable fuels)	GJ	MWh
Liquefied Petroleum Gas	16,770	4,658
Liquefied Natural Gas	324,214	90,060
Gasoline	6,593	1,831
Diesel	73,337	20,371
Heavy Oil	32,534	9,038



■ Process Energy Savings
 ■ Building Services Energy Savings

Carbon Reduction Projects	Carbon Reduction (tCO ₂ e)
Process Energy Savings	12,859
Building Services Energy Savings	29,537

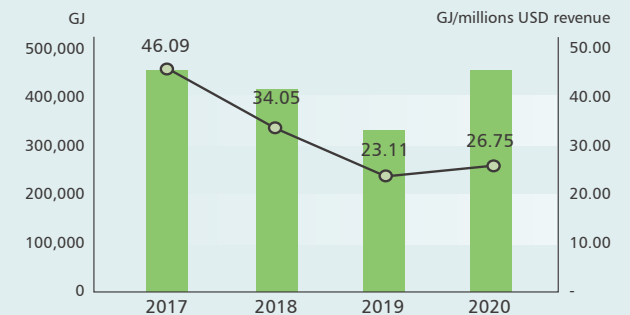
Fossil Fuels (Non-renewable)

Petroleum gas, natural gas, gasoline, diesel, and heavy oil are the main fossil fuels¹ used at ASEH, accounting for a total consumption of 453,448 GJ² in 2020. Among them, liquified natural gas used in kitchens, furnaces, and preventive equipment, accounted for the highest proportion of 71.5%; followed by diesel used in stackers and emergency power generators. In recent years, dependency on fossil fuels has been reduced through the gradual introduction of electric stackers and the use of substitute fuels and clean energies.

¹ Fossil (Non-renewable Energy) are used in: (1) Facilities: Emergency power generators, furnaces, (2) Distribution: Stackers, company vehicles, (3) Air pollution preventive equipment

² The calorific value of fuel refers to the unit calorific value table of energy products. Total energy consumption within the organization = non-renewable fuel consumption + renewable fuel (electricity) consumption + purchased electricity, heating, cooling and steam

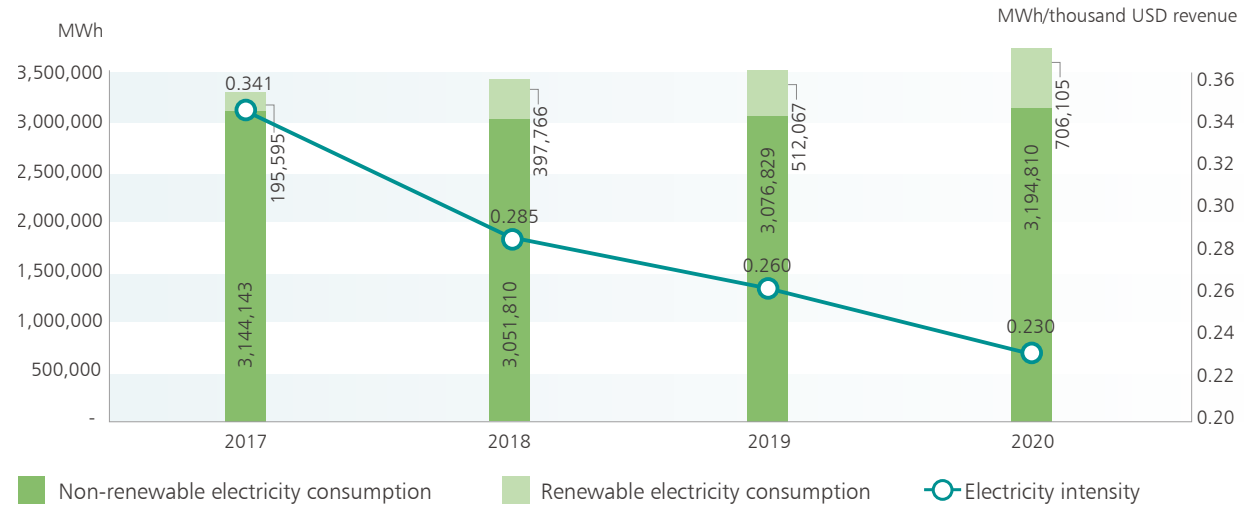
Fossil Fuels (Non-renewable) Consumption and Intensity



Energy Conservation and Carbon Footprint Reduction

ASEH aims to strengthen its climate resilience by increasing the use of low-carbon energy and developing a diversified power supply portfolio. In 2020, our total energy consumption is 3,900,915 MWh. Although consumption increased by 8.69% in comparison with 2019 due to the increase in scopes at our subsidiaries as well as a 20% expansion in production capacity, our energy intensity is decreased by 12% owing to efficiency improvements. Additionally, 11 facilities are using 100% renewable energy or REC for a total of 706,105 MWh (equivalent to 18% of the year's electricity demand). In the future, we will continue to install and purchase renewable energy in order to achieve low-carbon transformation.

Electricity Consumption and Intensity



Installing Solar Photovoltaic

- ASE
 - <1%_Kaohsiung (37MWh)
 - <1%_Wuxi (0.55MWh)
 - 5%_ISE Labs (307MWh)

Purchasing Renewable Energy

- ASE
 - 2%_Kunshan (2,006MWh)
- SPIL
 - <1%_Suzhou (1,472MWh)

Purchasing Renewable Energy Certificates

- ASE
 - 100%_Kunshan(47,895 MWh), Wuxi(5,070 MWh), Weihai(55,150 MWh), Suzhou(98,848 MWh), Shanghai (A&T) (77,427MWh), ISE Labs China(1,848 MWh)
 - <1%_Kaohsiung(21MWh) , 6%_Shanghai (Material) (4,344MWh)
- USI
 - 100%_Zhangjiang(87,548MWh), Jinqiao(51,361MWh),Shenzhen(30,888MWh), Kunshan(28,182MWh)
 - 20%_Mexico(1,937MWh)
- SPIL
 - 100%_ Suzhou(211,763MWh)

Major Energy Saving and Carbon Reduction Projects

The 3 pillars of our carbon reduction strategy are low-carbon energy, process energy saving, and green buildings and facilities. The 300 projects were carried out in 2020, effectively reducing 585,744 tCO₂e in carbon emissions, equivalent to reducing the annual electricity consumption of about 20 thousand households¹. In addition to using energy management systems to increase energy use efficiency, we also encourage and motivate facilities to strive towards efficiency improvements through technology sharing and competitions. Integrated the continuous development of low-carbon green buildings (for details, please see the "Green Facility" chapter) to manage and cut down on operational carbon emissions.

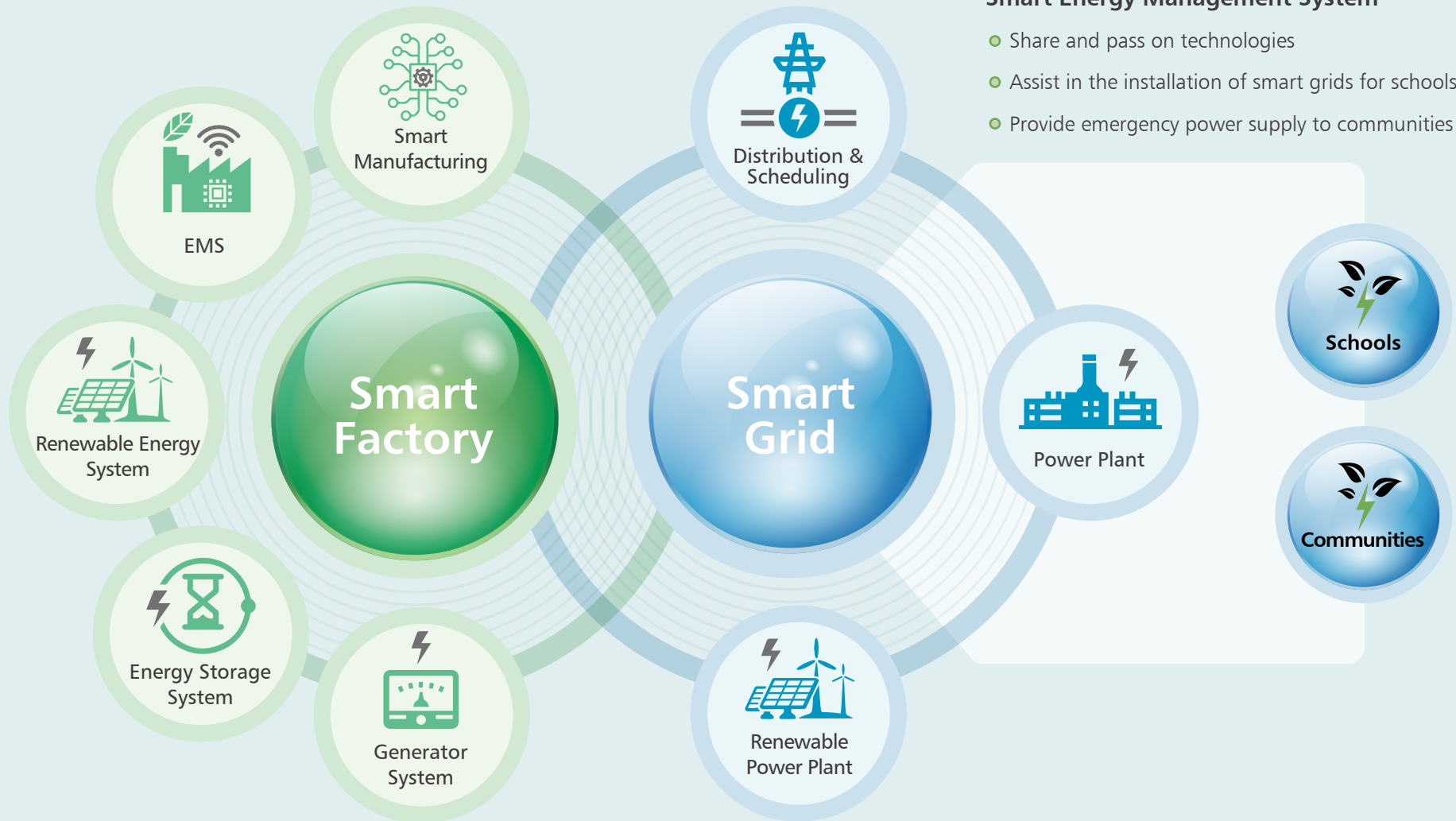
Category	Annual Energy Saving (MWh)	Annual Energy Saving (GJ)	Annual Carbon Reduction (tCO ₂ e)
Process energy saving	24,688	6,858	12,859
Building services energy savings	56,302	15,639	29,537
Low-carbon energy			543,348
Total	80,990	22,497	585,744

¹ The calculation is based on the household electricity consumption, 339 kWh, per month estimated by Taipower Company in 2019.



Smart Grid

Since 2018, ASEH has invested in smart grid research to build an optimized electricity consumption model by evaluating electricity and energy storage systems and dispatch methods, establishing power decision models and gradually introducing optimized power supply and simulation into our facilities. In 2020, we transferred our smart grid expertise to improve and provide stable electricity supply at a local school in a remote location (for details, please see the “Environmental Conservation” chapter). We will continue to contribute and share our expertise, starting from our facilities and then expanding to cities and the greater society.



5.2 Water Resource

Risk Assessment

To gain insight into water risks at our facilities worldwide, we implemented the Aqueduct risk assessment tool developed by the World Resource Institute (WRI) to evaluate the baseline water stress level of each facility. As the Aqueduct tool lacks local data from Taiwan, ASEH has commissioned an academic research institution to perform climate risk analyses on eight main facilities in Taiwan by replacing the data in the original database with accurate local data published by Taiwanese authorities and implementing the actual management situations within each facility. Setting 2030 as the target year, we disassembled the physical risks brought on by climate change using the climate adjustment algorithm, and performed calculations on the four hazards of high temperature, low temperature, heavy rainfall and water shortage. In regards to water risk assessment, we compartmentalized the problem into small, manageable parts by presenting the potential hazards, exposures and weakness factors of actual risks separately, to serve as a basis for future adjustments and risk ranking. In the future, we plan to build water assessment and analysis tools to grasp the local water supply and water demand risk status of each facility and to analyze the tolerance of key facilities. To enhance risk adjustment and resilience, other than improving water despatch support and water resource efficiency, we also request suppliers to align with our water resource management and actively search for water saving opportunities as well as control pollution pathways.

Risk Hazard Dimension	Considerations for Continued Operations
Flood	Heavy rainfall in the future exceeds the design of the facility – water discharge capabilities should be enhanced
Extreme Temperature	Extreme high temperature occur approximately 8.6~16.5 days every year; extreme low temperature occur approximately 1.6~8.3 days every year. Relevant operations, logistics, outdoor procedures, and other arrangements should all beware of the effects of extreme temperature.
Drought	Manifested by changes in rainfall, future drought seasons (November to the following May) will experience an average of 8~20% less rainfall, with the drought standard deviation also decreasing by 1~37%. There is a high chance that future rainfall will 'decrease steadily', thus, we should continue to increase efficiency of water resources and search for a replaceable, alternative water source, water storage and water recycling system.

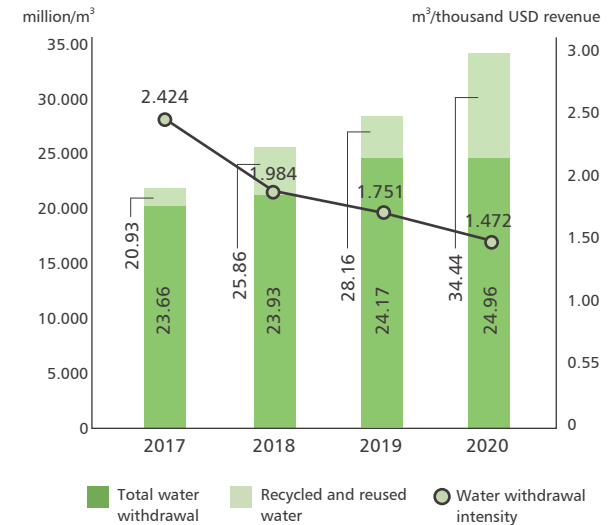
Water Withdrawal and Reuse

ASEH adopts three water use strategies: reduce, reuse, and recycle. The main source of water-use is tap water. Total water withdrawals in 2020 amounted to 24,961,039 tons¹, while water withdrawal increased by 3% compared to the previous year due to newly added scopes and a 20% increase in manufacturing capacity. However, water use intensity per unit revenue (including rainwater) decreased by 16% compared to the previous year, reaching our goal of a 30% decrease compared to 2015.

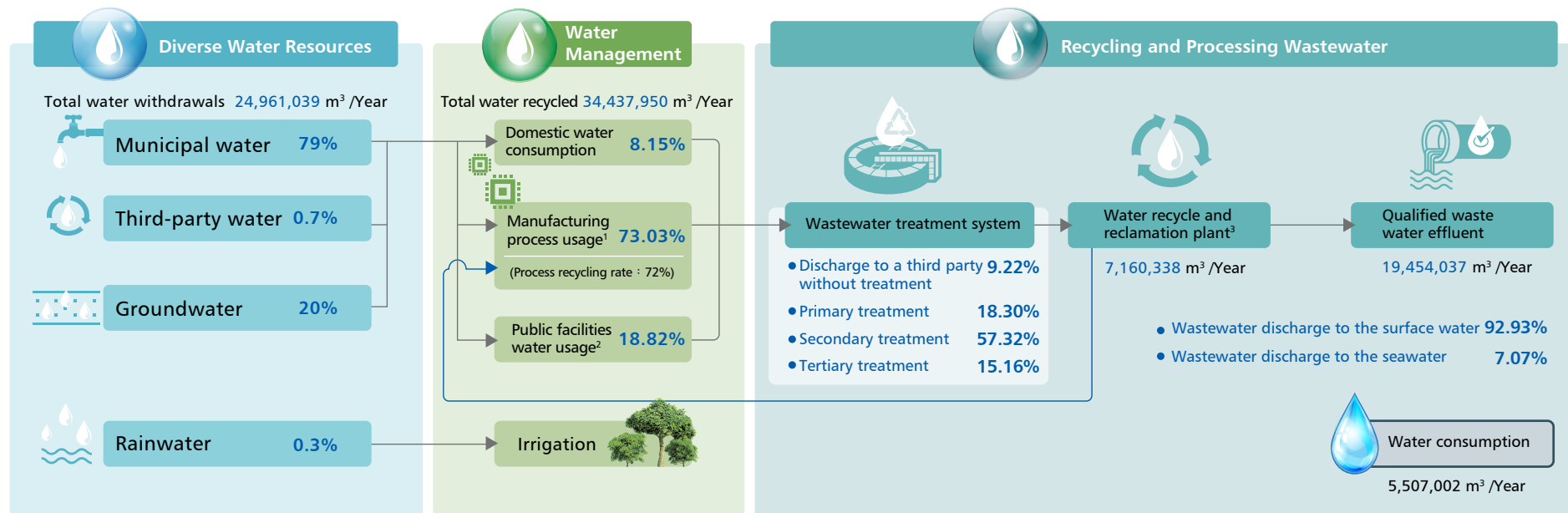
In regards to water resource recycling and reusing, we have established water recycling facilities at ASE Kaohsiung and Chungli to process wastewater that meets local regulatory effluent standards. The recycled water is distributed back to the ASE facilities for reuse and has resulted in reducing effluent by about 70% and significantly reducing water pressure and effluent discharge. With the participation of all facilities in our 22 water conservation projects, we have increased recycling rates by 6% compared to the previous year. In 2020, we dedicated US\$36 million, which includes

capital expenditure and operating expenses, to the recycling and reusing of water resources. We are committed to continuing to invest in water recycling, and strive to maximize our water resource utilization efficiency by circular economy principles.

2020 Water Resource and Water Withdrawal Intensity¹



¹ The data includes that of all ASEH facilities that offer assembly, testing, and material services and electronics manufacturing services.



¹ Manufacturing process water use includes: manufacturing water use cycle, cleaning/grinding water, electroplating water recycling, and other reuse

² Public water use includes: washing tower discharge, cooling tower discharge, purified/wastewater systems recycling and reuse

³ Water reclamation: recycling and renewal of processed water that meets guidelines, supplying the manufacturing water usage cycle

Wastewater Management

In 2020, 19.45 million tons¹ of effluent was discharged, while the total water consumption was 5.51 million tons. Our effluent management system is more stringent than that stipulated by law, and we regularly/continuously monitor effluent water quality. In addition to internal water quality tests, we also outsource offline sampling and water quality analysis to ensure that the ecology of the aquatic environment is under strict management. Currently, there are 15 facilities that collect and classify process chemicals by channel and treat each independently based on effluent characteristics, increasing the efficiency of effluent treatment processes.

To increase treatment efficiency and the recycling and reusing of effluent, we invested US\$14.43 million in 2020 for the treatment and renewal of effluent that contains silicon or was used for bumping/grinding/electroplating/cleaning, as well as for industry-academia technological development. This is the sixth year of our collaborative research with academic institutions in 24 research focuses, including developing new water treatment technologies, recycling and reusing of high-concentration chemical waste, monitoring of aquatic environments and risk evaluation, groundwater recovery methodology, aquatic ecology, health risk evaluation, etc.

¹ Three electronic manufacturing services facilities (Kunshan, Shenzhen, and Mexico) do not have on-site wastewater treatment facility, so the amount of wastewater discharge is estimated. Others' data is recorded from water meters

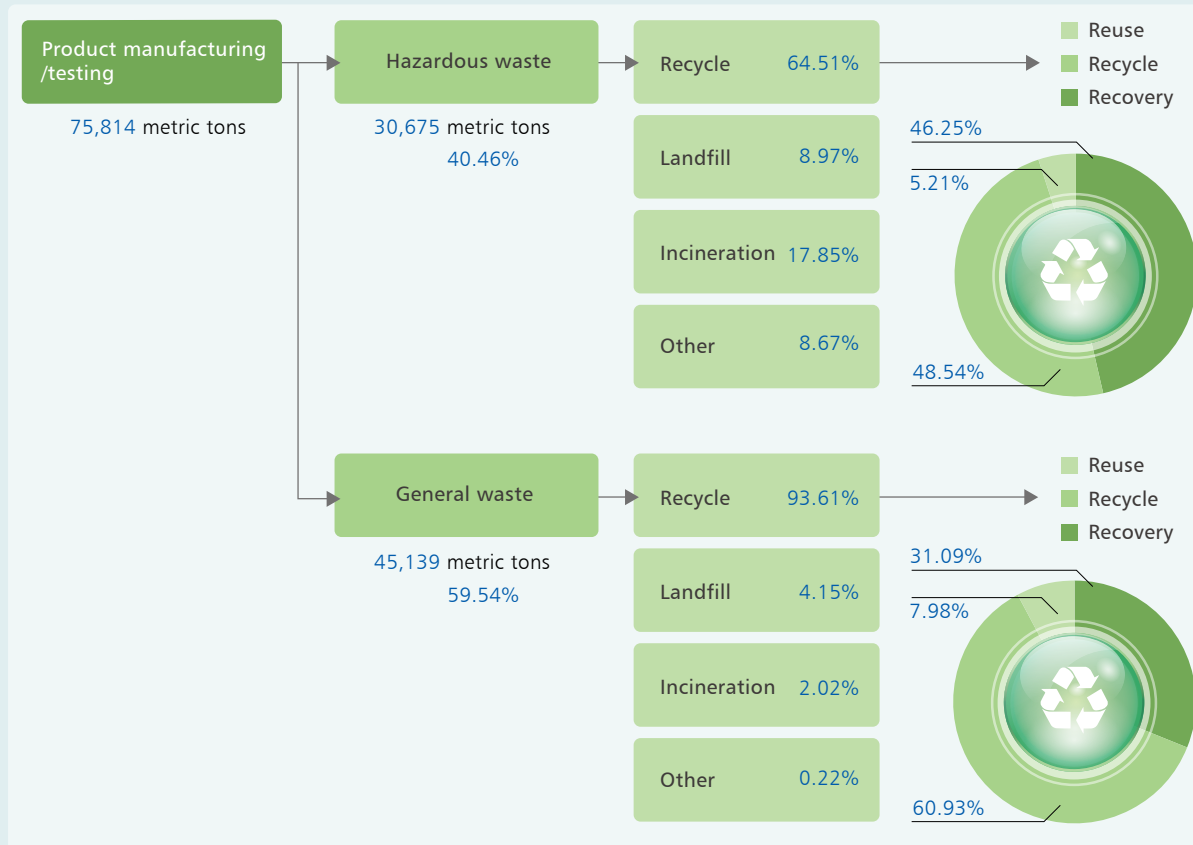
2020 Focuses:

- Continuous monitoring of water quality/quantity
- Development of new and innovative processing technologies through industrial-academic collaboration
- Recycling and reuse of wastewater, reduction of effluent discharge
- Sorting of chemical products, aiming towards recycle and reuse

5.3 Waste Management

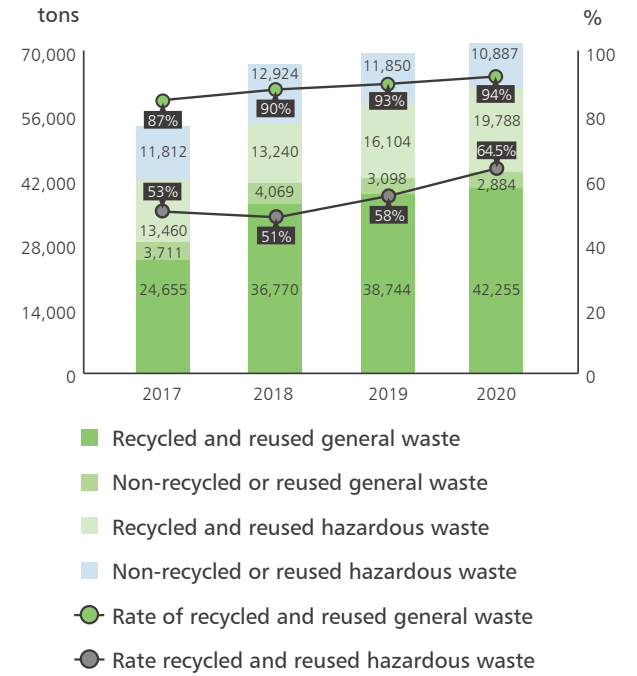
Waste Generation and Recycling

ASEH adopts source reduction measures and prioritizes the use of eco-friendly materials to minimize waste generation and reduce environmental pollution. In 2020, we generated 75,814 tons of waste and achieved a 100% recycling and processing rate by commissioning qualified local firms to process waste within borders. To increase the recycling rate of waste, we adopted the business model of circular economy with the goal to increase the recycling and reusing of waste, achieving a 82% recycling rate of waste, a 3.8% increase from the previous year.



Description: Recycled general waste includes compost

Waste output and recovery rate



Description:

- (1) Rate of recycled general waste reached 94% > target recycling rate (90%)
- (2) Rate of recycled hazardous waste in 2020 (64.5%) was higher than the last year (58%)
- (3) Rate of recycling of hazardous waste (excluding recycled energy) was 38.6%

Moving Towards a Circular Economy

Depletion of finite natural resources has made resource reuse and circulation an issue of major concern, and is driving companies like ASEH to consider technology and economic benefits for the practical implementation of circular economy and partaking in and promoting circular economy activities in company operations. The transition to a circular economy comprises of 5 key elements: direct recycling, reuse, off-site regeneration, renewable materials, and supply and rental. ASEH collaborates closely with its business and supply chain partners to build a circular economy in the semiconductor industry through redesign, circular value-added, recycling and recovery, a shared economy, circular agriculture, and industrial symbiosis. ASEH has formed several industry alliances and cross-industry partnerships to examine the life cycle and process of resource usage, so as to identify areas to reduce, recycle and reuse to increase resource lifespan and maximizing resource efficiency.

Circular Economy Promotion Blueprint

Circular value add

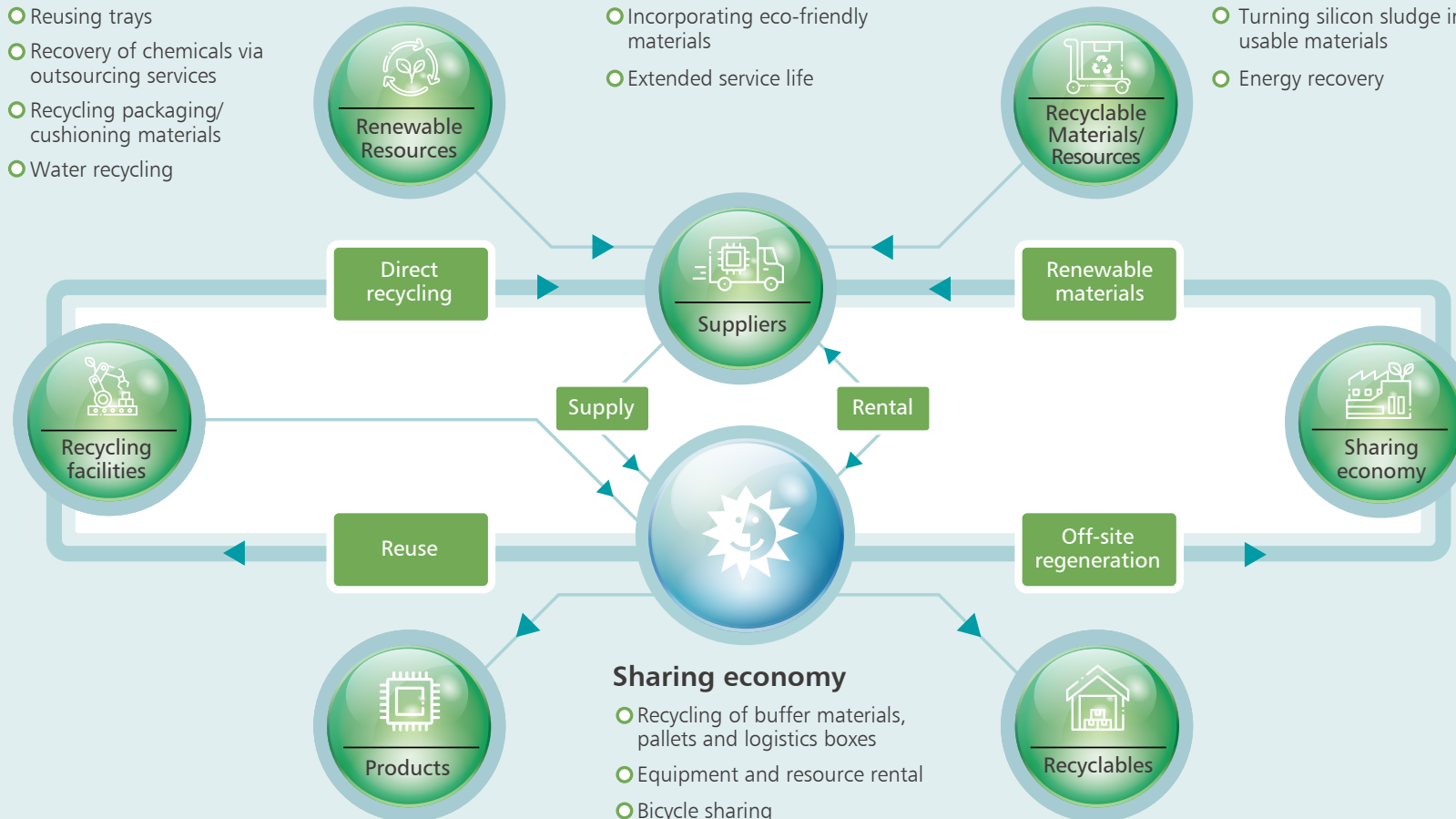
- Reusing trays
- Recovery of chemicals via outsourcing services
- Recycling packaging/cushioning materials
- Water recycling

Redesign

- Incorporating eco-friendly materials
- Extended service life

Industrial symbiosis

- Turning silicon sludge into usable materials
- Energy recovery



ASEH actively rallies the support from our supply chain, industry chain, academic institutions and cross-industry partners to promote a circular economy. A total of 30,442 tons of materials were recycled or reused in 2020. For every US\$10,000 invested, we contributed to reducing about 35.6kg of global waste. In the future, we will continue to implement the 5 key elements of circular economy to assist our facilities around the world in reducing waste and greenhouse gas emissions.



Recycling of Phenol formaldehyde (PF) Laminate Plates – Case Study

ASEH collaborates in many technology development projects with suppliers to recycle waste materials effectively and deploying such practices to all subsidiaries. With the success in our research of recycling phenol formaldehyde laminate plates (aka bakelite plates), we proceeded to engage in industry-academic collaborations to discuss recycling parameters in 2019. In 2020, we worked with a Taiwanese firm to develop equipment, which entailed performing pyrolysis on to-be-discarded bakelite plates to produce high-quality, porous carbon material with high specific surface area to be used for absorption processing.

Additionally, we collaborated with a Shanghai processing firm to plan for combining broken bakelite plates with resin, which is heated and compressed to produce products such as WPC bricks and WPC pipes that are used in architectural fences and other low-strength, basic structures. These efforts have reduced our need to outsource the recycling and at the same time, created value through resource recovery. We expect to set up the complete infrastructure from our cross-industry collaborations by 2021, and plan to promote the recycling methodology outside.

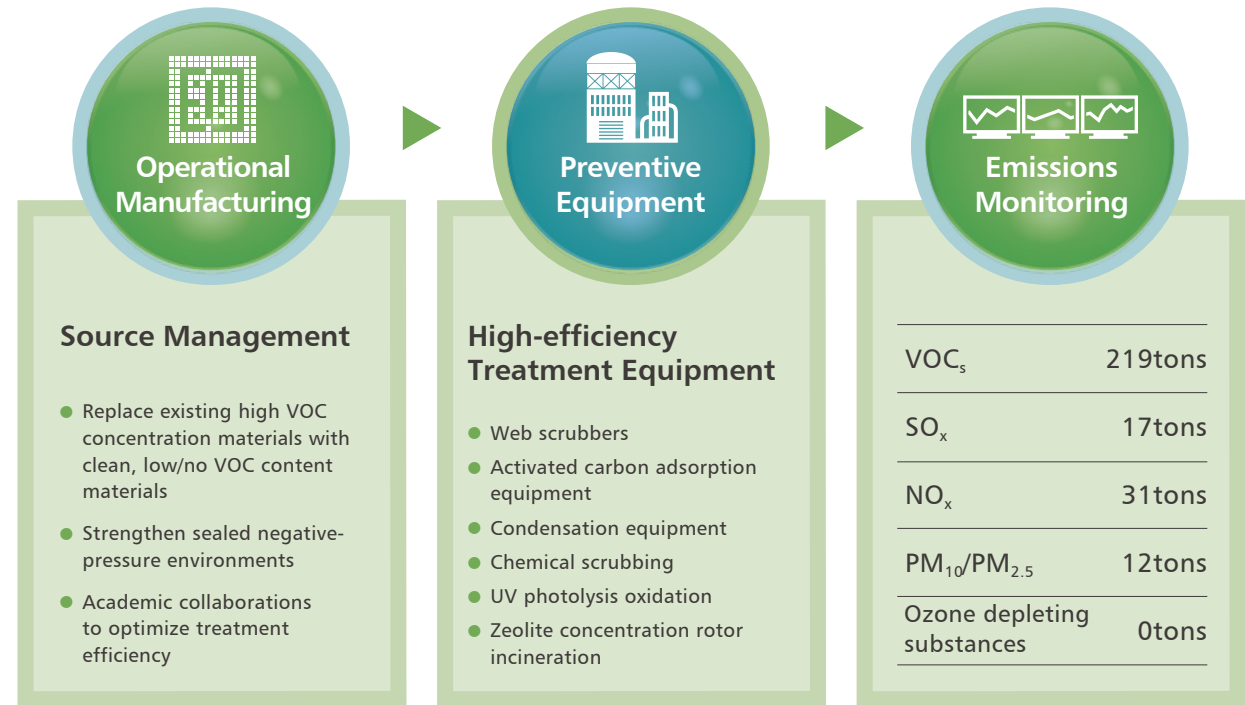


5.4 Air Emissions Control

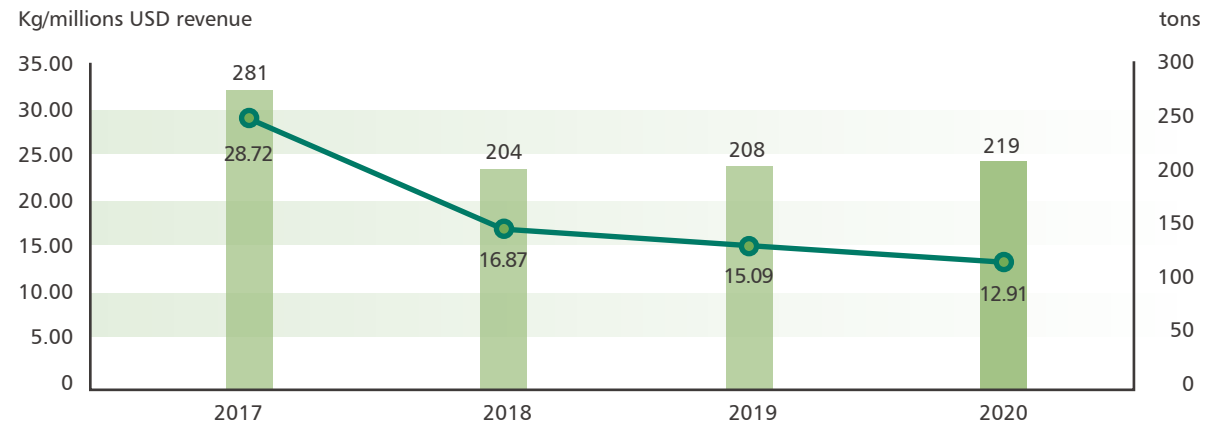
Air pollutants emitted in 2020 include VOCs¹, SOx², NOx³, and particulate pollutants.⁴ We adopted the use of wet scrubbers, activated carbon adsorption equipment, condensation equipment, chemical scrubbing, biological scrubbing, UV photolysis, zeolite concentration rotor incineration systems, and other preventive equipment to manage process gases and control the concentration of air pollutant emissions. Due to operation expansions in 2020, our VOCs emissions have increased from the previous year. However, the emissions strengths of individual departments have continued to decrease as of the recent 4 years, with 2020 showing a rate 14% lower than the previous year. In terms of future expansions, in addition to our current equipments and practices, we will continue to improve our emissions management in the following ways:

- Replace existing high VOC concentration materials with clean, low/no VOC content materials
- Continue to equip facilities with high-efficiency abatement equipment (such as the zeolite concentration rotor incineration system, active carbon adsorption equipment, etc.)
- Collaborate with academic institutions to study the biological treatment efficiency of air pollutants as well as conduct efficiency analyses on microbial composition and treatment, so as to quickly adjust and optimize biological processing systems
- Adopt the sealed negative-pressure design to improve gas collection efficiency and comprehensively collect pollutants from stationary sources

¹ VOCs are calculated using public coefficients, and are either directly measured or calculated using mass balance.
² SO_x are calculated using public coefficients or converted through the concentration ratio.
³ NO_x are calculated using public coefficients or directly measured.
⁴ Particulate pollutants are calculated using public coefficients or directly measured.



VOCs Emission Intensity



5.5 Green Facility

Low Carbon Buildings and Green Factories

Reducing the carbon emissions of buildings is a critical step to slowing down climate change. Since 2012, we have transformed existing facilities and built new facilities and offices that comply with international low carbon building standards. Through quantifying and analyzing the entire lifecycle of building carbon emissions, carbon reduction was driven from the design stage and promoted along the value chain to build a sustainable campus. We have also integrated the evaluation of clean production in the manufacturing process, with green buildings to achieve Green Factory Certification. In the future, we will continue to promote and work towards obtaining certification for 100% of our new facilities.

Green Certificate

Green Certificate	28
EEWH 7 Diamond, 1 Gold, 2 Silver, 7 Bronze, 2 Qualified	19¹
LEED 4 Platinum, 4 Gold	8²
Low-Carbon Building Diamond	1³

Green Factory 12⁴ facilities

¹ EEWH Certification: K3/K4/K5/K7/K11/K12/K14B/K15/K16/K21/K22/K26/KH-dom/CL-A/CL-K&L/CL-B/CL-M/SPIL Zhong Ke/USI-NK

² LEED Certification: K12/K21/K22/K26/CL-K&L/CN-HQ/K23/CN-SH

³ Building Carbon Footprint Diamond Grade: K24

⁴ Green Factory: K3/K5/K7/K11/K12/K15/K21/K22/CL-A/CL-K&L/CL-B/SPIL Zhong



5.6 Environmental Expenditures and Investments

ASEH adopted the "Industry Guidelines for Environmental Accounting" published by Environmental Protection Administration of Taiwan. We combined our existing accounting systems with environmental control coding to classify our environmental expenditures into categories in accordance with the nature of costs incurred. Our environmental expenditure is calculated and analyzed quarterly to ensure data accuracy and facilitate effective assessment.

Environmental Costs

ASEH's total environmental costs for 2020 amounted to US\$108.2 million, with capital expenditure and expense accounting for 47% and 53% respectively.

Unit:US\$ millions

Category	Description	2017		2018		2019		2020	
		Capital Investments	Operating Expenses	Capital Investments	Operating Expenses	Capital Investments	Operating Expenses	Capital Investments	Operating Expenses
Operating Cost	Pollution Prevention Cost Air, water, other pollution prevention, etc.	12.2	8.0	20.0	15.4	29.7	13.5	43.0	14.6
	Resource Circulation Cost Efficient utilization of resources, waste reducing, recycling, and disposal, etc.	12.4	15.0	8.6	12.0	10.6	15.5	7.7	25.5
Upstream/Downstream Cost	Green procurement, recycling of used products, etc.	0.56	0.3	0.4	1.3	0.7	3.6	0.1	3.0
Administration Cost	Manpower engaged in environmental improvement activities and environmental education, acquisition of external environment licenses/certification, government environmental fees, etc.	-	8.1	-	9.3	0.5	9.7	0.1	10.2
Social Activity Cost	Donations to, and support for, environmental groups or activities, etc.	-	3.4	-	3.9	0.1	3.4	-	4.0
Environmental Remediation Cost (Violation cases)	Fines, recovery of the environmental degradation, degradation suits, and insurance fees, etc.	-	0.2 (0 major case ¹)	-	0.1 (2 major case ¹)	-	0.05 (0 major case ¹)	-	0.01 (0 major case ¹)
Others	Global environmental conservation cost and cost to develop products to curtail environmental impact at the product manufacturing stage, etc.	-	0.07	-	0.06	0.02	0.1	-	0.04
Total		25.2	35.1	29.0	42.1	41.6	45.8	50.9	57.3

¹ We defined major cases as the environmental-related fines or penalties greater than US\$10,000. In 2020, we didn't receive any major environmental-related fines or penalties, and we were not subjected to any major non-financial penalty or litigation that results in facility shutdown.

Environmental Benefits

ASEH records environmental benefits generated from activities that reduce impacts on the environment. Our total environmental benefits for 2020 amounted to US\$98.3 million.

Unit: US\$ millions

Category	Description	2017		2018		2019		2020	
		Environmental Benefits	Economic Benefits	Environmental Benefits	Economic Benefits	Environmental Benefits	Economic Benefits	Environmental Benefits	Economic Benefits
Cost Savings	Reduction in electricity costs due to energy saving projects	60,988 MWh	5.4	483,405 MWh ¹	44.6	599,833 MWh ¹	52.0	787,095 MWh ¹	71.1
	Reduction in water costs due to water saving projects	15,175,519 metric tons	6.7	22,934,123 metric tons	9.5	28,158,345 metric tons	11.5	34,437,950 metric tons	11.0
	Reduction in waste disposal costs due to waste recycling	38,115 metric tons	7.6	50,011 metric tons	6.5	54,847 metric tons	7.9	62,043 metric tons	16.2
Total		-	19.7	-	60.6	-	71.4	-	98.3

Our estimated environmental capital expenditures for 2021 will be approximately US\$20.9 million. The board of directors has resolved at the end of 2020 to contribute around US\$3.6 million (NT\$100 million) through the ASE Environmental Protection and Sustainability Foundation to fund various environmental projects in 2021.

¹ The reduction in electricity by using renewable energy and purchasing I-REC is included.

Sustainable Finance

Green Bond

To demonstrate our commitment on transition to low-carbon and climate resilient growth, ASE Inc. issued Asia's first corporate US\$300 million Green Bond through our subsidiary Anstock II Limited in July 2014. The first green bonds matured in July 2017, and ASEH launched a second US\$300 million Green Bond in 2019. Proceeds from the issuance of the bonds will be invested in developing renewable energy and related technologies, increasing energy efficiency, promoting energy conservation, reducing greenhouse gas emissions, recycling and reusing waste materials, and water conservation/purification/recycling. ASEH has created largest green factory cluster among world's semiconductor assembly and test industry and Taiwan's largest rate of water recycling plant.

ASEH has obtained 28 Green Building certifications for 19 factory buildings and on an annual basis, the ability to reduce 350,000 tCO₂e, and achieve an accumulated water recycling volume of 20 million metric tons.

Sustainability-Linked Loans

As a demonstration of our continued promise of and commitment to strengthening sustainable development, ASEH began planning for sustainability-linked loans in 2020, and we have entered into a formal agreement with our banking partner in 2021. The terms of the loans will be linked to ASEH's overall performance in reaching its sustainable goals, with particular emphasis on greenhouse gas emissions, renewable energy, waste processing, and inclusion in the Dow Jones Sustainability Indices, among others. With discounted bank rates as an incentive, we will urge ourselves to implement sustainable practices. Going forward, we will continue to assess and plan meaningful green investments, with the aim of further promoting the use of green financial instruments in Taiwan, and driving the development of a low-carbon sustainable industry.

6 INCLUSIVE WORKPLACE



ASEH is committed to protecting human rights, ensuring diversity in our workforce and providing employees with a safe, healthy and stimulating work environment.

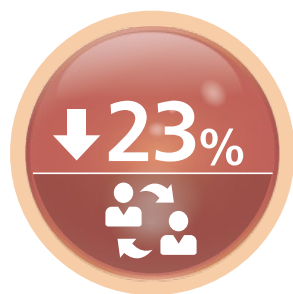
ASEH strives to continuously invest in talent cultivation by motivating employees to further their career within the company and retaining highly skilled and experienced employees. We respect the rights of our employees and we strive to provide a safe, comfortable, healthy and productive workplace for our employees.



2020 • Key Performance



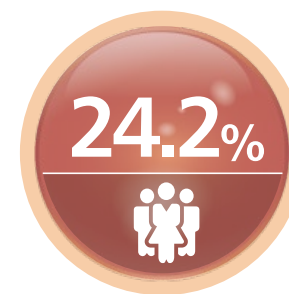
New Hires



Turnover Rate



Regular Employees in Labor Unions



Percentage of Females in Management Positions



Employees Bonus¹ Million (US\$)

SDGs	Business Actions	2020 Material Aspects	KPI	2020 Target	Status	2020 Performance	2021 Target	2025 Target
	Ensure that all employees have access to vocational training and life-long learning opportunities	Talent Cultivation and Development	Employee Engagement Survey Coverage (%)	>73%	Achieved	82.1% ²	>85%	Employee Engagement Survey Coverage: >95%
			Turnover Rate (%)	<20%	Achieved	16.6%	<20%	Turnover Rate: <20%
			Female Employee in Top Management Positions (%) ³	NA	NA	12.9%	13.3%	Female Employee in Top Management Positions: 15%
		Human Resource Development	Management Positions through Internal Promotions (%)	>75%	Achieved	79.3%	>75%	Management Positions through Internal Promotions: >75%
	Formulate and support a comprehensive workplace safety framework to ensure decent working conditions for all employees across the industry	Occupational Health and Safety	Cases of Occupational Disease and Major Injury	0	Not Achieved	Major Injury: 1 Occupational Disease: 20	0	Cases of Occupational Disease and Major Injury: 0
			Disabling Injury Frequency Rate (FR)	<0.5	Not Achieved	0.56	<0.5	FR: <0.5
			Disabling Injury Severity Rate (SR) ⁴	<9	Not Achieved	9.3	<9	SR: <9

¹ Employee Bonus includes: Monthly Incentive Bonuses + Annual Profit-sharing Bonuses
² The employee engagement survey is conducted every 2 years with the most recent in 2019.
³ New target in 2020
⁴ The target of disabling injury severity rate does not include major injuries.

6.1 Talent Attraction and Retention

Diversity in Human Resources

ASEH has over 92,000 employees worldwide¹, of which 95.2% are regular employees and 4.8% are contract employees. There are 39,813 employees in management, engineering and administration positions, and 52,592 employees in technical positions on the production line. With an average employee age and tenure of 35 years old and 7 years respectively, ASEH's human capital structure is robust enough to support the company's rapid growth. To attract employees, ASEH ensures that its subsidiaries offer compensations and benefits that do not discriminate on the basis of gender, age, nationality, race, religion or job position. Due to the nature of the semiconductor industry, engineering positions require STEM (science, technology, engineering, and mathematics) knowledge and skills. Therefore, 80% of the company's engineering positions are held by male employees, while female employees form the majority in administrative positions (over 70%) and technical positions on the production line (over 60%). About 5,800 female employees at ASEH hold STEM-related positions, accounting for approximately 17% and the proportion of female employees who hold management positions is as high as 24%.

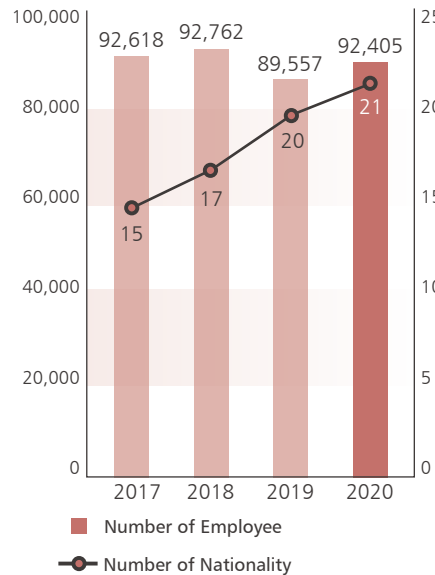
We understand that a diverse and inclusive workplace environment that maximizes the unique and different traits of employees facilitate the organization's operational efficiency. Globally, ASEH has established 26 operating locations in eight countries and hired employees of 21 different nationalities. 96% of our employees are from Taiwan, China, Philippines, Mexico, Malaysia and South Korea. Over 50% of our employees are based in Taiwan - the primary location of our operations, 20% in China, and the rest in the Asia-Pacific and America regions. Since 2017, we have gradually increased the hiring of persons with disabilities - achieving 678 persons in 2020. This number exceeds the hiring percentage stipulated by local governments.

¹ The employees' data covers all of our manufacturing facilities, but excludes our sales, administrative and other offices located in U.S.A. and Europe.

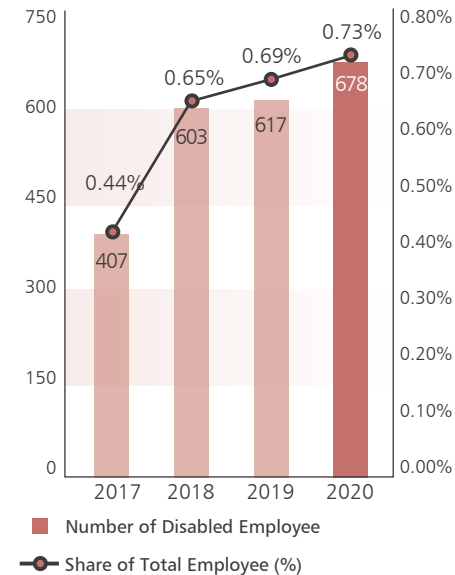
Global Workforce Structure

Category	Group	Number	Percentage of Total Employee (%)
Employment Type	Regular	88,008	95.2%
	Contract	4,397	4.8%
Gender	Male	47,610	51.5%
	Female	44,795	48.5%
Location	Taiwan	57,846	62.6%
	China	25,537	27.6%
	Rest of Asia	6,351	6.9%
	Americas	2,671	2.9%
Disabled Employee	Male	409	0.44%
	Female	269	0.29%
Position	Management	6,062	6.6%
	Engineering	27,953	30.2%
	Administration	5,798	6.3%
	Skill Job	52,592	56.9%
Age	<30	29,148	31.5%
	30-50	59,089	64%
	>50	4,168	4.5%
Education	Ph.D	171	0.2%
	Master	7,052	7.6%
	Bachelor	30,625	33.1%
	Other Higher Education	17,139	18.6%
	High School and below	37,418	40.5%
Total		92,405	

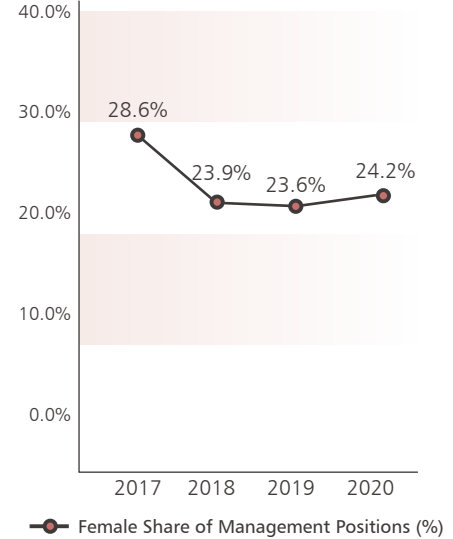
Total Employee and Nationality



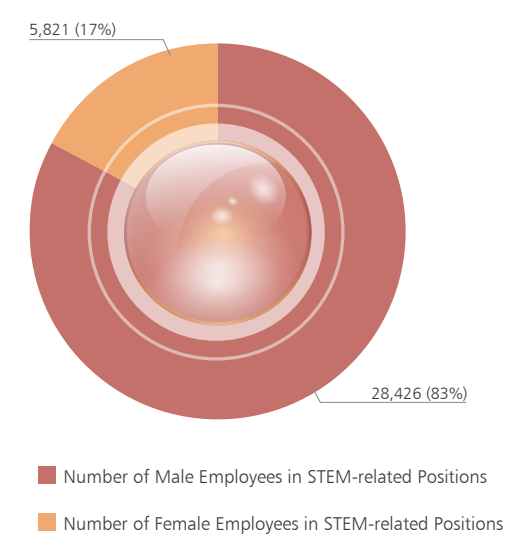
Disabled Employee



Females in Management Positions



2020 STEM-related Positions Employees



Diversity Indicator

Category	Group	Male		Female	
		Number	Group Percentage (%)	Number	Group Percentage (%)
Job Position	Management Position	4,595	75.8%	1,467	24.2%
	Top Management Positions	663	87.1%	98	12.9%
	Junior Management Positions	2,256	80.6%	544	19.4%
	Management Positions in Revenue-generating Function	3,812	78.6%	1,039	21.4%
	Engineering	24,248	86.7%	3,705	13.3%
	Administration	1,680	29.0%	4,118	71.0%
	Skill Job	17,087	32.5%	35,505	67.5%

Global Male/Female Salary and Compensation Ratio

Category	Group	2018		2019		2020	
		Male	Female	Male	Female	Male	Female
Executive Level	Salary	1	0.99	1	0.99	1	0.96
	Compensation	N/A		N/A		1	0.76
Management	Salary	1	0.88	1	0.83	1	0.89
	Compensation	1	0.85	1	0.82	1	0.88
Engineering	Salary	1	1.04	1	0.97	1	1.02
Administration	Salary	1	0.93	1	0.91	1	0.96
Skill Job	Salary	1	0.99	1	0.96	1	1.004

Talent Recruitment

ASEH and its subsidiaries employ a diverse and inclusive recruitment policy that prohibits discrimination against any employee or job applicant on the basis of gender, age, race, nationality, religion, political affiliation or sexual orientation. The company is committed to complying with local laws and regulations, upholding its Code of Business Conduct and Ethics, protecting and respecting human rights and adhering to the Responsible Business Alliance (“RBA”) Code of Conduct. ASEH forbids the use of child or forced labor and discourages recruitment agencies from collecting agency fees from foreign employees.

ASEH’s corporate recruitment policy takes into account the conditions and culture of the local communities as well as the job characteristics. We recruit through various channels including campus recruitment, employee referrals, industry-academia internship programs, the R&D substitute service program, executive search firms, recruitment fairs, online recruitment and digital job boards. In 2020, ASEH recruited over 35,000 employees. Those under 30 years old accounted for 70.87%, of which 84.81% are skilled technical positions on the production lines. ASEH has also hired 94 persons with disabilities.

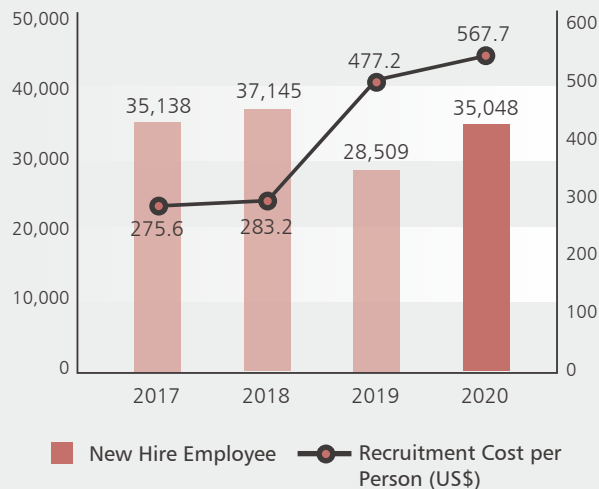
Over 1,300 new foreign employees were hired this year. To help foreign employees adapt to the workplace, our subsidiaries provide new hires with interpreter service and also assign them with senior foreign employees from the same country so as to help them adjust to their new work environment and familiarize themselves with the local culture. Foreign employees are also provided educational training programs in languages they understand and enjoy the same benefits as local employees. In 2020, the average cost of recruiting an employee was over US\$560. Our global and diverse talent recruitment policy has helped us improve the company’s global advantage and competitive capabilities, thus allowing us to meet the market needs of an increasingly diverse customer base. We believe that a workplace culture defined by diversity and inclusion, will allow employees to grow and develop mutual respect, resulting in a genuinely inclusive work environment.

Employee Turnover¹

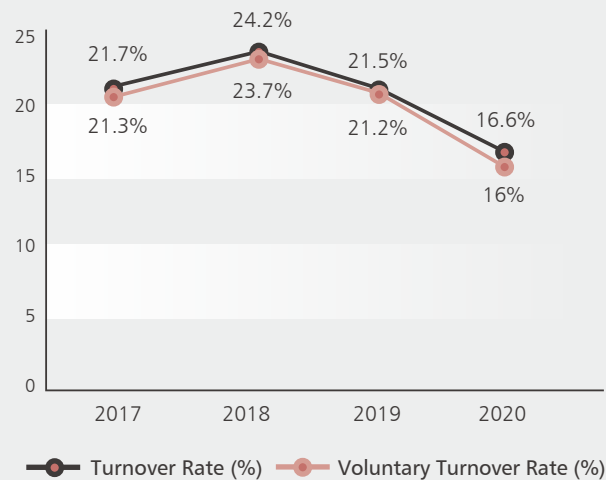
The employee turnover rate at ASEH for 2020 was 16.6%, representing a 23% percent decrease from 2019, broken down into 55% male vs 45% female. In terms of job types, production line skill job position form the majority with 72.7%, while management, engineering and administrative positions formed the remaining 27.3%. On a biannual basis, each ASEH subsidiary conducts employee engagement surveys to hear the thoughts and feedback of employees and annual analyses on the underlying causes of attrition for different job types so as to make corresponding improvements for employee job satisfaction. Each facility also formulates appropriate solutions to lower employee turnover using regional attributes and challenges as a basis, and using big data analytics to project employee turnover, identify underlying and correlating factors that affect turnover, extrapolate behavioral factors that contribute to talent attrition, and manage talent retention risks based on scenarios predicted by the data. Meanwhile, for facilities with high turnover among new hires, various actions will be adopted to help employees adapt to their work environment and prevent the depletion of human capital.

¹ Turnover rate includes voluntary resignations and terminations due to poor performance, but does not include employees on probation at time of termination.

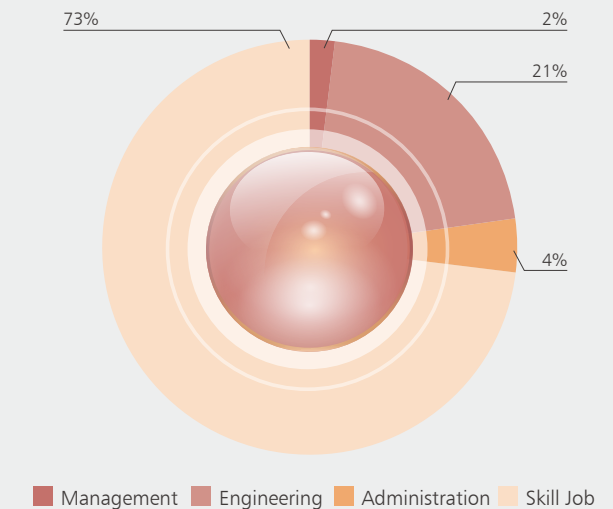
New Hires and Recruitment Cost



Turnover Rate



2020 Turnover Employees (by position)

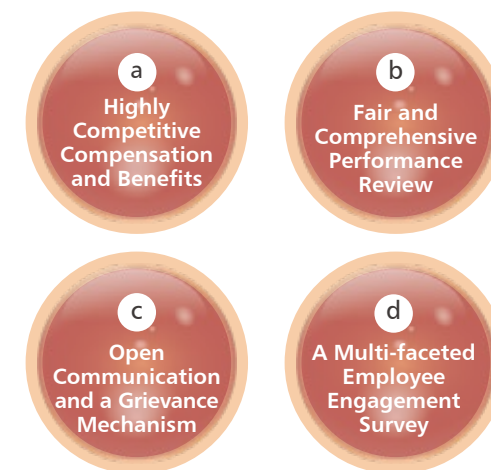


Reason for Resignation	Improvement Measures
Salary and Benefits	<ul style="list-style-type: none"> Periodically adjust salary and benefit packages based on industry standards to maintain the Company's competitiveness Issue stock options and cash bonuses to employees that display outstanding performance
Career Advancement	<ul style="list-style-type: none"> Build a comprehensive career advancement system that provides multi-channel trainings (internal and external training programs) and an internal job rotation and transfer mechanism, helping employees to acquire the necessary on-the-job training or project experience and offering promotion or job transfer opportunities based on organizational/business needs Create a direct communication channel through which executives can explain future career pathways to entry-level employees in person
Family/Personal Health Issues	<ul style="list-style-type: none"> Promote awareness of statutory standards on working hours through employee training and communications Develop an in-house working hours management and control system to help supervisors manage their subordinates' working hours, send SMS or email alerts to employees working longer hours and remind them to complete their tasks more efficiently so as to balance their work and family life For family/personal health issues that can be resolved by the company, supervisors may adjust the job requirements or place of work of subordinates with their consent
Work Environment	<ul style="list-style-type: none"> Conduct work environment surveys in order to make timely improvements

Talent Retention

ASEH provides a conducive environment for employees to unleash their full potential to create innovative technologies or to demonstrate effective management skills. The growth of the company is strongly dependent on attracting and retaining talent.

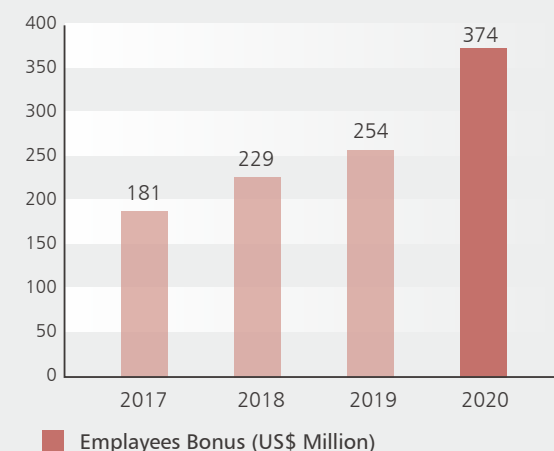
Key Retention Strategy



Compensation and Benefit Policy

ASEH provides competitive salaries and remuneration packages that consist of base salary, subsidies, employee cash bonuses and other compensation based on job responsibilities, academic qualifications, work experience and job performance etc. Employee remuneration is not determined based on factors such as gender, age, race, nationality, religion, political stance or gender orientation. Every year, our facilities benchmark employee base salaries with the local market rates to ensure a competitive compensation structure. In order to attract and retain talent, and reward performing employees, the company has established monthly incentive and annual profit-sharing bonuses. Monthly cash incentive bonuses are provided to employees with outstanding performance based on the company's operating goals and profitability, while annual profit-sharing bonuses vary according to the employee's individual contribution levels and performance. In 2020, ASEH's employee bonuses amounted to US\$374 million (including monthly incentive and annual profit-sharing bonuses), with the accumulated total from 2017 to the end of 2020 reaching US\$1,038 million. In addition, employees with outstanding performance are awarded company stock options. The employee stock option program, which has a ten-year validity period from the date of issue, is aimed at retaining outstanding employees.

Employees Bonus



Bottom-up Profit Sharing Scheme

At ASEH, we value the unique importance of each employee, and maximizing their potential to play key roles within the company is the primary motivation behind the inception of our profit sharing concept. Against a backdrop of an industry downturn in 2005, ASEH continued to make meaningful investments in its people and resources, including the roll out of a bottom-up profit sharing scheme. On a monthly basis, the company formulates a bonus payout, that is determined by the achievement rate of operational goals set by the management team with participation from employees. Since the launch of the scheme in 2005, ASEH has grown steadily in terms of revenue, profitability and output efficiency, and is now a reputable leader in the packaging and test industry.

Semiconductors form part of the electronics supply

chain and, the impact of global economic and competitive environments has a significant influence on the industry. As such, our profit sharing scheme is designed based on the principles of real time adjustments (Real-time), talent spotting (Potential) and increased productivity (Efficiency) that enable a corporate culture of management empowerment, organizational agility and synergistic goal alignment.

Since the launch of the bottom-up profit sharing scheme at ASE Kaohsiung in 2006, the turnover rate at the factory management and junior engineering levels have seen a dramatic reduction from between 12.4%-16.3% (1995-2005) to a healthy rate of between 2.7%-9.8% (2007-2020). The results demonstrated the effectiveness of the scheme in talent retention as well as raising the company's overall competitiveness. The

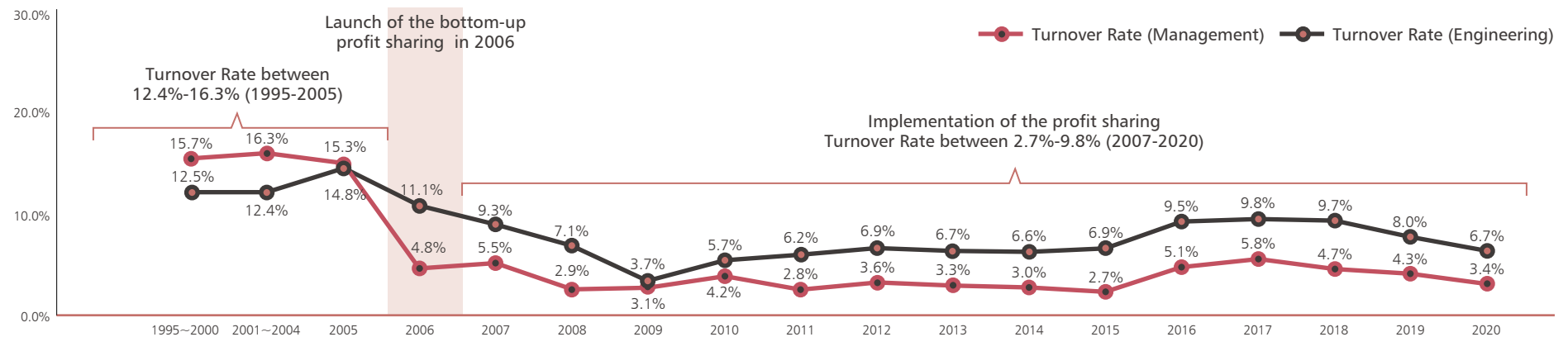
ability to retain good people at ASE creates a healthy and stable working environment that generate a virtuous cycle of organizational productivity.

We believe that the effectiveness of an incentive lies in its ability to improve employee morale and strengthen organizational identification through a system that optimizes leadership, ownership and provides instant gratification with transparency. ASEH continues to build on the value of employee skills, fostering their dedication and commitment at work, and shaping the development of mutual trust between employees and supervisors. When employees are aligned with the company's strategic goals, they exert a positive influence across various levels in the organization resulting in a stimulating, dynamic, growth-focused and agile team.

Principles and Features of the Bottom-up Profit Sharing Scheme

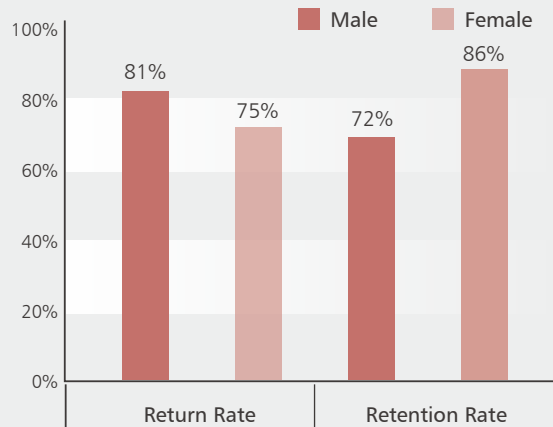


Principle	Feature	Description
Real-time	Monthly Evaluation Mechanism	The scheme is designed to provide a monthly bonus payout based on performance evaluations tied to the achievement of operational goals. The monthly evaluations ensure regular communication between managers and employees. Ground level communication allows the monitoring of organizational productivity that reflect real-time performance of departments and employees as well as the identification of new ways to enhance output efficiency.
Potential	System Transparency	Outstanding junior employees get the opportunity to become star employee of the month which further stimulate their passion for their work. The system also encourages development of high potential employees, improving the cohesion of organizational dynamics.
Efficiency	Frontline Priority	We believe that frontline employees have the strongest ties to improving productivity and efficiency in production output. Therefore, we adopted a bottom up approach for bonus distribution with priority given to junior engineers and the management level given the last consideration. Rewarding from the bottom up sets the company on a positive cycle of achieving higher levels of efficiency with a motivated workforce.



Maternity Benefits and Parental Leave Policy

In support of the government’s parental leave policy and to reduce employees’ burden, ASEH has designed a comprehensive leave management system. The company proactively provides information on labor insurance and subsidies, as well as assists in the application process, thereby ensuring that employees are able to return to the workplace. Employees can apply for voluntary early or delayed reinstatement based on their needs, allowing them to attend to their personal and family care needs. In 2020, a total of 1,042 ASEH employees applied for unpaid parental leave. Among them, the number of employees that was expected to return is 761 while the number of those who returned is 582, contributing to an employee return rate of 76% and a retention rate as high as 82%.



ASEH subsidiary ASE has established 3 nurseries in Taiwan and Korea, 2 of which are at the ASE Chungli and Kaohsiung Facilities, respectively, in the main operative location of Taiwan.

The ASE Korea Facility established its nursery in 1998, which enrolls children between the ages of 2 and 5. The ASE Korea Facility nursery not only accepts the children of employees, but as part of its CSR, designates a number of spots for the children of local residents. In 2020, 64 children were accepted for enrollment, making for an accumulated total of over 430 nursery graduates over the years.

ASE Chungli’s kindergarten was the first to be established in the Taiwan semiconductor industry. The kindergarten occupies a land space of over 400 square meters, with a playground, nature park, library, class and activity rooms, kitchen and gym. The facility is designed with good ventilation and lighting, and the space is comparable to those of expensive private kindergartens. In 2020, 130 children of employees were enrolled at the kindergarten. To date, ASE Chungli’s kindergarten has admitted over 900 students.

In 2018, ASE Kaohsiung began construction of a kindergarten exclusively for employees’ children. The kindergarten will be built at a cost of NT\$100 million, and will begin enrolling students in 2021 with a target of 300 children. Tuition fees will be comparable with public kindergarten standards and children of entry-level employees will be given priority. The kindergarten’s total area of 1,938 square meters will combine the historic site of Oil Refinery Elementary School with a newly-constructed three-story green building. A colony of 80 old trees will be preserved at the site, and the landscape designs will incorporate biological habitats and aquaporin pond systems for children to learn about nature.

Our kindergartens are non-profit operations that aim to promote high-quality and affordable education and childcare services for employees. The company covers the cost for the facility including utilities, cleaning and disinfection, maintenance, fire safety measures, meal plans designed by dietitians and outdoor learning activities. By supporting the operations of

the kindergartens, we are able to reduce tuition fees and ease the financial pressures of employees while allowing the children to enjoy a high-quality childcare and learning environment. In addition, the kindergartens accommodate employees’ work schedules by providing extended childcare services, allowing employees to work without worries, which in turn enhances employees’ loyalty to the company, reduces the turnover rate, and fortifies the company’s ability to recruit and retain talents.



ASE Korea’s Kindergarten



ASE Chungli’s Kindergarten



ASE Kaohsiung’s Kindergarten

Performance Review

ASEH conducts a fair and equal performance appraisal of all employees across the board on a biannual/annually basis. The review involves management by objectives and performance ranking, a multifaceted evaluation, and equipment operator certificate reviews. Employees with poor performance ratings are offered employee counseling on a case-by-case basis by their managers, who are able to make adjustments to their roles and focus on individual performance.

Performance Appraisal

Evaluation	Object	Approaches
Ranking and Management by Objectives	All Employee	Work project targets and quantifiable performance indicators are presented by employees to their direct supervisors for discussion and confirmation before being set as preliminary targets. In 6 months/12 months, employees are required to present their self-evaluation to their supervisors, who shall assess their performance and determine if the performance targets have been reached. A final evaluation is made before all employees in each department are ranked according to their performance.
Multidimensional Performance Appraisal	Management, Engineering and Administration Position Employee	After receiving MTP training, performance personnel will be interviewed by their direct supervisors and then jointly evaluated by cross-departmental supervisors, colleagues, and subordinates.
Qualification Certificate Evaluation	Skill Job Position Employee	According to the various types of machine equipment at each station on the production line and the need to inspect products and resolve anomalies, qualified instructors are assigned to evaluate the performance of production line employees.

Employee Communication

ASEH values and respects the opinions and rights of its employees. In an effort to promote open and transparent communication, the company has established comprehensive communication channels including unidirectional and bidirectional communication modes. Employees are able to receive the latest news about the company and express any opinions or concerns they may have about the workplace. To protect and ensure employees' rights, employee opinions may be submitted anonymously. We promise to maintain the confidentiality of the identities and opinions of employees, who shall not be subject to any unfair treatment or retaliation as a result of their whistleblowing or grievance.

Announcements and publications	Communications
<ul style="list-style-type: none"> • Intranet - to publish the company's latest news • E-mail Announcements - to announce company-wide updates and messages from top management • Bulletin Boards - to provide information related to labor compliance policy, health and safety and company events • Internal Periodical Publications – interviews with employees and a platform for employees to express their opinions • News/Information TV Screens - to broadcast employee welfare information 	<ul style="list-style-type: none"> • Employee Opinion Box / Employee Care Mailbox - to collect and respond to employees' grievance and feedback • Employee/Foreign Employee Symposium - to share and discuss work experiences; to hold regular symposiums with foreign employees • Counseling Room - to provide one-on-one counseling sessions • Email Mailboxes - General Manager/Plant Director Mailbox • Service/Grievance Hotline – designated telephone hotlines • Labor Unions and Labor Management Meeting - to have regular communication with labor representatives

ASEH and its subsidiaries received a total of 915 employee complaints in 2020. Amicable resolutions were reached for all cases after communicating and clarifying the facts with complainants. Among the complaint cases, 23 pertained to labor disputes, all of which were resolved amicably after clarifying the facts and giving proper care to complainants; and another five cases were sexual harassment complaints relating to non-consensual physical contact in the workplace where the victims felt violated. Pursuant to internal regulations and procedures formulated in accordance with the 'Act of Gender Equality in Employment' and 'Regulations for Establishing Measures of Prevention, Correction, Complaint and Punishment of Sexual Harassment at Workplace', we forwarded these cases to an internal sexual harassment complaint processing committee to conduct closed door investigations to protect the privacy of complainants. An agent was assigned by the committee to interview both the complainants and appellees, whose given statements were presented to the committee for a final decision on whether each case constituted sexual harassment.




Sexual harassment prevention is integral to promoting a healthy and gender-neutral work environment. In addition to carrying out awareness campaigns within our facilities and implementing thorough complaint and processing procedures, we have protective measures in place that give victims the proper care required. Additionally, all of our employees (220,659 person-times) completed a total of 314,363 hours of compulsory human rights training which covered the topics of RBA management, labor rights, gender equality and sexual harassment awareness.

Labor Unions

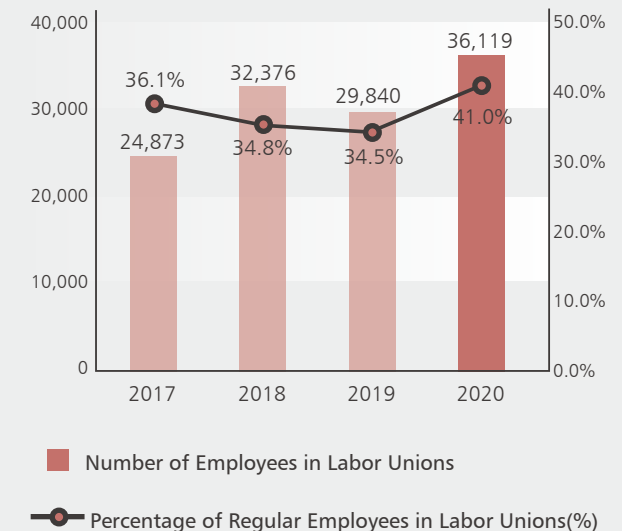
As of the end of 2020, the total number of union members was 36,119, accounting for around 41% of all ASEH regular employees. Among the three ASEH subsidiaries, 14 facilities that have established a labor union – ASE facilities in Kaohsiung, Shanghai(A&T), Kunshan, Suzhou, Wuxi, Weihai, Korea, Japan and Singapore; SPIL's Suzhou facility; and USI facilities in Zhangjiang, Kunshan and Mexico. Of these 14 facilities, the labor unions of 8 facilities have signed a collective agreement¹ with the company and have regular meetings organized to discuss and resolve issues with employee representatives on employee benefits and the health and safety of the working environment.

¹ Facilities that have signed a collective agreement are ASE facilities in Kunshan, Suzhou, Wuxi, Weihai, Japan, and Korea; SPIL's Suzhou facility; and USI's Mexico facility. Employees in labor unions accounted for 16% of all regular employees.

Guidelines for Processing Sexual Harassment Complaints

 Punishment	 Counseling	 Remediation
For cases that constitute sexual harassment, the committee shall issue a warning, disciplinary order, or another form of punishment to the offenders and require that they make an apology to the victims. Serious offenses may be grounds for dismissal.	Victims' personal information shall be kept confidential. Victims may apply to transfer to another position as appropriate, or may receive enhanced counseling and care as needed from the HR department to facilitate their smooth return to the workplace.	Each case shall be reviewed to determine its cause, and offenders shall be tracked, reviewed and monitored to ensure the effectiveness of the disciplinary or counseling measures, and to prevent similar incidents or retaliation from occurring. The results of such processes will then be used as a reference for making adjustments to workplace environment and regulations.

Union Statistics



Employee Engagement Surveys

Employees are a company’s most valuable asset. Thus, maximizing the potential of our human resources to create value is an important part of ASEH’s sustainable development strategy. To understand employees’ level of engagement in the company, since 2017, we have conducted the Employee Engagement Survey once every two years. In 2019, the survey was extended to our three major subsidiaries, encompassing 23 global facilities, and the survey was administered to a total of 67,205 people — 82.1% of total employees. Employees’ cooperation in taking the surveys helped us to effectively understand and collect employee feedback retaining and nurturing talent, thereby strengthening the compatibility between employees and the company.

The Employee Engagement Survey is divided into 15 aspects under 6 major facets, and measures engagement based on the work characteristics of direct and indirect employees. In 2019, the survey results showed higher employee engagement in the facets of “The Basics”, “Brand”, and “The Work”. The next Employee Engagement Survey is set to be conducted in 2021.

Employee Engagement Surveys Results

Category	Year	2019		2021
	2017	Target	Result	Target
Engagement (%)	75	73	83	>75
Coverage ¹ (%)	73.6	80	82.1	>85

¹ Coverage = Actual number of employees surveyed/ Targeted number of employees to be surveyed



6.2 Talent Cultivation and Development

The innovative spirit, talent, and passion of employees are the driving force behind the company's sustainable operations. We therefore place great emphasis on improving the development and cultivation of talents in the fields of "management", "technology" and "manufacturing". In response to the organization's growth, we continue to invest resources into collaborations with management consulting companies and top universities, thereby increasing innovative momentum and maintaining our competitive edge in the industry.

Talent Cultivation Strategy

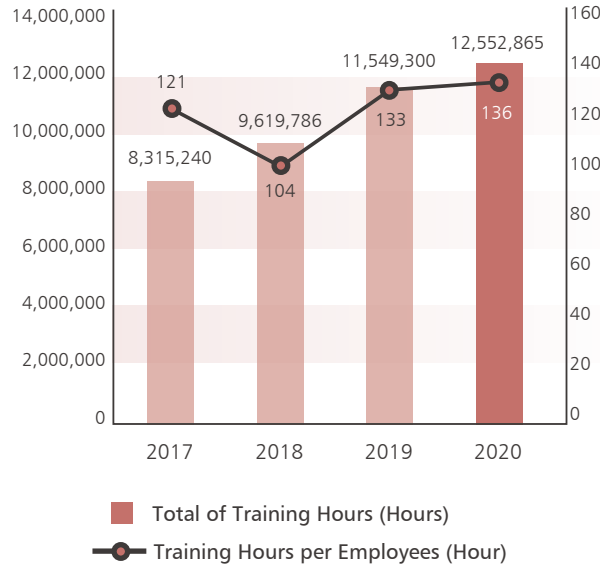


ASEH is committed to the nurturing of talent through consolidating comprehensive and multifaceted courses and training resources for the creation of diverse training methods, including physical training, online courses, work practice, and external training, etc. In 2020, more than 12.55 million training hours in total were completed, with each employee completing 136 hours of training on average. The total spent on training exceeded US\$6.5 million, averaging around US\$71 per employee. The company also encourages employees to further their studies on skills and knowledge in work-related fields by funding certified courses in work-related disciplines. In 2020, a total of 234 employees received a work-related certification. We use systematic cultivating mechanisms to nurture future management talent and promote the development of mid- to senior management reserved talents, allowing employees to reach their full potential and continue growth. The ratio of internally promoted employees within the company's management level has increased annually, reaching 79.3% in 2020.

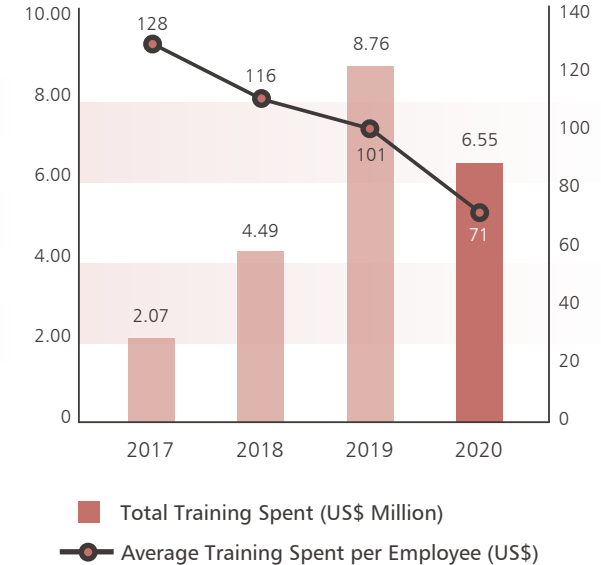
Training Index

Category	Group		Number	Training Hours per Employee
Training Hours (Hour)	Gender	Male	7,259,096	152.47
		Female	5,293,769	118.18
	Position	Management	600,129	99.00
		Engineering	2,954,021	105.68
		Administration	480,221	82.83
		Skill Job	8,518,494	161.97
Total			12,552,865	135.85

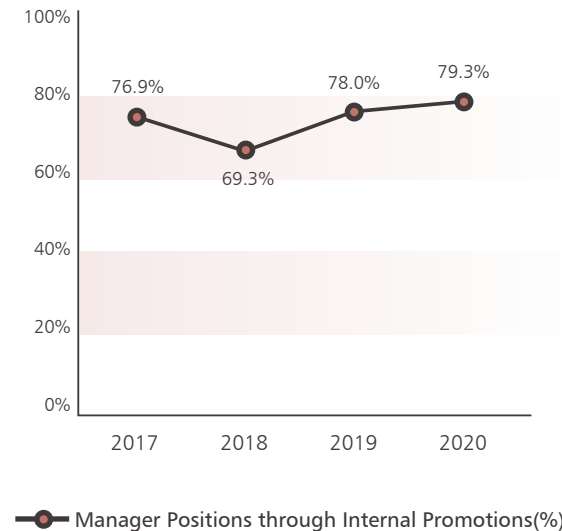
Training Hours



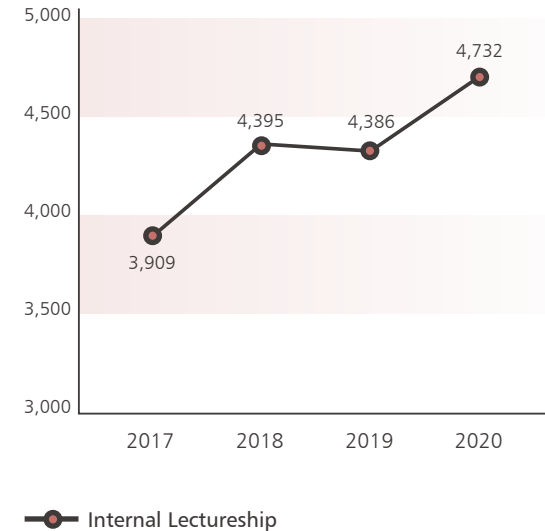
Training Spent



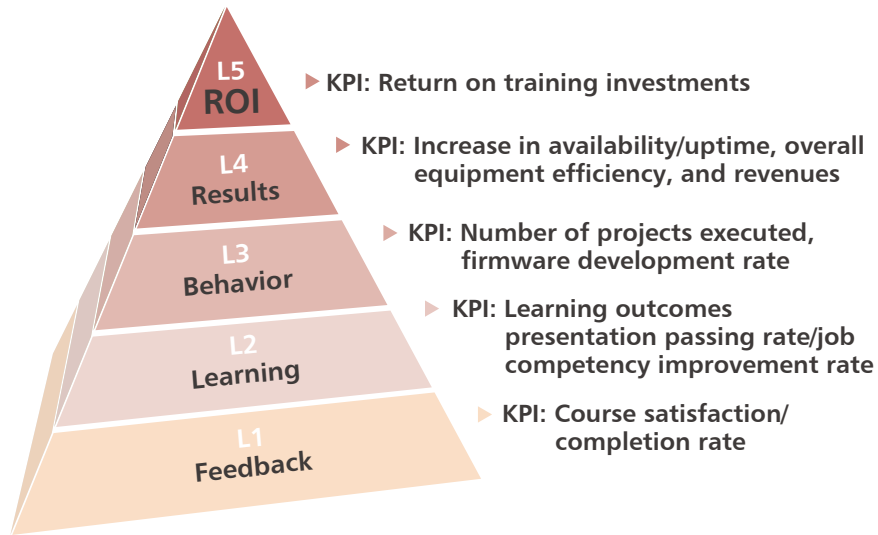
Internal Promotions



Internal Lectureship



School of Smart Manufacturing



▶ **Program title**

Smart Manufacturing and Digital Transformation

▶ **Course Outline**

The semiconductor industry is moving towards heterogeneous integration and innovative customer requirements setting forth a digital transformation. Smart manufacturing is a step towards industry 4.0 and is driving developments in robotic arms, automated material handling, integration of various machinery, smart equipment troubleshooting and predictive machine maintenance, which in turn improves plant efficiency and capacity, manufacturing process quality, costs and time to market. In this course, employees will also be familiarized with basic Python Programming Language, AI deep learning, and the applications of AI in image recognition, security systems, warehouse and inventory management, and innovative applications such as the Internet of Things.

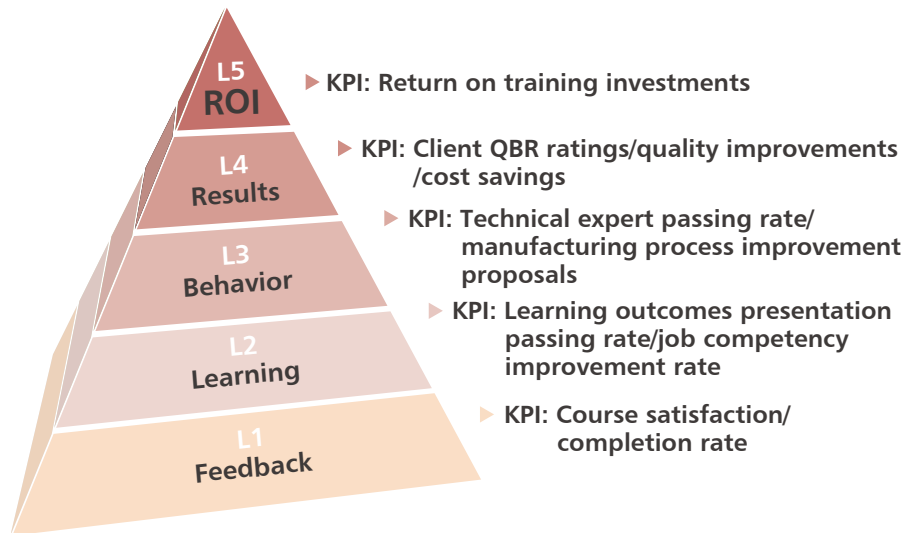
▶ **Target Audience**

R&D, manufacturing process, and equipment engineers

▶ **Commercial Benefits**

- Reduce external software purchasing costs
- Increase machinery availability/uptime
- Cut down on machinery inspection time
- Increase product yield
- Improve overall equipment efficiency

School of Engineering Experts



▶ **Program title**

Six Sigma Engineering Experts

▶ **Course Outline**

This course is created to respond to customer needs and the increasing number of engineering employees. The program incorporates the Six Sigma concept and the 8D process, and fosters internal competition and improvement proposals to hone skills in problem analysis and project execution. Employees play the role of technical experts, helping the Company to improve the overall quality of manufacturing processes, service, on-time delivery and production capacity, which results in raising teamwork and customer satisfaction.

▶ **Target Audience**

Manufacturing process and equipment engineers

▶ **Commercial Benefits**

- Manufacturing process improvement proposals
- Technical experts
- Increase in process capability index (CPK)
- Quality improvements
- Increase in production capacity
- Cost savings
- Better ratings in customer quarterly business reviews (QBRs)

6.3 Occupational Health and Safety

ASEH is committed to providing workers with a safe, healthy, and conducive work environment. To ensure the health and safety of employees, and prevent accidents at the workplace, we have formulated comprehensive procedures for managing occupational health and safety ("OHS"). The main focuses of ASEH's OHS Management include the OHS Management System and health promotion.

In addition, we identify higher-risk operating environments within our facilities such as locations that could expose employees to ionizing radiation, noise, dangerous chemicals and dust, and provide such employees with high quality protective equipment and regular health examinations to monitor their health.

OHS Management System

All ASEH facilities worldwide have established OHS management organizations¹, and formulated methods and procedures that follow ISO 45001/OHSAS 18001 standards, the RBA Code of Conduct and local regulations. In addition to setting up a system for regular reviews, the OHS management system contributes effectively to preventing accidents and achieving the goal of 'zero accidents'.

The OHS Committees at ASEH's worldwide facilities are tasked to keep abreast of local regulatory updates and evaluate internal policies, emergency response and environmental safety procedures, so as to ensure compliance with applicable laws and regulations. On an annual basis, we perform hazard identification and risk assessment procedures on the work environment, facility, equipment and services, to determine risk levels and devise appropriate management plans based on severity of hazard, frequency of occurrence and incidence rate. For high-risk work environments, immediate risk control measures are put in place to reduce risks.

OHS Management Aspects



OHS Management Processes

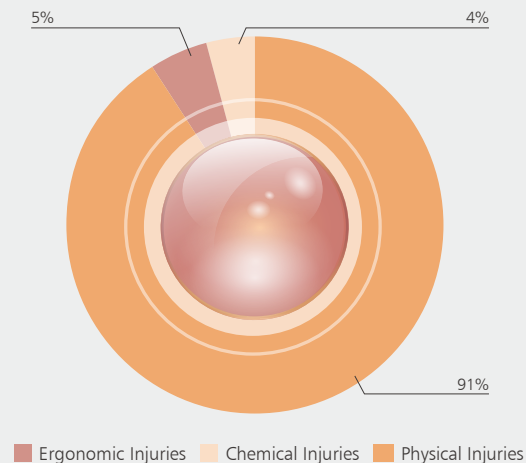


¹ ISO 45001: ASE (Kaohsiung, Chungli, Suzhou, Kunshan, Weihai, Wuxi, Korea and Singapore), SPIL (Da Fong, Chung Shan, Zhong Ke, Hsinchu, Changhua and Suzhou), USI (Taiwan, Zhangjiang, Kunshan, Jinqiao and Shenzhen). OHSAS 18001: ASE (Shanghai (A&T) and Shanghai (Material)) and USI Mexico.

Occupational Injury Management

Occupational injury and incident reporting and investigation procedures are firmly established at all ASEH facilities. When an occupational injury incident occurs, standard operating procedures shall be followed and reported to local authorities in accordance with the management policy and local regulations, while injury incidents are reviewed regularly to improve preventive measures. Each subsidiary manages the statistical analysis of occupational injuries using the major indicators published by the Ministry of Labor and the Global Standards for Sustainability Reporting (GRI Standards) - Disabling Injury Frequency Rate (FR) and Disabling Injury Severity Rate (SR) are key measurements but the statistics do not include traffic accidents. There were 110 incidents of occupational injuries in 2020, amounting to 1,835¹ lost working days. Physical injuries had the highest proportion out of all incidents, followed by ergonomic injuries caused by human factors and chemical injuries. ASEH recorded a total of 20 cases of occupational disease and 1 major occupational fatality, which occurred at ASE Malaysia and SPIL Taichung respectively. For more information, please refer to the "Appendix- J. Workers Occupational Health and Safety".

2020 Occupational Injury Category



Occupational Disease

A total of 20 occupational disease incidents occurred at ASE Malaysia, all attributed to hearing damage caused by machine operations. Improvements include immediate protective measures installed in machines and these actions were completed in 2020.

Major Occupational Incidents Resulting in Injuries or Deaths

A major occupational incident occurred at SPIL Taichung which involved the death of an employee caught in a pinch point while conducting machine maintenance. The main reason from the incident was determined to be improper isolation of safety mechanisms. After the incident, the company conducted thorough inspections and made improvements to related hardware/equipment and management procedures.

- (1) Hardware/equipment: The ability to isolate safety mechanisms was removed from all machinery so that the manual isolation of safety mechanisms is replaced with engineering controls during maintenance work.
- (2) Management: We have established a stringent signage and supervisor inspection mechanism to improve on-site control and monitoring. We have also included machinery safety into our occupational hazard identification and assessment matrix, and the risks across all manufacturing units were re-evaluated in accordance with the new assessment guidelines. Through addressing the source of problems and implementing improvements on-site, we aim to enhance internal monitoring and control in keeping with the principles and spirit of PDCA.

Occupational Injury Statistics

Category	2020	
	Male	Female
Number of Occupational Injury Accidents	51	60
Injury Rate ²	0.10	0.12
Disabling Injury Frequency Rate (FR) ³	0.51	0.62
Disabling Injury Severity Rate (SR) ⁴	66.18	12.78

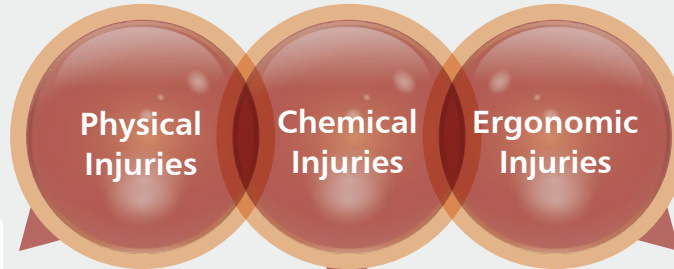
¹ Lost work day calculations did not include occupational fatality; if added, the total lost days would be 7,835.

² Injury Rate = (total number of injuries×200,000) / total hours worked, excluding traffic accidents

³ Disabling Injury Frequency Rate (FR) = (total number of disabling injuries × 1,000,000) / total hours worked

⁴ Disabling Injury Severity Rate (SR) = (disabling injury work loss days× 1,000,000) / total hours worked

2020 Occupational Injuries and Improvement Measures



Causes:	Improvement Measures:
(1) Falls/Slips	(1) Strengthen communication (videos, warning signs)
(2) Caught in/ Between objects	(2) Increase adequate machine safeguards
(3) Cuts/Bruises	(3) Formulate relevant protocols and standard operating procedures (SOP)
	(4) Personnel education and training
	(5) Wearing of protective equipment

Causes:	Improvement Measures:
Spraying of chemicals	(1) Formulate relevant protocols and standard operating procedures (SOP)
	(2) Personnel education and training
	(3) Increase notices on the use of protective equipment

Causes:	Improvement Measures:
Poor posture when carrying items, resulting in muscle strain	(1) Formulate relevant protocols and standard operating procedures (SOP)
	(2) Personnel education and training
	(3) Auxiliary equipment

Occupational Injury Incident Reporting Procedures



Disaster Response and Emergency Drills

All of our manufacturing facilities develop disaster response and recovery plan and conduct full-scale emergency drills annually in cooperation with the local authorities. Various scenarios are simulated at these drills to improve our disaster response plans. In 2020, we completed 400 drills for earthquakes, fire and chemical disasters.

Establishing a Medical Mask Factory for Employee Health and Safety Protection

In response to the outbreak of the COVID-19 pandemic in 2020, ASEH established an epidemic prevention management framework that covers the organizing of a global epidemic taskforce, and designed epidemic prevention management systems powered by AI technology. Following the Central Epidemic Command Center's mask wearing mandate and to prevent Covid-19 infections, we made it compulsory for all employees to wear masks at the workplace.

At the start of the pandemic, there was a global mask shortage that caused much worry to the general community. ASEH decided to engage in the production of medical masks to ensure that stocks are available for the protection of our employees from Covid-19 and allay their concerns about mask shortages. ASEH subsidiary's ASE invested nearly NT\$10 million dollars to construct a Class 100K mask manufacturing line. To promote environmental

sustainability, reduce the use of packaging materials and increase our operational efficiency, we modified the production line to accommodate automated mask packing. To prevent occupational hazards, we installed self-developed equipment safety protection devices in the machines. These endeavors illustrate our efforts to create a favorable working environment for our employees and fulfill our responsibility in safety management.

Volume production at the mask factory began in Aug. 2020 after obtaining a medical device license from the Ministry of Health and Welfare. Since then, a total of 60,000 Medical masks have been provided free of charge to employees of ASEH subsidiaries including ASE, SPIL, and USI. We will continue to produce medical masks in order to build a safe and comfortable workplace environment and strengthen our epidemics prevention and responses, as part of our corporate social responsibility.



Automated Mask Packing



Health Promotion

The healthy workplace development principles proposed by the World Health Organization (WHO) stipulate that a healthy workplace must account for the following aspects; " Workplace Physiological Health," " Workplace Psychosocial Health," "Personal Health Resources," and " Community Involvement ". Moreover, it must strive for continuous improvement

by implementing processes of integration, needs assessment, prioritization, planning, execution, evaluation, and improvement. ASEH provides our employees with various medical, health and psychological counseling services, formulates employee health management measures based on the concept of preventive healthcare, emergency

infectious disease response procedures, emergency rescue procedures and maternal health. The company identified employees with high health risks and offered them health improvement plans as well as inviting them to participate in health improvement activities.

Key Achievements of Healthy Workplace Promotion in 2020

Aspects	Key Activities	Key Achievements
Workplace Physiological Health	<ul style="list-style-type: none"> • Training on health and safety topics • Ergonomic assessment of working environments • Assessment on the causes of occupational injuries 	<ul style="list-style-type: none"> • Completed over 370,000 hours of occupational health and safety education, and training for more than 200,000 participants. • Provided on-site health services conducted by occupational physicians.
Workplace Psychosocial Health	<ul style="list-style-type: none"> • Monitoring of grievance procedures for workplace bullying • Workplace health and mental health workshops 	<ul style="list-style-type: none"> • Established an independent counselling center and assigned dedicated staff to assist in dealing with employees' physical and mental problems. • Built massage rooms and gyms
Personal Health Resources	<ul style="list-style-type: none"> • Regular health screening for general employees • Health screening for employees working in high risk environments • Family medical clinics 	<ul style="list-style-type: none"> • Provided health screening for more than 53,000 employees at a cost of approximately US\$3.5 million • Provided health consultations (quitting smoking, weight loss, mental health, etc.) and workshops (pandemic prevention, pregnancy care, cardiovascular diseases, etc.). • Health education and advice provided to 6,400 people by onsite nursing professionals
Community Involvement	<ul style="list-style-type: none"> • Community medical and healthcare services • Promotion of community sporting events 	<ul style="list-style-type: none"> • Provided health screenings in rural areas through the use of smart mobile health clinics. • Held long-term care and community events/educational programs for senior citizens.

Contractor Operation Safety Management

ASEH facilities have established contractor management policies to ensure that safety protocols are observed when contractors work at our facilities and to achieve the target of zero contractor occupational injuries. Eight high-risk types of operations at ASEH's facilities were identified which include work on pipelines, flammable sources, work inside confined spaces, live-line, crane operations, elevated operations, chemical filling and roof works, for which stricter SOPs were instituted. Additionally, ASEH will continue to request contractors conducting high-risk operations to meet the requirements specified in the ISO 45001/OHSAS 18001 management systems.

Contractors in-plant Construction Procedures

Contractors presenting operation safety management proposals

Training personnel who enter the plant and informing them of likely hazards

Performing periodic patrol inspection according to the safety checklists for before, during and after construction

Filing the project closure report for record



7 RESPONSIBLE PROCUREMENT

ASEH is committed to partnering with our suppliers to ensure that working conditions in ASEH's supply chain are safe, their workers are treated with respect and dignity, and that business operations are environmentally responsible and conducted ethically.

The supply chain is a critical extension of the ASEH value chain. We are actively involved in the sustainable development of our supply chain to ensure that our tier-1 suppliers and contractors provide high-quality products and services to ASEH in a sustainable, ethical and responsible fashion.

2020 • Key Performance



Tier-1 Suppliers (Raw Materials) Sustainability Audits



Non-tier 1 Suppliers (Raw Materials) Number of Suppliers



Non-tier 1 Suppliers (Raw Materials) Risk Assessment (by tier-1 suppliers' total procurement amount)



Conflict Minerals: Suppliers' Survey



Conflict Minerals: Compliant Suppliers



Conflict Minerals: DRC Conflict-Free Products

SDGs	Business Actions	2020 Material Aspects	KPI	2020 Target	Status	2020 Performance	2021 Target	2025 Target
 	Ensure that all employees across the business and supply chain earn a wages that allows them to support the education of their dependents and ensure that there is zero child labor.	Sustainability Supply Chain	DRC Conflict-Free Product Lines of Packaging and Material Services (%)	100%	Achieved	100%	100%	DRC Conflict-Free Product Lines of Packaging and Material Services: 100%
			DRC Conflict-Free Product Lines of Electronic Manufacturing Services (%)	100%	Achieved	100%	100%	DRC Conflict-Free Product Lines of Electronic Manufacturing Services: 100%
			Number of Supplier Sustainability Audits	100	Achieved	103	100	Number of Supplier Sustainability Audits: 100
			Critical Direct Material Suppliers Completing RBA SAQ (%)	85%	Not Achieved	64%	85%	Critical Direct Material Suppliers Completing RBA SAQ: 100%
			Non-tier 1 Suppliers Conduct Risk Assessment (by tier-1 procurement amount) (%)	45%	Achieved	56%	50%	Non-tier 1 Suppliers Conduct Risk Assessment (by tier-1 procurement amount): >50%
	Substantially reduce emissions from our supply chain and our operations, in alignment with climate science.		Critical Suppliers Obtaining ISO 14064-1 Citification (%)	60%	Not Achieved	45%	70%	Critical Suppliers Obtaining ISO 14064-1 Citification: 100%

7.1 Supply Chain Overview

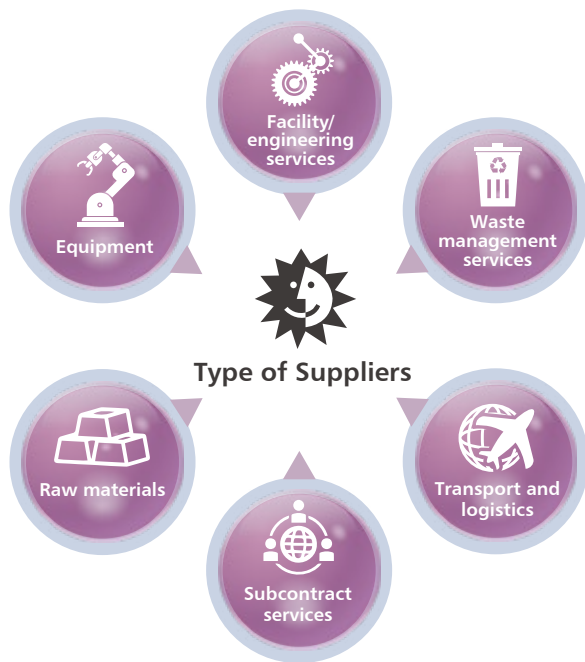
As a global leader in semiconductor assembly and testing services as well as a key systems and core technology integrator, ASEH primarily provides assembly, testing and material (ATM) services and electronics manufacturing services (EMS). We work with thousands of suppliers globally to procure raw materials, equipment, facility/engineering services, waste management services, transport, logistics and subcontract services., and are committed to the expansion of our global footprint in Taiwan, China, Japan, South Korea, Malaysia, Singapore, the U.S.A. and Mexico.

The supply of raw materials have the most direct impact on ASEH's day-to-day operations and manufacturing. Raw material suppliers are classified into two categories according to their attributes; direct material suppliers (suppliers of materials directly related to manufacturing) and indirect/packaging material suppliers (suppliers of packaging materials or materials indirectly related to manufacturing). To ensure efficient resource allocation and management of raw material suppliers, we identify tier-1 suppliers based on their annual procurement value and maintain regular management controls with these critical suppliers¹.

To lower overall supply chain risks, ASEH has expanded the scope of sustainability risk management to non-tier-1 suppliers. There are currently over 800 non-tier-1 suppliers which accounted for 56% of our total procurement amount.

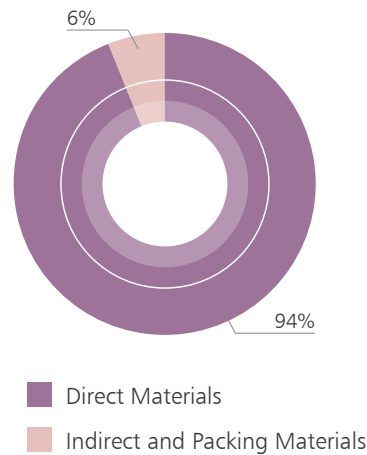
We also performed risk assessment on the geographic locations of, and type of materials supplied by non-tier-1 suppliers, from which 201 critical non-tier-1 suppliers² were identified.

ASEH shall follow up on the risk status of these suppliers and perform further risk control.



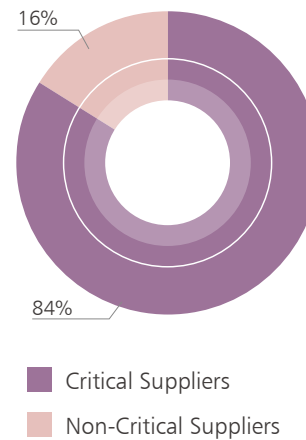
2020 Raw Materials Supplier Category

(Per annual procurement amount)



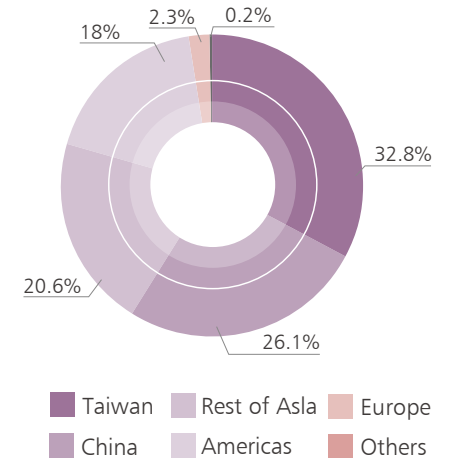
2020 Critical and Non-Critical Supplier Distribution

(Per annual procurement amount)



2020 Raw Material Supplier Distribution Area

(by annual procurement amount)



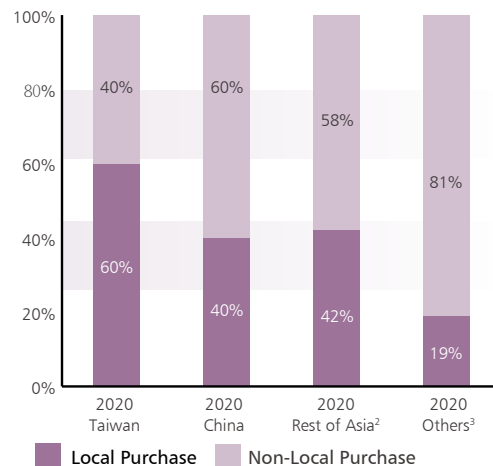
¹ The definition of critical raw material supplier as follow: (1) Top 85% of direct material purchasing amount, (2) Indirect material suppliers refer to those with a purchasing spending over US\$2 million with ATM; purchasing spending over US\$1 million with EMS, (3) Single source or non-substitutable suppliers.

² The definition of critical non-tier 1 suppliers as follow: (1) Supply to critical tier 1 suppliers, (2) Supply to tier 1 direct materials suppliers who ASE spend over 10 million USD/year, (3) Supply to more than two tier 1 suppliers.

Supporting Local Suppliers

ASEH endeavors to boost local development through its procurement efforts, and is thus working closely with local suppliers¹, and helping them develop technological capabilities. Such efforts benefit the environment by reducing carbon emissions within the supply chain, community by creating local job opportunities and reduce the risk of supply chain. In 2020, procurement from local suppliers accounted for approximately 48% of the total procurement amount.

2020 Raw Material Local Purchasing Spends



¹ Local supplier refers to the supplier's register location is located at the same country where our manufacturing facility is located.

² Rest of Asia: Japan, Korea, Malaysia and Singapore

³ Others: America and Mexico

7.2 Supply Chain Management Framework

Purchasing and Supply Chain Development Policy

The ASEH Purchasing and Supply Chain Development Policy is published on the company website to communicate ASEH's supplier sustainability expectations.

We hope to make a positive impact on the global electronic industry supply chain and establish sustainable supply chains with its suppliers.

ASEH is also devoted to socially responsible procurement and innovation throughout the supply chain, on top of providing responsible and quality services to our customers.

Please visit: https://www.aseglobal.com/en/pdf/2019_aseth_purchasingandsupplychaindevelopmentpolicy.pdf

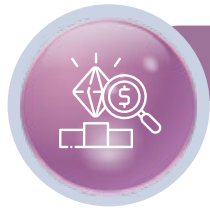
Supplier Code of Conduct

The supply chain is a major extension of ASEH's business operations and we actively foster sustainability throughout our supply chain. ASEH's suppliers are expected to comply with our Supplier Code of Conduct which requires them to comply with local laws and regulations where they operate, and conduct business in a manner that meets labor, health and safety, environment, business ethics and management and various corporate compliance standards. The suppliers are also required to drive their suppliers to meet such standards and oversee their compliance status.

Please visit: https://www.aseglobal.com/en/pdf/ase_holding_supplier_coc_en_2018.pdf

Supply Chain Management Strategy

Through stable partnerships with its suppliers, ASEH hopes to improve the overall supply chain resilience and implement socially responsible procurement. Supply chain sustainability is a key factor influencing our day-to-day procurement besides cost and quality, and enables our long-term growth with suppliers. From an overall supply chain management perspective, and using a risk and opportunity assessment to analyses our current supply chain status, we developed various programs in recent years focusing on responsible procurement, supply chain diversification and mitigation of supply chain disruption to attain win-win collaboration with our suppliers.



Value Oriented

Strategy | To obtain a competitive overall value in the supply chain

Target | Upgrading the Sustainable Value of the Supply Chain

Subsidiary | ASE

Project: Recyclable IC Trays

To increase the competitiveness of raw material costs, we actively promoted the use of recyclable IC trays. There were initial challenges on the use of recyclable trays as customers had concerns on the quality. These were resolved through the close collaboration between the procurement team and tray suppliers by providing relevant and complete data on the tray quality to gain customer confidence. The use of recyclable trays has also helped to reduce the risk of supply disruption by increasing supply diversity and supply chain flexibility. This is prominent in the example of electric cars, where the increase in popularity has caused price increases and shortages in key materials especially PPE. Recycling trays also help to reduce the impact to the environment.



Diversified Sources

Strategy | To maintain at least two suppliers for the same material to ensure continuous supply

Target | Reduce the Risk of the Supply Interruption

Subsidiary | USI

Project 1: Supplier Financial Risk Monitoring

To manage our suppliers' financial risk, USI's Procurement Department works closely with the Finance Department to monitor a supplier company's financial health so as to prevent any disruption resulting from the company's financial problems. Through preliminary risk analysis, suppliers with potential risks are identified and monitored. For the suppliers that are identified to be high-risk, the Procurement Department immediately looks for a second source supplier, and continues to monitor the high-risk suppliers' financial condition regularly every six months, to ensure effective control and to reduce the supply interruption.

Project 2: End of Life Components Active Pre-Monitoring

To prevent risk of supply interruptions due to discontinued materials, USI has carried out material procurement source controls based on product life cycles and future market trends since 2015, as well as front-end risk analyses and product exit strategies for supply materials to prevent impacts on customers due to end-of-life (EOL) supply parts. USI's procurement department, in collaboration with the R&D, manufacturing, engineering and other departments, negotiates with customers in advance about introducing alternative materials for parts that may be discontinued or not sold in the future and recommends materials for new products. The project's advance evaluations and follow-ups reduce the risk of supply chain disruptions from future product discontinuations.



Quality First

Strategy | To obtain the best quality products and services from suppliers

Target | Shaping Knowledge and Quality across the Value Chain

Subsidiary | ASE

Project: Development of Electroplating Carriers

ASE cooperated with equipment suppliers to develop novel electroplating carriers that provide appropriate electric conductivity during the electroplating process and reduce contact resistance. The development has also helped resolve the problem of uneven plating thickness caused by electrostatic discharge from the edge of the wafer. The collaboration improved our knowledge about electroplating, and we then set up a database to solve related problems in the field. We were also able to cut down on the quantity of scrapped wafers and increase product yields.



Strategic Cooperation

Strategy | To integrate suppliers' resources and capabilities for greater innovation

Target | Reinforcing Supply Chain Collaboration and Resilience

Subsidiary | ASE

Project: e-Hub Supply Survey and Risk Assessment

To increase mutual collaboration across the supply chain, ASE launched the e-Hub in 2010, a platform that provides real time information exchange, enabling a supply chain that is agile and eliminating the bullwhip effect.

We have adopted the following approaches to upgrade the efficiency of the supply chain: 1) Implementing a flexible supply chain management for suppliers; 2) real time WIP (work in process) of supplier inventory at each process site, and uploading WIP data through the e-Hub; 3) adopting B2B (business to business) information exchange to support MRP (material requirement planning), so as to calculate valid orders. In addition, to facilitate ASEH's global deployment, we further analyzed the results of material demand and supply risks, and conducted a comprehensive inventory of the required materials according to the production country and customs declaration based on inventory status and customer demand.

We are gradually transforming from focusing on costs and efficiency to strengthening the overall resilience of the supply chain. Through the e-Hub, we introduced the continuous procurement concept, consolidated materials, inventories and risk assessments, enabled real-time interactions with suppliers as well as established the Supplier Risk Questionnaire System. The data from the e-Hub has provided us a high level of visibility of the supply chain to enable better decision making and reduce risks of supply disruption.



Sustainable Sourcing

Strategy | To raise suppliers' economic, environmental and social performance in sustainability

Target | Creating a Supply Model for a Circular Economy

Subsidiary | ASE

Project 1: Development of Plastic Waste Calcination Technologies and Conversion of Waste to Clean Fuel

To progress towards a circular economy, besides the careful assessment of materials and resources used at every stage of the production process, we are also focusing on transforming waste to resources. Liquid waste from the semiconductor manufacturing processes and bakelite used in circuit boards are mostly incinerated resulting in resource wastage as well as increasing carbon emissions. ASE has been working with suppliers to develop solutions to turn hazardous liquid waste into clean fuels to be used for the calcination of bakelite. We developed different calcination techniques for different types of bakelite and transformed them into activated carbon, which could be reused in waste water treatment plants or for air pollution control. By generating less waste from bakelite circuit boards, we were able to reduce our impact to the environment and the costs of waste disposal, fulfilling the concept of cradle to cradle.

Project 2: Development of Techniques to Concentrate Electroplating Solution Waste

Sludge can be hazardous and is a serious concern in wastewater treatment, and ASE has been collaborating with suppliers and academic institutions to develop a concentrated processing technique to increase the metal content in the sludge produced through waste water treatment. The metal is then recycled and reused, leaving behind sludge with less hazardous content. This innovative method reduces the cost of waste disposal and has the benefit of transforming waste into resources and reducing harmful impact to the environment.



Responsible Minerals Sourcing

Strategy | To ensure that suppliers are using only responsibly sourced, conflict-free minerals in their products

Target | Conducting Responsible Procurement Practices

Subsidiary | ASE, SPIL, USI

Project: Conflict Minerals Management

We have identified and survey the source of smelters and minerals in the supply chain annually. According to our supplier survey, we believe that the identified SoRs used for all of our packaging and materials services products are DRC Conflict-Free. For detailed information, please refer to the "Conflict Minerals Compliance."

7.3 Supply Chain Sustainability Management

ASEH has suppliers around the world, all of which are important partners. Beyond value creation, we also hope to be able to address labor rights and environmental protection issues by joining the RBA and actively participating in its annual conference. ASEH adopts the RBA Code of Conduct in the management of labor, environment and ethics. ASEH also applies the code to its supply chain management

to ensure the provision of a safe work environment, respect for workers, environmental protection and ethical conduct. ASEH forbids the use of child labor or forced labor by its suppliers, and shall terminate its relationship with suppliers involved in serious violations although no such instances were found in 2020.

Supplier Sustainability Management Approach

As part of the ASEH Procurement and Supply Chain Development Policy and Commitment, we established a four-stage sustainability supply management process that is run repeatedly to ensure supplier compliance and enhance their sustainability performance.

Supplier Sustainability Management Approach



Sustainability Requirement

ASEH's raw material suppliers are required to sign the "ASEH Supplier Code of Conduct Commitment Letter". The suppliers are also required to complete a sustainability risk assessment questionnaire that covers regulatory compliance, sustainable management, supplier management, conflict mineral management, environmental protection, health and safety, labor rights, human rights, etc. The purpose of the questionnaire is to assess each supplier's sustainability risk and conduct an on-site audit where necessary to ensure conformity to ASEH's supplier sustainability standards. In parallel, we encourage suppliers to seek continuous improvement by acquiring internationally recognized certifications such as ISO 9001, IATF 16949, ISO 14001, ISO 45001 and ISO 14064-1.

Sustainability Risk Assessment

To assess the current status of supply chain sustainability development and risk management status, ASEH conducts an annual three-step supplier sustainability risk evaluation and analysis. This allows ASEH to identify the suppliers that exhibit potentially high social, economic, and environmental risks. Deficient suppliers will have to undergo audits and follow ASEH's corrective guidelines to ensure effective mitigation and control of risk.

Risk Assessment 1 (RA 1): Active Risk Assessment

We conduct a preliminary assessment and analysis of potential risks to suppliers based on location, procurement amount, type of product supplied and manufacturing process.

Risk Assessment 2 (RA 2): Sustainability Risk Self-Assessment Questionnaire (SAQ)

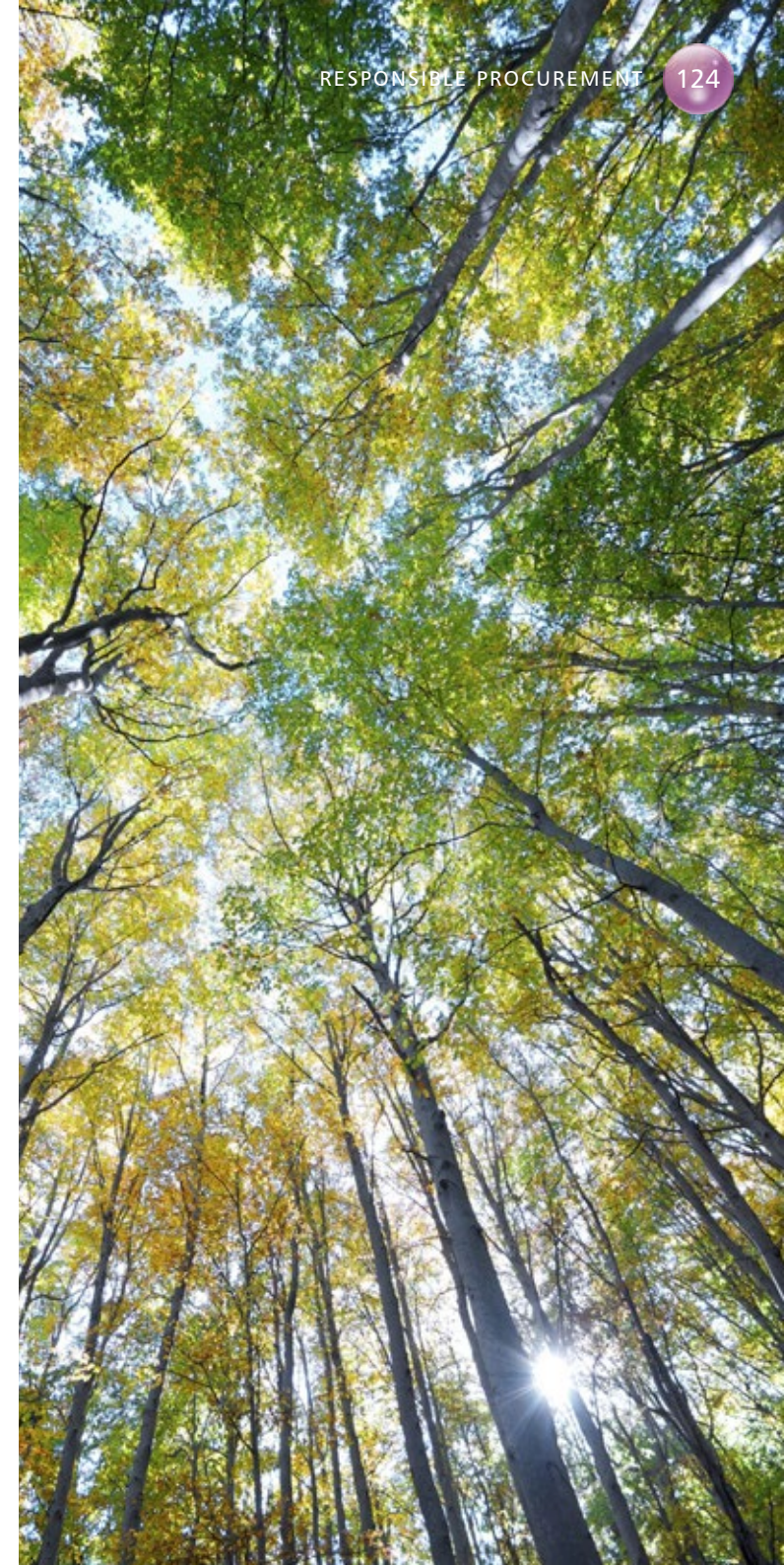
To ensure effectiveness in the assessment and protection of small and medium suppliers, we have established various standards and requirements for critical and noncritical suppliers that help ASEH develop a more resilient and sustainable supply chain. In 2020, we conducted SAQ and achieved a response rate of more than 74% from tier-1 suppliers.

- Critical Suppliers: the implementation of a management system is a basic requirement, with the sustainability management practices and performance included as assessment criteria; or the completion of a RBA SAQ.
- Non-critical Suppliers: the focus is on management system requirements.

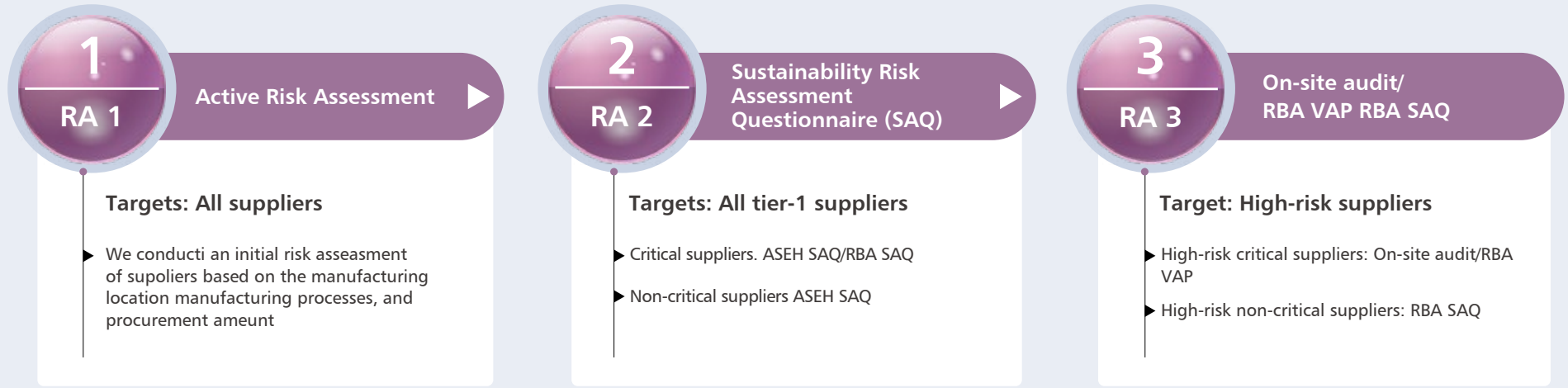
Risk Assessment 3 (RA 3): On-site audit/RBA VAP/RBA SAQ

From the review and analysis of the questionnaire results, we were able to identify potential high-risk suppliers and take appropriate action to ascertain their risk status and reduce the risks.

- Critical Suppliers: implement on-site audits or request for completion of RBA Validated Audit Process (VAP).
- Non-critical Suppliers: request for completion of the RBA SAQ.



Supplier Sustainability Risk Assessment Targets and Procedures



Sustainability Risk Assessment Factors



Supplier Major Sustainability Risk Factors in 2020

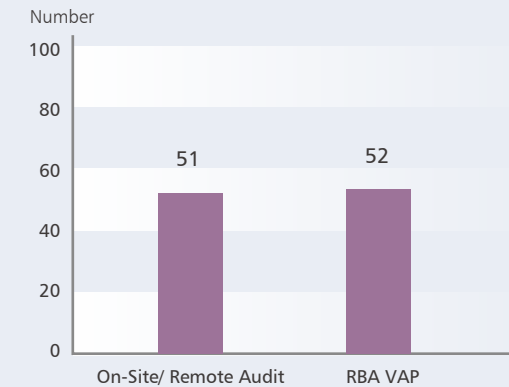
Category	Risk Factors	Risk Description
Economic	Risk Management and Continuous Operation Management	An information security management and risk simulation exercise have yet to be established
	Supplier Sustainability Management	A system for sustainable supply chain sustainability policy and management has yet to be established
Environmental	Environmental Management	An evaluation procedures for risks and impacts associated with climate change have yet to be established
		A GHG inventory mechanisms have yet to be established
		A system and targets for water use reduction in water resource and water recycling management has yet to be established
Social	Occupational Health & Safety (OHS)	A system for the identification of OHS regulations have yet to be established
	Labor Rights	An anonymous complaint mechanism has yet to be established
		A system for the assessment of labor-related risks and impacts has yet to be established
		A mechanisms for managing employment agencies have yet to be established

Sustainability Audit Mechanism

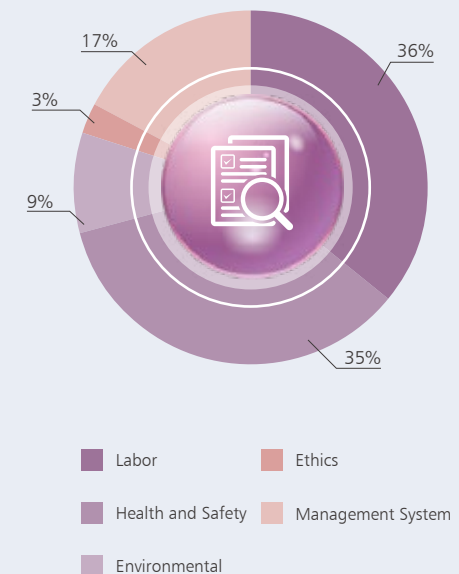
ASEH established a supplier sustainability audit system to carry out routine and ad hoc audits. Due to the global COVID-19 pandemic in 2020, our supplier auditing methods involved document audits, on-site audits, remote audits, and the RBA VAP, as well as various auditing checks. Deficient suppliers are required to draw up corrective action plans and rectify them within a given time frame. We will then review the results of their corrective action plans, followed by another assessment on the status the following year.

In 2020, we conducted on-site audits, remote audits or RBA VAP on 103 raw material suppliers, including high-risk critical suppliers. All audited suppliers completed the corrective actions within the given time frame; and after evaluation, no supplier was terminated for non-compliance. To further reduce supply chain risks, we also conduct risk assessment questionnaires and audits for non-tier-1 suppliers. In 2020, 30% of our non-tier- 1 suppliers completed sustainability questionnaires, and 5% of the non-tier-1 suppliers completed on-site audits, remote audits and RBA VAP. We shall continue to perform sustainability risk assessment on non-tier 1 suppliers to better manage risks to our supply chain.

Type of Raw Material Suppliers Audits in 2020



Supplier Sustainability Audit Findings by Category in 2020



Supplier Audit Results and Corrective Actions in 2020

Category	RBA Classification	Major Non-conformance Finding	Corrective Action
Labor	Working Hours	<ul style="list-style-type: none"> Working hours exceeding 60 hours a week Working seven days consecutively 	<ul style="list-style-type: none"> Recruiting a sufficient number of employees to meet production needs that would prevent the need for overtime work due to manpower shortage. Establishing overtime monitoring and tracking mechanisms to ensure workers have one day off every seven days.
	Wages and Benefits	<ul style="list-style-type: none"> Deductions from wages as a disciplinary measure 	<ul style="list-style-type: none"> Stipulating clearly in company regulations prohibiting the use of wage deductions as a disciplinary measure.
Health and Safety	Occupational Safety	<ul style="list-style-type: none"> Employees not equipped with proper protective equipment in hazardous working environments 	<ul style="list-style-type: none"> Enhancing training and management mechanisms to improve employees' safety awareness.
	Emergency Preparedness	<ul style="list-style-type: none"> Obstruction of fire safety equipment Incomplete information on escape routes Night-shift employees not included in fire drills 	<ul style="list-style-type: none"> Performing regular inspections to ensure the effectiveness of fire safety equipment and unobstructed egress. Reviewing and updating the emergency evacuation plans of facilities and establishing regular review mechanisms. Including night-shift employees in fire drills and revising drill plan.
Environmental	Air Emissions	<ul style="list-style-type: none"> Lack of mechanisms for the inspection of air pollution prevention equipment 	<ul style="list-style-type: none"> Establishing a regular inspection mechanism to ensure the proper management of air pollution prevention equipment.
	Water Management	<ul style="list-style-type: none"> Rainwater-related management systems not yet established 	<ul style="list-style-type: none"> Identifying the potential risks of rainwater pollution and establishing relevant management systems.
Ethics	Protection of Identity and Non-Retaliation	<ul style="list-style-type: none"> Lack of anonymous reporting mechanism 	<ul style="list-style-type: none"> Establishing anonymous reporting/grievance procedures and response mechanisms to protect the rights and privacy of complainant.
Management System	Management Accountability and Responsibility	<ul style="list-style-type: none"> Incomplete labor-related management policies (e.g. anti-discrimination, workers' rights, etc.) 	<ul style="list-style-type: none"> Establishing comprehensive labor-related management policies.
	Legal and Customer Requirements	<ul style="list-style-type: none"> Incomplete identification and tracking mechanisms for labor, health and safety, and environment-related legislation 	<ul style="list-style-type: none"> Establishing comprehensive identification and tracking mechanisms for labor, health and safety, and environment-related legislation.

Sustainable Supply Chain Development Program

ASEH continues to support its suppliers by providing education and training, organizing seminars, forums and counseling sessions. These efforts help ASEH stay responsive to an ever changing business landscape and to foster sustainability values throughout the supply chain.

Risk of Foreign Forced/Bonded Labor in Supply Chain Corrective Action Project

ASEH is committed to the protection of the dignity and the rights of workers. In 2018, we collaborated with suppliers to review and conduct due diligence on the hiring process of foreign workers, and explore ways to improve the process. The aim is to eliminate any practice of forced or indentured labor, and to make up for the inadequacy in local labor law protection and/or complex hiring procedures within our supply chain.

Supplier Sustainability Education and Training

ASEH continues to invest resources enhance the sustainability performance of its supply chain risks. We have organized various sustainability education and training, and conducted guidance outreach at multiple facilities to communicate our supply chain management requirements. As in-person sessions were difficult to hold in 2020 due to the global COVID-19 pandemic, we held two in-person/virtual sessions instead.

ASE-Contractor Trainings

- We organized a contractor training in ASE Chungli. A total of 61 people from 12 contractors participated in the training
- Strengthened the adaptive capability of and preventative measures for contractors in regard to the occupational injuries that occur in the semiconductor industry through holding semi-conductor occupational injury case discussion seminars

USI-Sustainability Seminar

- Hosted a Supplier Sustainable Supply Chain Information in Taiwan through online video conference due to the pandemic, for a total of 120 participants
- Shared USI sustainability results and future shared goals with supplier partners in the information session; strengthened supply chain management so that it conforms to environmental regulations and changes in clients' environmental requirements; invited SGS to present the topic of "Post-Pandemic Corporate Sustainability Management Trends"

ASEH Supplier Sustainability Awards

As part of our strategic efforts to build a more sustainable supply chain, we established the Supplier Sustainability Award in 2017, to recognize suppliers with outstanding performance in sustainability. In 2020, the award program was jointly organized by all three ASEH subsidiaries. In addition, a new supplier incentive program focusing on the company's Low Carbon and Circular strategies was launched, and the number of participating suppliers expanded. The program encourages suppliers to submit sustainability partnership projects of between 1-3 year duration to be reviewed by ASEH and independent third parties. The submitted projects undergo a rigorous selection process based on their duration and efficacy, and selected projects will be funded by the ASE Environmental Protection and Sustainability Foundation. One supplier project for Low Carbon and two supplier projects for Circular were selected eventually.

We are constantly refining our approaches to building a resilient supply chain and strengthening the bond between ASEH and our supply partners. We believe that a creative model with built-in incentives could accelerate the achievement of a circular economy and a low-carbon transition that allows ASEH to increase value and capture business opportunities. Recognizing the efforts of our suppliers through the awards will boost their commitment to sustainable development and encourage more suppliers to be proactive in advancing a sustainable future for the semiconductor industry. Going forward, every three years, we will select and fund unique sustainability projects that have the potential to demonstrate a high degree of positive influence and produce beneficial results.

Selected Suppliers in 2020

Sustainability Strategies	Selected Supplier	Partnership Project	Expected Outcomes and Benefits
Low Carbon	Air Liquide Far Eastern Ltd.	Optimizing gas supplies for manufacturing	<ul style="list-style-type: none"> • Reduce the energy intensiveness of manufacturing and the carbon emissions from transporting gas materials • Minimize transport mileage and labor hours
Circular	Hsiang Tai Water Electricity Co., Ltd.	Water supply circular regeneration technology	<ul style="list-style-type: none"> • Reduce water waste • Minimize loss due to equipment downtime or plant construction
	Hwa Shu Enterprise Co., Ltd.	Circular reuse of packaging materials	<ul style="list-style-type: none"> • Reduce carbon emissions • Reduce demand for pulp raw materials and minimize waste

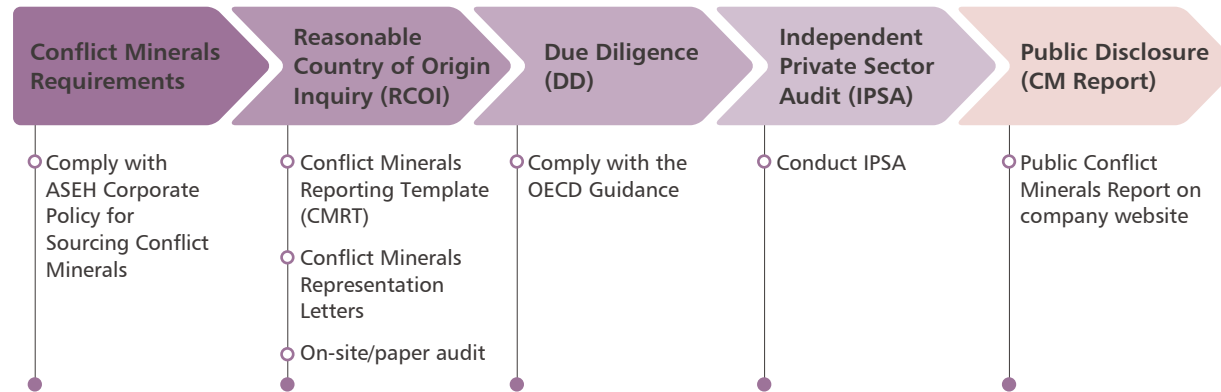
7.4 Conflict Minerals Compliance

To communicate ASEH's conflict minerals management requirements, the ASEH Corporate Policy for Sourcing Conflict Minerals is posted on our company website, please visit: https://www.aseglobal.com/en/csr_conflict_minerals_compliance.html

Conflict Minerals Compliance

To prevent the unintentional use of any conflict mineral such as tantalum, tin, tungsten and gold (3TG) from the Democratic Republic of the Congo and its neighboring countries, we have established the ASEH Corporate Policy for Sourcing Conflict Minerals, joined the Responsible Minerals Initiative (RMI)¹, and participated in the RMI Mineral Reporting Templates (MRT) Teams and Due Diligence (DD) Practices Team to resolve conflict minerals issues in the supply chain and support responsible sourcing.

Conflict Minerals Management Approach



Conflict Mineral Requirement

ASEH communicates conflict mineral policies to our suppliers through our website. The suppliers are required to comply with ASEH Corporate Policy for Sourcing Conflict Minerals and establish their own conflict minerals policies and to their own suppliers. We also require our suppliers to actively assess and validate their supply chain, and encourage them to source minerals from Smelters or Refiners (SoRs) that have received "conflict-free" designations by the Responsible Minerals Assurance Process (RMAP), or other independent third party audit program.

Reasonable Country of Origin Inquiry (RCOI)

Each year, ASEH performs RCOI to identify and validate the sources of 3TG in our packaging and material services and electronic manufacturing services and products, and whether they come from conflict-affected regions.

Our RCOI includes two steps:

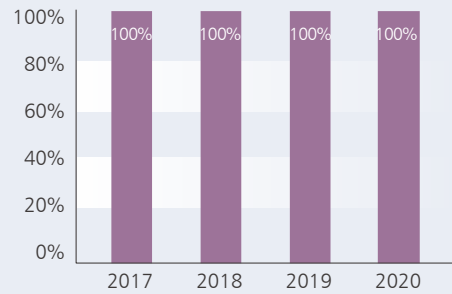
1. Identify sources of 3TG SoRs through CMRT by conducting supplier survey.
2. Suppliers are asked to sign the Representation Letters of compliance with ASEH Corporate Policy for Sourcing Conflict Minerals and to fully reveal the source of the SoRs they sourced from.

Since 2011², we have conducted the supply chain survey to identify the source of SoRs that are used in the processes of our packaging and material services, electronic manufacturing services and products. We identified the minerals and the source of smelters through CMRT. In 2020, we have extended the scope of 3TG supplier survey and identified 268 SoRs from more than 500 suppliers. According to the supplier survey we conducted in 2020, 100% of our suppliers are compliant with ASEH's requirement for sourcing DRC conflict-free minerals.

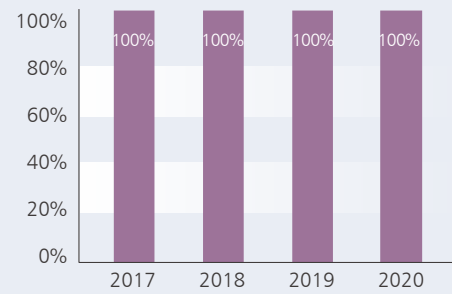
In addition to 3TG, we have conducted proactively the supply chain survey for Cobalt since 2018, and disclosed the source of Cobalt smelters to our customers. In 2020, we identified 56 suppliers who use cobalt from 52 smelters.

¹ ASE took the initiative to join the RMI in 2015 and has continued its participation as ASEH to this day.
² Since 2011, ASE and USI have performed annual investigations on the smelters' sources of 3TG necessary to the manufacturing processes or products of the assembly and material manufacturing services and electronics manufacturing services. The CMRT is further used to identify the sources and minerals used by suppliers and smelters.

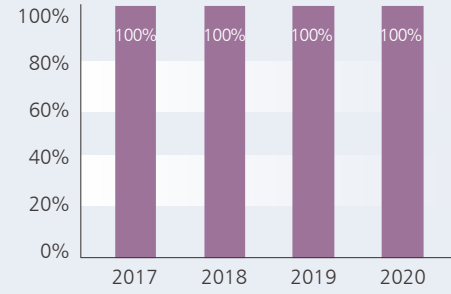
Gold



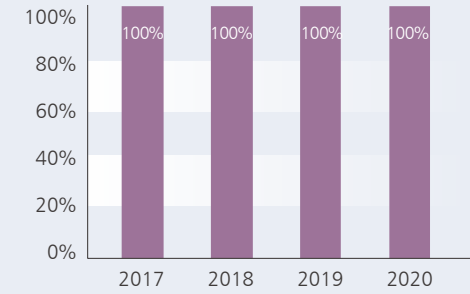
Tin



Tantalum



Tungsten



■ Conformant Smelters ■ Non-Conformant Smelters

Conflict Minerals Compliant Suppliers



Due Diligence (DD)

ASEH designed its DD measures to conform to the Organization for Economic Co-operation and Development Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (the "OECD Guidance") and we also adopted the OECD Guidance to not only identify/ assess supplier risks and mitigate these identified risks, but also to design a conflict minerals audit form for ASEH's suppliers. We were therefore able to provide guidance through both on-site/off-site audits to help suppliers set up management mechanisms that complied with OECD Guidance.

2020, we reasonably believe that the identified SoRs used for all of our packaging and materials services products are DRC Conflict-Free. Given the large number of suppliers for our electronic manufacturing services, we developed a sampling program to select material suppliers for the purpose of identifying SoRs. We believe that our due diligence performed based on the sampling program is sufficient and appropriate to provide a reasonable basis for our determination. Therefore, we reasonably believe that such SoRs used for all of our electronic manufacturing services products are DRC Conflict-Free.

Independent Private Sector Audit (IPSA) and Public Disclosure

We undertake an IPSA¹ on our Conflict Minerals Report and DD procedure to ensure they are in compliance with the requirements set forth by the U.S. Securities and Exchange Commission (SEC). Each year, the Conflict Minerals Report is also disclosed publicly. Based on our RCOI analysis and DD measures in

ASEH SEC Conflict Minerals Filing

We disclose the Conflict Minerals report on our company website annually. For complete file of ASEH SEC Conflict Minerals Filing, please visit:

https://www.aseglobal.com/en/pdf/2020_ASEH_CM_Report.pdf

¹ Since 2015, ASE and USI have conducted an IPSA annually.



0 CORPORATE CITIZENSHIP

The community has played an important role supporting ASEH's growth. We therefore, have a responsibility to exert our social influence and give back to the community in the locations our businesses operate in. ASEH actively participates in charity campaigns, educational projects and social work by optimizing resources in the best possible way and continuing to expand the sphere of positive influence.

As a leading enterprise in the global semiconductor industry, ASEH is fulfilling corporate citizenship by engaging with local communities, environmental NGOs, and stakeholders in the industry, government and academic sectors. The company seeks to establish mutually trusting long-term partnerships and invest in resources to promote overall social development and value creation. Externally, we are initiating sustainable development in core business areas to strengthen the value of our sustainable innovations that will result in employee cohesiveness, and higher stakeholder confidence.

2020 • Key Performance



2014 ~ 2020
Environment
Conservation Fund(ECF)
Programs



2020
Community
Engagement



2020
Industry-Academia
Collaboration





2014 ~ 2020
LED Lamps
Installation





2014 ~ 2020
Tree Planting

SDGs	Business Actions	2020 Material Aspects	KPI	2020 Target	Status	2020 Performance	2021 Target	2025 Target
	Promote climate conscious behavior and build capacity for climate action	Social Involvement	<ul style="list-style-type: none"> Number of industry-academia collaboration projects on environmental technology Number of energy-saving LED tube lights installed and number of schools with LED tube lights installed Total area planted with trees (global) 	<ul style="list-style-type: none"> 10 industry-academia collaboration projects on environmental technology 10,000 LED light tubes installed at 10 schools 10 hectares planted with trees 	Achieved	<ul style="list-style-type: none"> 10 industry-academia collaboration projects on environmental technology 15,000 LED light tubes installed at 25 schools 18 hectares planted with trees 	<ul style="list-style-type: none"> 10 industry-academia collaboration projects on environmental technology 10,000 LED light tubes installed at 10 schools 10 hectares planted with trees 	<ul style="list-style-type: none"> Over 100 industry-academia collaboration projects on environmental technology LED light tubes installed at 100 schools 200 hectares planted with trees
	Implement programmes to support higher education and access to free, equitable, and inclusive primary and secondary education		<ul style="list-style-type: none"> Number of students attending semiconductor course Number of disadvantaged students attending after school program 	<ul style="list-style-type: none"> 100 students attending semiconductor courses 100 disadvantaged students in the community attending after school program 	Achieved	<ul style="list-style-type: none"> 169 students attended semiconductor courses 316 disadvantaged students in the community attending after school program 	<ul style="list-style-type: none"> 100 students attending semiconductor courses 100 disadvantaged students in the community attending after school program 	<ul style="list-style-type: none"> 500 students attending semiconductor courses 1,500 disadvantaged students in the community attending after school program
	Drive economic growth and productivity by investing in R&D, upgrading skills, and supporting growing businesses, in a way that is compatible with sustainable development		<ul style="list-style-type: none"> Number of innovative industry-academia collaboration projects Number of legislative or sustainability initiatives 	<ul style="list-style-type: none"> 30 innovative industry-academia collaboration projects 2 legislative initiatives for issues related to the semiconductor industry 	Achieved	<ul style="list-style-type: none"> 74 innovative industry-academia collaboration projects 4 legislative initiatives for issues related to the semiconductor industry 	<ul style="list-style-type: none"> 30 innovative industry-academia collaboration projects 2 legal initiatives for issues related to the semiconductor industry 	<ul style="list-style-type: none"> 300 innovative industry-academia collaboration projects 15 legal initiatives for issues related to the semiconductor industry

Corporate social involvement focus, benefits, and KPIs

Focus	SDGs Alignment	Business Drivers	Business Benefits & KPIs	Social/Environmental Benefits & KPIs	Impacts
Environmental Conservation		<p>ASE is raising awareness in climate change mitigation and adaptation, impact reduction and early warnings through education, and intensifying R&D in environmental technologies and improvements in production efficiency to reduce environmental impacts.</p> <p>The primary factors driving the company's core operations are:</p> <ul style="list-style-type: none"> Increasing production efficiency; changing volatile organic compound treatment methods; reducing treatment costs; ensuring competitive pricing Promotion of green products and services and implementation of community environmental education programs to encourage green consumer behavior <p>2025 Targets:</p> <ul style="list-style-type: none"> Over 100 collaborative academic research projects on environmental technology US\$5 million reduction in outsourced waste management costs 	<p>Improvements to environmental technology R&D and production efficiency in 2020:</p> <ul style="list-style-type: none"> 10 research projects on environmental technology in collaboration with academic or research institutes An intelligent wastewater treatment chemical dosing system is adopted to replace conventional manual inspections and is able to monitor and adjust chemical dosing in a timely manner, resulting in a reduction of poly aluminum chloride dosages by 3.4% Reduction of 30% in n-methyl-2-pyrrolidone liquid waste disposal and 160 tons in the volume of outsourced liquid waste disposal, saving approximately US\$100,000 each year Reuse rate of more than 90% for titanium etching liquid waste and a reduction of 720 tons in the volume of outsourced liquid waste disposal, saving approximately US\$460,000 each year <p>2015-2020</p> <ul style="list-style-type: none"> 62 research projects on environmental technology in collaboration with academic or research institutes; resulted in a total cost reduction of US\$3.8 million <p>*More information refer to appendix (Social Data - K.Social Involvement Key Performance)</p>	<p>Reduced environmental impact and enhanced living environment for local communities in 2020 :</p> <ul style="list-style-type: none"> 15,360 LED light tubes installed at 25 schools reduced energy use by approximately 615,000 kWh and carbon emissions by approximately 313 tons CO₂e A tree planting area totaling 18.05 hectares, reducing 270 tons of CO₂e Assisting the first school to build a smart microgrid system, saving approximately 108,590 kWh in electricity and reducing 55 tons of CO₂e each year Implemented 31 environmental education courses; 2,700 students participated; 36 promotional videos on environmental education were produced Transferring successful environmental projects from industry-academia cooperation to four other semiconductor businesses <p>2015-2020</p> <ul style="list-style-type: none"> Replacing and installing 91,630 energy-saving LED tube lights in 92 schools, saving approximately 11,347,000 kWh in electricity and reducing about 5,980 tons of CO₂e over the years A total tree planting area of 152.05 hectares, reducing 2,270 tons of CO₂e each year <p>*More information refer to 8.2 Environmental Conservation</p>	<ul style="list-style-type: none"> Improving environmental awareness: Increasing employee and supply chain awareness in environmental protection and carbon reduction. Adopting green production processes: Using recyclable materials and green production processes in the development of new products, and improving waste disposal methods to minimize impacts on the environment. Expanding adoption of green technology: 11 OSAT (outsourced semiconductor assembly and test) industry peers have improved their manufacturing eco-efficiency by drawing upon the success of our industry-academia collaboration on environmental research projects.
Industry-Academia Collaboration	 	<p>The semiconductor industry is a high-tech industry that requires a large pool of talent in technological research and interdisciplinary R&D. We should leverage on the multiple professional and recruitment opportunities to attract talent and increase youth employability, by nurturing and equipping future employees with the relevant knowledge and professional skills to enhance the value of our human capital.</p> <p>The primary factors driving the company's core operations are:</p> <ul style="list-style-type: none"> Training potential talent (employees) for the future so as to enhance the value of the company's human capital Developing next-generation semiconductor technologies and materials <p>2025 Targets</p> <ul style="list-style-type: none"> Participate in over 300 collaborative academic projects on semiconductor materials and advanced technologies Recruit over 5,000 interns 	<p>Cultivating human capital and promoting technology innovation and development in the semiconductor industry in 2020:</p> <ul style="list-style-type: none"> 74 industry-academia cooperation projects on research topics that include assembly process, substrate design, product applications, production line process end enhancement, supply chain management, and corporate management risk control 169 students participated in the semiconductor courses <p>2015-2020</p> <ul style="list-style-type: none"> Participated in 195 industry-academia projects involving semiconductor assembly, advanced materials, manufacturing automation technologies, etc. 1,014 students participated in the semiconductor courses <p>*More information refer to appendix (Social Data - K.Social Involvement Key Performance)</p>	<p>Talent development via cooperative education, internship, and technological collaborations in 2020:</p> <ul style="list-style-type: none"> Recruited 638 interns 127 students participated in collaborative academic research projects Awarded scholarships to 74 students Collaborated with over 60 schools <p>2015-2020</p> <ul style="list-style-type: none"> Recruited 4,170 interns <p>*More information refer to appendix (Social Data - K.Social Involvement Key Performance)</p>	<ul style="list-style-type: none"> Promoting innovative research and development of semiconductor technologies: Working with top universities to establish the ASE Semiconductor Industry Institute, covering semiconductor assembly and testing, smart factories, and artificial intelligence; and continuing to promote industry-academia cooperation projects to induce the research and development of new technologies and propel industry development. Improving the employability of young persons: Enhancing the employability and competitiveness of young persons, cultivating relevant talent and strengthening the semiconductor industry talent pool.

Focus	SDGs Alignment	Business Drivers	Business Benefits & KPIs	Social/Environmental Benefits & KPIs	Impacts
Community Engagement		<p>ASEH is committed to bridge the economic, social and environmental development gaps between urban and rural areas in the communities where we operate. We are fostering stronger community bonds at each location through high levels of engagement in community development and caring for the disadvantaged.</p> <p>The primary factors driving the company's core operations are:</p> <ul style="list-style-type: none"> Ability to operate in a stable social environment Enhanced corporate image and employee engagement <p>2025 Targets</p> <ul style="list-style-type: none"> Reach 20,000 volunteers Afterschool care for over 1,500 students from disadvantaged households Providing over 70,000 subsidies to students from disadvantaged households 	<p>Improvements to the quality of life and strengthening of emergency care and disaster response in local communities in 2020:</p> <ul style="list-style-type: none"> 5,900 volunteer service hours 2,800 volunteers <p>2015-2020</p> <ul style="list-style-type: none"> 41,100 volunteer service hours 12,160 volunteers <p>*More information refer to appendix (Social Data - K.Social Involvement Key Performance)</p>	<p>Corporate citizenship programs to improve mutual development with the local community in 2020:</p> <ul style="list-style-type: none"> Participated in afterschool care for 316 students from disadvantaged households Provided support for 51 charities Provided financial aid for 7,879 students from disadvantaged households <p>2015-2020</p> <ul style="list-style-type: none"> Participated in afterschool care for 992 students from disadvantaged households Provided financial aid for 44,279 students from disadvantaged households <p>*More information refer to 8.4 Community Engagement</p>	<ul style="list-style-type: none"> Improving senior citizens' quality of life: Setting up senior citizen learning centers in the community for employee dependents and encouraging senior citizens to take part in courses for improving physical and mental health; providing intelligent mobile medical services; and developing smart Cloud medical care to reach remote areas to make up for the gap in medical resources. Improving the learning and living environments of underprivileged children: Conducting fun educational courses, driving the development of diverse education in rural areas, showing concern for underprivileged children, and giving support and encouragement to underprivileged families and schoolchildren.
		<p>Sustainable development goals are achieved through the sharing of knowledge, expertise, technologies and financial resources. To that end, ASEH is promoting global partnerships in sustainable development, exchanging knowledge, expertise and technology knowhow with stakeholders, and expanding its sphere of influence through active involvement in industry organizations.</p> <p>The primary factors driving the company's core operations are:</p> <ul style="list-style-type: none"> Developing and formulating the next generation semiconductor technology blueprint and standards with the industry supply chain Co-developing policy white papers with industry associations to serve as references for the establishment of policies and regulatory standards <p>2025 Targets</p> <ul style="list-style-type: none"> 15 sustainability initiatives 	<p>Driving innovation and development in semiconductor and electronic technologies and improving ASEH's leadership status in sustainable development</p> <p>2020</p> <ul style="list-style-type: none"> Collaborated with 44 external organizations in areas related to core business Active involvement in SEMI's industry advisory board <p>2015-2020</p> <ul style="list-style-type: none"> Collaborated with 396 external organizations in areas related to core business 	<p>Advancement of sustainability topics to help formulate CSR initiatives for the semiconductor industry</p> <p>2020</p> <ul style="list-style-type: none"> Collaborated with 100 external organizations in sustainable development Putting forth four bill amendment initiatives: the initiative on cultivation of talents for the semiconductor industry, the initiative on photovoltaic energy policy, the initiative on control of air pollution sources and greenhouse gases, and the initiative on disposal of industrial waste Hosting the 2020 Asia's Sustainable Supply and Circular Economy Conference and Exhibition <p>2015-2020</p> <ul style="list-style-type: none"> 13 sustainability and legislative initiatives 	<ul style="list-style-type: none"> Semiconductor Industry Development: Formulated a blueprint for the development of SiP (system-in-package) heterogeneous integration to develop next generation semiconductor manufacturing technologies. Improving the environment for semiconductor industry development: Proposing initiatives for the semiconductor industry to increase economic benefits.
Public Advocacy					

8.1 Social Involvement Overview

To achieve the common good for society, ASE Technology Holding is taking actions to stimulate positive social change, and bring about an increase in awareness, behavioral changes, skill development and quality of life, based on the principles of Connection, Improvement and Transformation. The Corporate Sustainability Committee (CSC) is ASEH’s highest level of organization for social involvement and is responsible for the planning, formulation and implementation of social involvement policies and regulations within the group. ASEH’s “Public Affairs Engagement Policy”¹ is a set of principles formulated to provide responsible policy directions for all its subsidiaries, and guidance in the selection of organizations to support. An audit mechanism is also in place to evaluate the level of social impact resulting

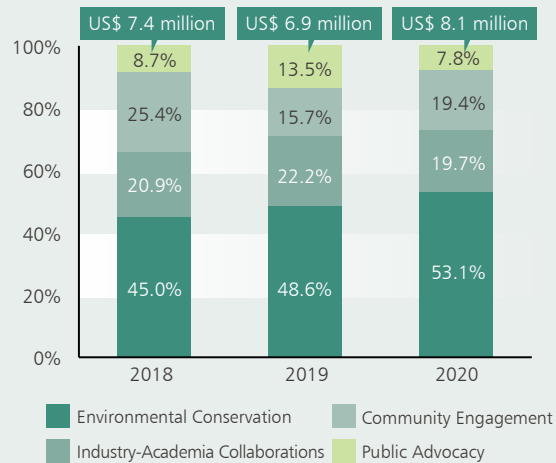
from the support given to those foundations and social organizations.

ASEH conducts annual reviews to evaluate its campaigns and performance based on four development strategies — environmental conservation, industry-academia collaboration, community engagement and public advocacy. The CSC Social Involvement Taskforce is responsible for implementing social involvement policies at company facilities worldwide, evaluating the risks and opportunities, planning and organizing activities in public engagement. Each facility is responsible for the creation of local organization teams to plan and execute the programs in compliance with corporate policies and development goals.

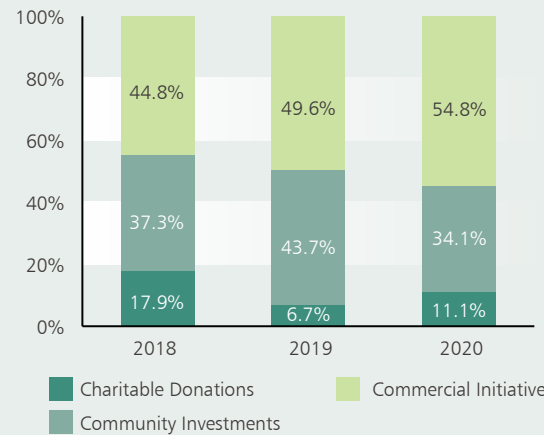
ASEH adopts the LBG (London Benchmarking Group) framework and SROI (Social Return on Investment) model to measure the input, output and impact of social involvement activities, and conducts biannual performance reviews and reporting.

In 2020, we spent US\$8.1 million on social involvement activities, accounting for 0.64² percent of the group’s pre-tax net profit. Compared with 2019, we invested more resources into environmental protection and community development that focused heavily on reinforcing community connections and caring for the underprivileged. We recorded over 5,900 hours of voluntary service performed by over 2,800 volunteers.

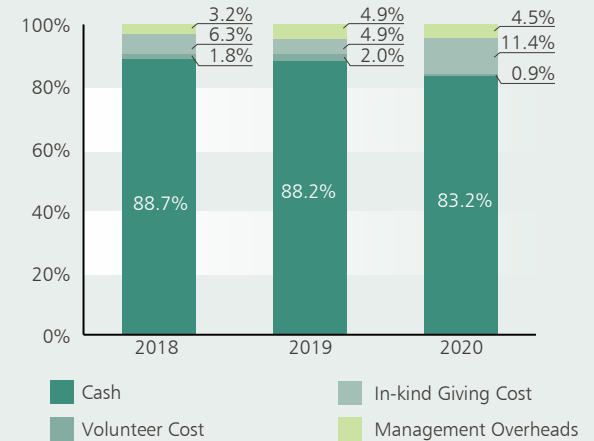
Distribution by Four Aspects



Distribution by Application



Type of Contribution



¹ ASEH Public Affairs Engagement Policy (https://www.aseglobal.com/en/pdf/aseh_public_affairs_policy.pdf).

² The 2020 pre-tax net profit was NT\$35,768,798 thousand (for more information, please refer to ASEH Form 20-F).

The Social Investment Performance Evaluation System

In 2020, we set up a social investment performance evaluation system to better understand and manage social investment resources, activities, and operational approaches. The system is focused on assessing ASEH's social engagement programs (conducted by the ASE Cultural and Education Foundation and the ASE Environmental Protection and Sustainability Foundation) through analyses of the social return on investment (SROI). SROI references the concept

of rate of return to evaluate the social investments vs the benefits produced and presents the results in monetary value.

The evaluation system integrates objectives and key results (OKR) and focuses on the key results that could be concretely achieved by various project stakeholders. Project owners set annual targets from the start and the ASE foundations consolidate them into a unified

framework system that allows them to conduct annual evaluations, management and tracking. The system also allows evaluation and adjustments throughout the project, so as to conform with the set targets. We also apply the standards and principles from UN SDGs, Dow Jones Sustainability Indices and the Sustainability Accounting Standards Board into the evaluation to stimulate social engagement and optimize results.

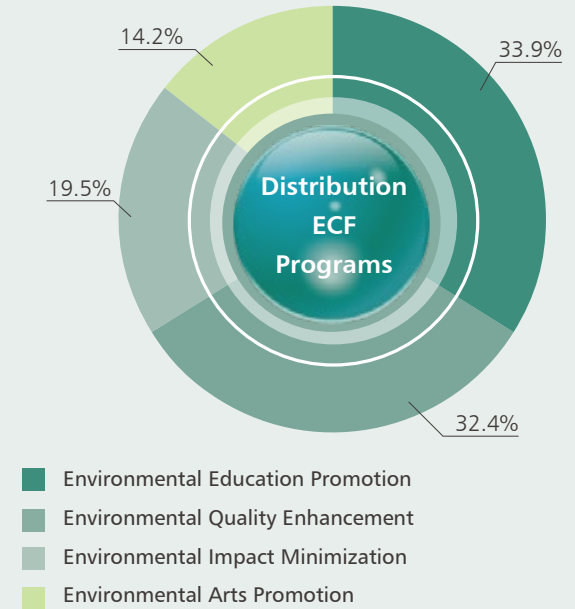


8.2 Environmental Conservation

In 2014, ASEH committed to a 30-year contribution of at least NT\$100 million per year, for environmental conservation efforts in Taiwan. For the year 2020, NT\$100 million was disbursed through the ASE Cultural and Educational Foundation, to support key environmental programs including environmental education, environmental improvements, climate change mitigation and environmental arts. We carried out 42 charity projects in 2020. For more information on our major achievements, please refer to the ASE Everywhere section (www.asefund.org.tw).

To fulfill our commitment to environmental protection and environmental issues, and to increase the efficiency in the execution of environmental projects, ASEH established the ASE Environmental Protection and Sustainability Foundation in 2020. The foundation will undertake the responsibility of managing the NT\$100 million annual funding for meaningful environmental programs in Taiwan.

Distribution by 2020 ECF Programs



2020 Accomplishments of ECF Programs

Programs	Major Projects	Programs	Major Projects
Environmental Education Promotion	<ul style="list-style-type: none"> Funding for master’s theses and doctoral dissertations on environmental protection issues Research projects associated with environmental technologies Community environmental education projects ‘Smile Taiwan’ creative teaching project competition Environmental education publicity film and microfilm production projects World Ocean Day activity series 	Environmental Impact Minimization	<ul style="list-style-type: none"> Campus LED light installation projects Shanlin Junior High School smart microgrid installation project Promotion of the restoration and conservation of yellow-margined box turtles Global corporate sustainability forums Waste reduction research and development projects
Environmental Quality Enhancement	<ul style="list-style-type: none"> Reforestation projects Water environment patrol teams Taoyuan City contact bed and wetland water purification improvement projects Community solar-powered alarm lamp installation projects Medical resource funding 	Environmental Arts Promotion	<ul style="list-style-type: none"> “Universe – Realm – Chrysanthemum Island” environmental conservation choir performances Kaohsiung New Year’s eve activity series National Chengchi University marathon Funding for charity performances

Campus LED installation projects

The ASE Cultural and Educational Foundation has been helping elementary and junior high schools in rural areas and surrounding ASE plants to replace fluorescent tubes and light bulbs with LED lights since 2014. So far, we have installed 91,000 LED tube lights in 92 schools in the Nantou and Kaohsiung areas. Over the years, the LED projects have helped schools to save 11,347,000 kWh of electricity and reduce 5,980 tons of CO₂e. LED lighting has also helped to protect the eyesight of schoolchildren.



▶ Campus LED installation projects

	School	LED Lamps	Electricity saved annually(kWh)
2017	13	13,100	524,524
2018	4	8,900	356,356
2019	17	14,050	562,562
2020	25	15,360	615,014

Shanlin Junior High School Smart Microgrid Installation Project

In 2018, ASE Technology Holding and the ASE Cultural and Education Foundation collaborated on a smart grid research program with the Chung-Hua Institution for Economic Research and Taiwan Institute of Economic Research. A memorandum of understanding was signed in 2019 with Shanlin District, a remote area in Kaohsiung City, to transfer the smart grid technology and help transform Shanlin into a smart city. The smart grid has since been implemented at the Shanlin Junior High School.



▶ Shanlin Junior High School Smart Microgrid Installation Project

Located in a remote area of Kaohsiung City, Shanlin Junior High School has been designated an emergency shelter to accommodate 11,460 people. It also serves as a central kitchen for four neighboring elementary schools, providing school lunches for about 400 students each day. As such, the school was an ideal location for the smart grid. The grid is designed to use 100% renewable energy including solar panels totaling 100kWp and an energy storage device capacity of 90kW, to generate electricity. The smart grid integrates energy generation and energy storage, creating an independent electricity source that also reduces carbon emissions through the use of photovoltaic cells. During the recent outage caused by a power failure at the Hsinta power plant on May 13, 2021, the smart grid was able to supply uninterrupted power at the school by redistributing the power supply. The smart grid also includes a power consumption and smart monitoring system to provide quantified data that facilitate power consumption management and power distribution. The school was able to save 108,590 kWh of electricity and reduce 55 tons of CO₂e each year, to become a low-carbon sustainable campus. The school has also incorporated environmental topics including renewable energy and smart grids into the curriculum that will help students to expand their horizons and to explore the connection between daily life and sustainable development.

The Million Tree Planting Project



▶ The Million Tree Planting Project

The Shanghai Roots and Shoots Million Tree Planting Project aims to arouse the public's environmental awareness, minimize impact on the natural environment, and mitigate climate change that will protect the local community. USI has participated in the project for over 8 years, and has planted 21,040 trees covering 14.14 hectares in Inner Mongolia and Ningxia in 2020. As of the end of 2020, the number of trees planted by USI in Inner Mongolia and Ningxia totaled 85,969, covering an area of 67.2 hectares.

8.3 Industry-Academia Collaborations

Technology innovation and talent development are two key factors that contribute to the company's leading position in the semiconductor assembly industry. We engage in long-term industry-academia collaborations with top universities to enhance our R&D capabilities and develop advanced semiconductor technologies. At the same time, we continue to develop industry talent by offering different industry courses and practical training to bridge skills gap and strengthen industry competitiveness.

ASEH has created key programs like "academia cooperation and corporate internship", "academic research collaboration", and "scholarships" to leverage on the expertise from these academic resources. In 2020, ASEH continued its collaborations with local schools, contributing over US\$1.6 million, including US\$1.41 million towards 74 technology research collaborations and US\$0.06 million for scholarships. We also recruited 638 interns and enrolled 169 students in the semiconductor master's degree program. Nearly 60 schools and research institutions in Taiwan, China, Singapore, Malaysia, South Korea, Japan, etc. were involved in these collaborations.

2020 Accomplishments of Industry-Academia Collaboration Programs



Industry-Academia Research in Automation Technologies for Efficient, Automated Manufacturing

The smart factory concept is an important development at ASEH. Since 2015, our Kaohsiung facility has collaborated with the National Taiwan University, National Cheng Kung University, National Sun Yat-sen University, and National Kaohsiung University of Science and Technology on 35 projects to train students on technical and practical skills and conduct research on automation technologies. This year, the research is focused on three major aspects: 1) Manufacturing process enhancement. We incorporate automatic virtual metrology in equipments to effectively reduce the machine testing time and improve capacity utilization. Hence, allowing for flexible and swift adjustments to be made to the manufacturing processes. Manual visual inspection is replaced by defect detection processes that use AI to help improve product quality. 2) Supply chain management. We use algorithms to optimize material allocation and the management of raw material inventory in order to control costs and meet our customers' needs. 3) Business risk management. We implement layers of cybersecurity to ensure secure data transfers and mitigate leakage risks. We also preempt risks through indepth analysis of public sentiment and early preparation of countermeasures to avoid any disruption to the company's operation and efficiency.

Advances in the 5G network technology is accelerating ASEH's smart factory development. In August 2020, the company partnered with Chunghwa Telecom and Qualcomm to build Taiwan's first smart factory powered by a 5G mmWave private network at our Kaohsiung facility. In recent years, industry-academia have been centered around the use of AI to improve manufacturing operations. To that end, ASEH will continue its focus on industry-academia research in smart manufacturing and the integration of Taiwan's R&D and technology talent, so as to seize the opportunities for future industry development and exercise Taiwan's influence in the global semiconductor market.

Semiconductor Packaging Technology Research

Nine R&D projects on semiconductor packaging technologies were presented at the 8th ASE Semiconductor Packaging Technology Industry-Academia Conference. The projects focused on three major areas - packaging process, substrate design and product application, and displayed promising results.

To solve warpage issues in Fan-Out Chip on Substrate (FOCoS) packaging and its end products, we leveraged on our expertise in material science, package structure and heterogeneous integration to solve warpage issues through the use of simulation and prediction modelling tools. Research projects on package substrate design are focused on chip applications in high-performance computing, networking and high-end product requirements. A unique substrate circuit design has been developed to effectively reduce mismatched impedance and improve signal integrity. We have also co-developed an optical inspection system for optical sensor ICs that can quickly and accurately determine component quality and provide simultaneous feedback on component parameters, allowing designers to further optimize their product design.

ASEH has also conducted a study on the absorption and diffusion materials used in optical sensor modules to find ways to improve the light absorption rate through the application of packaging technologies. Big data, cloud computing and high-speed networks are driving exponential growth in the demand for fiber-optic communication. Optical fiber technology reduces signal attenuation and distortion, and when applied on silicon photonic modules, allows for the precision positioning of fiber-optic signals for different product specifications. This development optimizes our manufacturing process and delivers stable and high-speed performance with low-latency.

Corporate Mentorship

SPIL, an ASEH subsidiary has been working with top universities on talent development. Currently in its seventh year, the corporate mentoring program is a collaboration between SPIL and the National Chung Hsing University. The program includes a diverse range of activities - Cutting-edge Assembly & Testing Technologies and Human Resource

Seminars, Production Line Visits, Mentor-Mentee Lunch Gatherings, Alumni Symposium and Project Competitions. The program enables the company to attract outstanding talent and helps students learn about industry dynamics, explore career options, bridge skills gap and prepare them well to meet workplace challenges. SPIL's corporate mentoring program has introduced a new model for career guidance that serves as a vigorous and flexible learning platform. In 2020, the National Taiwan University of Science and Technology was invited to participate for the first time, increasing the intensity of the competition. The company recorded participation of 52 students covering 1,040 hours. Monetary rewards were also included to encourage students to participate in activities and establish a tacit understanding of teamwork throughout the project. Students were also given information on opportunities within the assembly and test industry, which together could help the company strengthen its competitive advantage.

USI University

Employee education, training and transfer of skills rank highly at USI. To that end, the USI University was established in 2006 to provide free courses covering corporate experiences, management knowledge and the latest technology and industry trends. The USI University actively collaborates with industry and public associations, and universities and provides internally trained instructors to design the courses. Programs offered include 8D (eight disciplines) problem solving and Production Part Approval Process (PPAP) that are helpful to small and medium enterprises in establishing their own procedures. The company also organizes seminars at universities to share the company's knowledge and research achievements covering topics such as electrical simulation applications in electronic product design and the evolution of the mobile phone antenna. These sessions allow students to learn how theoretical applications are used in the industry to produce substantial results. A total of 21 classes attended by 734 participants were offered in 2020, recording a total participation 2,095 hours. Moving forward, USI University will continue to invest in education and contribute actively to enhancing youth employability.



Automation Technology Forum



Assembly Technology Forum



Corporate Mentorship



Internship Final Presentation



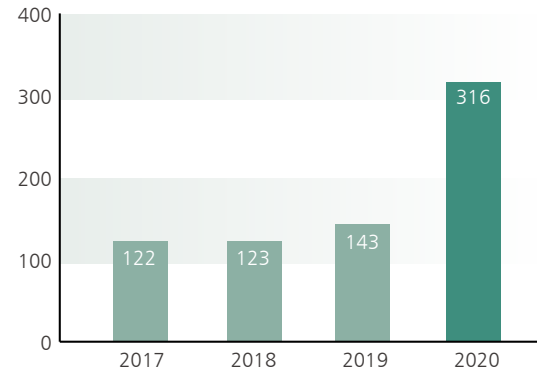
Environmental Technology Forum

8.4 Community Engagement

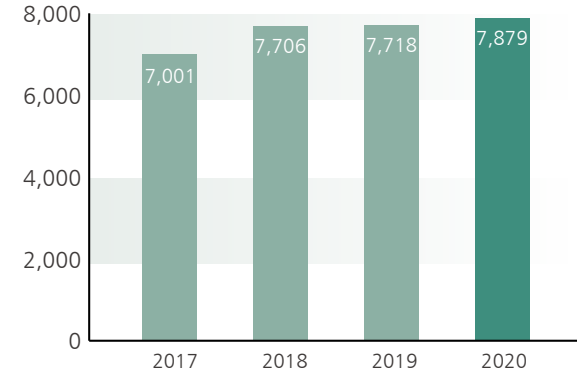
ASE Technology Holding has operations located all over the world and we recognize the value of peaceful co-existence and mutual prosperity with local communities. We focus our efforts towards community growth, charitable care, emergency relief and various community support programs to promote social cohesion and build a better society. We have also established robust communication platforms to facilitate meaningful interaction with the local communities in each of our global sites.

In order for the company to continue creating economic value and extend its sustainability development, we have committed to long-term projects that promote community welfare. We work in tandem with the ASE Charitable Foundation and the Chang Yao Hong-Ying Social Welfare and Charity Foundation to execute these projects. In 2020, we contributed over US\$1.57 million for community engagement activities. We provided afterschool care for 316 students and financial assistance to 7,879 students from disadvantaged families, and made donations to 51 charities.

Afterschool care for disadvantaged household students



Financial aid for disadvantaged household students



The 'Blessed and Joyful Learning' Holistic Health Care and Education Program

In light of an aging society, ASEH has worked with the Chang Yao Hong-Ying Social Welfare and Charity Foundation, Ming Chuan University and Wenzao Ursuline University of Languages to promote the ASE 'Blessed and Joyful Learning' Holistic Health Care and Education program. The program covers three major aspects - health promotion, physical-mental balance and social participation, while also incorporating elements of the humanities, science and technology and environmental sustainability, to design a series of learning activities for enhancing the physical and mental

health of senior citizens. In 2020, ASE Chungli and USI Nantou conducted a session each, which served about 60 senior citizens from the local community.



▶ The 'Blessed and Joyful Learning' Holistic Health Care and Education Program

ASE Happy Learning Summer Camp

To improve education in rural areas, ASEH and the Chang Yao Hong-Ying Social Welfare and Charity Foundation held a series of youth activities, and roped in the teaching resources of Wenzao Ursuline University of Languages, Ming Chuan University and International STEAM Education Association to organize a youth summer camp. Participants were able to learn from a wide variety of courses including sustainability conducted in English, news broadcast training and science innovations. These courses lead to better awareness in environmental protection and sustainability, improvement in English standards and increased interest in science. The participants included 60 students from Sinjhuang Elementary School, Jilai Elementary School and Shanlin Elementary School in the Shanlin District, Kaohsiung City.



ASE Happy Learning Summer Camp

Dragon Boat Festival Rice Dumpling Making

SPIL had been purchasing rice dumplings for the annual dragon boat festival from traditional food vendors operated by an elderly couple for six consecutive years. In 2020, a group of SPIL employees supported by the seniors at the Huashan Social Welfare Foundation, made 165 bunches of rice dumplings to distribute to underprivileged elderly people in the community. The company has donated over 6,000 rice dumplings in the last six years and supported the Huashan Social Welfare Foundation's annual Dragon Boat Festival elderly care program by donating nearly US\$71,000 over the years.



Dragon Boat Festival Rice Dumpling Making

The Picking up Pearls Project

USI Shenzhen Plant and Kunshan Plant worked together to improve education in remote areas. A special program consisting of a 'pearl class' was set up at Qianshan Yezhai Middle School in Anhui province, with each plant helping 20 students (using 'pearls' as a metaphor for students) to complete their education. In addition, employees were actively encouraged to go online and check-in for English classes and charity-related activities. The activity has accumulated a total of 20,000,000 hearts, indicating an overwhelming level of participation. A charity family walk was also organized to promote the Picking up Pearls project. The event registered a total of 35 families comprising of 88 adults and children.



The Picking up Pearls Project

8.5 Public Advocacy

As a global industry leader in semiconductor assembly and test, ASEH aims to be an advocator for important issues in the semiconductor industry and is committed to working together with the international community to advance the semiconductor industry. Aligning with United Nations' goal of improving the wellbeing of mankind, ASEH is fully committed to initiatives related

to our core business and sustainable development (environmental, social and economic aspects). We support initiatives in corporate sustainability and economic development; technological innovation and development; environmental projects; climate change; human rights; and supply chains etc.

In 2020, ASEH contributed US\$0.63 million and was active in over 140 external organizations, allowing ASEH to share our value system with industry peers and supply chain partners, and extend a broader social impact.



SEMI FlexTech Conference



TASS 2020 Asia's Sustainable Supply and Circular Economy Conference and Exhibition

Participation in Major Industry Associations in 2020:

Association	Major Activities	Resources invested (US\$)
Semiconductor Equipment and Materials International (SEMI)	<p>SEMI is a global electronic manufacturing supply chain industry association. ASEH is actively involved in public policy initiatives and highly supportive of international SEMI events, the promotion of collective interests, and the focus on education, business, technology and sustainable development. Our participation in SEMI allows us to exchange information about market trends, system-in-package ecosystems, heterogeneous integration and advanced IC packaging technology. In 2020, SEMI created the High-tech Innovation and Startup Platform to encourage companies to extend the use of venture capital, acquisition and private equity funds that could help create more innovation, increase competitive advantages and support startups to connect with global markets. ASEH is an active SEMI member and has a seat on the Board of Directors. ASEH is also represented in numerous SEMI committees including the chair of the Packaging and Test Committee, Smart Manufacturing Committee and SEMI FlexTech Committee and deputy chair of the Semiconductor Materials Committee. The key SEMI initiatives of 2020 are as follows:</p> <ol style="list-style-type: none"> 1. Talent cultivation for the semiconductor industry. A Semiconductor Industry Development Promotion Committee was established to provide advice on policies that are focused on cultivating talents, semiconductor technologies, localizing equipment and reinforcing cybersecurity. 2. Photovoltaic energy policy. Cooperating with the government to promote energy transition on a large-scale, as well as stipulate clear-cut policies and regulations, so as to realize the vision of a green economy. 	<p>154,000</p>

Association	Major Activities	Resources invested (US\$)
Taiwan Semiconductor Industry Association (TSIA)	<p>Initiated by ASEH and a group of outsourced semiconductor assembly and test (OSAT) companies, the Environmental Safety and Health (ESH) Committee - Assembly and Test Working Group was formed to address industrial safety and environmental issues and provide references for government agencies to formulate policies and regulations related to the OSAT industry. An ESH sharing platform was also established for members to exchange ideas and share best practices related to environmental safety and health. We are a TSIA member and hold a director position in the association. The key initiatives and programs promulgated by TSIA in 2020 are as follows:</p> <ol style="list-style-type: none"> 1. Initiative on the control of air pollution sources and greenhouse gases. Actions on the control of greenhouse gas emissions, revision of the OSAT industry's air pollution control and emission standards, installation of automatic public surveillance systems and establishing communication with main authorities. 2. Initiative on disposal of industrial waste. Promoting the auditing of industrial waste disposal plants and source of waste generation. Conducted 8 events to promote waste recycling systems in 2020. 3. Initiative on the creation of a cooperative platform for supply chain sustainability and a circular economy. The Assembly and Test Working Group has helped to establish sustainable material data standards; consolidate international guidelines, regulations, and corporate internal control needs; and develop standardized and mobility management models, resulting in the availability of complete data for managing operations and emergency responses. 	128,000
Responsible Business Alliance (RBA)	<p>Founded in 2004 by a group of leading electronics companies, the Responsible Business Alliance (RBA) is a nonprofit organization comprised of electronics, retail, auto and toy companies committed to supporting the rights and well-being of workers and communities worldwide affected by the global electronics supply chain. RBA members commit to and are held accountable to a common Code of Conduct, and utilize a range of RBA training and assessment tools to support the continued improvement of the social, environmental, and ethical responsibility of their supply chains. RBA regularly engages in dialogue and collaborations with workers, governments, civil society, investors and academia to gather the necessary range of perspectives and expertise to support its members in achieving the RBA mission of a responsible global electronics supply chain. ASEH joined the RBA as a member in 2015 and has since administered annual self-assessment questionnaires (SAQs) at its facilities worldwide in order to identify labor, environmental and ethical risks. The Worker Voice Platform was launched in 2020 by the RBA to provide employees with diverse methods for expressing their opinions, giving feedback and learning important professional and personal skills. The platform also aims to increase the company's visibility and help alliance members and their suppliers to improve conditions across the global supply chain.</p>	35,000
Taiwan Alliance for Sustainable Supply (TASS)	<p>TASS was founded in 2017 to establish a sustainable development platform and standard that incorporates supply management, logistical processes and information sharing. ASEH is a founding member of TASS and hold the deputy chair position. The 2020 initiatives and activities for promoting supply chain sustainability and a circular economy are as follows:</p> <ol style="list-style-type: none"> 1. Conducted the 2nd certified sustainable supply professional (CSSP) course to cultivate talents across different disciplines covering risk, compliance, procurement and supply frameworks. 2. Organized the 1st Green Circular Technology Innovation and Research Competition focusing on energy and resources as major themes, to connect the skills needed in the market with those taught in schools. The event attracted 39 teams from 19 universities and was relatively successful in promoting sustainable technology innovation and achieving a framework for enabling a circular model. 3. Hosted the 1st TASS 2020 Asia's Sustainable Supply and Circular Economy Conference and Exhibition, which included 10 professional forums, 80 sustainable energy business opportunity matchmaking meetings and over 350 exhibiting booths, attracting news media and more than 10,000 visitors. The event created an abundance of cooperative opportunities and business benefits. 	34,000
Munbal Industrial Park Association	<p>ASE Korea is a founding member of the Munbal Industrial Park Association which was established in 1994 in Munfa-dong, Paju-si, Korea. The association's mission is mainly to improve workplace environments, such as amenities in industrial parks, environmental beautification, and upgrading old facilities. In addition, the association also offered suggestions to the Paju-si and Gyeonggi Province officials on areas of improvement in the industrial park. The following are major 2020 projects:</p> <ol style="list-style-type: none"> 1. Improving old parking lots and adding additional spaces 2. Repairing the roads in the industrial park and improving the sidewalks 3. Operating COVID-19 checkpoints 	28,000

APPENDIX

Sustainability Data - Environmental Data

A. The environmental data (waste, water, energy, GHG & air emission) of our manufacturing facilities around the world over the past four years are presented in the table below

Category	Environmental Performance Index	Unit	2017	2018 ¹	2019 ¹	2020 ¹
Waste	Total general and hazardous waste	metric ton	53,638	67,004	69,795	75,814
	General waste production	metric ton	28,366	40,839	41,841	45,139
	Recycled and reused	metric ton	24,655	36,770	38,744	42,255
	Non-recycled and reused	metric ton	3,711	4,069	3,098	2,884
	Non-recycled and reused ¹	metric ton	4,173	4,141	3,098	2,884
	Recycled and reused rate	%	87	90	93	94
	Hazardous waste production ¹	metric ton	28,983	27,838	27,954	30,675
	Hazardous waste production	metric ton	25,272	26,164	27,954	30,675
	Recycled and reused	metric ton	13,460	13,240	16,104	19,788
	Non-recycled and reused	metric ton	11,812	12,924	11,850	10,887
	Recycled and reused rate	%	53	51	58	65
	Total recycled and reused	metric ton	38,115	50,011	54,847	62,043
	Total non-recycled and reused	metric ton	15,523	16,993	14,948	13,771
	Total recycled and reused rate	%	71	75	79	82
Water	Water withdrawal	metric ton	16,034,472	21,571,571	24,177,331	24,961,039
	Water withdrawal intensity	ton/thousand USD revenue	1.639	1.784	1.755	1.468
	Ultra-pure water usage ¹	metric ton	27,300,190	26,148,689	25,113,761	26,304,664
	Water recycled and reuse	metric ton	15,175,519	22,934,123	28,158,345	34,437,950
	Precess water recycle rate ¹	%	62	64	68	72

Category	Environmental Performance Index	Unit	2017	2018 ¹	2019 ¹	2020 ¹
Water	Wastewater discharge	metric ton	11,742,595	17,303,186	18,778,265	19,454,037
	Total fresh water consumption ¹	Million metric ton	23.65	24.02	24.08	24.71
Energy	Electricity consumption ²	MWh	2,300,523	3,130,150	3,588,896	3,900,915
	Renewable electricity	MWh	195,595	397,766	512,067	706,105
	Non-renewable electricity	MWh	2,104,928	2,732,384	3,076,829	3,194,810
	Electricity intensity	MWh/ thousand USD revenue	0.235	0.259	0.260	0.230
	Liquefied Petroleum Gas (LPG)	GJ	8,374	2,802	3,094	16,770
	Liquefied Natural Gas (LNG)	GJ	381,022	354,857	255,582	324,214
	Motor gasoline	GJ	8,843	9,141	8,956	6,593
	Diesel	GJ	16,637	15,653	18,892	73,337
	Heavy oil	GJ	36,089	29,325	31,906	32,534
	Total non-renewable energy consumption ¹	MWh	3,310,931	3,207,383	3,208,516	3,352,288
	Greenhouse Gas	SCOPE 1	tCO ₂ e	60,675	85,279	98,880
SCOPE 1 ¹		tCO ₂ e	82,996	99,504	98,880	93,996
SCOPE 2 (Market-based)		tCO ₂ e	1,215,698	1,544,880	1,695,223	1,658,606
SCOPE 2 ¹ (Market-based)		tCO ₂ e	1,806,806	1,735,097	1,695,223	1,658,606
SCOPE 1 + SCOPE 2 (Market-based)		tCO ₂ e	1,276,373	1,630,159	1,794,103	1,752,602
GHG intensity (Market-based)		tCO ₂ e/thousand USD revenue	0.130	0.135	0.130	0.103
PFC emissions / number package output ¹		kgCO ₂ e/kPCs	0.00065	0.00081	0.00086	0.00077
Air Emission	VOC (Volatile organic compounds)	metric ton	281	204	208	219
	VOC (Volatile organic compounds) ¹	metric ton	288	207	208	219

¹ This table includes ASE, SPIL and USI data for 2017-2020.

² The electricity consumption in 2020 was 14,043,296 GJ, with grid (imported) non-renewable electricity accounting for 78.72% of the total consumption and renewable electricity accounting for 17.40%.

B. The amount of water withdrawals and discharge in water-stressed regions¹

Water withdrawals			
		Water withdrawals at ASEH facilities (ML)	Water withdrawals in water-stressed regions ² (ML)
Total water withdrawals	Surface water (total)	74	0
	Groundwater (total)	4,919	0
	Third-party water (total)	19,968	5,172
Water withdrawals by source of water ³	Freshwater (TDS ≤ 1,000 mg/L)	2,0839	2,990
	Other sources of water (TDS > 1,000 mg/L)	0	0

Water discharge and consumption			
		Water discharge at ASEH facilities (ML)	Water discharge in water-stressed regions (ML)
Water discharge by discharge destination	Surface water	10,322	0
	Groundwater	0	0
	Marine water	1,377	0
	Third-party water	7,756	3,514
Total water discharge	Surface water + groundwater + marine water + third-party water	19,454	3,514
Water discharge by source of water ⁴	Freshwater (TDS ≤ 1,000 mg/L)	2,014	3,076
	Other sources of water (TDS > 1,000 mg/L)	3,213	0
Total water consumption		5,507	1,658

¹ Areas in water stress (Stress>40%): Water withdrawal in these areas accounted for 20.7 % of the overall water withdrawal, and water consumption accounted for 30.1 % of the total water consumption.

² Water-stressed regions (Stress>40%) : (1) ASE: Shanghai (A&T), Shanghai Materials, Kunshan, Suzhou, Weihai, Wuxi, ISE Labs China (2) USI: Kunshan, Zhangjiang, Jinqiao, Shenzhen, Mexico.

³ Facilities that measure TDS in the water withdrawals: ASE (Kaohsiung, Shanghai(A&T), Shanghai(Material) ,Suzhou, Wuxi, Korea, Malaysia, Singapore), USI (Zhangjiang, Jinqiao, Kunshan, Shenzhen, Taiwan, Mexico), SPIL (Taiwan, Suzhou) : TDS is not measured at other facilities.

⁴ Facilities that measure TDS in the water discharge: ASE (Kaohsiung , Shanghai(Material), Kunshan, Suzhou, Japan , Singapore) : TDS is not measured at other facilities.

C. Water discharge in water-stressed regions (ML)¹

Item Unit	Item Unit	Taiwan_to land		Taiwan_to ocean		China		Japan			Korea		Malaysia	
		Effluent standard	Min.~ Max.	Effluent standard	Min.~ Max.	Effluent standard	Min.~ Max.	Effluent standard (Nantion)	Effluent standard (Yamagata)	Min.~ Max.	Effluent standard	Min.~ Max.	Effluent standard	Min.~ Max.
pH	pH	6~9	7.3~8.1	6~9	7~7.7	6~9	6.6~8.9	5.8~8.6	5.8~8.6	-	5.8~8.6	7~8	5.5~9.0	6.4~8.06
COD concentration²	mg/L	<100	19~84.9	<300	5.2~84.9	500	50~402	160	-	-	90	2~32	200	3~193
BOD concentration	mg/L	-	3.8~140	<150	23.9~48.7	300	19.3~126	160	25	0.5~2.5	80	2~49	50	2~48
Suspended Solid(SS) concentration³	mg/L	<30	5~23.2	<50	1.0~8.1	400	23~168	200	60	1~31	80	0~3	100	<1~17
Cu²⁺ concentration	mg/L	<3	0~0.389	<2	0.1~0.01	1	0~0.719	3	1	0.01~0.2	3	0~0	1	<0.01~0.08
Ni²⁺ concentration	mg/L	<1	0~0.06	<1	<0.006~0.04	0.5	0~0.071	-	-	-	3	-	1	<0.02~0.3

¹ ISE Labs, ASE Singapore and three electronic manufacturing service facilities (Kunshan, Shenzhen and Mexico) do not have on-site wastewater treatment, thus not included in the statistics.

² Waste water discharge from the SPIL Hsinchu facility is diverted into the park's sewer system and waste water treatment plant in accordance with the Hsinchu Science Park Effluent Standards, and is therefore not included.

³ Waste water discharge of the SPIL Zhong Ke facility is diverted into the park's sewer system and waste water treatment plant in accordance with the Central Taiwan Science Park Effluent Standards, and is therefore not included.

Sustainability Data - Social Data

A. Global Workforce Structure by Nationality

Nationality	Total Employee		Total Employee of Management Level	
	Number	Percentage of Total Employee (%)	Number	Percentage of Total Management Level (%)
Taiwan	50,793	54.968%	4,112	67.832%
China	21,774	23.564%	1,440	23.755%
Philippines	10,982	11.885%	18	0.297 %
Mexico	2,622	2.838%	64	1.057%
Malaysia	2,168	2.346%	142	2.342%
Korea	1,812	1.961%	133	2.194%
Indonesia	1,243	1.345%	0	0%
Japan	359	0.389%	46	0.759%
Singapore	345	0.373%	54	0.891%
U.S.A	152	0.164%	46	0.759%
Nepal	92	0.1%	0	0%
Vietnam	41	0.044%	0	0%
India	11	0.012%	3	0.049%
Russia	2	0.002%	2	0.033%
United Kingdom	2	0.002%	1	0.016%
Myanmar	2	0.002%	0	0%
Turkmenistan	1	0.001%	0	0%
Bengal	1	0.001%	0	0%
Guatemala	1	0.001%	1	0.016%
France	1	0.001%	0	0%
Thailand	1	0.001%	0	0%
Total	92,405		6,062	

B. Foreign Employee

Business Unit	Category	Group	Number	Percentage of Total Employee in Business Unit (%)	
Semiconductor Assembly (packaging), Testing and Materials (ATM)	Employment Type	Regular	12,478	16.910%	
		Contract	3	0.004%	
	Gender	Male	1,465	1.985%	
		Female	11,016	14.929%	
	Total			12,481	
	Employment Visa	Gender	Male	1,355	1.836%
			Female	10,880	14.745%
		Total			12,235
	Electronic Manufacturing Service (EMS)	Employment Type	Regular	626	3.363%
			Contract	0	0%
Gender		Male	105	0.564%	
		Female	521	2.799%	
Total			626		
Employment Visa		Gender	Male	105	0.564%
			Female	521	2.799%
Total			626		

C. New Hire Employee

Category	Group	Number	Percentage of Total New Hire Employee (%)
Gender	Male	21,490	61.32%
	Female	13,558	38.68%
Nationality	Native	33,681	96.10%
	Foreign	1,367	3.90%
Disabled	Male	64	0.18%
	Female	30	0.09%
Position	Management	216	0.62%
	Engineering	4,204	11.99%
	Administration	905	2.58%
	Skill Job	29,723	84.81%
Age	<30	24,838	70.87%
	30-50	10,052	28.68%
	>50	158	0.45%
Education	Ph.D	11	0.03%
	Master	1,069	3.05%
	Bachelor	4,957	14.14%
	Other Higher Education	3,789	10.81%
	High School and below	25,222	71.97%
Total		35,048	

D. Turnover Rate

Category	Group	2017		2018		2019		2020	
		Number	Percentage of Group(%)	Number	Percentage of Group(%)	Number	Percentage of Group(%)	Number	Percentage of Group(%)
Gender	Male	10,016	49.8%	11,887	53.0%	10,225	53.0%	8,485	55.3%
	Female	10,103	50.2%	10,551	47.0%	9,052	47.0%	6,851	44.7%
Position	Management	467	2.3%	437	2.0%	1,396	7.3%	346	2.3%
	Engineering	3,656	18.2%	3,745	16.7%	3,189	16.5%	3,163	20.6%
	Administration	866	4.3%	925	4.1%	716	3.7%	685	4.5%
	Skill Job	15,130	75.2%	17,331	77.2%	13,976	72.5%	11,142	72.6%
Age	<30	13,482	67.0%	14,902	66.4%	12,247	63.5%	8,840	57.6%
	30-50	6,179	30.7%	7,003	31.2%	6,649	34.5%	6,080	39.7%
	>50	458	2.3%	533	2.4%	381	2.0%	416	2.7%
Education	Ph.D	22	0.1%	17	0.1%	17	0.1%	17	0.1%
	Master	786	3.9%	817	3.6%	652	3.4%	699	4.6%
	Bachelor	3,861	19.2%	3,882	17.3%	3,463	18.0%	3,306	21.5%
	Other Higher Education	3,343	16.6%	3,571	15.9%	3,263	16.9%	2,406	15.7%
	High School and below	12,107	60.2%	14,151	63.1%	11,882	61.6%	8,908	58.1%
Total		20,119		22,438		19,277		25,336	

E. Full-time Employees in Non-executive Positions

	2018	2019	2020	Difference of 2019-2020
Number of Employee ¹	46,885	46,493	47,753	1,260
Average Compensation (NT\$)	744,918	759,968	799,730	39,762
Median Compensation (NT\$)	N/A	627,111	670,687	43,576

¹ "Employees" here refers to those under the employment of ASEH, ASE (ASE Kaohsiung and ASE Chungli; excluding ASE Test Inc. and ASE Electronics Inc.), SPIL and USI facilities in Taiwan.

F. Parental Leave

Category	Group	Number	Percentage of Group (%)	Total
Employees Qualified for Parental Leave in 2020	Male	4,141	62%	6,674
	Female	2,533	38%	
Employees that Applied for Parental Leave in 2020	Male	216	21%	1,046
	Female	830	79%	
Application Rate (%)	Male		5%	16%
	Female		33%	
Employees Expected to Return to Work in 2020 After Parental Leave	Male	175	23%	761
	Female	586	77%	
Employees Return to Work in 2020 After Parental Leave and Returned as Scheduled or In Advance	Male	141	24%	582
	Female	441	76%	
Return Rate (%)	Male		81%	76%
	Female		75%	
Actual Number of Employees Returned to Work in 2019	Male	197	26%	767
	Female	570	74%	
Employees that Returned to Work in 2019 and Still in Service in 2020	Male	142	22%	632
	Female	490	78%	
Retention Rate (%)	Male		72%	82%
	Female		86%	

G. Employee Engagement Survey

Category	Total of Indirect Employee ¹	Gender		Age			Country			
		Male	Female	<30	30-45	>45	Taiwan	China	Rest of Asia	USA
The Work Experience (%)										
Performance Management	86	86	89	87	86	89	85	93	82	62
Career Opportunities	85	84	87	85	84	89	83	92	79	56
Learning & Development	86	85	88	86	85	88	84	93	77	58
Performance Management	83	85	88	86	86	90	84	92	86	75
Reward & Recognition	86	85	89	86	86	88	84	93	80	54
Manager	89	89	92	90	89	90	88	95	86	67
Brand	89	89	92	88	90	93	89	94	81	63
Brand	89	89	92	88	90	93	89	94	81	63
Leadership	86	83	88	84	84	89	82	94	79	59
Survey Follow Up	85	84	88	85	85	89	83	94	79	59
Senior Leadership	86	82	88	83	83	88	81	93	78	59
Company Practices	86	85	88	86	85	88	84	92	79	63
Diversity & Inclusion	90	89	92	90	90	90	89	94	82	75
Enabling Infrastructure	88	87	90	87	87	90	85	94	79	61
Talents & Staffing	79	78	83	80	78	83	77	88	75	54
The Work	89	89	92	89	89	92	88	94	86	73
Empowerment/Autonomy	89	89	92	89	89	91	88	95	87	78
Collaboration	88	87	91	88	87	90	86	93	82	63
Work Tasks	91	91	93	90	91	94	90	95	90	78
The Basics	90	90	92	90	90	92	89	96	79	72
Work Life Balance	90	90	92	90	90	92	89	96	79	72
Behavior (%)										
Say	83	82	86	82	83	88	81	91	70	63
Stay	80	79	82	76	81	88	78	87	70	55
Strive	80	79	84	78	80	87	78	89	74	67

¹ Indirectly employees include management, engineering and administration

H. Training Hours and Training Cost

Category	Group	Number	Percentage of Group (%)	
Training Hour (Hour)	Gender	Male	7,259,096	58%
		Female	5,293,769	42%
		Total	12,552,865	
	Position	Management	600,129	5%
		Engineering	2,954,021	24%
		Administration	480,221	4%
		Skill Job	8,518,494	68%
	Training Type	Mandatory Trainings ¹	7,988,571	64%
		Non-mandatory Trainings ²	4,564,294	36%
Training Spent (US\$)	Gender	Male	3,637,556	56%
		Female	2,913,159	44%
		Total	6,550,715	
	Age	<30	1,803,910	28%
		30-50	4,388,356	67%
		>50	358,449	5%
	Management	Senior	50,874	6%
		Middle	302,128	34%
		Junior	526,428	60%
	Training Type	Mandatory Trainings	1,667,575	25%
		Non-mandatory Trainings	4,883,140	75%

¹ Mandatory Trainings refer to the trainings that provide employees with the basic skills they need to carry out their daily work. For example, training on occupational health and safety, legal/regulation compliance, RBA etc.

² Non-mandatory Trainings refer to the trainings that develop or improve employee skills. For example, smart manufacturing, automation related courses.

I. Human Capital Return on Investment

Year	2017	2018	2019	2020
Human Capital Return on Investment (ROI)	1.47	1.38	1.31	1.42

J. Workers¹ Occupational Health and Safety

Category	Group	Employee	Contractor
Category of Occupational Injuries	Number of Physical Injuries	100	2
	Number of Chemical Injuries	4	0
	Number of Ergonomic Injuries	6	0
	Number of Biological Injuries	0	0
	Number of Psychosocial Injuries	0	0
Occupational Injuries	Number of Occupational Injuries	110	2
	Rate of Occupational Injury ²	0.563	0.176
	Number of Disability Cases	11	0
	Rate of Disability ³ Cases	0.056	0
	Number of Fatalities	1	0
Occupational Diseases	Rate of Fatalities ⁴	0.005	0
	Number of Occupational Diseases	20	0
	Number of Fatalities	0	0
	Rate of Fatalities ⁵	0	0
Total Number of Working Hours (Hour)		197,017,561	11,352,058

¹ The Workers include employee and contractor(exclude visitors)

² Rate of occupational injury= (number of occupational injury *1,000,000)/ total hours of actually worked

³ Rate of disability cases from occupational injuries = (number of disability cases from occupational injuries *1,000,000)/ total number of working hours, excluding number of fatalities

⁴ Rate of fatalities from occupational injuries= (number of fatalities from occupational injuries *1,000,000)/ total number of working hours

⁵ Rate of fatalities from occupational diseases= (number of fatalities from occupational diseases *1,000,000)/ total number of working hours

K. Social Involvement Key Performance

Environmental Technology Research Projects

	2017	2018	2019	2020
No. of project	11	9	11	10
Cost-saving of outsourced waste management	US\$558,000	US\$2,140,000	US\$348,000	US\$566,000

Industry-Academia Collaboration Programs

	2017	2018	2019	2020
No. of interns	390	366	1,183	638
No. of semiconductor master's degree students	122	158	230	169
No. of semiconductor assembly technology research projects	16	42	38	74

Afforestation Projects

	2017	2018	2019	2020
No. of planting area (hectares)	9.85	13.18	13	18.05

Volunteer

	2017	2018	2019	2020
No. of volunteers participating in the event	2,380	2,130	2,300	2,822
No. of volunteer hours	8,800	12,000	9,200	5,918

Environmental Education Program

	2017	2018	2019	2020
No. of courses	18	20	24	31
No. of participation	2,700	2,100	2,500	2,700
NO. of seed teachers	120	170	120	238
No. of training materials/films	4	2	10	38

Critical Supplier List

ASEH Critical Supplier List (ATM) in 2020

3M	ADVANTEK	Air Liquide Far Eastern Ltd.	Air Products and Chemicals, Inc.	ASE (Shanghai) Inc.
ASE Electronics Inc.	ASE Tray Plant	Ato Tech	Chang Wah Electromaterials Inc.	Chemleader Corporation
Daewon Semiconductor Packaging Industrial Co.,Ltd.	DDP Specialty Products Taiwan Co., Ltd	DISCO Corporation	Dou Yee Enterprises	FUJIFILM Electronic Materials Co., Ltd.
Furukawa Electric Co., Ltd.	Fusheng Electronics Corporation	HAESUNG DS Co.,Ltd	Henkel AG & Co. KGaA	Heraeus Group
Hon Hai Precision Ind. Co., Ltd.	HOUNG YANG CO.,LTD	Hwa Shu Enterprise Co., Ltd.	ISHIHARA CHEMICAL CO.,LTD	ITW Meritex Sdn Bhd
Jentech Precision Industrial Co.,Ltd	KAKEN TECH Co., Ltd.	KINSUS INTERCONNECT TECHNOLOGY CORP	Korea Circuit Co., LTD.	Kostat, Inc.
Kulicke & Soffa	KYOCERA ASIA PACIFIC PTE. LTD.	LG Innotek Co., Ltd.	Lintec Advanced Technologies	LT Metal Co., Ltd.
MACDERMID PERFORMANCE SOLUTIONS TAIWAN LTD.	Merck Performance Materials Ltd	Mitsubishi Chemical Corporation	Mitsui Chemicals Inc.	Mitsui High-tec, Inc.
MK ELECTRON Co., Ltd.	Murata Manufacturing Co., Ltd.	NAMICS Corporation	Nan Ya PCB Corporation	Nanya Technology Corporation
Nippon Micrometal Corporation	NITTO DENKO CORPORATION	Opto Tech Corporation	OSRAM Opto Semiconductors inc	Peak International
Peco Tek Co., Ltd.	RESOUND TECH INC.	ROHM AND HAAS ELECTRONIC MATERIALS TAIWAN LIMITED	Samsung Electro-Mechanics Co., Ltd.	Senju Metal Industry Co., Ltd.
SEO KWANG MANUFACTURING CO.,LTD.	Shennan Circuits Co., Ltd	Shenzhen Tengxin Precision Stickies Products Co., Ltd	Shinko Electronics Co.,Ltd.	SHINON LIMITED
SHOWA DENKO K.K.	SIMMTECH Co., Ltd.	Small Precision Tools, Inc.	SOLEO CO., LTD.	SUMITOMO BAKELITE CO., LTD.
Sun Surface Technology Co., Ltd.	SUNBRIGHT APPLIED MATERIALS CORP.	SUNRISE PLASTICS INDUSTRY CO., LTD.	Taihong Circuit Ind. Co. Ltd.	TAIWAN REFINE CO., LTD.
TAIWAN TOKUYAMA CORPORATION	Taiyo Yuden Co.,Ltd.	Tanaka Kikinzoku Kogyo K.K.	TOK Taiwan Co., Ltd	Tongren Industrial Automation Equipment Co., Ltd.
TOPPAN Printing Co., Ltd.	UBoT Incorporated Limited.	Umate Electronic Co., Ltd.	Unimicron Technology Corporation	Yantai Zhaojin Kanfort Precious Metals Co., Ltd.
Zhen Ding Tech. Group				

Third Party Assurance Statement



勤業眾信

勤業眾信聯合會計師事務所
11073 台北市信義區松仁路100號20樓

Deloitte & Touche
20F, Taipei Nan Shan Plaza
No. 100, Songren Rd.,
Xinyi Dist., Taipei 11073, Taiwan

Tel: +886 (2) 2725-9988
Fax: +886 (2) 4051-6888
www.deloitte.com.tw

INDEPENDENT AUDITORS' LIMITED ASSURANCE REPORT

The Board of Directors and Stockholders
ASE Technology Holding Co., Ltd.

We have performed a limited assurance engagement on the Corporate Social Responsibility Report ("the Report") of ASE Technology Holding Co., Ltd. ("the Company") for the year ended December 31, 2020.

Responsibilities of Management for the Report

Management is responsible for the preparation of the Report in accordance with Taiwan Stock Exchange Corporation Rules Governing the Preparation and Filing of Corporate Social Responsibility Reports by TWSE Listed Companies, GRI Standards for core option, the Sustainability Accounting Standards for Semiconductors Industry and Electronic Manufacturing Services & Original Design Manufacturing Industry issued by Sustainability Accounting Standards Board and other applicable rules according to its sector features, and for such internal control as management determines is necessary to enable the preparation of the Report that are free from material misstatement.

Auditor's Responsibilities for the Limited Assurance Engagement performed on the Report

Except as stated in the following paragraph, we conducted our work on the Report in accordance with the International Standard on Assurance Engagements 3000 (Revised) (ISAE 3000 (Revised)) to express our conclusion on whether the information in the Report was stated fairly, in all material respects, in accordance with the abovementioned reporting criteria. The nature, timing and extent of procedures performed in a limited assurance engagement are different from and more limited than a reasonable assurance engagement and, therefore, a lower assurance level is obtained than a reasonable assurance.

The information on greenhouse gas emission (scope 1, scope 2 and scope 3) and related energy and electricity consumption that is disclosed in the Report has been verified by other third party verification organization. Thus, the scope of this Independent Auditor's Limited Assurance Report does not include conclusion on the disclosure of information on greenhouse gas emission (scope 1, scope 2 and scope 3) and related energy and electricity consumption.

We applied professional judgment in the planning and conduct of our work to obtain evidence supporting the limited assurance. Because of the inherent limitations of any internal control, there is an unavoidable risk that even some material misstatements may remain undetected. The procedures we performed include, but not limited to:

- Obtaining and reading the Report.
- Inquiring management and personnel involved in the preparation of the Report to understand the policies and procedures for the preparation of the Report.

- Inquiring the personnel responsible for the preparation of the Report to understand the process, controls, and information systems in the preparation of the Report.
- Analyzing and examining, on a test basis, the documents and records supporting the Report.

Inherent Limitations

The subject information included non-financial information, which was under inherent limitations than financial information. The information may involve significant judgment, assumptions and interpretations by the management, and the different stakeholders may have different interpretations of such information.

Independence and Quality Controls

We have complied with the independence and other ethical requirements of The Norm of Professional Ethics for Certified Public Accountant in the Republic of China, which contains integrity, objectivity, professional competence and due care, confidentiality and professional behavior as the fundamental principles. In addition, the firm applies Statement of Auditing Standard No. 46 "Quality Control for Public Accounting Firms" issued by the Accounting Research and Development Foundation of the Republic of China and, accordingly, maintains a comprehensive system of quality controls, including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

Conclusion

Based on the procedures performed and evidence obtained, nothing has come to our attention that causes us to believe that the information in the Report is not stated fairly, in all material respects, in accordance with the abovementioned reporting criteria.

Other Matters

We shall not be responsible for conducting any further assurance work for any change of the subject matter information or the criteria applied after the issuance date of the Report.



Deloitte & Touche
Taipei, Taiwan
Republic of China

July 28, 2021

Notice to Readers

For the convenience of readers, the independent auditor's limited assurance report has been translated into English from the original Chinese version prepared and used in the Republic of China. If there is any conflict between the English version and the original Chinese version or any difference in the interpretation of the two versions, the Chinese-language independent auditor's limited assurance report shall prevail.

GRI Content Index

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102-29	Identifying and managing economic, environmental, and social impacts	2.1 Organization and Structure 3.1 Board of Directors	13-19 38
102-30	Effectiveness of risk management processes	3.1 Board of Directors 3.4 Risk Management	37 44-46
102-31	Review of economic, environmental, and social topics	3.1 Board of Directors	38
102-32	Highest governance body's role in sustainability reporting	This report was approved and authorized by the Corporate Sustainability Committee.	-
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102-46	Defining report content and topic Boundaries	2.4 Materiality Assessment and Stakeholder Communication	31-34
102-47	List of material topics	2.4 Materiality Assessment and Stakeholder Communication	31-34
102-48	Restatements of information	There is no restatement of information from previous report.	-
102-49	Changes in reporting	2.4 Materiality Assessment and Stakeholder Communication	31-34
102-50	Reporting period	2020.01.01 ~ 2020.12.31	-
102-51	Date of most recent report	The previous report was published in July 2020.	-
102-52	Reporting cycle	We publish CSR Report annually.	-
102-53	Contact point for questions regarding the report	ABOUT OUR REPORTING	3
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GRI 201: Economic Performance 2016 (GRI 103: Management Approach 2016)			
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103-3	Evaluation of the management approach	LETTER FROM THE CHAIRMAN 1.3 Financial Performance	7-8 12
201-1	Direct economic value generated and distributed	1.3 Financial Performance	12
		2.3 UN Sustainable Development Goals and Sustainable Value Assessment	24-30
201-1	Direct economic value generated and distributed	3.2 Economic Performance and Tax Governance	39-40
		For further details on financial performance, please refer to our consolidated financial report: https://ir.aseglobal.com/html/ir_financial_overview.php	-
201-2	Financial implications and other risks and opportunities due to climate change	5.1 Climate Leadership 5.6 Environmental Expenditures and Investments	73-79 94-95

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
201-3	Defined benefit plan obligations and other retirement plans	6.1 Talent Attraction and Retention- Compensation and Benefit Policy Retirement/pension plans for ASEH employees were formulated in compliance with relevant Taiwanese laws such as the Labor Standards Act, Labor Pension Act, and applicable laws in the countries in which ASEH offices are located. For more information, please refer to page 130-134 of the ASEH 2020 Annual Report (English version) and page 69-75 of 2020 Financial Report (English version).	102-103 -
		ASEH is entitled to tax incentive. Please refer to page 88 of our Chinese Annual Report.	-
GRI 202: Market Presence 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	6.1 Talent Attraction and Retention	99-100
103-3	Evaluation of the management approach	6.1 Talent Attraction and Retention	99-100
202-2	Proportion of senior management hired from the local community	3.1 Board of Directors ASEH is a registered company established under the jurisdiction of the Republic of China. Among board members who also serve as top managements (directors who hold executives positions), 70% were local residents (with Republic of China citizenship).	37 -
GRI 203: Indirect Economic Impacts 2016 (GRI 103: Management Approach 2016)			
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203-1	Infrastructure investments and services supported	2.3 UN Sustainable Development Goals and Sustainable Value Assessment	24-30
GRI 204: Procurement Practices 2016 (GRI 103: Management Approach 2016)			
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103-3	Evaluation of the management approach	7. Responsible Procurement - 2020 Key Performance	118
204-1	Proportion of spending on local suppliers	7.1 Supply Chain Overview	120
GRI 205: Anti-corruption 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
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103-3	Evaluation of the management approach	3.3 Business Ethics	41-42
205-1	Operations assessed for risks related to corruption	3.3 Business Ethics	42
205-2	Communication and training about anti-corruption policies and procedures	3.3 Business Ethics 7.2 Supply Chain Management Framework	42 120
205-3	Confirmed incidents of corruption and actions taken	3.3 Business Ethics In 2020, ASEH did not engage in any political contributions.	42-43 -
GRI 206: Anti-competitive Behavior 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	3.3 Business Ethics	41-42
103-3	Evaluation of the management approach	3.3 Business Ethics	41-42
206-1	Legal actions for anticompetitive behavior, antitrust, and monopoly practices	In 2020, ASEH was not subjected to any legal actions regarding anti-competitive behavior and violations of anti-trust and monopoly legislation.	-
GRI 302: Energy 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	5.1 Climate Leadership	73-75
103-3	Evaluation of the management approach	5.1 Climate Leadership	75-79
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302-3	Energy intensity	5.1 Climate Leadership - Electricity and the Use of Renewable Energy	84

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
302-4	Reduction of energy consumption	5.1 Climate Leadership - Energy Resource Management	85
GRI 303: Water and Effluents 2018 (GRI 103: Management Approach 2016)			
103-1 2016	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2 2016	The management approach and its components	5.2 Water Resource	87-88
103-3 2016	Evaluation of the management approach	5.2 Water Resource	87-88
303-1	Interactions with water as a shared resource	Please refer to the 2020 Key Performance section for our goals and targets. 5.1 Climate Leadership - Transitioning towards Low-Carbon Resilience 5.2 Water Resource	72 78 87-88
303-2	Management of water discharge related impacts	5.2 Water Resource - Waste water management and control	88
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305-1	Direct (Scope 1) GHG emissions	5.1 Climate Leadership - Greenhouse gas emissions management	80-81
305-2	Energy indirect (Scope 2) GHG emissions	5.1 Climate Leadership - Greenhouse gas emissions management	80-81
305-3	Other indirect (Scope 3) GHG emissions	5.1 Climate Leadership - Greenhouse gas emissions management	82
305-4	GHG emissions intensity	5.1 Climate Leadership - Greenhouse gas emissions management	81

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
305-5	Reduction of GHG emissions	5.1 Climate Leadership - Greenhouse gas emissions management	81
305-6	Emissions of ozone-depleting substances (ODS)	5.4 Air Emissions Control	92
305-7	Nitrogen oxides, sulfur oxides, and other significant air emissions	5.4 Air Emissions Control	92
GRI 306: Effluents and Waste 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	5.2 Water Resource 5.3 Waste Management	87 89
103-3	Evaluation of the management approach	5.2 Water Resource 5.3 Waste Management	87 89
306-1	Water discharge by quality and destination	Appendix: Sustainability Data - Environmental Data	145-148
306-2	Waste by type and disposal method	5.3 Waste Management	89
306-3	Significant spills	No significant spill in 2020.	-
306-4	Transport of hazardous waste	5.3 Waste Management	89
GRI 307: Environmental Compliance 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	3.6 Regulatory Compliance	55
103-3	Evaluation of the management approach	2.2 Sustainability Strategies – Sustainability Vision 3.6 Regulatory Compliance	21-23 55
307-1	Non-compliance with environmental laws and regulations	5.6 Environmental Expenditures and Investments	94
GRI 308: Supplier Environmental Assessment 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	7.3 Supply Chain Sustainability Management - Supplier Sustainability Risk Assessment	124-126
103-3	Evaluation of the management approach	7. Responsible Procurement - 2020 Key Performance	118
308-1	New suppliers that were screened using environmental criteria	7.3 Supply Chain Sustainability Management - Supplier Sustainability Requirement / Supplier Sustainability Risk Assessment	124-126

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
308-2	Negative environmental impacts in the supply chain and actions taken	7.3 Supply Chain Sustainability Management - Supplier Sustainability Requirement / Supplier Sustainability Risk Assessment	124-126
GRI 401: Employment 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	6.1 Talent Attraction and Retention	101-102
103-3	Evaluation of the management approach	6.1 Talent Attraction and Retention	101-102
401-1	New employee hires and employee turnover	6.1 Talent Attraction and Retention Appendix: Social Data – C. New Hire Employee, D. Turnover Rate	101-102 151-152
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	ASEH has provided all full-time employees with comprehensive insurance / parental leave / retirement schemes.	102-104
401-3	Parental leave	Appendix: Social Data – F. Parental Leave	153
GRI 402: Labor/Management Relations 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	6.1 Talent Attraction and Retention	105-107
103-3	Evaluation of the management approach	6.1 Talent Attraction and Retention - Employee Communication	105-106
402-1	Minimum notice periods regarding operational changes	Regarding employee discharges and layoffs, all ASEH sites notify their employees of significant changes to collective agreements in advance pursuant to local laws and regulations. Any labor-management dispute regarding collective agreements is submitted to the employee representatives in writing for further negotiation.	-
GRI 403: Occupational Health and Safety 2018 (GRI 103: Management Approach 2016)			
103-1 2016	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2 2016	The management approach and its components	6.3 Occupational Health and Safety	111
103-3 2016	Evaluation of the management approach	6.3 Occupational Health and Safety	111

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
403-1	Occupational health and safety management system	6.3 Occupational Health and Safety	111
403-2	Hazard identification, risk assessment, and incident investigation	6.3 Occupational Health and Safety	111-113
403-3	Occupational health services	6.3 Occupational Health and Safety	114-115
403-4	Worker participation, consultation, and communication on occupational health and safety	6.3 Occupational Health and Safety	111-116
403-5	Worker training on occupational health and safety	6.3 Occupational Health and Safety	111-116
403-6	Promotion of worker health	6.3 Occupational Health and Safety	115
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	6.3 Occupational Health and Safety	111-116
403-8	Workers covered by an occupational health and safety management system	6.3 Occupational Health and Safety Appendix: Social Data – J. Workers Occupational Health and Safety	111-116 156
403-9	Work-related injuries	6.3 Occupational Health and Safety Appendix: J. Workers Occupational Health and Safety	112-113 156
403-10	Work-related ill health	6.3 Occupational Health and Safety Appendix: J. Workers Occupational Health and Safety	111-116 156
GRI 404: Training and Education 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	6.2 Talent Cultivation and Development	108-110
103-3	Evaluation of the management approach	6.2 Talent Cultivation and Development	108-110
404-1	Average hours of training per year per employee	6.2 Talent Cultivation and Development	109
404-2	Programs for upgrading employee skills and transition assistance programs	6.2 Talent Cultivation and Development ASEH does not provide terminated employees with any continued employability or career transition assistance.	108-110 -
404-3	Percentage of employees receiving regular performance and career development reviews	6.1 Talent Attraction and Retention	105

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
GRI 405: Diversity and Equal Opportunity 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	6.1 Talent Attraction and Retention - Diversity in Human Resources	99-100
103-3	Evaluation of the management approach	6.1 Talent Attraction and Retention - Diversity in Human Resources	99-100
405-1	Diversity of governance bodies and employees	3.1 Board of Directors 6.1 Talent Attraction and Retention - Diversity in Human Resources	37 99-100
GRI 408: Child Labor 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	3.5 Human Rights Management 7.3 Supply Chain Sustainability Management	51-54 123-127
103-3	Evaluation of the management approach	3.5 Human Rights Management 7.3 Supply Chain Sustainability Management	51-54 123-127
408-1	Operations and suppliers at significant risk for incidents of child labor	3.5 Human Rights Management 7.3 Supply Chain Sustainability Management No significant risk of hire child labor and young workers exposed to hazardous work.	51-54 123-127 -
GRI 409: Forced or Compulsory Labor 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	3.5 Human Rights Management 7.3 Supply Chain Sustainability Management	51-54 123-127
103-3	Evaluation of the management approach	3.5 Human Rights Management 7.3 Supply Chain Sustainability Management	51-54 123-127
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	3.5 Human Rights Management 7.3 Supply Chain Sustainability Management Non-significant risk for incidents of forced or compulsory labor either.	51-54 123-127 -
GRI 412: Human Rights Assessment 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	3.5 Human Rights Management	51-54

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
103-3	Evaluation of the management approach	3.5 Human Rights Management	51-54
412-1	Operations that have been subject to human rights reviews or impact assessments	3.5 Human Rights Management	51-54
412-2	Employee training on human rights policies or procedures	3.5 Human Rights Management All employees trained in human rights policies procedures concerning.	51-54 106
GRI 414: Supplier Social Assessment 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	7.3 Supply Chain Sustainability Management- Supplier Sustainability Requirement / Supplier Sustainability Risk Assessment	124-126
103-3	Evaluation of the management approach	7. Responsible Procurement - 2020 Key Performance	118
414-1	New suppliers that were screened using social criteria	7.3 Supply Chain Sustainability Management- Supplier Sustainability Requirement / Supplier Sustainability Risk Assessment	124-126
414-2	Negative social impacts in the supply chain and actions taken	7.3 Supply Chain Sustainability Management- Supplier Sustainability Requirement / Supplier Sustainability Risk Assessment	124-126
GRI 418: Customer Privacy 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	3.7 Information Security Management	56-58
103-3	Evaluation of the management approach	3.7 Information Security Management	56-58
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	We don't have any substantiated complaints regarding breaches of customer privacy and losses of customer data in 2020.	-
GRI 419: Socioeconomic Compliance 2016 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	3.6 Regulatory Compliance	55
103-3	Evaluation of the management approach	3.6 Regulatory Compliance	55

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
419-1	Non-compliance with laws and regulations in the social and economic area	ASEH did not receive significant fines or non-monetary sanctions for non-compliance with laws and/or regulations in the social and economic area in 2020. (By "significant violations", we mean the fine/penalty individually costs more than US\$10,000)	-
Customer Relationship Management (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	4.3 Products and Services - Customer Service	70
103-3	Evaluation of the management approach	4.3 Products and Services - Customer Service	70
Innovation Management (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	4.1 R&D and Innovation	60-66
103-3	Evaluation of the management approach	4.1 R&D and Innovation	60-66
Green Solutions (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	4.2 Sustainable Manufacturing	67-69
103-3	Evaluation of the management approach	4.2 Sustainable Manufacturing	67-69
Social Involvement (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	8. Corporate Citizenship	131
103-3	Evaluation of the management approach	8. Corporate Citizenship - 2020 Key Performance	132
Local Communities (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-34
103-2	The management approach and its components	8.1 Social Involvement Overview	135-136
103-3	Evaluation of the management approach	8.1 Social Involvement Overview	135-136

Sustainability Accounting Standards Board

SEMICONDUCTORS (Applicable to ASE and SPIL Facilities)

Topic / Code	Accounting Metric	Related Section / Explanatory Notes	Page No.
Greenhouse Gas Emissions			
TC-SC-110a.1.	(1) Gross global Scope 1 emissions and (2) amount of total emissions from perfluorinated compounds	5.1 Climate Leadership - Greenhouse gas emissions management	80
TC-SC-110a.2.	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	5.1 Climate Leadership - Greenhouse gas emissions management	80-81
Energy Management in Manufacturing			
TC-SC-130a.1	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	5.1 Climate Leadership - Electricity and the Use of Renewable Energy Appendix: Sustainability Data - Environmental Data	83-84 146
Water Management			
TC-SC-140a.1	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	5.2 Water Resource Appendix: Sustainability Data - Environmental Data	87-88 147
Waste Management			
TC-SC-150a.1	Amount of hazardous waste from manufacturing, percentage recycled	5.3 Waste Management	89
Employee Health & Safety			
TC-SC-320a.1	Description of efforts to assess, monitor, and reduce exposure of employees to human health hazards	6.3 Occupational Health and Safety	111-116
TC-SC-320a.2	Total amount of monetary losses as a result of legal proceedings associated with employee health and safety violations	In 2020, ASEH was fined approximately US\$12,400 for violating employee health and safety protocols (there were no fines exceeding US\$10,000).	-
Recruiting & Managing a Global & Skilled Workforce			
TC-SC-330a.1	Percentage of employees that are (1) foreign nationals and (2) located offshore	Appendix: Social data - B. Foreign Employee Taiwan is the registered location of ASEH and the employees of ASEH's facilities outside Taiwan are considered overseas employees. Overseas employees account for 39% of the total ASEH employees.	150 -
Materials Sourcing			
TC-SC-440a.1	Description of the management of risks associated with the use of critical materials	7.3 Supply Chain Sustainability Management	123-127
Intellectual Property Protection & Competitive Behavior			
TC-SC-520a.1	Total amount of monetary losses as a result of legal proceedings associated with anticompetitive behavior regulations	In 2020, ASEH did not suffer any financial losses from violating anti-competitive regulations.	-

ELECTRONIC MANUFACTURING SERVICES & ORIGINAL DESIGN MANUFACTURING (Applicable to USI Facilities)

Topic / Code	Accounting Metric	Related Section / Explanatory Notes	Page No.
Water Management			
TC-ES-140a.1	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	5.2 Water Resource Appendix: Sustainability Data - Environmental Data	87-88 147
Waste Management			
TC-ES-150a.1	Amount of hazardous waste from manufacturing, percentage recycled	5.3 Waste Management	145
Labor Practices			
TC-ES-310a.1	(1) Number of work stoppages and (2) total days idle	In 2020, there were no incidents that resulted in a shutdown at USI.	-
Materials Sourcing			
TC-ES-440a.1	Description of the management of risks associated with the use of critical materials	7.3 Supply Chain Sustainability Management	123-127
Activity Metrics			
TC-ES-000.C	Number of employees	Total number of USI employees is 18,615.	-

Contact Information

ASE

TAIWAN (KAOHSIUNG)

No.26, Chin 3rd Rd., Nanzih Dist., Kaohsiung, Taiwan
Tel: +886-7-361-7131

TAIWAN (CHUNGLI)

No.550, Chung-Hwa Rd. Sec. 1 Chungli, Taiwan
Tel: +886-3-452-7121

CHINA (SHANGHAI) | ASSEMBLY & TEST

No. 669, Guoshoujing Road, Zhangjiang Hi-Tech Park,
Pudong New Area, Shanghai 201203, China
Tel: +86-21-5080-1060

CHINA (SHANGHAI) | MATERIAL

No. 2300 Jin Ke Rd., Zhangjiang Hi-Tech Park, Pudong
New Area, Shanghai 201203, China
Tel: +86-21-5080-5888

CHINA (SHANGHAI) | ISE labs

No. 169, Shengxia Road, Pudong New Area, Shanghai 201203, China
Tel: +86-21-5087-7568

CHINA (KUNSHAN)

No.373, Songnan Road, Qiandeng, Kunshan, Jiangsu Province
215341, China
Tel: +86-512-5528-8888

CHINA (WEIHAI)

16-1 Hai Nan Road, Economic & Technological Development Zone,
Weihai, Shandong 264205, China
Tel: +86-631-591-5000

CHINA (SUZHOU)

188 Su Hong Xi Road, SIP Suzhou 215021, China
Tel: +86-512-6725-1788

CHINA (WUXI)

Building No. 29-B, Block No. 52
Wuxi-High-Tech Industrial Development Zone
Wuxi, Jiangsu 214028, China
Tel: +86-510-8522-5352

KOREA (PAJU)

76 Saneopdanji-gil, Gyoha-dong, Paju-si, Gyeonggi-do, Korea
Tel: +82-31-940-0484

JAPAN (YAMAGATA)

1863, Ooazairyuda, Takahata-machi
Higashiokitama-gun, Yamagata, 992-0324, Japan
Tel: +81-238-57-3894

MALAYSIA

Phase 4, Bayan Lepas Free Industrial Zone 11900 Penang,
Malaysia
Tel: +60-4-632-8202

SINGAPORE

2 Woodlands Loop Singapore 738074
Tel: +65-6631-4499

ISE Labs

46800 Bayside Parkway Fremont, CA 94538, U.S.A.
Tel: +1-510-687-2500

SPIL

TAIWAN | Da Fong

No. 123, Sec. 3, Da Fong Rd., Tantz, Taichung, Taiwan
Tel: +886-42534-1525

TAIWAN | Chung Shan

No. 153, Sec. 3, Chung Shan Rd., Tantz, Taichung, Taiwan
Tel: +886-42534-1525

TAIWAN | Zhong Ke

No. 19, Keya Rd., Daya, Taichung, Taiwan
Tel: +886-42554-5527

TAIWAN | Hsinchu

No. 1-1, R&D Rd. 2, Science-Based Industrial Park, Hsinchu,
Taiwan
Tel: +886-3578-7799

TAIWAN | Changhua

No.8, Sec 2, Chang Hsin Rd., Hemei. Changhua, Taiwan
Tel: +886-4721-8888

CHINA | SUZHOU

No. 288, Feng Li Street, SuZhou Industrial Park SuZhou 215123, China
Tel: +86-0512-6253-5288

USI

TAIWAN

No.141, Lane 351, Sec. 1, Taiping Road,
Tsaotuen, Nantou County, Taiwan
Tel: +886-49-221-2700

CHINA (SHANGHAI-ZHANGJIANG)

No.1558, Zhang Dong Rd., Pudong New Area,
Shanghai 201203, China
Tel: +86-21-5896-6996

CHINA (SHANGHAI-JINQIAO)

No. 501 Longgui Road, Jinqiao Export Processing (South) Zone, Pudong
New Area, Shanghai 201201, China
Tel: +86-21-3813-6668

CHINA (KUNSHAN)

No. 497, Huangpujiang Road, Qiandeng, Kunshan,
Jiangsu Province 215341, China
Tel: +86-512-5528-0000

CHINA (SHENZHEN)

USI Electronics Park, No. 9028, Beihuan Road, North of High-Tech
Industrial Park, Nanshan District, Shenzhen 518057, China
Tel: +86-755-6182-1666

MEXICO (GUADALAJARA)

Anillo Periferico Manuel Gomez Morin No. 656, Jardines de, Santa Isabel
C.P. 44300 Guadalajara, Jalisco, Mexico
Tel: +52-33-3648-1800

Sales Offices & Service Centers

If you wish to contact an ASEH sales representative
in your region, please visit www.aseglobal.com

www.aseglobal.com

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