



ASE HOLDINGS

TAIEX: 3711
NYSE: ASX

2021

ASE HOLDINGS
ESG REPORT



Low Carbon

Circular

Inclusive

Collaborative

Committed to a Win-Win Sustainable Future

As a leading global service provider of semiconductor assembly and testing, ASE Technology Holding Co., Ltd. and its subsidiaries (collectively ASEH) are fully committed to building its core business and strengthening research and development. The company continues to advance its corporate sustainability strategy through a framework that comprises four pillars - Low Carbon, Circular, Inclusive and Collaborative. This year, we have conducted Employee Engagement Survey, published TCFD Report, implemented Water Risk Analysis of Facilities Worldwide, established ASE Social Enterprise Co., Ltd., and acquired Cybersecurity Insurance. ASEH intends to respond proactively to industry trends and stay abreast of social changes, as well as implement social responsibility and contribute to positive social and environmental impacts.

To highlight ASEH's proactive efforts to contribute to environmental sustainability, including promoting water source recycling, planting trees with its employees, enforcing energy conservation and carbon reduction, nurturing biodiversity, and introducing smart technologies, the cover design of this Report was based on the themes of sustainable earth, green technology, and the city of lights, along with the origins of life on earth, water and forest. At the same time, ASEH's continues to focus on research and development and innovative culture, making contributions to industrial technology advancements, and like the lights that illuminate the city, offering hope for green and sustainable living.

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Employee Engagement Survey

In recent years, talent risks have become a key focus of ASEH as employees form the core of the company's sustainability development and competitive advantage. To create a business environment that supports employee welfare and improves management resilience, ASEH began conducting employee engagement surveys once every two years from 2017. In 2021, we introduced a new framework and new measurement indicators, restructuring the employee survey to a sustainability engagement survey. The sustainability survey is conducted across the 3 main subsidiaries of ASEH, covering 26 factories worldwide and all employees in 8 countries (including direct and indirect employees). An indicator measuring employees' understanding of the company's ESG policy was also added to the current employee engagement survey to help us better understand their opinions. Based on employee feedback, areas of improvement in the work environment or management policies can be identified and addressed effectively. As a result, employees will feel empowered to handle greater responsibilities, embrace change and continue to make improvements, optimizing ASEH's performance in sustainability.

TCFD Report

ASEH is committed to taking mitigation and adaptation actions against climate change and internalizing climate risk management and solutions in our facilities worldwide. To facilitate our climate disclosures, we have adopted the recommendations and framework of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD). Our first TCFD Report, published this year, highlights our operational management and strategic actions, product development and innovation, value chain engagement and net zero goals. The report emphasizes our commitment to fulfill climate leadership in response to stakeholders' call to action and we hope to inspire more businesses around the world to join our net zero mission. Regarding our carbon reduction practices, ASEH has adopted woodlands to analyze the amount of carbon captured and stored, conduct feasibility studies and formulate device carbon sequestration strategies for the future. At the same time, we place equal importance on biodiversity risks from all aspects of our business including operations and social welfare initiatives, and we will devote considerable efforts to activities for biodiversity conservation.

Water Risk Analysis of Facilities Worldwide

To gain precise insights into water risks at our facilities worldwide, we performed a water risk analysis using the Aqueduct risk assessment tool developed by the World Resource Institute (WRI) as well as NASA's climate data. The analysis helps us to understand the water consumption and characteristics of water resources at each facility, thereby allowing us to identify areas vulnerable to the risks of water shortages. The water stress levels of the facilities are assessed in totality with regional and operational risks to determine appropriate response strategies and adaptation pathways for climate risks.



Key Highlights

In this report, we discuss our sustainability activities in 2021.

Establishing ASE Social Enterprise Co., Ltd. and Executing Social Welfare Projects

This year, ASEH began preparations for the establishment of the ASE Social Enterprise Co., Ltd., applying an innovative business model to advance sustainable development, promote social inclusion, and address environmental problems. In memory of Madam Chang Yao Hung-Ying, the founder of the ASE Group, and her unyielding entrepreneurship, we are planning to launch a "Sustainable Entrepreneurship Competition and Dream Ambition Fulfilment Program for Women." The program is aimed at inspiring innovative thinking in women, encouraging entrepreneurship, and building an inclusive and vibrant entrepreneurial environment. In the meantime, we continued to launch campus sustainability programs, and worked with socially responsible universities to build renewable energy-powered aquaponics farms in elementary schools to promote education on sustainable food production and farming. Smart energy-saving guidance and environmental education programs are offered to schools in rural areas, helping them save more than 6% of electricity consumption. As long-term advocates of disadvantaged students who live in rural areas, we support school assistance programs such as after-school programs, to improve their learning environment and quality of life that would lead to a better future.

Information Security Management

Given the trend of digital transformation, ASEH continuously improves information technology (IT) and applies cybersecurity experiences to operational technology (OT). We started planning and conducting OT cybersecurity evaluation in stages. This involves inspections and tests by external experts to reduce any potential threats and risks in our OT cybersecurity environment. In 2021, ASEH began developing an organization-level process for classifying, reporting, and responding to cybersecurity incidents. Relevant management mechanisms will be adopted to ensure that cybersecurity incidents are handled in a timely manner so as to reduce risks and minimize the scope of damage. Recently, we planned an automated system for collecting and transmitting cybersecurity information in real-time to improve the company's overall cybersecurity capability and develop a horizontal joint defense mechanism. In light of the cybersecurity risks and challenges facing business entities, ASEH adopted a cyber liability insurance policy as the last line of defense, with risk management as the starting point. Such a policy is expected to help us respond to and control the impact of a cybersecurity incident. It provides insurance coverage to reduce any possible cybersecurity losses sustained by the company, customers, and suppliers, thereby enabling us to quickly restore business operations.

Industry Leader

Named Industry Leader in the 2016-2021 Dow Jones Sustainability Indices, and listed as a constituent of the Dow Jones Sustainability World Index and Emerging Markets Index



Top 1% S&P Global Gold Class

Listed on the S&P Global Sustainability Yearbook 2016-2021, and awarded the "Gold Class" for six consecutive years (within 1% of top performing company's score under the Semiconductors and Semiconductor Equipment Industry Group)



Triple Leadership Status

In 2021, ASEH received recognition from the CDP for leadership on Climate Change and Water Security, and continued to be amongst the highest rated companies listed on the Supplier Engagement Rating Leaderboard

- Maintained leadership position on climate change for six consecutive years
- Recognized on the water security A List for two consecutive years
- Rated 'A' in Supplier Engagement Rating for three consecutive years



8 Awards

Received 2021 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, Corporate Sustainability Report Award (Platinum) and GCSA Sustainability Reporting Award (Gold)



2021 Awards and Recognitions

Gold Award

At the 1st Taiwan Sustainability Action Awards (TSAA), ASEH received a Gold award for the company's low-carbon transition towards net-zero emissions demonstrated through measurable actions to combat climate change and its impacts (UN SDG 13). The TSAA was organized by the Taiwan Institute for Sustainable Energy (TAISE)



7 Years in a Row

Included in the FTSE4GOOD Emerging Markets Index for seven years in a row (2015-2021)



4 Consecutive Years

Listed on the 2018-2021 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 Three Times

Received the 2021 Asia Responsible Enterprise Awards - Corporate Governance and Green Leadership hosted by Enterprise Asia



ABOUT OUR REPORTING

This is our 4th ESG Report for ASEH. This report has been prepared in accordance with the GRI Standards: Core option 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:

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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, Advanced Semiconductor (Shanghai), 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: Nantou, Zhangjiang, Kunshan, Jinqiao, Shenzhen and Mexico

Any boundary adjustment made to the scope of data will be separately explained in the text of the report. Financial figures in this report are prepared in accordance with international standards and domestic regulations approved and promulgated by the Financial Supervisory Commission (FSC), including International Financial Reporting Standards (IFRS), International Accounting Standards (IASs), and the interpretations and statements of Standing Interpretations Committee (SIC) and International Financial Reporting Interpretations Committee (IFRSIC) adopted by the International Accounting Standards Board (IASB), as well as the Regulations Governing the Preparation of Financial Reports by Securities Issuers, and are audited by Deloitte & Touche. All figures are presented in US dollars unless otherwise specified.

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 ESG/Sustainability Reports in ASEH

Within the ASEH, we have also published three separate ESG/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>



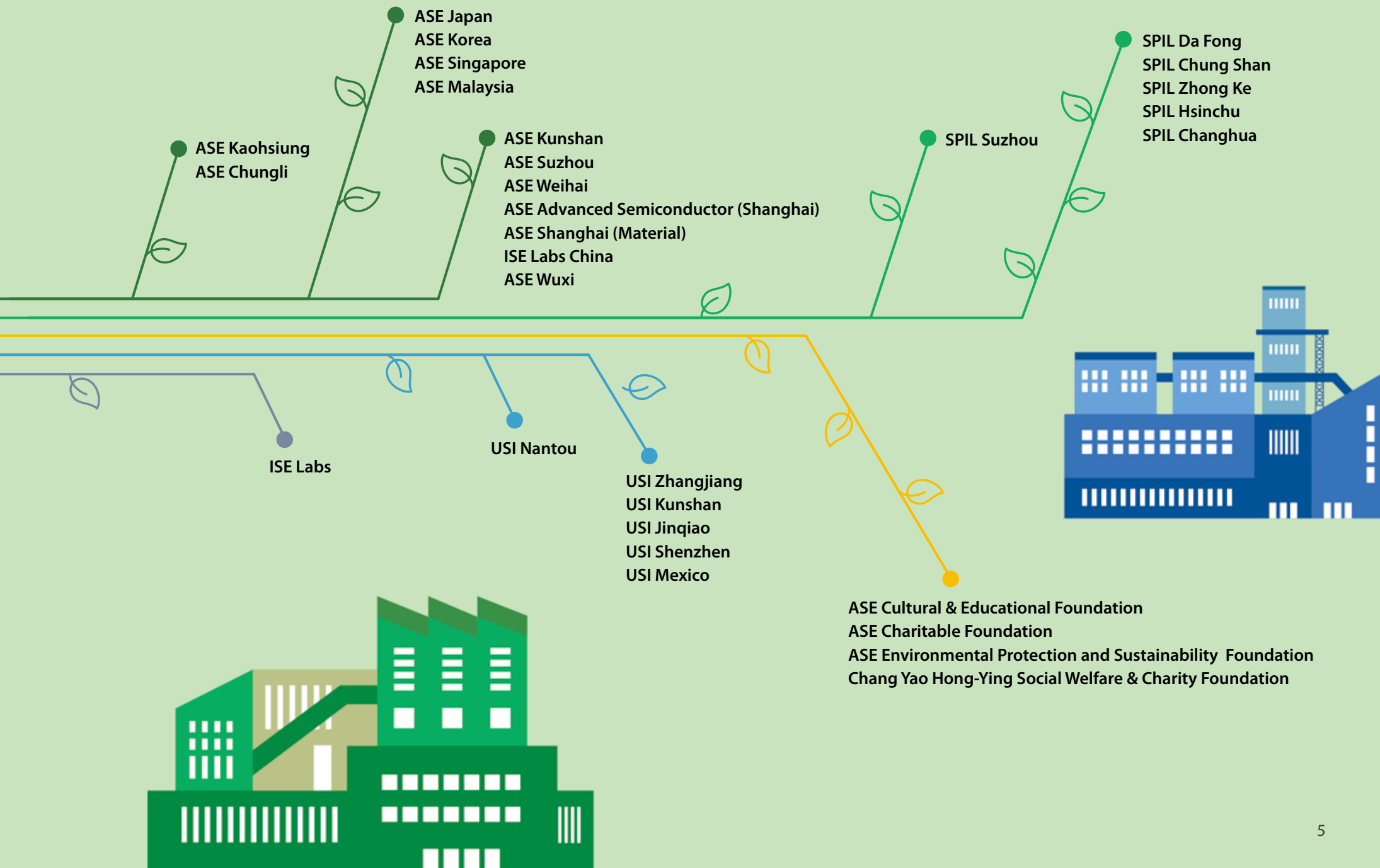
ASE Kaohsiung - Sustainability Report



SPIL - Sustainability Report



USI - ESG Report





External Assurance

In accordance with the ISAE 3000 (Revised), ASEH engaged Deloitte & Touche to perform a limited assurance engagement on this report that reflected disclosures presented in accordance with the GRI Standards for core option, SASB Standards, and Taiwan Stock Exchange Corporation Rules Governing the Preparation and Filing of Sustainability Reports by TWSE Listed Companies.

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:

Certification Facility	ISO 14001 Environmental Management Systems	ISO 50001 Energy Management Systems	ISO 46001 Water Efficiency Management 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 Kunshan	●			●	●	●	
ASE Suzhou	●	●		●	●	●	
ASE Weihai	●			●	●	●	
ASE Wuxi	●			●	●	●	
ASE Advanced Semiconductor (Shanghai)	●			●	●	●	
ASE Shanghai (Material)	●			●	●	●	
ISE Labs China				●			
ASE Japan	●			●	●		
ASE Korea	●			●	●	●	
ASE Singapore	●			●	●	●	
ASE Malaysia	●			●	●		
ISE Labs ²	●			●	N/A		
SPIL Da Fong	●	●		●	●	●	●
SPIL Chung Shan	●	●		●	●	●	●
SPIL Zhong Ke	●	●		●	●	●	●
SPIL Hsinchu	●	●		●	●	●	●
SPIL Changhua	●	●		●	●	●	●
SPIL Suzhou	●	●		●	●	●	
USI Nantou	●	●		●	●	●	●
USI Zhangjiang	●	●		●	●	●	●
USI Kunshan	●	●		●	●	●	●
USI Jinqiao	●	●		●	●	●	●
USI Shenzhen	●	●		●	●	●	●
USI Mexico	●	●		●	●	●	●

¹ OHS Certification includes ISO 45001 or OHSAS 18001.

² QC 080000 is not applicable to ISE Labs as it is not a manufacturing facility.

Leading Change in the World

2016-2021 ASEH has been on the leaderboard of the Semiconductors and Semi Equipment industry on the Dow Jones Sustainability Indices for 6 consecutive years.

Letter from the Chairman

In a world shaped by complex geopolitical, environmental and economic risks, it is important to build a highly resilient organization to manage these challenges. To enhance our industry leadership, ASEH has established a strategic business model based on comprehensive Environmental, Social and Governance (ESG) approaches to guide the company in its sustainable development and business growth. We will also continue to focus on our strengths in technology and innovation to enhance our competitiveness and maintain our growth trajectory.

An Innovation-Driven, Customer-Oriented Culture

We have been accelerating our smart manufacturing capabilities to advance our developments in flip chip, wire-bond and wafer-level packaging, as well as advanced packaging and module technologies. In addition, as a customer-oriented company, it is our mission to provide innovative solutions for sophisticated chip designs that are fueling the growth in 5G, artificial intelligence (AI), Internet of Things (IoT), autonomous vehicles and smart manufacturing applications. The breadth and depth of our technology offerings have contributed to a healthy 19.5% growth in operating revenues in 2021.

The launch of our first lights-out factory in 2016 ushered in the smart manufacturing era at ASEH, and is a catalyst for facilitating Taiwan's digital transformation. In 2020, we launched the world's first 5G smart factory powered by a 5G mmWave network at the ASE Kaohsiung facility. At the same time, we expanded the adoption of industrial artificial intelligence (IAI) platforms through the application of smart AI technologies that improve manufacturing yields and accuracy. We project that by the end of 2022, we will achieve our goal of 37 smart factories.

Green Transition and Climate Solutions

ASEH is committed to energy conservation across its business operations, and advancing the company's transition towards the use of renewable energy sources. To help achieve our low carbon energy transition, we continue to establish smart factories, build smart grids and develop various low carbon projects through a three-prong approach that involves energy conservation, and the use of green energy and energy storage systems. Currently, 65% of ASEH facilities worldwide use energy from renewable sources or through the purchase of REC certificates, of which 13 facilities obtained 100% of their electricity from renewable sources including the purchase of RECs. Our renewable electricity usage recorded an increase of 46% compared to the previous year and accounted for 24% of total energy consumption. We have also executed 316 carbon reduction projects that resulted in a carbon reduction of 781,124 tCO₂e. In the same year, we received the IPMVP (International Performance Measurement and Verification Protocol) energy performance verification, setting a new precedent for the semiconductor industry in Taiwan.

The adoption of the circular economy approach is key to the acceleration of climate transition. With the growth and expansion of our business, we recognize an urgent need to formulate more robust waste management strategies that promote resource optimization. The ASEH team has diligently explored and developed innovative methods to transform waste into useful resources. For example, we were able to create activated carbon from bakelite waste, which can be reused for air pollution control or in wastewater treatment facilities. We have also developed techniques to transform plastic waste strips



Jason C.S. Chang
Chairman



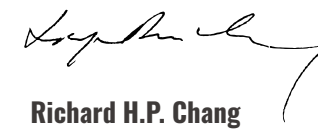
into eco-friendly bricks for the construction industry, where it was recently used to construct the pavements at the ASEH childcare center. Another upcycling methodology involves the repurposing of silicon debris generated during the wafer slicing process. The silicon debris are collected and processed into silicon composites that can be used as heating agents for the steelmaking industry. Our efforts have demonstrated that waste recycling solutions can not only benefit ASEH but can also be applied across other industries. We hope to be able to achieve our goal of complete resource utilization by 2030, and optimal plastic recycling and zero incineration by 2025.

Since 2016, ASEH has been operating the largest water recycling facility in Taiwan that has allowed us to maximize the use of each drop of water by up to 3.12 times. The facility is capable of processing 21,000 tons of waste water daily, and has accumulated a total of 24.88 million tons in water savings equivalent to the volume needed to fill up 9,442 standard-sized swimming pools. Our water use intensity per unit revenue have decreased by 67% from our base in 2015, surpassing the goal of a 1% reduction annually. We are also tapping on scientific data from the World Resources Institute (WRI) to conduct climate risk assessments at our facilities worldwide, and developing robust water risk management strategies that will help us address climate challenges in the next decade and beyond.

We have also established a target to reduce emissions for Scope 1 and Scope 2 by the year 2030 in line with the corporate target of 'well below 2°C'. These targets are validated by the Science Based Targets Initiative (SBTi), an organization that helps companies reduce

CDP A List

The only company from Taiwan to be listed five times on the CDP Climate A List.
The only semiconductor company from Taiwan to be listed simultaneously on the CDP A list for Climate and Water Security.

Richard H.P. Chang
Vice Chairman and President

their emissions based on climate science. In 2022, we will release our first TCFD report that documents our approach on the governance of climate-related risks, strategy for identifying climate-related risks and opportunities, risk management, and metrics and targets.

Diversity and Organizational Resilience through Partnerships

ASEH is a people-oriented company that values diversity and respects individual differences. More than 6,300 of female employees are in STEM positions, accounting for 17.6% 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 27%. We will continue to promote the empowering of women in technology and have set a target of increasing the proportion of women in senior management positions to 15%.

In 2021, we redesigned our employee engagement survey to include focus on sustainability engagement, and administered it to more than 80,000 employees across the globe. The feedback and opinion expressed through the survey allow the company to calibrate management policies and make improvements at the work place. As part of the company's digital transformation, we are applying big data analytics to understand the dynamics affecting turnover, productivity and long term human resource planning, that will in turn raise the value of our human capital.

The supply chain is a critical extension of ASEH's value chain, and the strong partnership we form with our suppliers are integral to achieving

a sustainable future. Each year in March, we present the Supplier Sustainability and Technology Development Award to outstanding suppliers who were selected for their innovative project plans amongst 130 to 200 submissions from our supply chain. We promulgated a new incentive program in 2020 to encourage suppliers to propose collaborative projects that are focused on low carbon and circularity. Following that, in 2021, we launched another initiative to guide our suppliers in the management of carbon inventory and establishment of emission reduction pathways. We are constantly refining our approaches to build a sustainable supply chain that promotes value creation and accelerates green transformation.

Social Value and the Power to Make a Difference

Upon the establishment of the ASE Environmental Protection and Sustainability Foundation in 2020, the company began planning in 2021 for the launch of the ASE Social Enterprise Co., Ltd. with an investment of NTD250 million. The social enterprise was set up as a channel for ASE to apply innovative business models that maximize benefits to society. The social enterprise intends to play an active role in developing eco-industrial parks, exploring creative recycling and upcycling techniques to promote circularity, and setting up an adult daycare center for our employees' family members.

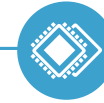
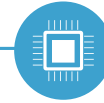
Educating today's youths on the future of our planet remain high on our climate agenda. An interesting project that we have successfully executed was a collaboration with the Ming Chuan University to set up an aquaponic farm at Da-Gang Elementary School, that promotes sustainable food production and demonstrates our commitment

towards a water positive goal. We are also actively engaging universities and research institutions in Taiwan where we are driving 10 collaborative projects on environmental technology research and development. Viable solutions that resulted from these projects were shared with 26 other industry peers, helping them to improve their efficiency in eco-manufacturing and energy transition.

Investing in engineering resources is crucial in an industry that depends highly on innovation. To date, we have invested a total of NTS 69.3 million to develop more STEM talent including NTS7.6 million in scholarships, 224 internships and support for the master's degree course in semiconductor technology where 862 students have signed up.

Looking Ahead

For the sixth consecutive year, we have remained on the leaderboard of the Dow Jones Sustainability Indices – Semiconductors and Semiconductor Equipment, a global benchmark on sustainability excellence. While this was a remarkable achievement, we view participation in these global frameworks as an impetus for us to set higher standards for our ESG performance year on year. We will continue to develop innovative packaging solutions and expand the heterogeneous integration platform for diverse applications and to help address the impact of climate change together with our customers. At ASEH, we believe that we can lead the change through a strategy that is grounded by a culture of innovation, and a strong commitment to green transformation, partnerships and social value.



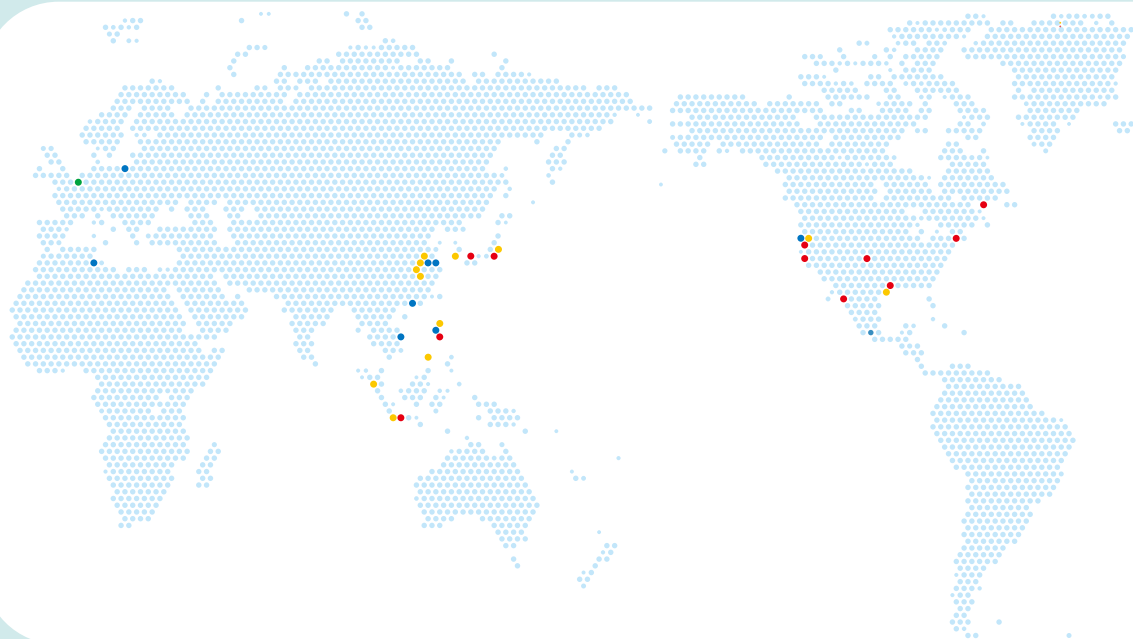
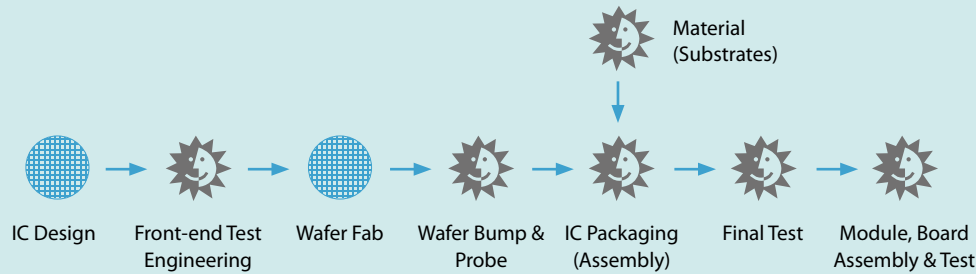
OPERATING MODEL

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 <https://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, Malaysia, Singapore, Vietnam, Mexico, U.S.A., Tunisia and European countries. ASEH has a worldwide headcount of over 95,000 employees (as of December 2021).

- 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.

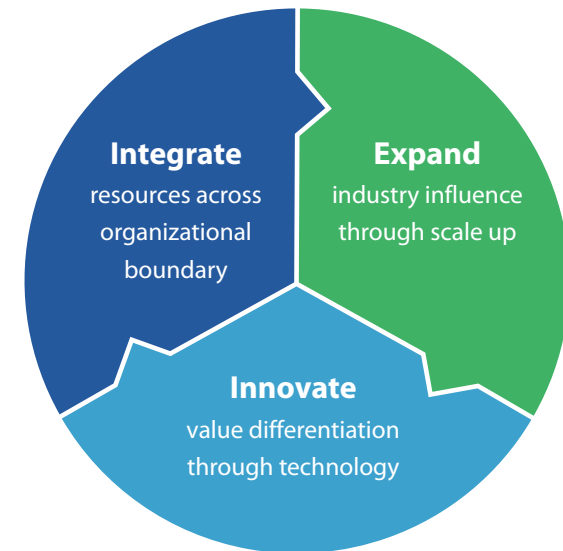
ASEH adheres to the highest corporate governance standards and transforms business philosophies into sustainable actions. As a major player of the global semiconductor chain, we carefully strategize according to industry development and trends, and seek talent and resources worldwide. We form strategic 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.



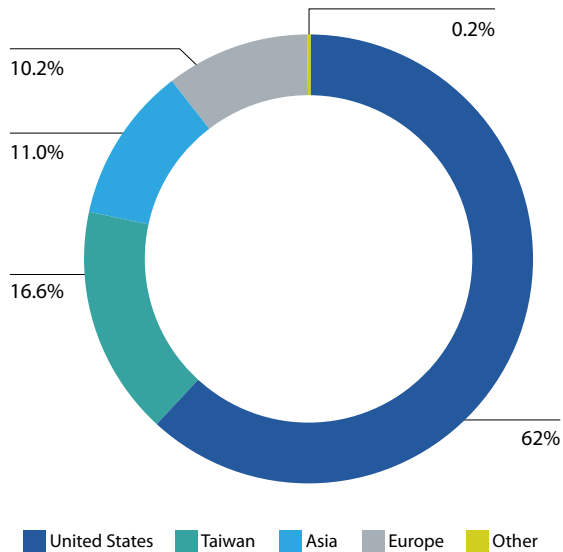
1.3 Financial Performance¹

The Group's consolidated revenue in 2021 amounted to NT\$570 billion (including NT\$322.5 billion in semiconductor assembly and testing business, NT\$239.5 billion in Electronic Manufacturing Services (EMS) and others NT\$8 billion), an increase of approximately NT\$93 billion over 2020, with an annual growth of 19.5%. We've achieved the highest record than ever for the past year. For our semiconductor packaging and testing businesses, the consolidated revenue in 2021 increased NT\$56.6 billion over 2020, with an annual growth of 21.3% (excluding substrate and semiconductor manufacturing, sale and leasing of real estate properties as well as inter-segment revenue). In addition, for our EMS business, the consolidated revenue in 2021 increased approximately NT\$34.8 billion over 2020, with an annual growth of about 17%. The overall financial data have grown significantly compared with that in 2020.

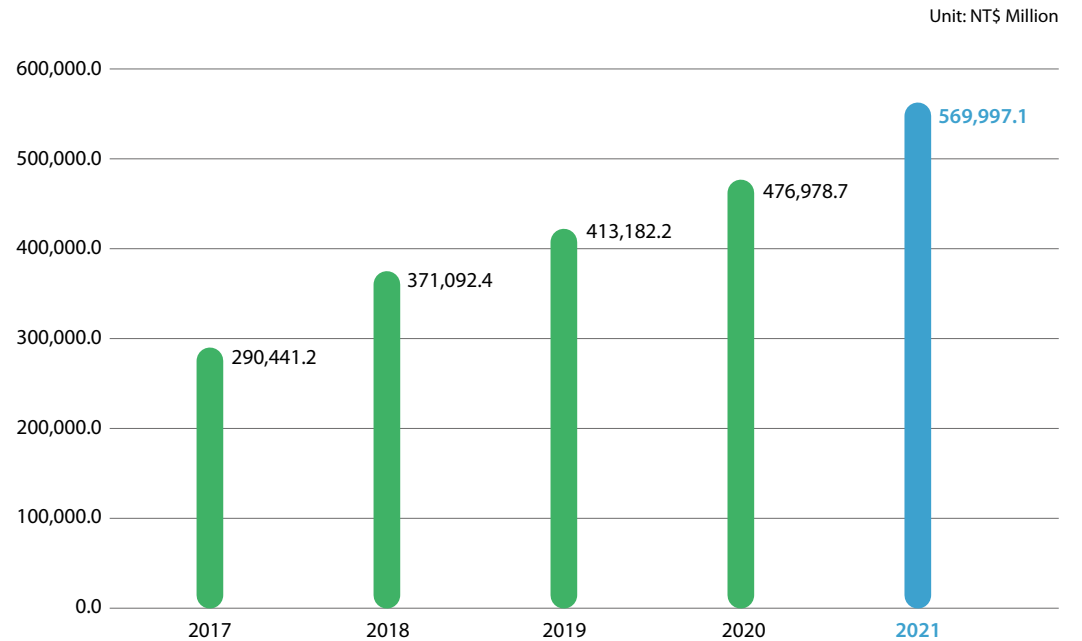
¹ For further details on financial performance, please refer to our consolidated financial report: https://ir.aseglobal.com/html/ir_financial.php

2021 Revenue

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



Annual Operating Revenue





SUSTAINABLE GOVERNANCE

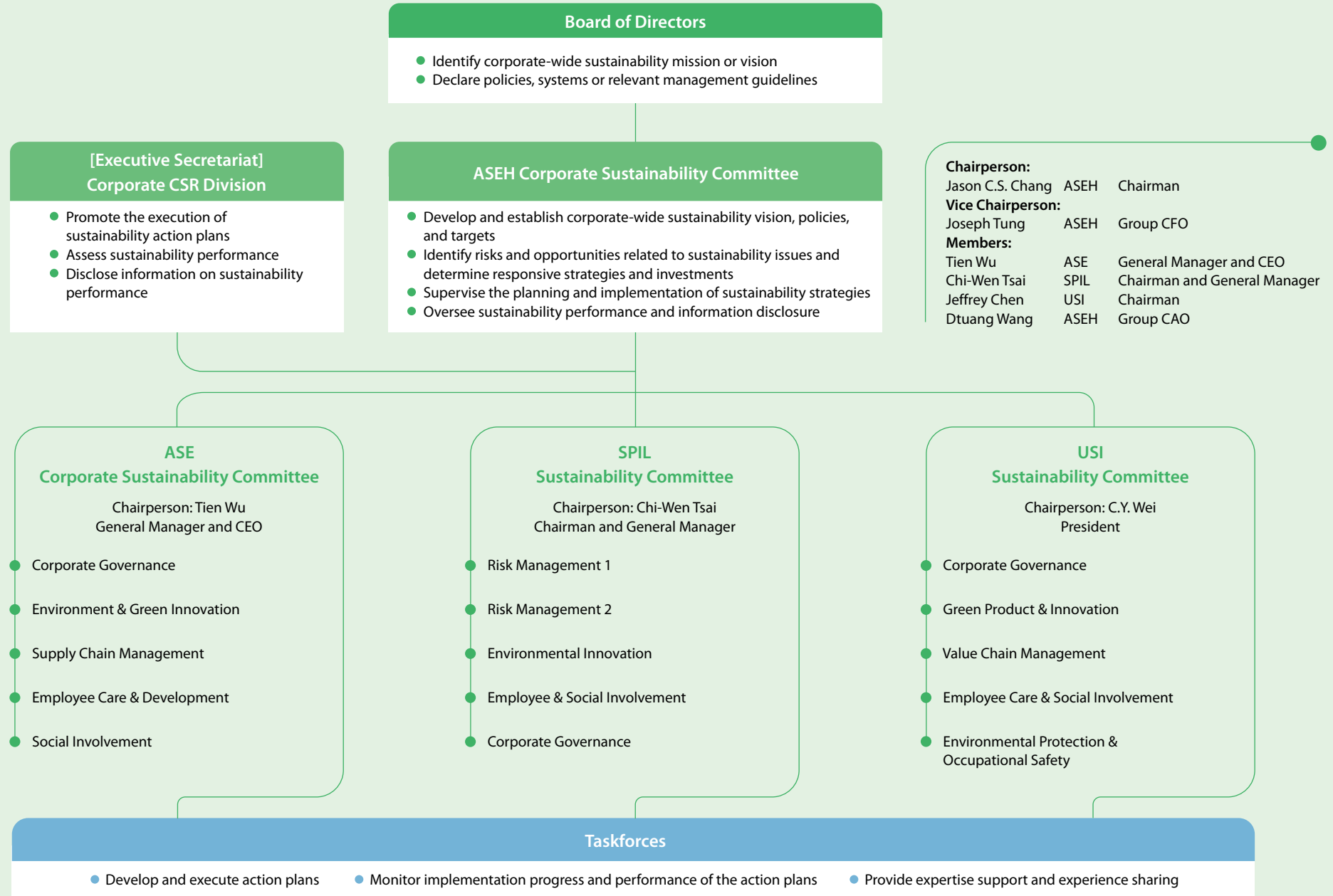
2.1 Organization and Structure

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 2021 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.





2021 Key Sustainability Projects

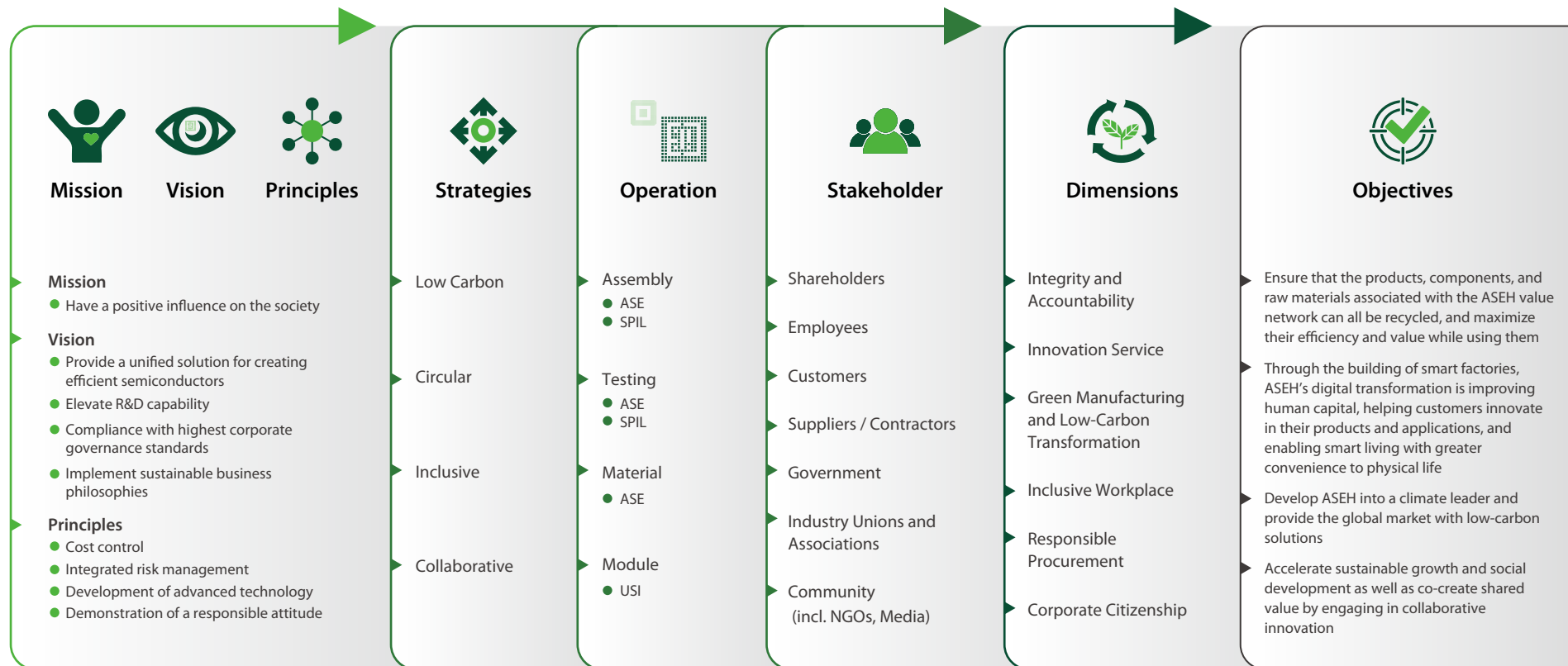
Dimensions	2021 Key Projects	Partners	Positive Changes
Environmental	Net Zero Action Plan	<ul style="list-style-type: none"> External Consultants 	<ul style="list-style-type: none"> Structural Transformation of Energy and Lower Operational Risks Mitigation of Extreme Climate Change
	TCFD Report	<ul style="list-style-type: none"> External Consultants 	<ul style="list-style-type: none"> Strengthening Global Climate Risk Management Responding to Stakeholders' Concerns
	Water Risk Analysis of Facilities Worldwide	<ul style="list-style-type: none"> External Consultants 	<ul style="list-style-type: none"> The Integration of Scientific Analysis in Risk Management 100% Effective Oversight of Water Risks at Our Facilities Worldwide
	Circular Economy within Our Value Chain	<ul style="list-style-type: none"> Academic and Research Institutions Suppliers 	<ul style="list-style-type: none"> Increasing the Circular of Energy Resource and the Eco-Efficiency
	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 ASE Social Enterprise Co., Ltd.	<ul style="list-style-type: none"> External Consultants 	<ul style="list-style-type: none"> Developing an Innovative Model for Corporate Sustainability
	School-based Aquaponics Farming Program	<ul style="list-style-type: none"> External Professional Institutions Academic and Research Institutions 	<ul style="list-style-type: none"> Promoting Education on Sustainable Food Production and Farming Development of Local Communities
	Assistance Program for Disadvantaged Students	<ul style="list-style-type: none"> Academic and Research Institutions 	<ul style="list-style-type: none"> Improving Learning Environment Increasing the Willingness of and Opportunities for Disadvantaged Students to Learn
	Key Talent Retention Management Mechanism	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Strengthening Employee Recruitment and Retention
	Employee Engagement Survey	<ul style="list-style-type: none"> External Consultants 	<ul style="list-style-type: none"> Strengthening Talent Retention and Talent Development Increasing Employees' Level of Organizational Identification and Compatibility with the Company
Governance	Human Rights Strategies and Risk Assessment	<ul style="list-style-type: none"> External Consultants 	<ul style="list-style-type: none"> Fortifying Human Rights Management
	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
	Supplier Guidance on Carbon Inventory	<ul style="list-style-type: none"> External Consultants Auditing Organizations Suppliers 	<ul style="list-style-type: none"> Developing Supplier Capabilities to Perform Carbon Inventory
	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 Sustainable Development 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

Sustainable Development Best Practice Principles
Corporate Sustainability and Citizenship Policy



Enriching and Promoting Sustainable Culture

Sustainability is integral to corporate culture and drives broad transformation in companies. At ASEH, we continue to rigorously fulfil our corporate social responsibilities in tandem with maintaining our competitive edge. We have developed a diverse range of programs to ensure that sustainability is firmly ensconced at the core of ASEH's corporate DNA. To that end, we aim to extend the culture from our employees to external stakeholders, further demonstrating the company's intangible value. Our resolute focus on surpassing ourselves and giving back to society have allowed us to achieve corporate social responsibility and build an inclusive society. Together with the integration of resources from all disciplines, the company is on track to creating positive social impacts.

2021 Activities to Cultivate Sustainable Culture at ASEH

Dimensions	Activities	Impact of Cultivating Culture
Environmental	ASEH actively engages with government agencies, academic communities and non-profit organizations on carbon reduction topics. As a member of the Taiwan Alliance for Net Zero Emission (founded by Taiwan Institute of Sustainable Energy, TAISE), we are a signatory to the alliance's Net Zero X 2030/2050 initiative to exert a global influence and build a resilient, transformative and thriving semiconductor supply chain. ASEH continues to analyze the consolidated Scopes 1, 2, and 3 GHG emission inventories from all our facilities to initiate carbon reduction actions. We are also focusing on Scope 3 emission hot spots in areas where we procure goods and services as well as upstream transportation and distribution.	<ul style="list-style-type: none"> • Extending the Influence of Net Zero Initiative • Driving Low-carbon Transformation across the Supply Chain • Driving Low-carbon Manufacturing through Innovation
Social	ASEH collaborates with colleges and universities to build aquaponics farms in elementary schools. Aquaponics farms adopt environmentally friendly food production and farming techniques that reduce demand for land by 83% and use 99% less water when compared with traditional farming methods. Free from chemical fertilizers and pesticides, aquaponics systems do not harm the soil environment and are therefore water positive efforts. Aquaponics farms can tap on renewable energy from solar panels and energy storage systems, thus conserving energy and reducing carbon emissions. Compared with traditional farming, aquaponics farming contributes to an annual reduction of 80% of carbon emissions. Aquaponics is a sustainable approach for communities to fulfill their sustainability commitments and is an effective channel for ASEH to promulgate environmental education to the general public.	<ul style="list-style-type: none"> • Elevating Environmental Literacy • Reducing Use of Natural Resources • Mitigating the Impact of Global Warming
Economic	Supplier sustainability meetings are convened at our major operating locations. We have established the ASEH Supplier Sustainability Awards to recognize suppliers with excellent SDG performance, and cooperate with them to raise their sustainability development standards and fortify our partnerships. We designed "Low Carbon" and "Circular" environmental programs that are well-funded, in order to strengthen the bond between ASEH and its supply partners in support of a circular economy and carbon reduction goals.	<ul style="list-style-type: none"> • Encouraging Suppliers to Boost Their Sustainability Performance • Building a Circular Industry Chain • Reducing Social Cost of Carbon



ASE CSC Annual Meeting



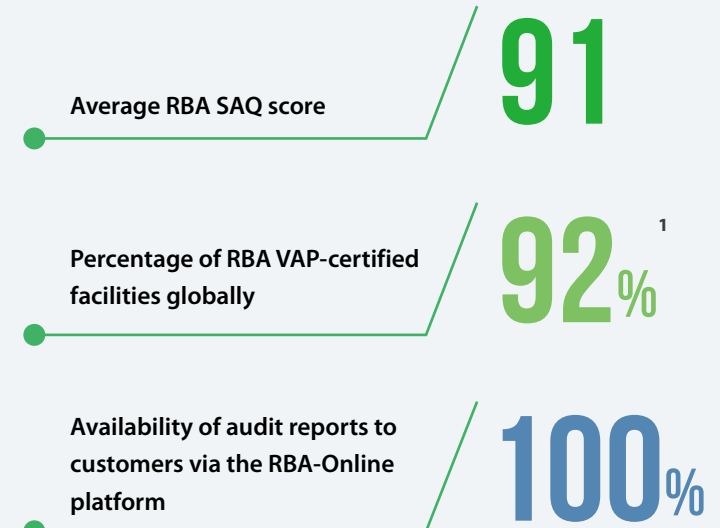
ASE CSC Annual Meeting



USI Sustainability Committee Annual Meeting and Forum

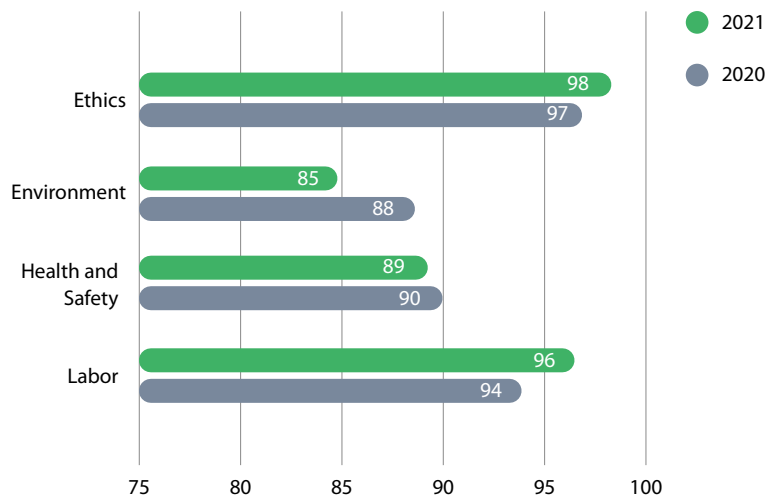
As a global leader in semiconductor packaging and testing, and system integration, ASEH is committed to environmental protection and compliance to the highest ethical standards. We shall maintain a safe working environment that ensures respect and dignity for all employees at the company and along the 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 Questionnaire (SAQ) in order to identify any potential labor, environmental or ethical risks in their operations. In parallel, ASEH adopted the RBA Validated Audit 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 2021, 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 91 and above. The adoption of RBA standards at all our facilities is a key driving force for promoting sustainability management.

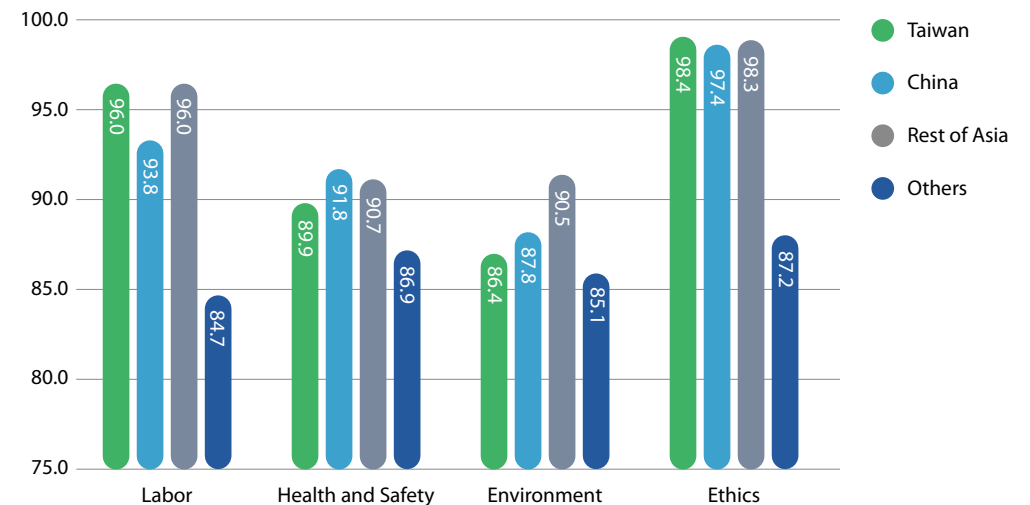


¹ ASE Shanghai (Material) and ISE Labs China do not complete RBA VAP.

Average SAQ scores (by category)

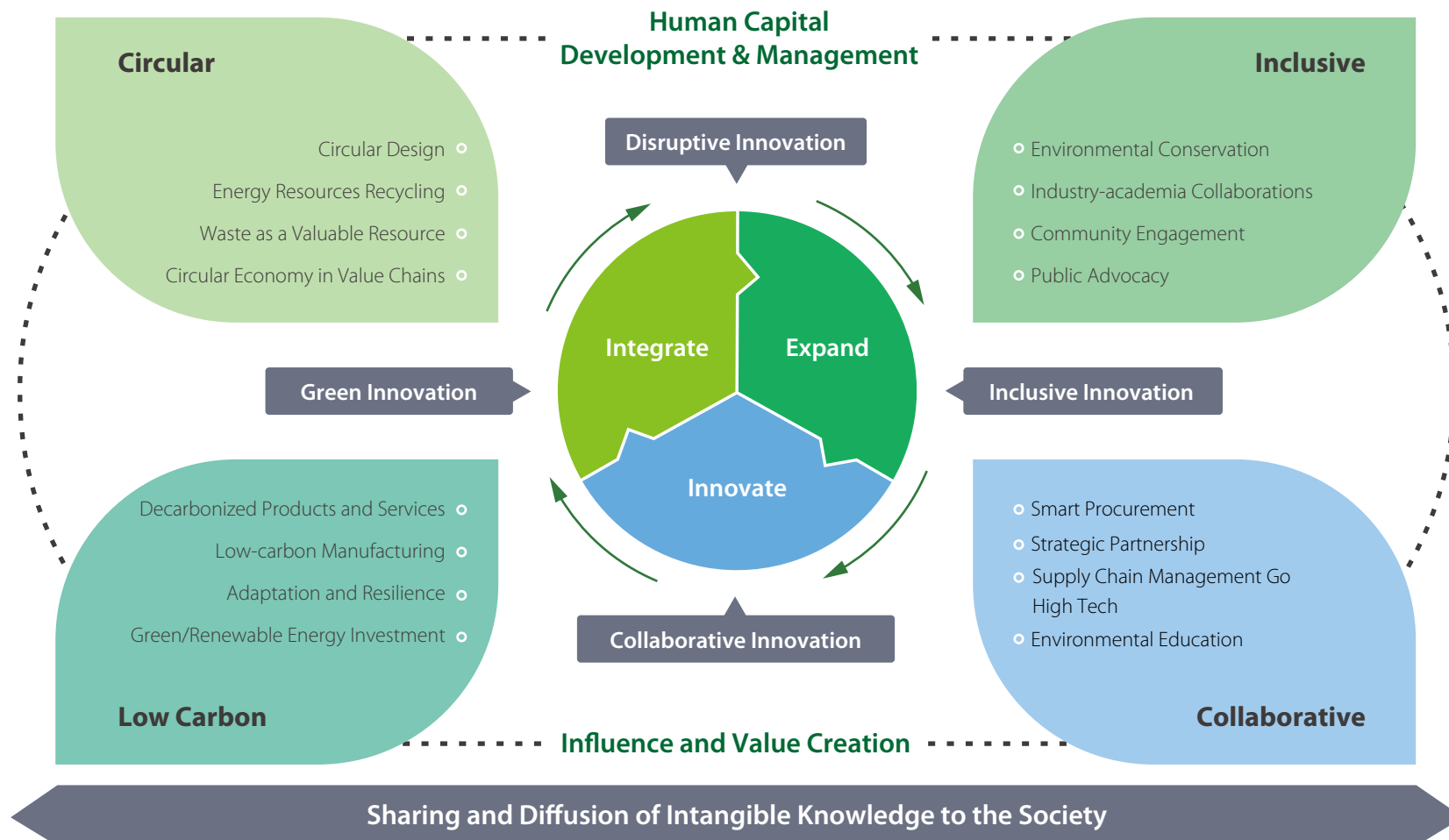


Average SAQ scores in 2021 (by region)



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 2021, we established our long-term sustainability targets for 2030 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



Dimensions	Key Issues	Business Impact on ASEH	Strategic Approach	2030 Target	Progress/ Status
	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 	
Integrity and Accountability	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 Scope of product Life Cycle Assessment (LCA): 50% 	
	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.



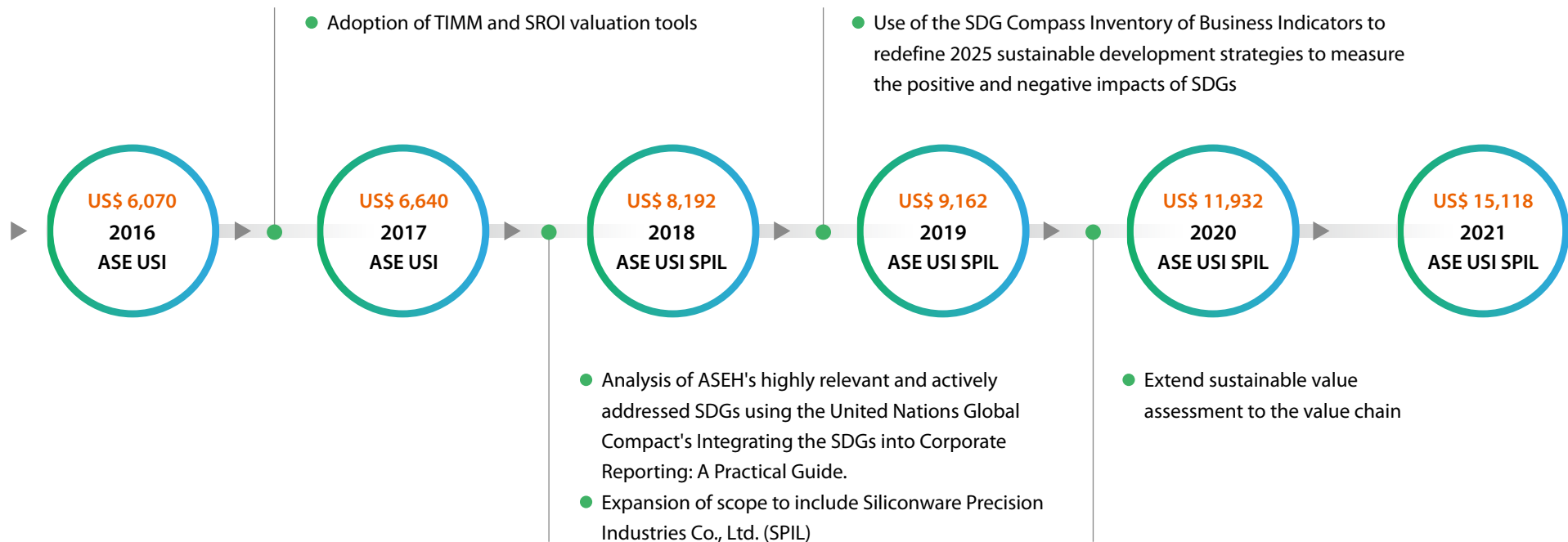
Dimensions	Key Issues	Business Impact on ASEH	Strategic Approach	2030 Target	Progress/ Status
	Energy Management	Use of low carbon and diverse energy sources and smart energy management will increase energy efficiency, reduce GHG emissions, and lower operational risks.	<ul style="list-style-type: none"> • Increase the use of clean/renewable energy. • Continue to improve energy management: Establish standardized management systems through ISO 50001 to improve energy efficiency, 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 42% of total energy consumption. 	
Green Manufacturing and Low-carbon Transformation	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.	<p>Reduce GHG emissions & provide green manufacturing services: Set up ASEH water management objective and strategy based upon integrated circular thinking.</p>	<ul style="list-style-type: none"> • GHG emissions inventory coverage of the manufacturing facilities: 100% • GHG intensity (GHG emissions per revenue): achieve 15% reduction compared with 2015. • Absolute GHG emissions reduction target: Reduce Scopes 1 and 2 emissions by 35% with 2016 as baseline and Scope 3 emission by 15% with 2020 as baseline. • 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.	<p>Establish sustainable water recycling system: Set up ASEH water management objective and strategy based upon integrated circular thinking.</p>	<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 15% reduction compared with 2015. 	
	Waste and Circular	Improving material utilization rate to reduce waste production and lessen the environmental impact of the company's operations.	<p>Enhancing source reduction in waste management: Identify recyclable raw materials and moving towards minimizing waste through a circular model.</p>	<ul style="list-style-type: none"> • General waste recycling rate: > 90% • Hazardous waste intensity (hazardous waste generated per revenue): achieve 15% reduction compared with 2015. 	

Dimensions	Key Issues	Business Impact on ASEH	Strategic Approach	2030 Target	Progress/ Status
Inclusive Workplace	Talent Attraction and Retention	Positive labor relations can promote organizational harmony, increase employee identification with the company, support the company's global competitiveness, and maintain its competitive advantages.	Implement employee engagement survey and feedback mechanisms: Encourage employees to be proactive in company activities, understand employees' opinions by using employee engagement surveys, 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"> Result of employee engagement survey: >85% Employee coverage: >95% Overall turnover rate: <20% 	
	Talent Development	Good training and development programs help attract and retain talents, and create a pleasant working environment, thereby increasing corporate productivity and innovation, and supporting the company's requirements and capabilities for long-term business growth.	Enhance talent development and training effectiveness: Provide challenging and valuable career development opportunities for employees by offering better training plans and promotion opportunities within the company.	<ul style="list-style-type: none"> Percentage of management vacancies filled through internal promotion: >75% 	
	Diversity and Inclusion	Establishing a diversified, equal, inclusive, and friendly workplace that respects the differences and uniqueness of employees to generate positive impacts on the company's operations.	Building a diversified and open workplace: Promoting long-term plans for training and cultivating female managers and enhancing the technology competence of female employees as well as their knowledge in science, technology, engineering, and mathematics (STEM). Establishing a diversified, equal, inclusive, and friendly workplace that respects employees' uniqueness and differences.	<ul style="list-style-type: none"> Female employee in top management positions:15% 	
	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 the physical and mental health of employees by shaping a corporate safety culture where the safety and health of all employees are safeguarded.	<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 150 industry-academia collaboration projects on environmental technology. Organizing semiconductor courses for 2,000+ students. Over 2,000 disadvantaged students attending the after school program. Offering financial aid to 95,000+ school children from underprivileged families. Advocating 25+ semiconductor industry-related regulatory initiatives. 	

2.3 UN Sustainable Development Goals and Sustainable Values Assessment

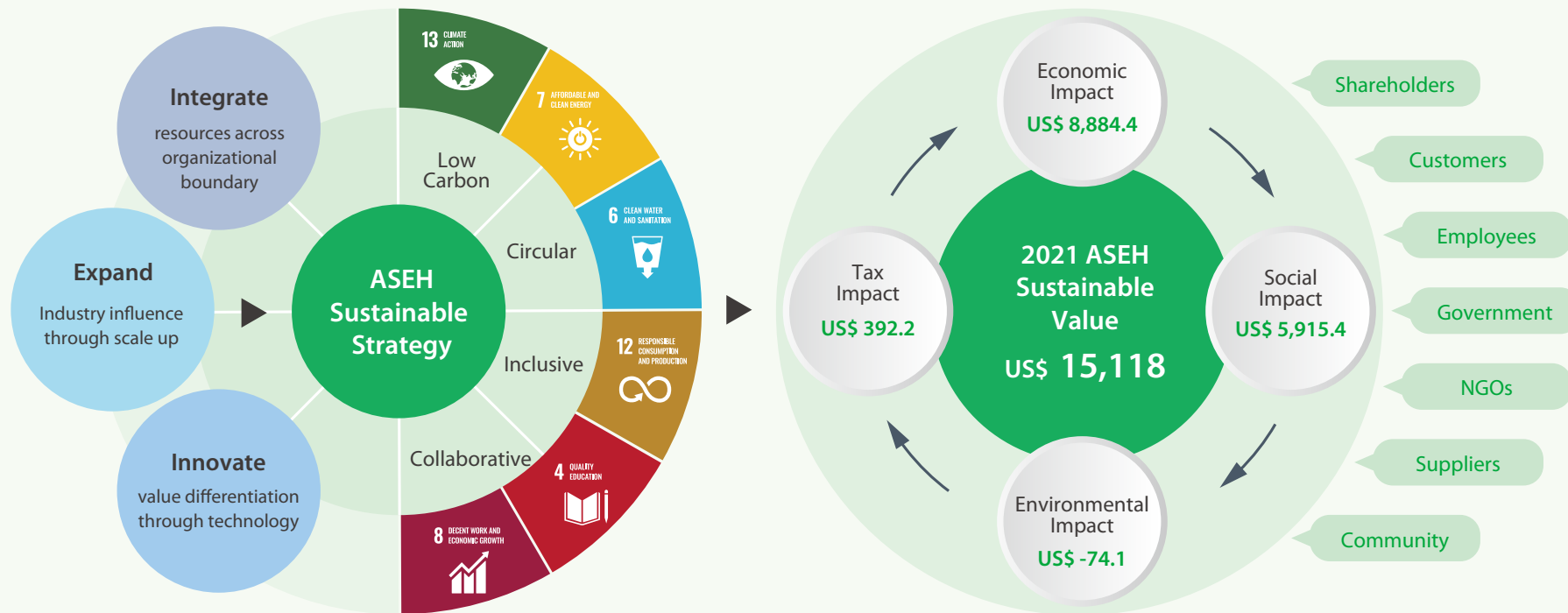
ASEH is building upon its technology leadership to steer the semiconductor industry towards greater sustainability. Since 2017, we have adopted the Total Impact Measurement and Management (TIMM) framework and Social Return on Investment (SROI) analysis to assess the social impacts and operational risks 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 2021, we continuously 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

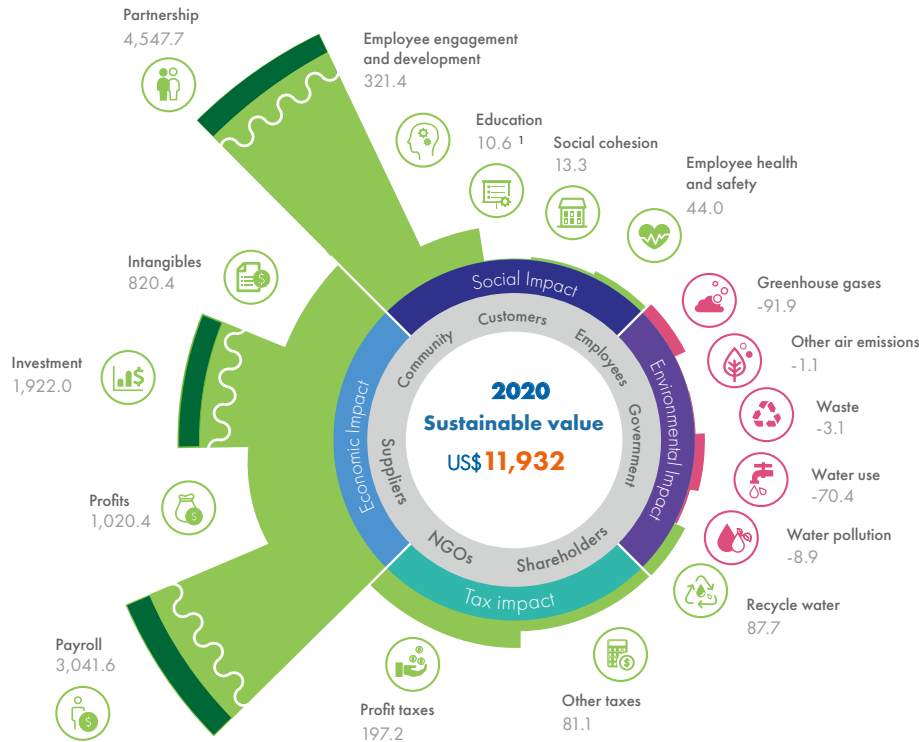
ASEH Valuation Model



Unit: US\$ million

Contributions to Global SDGs

We adopted sustainability management measures for prioritized SDGs to generate more positive impacts and contributions. In 2021, 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, therefore, can result in positive impact on the SDGs of decent work and economic growth, quality education and responsible consumption and production in terms of sustainable management. Demands on environmental resources in our business operations can result in negative impacts on the SDGs of affordable and clean energy, climate action, and clean water and sanitation. We have therefore committed ourselves to mitigating these impacts by focusing on sustainability programs through our Low Carbon and Circular strategies. In 2021, we are refining our goals for 2030 based on our four major sustainability strategies, so as to fulfill our commitment toward realizing these SDGs.



Unit: US\$ million



Unit: US\$ million

¹ Vocational education and training in 2020 will be quantified using the same transfer reference report as in 2021.

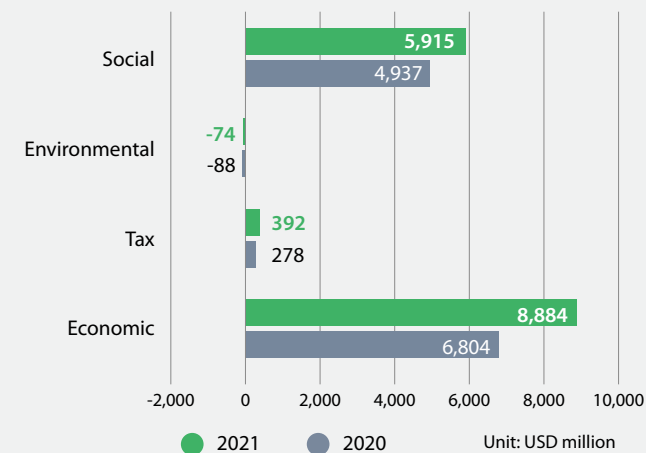
Sustainability Value and Impacts

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 2021, ASEH generated US\$15,118 million worth of sustainable value for stakeholders, which is 27% higher than in 2020. The sustainable value of positive impacts increased by US\$3,232 million.

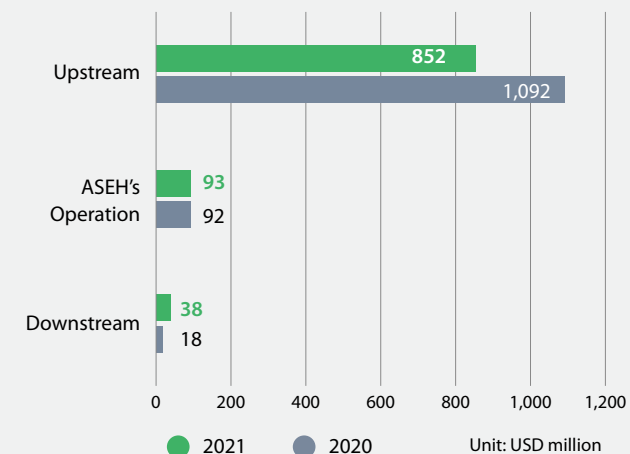
Economic and tax dimensions: 2021 was a watershed year in the semiconductor industry, creating invaluable applications that power the digital transformation. While the pandemic has caused much disruptions on one spectrum, it has also created new demands for 5G, IoT, electric vehicle and other applications that has led to a strong growth in global IC sales. The successive recovery of the world's major economies boosted the export performance of Taiwan, and contributed to significant revenue growth and profitability at ASEH's operations. The growth in revenues have brought about an increase in employee remuneration, and also the number of employees converting their stock options. In the same year, the strategic disposal of a subsidiary business operation resulted in an increase in non-operating revenue and tax payments. In order to capture future business opportunities and increase the value of our products and services, we continue to purchase capital equipment, expand our plants to build capacity, invest in the R&D of new technologies and acquire more patents. We will remain focused on strengthening our core competitiveness and optimizing the synergy of all entities within ASEH. For the year 2021, we recorded an increase in our value creation by 31%.

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 24% of the total electricity consumption in 2021. 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 2021, the positive effects created from recycled water usage grew by 68%, while the overall environmental impact of our operations decreased by 16% compared to 2020. 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.

2020-2021 ASEH Sustainable Values



2020-2021 Greenhouse Gas Value Chain Outcomes



Social dimension: The primary outcomes are the establishment of supplier partnerships, and employee development and support. The value of social impacts in 2021 increased by 20% compared to 2020. The difference in value stemmed from an increase in local procurement by 21% in 2021, which increased the assessed value of local employment and economic prosperity. The total resources invested in community and education rose by 49% and 35% respectively in 2021 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.

Environmental Impact

In 2021, ASEH's overall environmental impact of US\$-74 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 2020, the monetized value of the environment negative impact of our operations decreased by 16% in 2021. In particular, the positive impact of water recycling increased significantly. Meanwhile, emissions of greenhouse gasses, air pollution, and water resource consumption all increased slightly, while water pollution remained the significant source of environmental impacts. For this reason, we continued to increase our renewable energy 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 and circularity. This year, we applied the sustainable value assessment method used internally to the value chain. In 2021, the monetized value of the environmental impact of our greenhouse gas emissions amounted to US\$-890 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 2021 ¹

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 2021, overall capacity demand increased 21%, and our manufacturing operations are spread across 8 regions including Taiwan, China, Korea, Japan, Singapore, Malaysia, United States and Mexico. The energy resource demands for our manufacturing operations are as follows:

Resource Demand	2020	2021	
Water resource consumption (megaliters)	24,961	25,872	↗
Non-renewable energy (MWh)	3,194,810	3,255,018	↗
Renewable energy (MWh)	706,105	1,030,137	↗
Resource circulation investments (US\$ million)	33.2	46.7	↗

Notes : ↘ decrease ↗ increase

¹ For more information on ASEH's sustainable values, please refer to ASEH's Total Impact Measurement and Management Report 2021.

Output

Our operational coverage continued to expand in 2021 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 environmental impact of our operations is as follows:

Impact Items		2020	2021	
Greenhouse gas emissions	Scope 1 emissions (tCO ₂ e)	93,996	90,591	↘
	Scope 2 emissions (tCO ₂ e)	1,658,606	1,612,049	↘
	Scope 3 emissions (tCO ₂ e)	21,179,759	16,231,394	↘
Air pollutant emissions	Volatile organic compound, sulfur oxide, nitrogen oxide and particulate matter emissions (tons)	279	329	↗
Waste disposal	Hazardous waste disposal (tons)	10,887	10,305	↘
	Non-hazardous waste disposal (tons)	2,884	2,762	↘
Wastewater discharge ¹	Wastewater discharge (megaliters)	19,454	19,569	↗

¹ 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\$ million

Environmental Impact		2020	2021	
Greenhouse gas emissions	ASEH operations	-91.9	-93.5	↗
	Products and services	-1,110.2	-890.0	↘
Air pollution		-1.1	-1.4	↗
Waste		-3.1	-3.1	↘
Water resource consumption		-70.4	-76.4	↗
Water pollution		-8.9	-47.3	↗
Water recycling		87.7	147.6	↗

ASEH's overall environmental impact totaled US\$-74 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\$148 million, which is 68% higher than that of 2020. 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 37,817 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\$222 million, an increase of 26% compared to 2020, 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 46% increase in renewable energy or REC purchases compared to 2020, which resulted in a positive contribution of US\$39 million.
- The monetized value of the indirect environmental impact of value chain greenhouse gas emissions amounted to US\$-890 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 and contractor health and safety, and education and community cohesion. In 2021, ASEH's overall social impact totaled US\$5,915 million, with US\$5,887 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 2021

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 125 raw materials suppliers² • Procurement of 49% 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\$2.5 million in employee health checkups • Investment of approximately US\$1 million in industry-academia occupational training 	<p>Supplier partnerships:</p> <ul style="list-style-type: none"> • Supplier audit results showed that 31% were related to management systems, 26% of nonconformities were related to occupational health and safety, 18% were related to labor, 17% were related to environment, and 8% were related to ethics • A total of 600 attendees 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 79% with a response rate of 96% <p>Employee and contractor health and safety:</p> <ul style="list-style-type: none"> • 126 occupational injuries and 3 occupational diseases to employees and contractors • 52,168 employees participated in health checkups <p>Education:</p> <ul style="list-style-type: none"> • Conducted a total of 41 industry-academia projects on innovative semiconductor research and development 	<p>Social impact resulting directly from operations totaled US\$5,887 million.</p> <p>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\$5,520 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 sense of achievement, belonging in the workforce, psychological health, managerial ability, and cohesion of employees. Based on the degree of these outcomes, it was estimated that the social value generated was US\$315 million. • Employee and contractor 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\$46 million. Negative impacts included harm to employees' and contractors physical, mental, and spiritual well-being to occupational injury incidents, which were assessed at a negative value US\$0.5 million. • Education: We used the value transfer method to assess the social value of industry academia occupational training related to business activities, which totaled US\$6 million. The major outcome was that industry-academia cooperation will give talented graduates the opportunity to work at ASEH and also bring new talent into ASEH to improve the competitiveness of our talent pool.
<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\$5 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\$0.9 million in other education 	<ul style="list-style-type: none"> • A total of 140 outputs in social cohesion activities, including 26 in public development, 58 in community care, 32 in care for disadvantaged families, 5 in healthcare sponsorships, 14 in arts and culture sponsorships, 2 in sports sponsorships, and 3 in reforestation • A total of 54 outputs in education, including 30 in environmental education and 24 in occupational education 	<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\$20 million. Of these activities, care for disadvantaged families accounted for the largest percentage at 54%, and arts and culture sponsorships accounts for 20%. The third is the care for community, which accounts for 12%. The three major outcomes were as follows: increased self-identity of disadvantaged children, enhanced learning performance of disadvantaged children, and improvement in public knowledge about art, which improved the well-being of neighboring residents and the general public on the whole. • We used the value transfer method to assess the social value of environmental education, which was estimated to be US\$8 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 (Sustainable Supply Chain Management)

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

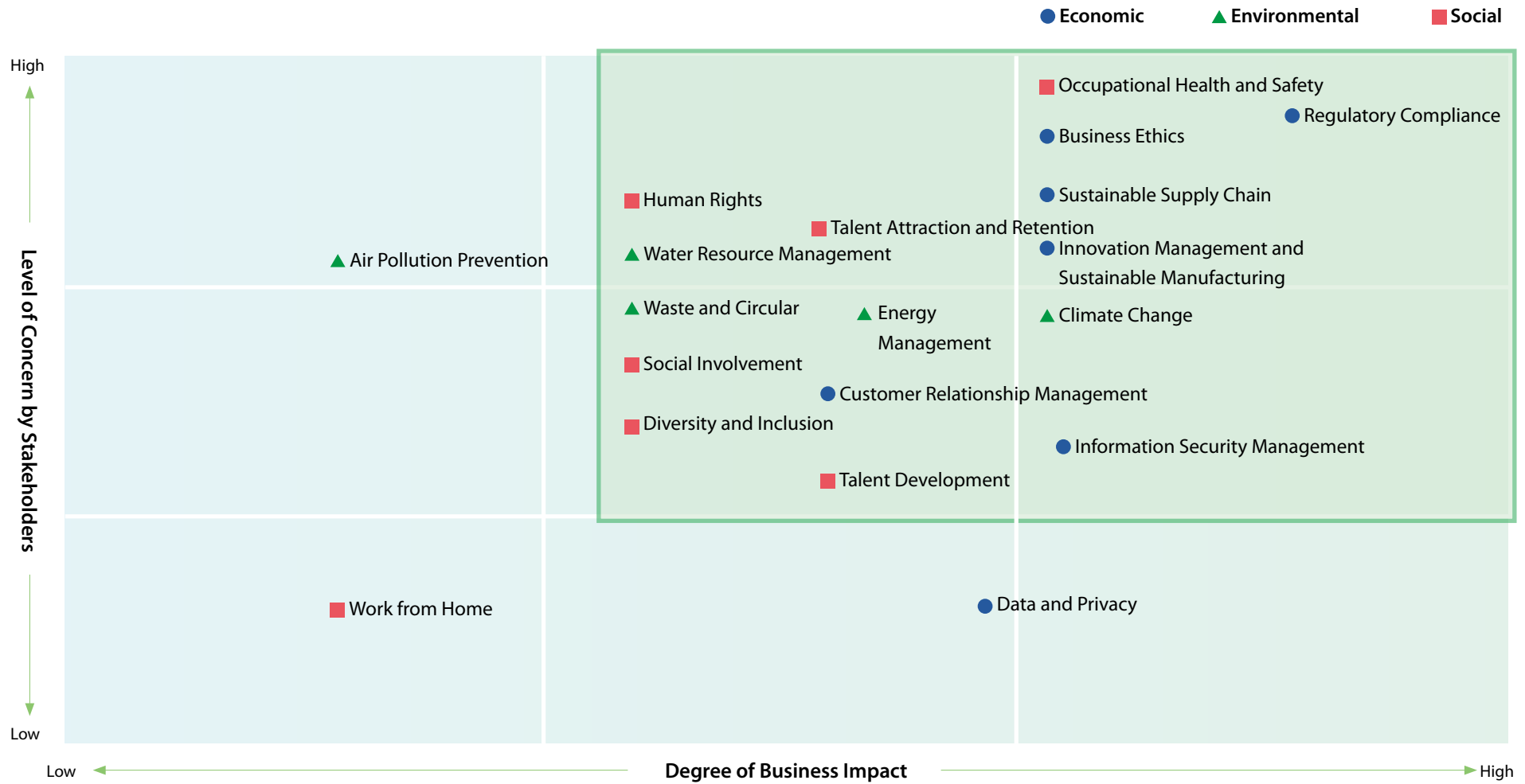
2.4 Materiality Assessment and Stakeholder Communication

Materiality Assessment

To ensure effectiveness in communicating the company's sustainability information disclosures, ASEH has adopted the GRI Standards, AA 1000 Stakeholder Engagement Standard (SES) and AA1000 AccountAbility Principles as the benchmark for developing the materiality analyses framework, and identifying 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 2021 ESG Report, we collected the feedback of 2,638 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 189 members) in identifying the importance of each sustainability issue with regard to our company operations. We selected 16 major issues to be prioritized in driving corporate sustainability and setting long-term sustainability targets.

Step 1 : Inclusiveness	Step 2 : Materiality	Step 3 : Responsiveness	Step 4 : Impact
<p>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 19 issues that are related to ASEH's sustainability issues. Compared with the previous year, we added "Data and Privacy" and "Work from Home" issues.</p>	<p>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.</p>	<p>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). Compared with the previous year, we added "Diversity and Inclusion" as key issue.</p>	<p>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.</p>
<p>7 Economic Issues 5 Environmental Issues 7 Social Issues</p> <ul style="list-style-type: none"> 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. 	<p>2,638 Stakeholders</p> <p>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 2,638 stakeholders' responses. Respondents include employees (1,326), customers (184), shareholders (42), suppliers/ contractors (795), government (53), industry unions/associations (18), and community (incl. NGOs, Media) (220).</p> <p>189 CSC Members</p> <p>Integrating ESG (Environmental, Social and Governance) into the company's core operations is a key driver for ASEH's corporate sustainability. A 189-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, customer satisfaction and employees' organizational identification, and ranking the level of each topic's importance according to the impact.</p>	<p>16 Key Issues</p> <p>The CSC initially identified 16 material issues that are of importance to stakeholders and of impact to the company's sustainable development. After further deliberation, the assessment ultimately yielded 16 issues of materiality that form the basis for the disclosures in the 2021 ESG report and formulating internal sustainable management goals.</p> <p>22 Sub-topics</p> <p>A further 22 sub-topics (19 GRI-specific and 3 ASEH-specific) for disclosures were derived from the 16 issues. Other topics of lower priority will also be concurrently disclosed in the report.</p>	<p>39 Long-term Goals</p> <p>To elevate the impact of corporate sustainability, we have made commitments to various major issues and formulated 39 long-term sustainability goals for 2030. In addition, we have promoted and implemented various projects at our factories worldwide year by year.</p> <p>4 Committees</p> <p>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.</p>

Results of Materiality Assessment



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 and Effluents		√		○		
	Energy Management	Energy		√		○		
	Climate Change	Emissions		√		○		
	Waste and Circular	Waste		√		○		
Social	Diversity and inclusion	Diversity and Equal Opportunity		√		○		
	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			√		○	

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 (incl. NGOs, media), government and industry unions/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	Responsible Units	2021 Issues of Concerns ²	2021 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"> COO Office Sales Offices 	<ul style="list-style-type: none"> Innovation Management and Sustainable Manufacturing Sustainable Supply Chain Business Ethics Customer Relationship Management Data and Privacy 	<ul style="list-style-type: none"> Satisfied customer percentage is 90% in 2021, which achieved 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 Seminars/employee forums Employee engagement survey Service and complaint hotline 	<ul style="list-style-type: none"> CAO Office HR Departments 	<ul style="list-style-type: none"> Occupational Health and Safety Human Rights Talent Attraction and Retention Work from Home Data and Privacy 	<ul style="list-style-type: none"> In 2021, more than 1,200 seminars/employee forums were held, including 346 sessions for new employees, 466 sessions for foreign workers, and 455 sessions for regular employees. The number of internal employee complaints amounted to 1,188, all of which have been closed satisfactorily. 96.1% of employees participated in the employee engagement survey, and the sustainability engagement survey result was 79%.
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"> Company Spokesperson Investor Relations Department, CFO Office 	<ul style="list-style-type: none"> Sustainable Supply Chain Innovation Management and Sustainable Manufacturing Climate Change Waste and Circular Occupational Health and Safety 	<ul style="list-style-type: none"> In 2021, we held an annual shareholders meeting, 4 quarterly earnings calls, and attended 5 institutional investor conferences to communicate economic, environmental, and social issues to our shareholders. In 2021, our consolidated operating revenues were NT\$ 570 billion, representing an increase of approximately NT\$ 93 billion, or 19.5% as compared with 2020.

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.

Stakeholder	Communication Mechanisms ¹	Responsible Units	2021 Issues of Concerns ²	2021 Communication Key Outcome ³
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"> Corporate CSR Division Group Procurement Department 	<ul style="list-style-type: none"> Occupational Health and Safety Business Ethics Sustainable Supply Chain Data and Privacy Customer Relationship Management 	<ul style="list-style-type: none"> More than 600 suppliers completed the survey, while 125 suppliers have on-site audits/ remote audits or RBA VAP. 600 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. Attended the launch announcement of the SEMI E187: Specification for Cybersecurity of Fab Equipment organized by SEMI Taiwan Cybersecurity Committee. The standard is a specification designed to help protect semiconductor manufacturing data. ASEH supports the efforts of the semiconductor industry as well as government agencies, academia and research communities to build a resilient semiconductor supply chain and collectively ensure the information security of semiconductor manufacturers in Taiwan and around the world.
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"> Public Affairs Division, CFO Office CAO Office 	<ul style="list-style-type: none"> Water Resource Management Air Pollution Prevention Waste and Circular Energy Management Climate Change 	<ul style="list-style-type: none"> The Environmental Safety and Health (ESH) Committee – Assembly and Test Working Group was formed by ASEH together with industry peers to address industrial safety and environmental issues pertaining to the semiconductor industry in Taiwan. The group analyzes the development trends of international laws to provide references for government agencies to formulate policies and regulatory amendments related to the semiconductor assembly and testing industry, and for assisting competent authorities in formulating regulatory proposals that align with current and future industry developments.
Community (incl. 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"> Public Affairs Division, CFO Office CAO Office HR Departments 	<ul style="list-style-type: none"> Waste and Circular Water Resource Management Air Pollution Prevention Climate Change Social Involvement 	<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\$ 2.67 million in support of environmental conservation programs, charitable activities and civic educational programs through collaboration with 40 NGOs.
Industry Unions / Associations	<ul style="list-style-type: none"> Organizational member conference Technology forums held by industry unions/associations 	<ul style="list-style-type: none"> CAO Office Subsidiaries 	<ul style="list-style-type: none"> Regulatory Compliance Business Ethics Waste and Circular Occupational Health and Safety Sustainable Supply Chain Data and Privacy Talent Attraction and Retention 	<ul style="list-style-type: none"> We engaged over 120 external organizations and contributed approximately US\$ 0.62 million in public policy and industry development. Attended the SEMI Cybersecurity Alliance Kick-Off Ceremony during which ASEH and industry members, government agencies, academia and research communities jointly declared their commitment to convey the core goals for cybersecurity and sustainability of the semiconductor industry in alignment with the SEMI Sustainability Initiative.



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.



CG 100

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

5%

Being selected as the top 5% listed companies in the Corporate Governance Evaluation System for the first time



External Performance Assessment of the Board and the Functional Committees



2021 Key Performance

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 2021, ASEH was among the top 5% best performing listed companies with better ratings in the categories of "Enhancing Board Composition and Operation" and "Putting Corporate Social Responsibility into Practice".

In 2021, ASEH was again selected to be a constituent stock of the "TWSE Corporate Governance 100 Index (TWSE CG100 Index)" based on the 2020 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.

97.5

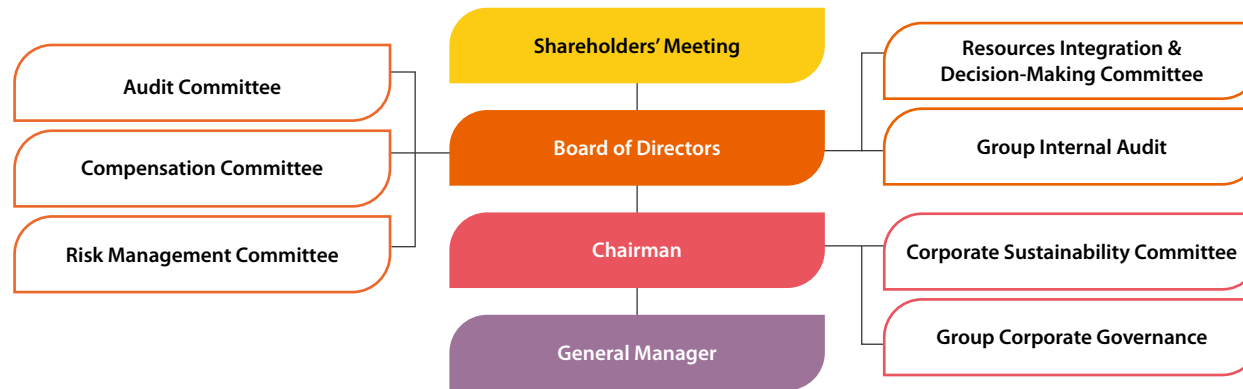
Continuous education for the Board members
hours¹



¹ Total training hours = course duration x number of people

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 is the Chairman of Advanced Semiconductor Engineering Inc. (“ASE”) since ASE’s listing on the Taiwan Stock Exchange in 1989. He is also the Chairman of ASEH since its founding in April 2018 and the Chair of the Resource Integration and Decision-Making Committee since 2021. 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 third 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 2021, a total of thirteen Board meetings were convened and attended by at least two independent directors in their supervisory capacity. The average Board meeting attendance rate was 97%. 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.

¹ For further details on the composition and responsibilities of the Audit Committee, Compensation Committee and Risk Management Committee, please refer to our 2021 Annual Report and Form 20-F “Item 6 Directors, Senior Management and Employees – Directors and Senior Management” 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 corporate governance affairs and training status of the Corporate Governance Officer, please refer to ASEH’s company website at https://ir.aseglobal.com/html/ir_corpor.php

³ For further details on succession planning, please refer to ASEH’s company website at <https://www.aseglobal.com/csr/integrity-and-accountability/succession-planning/>

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 2021 Annual Report.

Diversity of the Board of Directors

ASEH's Corporate Governance Best Practice Principles lists the guidelines, management objectives and goals for selecting the Board¹ and takes into account diverse and complementary factors such as: gender, age, nationality, culture, professional background and industry experience². Members of the Board come from different professional backgrounds with global market perspectives and possess the abilities to conduct risk oversight.

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. Considering global development trends and the company's risk assessment results, we arranged courses on climate change-related laws and risks and information security defense in 2021. 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 year³.

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 2021, the Board passed a resolution to donate NT\$100 million to environmental causes⁴ in Taiwan, appointed two independent directors to serve on the final selection committee for the ASEH Supplier Sustainability Award⁵, approved the issuance of restricted stock awards which include ESG metrics as part the performance indicators, and approved amendments to multiple policy documents pertaining to environmental and human rights. 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 financial⁶ performance targets. In 2021, ASEH issued 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.

¹ 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/20211118143329201714475_en.pdf

² For further details on the composition of the Board, and professional backgrounds and industry experiences of Board members, please refer to 2021 Annual Report "Ch. 3. Corporate Governance Report" or 2021 Form 20-F "Item 6".

³ For more detail on continuous education for board members, please refer to 2021 Annual Report "Ch. 3.4 Corporate Governance".

⁴ Since 2014, ASE has donated NT\$100 million annually and the program continue after the establishment of ASEH.

⁵ ASE has organized the Supplier Sustainability Award every year since 2017 and continue to do so after the establishment of ASEH.

⁶ such as revenue growth rate, etc

To enhance overall efficiency of the Board and to measure the performance of the Board on a yearly basis, individual members, and the functional committees 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. In accordance with the Rules of Performance Evaluation of the Board of Directors, we completed internal performance evaluations for the Board as a whole, and for individual directors and functional committees in 2021. We also commissioned an external professional independent institution to evaluate the Board as a whole by using questionnaires and on-site interviews, and specific recommendations were provided. 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 publicly disclosed on the company's website¹.

Compensation for top management includes cash, stock options and restricted stock awards. 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

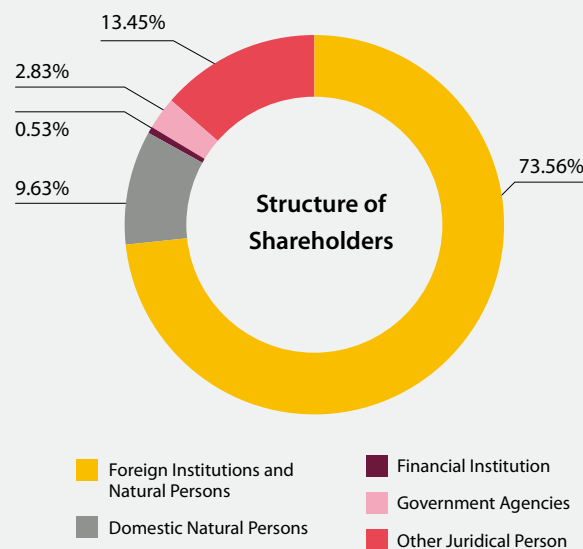
require reimbursement of any variable compensation received by the CEO and CFO to the extent permitted by applicable laws. These two important documents were publicly disclosed in ASEH website².

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, ESG 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. This not only establishes a smooth and effective communication channel, but also grasps the pulse of the market, economy, society and environment through feedback from stakeholders.

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 elections³, 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 For further details on 2021 Board Performance Evaluation Results, please refer to ASEH's company website at https://ir.aseglobal.com/html/ir_board.php

² For more important documents related to ASEH, please refer to ASEH's company website at https://ir.aseglobal.com/html/ir_doc.php

³ 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 tax policy was reviewed and approved by our chief financial officer. The company's accounting department is responsible for income tax filing, and obtains approvals of the appropriate level of authorization before filing.

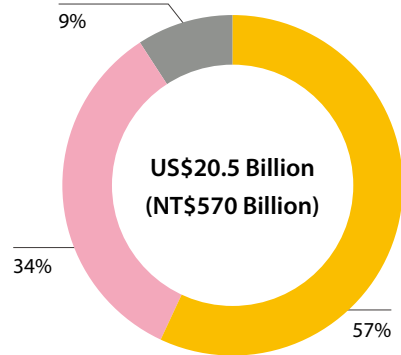
Consistent with our core values, ASEH is committed to fully meeting tax obligations while also being financially responsible for the potential effects that tax payments might have on our business activities and being supportive of corporate innovation, research and development, reinvestment and sustainable 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.

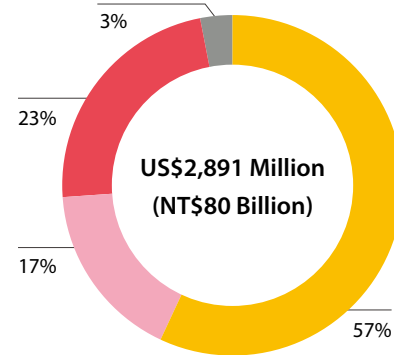
In 2021, a portion of income before tax and income tax accrued were contributed by our holding company in the Cayman Islands due to the disposal of our subsidiaries in China, and a portion of income tax was paid by our holding company in Bermuda due to the organization restructure; nevertheless, our principal executive offices and facilities are located in Taiwan and China/ Hong Kong, therefore, most of our operating revenues, profit before tax, income tax accrued for current year, and income tax paid are the result of business activities conducted in Taiwan and China/ Hong Kong. As a result of the disposal of our subsidiaries in China and the different industry development between Taiwan and China, the proportion of income before tax in China was not as robust as that of operating revenues in China. It should be noted that no more than 5% of our operating revenues, profit before tax, income tax accrued for current year, and income tax paid was accounted by business activities conducted in the rest of each individual country.

Please refer to the chart below for 2021 operating revenue, profit (loss) before tax, income tax accrued, and income tax paid by country.

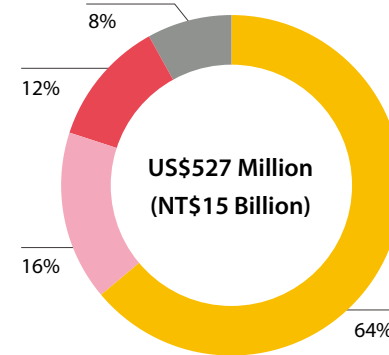
Operating Revenue



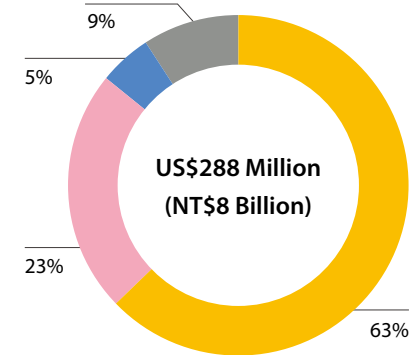
Profit (Loss) before Tax



Income Tax Accrued



Income Tax Paid



■ Taiwan
 ■ China/Hong Kong
 ■ Cayman
 ■ Bermuda
 ■ Others¹

¹ "Others" mainly includes South Korea, Singapore, Malaysia, Japan, U.S.A, Mexico, Tunisia and European countries, etc.

Our effective tax rate of 22.4% was higher than the industry average tax rate of 15.9% 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, and the additional income tax rate on unappropriated earnings in Taiwan is 5%. Most of our China subsidiaries that qualify as "High and New technology enterprises" are entitled to a reduced income tax rate of 15% and eligible for super deduction for qualified research and development expenses.

Our effective cash tax rate of 10.0% was below our effective tax rate of 22.4% and the industry average cash tax rate of 14.1%. The main reason for our relatively low effective cash tax rate was because the pre-tax income of our profitable country, such as Taiwan, had increased during 2021, but income tax will be filed and paid in the following year. Moreover, there was disposal of China subsidiaries, with a gain that accounted for 23% of our pre-tax income, occurred at the end of 2021. And because it is conditional upon the approval and levy by the Mainland China Taxation Bureau, the soonest possible time for the company to pay cash tax would be the following year, which resulted in a further decrease in our 2021 cash tax rate. The combination of the reasons outlined above resulted in our lower cash tax rate for 2021.

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

- | | |
|---|--|
|  Code of Business Conduct and Ethics |  Fair Competition and Antitrust Laws Compliance Policy |
|  Corporate Governance Best Practice Principles |  Guidance of Prevention of Corruption |
|  Sustainable Development Best Practice Principles |  Policy and Procedures for Complaints and Concerns Regarding Accounting, Internal Accounting Controls or Auditing Matters |
|  Ethical Corporate Management Best Practice Principles | |
|  Procedure for Ethical Management and Guidelines for Conduct |  Procedures for Handling Whistleblowing Cases of Unethical Conduct |
|  Administrative and Practice Procedures to Prevent Insider Trading |  Supplier Code of Conduct |

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, and reports to the Audit Committee regularly every year.

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.

2021 Programs and Implementation

- **Education and training, advocacy and communication**

1. At the meeting of the Board of Directors in July 2021, the Corporate Governance Officer reported to the Board the implementation status and plans pertaining to the company's ethical management. The company also sends an e-mail before the blackout period to communicate and remind all directors of any laws and regulations that are relevant to insider trading.
2. The company sent policies and documents relating to ethical management to its global business locations, and requested the human resources manager of global business locations to sign an acknowledgment letter on behalf of our global workforce. We also continued to investigate the current status and practices of ethical management at our global business locations.
3. The company has promoted its business code of conduct and ethical compliance reporting mechanism on the group's audit management system platform, which is shared with our global business locations. The purpose is to help employees understand when and where to file a report or complaint. We also conduct in-person and online meetings with executives and employees at our business locations worldwide to inform them on the rules and procedures for handling reports of unethical conducts. We encourage employees to be proactive in reporting unethical behaviours to implement the company's whistleblowing system and strengthen mechanisms for the detection and prevention of fraudulent activities.

4. 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 topics² covered including ethical management, anti-corruption, trade secret, avoidance insider trading, fair competition and antitrust, respect intellectual property, regulatory compliance, information security, RBA Code of Conduct, and employee code of conduct at all business locations (131,066 participants clocked a total of 76,561 hours on the course). In total, 16,174 employees attended the courses related to the company's Administrative and Practice Procedures to Prevent Insider Trading and on applicable laws and regulations, completing 5,234 hours.

- **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.

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 and Chapter 6.1 Talent Attraction and Retention- Employee Communication.

Consultation and Report

We have established channel of consultation for ASEH Members and various internal and external reporting channels¹. 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.

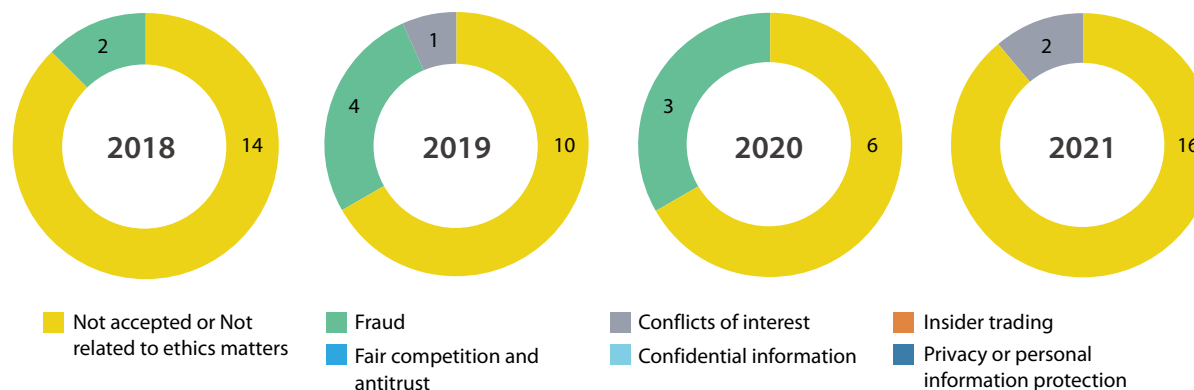
ASEH received a total of 18 complaints in 2021, of which 16 lack sufficient information to conduct further investigation or were employee-related complaints that have been forwarded to the HR department to follow up. The remaining 2 complaints were related to unethical business behavior. For the past 4 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 For further details on internal and external report channels, please refer to ASEH's website <https://www.aseglobal.com/csr/integrity-and-accountability/business-conduct-ethics/>
² The 2 cases contain the same allegations.
³ Of them, 2 cases contain the same allegations from 2018.

Cases Received by Code of Conduct Compliance Reporting System

	2018	2019	2020	2021
Number of cases received by Code of Conduct Compliance Reporting System	16	15	9	18
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	16
Related to ethics matters	2 ²	5 ³	3	2
Fraud	2	4	3	0
Conflicts of interest	0	1	0	2
Insider trading	0	0	0	0
Fair competition and antitrust	0	0	0	0
Confidential information	0	0	0	0
Privacy or personal information protection	0	0	0	0
Number of breaches (number of breaches confirmed related to ethics matters after investigation)	0	0	0	0



Processing Procedures for Violation Reporting

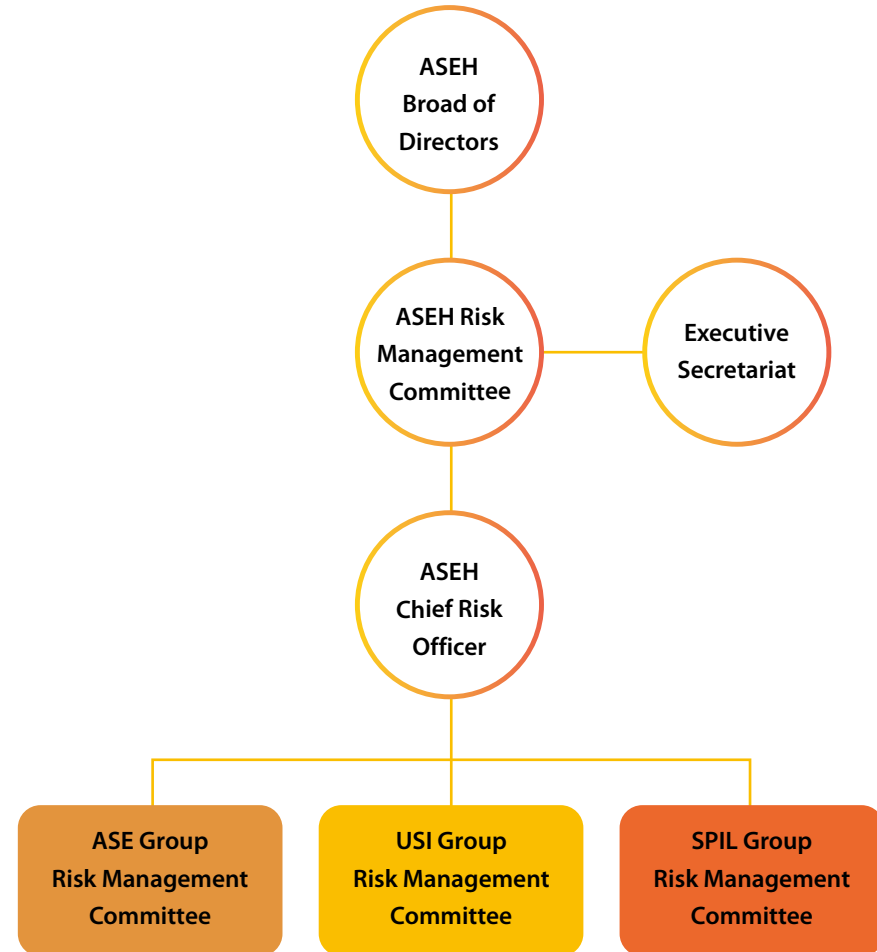


3.4 Risk Management

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 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. 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. 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, geopolitical crisis, renewable energy use, water shortage and energy conservation and talent shortage, Dtuang Wang, ASEH Chief Administration Officer, was appointed the Chief Risk Officer to synergize the subsidiary companies’ risk management with the goals of the corporate Risk Management Committee to manage overall risks effectively. 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.

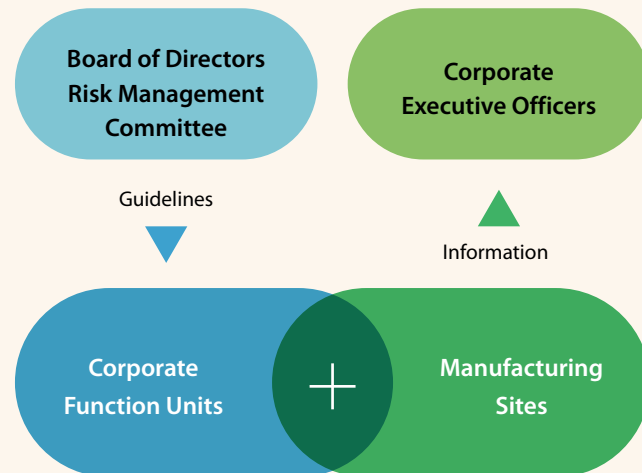
We manage risks through designated departments and functions ("risk functions") across all of our organizations. In addition, we have Enterprise Risk Management ("ERM") programs implemented in our major manufacturing sites (i.e., Kaohsiung, Chungli, Shanghai (Material), Real Estate Group as well as the 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, ASEH has effectively kept the respective risk scenarios under control.

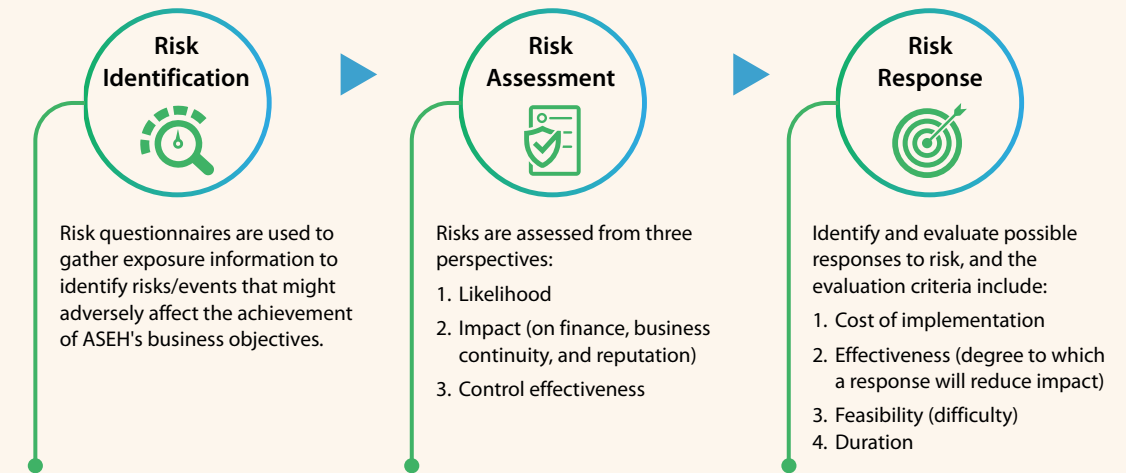
We had introduced a top-down ERM approach to connect the top management with the rest of the organization on risk matters and ensure sound management of corporate-wide risks. Specifically, our top managements are invited to identify key risks that are "top of mind" for the company. Meanwhile, each subsidiary identifies the

¹ 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.

Risk Management Organization Scheme



Risk Management Process



risks at the enterprise and operation level through the bottom-up risk inventory mechanism, and records the identified risks in the Risk Register. 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.

Furthermore, 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 adopts a rigorous risk management mechanism and reports the progress to the Board of Directors on a yearly basis. Our activities in 2021 include the following:

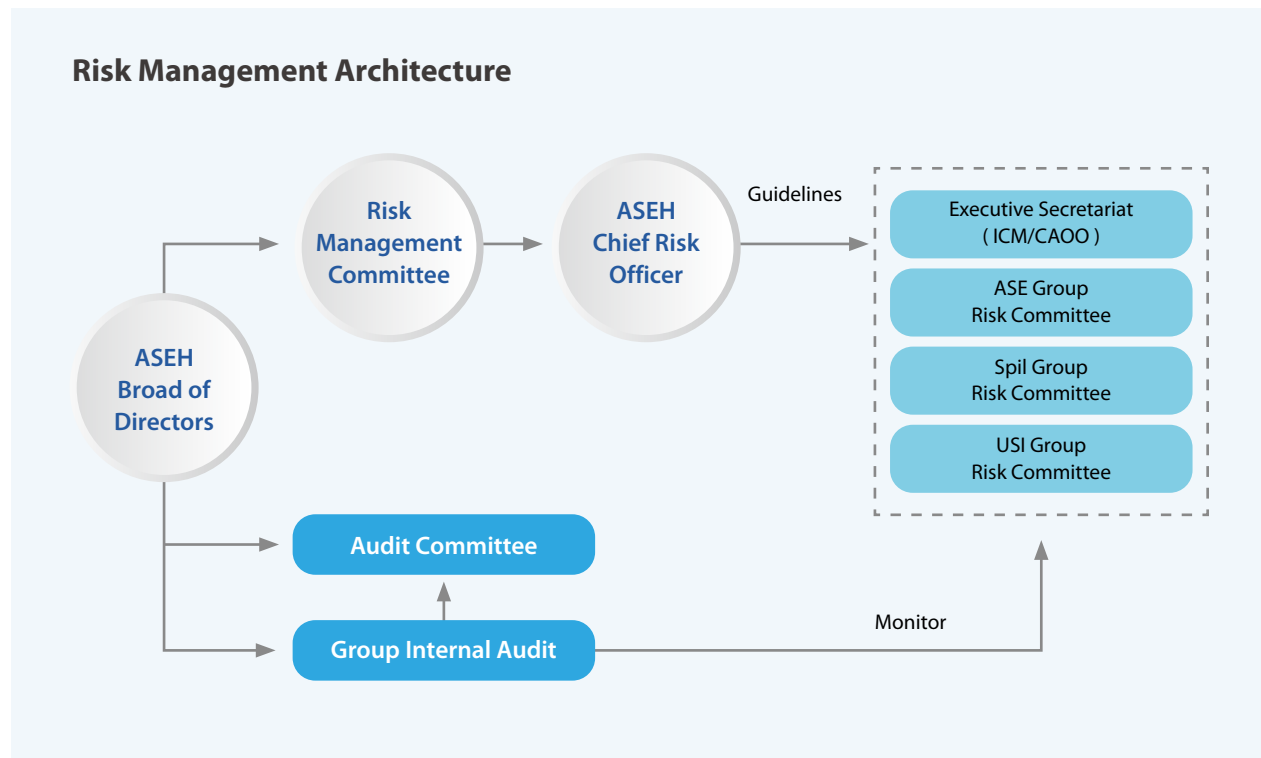
- The first Risk Management Committee convened the third committee meeting in 2021. The committee secretariat and representatives of the company's subsidiaries presented 2020 risk reports and 2021 work plans.
- On September 30, 2021, the Board of Directors appointed Mr. Sheng-Fu You (Independent Director), Ms. Mei-Yueh Ho (Independent Director) and Mr. Dtuang Wang (Group Chief Administration Officer and Chief Corporate Governance Officer), as the representatives for the second Risk Management Committee.

- The second Risk Management Committee convened its first meeting to present the 2021 report on major risks including the management of COVID-19, water shortage and power restrictions. The committee also discussed emerging risks for 2022 including human capital, cybersecurity and energy resources.

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.



Long-term Emerging Risks

Monitoring measures and control mechanisms for major risks that have been identified and analyzed are as follows:

Emerging Risks	Description	Potential Impacts	Response Strategies
Renewable energy risks	Global promotion of net zero emissions and use of renewable energy are issues that the company should tackle head-on. Several countries have enacted laws and regulations mandating the payment of carbon fees or carbon tax and use of renewable energy. In Taiwan, a major electricity consumer clause was announced in January 2021 and will take effect in 2025.	<ol style="list-style-type: none"> 1. Various countries have enforced laws requiring businesses to use renewable energy, and are also paying increasing attention to global net zero transition. Failure to acquire renewable energy will not only create compliance risks, but also greatly impact customer recognition and corporate image. 2. In terms of corporate sustainability, large international corporations are committed to achieving RE100 or net zero emissions by 2050, while external investors and citizens are concerned about whether corporations are making this commitment. This trend exerts a significant impact on sustainability. 	<ol style="list-style-type: none"> 1. In 2021, the Company established a green electricity platform composed of the Group's finance, administration, sustainability, and procurement units and its subsidiaries in Taiwan. The purpose of this platform is to evaluate purchases of green electricity in compliance with the major electricity consumer clause to achieve net zero emissions and sustainability. 2. At the end of 2021, the Company entered into a memorandum of understanding with a renewable energy supplier, and each subsidiary signed an electricity procurement agreement as required by the major electricity consumer clause. Even after obtaining this renewable energy, we will continue to evaluate the feasibility of purchasing renewable energy.
Information security management risks	Cyberattacks still occasionally occur. Long-term observation reveals a constant uptick in ransomware attacks, which are carried out using different programs and strategies than before. Current prevention methods are not advanced enough to detect new forms of ransomware. Among existing ransomware attacks, there is an increasing use of more powerful malware programs that infiltrate several times faster than before and steal a wider scope of data and information. Government organizations and businesses will put their operations at risk should they let their guard down and give hackers the time they need to find security loopholes.	<ol style="list-style-type: none"> 1. Automated (smart) factories are currently the main mode of operation. If a cyber security event occurs, the impacts will be severe, not only on production and operations but also in terms of confidential information leaks, which adversely affect customer's trust and threaten the company's competitiveness. 2. In the event of a ransomware attack, the company's operations and finances will be affected if the company fails to preempt the attack or recover its IT systems quickly enough to ensure the security of its network. 	<p>The Company has established an information security risk management framework, which consists of developing an information security policy, setting up an information security management group (which reports to the CSC Corporate Governance Taskforce), regularly reviewing the current status and strategies of information security management and periodically reporting to the Board of Directors. In 2021, the Corporate CSR Division invited the Information Security Teams of each subsidiary to create an information security platform. Apart from developing an information security incident classification and risk reporting mechanism, the teams will also integrate the information security protection capabilities of each subsidiary and strengthen them through the information security platform. In addition, a security health check is performed by an information security company on the subsidiaries' operational technology to implement information security risk control.</p> <p>Information security management measures</p> <ol style="list-style-type: none"> 1. Strengthen defensive deployment, including budgeting for information security and product efficiency improvements in the early identification, protection, and detection stage and conduct education and training to improve technical capabilities. 2. Strengthen response mechanisms in the mid and late response and recovery stages, and conduct regular disaster recovery exercises to ensure crisis readiness and the ability to maintain an uninterrupted information system in critical situations. 3. Extend the adoption of the ISO27001 standard across all factories worldwide and introduce education and training on the IEC62443 standard (industrial communication networks - IT security for networks and systems) to enhance the company's defense capabilities.

Emerging Risks	Description	Potential Impacts	Response Strategies
Key talent risks	Semiconductors have become essential to the world, prompting major semiconductor companies to recruit Taiwanese talent, which will lead to an outflow of skills from Taiwan. In addition, the declining birth rate and drop in the number of graduates in Taiwan and a supply–demand imbalance in technology talent will jeopardize the competitiveness of the company.	<ol style="list-style-type: none"> 1. As the company continues to implement its expansion plan, skills shortages may prevent the company from fulfilling production agreements, which would affect customer’s confidence and limit company growth. 2. The growth and development of the semiconductor sector can be attributed to the advancement of various technologies and products, both of which require the R&D and innovation input of key employees. The competitiveness of the company may be adversely affected by a shortage of key talent. 	<ol style="list-style-type: none"> 1. The Company worked with three major companies to develop a human resources platform for talent recruitment and training, incorporate the resources of its subsidiaries, discuss key talent risks and devise response strategies, and improve implementation methods. 2. The Company complies with government policy, works to foster an early understanding of industry practices in students at the secondary education level or higher, cultivates professional talent, and has established talent recruitment agreements with domestic and foreign universities to strengthen industry–academia cooperation and secure recruitment channels. 3. By establishing a key talent database and an effective performance evaluation management mechanism, the Company provides a platform where talented employees can unleash their potential and acquire a sense of achievement at work. The Company has adopted a family care mechanism, including preschool and long-term care facilities, to boost the well-being of employees, increase employee stickiness, and reduce the turnover rate. 4. The Company has developed automated manufacturing processes to reduce its manpower needs, and organizes professional training programs to foster the professional capabilities of operators and train them to be professional engineers.
Geopolitical risks	Various countries are enforcing or amending laws to regulate commercial activity. For example, the United States adopted the Export Administration Regulations and China issued Rules for Counteracting Unjustified Extra-territorial Applications of Foreign Legislation and Other Measures, both of which will increase the compliance costs of the company. In addition, the Russian invasion of Ukraine created geopolitical risks in that it has significantly impacted supply chains. Furthermore, increased transportation costs will adversely affect the company’s operating costs.	<ol style="list-style-type: none"> 1. Geopolitical risks generate a massive influence on interest rates and exchange rates and thus expose business operations to these risks. 2. Geopolitics affects economic globalization. The company may need to relocate its manufacturing base to facilitate business continuity, and the move will increase investment risks. 3. Geopolitical shifts will create uncertainties in supply chain management, which adds to the company’s operating costs. 	<ol style="list-style-type: none"> 1. In response to geopolitical developments, the Company has made early plans with respect to the location of its manufacturing base and to diversifying its investments. 2. Interest rate changes: Except for a portion of long-term borrowings and bonds payable at fixed interest rates, the company was exposed to interest rate risks because ASE primarily borrows funds at floating interest rates. Changes in market interest rates have led to variances in the effective interest rate on loans, from which future cash flow fluctuations arise. We will utilize financing instruments with low interest rates and favorable terms to maintain low financing costs and adequate financing lines, as well as to hedge interest rate risk. 3. Exchange rate changes: We are mainly subject to impacts from exchange rate fluctuations in the USD and JPY against NTD, RMB or EUR. We entered into a variety of derivative financial instruments to hedge foreign currency exchange rate risk to minimize the fluctuations of assets and liabilities denominated in foreign currencies. <p>Hedge accounting</p> <p>Our hedging strategy was to lift borrowings denominated in foreign currencies to avoid exchange rate exposure from its investments in equity instruments denominated in foreign currencies and net investment in foreign subsidiary. Hedge adjustments were made to totally offset the foreign exchange gains or losses from those equity instruments denominated in foreign currencies and foreign operations when they were evaluated based on the exchange rates on each balance sheet date.</p> <p>The hedge ineffectiveness in these hedging relationships arose from the material difference between the notional amounts of borrowings denominated in foreign currencies and the original investments in equity instruments denominated in foreign currencies and net investment in foreign operations. No other sources of ineffectiveness is expected to emerge from these hedging relationships.</p>

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 Securities and Exchange Commission of the U.S. 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

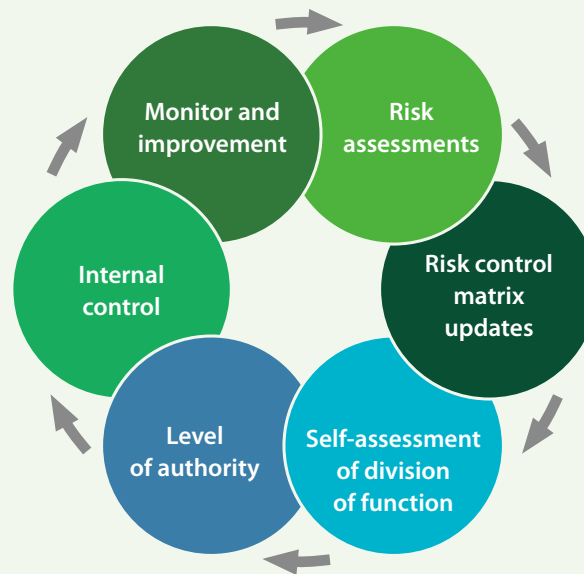
Every year, all of our subsidiaries conduct internal control self-assessments. The scope of the assessments covers the design and implementation of the company's internal control systems (e.g., Segregation of Duties Assessment, system authority management, chart of Authority Management, and Sarbanes-Oxley 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.

¹ Including Taiwan and China facilities of ASE.

² Including Taiwan and China facilities of USI.

³ Including Taiwan and China facilities of SPIL.

ASEH Internal Control Management 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 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 submitted the audit reports and audit follow-up reports by e-mail to the independent directors on a monthly basis. The internal audit officer presented and communicated the audit results to the audit committee in the closed meetings at least once a quarter, as well as quarterly reported internal audit activity report to the board of directors. 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 2021. The communication channel between the independent directors and the internal audit officer functioned well. In addition, GIA continuously followed up on the requirements and recommendations on internal audit raised by the independent directors and audit committee as well as the board of directors, and completed the requirements and recommendations and reported to them within the specified time limit.

In order to increase the value and enhance the results of internal audit, throughout 2021, we have been dedicated to

- (1) Accelerating the digital transformation of processes: Completing the new system development and launch of the SOX Control Self-Assessment and the systematization of risk assessment, continuously optimizing the Group Audit Management System, and completing the system planning and main development of the audit client feedback questionnaire and group data summary report, so as to conduct remote audit of overseas subsidiaries under the influence of COVID-19.
- (2) Improving data analysis ability: Conducting data analysis course training as well as software and hardware upgrading to strengthen the data analysis ability of internal auditors.
- (3) Ensuring audit quality: Implementing internal assessment of internal audit project level to ensure the quality of audit reporting and working papers.
- (4) Enhancing the utilization of internal audit resources of the group: Developing an assurance map of subsidiaries to reduce repeated audit work, focus on key risks and strengthen the depth of auditing.
- (5) Raising internal control and risk awareness: Sharing internal control tips for potential risks and common audit findings with the company and its subsidiaries on a regular basis.

Internal Audit Management Process



Promote and Enhance Risk Culture Measures

To build a corporate culture that is conducive to risk management, the ASE Group has added risk management indicators to its general management performance goals, and has also formulated financial incentives related to risk management; for example, the Company's shareholders' meeting resolved in August 2021 to add ESG risk management standards to the conditions for issuing restricted stock awards for employees. We also provide internal training that focuses on key aspects of risk management. We organize ERM and BCM work forums to strengthen risk awareness at the management level as well as courses for all employees that promote the importance of risk management. These courses have achieved full participation from all employees. The Company has also established organization-wide measures that enable individual employees to proactively identify and report potential risks. Employees are encouraged to participate in a structured feedback process to continuously improve risk management practices. Risk criteria are incorporated into product development or approval processes, 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/contractors, 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.

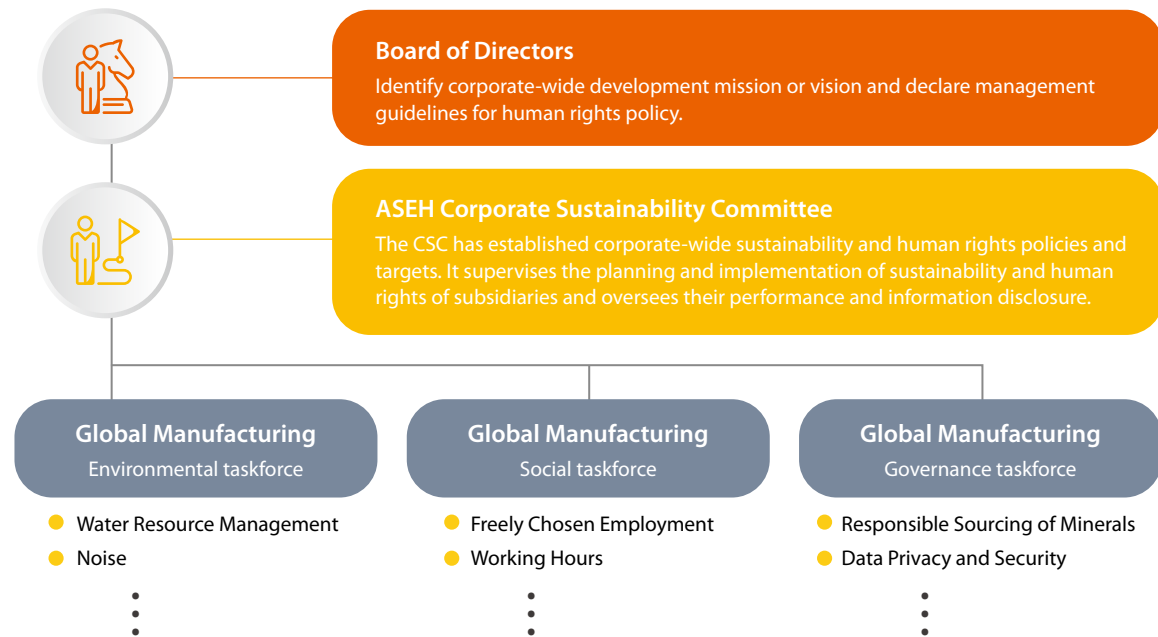
Commitment

- **Protection and Respect:** ASEH is committed to protecting and respecting human rights and creating an environment conducive to human rights protection.
- **Appeal and Remedy Process:** To prevent infringement of human rights, protect ASEH employees and value chain partners, and mitigate any adverse human rights impacts, ASEH has put in place formal processes for appeal and remedy.
- **Management and Investigation:** ASEH seeks to continuously improve human rights governance with education and training and human rights due diligence and feedback mechanism and keep in lockstep with business development trends.

Management Organization

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.

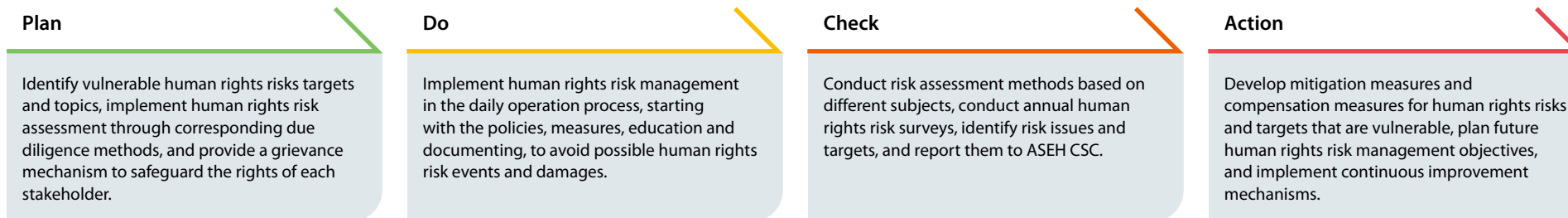
Human Rights Management



Guidelines of 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, local communities, and customers, performing due diligence with each group and providing whistle-blowing channels to prevent any human rights violations.

Risk Management Process



ASEH as a/an	Target	Human Rights Issues	Policy	Responsible	Management Mechanism	Complaint Mechanism
Employer Partners (Joint Venture, Mergers)	<ul style="list-style-type: none"> All Employees Foreign Employees Female Employees 	Freely Chosen Employment, Working Hours, Wages and Benefits, Non-Discrimination, Sexual Harassment, Occupational Safety, Emergency Preparedness, Occupational Injury and Illness, Data Privacy and Security	Corporation Human Rights Policy Statement	Subsidiaries' "Employee Care and Development Taskforce"	RBA SAQ, RBA VAP, and qualified internal audit	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
	<ul style="list-style-type: none"> Child Laborers 	Young Workers				
Purchaser	<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, Data Privacy and Security	Supplier Code of Conduct	Subsidiaries' "Supply Chain Management Taskforce"	Supplier sustainability questionnaires/RBA SAQ, on-site audits, RBA VAP, and qualified internal audit	
Contributor to Community Development	<ul style="list-style-type: none"> Local Communities 	Water Management, Noise, Air Pollution	Sustainable Development Best Practice Principles	Each facility	Monitoring of noise, effluent, and emissions sources at ASEH facilities	
Service Provider	<ul style="list-style-type: none"> Customers 	Data Privacy and Security	Policy on the Protection of Privacy and Personal Data	Each facility	Annual risk assessments, qualified internal audit, and independent third parties	

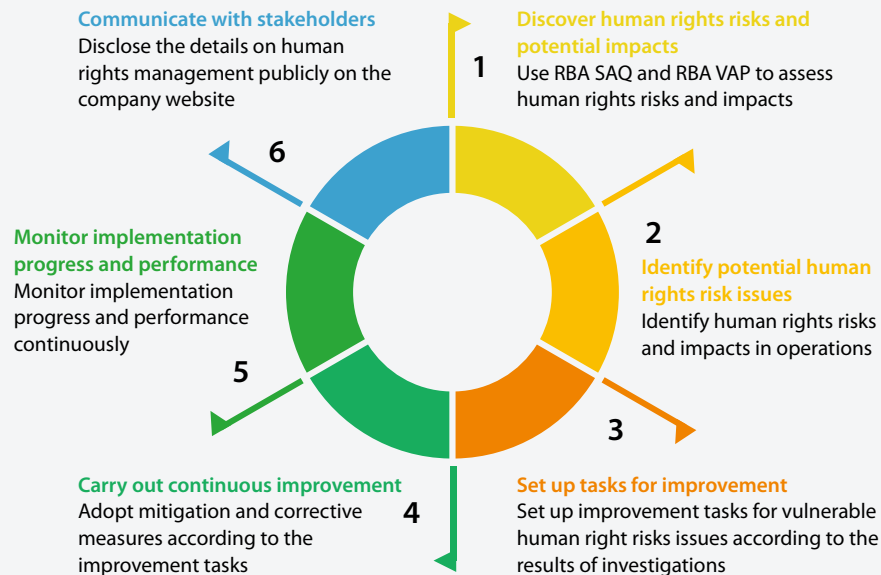
Human rights management standards and regulations:

1. Corporation Human Rights Policy Statement, <https://www.aseglobal.com/en/pdf/human-rights-policy-en.pdf>
2. Corporation Anti-Discrimination and Anti-Harassment Policy, <https://www.aseglobal.com/en/pdf/anti-discrimination-and-anti-harassment-policy-en.pdf>
3. Sustainable Development Best Practice Principles, https://media-aseholdco.todayir.com/20220324171126159296091_en.pdf
4. Code of Business Conduct and Ethics, https://media-aseholdco.todayir.com/20180622151727139618980_en.pdf
5. Supplier Code of Conduct, <https://www.aseglobal.com/en/pdf/aseh-supplier-coc-en.pdf>
6. Purchasing and Supply Chain Development Policy, https://www.aseglobal.com/en/pdf/2019_aseth_purchasingandsupplychaindevelopmentpolicy.pdf
7. Environmental Responsibility Policy, <https://www.aseglobal.com/en/pdf/environmental-responsibility-policy-en.pdf>
8. Policy on the Protection of Privacy and Personal Data, <https://www.aseglobal.com/en/pdf/privacy-policy-en-2022.pdf>

Due Diligence

ASEH has conducted regular human rights due diligence to assess and identify human rights risks and potential impacts. If risks, potential impacts, or violations are discovered during the human rights due diligence, ASEH shall take immediate actions to mitigate or remediate. Risks, potential impacts or violations assessed and identified through human rights due diligence process and their status will be reviewed and be the basis for adjusting ASEH human rights policy and human rights management regulations and management procedures to strengthen ASEH's human rights protection.

Due Diligence Procedure



Implementation and Outcome

Internal

The human rights risks of our manufacturing and business activities are mainly related to employee and local community interest groups. ASEH 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, ASEH was 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, sexual harassment, freely chosen employment and wages and benefits. Each year, ASEH has 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 Health and Safety of this report.

External

ASEH assessed human rights risks associated with the company's suppliers using supplier sustainability risk assessment questionnaires and the RBA SAQ. ASEH performed sustainability risk assessments on all tier-1 suppliers and conducted risk identification through the RBA VAP. Based on the assessment results, ASEH identified working hours, compensation and benefits, occupational safety, emergency preparedness, and responsible mineral sourcing as major human rights risks. ASEH 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 Human Rights Risk Matrix



Mitigation and Remediation Measures

The mitigation and remediation measures for the human rights risks identified with high frequency and high impact on companies in 2021 are as follows¹:

Target	Risk Issues	Mitigation Measures	Remediation Measures
Employees	Labor	<ul style="list-style-type: none"> Systems <ul style="list-style-type: none"> 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 Responsible Business Alliance. - Wages and Benefits: Periodically adjust salary and benefit packages based on industry standards. - Sexual Harassment: ASEH has formulated the Anti-Discrimination and Anti-Harassment Policy to protect all ASEH employees from workplace discrimination and harassment. Education and training <ul style="list-style-type: none"> ASEH continuously conducts human rights education and training to strengthen the internal awareness of human rights and implement the human rights protection activities wholeheartedly. - Sexual Harassment: ASEH periodically conducts human rights and Anti-Discrimination and Anti-Harassment education and training. 	<ul style="list-style-type: none"> Practices <ul style="list-style-type: none"> ASEH established the human rights policy to ensure all work should be voluntary and employees have the freedom to resign or terminate the employment relationship. - Working Hours: <ul style="list-style-type: none"> (a) Employment of sufficient manpower to meet manufacturing capacity and prevent manpower shortages and overtime. (b) Establishment of overtime management and tracking mechanism to prevent employees from working for seven or more consecutive days. (c) 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. - Wages and Benefits: <ul style="list-style-type: none"> (a) ASEH established the Human Rights Policy Statement to ensure that ASEH employee compensation shall comply with the relevant local laws on wages including minimum wage requirements, overtime hours and legally mandated benefits. (b) Compliance with local laws and regulations; regular review and revision of employee handbooks and regulations. (c) Establishment of monthly cash incentive bonuses and annual profit-sharing bonuses. In addition, employees with outstanding performance are awarded company stock options. - Sexual Harassment: 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. Remediation <ul style="list-style-type: none"> - Wages and Benefits: Disbursement of unpaid wages to terminated employees set forth in local laws and regulations. - Sexual Harassment: 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. The results of such processes will then be used as a reference for making adjustments to workplace environment and regulations. When ASEH confronts other human rights issues, ASEH will negotiate and adopt measures based on internal procedures. Punishment <ul style="list-style-type: none"> - Sexual Harassment: For cases that constitute sexual harassment, the internal sexual harassment complaint processing 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. When ASEH confronts other human rights issues, ASEH will negotiate and adopt measures based on internal procedures.

¹ The mitigation and remediation measures for other issues, please refer to the ASE Corporation Human Right Management Framework at <https://www.aseglobal.com/en/pdf/human-rights-management-framework-en.pdf>

Target	Risk Issues	Mitigation Measures	Remediation Measures
	<ul style="list-style-type: none"> Occupational Safety Emergency Preparedness Occupational Injury and Illness 	<ul style="list-style-type: none"> Systems <ul style="list-style-type: none"> All ASEH facilities worldwide have established OHS management organizations, 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. Emergency Preparedness: <ul style="list-style-type: none"> ASEH public fire safety measures in accordance with the recommendations of the National Fire Protection Association (NFPA) and ISO 45001/OHSAS 18001 standards. Education and training <ul style="list-style-type: none"> Occupational Safety and Emergency Preparedness: <ul style="list-style-type: none"> (a) Public fire safety measures in accordance with the recommendations of the National Fire Protection Association; enhanced training in disaster preparedness and safety education. (b) Regular emergency evacuation drills for fire, earthquake, and composite disasters; review and improvement of warning and prevention measures. Occupational Injury and Illness: <ul style="list-style-type: none"> In addition to the regular education and training, injury incidents and improvement of preventive measures are reviewed by ASEH each quarter. 	<ul style="list-style-type: none"> Practices <ul style="list-style-type: none"> Occupational Safety: <ul style="list-style-type: none"> ASEH facilities have established occupational accident and incident reporting and investigation procedures and management procedures. When an occupational injury incident occurs, the standard handling procedure is carried out and the incident is reported to the competent local authority according to management regulations and local laws and regulations. The injury incidents and improvement of preventive measures are reviewed simultaneously. Emergency Preparedness: <ul style="list-style-type: none"> 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. Occupational Injury and Illness: <ul style="list-style-type: none"> ASEH facilities have established occupational accident and incident reporting and investigation procedures and management procedures. When an occupational injury incident occurs, the standard handling procedure is carried out and the incident is reported to the competent local authority according to management regulations and local laws and regulations. Remediation <ul style="list-style-type: none"> Occupational Safety: <ul style="list-style-type: none"> (a) ASEH identifies higher-risk operating environments within ASEH 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. (b) Health assessments performed by professional physicians in medical consultation to help employees with self-health management. Occupational Injury and Illness: <ul style="list-style-type: none"> Assistance with medical insurance claims. When ASEH confronts other human rights issues, ASEH will negotiate and adopt measures based on internal procedures. Punishment <ul style="list-style-type: none"> ASEH will negotiate and adopt measures based on internal procedures.
Suppliers/ Contractors	<ul style="list-style-type: none"> Labor <ul style="list-style-type: none"> Freely Chosen Employment Working Hours Wages and Benefits Health and Safety <ul style="list-style-type: none"> Occupational Safety Emergency Preparedness Ethics <ul style="list-style-type: none"> Responsible Sourcing of Minerals 	<ul style="list-style-type: none"> Systems <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. Education and training <ul style="list-style-type: none"> Through regular education and training, ASEH promotes the importance and implementation measures of human rights to suppliers for reducing the human rights risks in advance. 	<ul style="list-style-type: none"> Practices <ul style="list-style-type: none"> ASEH has established a supplier sustainability audit system to carry out routine and ad hoc audits in order to continuously raise supply chain's sustainability. Remediation <ul style="list-style-type: none"> ASEH requests suppliers to adopt corrective measures for human rights risks and conduct follow-up on implementation. ASEH requests suppliers to provide guidance or financial compensation, or to implement policy changes or other compensatory measures for employees whose human rights have been violated. Punishment <ul style="list-style-type: none"> ASEH shall terminate the relationship with suppliers and request punitive liquidated damages when suppliers are involved in serious human rights violation.

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 2021, 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 2021, we did not receive any compliant or penalty related to personal data.

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

Complaint Mechanism and Procedure



3.6 Regulatory Compliance

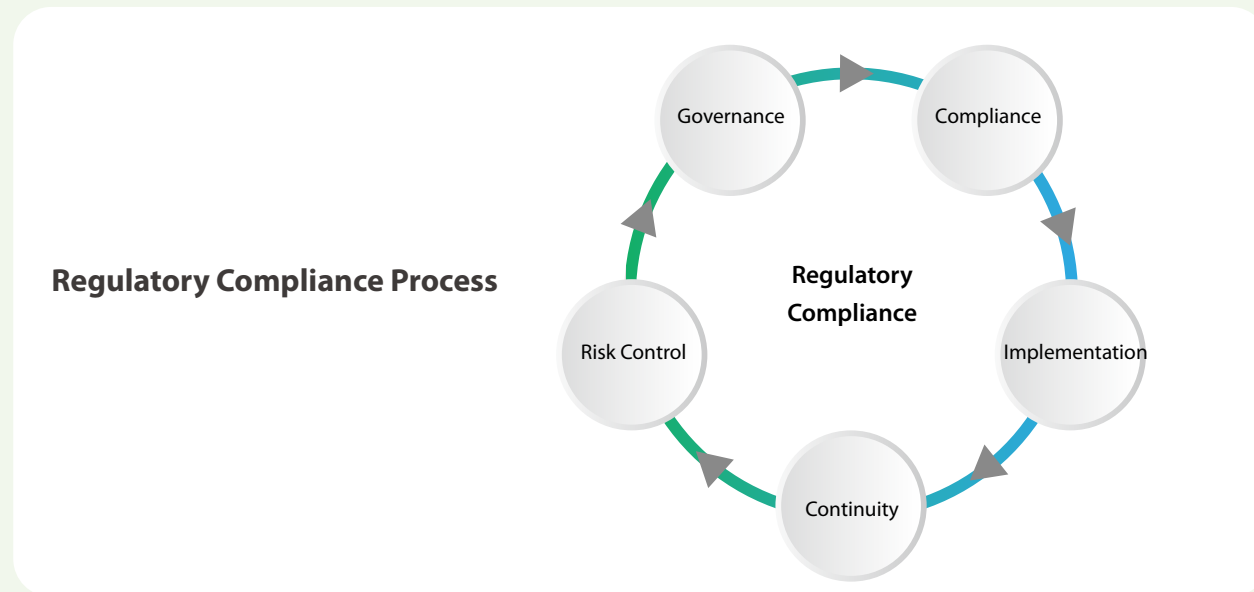
We conduct all our business activities in strict compliance with relevant laws. To ensure legal compliance, ASEH maintains regular updates on domestic and foreign laws and policies that affect its operations, and prioritizes regulatory compliance at all of its business locations.

ASEH's Corporate Governance Officer and Regulatory Compliance Department assists board directors with overall regulatory compliance and supervises activities at ASEH's subsidiaries to ensure compliance with relevant laws and regulations. Establishing an inventory, regular 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.

ASEH continued to conduct regular corporate audits on compliance throughout 2021 and increased the frequency of audits 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, Labor Standards Act, Labor Occupational Accident Insurance and Protection Act, Occupational Safety and Health Act, Waste Disposal Act and Regulations for the Management of Setting up Renewable Energy Power Generation Equipment. We have implemented the regulatory compliance system and 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 2021, 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. We have provided a 2021 status report on the management of regulatory compliance to the board of directors in January 2022 to enable the board to understand ASEH's subsidiaries' performance in regulatory compliance and to request corrective actions from the responsible subsidiary. ASEH is committed to pursue a perfect record in legal compliance for all of our business activities.



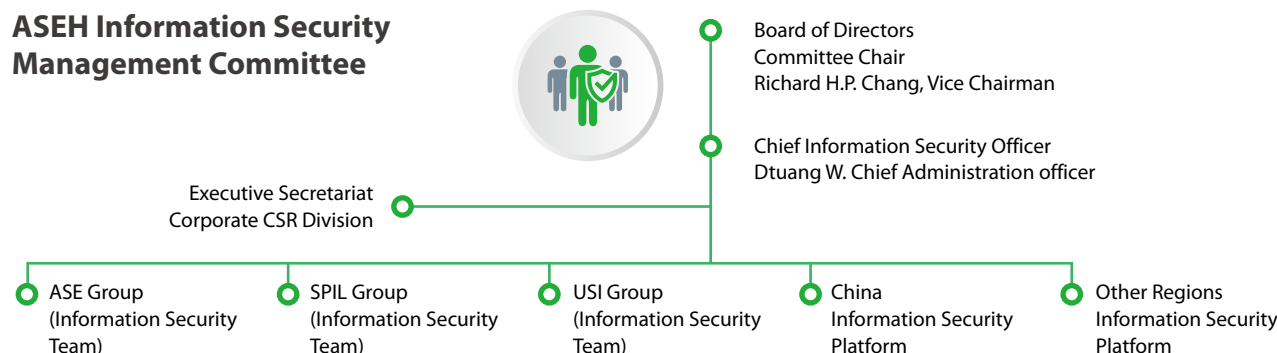
3.7 Information Security Management

Information Security Policy, Organization and Targets

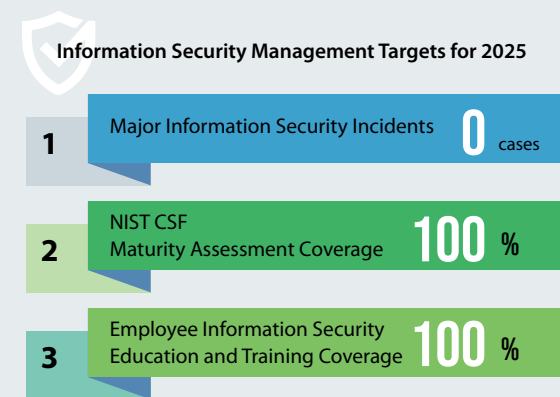
Rapid adoption of digital technologies at ASEH is driving an increased need to strengthen the protection of information assets. To that end, ASEH's Information Security Policy is designed to safeguard the confidentiality and maintain the integrity and availability of all information assets in accordance 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 Chief Information Security Officer (CISO) of the Information Security Management Committee, who is also the Group Chief Administration Officer and Corporate Governance Officer of the Company, assumes responsibility for the establishment of the information security management framework that includes regular reviews with all subsidiaries of ASEH and implementing incident response plans. The committee provides a status report to the Board of Directors in the last quarter of each fiscal year. In addition, the Executive Secretariat of the Company's Corporate CSR Division is responsible for promoting and executing information security-related work, and each subsidiary appoints its information security team as members of the committee to be responsible for implementing information security operations as resolved by the Information Security Management Committee. We regularly hold quarterly meetings of the Information Security Management Committee of ASEH to report and discuss the progress of our information security work, and invite external experts to share information security trends and significant issues.

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 regularly implemented the NIST CSF maturity assessment in all facilities every year. 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_aseh_ismp_en.pdf

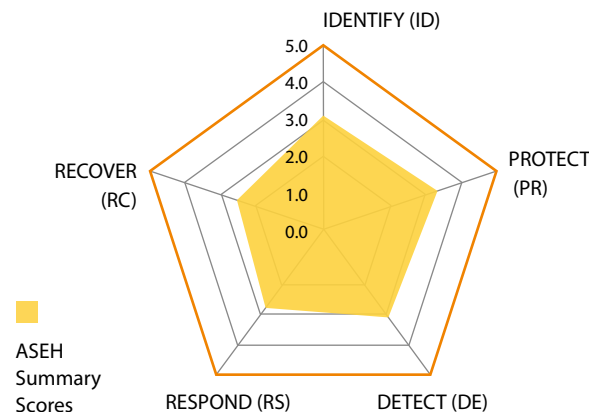
Information Security Assessment and Maturity

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, especially for the availability of continuous assessment to effectively capture the trends of strategy adjustment and strengthening of the organization's overall information security defense system in each year. Since 2019, ASEH, working with external consultants, has formally adopted the NIST CSF maturity assessment mechanism, with the first targets of benchmarking against the semiconductor industry standards and having a better understanding of its own conditions. The target going forward is to refine and enhance various information security requirements year by year. ASEH and its facilities tailor the improvements of their own information security system according to the results and recommendations from the maturity assessments. The Company may also use the maturity assessment results to understand the corresponding information security risks of different regions, countries, or operations. ASEH takes a step further to consolidate its resources and guidance so as to implement and continuously strengthen the foundation of overall corporate information security management.

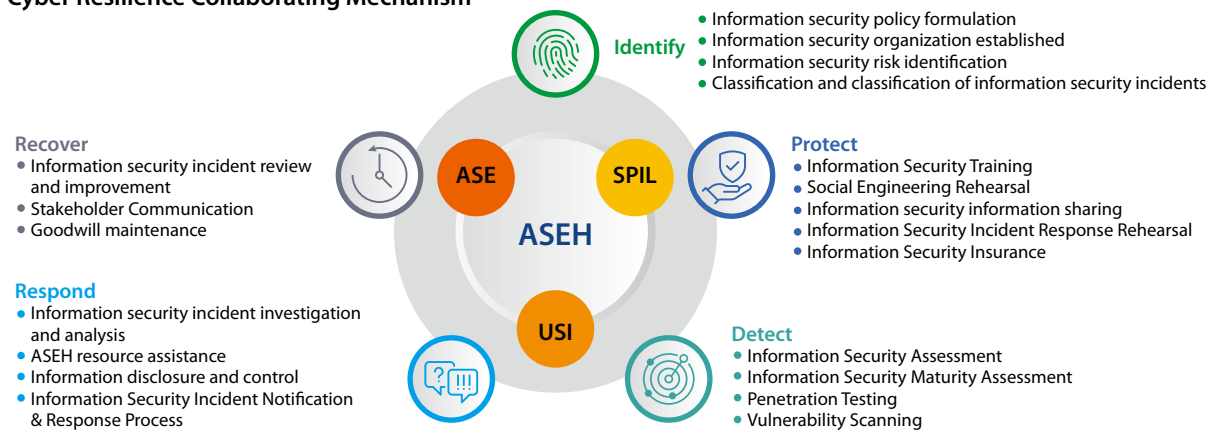
The NIST CSF combines industry standards and best practices to create a management framework for organizations to manage their cybersecurity risks. The framework applies five key functions - identify, protect, detect, respond and recover, to assess an organization's information security maturity for 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. In addition, with the advent of 5G, Internet of Things, and the global smart car era, ASE Kaohsiung has been facing the accelerating digital transition and is the first semiconductor assembly and testing facility in the world to receive the ISO/SAE 21434 international automotive network security standard certification with 100% compliance by being certified by TUV NORD of Germany. Moreover, it passed the mobile communication security certification standard and obtained the GSMA certification. As a manufacturer, it completed a comprehensive audit of the production sites and processes to comply with the UICC production safety standard (GSMA SAS-UP), in order to continuously improve the overall information security protection network as well as management and control mechanism, and to establish an information security management system with comprehensive sustainability mindset and strategy.

Cyber Security Resiliency



Cyber Resilience Collaborating Mechanism



Information Security Implementation and Safeguards

Under the trend of promoting digital transition, ASEH continues to refine information technology (IT) and gradually transfer information security-related experience to operational technology (OT). The Company has further begun to plan and execute OT information security assessment in phases in an attempt to minimize potential threats and risks in OT information security environment through external expert inspection and testing., and 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 over the past three years. Besides formulating the relevant procedures concerning information security incident levels, timely reporting and response, as well as executing an annual information security incident drill, through relevant management mechanisms, we are capable of handling information security incidents in a timely manner, reducing risks, minimizing the scope of damage, and planning for automatic and immediate access to and transmission of information security information, aiming to enhance the overall response and protection capability of information security as well as establish a horizontal joint prevention mechanism regarding the information security. Meanwhile, in response to the serious challenges posed by information security risks to enterprises, ASEH takes risk management as a starting point and information security insurance as a back-end protection method, which covers investment holding companies and any affiliated companies, expecting to respond to and control the impact of hacking in the event of an information security incident and minimize possible information security losses to itself, its customers and suppliers through insurance with quick resumption to normal business operations.

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 2021, 62,195 employees attended the PIP training course clocking in a total of 46,547 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. In addition to focusing on information security technologies and capabilities of the semiconductor industry and high-tech manufacturing, in 2021, ASE Technology Holding maintained close communication with government authorities, domestic and international information security organizations and platforms, while joining the SEMI to jointly develop and launch the SEMI E187 - Specification for Cybersecurity of Fab Equipment, Taiwan's first semiconductor wafer equipment information security standard.

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.



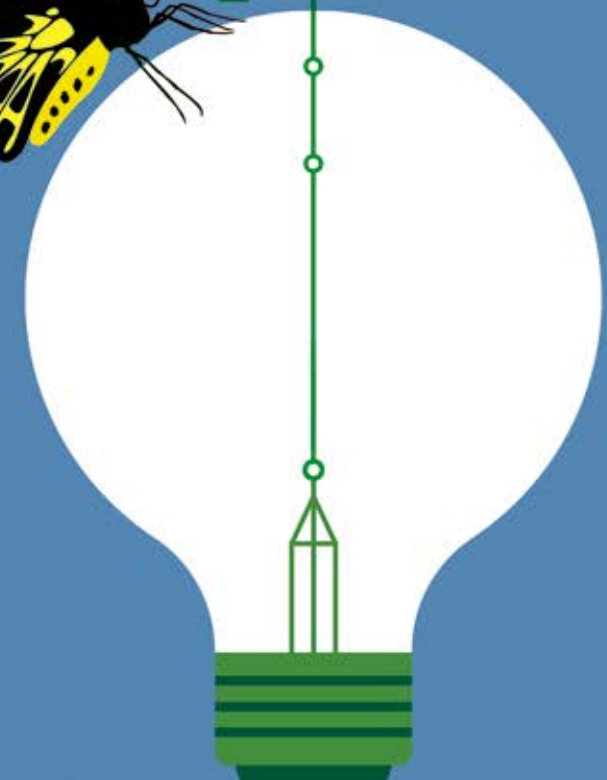
SEMI Semiconductor Wafer Equipment Information Security Standard Released



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 Smart 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, and Improve recyclability, with Enhance product durability.

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 9.1% to NT\$21,053.6 million in 2021, compared to NT\$19,302.4 million in 2020, accounting for 4.0% and 3.7% of operating revenues in 2020 and 2021, respectively. As of December 31, 2021, we had a research and development team of 9,928 employees, an increase of 8.8% compared with 10,890 R&D employees at the end of 2020¹.



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 2021 are as follows:

- (1) Flip Chip Packaging (FCP): technically attested process of 7 and 10 nano chips, the 14 and 16 nano copper-electroplating process/Low-K dielectric FCP application and silver-alloy wires for hybrid flip chip ball grid array packages.
- (2) Wire-bond packaging: development of second generation advanced embedded component packaging, pressure sensor packaging, copper/gold wires with ultra-fine spacing and wire internals, Mobile DRAM, and Fan-Out RDL wire bonding .
- (3) Wafer Level Packaging: Advanced Fan out with bridge die (HDCL), Fan Out DBG (Dicing before grinding) Technology), CPD wafer with 8 Hi HBM Grinding Technology, Through-Wafer Via, glass substrate panel packaging, hexahedral Wafer Level Chip Scale Packaging (WLCSP), Fan-Out PoP Chip product development, and the die-to-wafer fitting process.
- (4) Advanced packaging modules: low power consumption antenna design and packaging, bendable substrate panel and packaging, dual side thinning and wireless communication modules, and 5G antenna packaging product development.
- (5) Panel-Level Packaging: Fan-Out adaptive patterning panel-level packaging.
- (6) Sip Package: High Dk EMC Material with 3D Structure technology development for application on mmWave product.

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 2021, we held 85 seminars with research institutions, 125 workshops with suppliers and equipment manufacturers, and 95 technology blueprint alignment meetings with customers.

¹ In December 2021, the Company disposed of ASE Kunshan, ASE Suzhou, ASE Weihai and Jihjung Semiconductor (Shanghai) to designated subsidiaries of Wise Road Capital. The number of R&D personnel as of the end of December 2021 will not be included in the number of R&D personnel of the Company.

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 2021, a total of 20 manufacturing sites and more than 6,500 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 8,000 technology related data records that had been viewed more than 35,000 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.



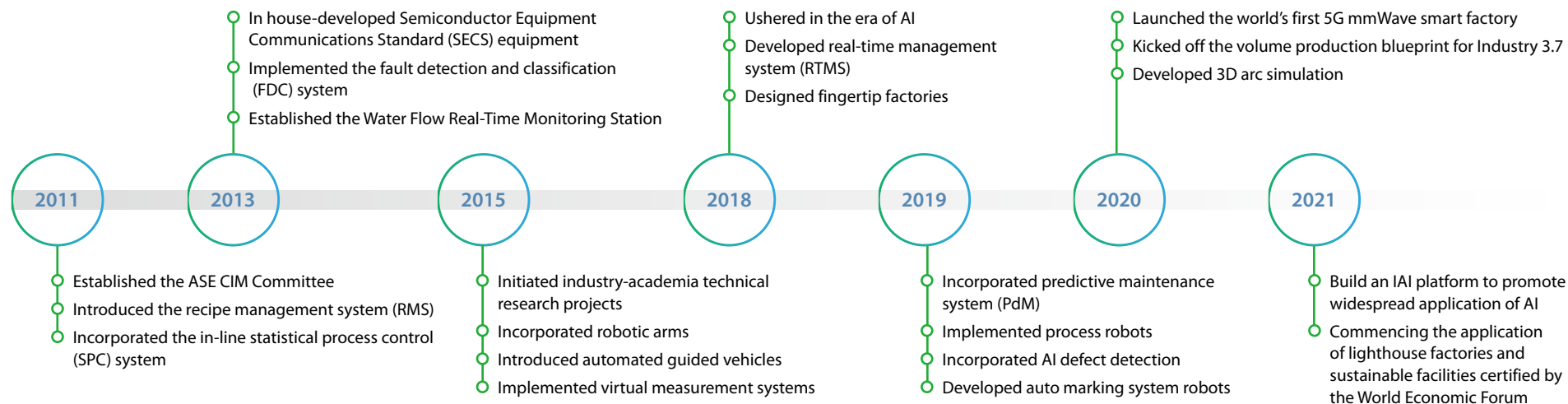
Smart Factories

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 2021, the company has 25 lights-out factories in operation, with more than 600 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 38 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 600 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 factory ▶ 25th light-out factory

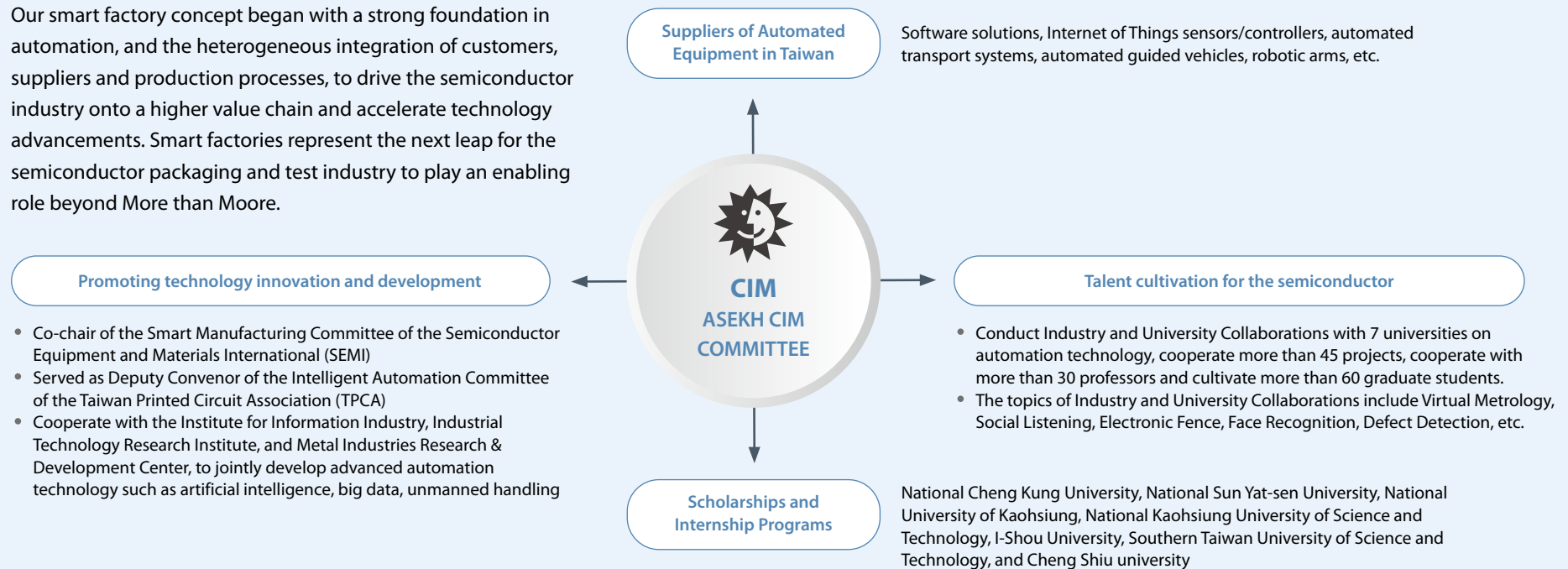


Smart Factory Milestones

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)	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	(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.
2021	Build an IAI platform to promote the universal application of AI	In 2018, ASEH ushered in the era of AI. In addition to actively cultivating AI technology talent, we began to build the IAI platform to create an AI no code environment and promote widespread application of AI throughout the company.

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.



Procurement

- Promoted economic development through local procurement, generating nearly NT\$1.4 billion of output value in equipment supplier and facilitating NT\$450 million¹ in local procurement
- Cultivated approximately 38 local automation suppliers, creating 183 jobs in the supply chain

Manufacturing

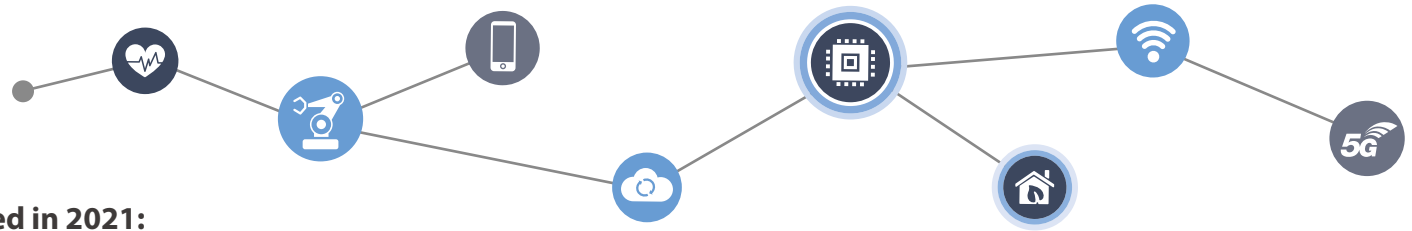
- Increased the value of our human capital through up skilling in automation and AI for more than 600 employees
- Accelerated ASEH's digital transformation in manufacturing, lowered employee overtime, resulting in a reduction of social costs by approximately NT\$100 million²
- Increased the production efficiency, quality, output value and to create the company revenue

Customer Service

- Enabled customers to develop innovative product applications, that provide greater benefits and convenience to society
- Improved product yields shorten time to market, helping customers develop new markets
- Completed 25 lights-out factories in operation and output value generated from smart factories amount to over NT\$10 billion

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 2021:

Technology	Feature
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The IAI (Industrial AI) platform hopes to quickly introduce AI learning, pass on experience through AI, and create a company culture of national AI. As long as data is provided, different prediction models can be built to achieve the purpose of production capacity, quality, and process prediction.

Introduce the popularization of AI platform		Image Recognition	Numerical Analysis	Data Scientist Professor Level	
	Multi-objective	Data Scientist Professor Level	<ul style="list-style-type: none"> Identify Solder Ball in Material Control Ball Short & Shift Detection 	<ul style="list-style-type: none"> Key factor analysis for yield improvement Predictive Maintenance Time-Series Analysis 	<ul style="list-style-type: none"> Variance analysis Vibration analysis for SmartTag Time-Series Anomaly detection
	No-Code	Democratizing AI for Everyone	CV Platform	PV Platform	AD Platform

RPA (Robotic Process Automation)

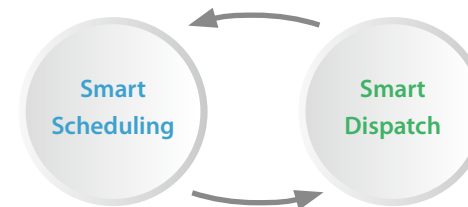
RPA is a software bot uses a combination of automation, computer vision and machine learning to carry out a ton of mundane and repetitive computer-based tasks at error-free, high volume and speed that are previously handled by humans.

5,018 RPA (Cumulative to 2021)



RTD (Real Time Dispatcher)

RTD (Real Time Dispatcher) aims at maximizing efficiency and output, considering various production conditions, using powerful computers and big data to develop intelligent dispatching systems and automatic dispatching systems to shorten the production cycle.



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:

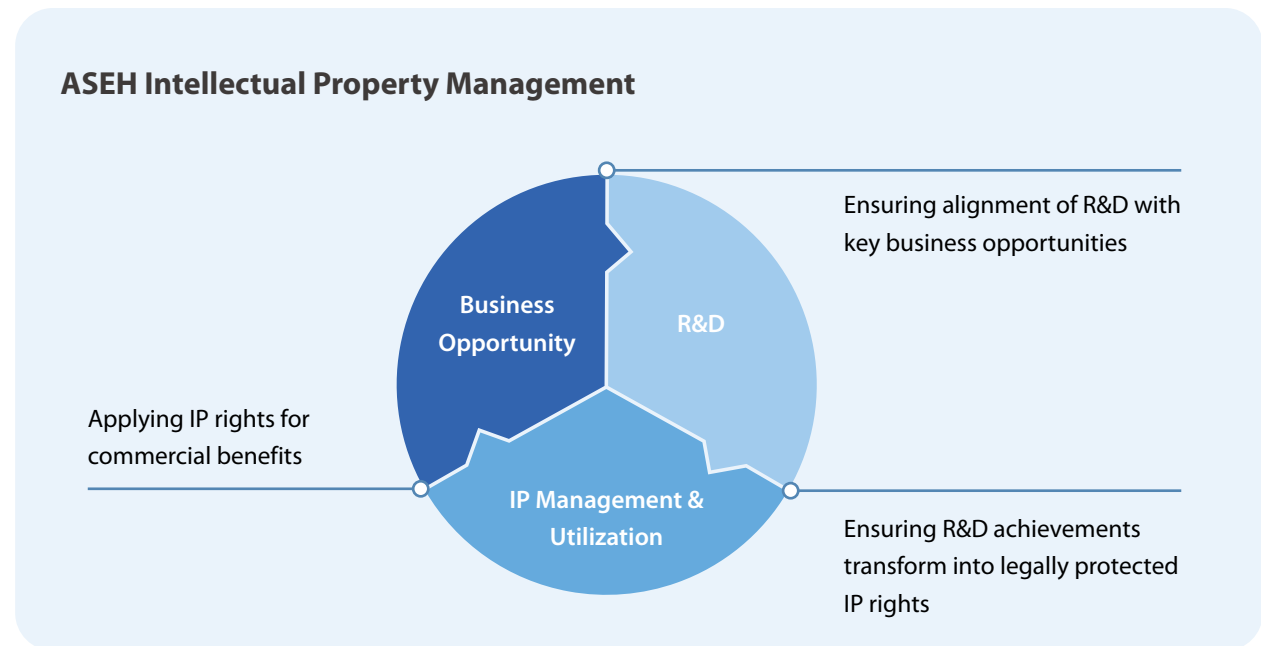
- 1) To maintain ASEH’s technology leadership and to better respond to future market needs, the company invests aggressively in research and development, aligns R&D with key future business opportunities and invests heavily in talent development and R&D resources.
- 2) Our robust IP application system 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



Advanced Semiconductor Engineering, Inc., the subsidiary of ASEH, first applied and successfully obtained the Taiwan Intellectual Property Management System (TIPS) certification issued by the Industrial Development Bureau of the Ministry of Economic Affairs in 2021. Based upon the foundation of long-term practices on intellectual property management, ASEH further enhanced the scheme of its intellectual property management, strengthened employees' intellectual property value awareness, intensify all aspects of protections of R&D achievements, and promoted the trust of its shareholders and customers in company by introducing TIPS framework and obtaining external certification.

As of January 31, 2022, ASEH owned 5,762 patents, primarily in various assembly and testing technologies as well as electronic manufacturing services technologies, including 2,278 patents in Taiwan, 1,765 patents in the U.S., 1,679 patents in the People's Republic of China, 13 patents in Europe and 27 patents in other countries¹.

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

¹ In December 2021, ASEH disposed of ASE Kunshan, ASE Suzhou, ASE Weihai and ASE Advanced Semiconductor (Shanghai) to designated subsidiaries of Wise Road Capital, whose patents will not be included in the number of patents owned by the Company starting from 2022. As of December 31, 2021, the four aforementioned companies owned 3 patents in Taiwan, 1 patent in the U.S. and 158 patents in the People's Republic of China.

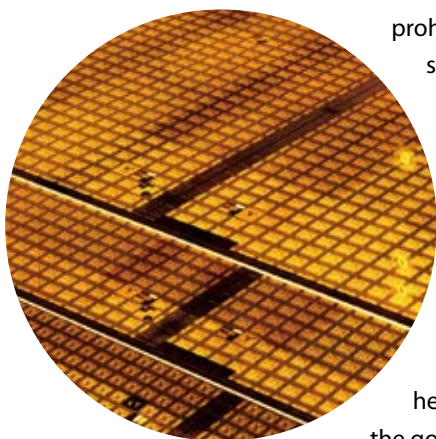


4.2 Sustainable Manufacturing

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 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. We also continue to cooperate with the competent authorities, academic experts and scholars to obtain more technical resources and applications to overcome bottlenecks in the R&D process, and gradually eliminate environmentally hazardous chemicals in the manufacturing process of ASEH. At the same time, ASE Kaohsiung also won two awards in the 2nd Green Chemistry Application and Innovation Awards in 2021, gradually realizing the vision of sustainability and implementing the management mechanism, providing employees with a safe and healthy environment to work with peace of mind, and moving towards the goal of green industry.



Production Commitments

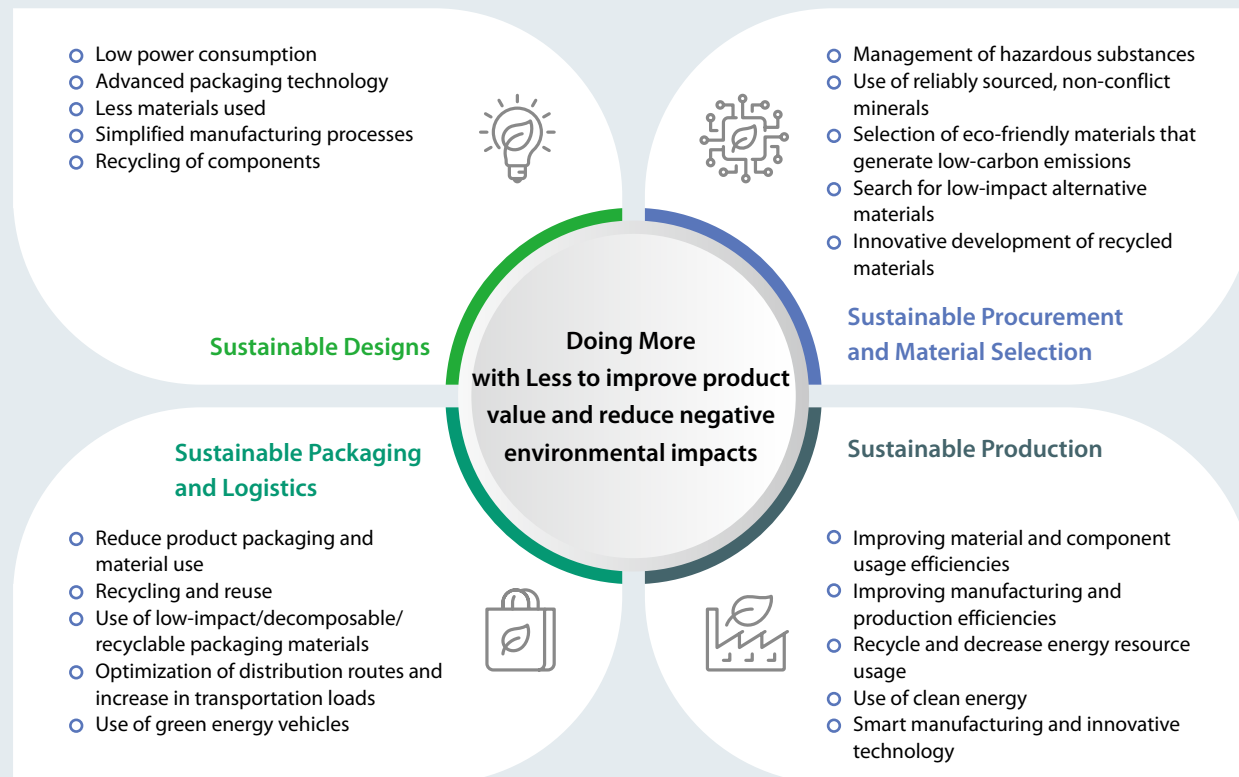
- Compliance with all applicable laws and regulations
- Management of hazardous substances in components and raw materials used in manufacturing
- Solutions for the design of lightweight, thin, small and energy-efficient products
- Reducing the environmental impact from manufacturing, packaging, and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

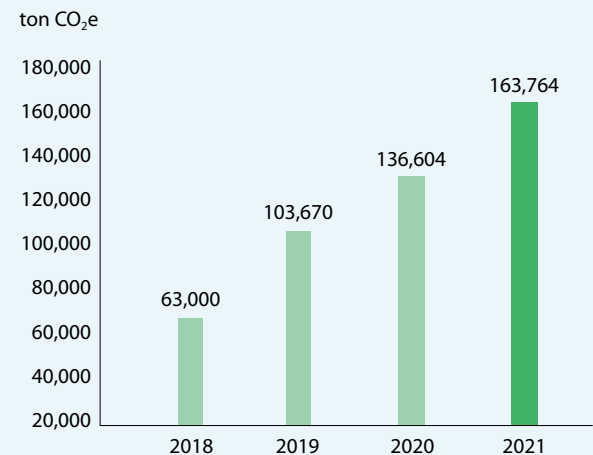
ASEH is looking to increase its product value while lessening environmental impacts.

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

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 2021

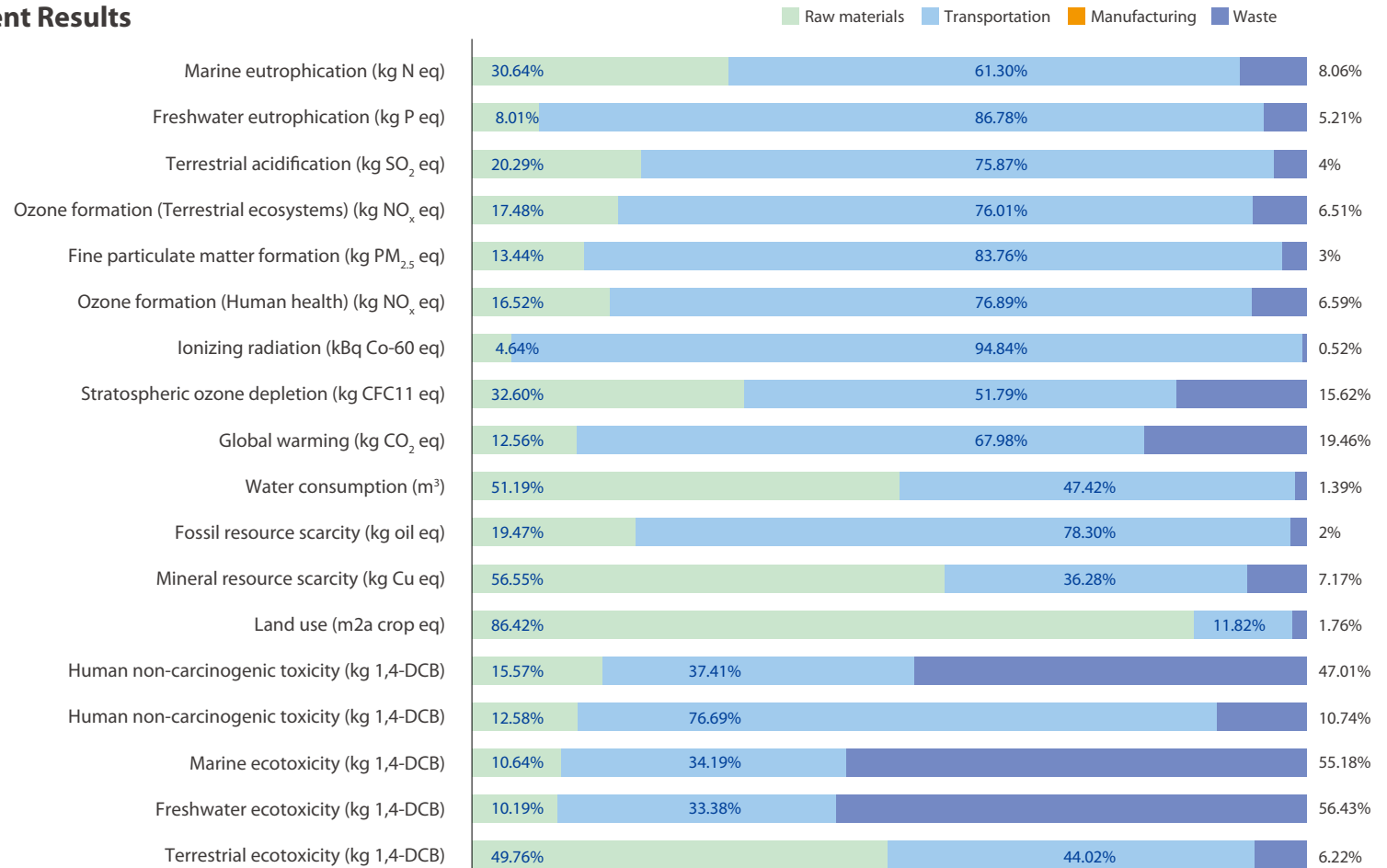
Category	Product Series	Carbon Footprint	Eco-efficiency Assessment/ Environmental Footprint	Improvement Strategies and Actions
Assembly	BGA	●	●	Design <ul style="list-style-type: none"> Consider factors such as product lifecycle, circulation and eco-efficiency during the design stage Develop a new generation 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	★	★	
	LED Drive Board	▲	▲	

We continue to extend our product lifecycle assessment and collaborate with professional teams, using the assessment software SimaPro and ReCiPe 2016 Midpoint(H) methodology to discuss the impact of our products on 18 environmental aspects. Take Printer Head as an example, from the results of carbon footprint and environmental impact ranking of key raw materials, the influence of the manufacturing stage on most of the indicators is more significant. Therefore, in the future, we will reduce the proportion of traditional electricity input in the manufacturing process and procure green energy to replace part of the electricity use in an attempt to minimize the damage impact arising therefrom.



Product Life Cycle Assessment Results

Printer Head



4.3 Products and Service

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.

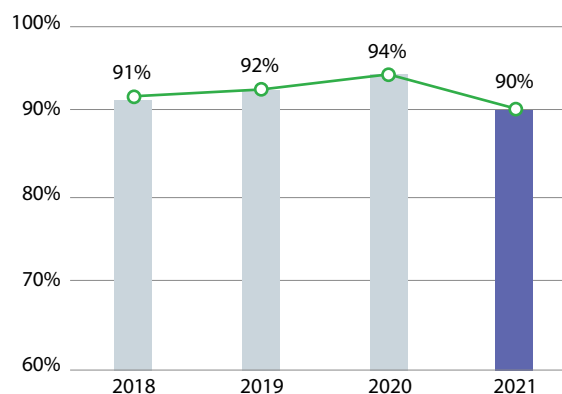
Customer Service

Our key customers typically operate in the semiconductor and electronics industries. Our five largest customers together accounted for approximately 51.1%, 54.5% and 49.6% of our operating revenues in 2019, 2020 and 2021 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 2021.

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 (In 2021, account for > 90% of the company's revenues)



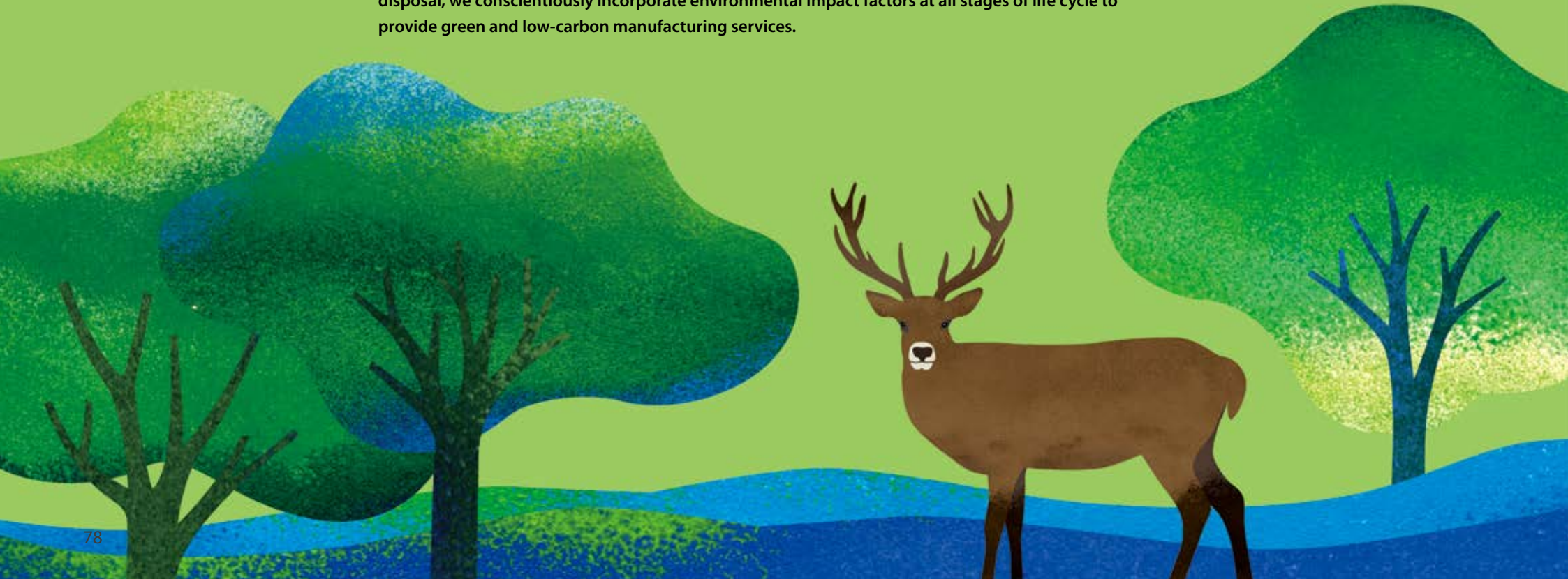


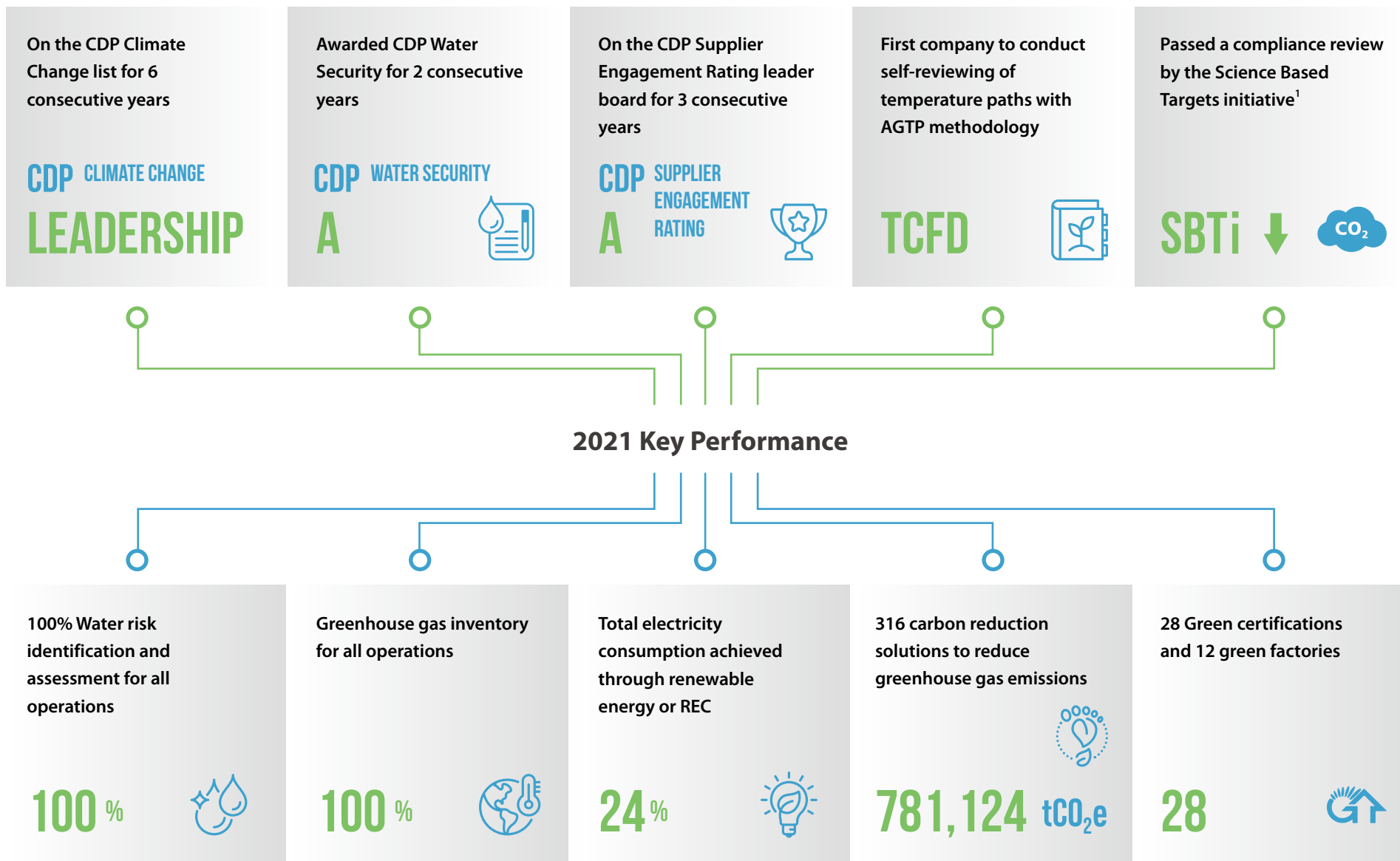
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GREEN MANUFACTURING AND LOW-CARBON TRANSFORMATION

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 an 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.





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.

SDGs	Business Actions and Contributions	2021 Key Aspects	KPI	2021 Target	Status	2021 Performance	2022 Target	2030 Target
	<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)	6% reduction compared to 2015	Achieved	67% reduction compared to 2015	7% reduction compared to 2015	15% 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
	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	Energy Management	Energy saving rate achieved through energy saving and carbon reduction projects	Equivalent to 2% of the electricity demand in 2021	Achieved	Equivalent to 28% of the electricity demand in 2021	Equivalent to 2% of the electricity demand in 2022	Equivalent to 2% of the electricity demand in 2030
	Develop and implement business models that deliver sustainable energy and energy efficiency technologies to new markets and communities		Renewable energy ¹ ratio	Renewable energy consumption accounts for 15% of total electricity consumption	Achieved	Renewable energy consumption accounts for 24% of total electricity consumption	Renewable energy consumption accounts for 18% of total electricity consumption	Renewable energy consumption accounts for 42% of total electricity consumption
	<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	95%	90%	90%
			Hazardous-waste intensity (hazardous waste output/revenue)	6% reduction compared to 2015	Achieved	45% reduction compared to 2015	7% reduction compared to 2015	15% reduction compared to 2015
	Align with science-based climate targets to substantially reduce emissions associated with our business and supply chain operations	Climate Change	GHGs intensity (scope 1 & 2 emission/revenue)	6% reduction compared to 2015	Achieved	50% reduction compared to 2015	7% reduction compared to 2015	15% reduction compared to 2015
			Absolute GHGs reduction (Scope 1 and 2)	12.5% reduction compared to 2016	Achieved	13% reduction compared to 2016	15% reduction compared to 2016	35% reduction compared to 2016
			Absolute GHGs reduction (Scope 3)	1.5% reduction compared to 2020	Achieved	23% reduction compared to 2020	1.5% reduction compared to 2020	15% reduction compared to 2020

¹ Renewable energy or REC



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.

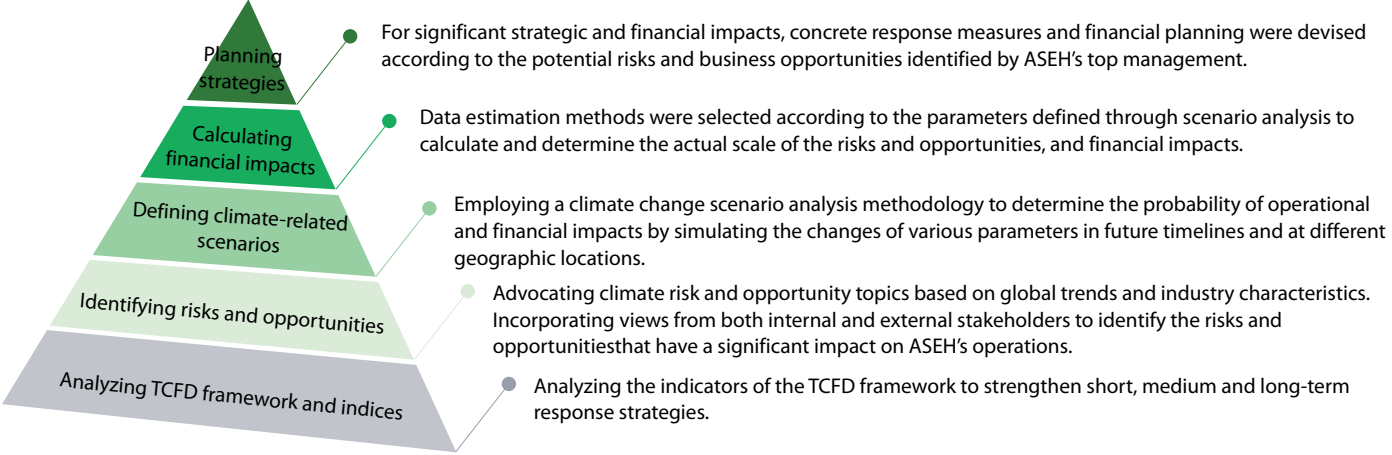
The Environment & Green Innovation Taskforce under the ASEH Corporate Sustainability Committee adopts a flexible management approach in its role as a coordinator. In order to track the progress of targets, an environment performance dashboard is used to dynamically track data on electricity consumption, 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.

5.1 Climate Leadership

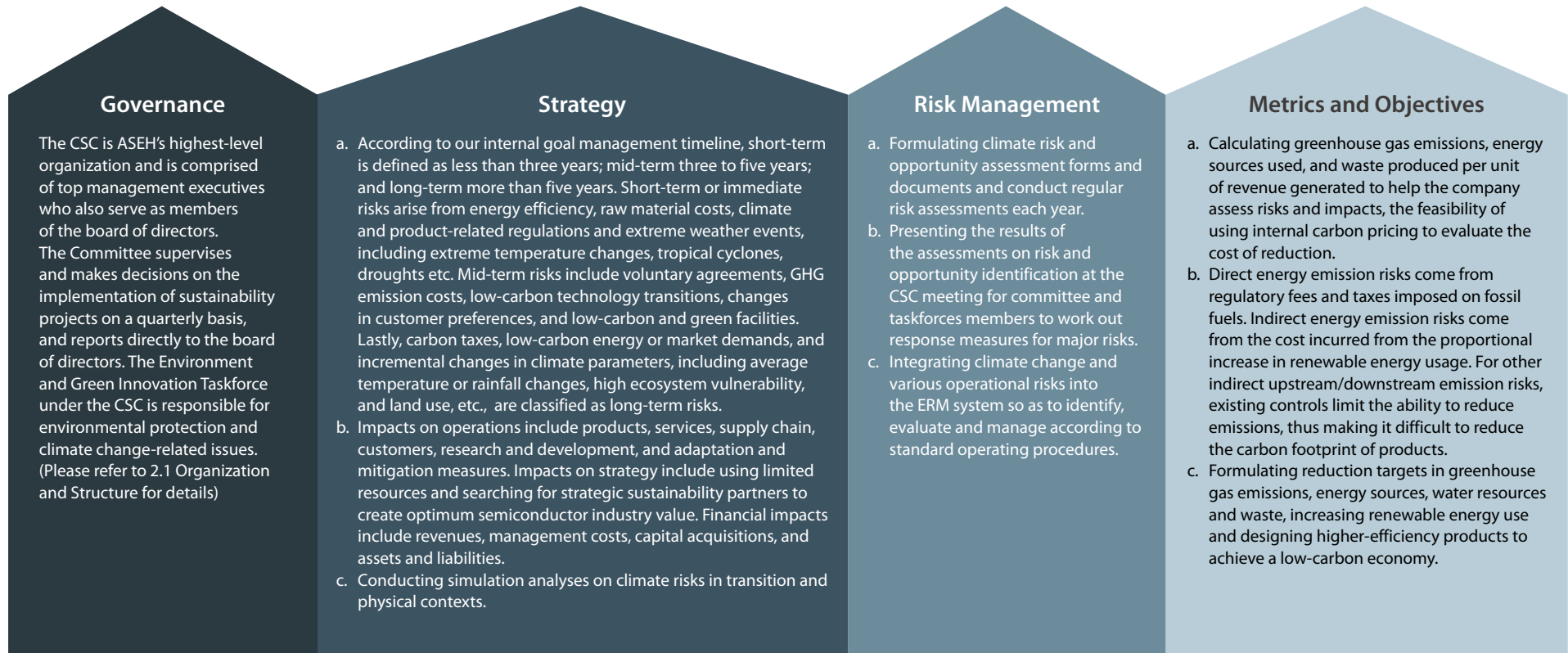
Transitioning towards Low-Carbon Resilience

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. To meet the expectations of stakeholders, we issued our first Task Force on Climate-related Financial Disclosures, (TCFD) report¹ this year, which publicly disclosed our net zero emission plans, targets, and strategies.

¹ TCFD report complete electronic version can be downloaded from our website. <https://www.aseglobal.com/en/pdf/2021-tcf-d-report-en.pdf>

Four Major Milestones	Principal Methodology		
<p>1</p> <p>Low-carbon strategies</p>	<ul style="list-style-type: none"> ✓ Low-carbon energy resource diversification: promoting low-carbon development through energy saving, green energy and energy storage. ✓ Smart green facilities: building low carbon buildings and factories which use resource recycling and smart technologies to manage operations and production. ✓ Innovative technology and investments: invest in renewable energy or carbon capture and storage technologies 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. 		
<p>2</p> <p>Comprehensive management framework</p>	<p>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.</p>		
<p>3</p> <p>Socially responsible actions</p>	 <ul style="list-style-type: none"> For significant strategic and financial impacts, concrete response measures and financial planning were devised according to the potential risks and business opportunities identified by ASEH's top management. Data estimation methods were selected according to the parameters defined through scenario analysis to calculate and determine the actual scale of the risks and opportunities, and financial impacts. Employing a climate change scenario analysis methodology to determine the probability of operational and financial impacts by simulating the changes of various parameters in future timelines and at different geographic locations. Advocating climate risk and opportunity topics based on global trends and industry characteristics. Incorporating views from both internal and external stakeholders to identify the risks and opportunities that have a significant impact on ASEH's operations. Analyzing the indicators of the TCFD framework to strengthen short, medium and long-term response strategies. 		
<p>4</p> <p>Performance-oriented results</p>	<p>Adaptation:</p> <ul style="list-style-type: none"> ✓ 100% 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. 	<p>Mitigation:</p> <ul style="list-style-type: none"> ✓ 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. ✓ Implement supplier carbon inventory (ISO14064 and ISO14067) and provide assistance in achieving carbon reduction. 	<p>Strategic and Financial Planning:</p> <ul style="list-style-type: none"> ✓ Evaluate the financial impacts of climate change risk and opportunity, publish climate-related financial reports, and continue to participate in DJSI and CDP surveys. ✓ Development of a long term blueprint for value chain partners, participation in customer's Supplier low-carbon transformation and producing low-carbon products. ✓ Launching two green bonds totaling US\$600 million and sustainability-linked loans 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

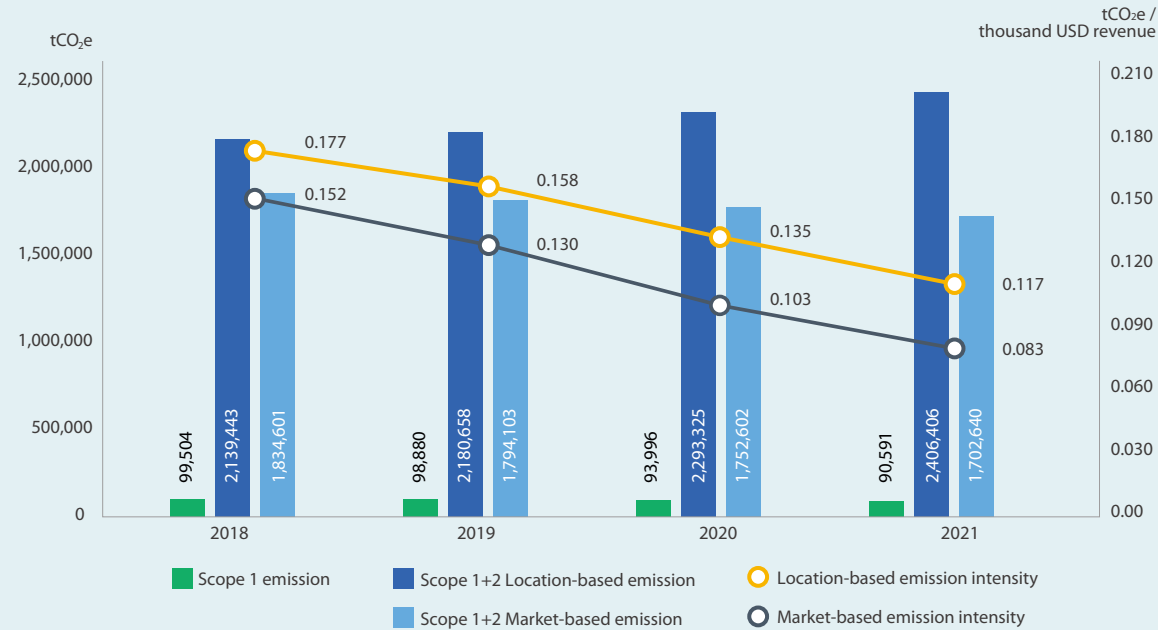


Greenhouse Gas Emissions Management

	Emissions (tCO ₂ e)	Means of Reduction
Scope 1	90,591	<ul style="list-style-type: none"> • Optimizing the use of process gasses and installing removal device (including PFCs) • Searching for low-carbon substitute
Scope 2 (market-based)	1,612,049	<ul style="list-style-type: none"> • Low-carbon energy transformation: renewable energy or certificates ratio: 24% • Increasing energy efficiency
Scope 3	16,231,394	<ul style="list-style-type: none"> • Collaborating with value chains to reduce carbon • Promoting low-carbon transportation

In 2021, all ASEH facilities followed the ISO 14064-1 guidelines for GHG quantification and reporting, and according to market-based¹ calculations, emitted a total of 1.7 million tCO₂e², reaching our goal of reducing GHG emission intensity by 50% compared to the base year 2015. 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 2021, 15 facilities passed the ISO 50001 certification, reaching a coverage rate of 59%. We have also begun large-scale renewable energy procurements in order to meet the 2030 reduction target and gradually move toward zero emissions. The Scope 3 reporting which focused on GHG reductions in the areas of goods and services purchased, accounted for 84% of emissions. We proactively collaborated with our value chain on carbon reduction programs including technology sharing, cross-industry cooperation, infrastructure assistance. ASEH plans mid/longterm 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.

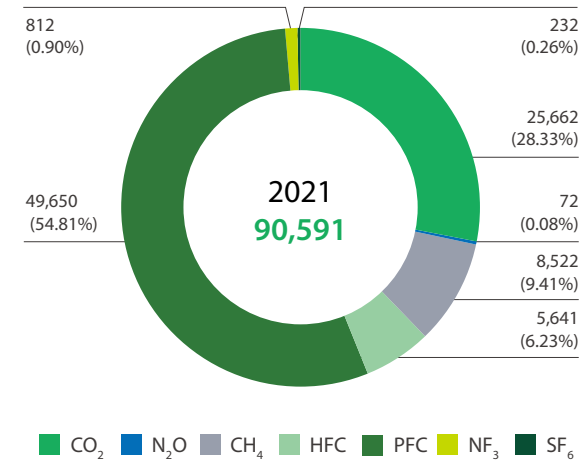
Greenhouse Gas Emissions and Intensities



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

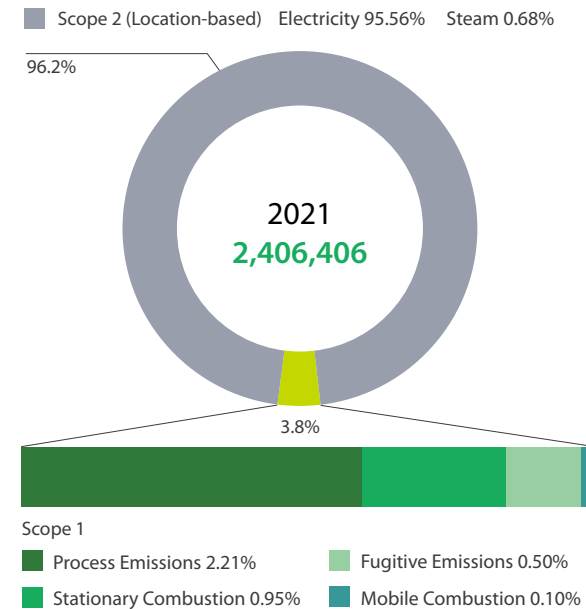
Scope 1 Emission Ratio

Unit: tCO₂e



Scope 1 & 2 Emission Category and Ratio

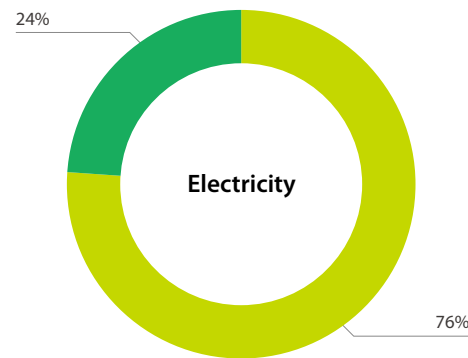
Unit: tCO₂e



2021 Scope 3 Emissions

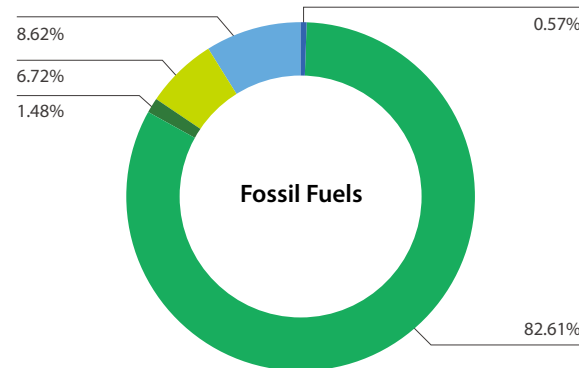
Emission Source	Emission (tCO ₂ e)	Emission factor	Reduction Courses of Action
Purchased goods and services	13,608,691	Ecoinvent3.5	Prioritize the purchase of low-carbon materials
Capital goods	1,191,040	Ecoinvent3.5	Prioritize the purchase of low-carbon equipments and build low carbon facilities
Fuel- and energy-related activities	548,114	Carbon footprint information platform	Progressively increase the use of clean energies and renewable energies
Upstream transportation and distribution	75,938	Ecoinvent3.5	Implement green distribution and simplify logistics packaging
Downstream transportation and distribution	80,751	Ecoinvent3.5	
Waste generated in operations	23,695	Carbon footprint information platform	Promote circular economy and increase the resource recycling rate
Business travel	449	Carbon Footprints of Local Public Transportation	Rationalize business travels
Employee commuting	93,337	Carbon footprint information platform	Promote public transportation
Upstream leased assets	4,922	Swiss Input Ouput Databas	Improve energy efficiency
Downstream leased assets	33,118	Ecoinvent3.5	
Investments	571,339	EXIOBASED	Invest in sustainable industries
Total	16,231,394		

Energy Resource Management¹



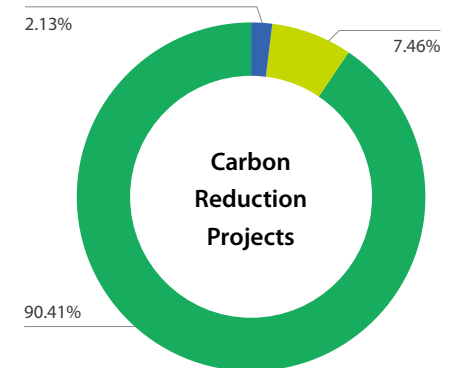
Electricity	MWh
Electricity Consumption	4,285,155
Non-renewable Electricity	3,255,018
Renewable Electricity or REC	1,030,137

■ Renewable Energy
 ■ Non-renewable Energy



Petrochemicals (Non-renewable fuels)	GJ	MWh
Liquefied Petroleum Gas (LPG)	2,273	631
Liquefied Natural Gas (LNG)	332,561	92,378
Gasoline	5,972	1,659
Diesel	27,231	7,564
Heavy Oil	34,703	9,640

■ Liquefied Petroleum Gas(LPG)
■ Liquefied Natural Gas(LNG)
■ Gasoline
■ Diesel
■ Heavy Oil



Carbon Reduction Projects	tCO ₂ e
Process	16,652
Building Services	58,285
Low-carbon Energy	706,187

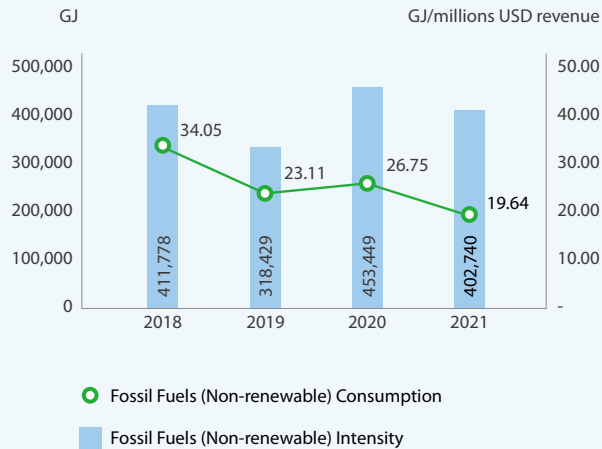
■ Process Energy Savings
 ■ Low-carbon Energy
 ■ Building Services Energy Savings

¹ Total energy consumption within the organization =(non-renewable fuel consumption) + (renewable fuel (electricity) consumption)+ (purchased electricity, heating, cooling and steam).

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 402,740 GJ² in 2021. Among them, gasoline used in stackers and emergency power generators accounted for the highest proportion of 82.57%. 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.

Fossil Fuels (Non-renewable) Consumption and Intensity

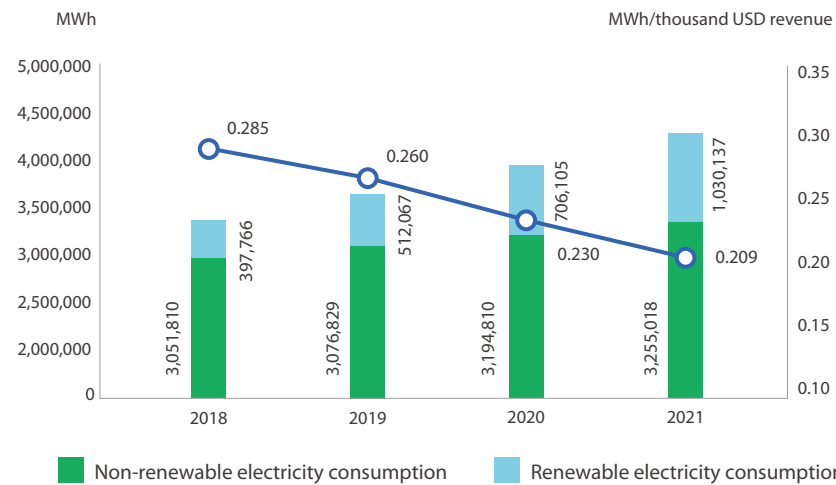


1. Fossil (Non-renewable Energy) are used in: (a) Facilities: Emergency power generators, furnaces, (b) Distribution: Stackers, company vehicles, (c) Air pollution preventive equipment.
2. The calorific value of fuel refers to the unit calorific value table of energy products.

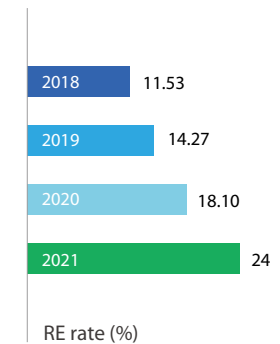
Energy Conservation and Carbon Footprint Reduction

ASEH aims to strengthen its climate resilience by increasing the use of low-carbon energy and developing a diversified power supply portfolio. In 2021, our total energy consumption is 4,285,155 MWh. Electricity consumption increase by 9.8% compared to that in 2020, due to the 21% capacity expansion of subsidiaries. However, with the construction of automated facilities in recent years, production efficiency has increased significantly, resulting in an approximately 9.2% decrease in electricity consumption intensity per unit of revenue and an approximately 10.7% decrease in electricity consumption intensity per unit of output compared to that in the previous year. 65% of our global facilities use electricity from renewable sources including RECs. Our renewable electricity usage totaled 1,030,137 MWh and accounted for 24% of total energy consumption. 13 of our global facilities obtain 100% of their electricity from renewable energy sources including RECs. ASEH proactively promotes low carbon energy transition and integrates its 3 major subsidiaries in establishing a renewable energy platform. Taiwan's regulation requires electricity users to install renewable energy power generation facilities when the volume of the chartered capacity on electricity consumption agreements is exceeded. Therefore, all our Taiwan facilities will meet the regulation in advance by 2023. Meanwhile, we continue to prepare for renewable energy procurement and make investments in clean energy.

Electricity Consumption and Intensity



Renewable electricity rate



Installing Solar Photovoltaic 387 MWh

- ASE <1%_ Kaohsiung (34 MWh)
<1%_ Wuxi (0.55 MWh)
5%_ ISE Labs (352 MWh)

Purchasing Renewable Energy 3,416 MWh

- ASE 2%_ Kunshan (2,005 MWh)
- SPIL <1%_ Suzhou (1,411 MWh)

Purchasing Renewable Energy Certificates 1,026,334 MWh

- ASE
 - > 100%_ Kunshan(57,857 MWh), Wuxi(5,805 MWh), Weihai(59,040 MWh), Suzhou(124,794 MWh), Advanced Semiconductor (Shanghai) (87,125 MWh), ISE Labs China(2,276 MWh), Shanghai (Material) (106,384 MWh), Malaysia (134,473 MWh)
 - > <1%_ Kaohsiung(26 MWh)
- USI
 - > 100%_ Zhangjiang(109,478 MWh), Jinqiao(47,215 MWh), Shenzhen(30,415 MWh), Kunshan(31,027 MWh)
 - > 30%_ Mexico(4,185 MWh)

- SPIL
 - > 100%_ Suzhou(226,193 MWh)
 - > <1%_ Da Fong(41 MWh)

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. 316 projects carried out in 2021 effectively reduced 781,124 tCO₂e in carbon emissions. In addition to using energy management systems to increase energy use efficiency, we encourage and motivate facilities to strive towards efficiency improvements through technology sharing and competitions. We also 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	Energy Saving(MWh)	Energy Saving(GJ)	Carbon Reduction(tCO ₂ e)	Reduction Scope
Process ¹	32,267	8,963	16,652	Scope 1+2
Building ²	44,741	12,428	58,285	Scope 2
Low-carbon energy			706,187	Scope 2

¹ Process carbon reduction includes process efficiency improvement and installation of on-site processing equipment for Fluorine-containing process, and accounts for 32,267,551 MWh (8,963,208 GJ) of energy saving.

² Building carbon reduction includes energy saving in lighting, air conditioning, air pressure, pump, treatment equipment, pure/wastewater and power systems, and accounts for 44,740,756 MWh (12,427,988 GJ) of energy saving.

Lighting System

1,468
MWh

748
tCO₂e

Air conditioning System

24,455
MWh

47,663
tCO₂e

- Implement smart control
 - Use high-efficiency LED
 - Implement smart control and adjust parameters
 - Replace low-efficiency equipment

Pneumatic System

15,630
MWh

8,274
tCO₂e

Energy Saving Pumps

301
MWh

151
tCO₂e

- Prevent leakage
 - Replace low-efficiency equipment
 - Use high-efficiency equipment
 - Install vary frequency drives

Preventive Equipment

143
MWh

72
tCO₂e

Enhanced Performance

32,268
MWh

16,652
tCO₂e

- Optimize control
 - Reduce pressure loss and raise efficiency
 - Integrate processes
 - Optimize parameters
 - Use high-efficiency equipment
 - Heat- recovery equipment

Pure/waste Water Systems

2,282
MWh

1,146
tCO₂e

Electric Power System

461
MWh

231
tCO₂e

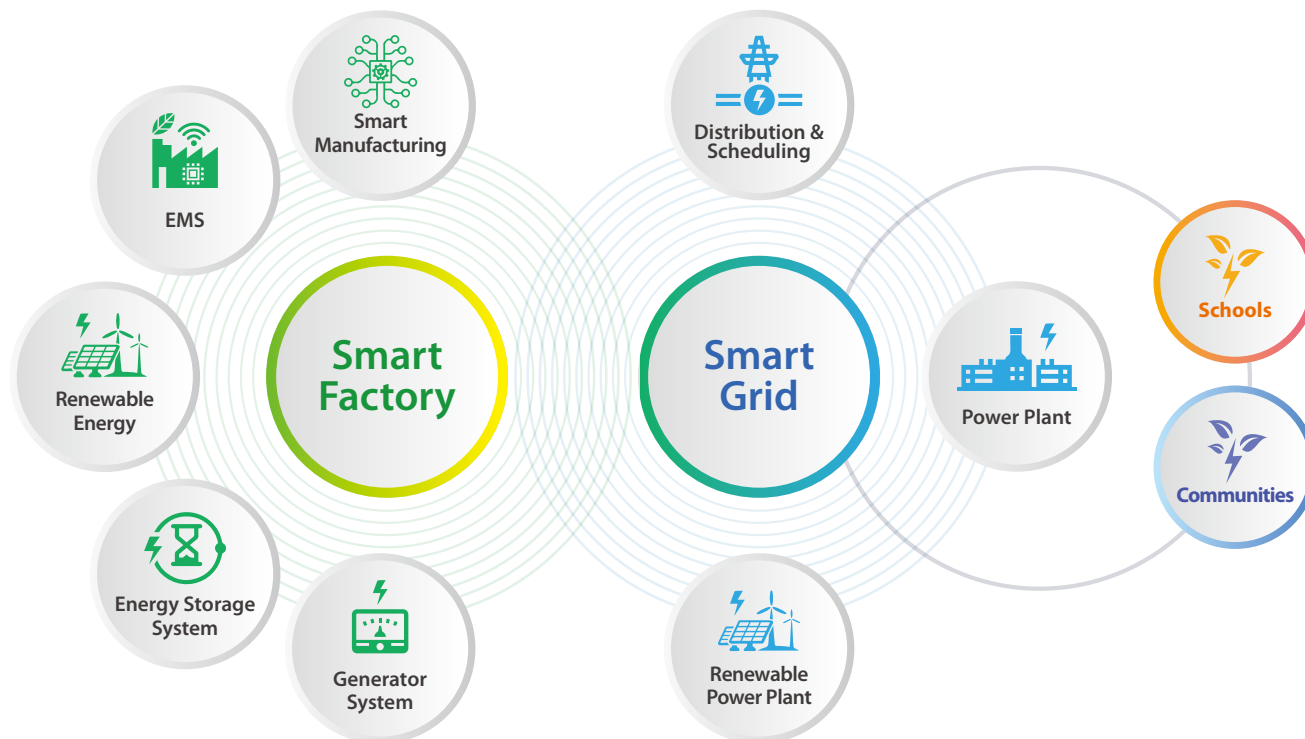
- Replace low-efficiency equipment
 - Install high-efficiency systems



Smart Grid

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. ISE Labs in the United States have installed solar photovoltaic and energy storage systems to generate their own electricity. Any excess electricity is stored in the energy storage system for use during peak hours and also for use as backup power, which can last up to two hours.

We also share our experiences and practices with local schools. In 2020, we assisted a junior high school in installing a smart microgrid system to create a smart school ground. In 2021, we helped a senior high school to build a smart monitoring system and find more effective ways to conserve energy. We also introduced courses on renewable energy and energy conservation so that the seeds of sustainability can spread and thrive starting from education. With our facilities as the starting point, we expanded smart grids to schools. From thereon, we will continue to contribute and share our expertise, starting from our facilities and then expanding to cities and the greater society, with such efforts also serving to benefit the environment.



5.2 Water Resource

Risk Assessment

ASEH collaborated with a team of project consultants to determine the water risks of its facilities worldwide. The Aqueduct risk assessment tool, which is an open-source database developed by the World Resource Institute (WRI), was used to identify the baseline water stress of each facility. In 2019, we performed climate-related water risk analyses on eight main facilities in Taiwan, using data published by Taiwanese authorities as a replacement for data in the original database. Actual management situations within each facility were also considered to bridge the gap in the database. The water risk analysis performed on all our facilities worldwide in 2021 was combined with NASA's information on climate change to bridge the gap in domestic and foreign databases. The analysis was also integrated with information on the water consumption of each facility to consider a facility's vulnerability to water shortage risk and effectively link regional risks to the actual operational risks of each facility. Subsequently, we developed a drought risk impact evaluation framework (Figure 1) based on the "water risk of areas affected by climate change" and "water vulnerability of a facility."

As recommended by the TCFD, we selected scenarios that cover a reasonable variety of future outcomes, both favorable and unfavorable, taking into consideration the optimistic (OPT²; SSP2, RCP 4.5), business-as-usual (BAU³; SSP2, RCP 8.5), and pessimistic (PES⁴; SSP3, RCP 8.5) climate scenarios. We then estimated losses due to water shortage (Table 1) by using the Standardized

Precipitation Index (SPI), and analyzed two time points: 2030 and 2040, where the former represents data that cover a decade before and after 2030 and the latter represents data spanning 2030 to 2050. We simulated the impact of water shortage in the last ten years and up to 2050, targeting two points of time (2030 and 2040) and three scenarios (OPT, BAU, and PES) for a total of six combinations in the analysis, which served as the basis for assessing physical and transition risks.

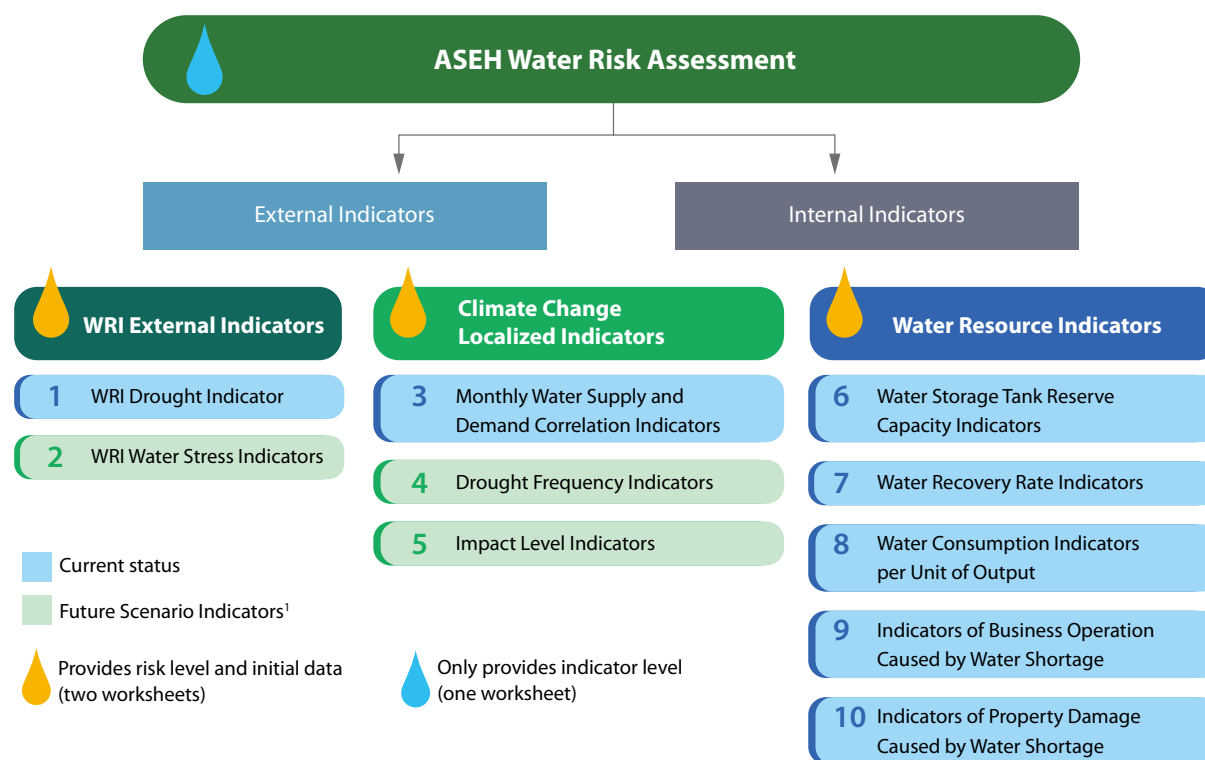


Figure 1. Integrated Water Supply and Demand Risks of ASEH Facilities

¹ Future scenario indicators provide two sets of target times (2030, 2040) and three scenarios (OPT, BAU, PES), for a total of six combinations

² OPT: Optimistic

³ BAU: Business as usual

⁴ PES: Pessimistic

According to IPCC, climate risk is a function of hazards, exposure, and vulnerability. Based on this analysis result, all facilities of ASEH were exposed to Levels 2 to 4 risk of regional water shortage; the indicator of water consumption in the facilities exhibited significant differences and ranged from Levels 1 to 5, with most of the facilities concentrated in the moderate-to-low risk area. Facilities at high risk of water shortage can mitigate future drought-related physical and transition risks by recycling more process water, establishing a central water management system, increasing their backup water reservoir, or reducing reliance on groundwater.

Regarding water risk assessment, we applied the concept of river basin management to present the potential hazards, exposures, and vulnerability factors of physical risks separately, thus providing a basis for future adaptation and risk classification. In the future, we will develop water risk assessment and analysis tools to manage the water risks of our facilities, determine risks related to local water supply and demand, and analyze the tolerance of key facilities. Where necessary, we will formulate risk adaptation measures based on risk assessment results and improve the resilience of our facilities accordingly to continuously strengthen our ability to arrange backup water supplies and to use water resources more efficiently. In addition, ASEH addressed the effect that different scenarios have on the organization's financial status, and integrated management systems into risk management systems to increase the trust of investors. We employed the method that financial institutions use to evaluate group operations, as the basis for assessing the effect of water risks on our financial performance. We strengthened the trust of stakeholders and leveraged communications by utilizing external assurance to evaluate the process of our organizational management. With respect to supplier water management, we requested suppliers to comply with the code of conduct for suppliers, which stipulates that suppliers shall adopt resource management plans to record/classify/monitor the use and discharge of their water resources, and seek effective ways to save water and implement pollution control.

Climate Scenario	Timepoint	WRI	NASA	SPI-estimated Loss due to Water Shortage
OPT ¹	2030s, 2040s	SSP2 RCP4.5	RCP4.5	RCP8.5
BAU ²	2030s, 2040s	SSP2 RCP8.5	RCP8.5	RCP8.5
PES ³	2030s, 2040s	SSP3 RCP8.5	RCP8.5	RCP8.5

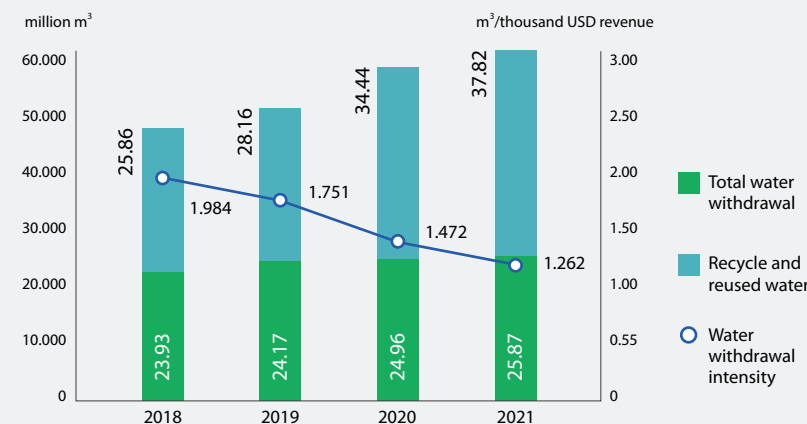
¹ OPT: Optimistic
² BAU: Business as usual
³ PES: Pessimistic

Table 1. Climate Scenario Explanation

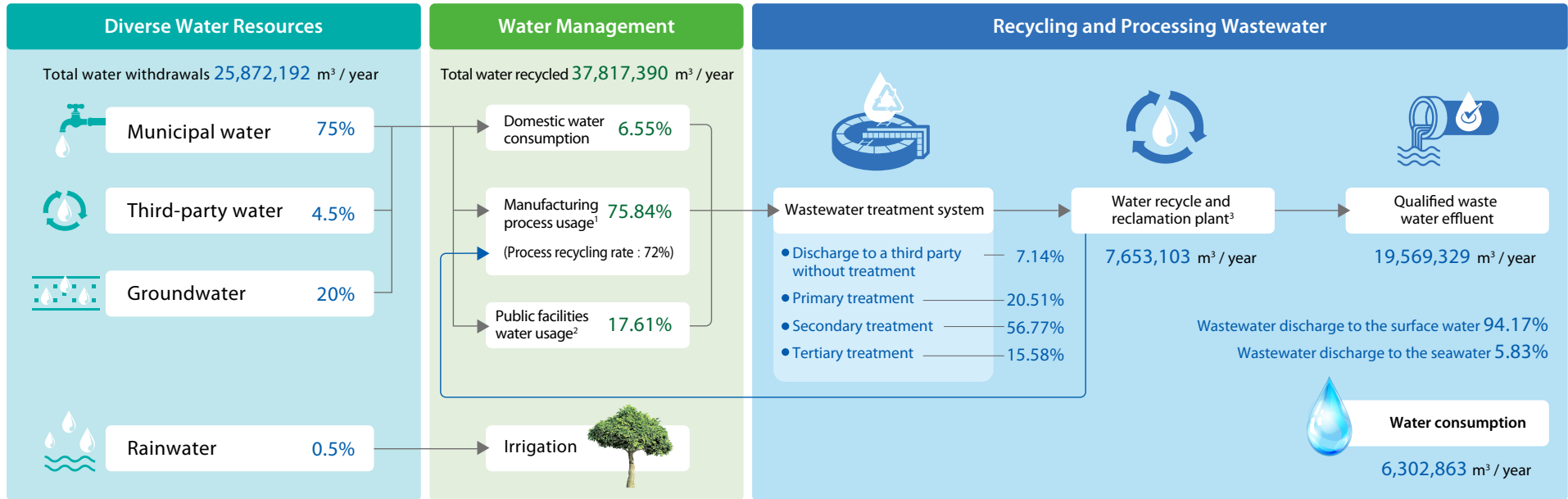
Water Withdrawal and Reuse

ASEH adopts three water use strategies: reduce, reuse, and recycle. The main source of water-use is tap water. Total water withdrawals in 2021 amounted to 25,872,192 tons¹, while water withdrawal increased by 23% compared to the previous year due to newly added scopes and a 4% increase in manufacturing capacity. However, water use intensity per unit revenue (including rainwater) decreased by 17% compared to the previous year, reaching our goal of a 67% 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 72% and significantly reducing water pressure and effluent discharge. Moreover, with the participation of all facilities in our 14 water conservation projects, we keep recycling rates by 72%. In 2021, we dedicated US\$44.07 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.

Water Resource and Water Withdrawal Intensity⁴



⁴ The data includes that of all ASEH facilities that offer assembly, testing, and material services and electronics manufacturing services.



Description:

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 2021, 19.57 million tons¹ of effluent was discharged, while the total water consumption was 6.30 million tons. Our effluent management system is more stringent than that stipulated by law, and we regularly monitor effluent water quality. In addition to internal water quality tests, we 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\$ 1.13 million over seven years in research with academic institutions (including 24 research focuses on the development of new water treatment technologies), recycling of high-concentration chemical waste, monitoring of aquatic environments and risk evaluation, groundwater recovery methodology, aquatic ecology, health risk evaluation, etc.

2021 Focuses:

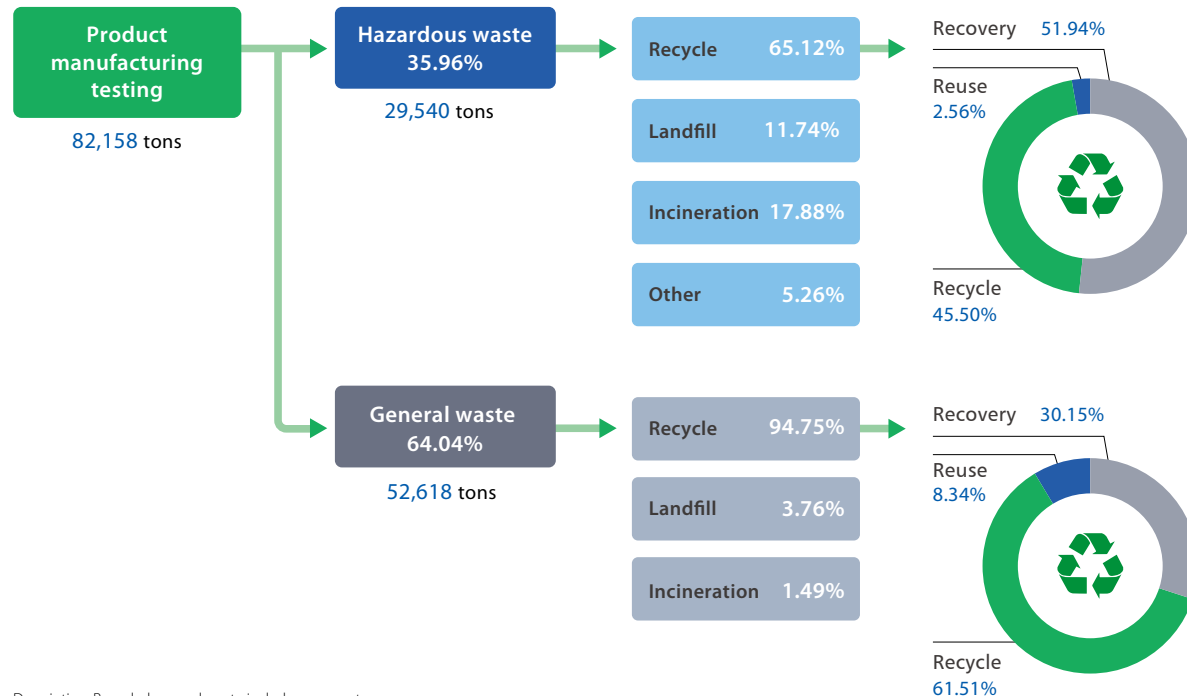
- Continuous monitoring of water quality/quantity
- Development of new and innovative processing technologies through industrial-academic collaboration
- Recycling and reuse of wastewater, reduction of effluent discharge
- Sorting of chemical products, aiming towards recycle and reuse

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.

5.3 Waste Management

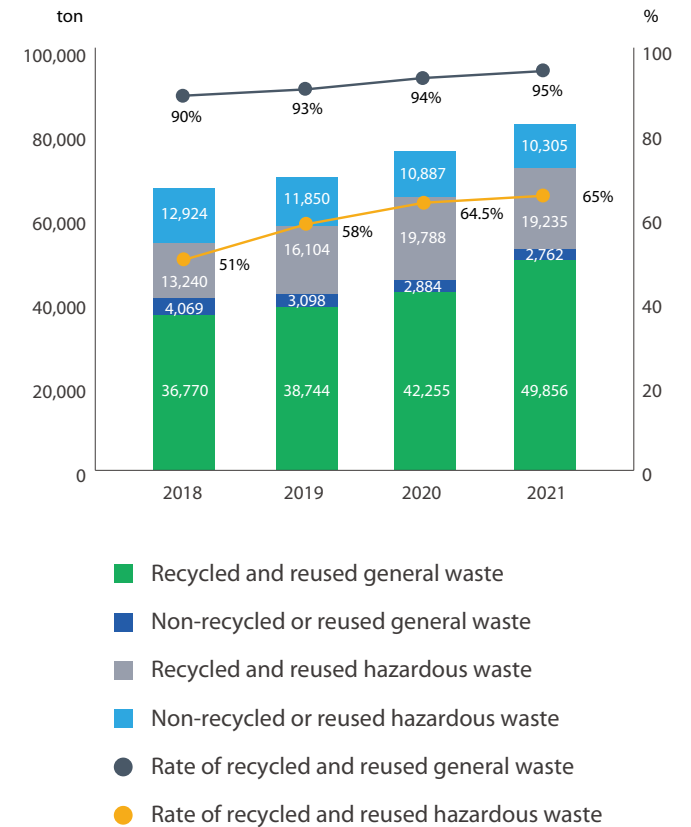
Waste Generation and Recycling

ASEH adopts source reduction measures and prioritizes the use of eco-friendly materials to minimize waste generation and reduce environmental pollution. At the same time, we request all facilities to acquire ISO14001 certificates, and collect and track environmental-related data through the Environmental Taskforce of each subsidiary. If the facilities have not achieved the target, they shall propose improvement plans in order to improve the waste output and recycling volume. In 2021, we generated 82,158 tons of waste and achieved a 100% recycling and processing rate by commissioning qualified local firms to process waste within borders. In order to manage the compliance of waste disposal manufacturers, each facility regularly conducts online, paper, or on-site audits, and no-warning audits on its manufacturers every year to avoid environmental impact issues. We adopted the business model of circular economy with the goal to increase the recycling and reusing of waste, achieving a 84% recycling rate of waste, a 2% increase from the previous year.



Description: Recycled general waste includes compost

Waste output and recovery rate



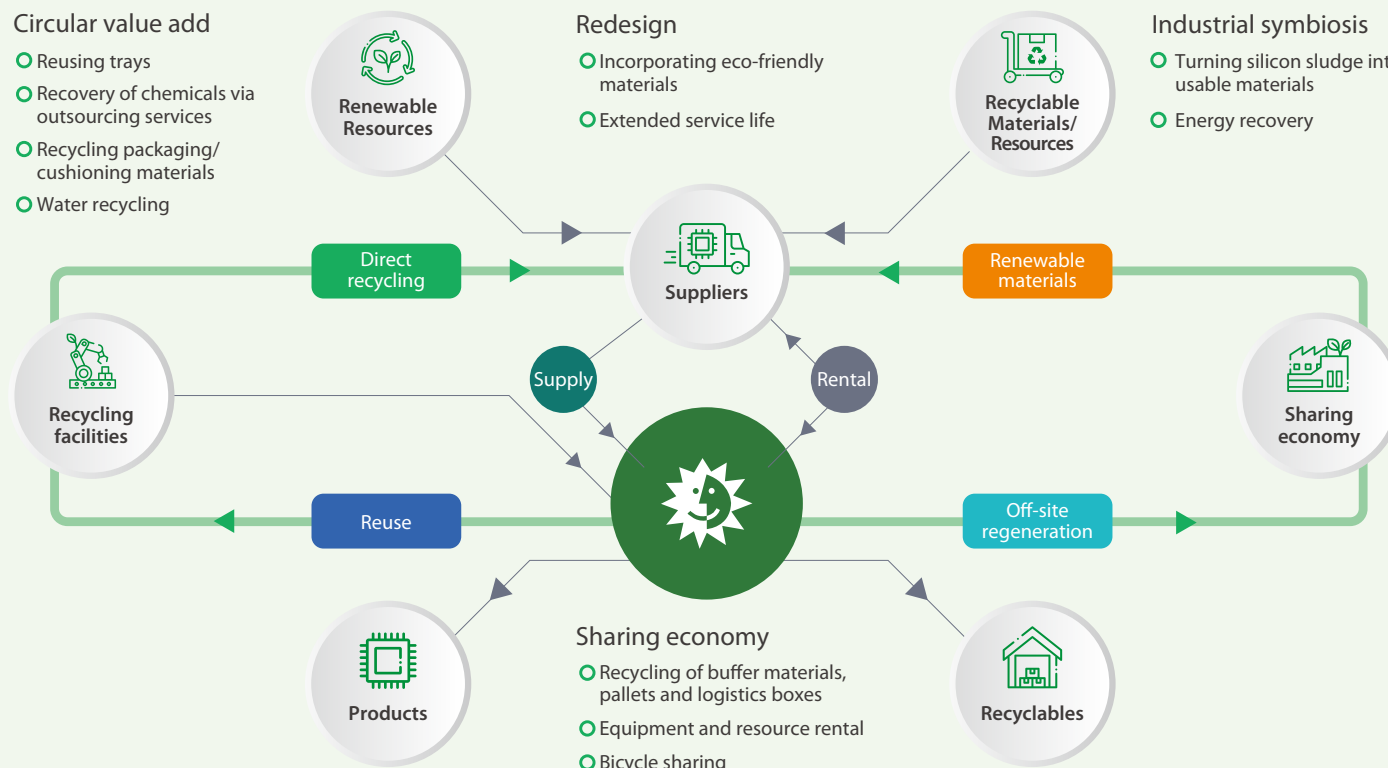
Description:

- (1) Rate of recycled general waste reached 95% > target recycling rate (90%)
- (2) Rate of recycled hazardous waste in 2021 (65%) was 0.5% higher than the last year (64.5%)
- (3) Rate of recycling of hazardous waste (only excluding recycled energy) was 20%

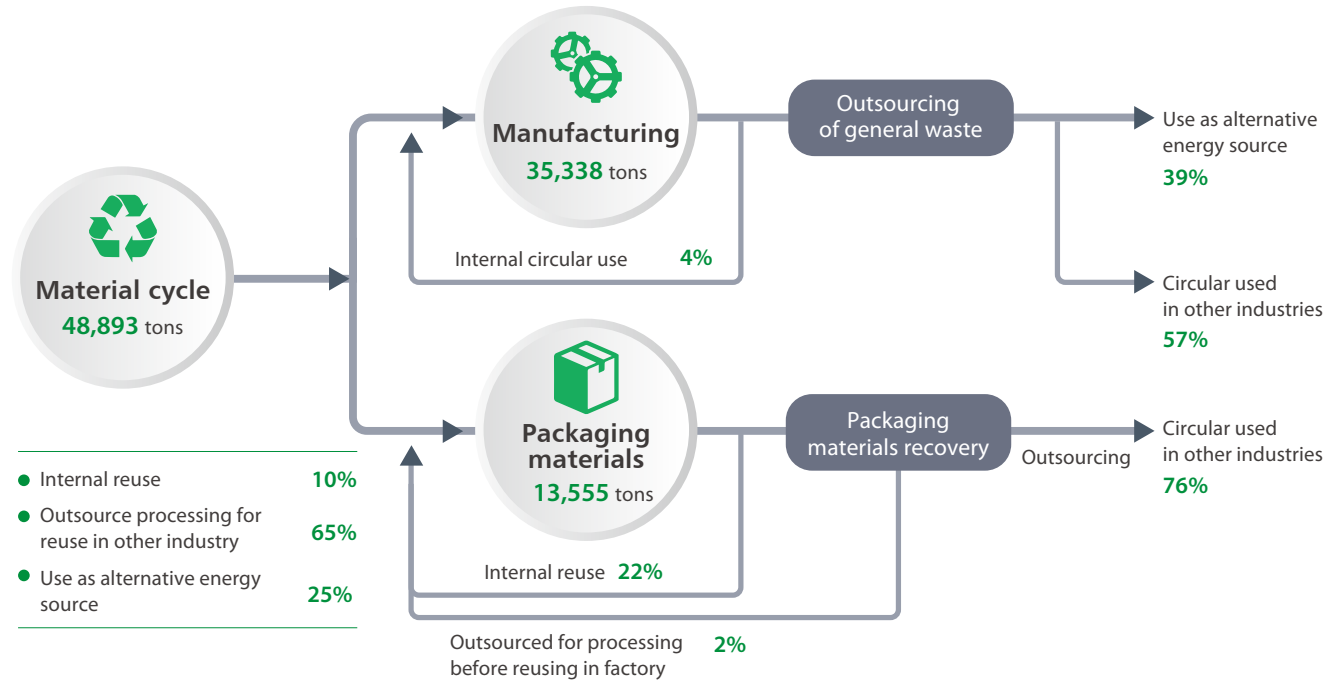
Striving Toward a Circular Economy

Issues concerning circular economy have garnered worldwide attention in recent years. The increasing depletion of natural resources has shifted the focus of resource recycling and reuse topics to using natural resources more efficiently. Specialized technologies and economic benefits will be the main factors considered in the application and implementation of circular economy to promote active participation in circular economic activities. ASEH continues to implement circular economy projects, which revolve around five key elements: direct recycling, reuse, off-site regeneration, renewable materials, and supply and leasing. With ASEH at the core, we collaborate with suppliers and business partners in the industry chain to build a circular economy in the semiconductor industry. The circular economy features the following activities: redesign, circular value addition, recycling and recovery, shared economy, circular agriculture, and industrial symbiosis. In practice, ASEH has formed alliances with industry peers and other sectors to examine the life cycle and process of resource usage and subsequently identify areas where resources can be reduced, recycled, and reused to prolong their lifespan and maximize resource efficiency.

Circular Economy Promotion Blueprint



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 48,893 tons of materials were recycled or reused in 2021. For every US\$10,000 invested, we contributed to reducing about 128.55 kg 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.



Circular-Reuse Packaging Material—Recycling and Converting Waste Plastic into Trash Bags

ASE Kaohsiung expects to achieve its objectives of zero plastic waste incineration in 2025. We have established the "plastic recycling center" to recover the plastic waste from facilities to be sent to center for shredding and sorting, and work with suppliers to make the trash bag. It would be recycled and reuses a total of 1,400 tons of plastic waste, thus reducing carbon emissions by 300 tCO₂e and saving waste processing costs every year.



5.4 Air Emissions Control

Air pollutants emitted in 2021 include VOCs¹, SOx², NOx³, and particulate pollutants⁴. 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 2021, 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 2021 showing a rate 1% lower than the previous year. In terms of future expansions, in addition to our current equipment and practices, we will continue to improve our emissions management in the following ways:

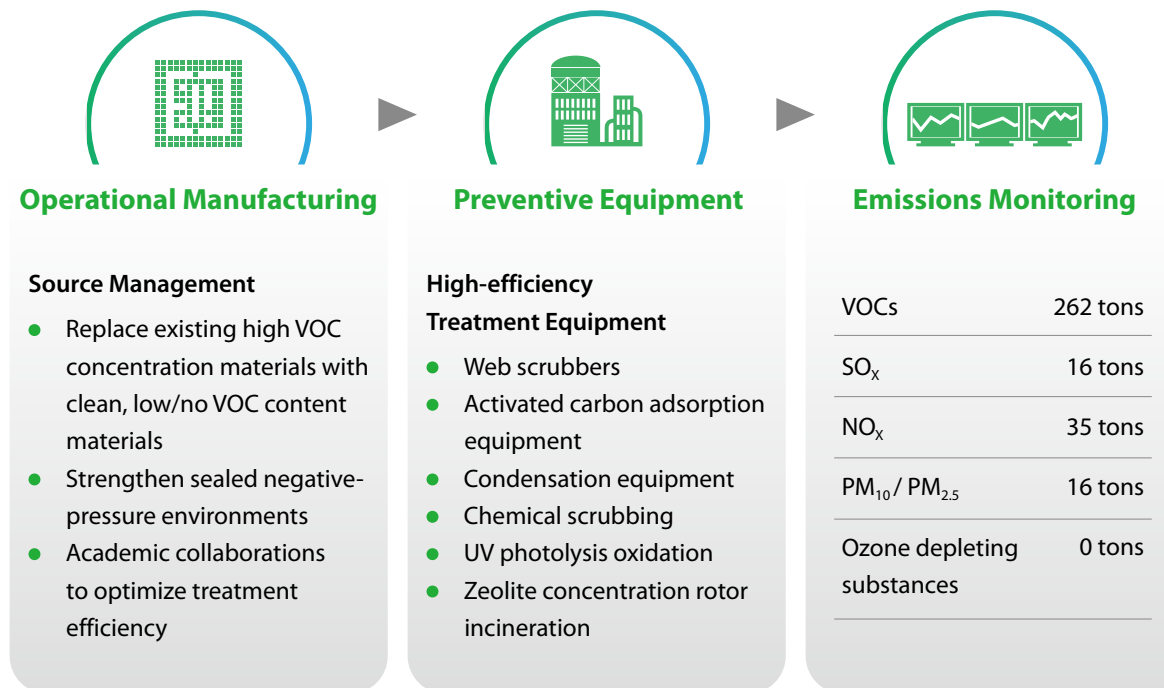
- Replace existing high VOC concentration materials with clean, low/no VOC content materials
- Continue to equip facilities with high-efficiency abatement equipment (such as the zeolite concentration rotor incineration system, active carbon adsorption equipment, etc.)
- Collaborate with academic institutions 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.

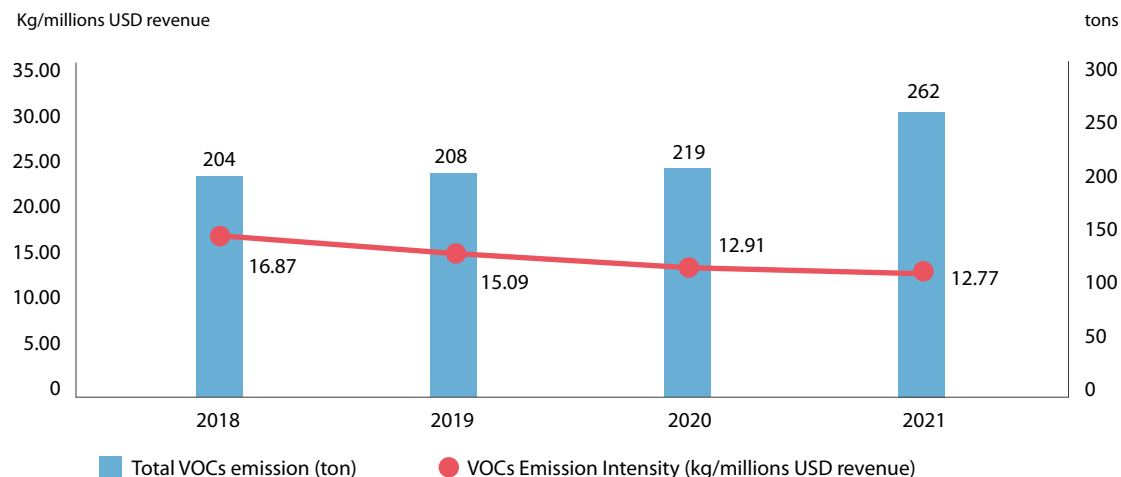
² SOx are calculated using public coefficients or converted through the concentration ratio.

³ NOx 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, meeting low carbon goals at both hardware and software levels. In the future, we will continue to promote and work towards obtaining certification for 100% of our new facilities for realizing the determination of green transition.

Green Building (EEWH)⁵

Number (facilities)	Energy Saving (MWh/year)	Carbon Reduction (tCO ₂ e/year)	Water Reuse (m ³ /year)
19	294,003	154,096	3,827,371

Clean Production⁶

Number (facilities)	Energy Saving (MWh/year)	Carbon Reduction (tCO ₂ e/year)	Water Reuse (m ³ /year)
24	74,692	41,055	7,925,641

GREEN CERTIFICATE 28

EEWH 19¹
7 Diamond, 1 Gold, 2 Silver,
7 Bronze, 2 Qualified

LEED 8²
4 Platinum, 4 Gold

LOW-CARBON BUILDING 1³
Diamond

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/SPIIL 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/SPIIL Zhong

⁵ The energy saving performance of green buildings only takes Taiwan EEWH into account, and it is calculated based on the energy saving efficiency assessed by each facility when applying for the green building label.

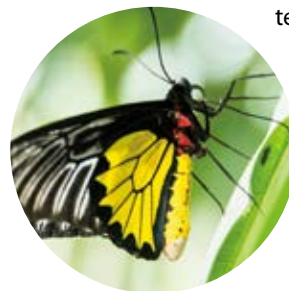
⁶ The energy saving performance of clean production is calculated based on the energy saving efficiency assessed by each facility when applying for clean production certification.

5.6 Biodiversity

Biodiversity Commitment

In 2015, the United Nations adopted the 2030 Agenda for Sustainable Development, in which SDG15 represents a key indicator of global biodiversity. ASEH's manufacturing facilities are all located in science and industrial parks. None of our operations are located in environments designated as international or national areas of special importance or sensitivity and we will continue to avoid locating new facilities adjacent to or neighboring these areas. In situations where our value chain activities have to be carried out in areas of biodiversity value or ecologically protected areas, actions will also be taken to avoid, minimize, restore or offset future losses of species diversity and ecosystem diversity. In regards to further steps for protecting biodiversity and ensuring ecological stability, ASEH promises to conserve terrestrial ecology in accordance with SDG15 and will focus on the conservation of the terrestrial ecosystem by collaborating with external organizations to jointly promote the implementation of ecological resource management. Our long-term goal is to achieve a net increase in the diversity and abundance of life on earth and the complexity of ecosystems. Furthermore, ASEH will gradually require its Tier 1 and non-Tier 1 suppliers to demonstrate commitment in alignment with global attention on the ecological environment, on top of meeting the business requirements of ASEH.

To balance biodiversity against the ecology of nature, ASEH has transformed existing facilities into low carbon buildings and built ecologically diverse corridors around these buildings. The plants and ecological ponds create a natural habitat that attract native birds and butterflies. Based on a biodiversity survey on the low carbon buildings in the ASE Kaohsiung Facility, there are 130 plant species, living organisms (including



terrestrial insects, birds, myriapods, and mollusks), and up to 35 species of aquatic fish, insects, crustaceans, and amphibians. Such diversity shows our success in transforming traditional factories into green facilities that can co-exist with the ecological environment. In the future, our new facilities will continue to incorporate ecological building design elements, and promote energy conservation, waste reduction and healthy living. Ecological surveys will be conducted to monitor and track targets, and relevant management measures will be introduced to ensure that the ecological environment around the facilities is properly maintained. We are also making plans for afforestation or forestation in other hinterlands, in hopes of boosting the diversity of local species by 2030.

No Deforestation Commitment

Forests are major sinks for atmospheric carbon and the natural habitats of plants and animals. ASEH's operational facilities worldwide operate in strict compliance with international and local laws and regulations. In order to fulfill our no-deforestation commitment, we are actively developing no-deforestation policies by establishing group-level monitoring systems, ceasing any deforestation activities that may occur along the value chain, restoring degraded forests, and substantially increasing and restoring global forest cover. In addition, ASEH will request its Tier 1 and non-Tier 1 suppliers to work with us in setting long-term targets that are aligned with the UN SDGs 13 (Climate Action) and 15 (Life on Land). We hope to engage with our value chain partners to manage and mitigate forest-related risks and negative impacts, and support sustainable agriculture, sustainable forestry, reforestation and natural habitat restoration. We are setting a goal to achieve zero deforestation by 2030, and aim to fulfill our objective of supply chain traceability to ensure that products are environment- and forest-friendly.



5.7 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 2021 amounted to US\$122.7 million, with capital expenditure and operating expense accounting for 34% and 66% respectively.

Unit: US\$ millions

Category	Description	2018		2019		2020		2021		
		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.	20.0	15.4	29.7	13.5	43.0	14.6	33.5	18.9
	Resource Circulation Cost	Efficient utilization of resources, waste reducing, recycling, and disposal, etc.	8.6	12.0	10.6	15.5	7.7	25.5	7.0	41.8
Upstream/Downstream Cost		Green procurement, recycling of used products, etc.	0.4	1.3	0.7	3.6	0.1	3.0	0.7	5.7
Administration Cost		Manpower engaged in environmental improvement activities and environmental education, acquisition of external environment licenses/certification, government environmental fees, etc.	-	9.3	0.5	9.7	0.1	10.2	0.1	11.2
Social Activity Cost		Donations to, and support for, environmental groups or activities, etc.	-	3.9	0.1	3.4	-	4.0	-	3.7
Environmental Remediation Cost		Fines, recovery of the environmental degradation, degradation suits, and insurance fees, etc.	-	0.1 ¹	-	0.05 ¹	-	0.01 ¹	-	0.01 ¹
Others		Global environmental conservation cost and cost to develop products to curtail environmental impact at the product manufacturing stage, etc.	-	0.06	0.02	0.1	-	0.04	0.01	0.04
Total			29.0	42.1	41.6	45.8	50.9	57.3	41.3	81.4

¹ We were not subjected to any major non-financial penalty or litigation that results in facility shutdown. For more details on major (greater than US\$10,000) environmental-related fines or penalties, please refer to Appendix: Environmental Data- D. Environmental Violations.

Environmental Benefits

ASEH records environmental benefits generated from activities that reduce impacts on the environment. Our total environmental benefits for 2021 amounted to US\$98.2 million.

Unit: US\$ millions

Category	Description	2018		2019		2020		2021	
		Environmental Benefits	Economic Benefits	Environmental Benefits	Economic Benefits	Environmental Benefits	Economic Benefits	Environmental Benefits	Economic Benefits
Cost Savings	Reduction in costs due to energy saving and carbon reduction projects	483,405 ¹ MWh	44.6	599,833 ¹ MWh	52.0	787,095 ¹ MWh	71.1	1,107,145 ¹ MWh	62.8
	Reduction in water costs due to water saving projects	22,934,123 metric tons	9.5	28,158,345 metric tons	11.5	34,437,950 metric tons	11.0	37,817,390 metric tons	16.7
	Reduction in waste disposal costs due to waste recycling	50,011 metric tons	6.5	54,847 metric tons	7.9	62,043 metric tons	16.2	69,091 metric tons	18.7
Total			60.6		71.4		98.3		98.2

Our estimated environmental capital expenditures for 2022 will be approximately US\$20.5 million. The board of directors has resolved in 2021 to contribute around US\$3.6 million (NT\$100.0 million) through the ASE Environmental Protection and Sustainability Foundation to fund various environmental projects in 2022.

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 plant².

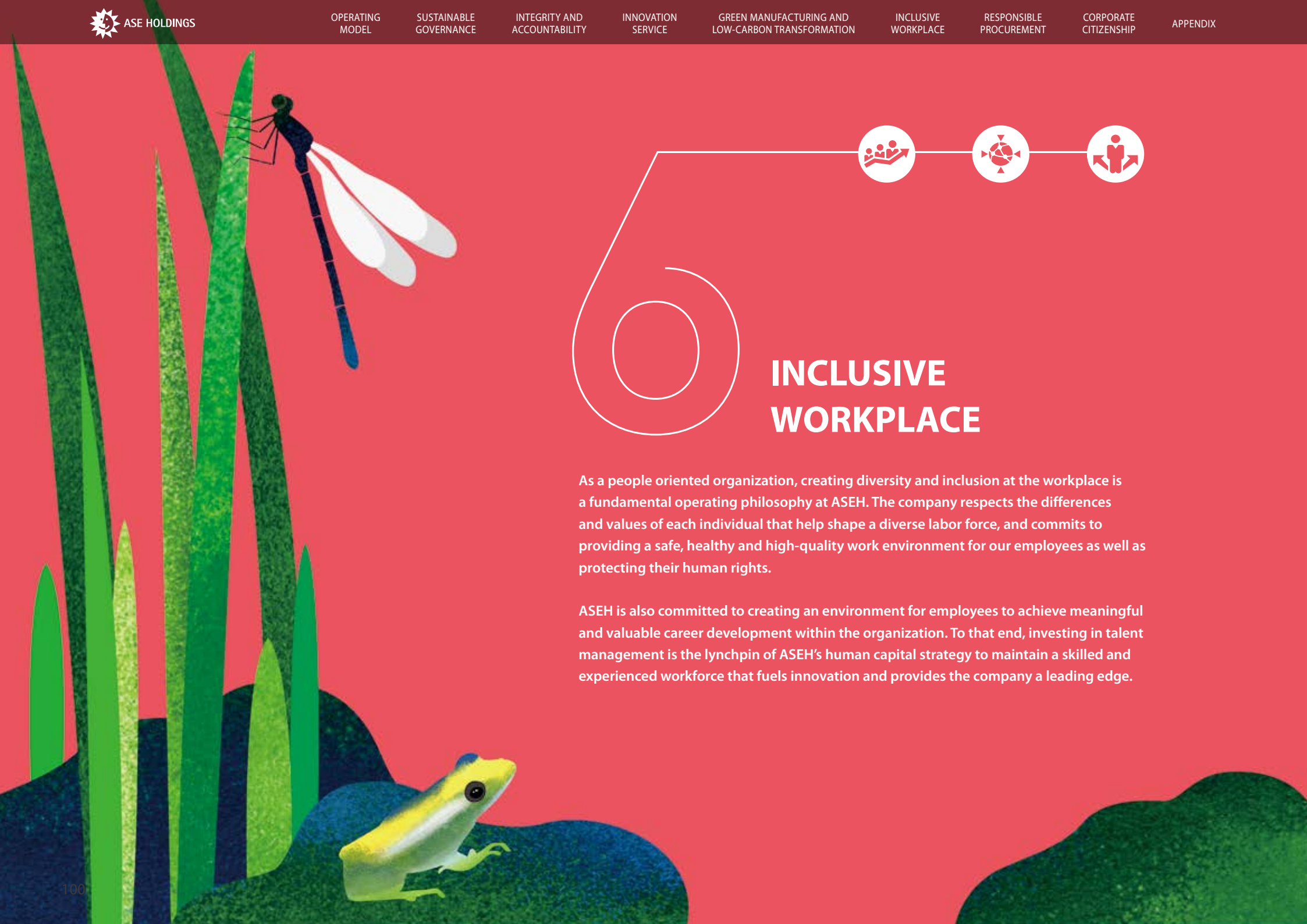
Sustainability-Linked Loans

As a demonstration of our continued promise of and commitment to strengthening sustainable development, ASEH entered into a formal agreement on sustainability-linked loans 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.

² For more information, please refer to 5.5 Green Facility and 5.2 Water Resource.



INCLUSIVE WORKPLACE

As a people oriented organization, creating diversity and inclusion at the workplace is a fundamental operating philosophy at ASEH. The company respects the differences and values of each individual that help shape a diverse labor force, and commits to providing a safe, healthy and high-quality work environment for our employees as well as protecting their human rights.

ASEH is also committed to creating an environment for employees to achieve meaningful and valuable career development within the organization. To that end, investing in talent management is the lynchpin of ASEH’s human capital strategy to maintain a skilled and experienced workforce that fuels innovation and provides the company a leading edge.

2021 Key Performance

ASEH Human Capital Development



Employees Bonus¹ (US\$) 578 Million	Percentage of Females in Management Positions 26.9 %
New Hires 36,924	Regular Employees in Labor Unions 36,678

SDGs	Business Actions	2021 Material Aspects	KPI	2021 Target	Status	2021 Performance	2022 Target	2030 Target
	Ensure that all employees have access to vocational training and lifelong learning opportunities	Talent Cultivation and Development	Employee Engagement Survey Coverage (%)	>85%	Achieved	96.1%	>85%	>95%
			Turnover Rate (%)	<20%	Achieved	19.0%	<20%	<20%
		Diversity and Inclusion	Female Employee in Top Management Positions (%)	13.4%	Achieved	13.4%	13.8%	>15%
		Human Resource Development	Management Positions through Internal Promotions (%)	>75%	Achieved	79.9%	>75%	>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 Major Injury ² and Occupational Disease	0	Not Achieved	Major Injury: 0 Occupational Disease: 3	0	0
			Disabling Injury Frequency Rate (FR)	<0.5	Not Achieved	0.59	<0.5	<0.5
			Disabling Injury Severity Rate (SR)	<9	Not Achieved	15.4	<9	<9

¹ Employee Bonus includes: Monthly Incentive Bonuses + Annual Profit-sharing Bonuses

² The definition of major Injury: occupational fatality

6.1 Talent Attraction and Retention

Diversity in Human Resources

ASEH has over 95,000 employees worldwide¹, of which 94.1% are regular employees and 5.9% are contract employees. There are 41,260 employees in management, engineering and administration positions, and 53,817 employees in technical positions on the production line. With an average employee age and tenure of 34 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 60%) and technical positions on the production line (over 60%). More than 6,300 female employees at ASEH hold STEM-related positions, accounting for approximately 17.6% and the proportion of female employees who hold management positions is as high as 27%.

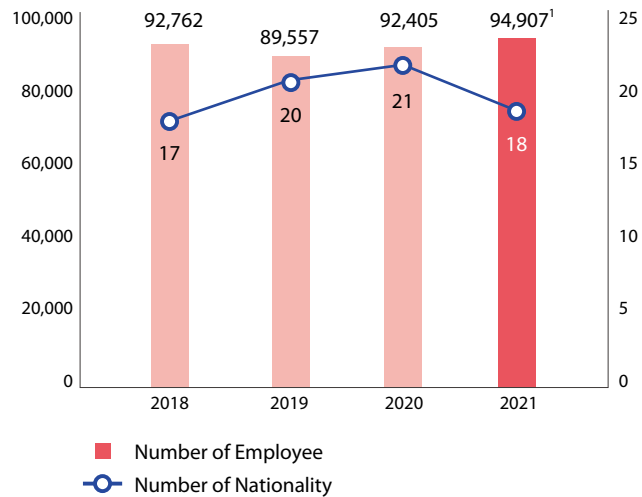
We understand that a diverse and inclusive workplace environment that maximizes the unique and different traits of employees facilitate the organization's operational efficiency. Globally, ASEH has established 26 operating locations in eight countries and hired employees of 18 different nationalities. More than 97% of our employees are from Taiwan, China, Philippines, Malaysia, Mexico and South Korea. Over 60% 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 625 persons in 2021. This number exceeds the hiring percentage stipulated by local governments.

Global Workforce Structure

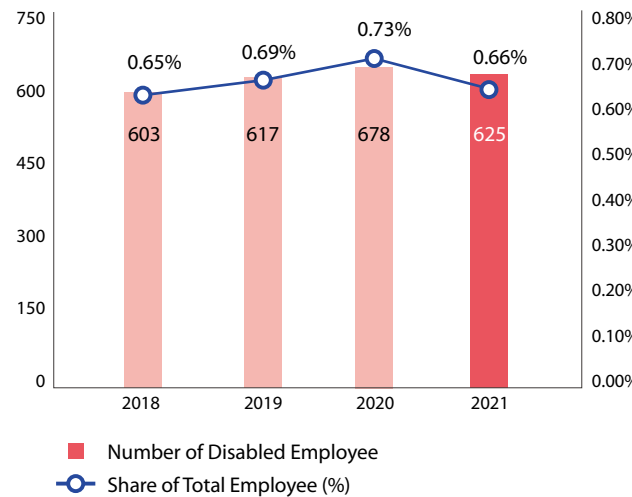
Category	Group	Number	Percentage of Total Employee (%)
Employment Type	Regular	89,494	94.1%
	Contract	5,583	5.9%
Gender	Male	50,155	52.8%
	Female	44,922	47.2%
Location	Taiwan	58,885	61.9%
	China	26,926	28.3%
	Rest of Asia	6,606	7%
	Americas	2,660	2.8%
Disabled Employee	Male	368	0.4%
	Female	257	0.3%
Position	Management	6,366	6.7%
	Engineering	28,939	30.4%
	Administration	5,955	6.3%
	Skill Job	53,817	56.6%
Age	<30	28,980	30.5%
	30-50	61,353	64.5%
	>50	4,744	5.0%
Education	Ph.D	168	0.2%
	Master	7,129	7.5%
	Bachelor	47,744	50.2%
	Other Higher Education/ High School and below	40,036	42.1%
Total			95,077

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.

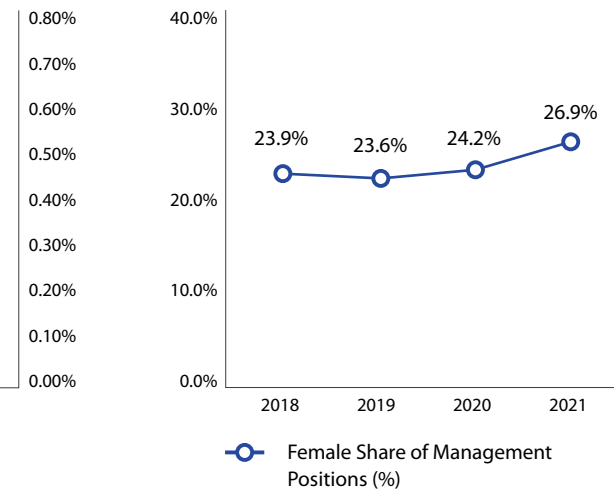
Total Employee and Nationality



Disabled Employee



Females in Management Positions



¹ The number of employee by nationality do not include ISE Labs.

Male/Female Employee (by Job Position)

Category	Group	Male		Female	
		Number	Group Percentage (%)	Number	Group Percentage (%)
Job Position	Management Position	4,651	73.1%	1,715	26.9%
	Top Management Positions	773	86.6%	120	13.4%
	Junior Management Positions	1,818	66.0%	935	34.0%
	Management Positions in Revenue-generating Function	3,879	75.0%	1,295	25.0%
	Engineering	25,051	86.6%	3,888	13.4%
	Administration	1,836	30.8%	4,119	69.2%
	Skill Job	19,902	37.0%	33,915	63.0%
STEM Related Position	29,639	82.4%	6,350	17.6%	

Male/Female Salary and Compensation Ratio

Category	Group	2018		2019		2020		2021	
		Male	Female	Male	Female	Male	Female	Male	Female
Executive Level	Salary	1	0.99	1	0.99	1	0.96	1	0.96
	Compensation	N/A		N/A		1	0.76	1	0.88
Management	Salary	1	0.88	1	0.83	1	0.89	1	0.94
	Compensation	1	0.85	1	0.82	1	0.88	1	0.96
Non-management	Salary	1	0.784	1	0.947	1	0.996	1	0.989
Engineering	Salary	1	1.04	1	0.97	1	1.02	1	1.01
Administration	Salary	1	0.93	1	0.91	1	0.96	1	0.97
Skill Job	Salary	1	0.99	1	0.96	1	1.004	1	0.99

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 2021, ASEH recruited over 36,000 employees. Those under 30 years old accounted for 68.5%, of which 80.7% are skilled technical positions on the production lines. ASEH has also hired 121 persons with disabilities.

Over 1,000 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. 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.

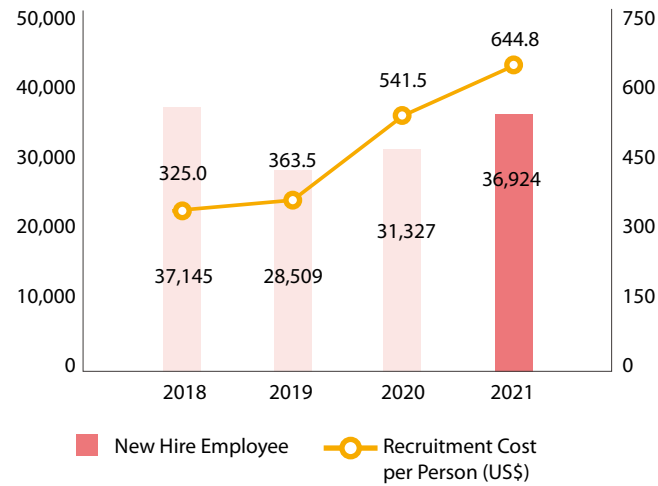
In 2021, our recruitment costs have increased significantly due to COVID-19. The average cost of recruiting an employee increased by 20% to US\$644 compared with US\$541 in 2020.

Employee Turnover¹

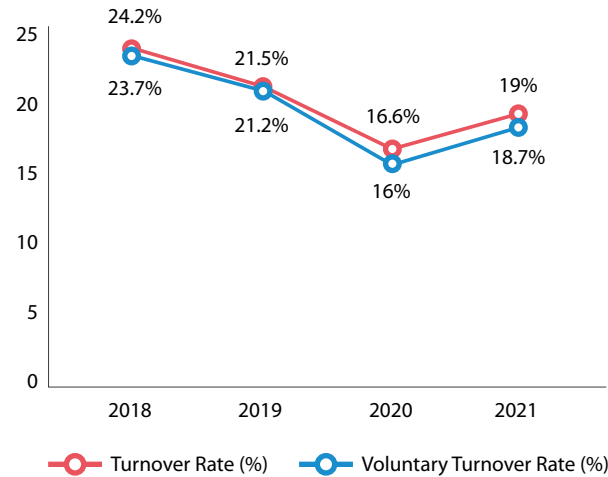
Employee turnover at ASEH was 19.0 % in 2021, a 2.4% increase from the previous year. The increase in turnover was mainly attributed to factors such as remuneration, career growth, work environment, and personal reasons. The employee turnover rate at ASEH broken down into 57.3% male vs 42.7% female. In terms of job types, production line skill job position form the majority with 71%, while management, engineering and administrative positions formed the remaining 29%. On a biannual basis, ASEH subsidiaries conduct employee engagement surveys to encourage feedback and opinion sharing from employees. ASEH also perform annual analyses on the causes of attrition for different job types so as to make corresponding improvements for increasing employee job satisfaction and talent retention rates. As a technology company, we apply big data analytics to identify underlying and correlating factors that affect turnover and extrapolate behavioral factors that contribute to talent attrition. The analysis combines other factors such as regional attributes and challenges, to identify talent retention risks and project potential employee turnover rates. A deeper understanding of the dynamics affecting turnover will help the company to formulate strategies to manage the risks for retaining talent. 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.

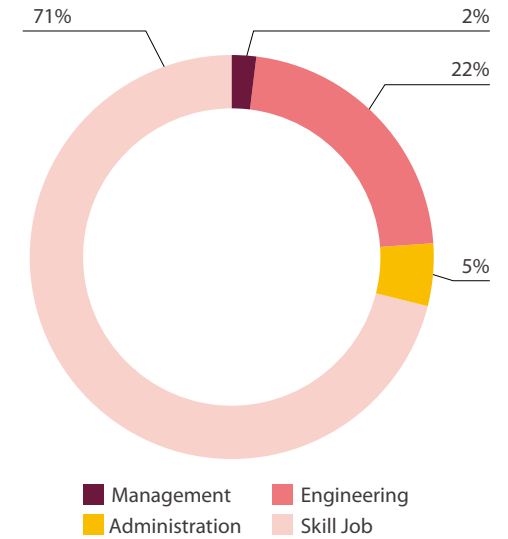
New Hires and Recruitment Cost



Turnover Rate



2021 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 and project experience and offering promotion or job transfer opportunities based on organizational/ business needs Create a direct communication channel through which management 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/House 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

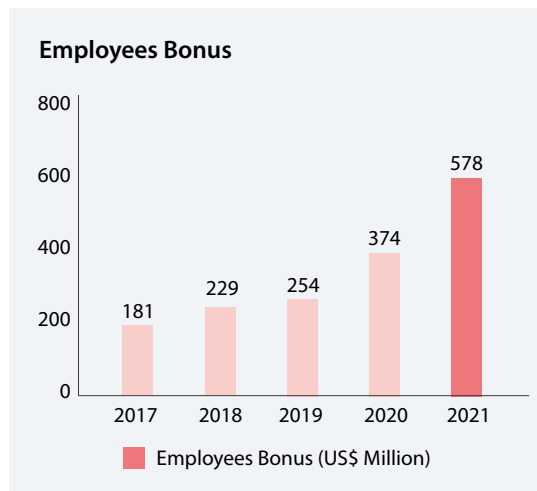
- a. Highly Competitive Compensation and Benefits
- b. Fair and Comprehensive Performance Review
- c. Open Communication and a Grievance Mechanism
- d. A Multi-faceted Employee Engagement Survey

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 2021, ASEH's employee bonuses amounted to US\$578 million (including monthly incentive and annual profit-sharing bonuses), with the accumulated total from 2017 to the end of 2021 reaching US\$1,616 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.

The continued growth of company revenue and profits have led to a corresponding increase in employee bonuses (including incentives and annual profit-sharing bonuses). Employee bonuses have increased from US\$181 million in 2017 to US\$578 million in 2021, an increase of nearly 200%. The accumulated total of employee bonuses for the period amounted to US\$1,616 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.



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.

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.

Flexible Work Arrangements

Taking care of employees’ health and well-being is critical to ensure high job satisfaction, productivity and retention rates. A flexible work scheme that allows employees to adjust their work schedules according to personal needs and commitments can drive improvements in morale and productivity, and lower absenteeism. It can also augment our human resource programs to attract and retain top talents, and reduce employee turnover. Flexible work schemes at ASEH and its subsidiary companies include flexible working hours, work from home arrangements and part-time positions.

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.

Flexible work hours

Providing flexible working hours based on the nature of work and personal needs (including family care or on-the-job training) to meet the requirements of different work hours or time zones. Our employees may apply for work hour adjustments with their supervisor’s approval. Flexible work hour schemes have been implemented at ASE facilities in Chungli, Japan and Singapore, as well as USI facilities.

- Employees are allowed to apply for flexible work arrangements due to health or other personal reasons.
- Attend to work duties during scheduled hours, while allowing work flexibility beyond that.
- Maintain flexibility to adjust working hours. Employees are allowed to end their work day whenever they have completed the day’s task.

Work from home

At the peak of the COVID-19 epidemic, our workers were permitted to apply for work from home. USI further formulated a set of remote working guidelines that provided allowances for employees to purchase equipment and ad hoc per diem for working from home arrangements. ASE Japan and ISE Labs have also designed guidelines to allow eligible employees to apply for work from home (remote) on a short or long-term basis.

Part-time positions

ISE Labs has officially implemented a part-time employee policy which provides company benefits to part-timers who work a minimum of 30 hours per week.

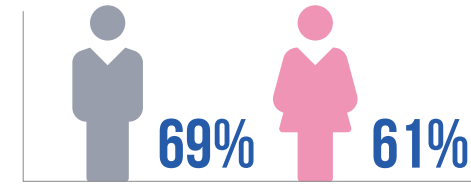
Maternity Benefits and Parental Care

Creating a Pregnancy-friendly Workplace

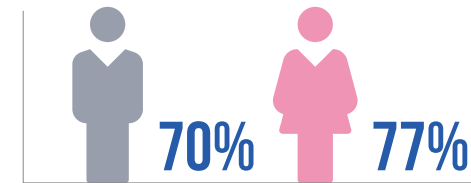
To alleviate the burden on employees, ASEH has built a comprehensive leave management system in alignment with the various local government policies on parental leave. We proactively provide employees with information on labor insurance and subsidies, and assist them with the leave application procedure. Employees' job positions are protected during their leave and they are allowed the flexibility to delay their return or return early from maternity leave. Our facilities have dedicated on-site breastfeeding rooms that provide a private, comfortable and safe environment for breastfeeding employees, with unrestricted access during normal working hours. At ASE Kaohsiung, a special maternity program was designed to monitor the health and provide support for employees who are pregnant, one year postpartum or are breastfeeding. Other pregnancy-friendly workplace programs include conducting health hazard assessments, adjusting work duties during pregnancy, and providing maternity benefits and reinstatement after giving birth. We have also launched a course for new parents in 2018 that attracts participation from over 60 employees every year, with approximately 300 participants to date.

A total of 9,105 ASEH employees were on parental leave in 2021, including 1,050 on unpaid leave. Among the 829 workers expected to return to work, 522 actually returned, equivalent to a 63 percent return rate and a 75 percent retention rate. The number of newborn children at the Taiwan facilities, ASEH's primary location, was 1,694, accounting for 1.10 percent of all newborns in Taiwan. The data demonstrated the success of the company's comprehensive parental care and benefits allowing our employees the peace of mind to give birth and raise children.

To encourage child birth, foster future generations, and address problems associated with population aging, subsidiaries of ASEH have established numerous childbirth-related benefits that support the career and family needs of employees.



Return Rate



Retention Rate

Childbirth Subsidies	<ul style="list-style-type: none"> • ASE: ASE Chungli offers a child birth subsidy of NT\$1,000 per child • SPIL: SPIL plans to offer a child birth subsidy of NT\$3,600 per child as of July 2022 • USI: USI offers a child birth subsidy of NT\$6,000 per child
New Born Congratulatory Leave	<ul style="list-style-type: none"> • ASE: ASE Malaysia offers one-day paid leave for birth of legal child to congratulate an employee on the new born
Childcare Allowance	<ul style="list-style-type: none"> • SPIL: SPIL plans to offer child birth subsidy as of June 2022, specifically, a monthly subsidy of NT\$5,000 per child aged 0–6 years-old, and a monthly subsidy of up to NT\$10,000 if the husband and wife both work at SPIL.



Breastfeeding room



Courses for expectant parents



Family activities



Family activities

ASE Kaohsiung's Kindergarten



Childcare Facilities

ASEH has 3 facilities worldwide that have set up childcare facilities within their premises – ASE Chungli and ASE Kaohsiung in Taiwan, and ASE Korea.

The ASE Korea childcare center was established in 1998 and accepts children from the ages of 2 to 5. While the priority is to cater for the employees' childcare needs, ASE also accepts children from the local community as part of its social engagement. In 2021, the childcare center has 62 children, with an accumulated total of over 440 children.

ASE Chungli was the first in the semiconductor industry in Taiwan to establish a kindergarten occupying over 1,983 square meters onsite. The kindergarten has an outdoor playground and nature park covering 1,322 square meters, and facilities equipped with good ventilation and lighting such as a library, classrooms, activity rooms, kitchen and healthcare corner. In 2021, a total of 130 employees' children enrolled at the kindergarten. To date, ASE Chungli's kindergarten has admitted over 900 employees' children with some of the graduates now working at ASE Chungli and enrolling their own children at the kindergarten as well.

In 2018, ASE Kaohsiung began the construction of a kindergarten exclusively for employees' children at a cost of NT\$100 million. Enrolment opens in 2021, with a plan for 6 classes catering to 88 children aged between 2 to 6. The buildings and facilities of the kindergarten were built according to green design standards. The site features a colony of 80 preserved old trees, a landscape design incorporating biological habitats and aquaporin ponds, and a 24 hour CCTV monitoring and entry control system. The kindergarten aims to provide a safe and caring environment for the children to learn basic skills and encourage them to embrace nature. The kindergarten sits on a land of 4,297 square meters, with five outdoor facilities covering 3,137 square meters. With proximity to nature and lush greenery in the surrounding areas, ASE was able to integrate food and farming education, green building design, art and aesthetic

experiences, multi-learning areas, a library and high quality teaching equipment into the teaching curriculum. Our aim is to provide an innovative educational environment to let children develop their abilities through real life experiences and achieve a balanced physical and psychological development.

The ASE kindergartens and childcare centers provide high-quality and affordable education and day care services for employees. To adjust to employee work schedules, our kindergartens operate flexible hours with the nursery operating from 7am to 8pm so that our employees do not need to worry about their children while at work. ASE subsidizes the operating cost of the facility including utilities, cleaning and disinfection, general maintenance, fire safety measures, meal plans designed by dietitians and outdoor learning activities. The subsidy helps to lower the tuition fees and alleviate our employees' financial burden, while allowing the children to benefit from high-quality childcare and learning environments.

The ASE childcare and kindergartens are an extension of our employee-care management and we will continue to implement programs that support family values and improve employees' loyalty.



ASE Chungli's Kindergarten

ASE Korea'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.

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.

Performance Appraisal

Evaluation	Object	Approaches
Ranking and Management by Objectives	All Employees	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 Employees	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 Employees	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.

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 1,188 employee complaints in 2021. Amicable resolutions were reached for all cases after communicating and clarifying the facts with complainants. Among the complaint cases, 24 pertained to labor disputes, all of which were resolved amicably after clarifying the facts and giving proper care to complainants; and another eight 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 (198,603 person-times) completed a total of 179,775 hours of compulsory human rights training which covered the topics of RBA management, labor rights, gender equality and sexual harassment awareness.

Item	2021
Training Content	RBA Management, Labor Rights, Gender Equality and Sexual Harassment Awareness
Target Audience	All Employees
Training Hour (hour)	179,775
Training Person-times	198,603

Guidelines for Processing Sexual Harassment Complaints



Punishment

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.



Counseling

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.



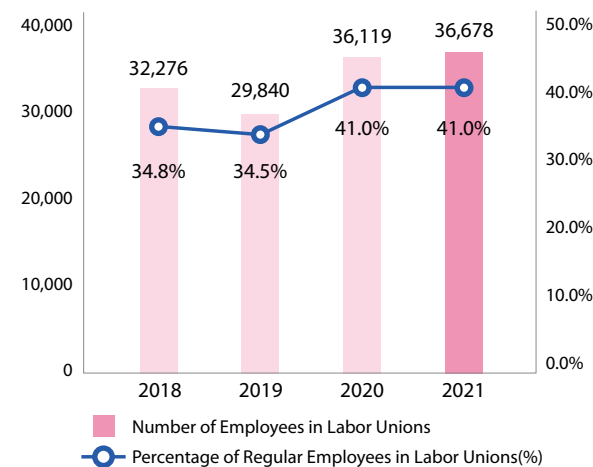
Remediation

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.

Labor Unions

ASEH recognizes employees' right to freedom of assembly and association. As of the end of 2021, the total number of union members was 36,678, accounting for around 41% of all ASEH regular employees. Among the three ASEH subsidiaries, 18 facilities that have established a labor union – ASE facilities in Kaohsiung, Shanghai (Material), Kunshan, Suzhou, Wuxi, Weihai, Korea, Japan and Singapore; all of SPIL facility; and USI facilities in Zhangjiang, Kunshan and Mexico. Of these 10 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.

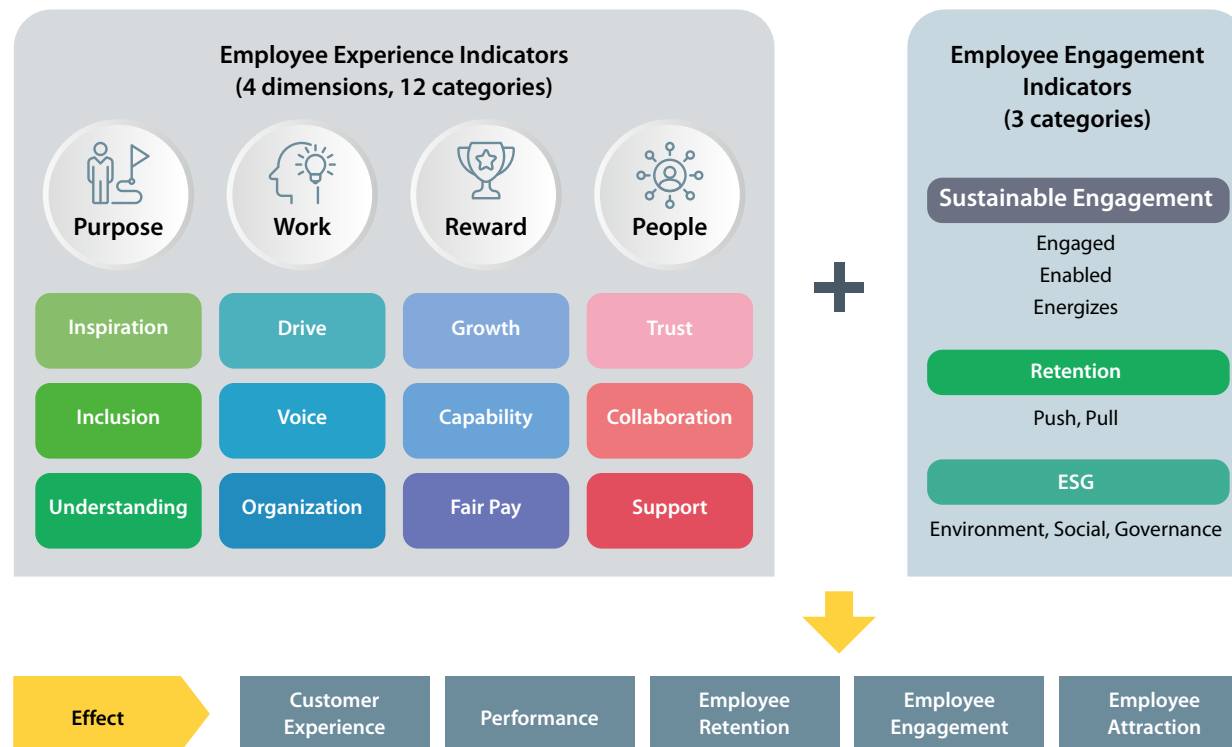
Union Statistics



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 Zhangjiang, Kunshan and Mexico facility. Employees in labor unions accounted for 20.3% of all regular employees.

Employee Sustainability Engagement Surveys

Employees are ASEH’s most valuable asset and strategic to the company’s sustainability development and competitiveness. Maximizing the potential of our human capital to create value forms a key pillar of ASEH’s sustainable development strategy. To enhance the workplace environment and gain better insights on employee experiences, we began conducting the Employee Engagement Survey every two years (since 2017) to understand our employees’ emotional attachment and professional commitment to their work, and the impact to the company. In 2021, we introduced a new survey framework that extended our focus to employee sustainability engagement. The engagement survey is now based on a 5-point scale, and we will aggregate the results of the total number of responses selected under ‘agree’ and ‘agree strongly’ on the scale. The scope of the engagement survey is now expanded to all three major subsidiaries covering direct and indirect employees at 26 facilities in 8 countries, accounting for 96.1 percent (81,479) of total employees surveyed.



The 2021 survey framework is segmented into employee experience indicators and employee engagement indicators towards the company. Under the employee experience indicators segment, there are 4 dimensions – purpose, people, work and total rewards, and 12 sub-categories customized according to direct and indirect employees across different job scopes. The employee engagement indicators segment comprise 3 dimensions – engagement, retention and ESG. Employees’ rating of the company’s ESG performance is a benchmark for measuring the effectiveness of ASEH’s overall ESG strategy and planning future developments. The results of the 2021 Survey indicated higher employee engagement levels in the sub-categories of organization, growth and fair rewards. Overall, the 2021 sustainability engagement survey recorded a score of 79%, exceeding the company’s target of >75%. The next Employee Sustainability Engagement Survey will be administered in 2023.

Employee Engagement Surveys Results

Category	Year	2017		2019		2021		2023
	Result	Target	Result	Target	Result	Target	Target	
Engagement (%)	75	73	83	>75	79	>75		
Coverage ¹ (%)	73.6	80	82.1	>85	96	>90		

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.

Key Strategy of Talent Cultivation

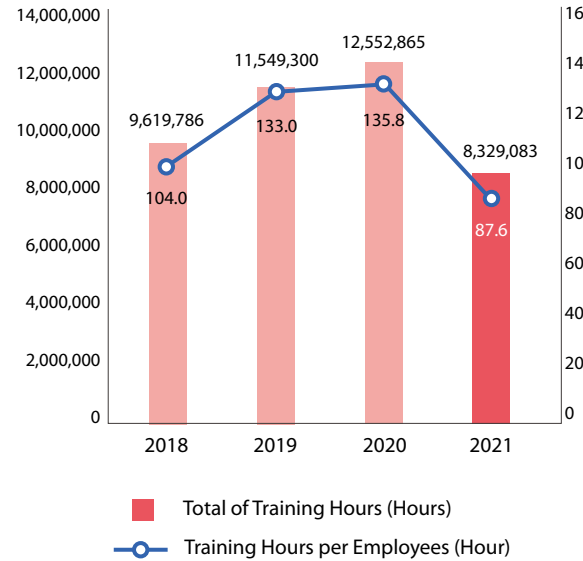


ASEH is committed to the nurturing of talent through consolidating comprehensive and multifaceted courses and training resources for the creation of diverse training methods, including physical training, online courses, work practice, and external training, etc. In 2021, more than 8.32 million training hours in total were completed, with each employee completing 87.6 hours of training on average. The total spent on training exceeded US\$12.3 million, averaging around US\$127 per employee and more than 5,500 internal lectureship. 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 2021, a total of 197 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 79.9% in 2021.

Training Index

Category	Group	Number	Training Hours per Employee
Training Hours (Hour)	Gender		
	Male	4,625,414	92.2
	Female	3,703,669	82.4
Training Hours (Hour)	Position		
	Management	479,217	75.3
	Engineering	2,176,238	75.2
	Administration	334,047	56.1
	Skill Job	5,339,581	99.2
Total		8,329,083	87.6

Training Hours



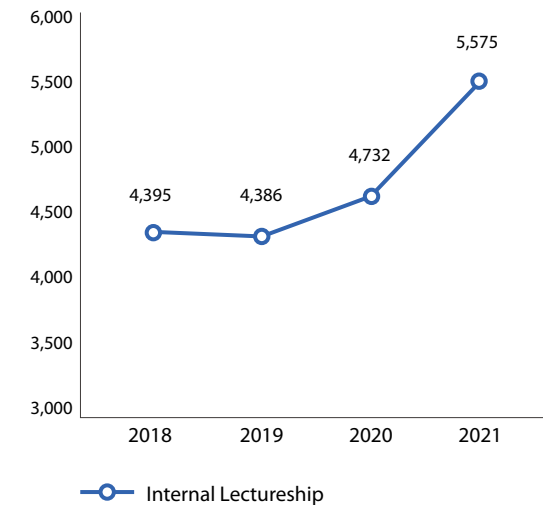
Training Spent



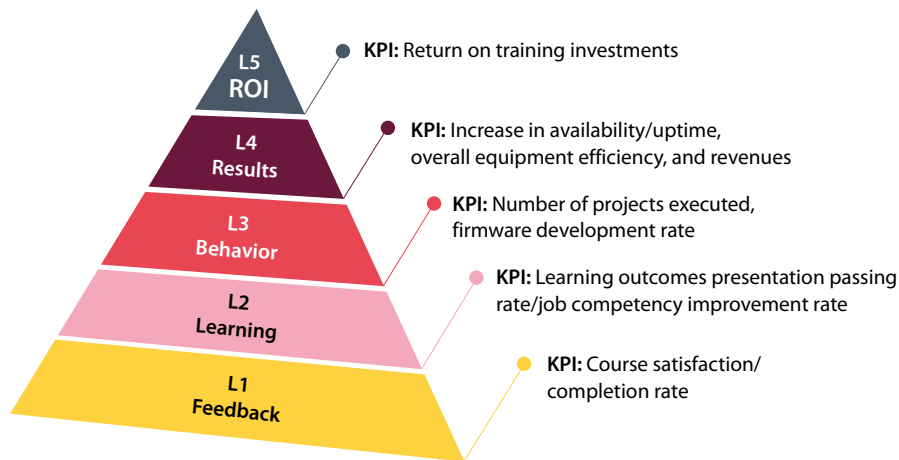
Internal Promotions



Internal Lectureship



School of Smart Manufacturing Training Program Efficiency Index



Program Title
Smart Manufacturing and Digital Transformation

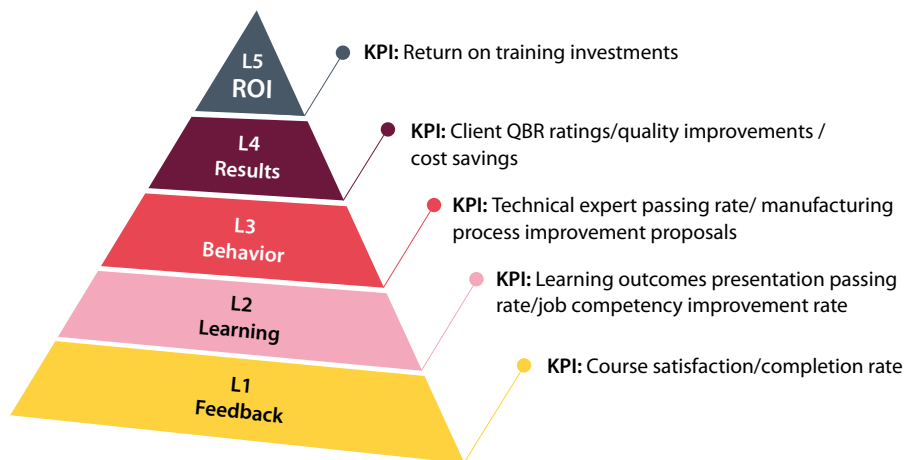
Course Outline
 (1) Nurture talent for technology leaders in the AI industry. Develop AI technologies and capabilities, starting with basic Python programming and then progressing to AI deep learning. Incorporate theory and practical training to align with the trend for semiconductor heterogeneous integration and to support new customer applications.
 (2) Explore applications for digital transformation, and the development of robotic arms and automated material handling systems for Industry 4.0. Application of the theoretical knowledge in practical manufacturing situations to improve production efficiency through automation and accelerate the development of smart factories.
 (3) Design software that executes pre-programmed operational processes. Application of the theoretical knowledge in practical manufacturing situations to improve production efficiency and accelerate the development of smart factories.

Target Audience
R&D, manufacturing process, and equipment engineers

Operational 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 Training Program Efficiency Index



Program Title
Six Sigma Green Belt and Engineering Experts

Course Outline
 (1) Improve analytical and problem solving skills through the 8D (Eight Disciplines Problem Solving) model. The model establishes corrective solutions based on the identification and statistical analysis of the root causes of abnormalities. The objective of the course is to help engineers improve product quality and yield, and avoid unnecessary waste.
 (2) The Six Sigma green belt program seeks to improve customer experience and problem-solving of engineering anomalies. The training provides a thorough understanding of improvement initiatives in the manufacturing process, service delivery, on-time delivery and production efficiency. The course is aimed at enhancing overall teamwork and customer satisfaction.

Target Audience
Manufacturing process and equipment engineers

Operational 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

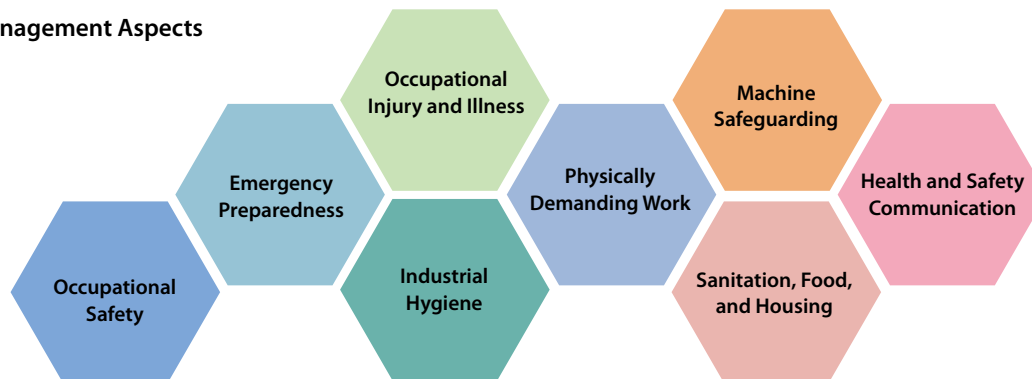
ASEH is committed to providing workers with a safe, healthy, and conducive work environment. To ensure the health and safety of employees, and prevent accidents at the workplace, we have formulated comprehensive procedures for managing occupational health and safety ("OHS"). The main focuses of ASEH's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

OHS Management System

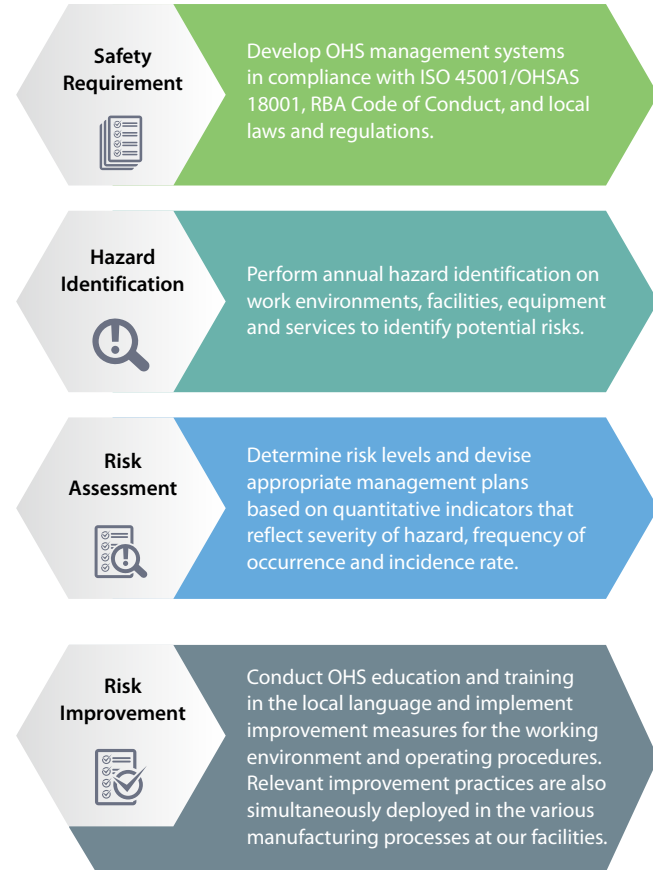
All ASEH facilities worldwide have established OHS management organizations, and formulated methods and procedures that follow ISO 45001/OHSAS 18001 standards¹, the RBA Code of Conduct and local regulations. In addition to setting up a system for regular reviews, the OHS management system contributes 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. 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 Aspects



OHS Management Processes



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

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 123 incidents of occupational injuries in 2021, amounting to 3,216 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 3 cases of occupational disease, which occurred at ASE Malaysia. For more information, please refer to the 「Appendix- J. Workers Occupational Health and Safety」

Occupational Disease

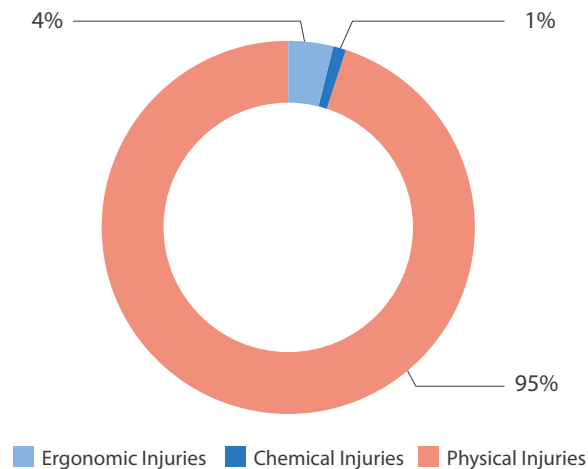
There were three cases of occupational incidents at ASE Malaysia caused by exposure to hazardous chemicals during operations. Excessive levels of a hazardous substance were detected during annual employee health checks. We immediately reassigned the affected employees to other locations and conducted thorough environmental inspection of the facility. We have also continued to monitor the employees' hazardous substance levels. The situation has since returned to normal, and the employees are now free from any health and safety concerns.

Occupational Injury Statistics

Category	2021	
	Male	Female
Number of Occupational Injury Accidents	63	60
Injury Rate ¹	0.12	0.12
Disabling Injury Frequency Rate (FR) ²	0.59	0.59
Disabling Injury Severity Rate (SR) ³	12.21	18.78

¹ Injury Rate = (total number of injuries x 200,000) / total hours worked, excluding traffic accidents
² Disabling Injury Frequency Rate (FR) = (total number of disabling injuries x 1,000,000) / total hours worked
³ Disabling Injury Severity Rate (SR) = (disabling injury work loss days x 1,000,000) / total hours worked

2021 Occupational Injury Category



Occupational Injuries and Improvement Measures

Physical Injuries

Causes:

- (1) Falls/Slips
- (2) Caught in/Between objects
- (3) Cuts/Bruises

Improvement Measures:

- (1) Strengthen communication (videos, warning signs)
- (2) Increase adequate machine safeguards
- (3) Formulate relevant protocols and standard operating procedures (SOP)
- (4) Personnel education and training
- (5) Wearing of protective equipment

Ergonomic Injuries

Causes:

Poor posture when carrying items, resulting in muscle strain

Improvement Measures:

- (1) Formulate relevant protocols and standard operating procedures (SOP)
- (2) Personnel education and training
- (3) Auxiliary equipment

Chemical Injuries

Causes:

Spraying of chemicals

Improvement Measures:

- (1) Formulate relevant protocols and standard operating procedures (SOP)
- (2) Personnel education and training
- (3) Increase notices on the use of protective equipment

Occupational Injury Incident Reporting Procedures

Reporting the injury incident to the occupational safety unit in the facility (who/what/when/where)

Performing initial medical treatment before taking the injured to the hospital

The occupational safety unit reporting the injury incident to the local competent authority

Cordoning off the site of an accident until the occupational safety unit and the competent local authority have completed the investigation and given permission for cordon removal to assure the same injury accident does not reoccur

Analyzing the causes of injury accident and working out measures for long-lasting improvement; filing the accident report for record

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 2021, we completed 300 drills for earthquakes, fire and chemical disasters.

Establishing a Medical Mask Factory for Employee Health and Safety Protection

Since the onset of the Covid-19 outbreak in 2020, ASEH has proactively responded with robust measures to protect the health of its employees. All employees are required to wear medical masks before entering ASEH facilities. To ensure adequate access to masks, we have constructed a Class 100K cleanroom to produce medical grade masks that meet regulatory health standards. The cleanroom is equipped with particle measuring systems (PMS) to maintain a clean production environment. We also promoted sustainability by minimizing the use of packaging materials and automating the production line to increase our operational efficiency. For the safety of employees on the production floor, we have retrofitted our machines with a safety device developed and modified the dust collector to reduce noise and vibration. Our mask line began volume production in August 2020 after a medical device license was granted from the Ministry of Health and Welfare. Since then, we have been providing a variety of high quality masks, free of charge, to nearly 60,000 ASEH employees. As COVID-19 cases continue to spike, we are ramping up our monthly production and distributing more masks so that employees could replace them more frequently. ASEH's mask production efforts are part of our comprehensive employee care plan and preventive pandemic measures to counter the adversity of the prolonged epidemic. To that end, we will continue on these paths to help fulfill our corporate social responsibility.



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 2021:

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 330,000 hours of occupational health and safety education, and training for more than 300,000 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 medicine clinics 	<ul style="list-style-type: none"> • Provided health screening for more than 52,000 employees at a cost of approximately US\$2.5 million • Provided health consultations (quitting smoking, weight loss, mental health, etc.) and workshops (pandemic prevention, pregnancy care, cardiovascular diseases, etc.).
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 management systems.

Contractors in-plant Construction Procedures





RESPONSIBLE PROCUREMENT

ASEH is committed to partnering with our suppliers to ensure that workers are treated with respect and dignity, working conditions in ASEH's supply chain are safe, 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.



2021 Key Performance



SDGs	Business Actions	2021 Material Aspects	KPI	2021 Target	Status	2021 Performance	2022 Target	2030 Target
<p>4 QUALITY EDUCATION</p>	<p>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.</p>	Sustainability Supply Chain	DRC Conflict-Free Product Lines of Packaging and Material Services (%)	100%	Achieved	100%	100%	100%
			DRC Conflict-Free Product Lines of Electronic Manufacturing Services (%)	100%	Achieved	100%	100%	100%
			Number of Supplier Sustainability Audits	100	Achieved	125	100	100
			Critical Direct Material Suppliers Completing RBA SAQ (%)	85%	Not Achieved	70.5%	88%	100%
			Non-tier 1 Suppliers Conduct Risk Assessment (by tier-1 procurement amount) (%)	50%	Achieved	61.1%	>50%	>50%
<p>13 CLIMATE ACTION</p>	Substantially reduce emissions from our supply chain and our operations, in alignment with climate science.		Critical Suppliers Obtaining ISO 14064-1 Certification (%)	70%	Not Achieved	51%	75%	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). With an aim to continuously elevate customer trust, we strengthen our service globally by providing manufacture base throughout Taiwan, China, Japan, South Korea, Malaysia, Singapore, the U.S.A. and Mexico. We also work with thousands of suppliers globally to procure raw materials, equipment, facility/engineering services, waste management services, transport, logistics and subcontract services.

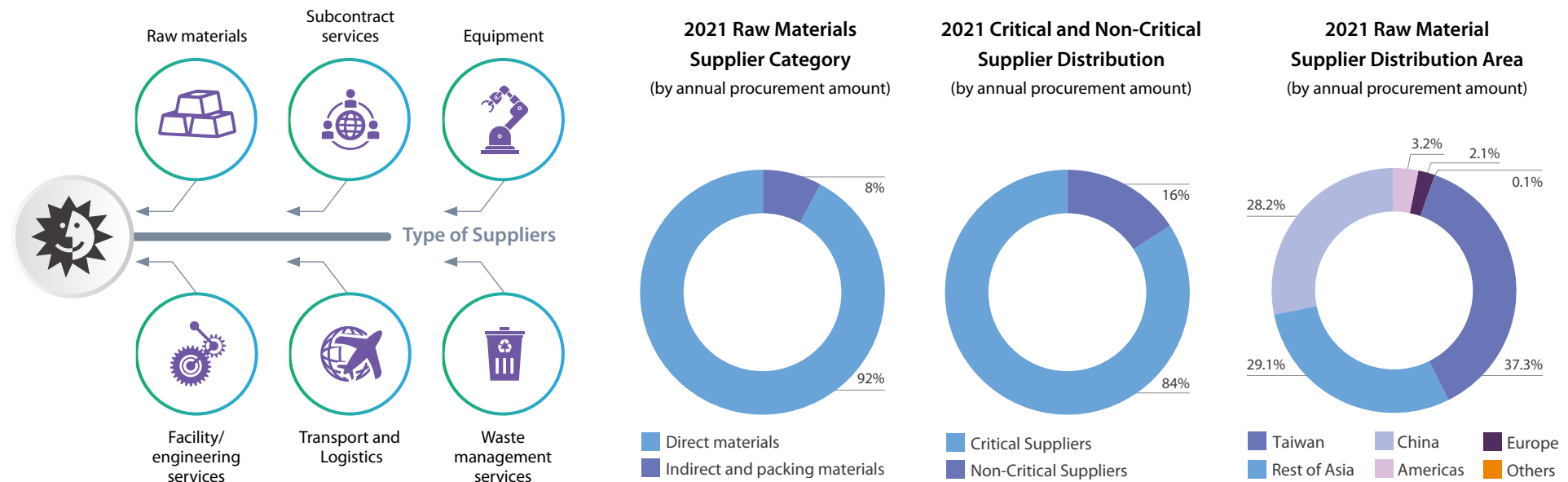
The supply of raw materials has the most direct impact on ASEH's day-to-day operations and manufacturing. Raw material suppliers are classified into two categories according to their attributes; direct material suppliers (suppliers of materials directly related to manufacturing) and indirect/packaging material suppliers (suppliers of packaging materials or materials indirectly related to manufacturing). To ensure efficient resource allocation and supplier management raw material, we identify tier-1 suppliers based on their annual procurement value and focus on the maintenance of 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 61.1% of tier-1 suppliers' total procurement amount.

We also performed sustainability risk assessment to non tier-1 suppliers by geographic locations as well as material type, 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.

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.

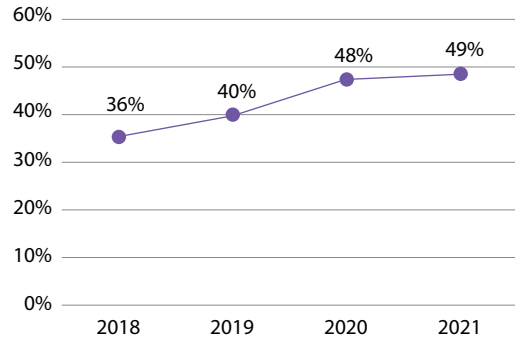


Supporting Local Suppliers

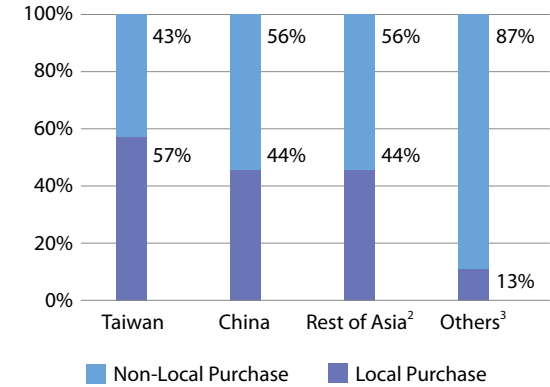
While investing globally, ASEH endeavors to boost local development through its procurement efforts, and is thus working closely with local suppliers¹, and helping them develop technological capabilities. Such efforts benefit the environment by reducing carbon emissions within the supply chain, as well as the community by creating local job opportunities. In 2021, procurement from local suppliers accounted for approximately 49% of the total procurement amount.

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

Local Purchasing Spends



2021 Raw Material Local Purchasing Spends



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

To ensure ASEH's core sustainability value can be extended 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, 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/aseh-supplier-coc-en.pdf>

Supply Chain Management Strategy

Through stable partnerships with 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 analyse our 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.

ASEH Supply Chain Management Strategy



Value Oriented

Strategy

To obtain a competitive overall value in the supply chain

Target

Upgrading the Sustainable Value of the Supply Chain

Project:

Replacing traditional cardboard boxes for IC storage with reusable anti-static boxes

As a key player in the semiconductor value chain, both ASE and SPIL have been actively researching and developing innovative solutions that meet the needs of the market. Traditionally, single-use cardboard boxes have been used to store and transport IC products. In light of recent material shortages, soaring costs and other operational challenges, our procurement team began working with suppliers to develop reusable packing solutions. After conducting several trials with customers and suppliers, a new solution was developed by applying a layer of special electrostatic coating on polypropylene (PP) corrugated boxes. The ESD PP corrugated boxes protect the IC products from electrostatic discharge (ESD) and eliminate customers' concerns of dust contamination from traditional cardboard boxes. The boxes were successfully adopted across all ASEH facilities. As these boxes were also reusable, we managed to achieve a box recycling rate of 85% within our facilities, and 50% outside our facilities.

ASEH continuously strives to improve customer satisfaction and enhance our market competitiveness by offering tangible solutions to address customers' pain points and create strategic value to the supply chain. We remain committed to our fundamental mission of taking care of the environment and incorporating sustainability to all aspects of our business operation.

Subsidiary: ASE, SPIL



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

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.

Subsidiary: USI



Quality First

Strategy

To obtain the best quality products and services from suppliers

Target

Shaping Knowledge and Quality across the Value Chain

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.

Subsidiary: ASE



Strategic Cooperation

Strategy

To integrate suppliers' resources and capabilities for greater innovation

Target

Reinforcing Supply Chain Collaboration and Resilience

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) real time WIP (work in process) of supplier inventory at each process site, and uploading WIP data through e-Hub; 2) 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.

Subsidiary: ASE



Sustainable Sourcing

Strategy

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

Target

Creating a Supply Model for a Circular Economy

Project 1: Development of Techniques to Concentrate Electroplating Waste Solution

Sludge can be hazardous and is a serious concern in semiconductor wastewater treatment. ASE has collaborated with suppliers and academic institutions to develop a processing technique that allows the concentration of electroplating waste solution during the wastewater treatment process. Through the technique, the metal content in the sludge is concentrated to a level that can be extracted easily. The extracted metal content can then be recycled and reused, while the sludge will be rid of hazardous content and can be discharged safely. This innovative method reduces the cost of ownership in waste handling and mitigates the impact to the environment through recycling the metal waste.

Project 2: Recovering waste plastic to produce environmental trash bags

In our shift towards a circular economy, ASEH has always been focused on adopting a 'high value, low carbon, waste reduction and smart tech' approach. ASEH began a novel recycling program that began with the identification of the source of the waste material. We started to conduct an initiative to collate waste material inventories throughout our facilities and recover discarded packaging films, buffer materials, foams and plastic bags. These materials are then crushed, compressed, sorted and processed into ASE-branded trash bags. To date, the annual volume of the waste plastics that ASE has recovered for producing trash bags has reached 639 metric tons, equivalent to the loading of 43 compressed garbage trucks. With 80,000 rolls of environmental trash bags produced monthly, this innovative approach has successfully reduced waste output and enabled us to recycle and reuse waste plastics.

Subsidiary: ASE



Responsible Minerals Sourcing

Strategy

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

Target

Conducting Responsible Procurement Practices

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."

Subsidiary: ASE, SPIL, USI

7.3 Sustainable Supply Chain Management

ASEH is committed to become an advocator and an action maker with regard to corporate sustainability issues. Since 2015, ASEH has joined RBA and proactively participated in relevant conferences and training courses. 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 2021.

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.

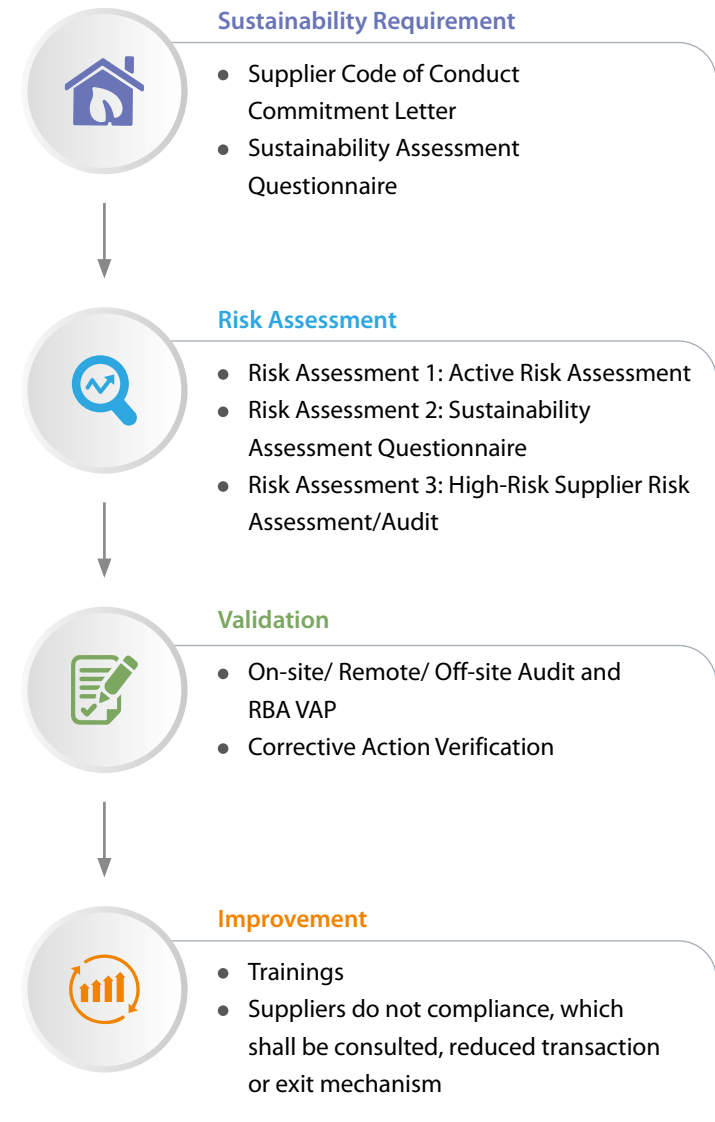
Sustainability Requirement

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 45001:2018 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 suppliers that exhibit potentially high social, economic, and environmental risks. ASEH will provide support to deficient suppliers through periodic audits and guidance to mitigate and control the risks effectively.

Supplier Sustainability Management Approach



Risk Assessment 1 (RA 1): Active Risk Assessment

We conduct preliminary assessments and analysis of potential risks based on the supplier’s location, procurement amount, type of product supplied and manufacturing process.

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

To ensure effectiveness in the assessment and take into account the interests of small and medium suppliers, we have established standards and requirements commensurate to the services rendered for critical and noncritical suppliers that help ASEH develop a more resilient and sustainable supply chain. In 2021, we conducted SAQ and achieved a response rate of more than 76% 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 the RBA SAQ.
- Non-critical Suppliers: the focus is on management system requirements.

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

From the review and analysis of the questionnaire results, we are 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, remote audits or request for completion of RBA Validated Audit Program (VAP).
- Non-critical Suppliers: request for completion of the RBA SAQ.

Supplier Sustainability Risk Assessment Targets and Procedures



Active Risk Assessment

Targets: All suppliers

- We conduct initial risk assessments of suppliers based on the manufacturing location, manufacturing processes and procurement amount



Sustainability Assessment Questionnaire (SAQ)

Targets: All tier-1 suppliers

- Critical suppliers: ASEH SAQ/RBA SAQ
- Non-critical suppliers: ASEH SAQ



On-site audit/RBA VAP \ RBA SAQ

Target: High-risk suppliers

- High-risk critical suppliers: On-site audit /Remote audits / RBA VAP \ RBA SAQ
- High-risk non-critical suppliers: RBA SAQ

Sustainability Risk Assessment Factors



Governance and Economic

- Flexibility, Quality, Cost, Service and Technology
- Sustainability Management Policies and Organization
- Risk Management
- Business Ethics
- Information Security
- Conflict Minerals Management
- Supply Chain Management



Environment

- Environmental Management System
- Carbon Management
- Water Management
- Waste Management



Social

- Occupational Health and Safety Management System
- Emergency Preparedness
- Labor Rights
- Labor Management System
- Human Rights
- Social Involvement

Supplier Major Sustainability Risk Factors in 2021

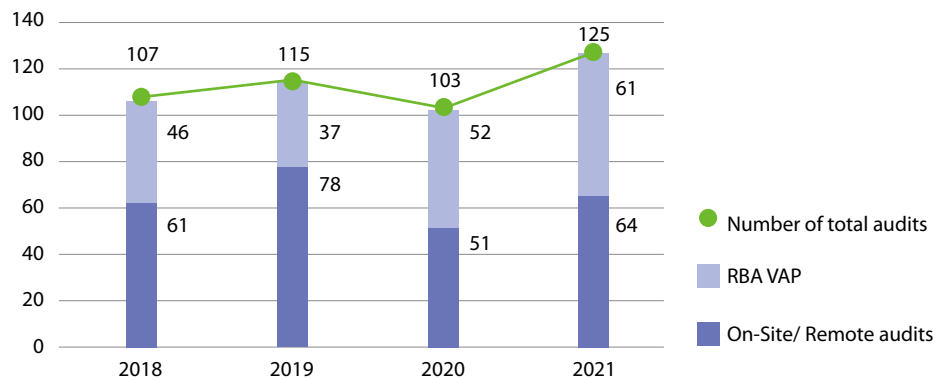
Category	Risk Factors	Risk Description
Governance and Economic	Risk and Business Continuity Management	Procedures for the identification of regulatory risks affecting business operations have yet to be established Emergency response and improvement plans for related risk management have yet to be established
	Information Security Management	Procedures for managing privacy and intellectual property has yet to be established Mechanism for information security management (including employee training) and risk simulation exercises have yet to be established
	Supplier Sustainability	A framework has yet to be established for the formulation of supplier sustainability policies and management
Environment	Climate Change and Carbon Management	Procedure for climate risk evaluation, and measurers for mitigation and adaptation have yet to be established Mechanisms to measure GHG inventory have to be established
	Water Management	Water use reduction targets and water recycling mechanism have yet to be established
Social	Occupational Health & Safety(OHS)	Mechanisms for the control and prevention of emerging infectious diseases have yet to be established
	Labor Rights	A system for the assessment of labor-related risks and impact has yet to be established A mechanism for managing employment agencies has yet to be established

Sustainability Audit Mechanism

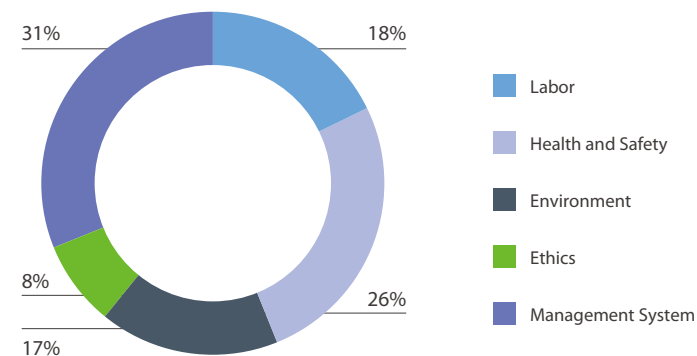
To strengthen the resilience of our supplier chain, ASEH has established a supplier sustainability audit system to carry out routine and aperiodic audits. Adapting to the global COVID-19 pandemic in 2021, we have adapted our approach and conducted audits through various channels, including document audits, on-site audits, remote audits and the RBA VAP. 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 the past year, we have conducted on-site audits, RBA VAP and remote audits for 125 raw material suppliers and high-risk critical suppliers. All suppliers have completed the corrective done improvements timely, 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 2021, 25% of our non-tier- 1 suppliers completed sustainability questionnaires, and 8% 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.

Suppliers Audits



Supplier Sustainability Audit Findings by Category in 2021



Supplier Audit Results and Corrective Actions in 2021

Category	RBA Classification	Major Shortcomings	Improvement Actions
Labor	Freely Chosen Employment	<ul style="list-style-type: none"> Foreign employees were forced to pay recruitment fees by recruitment agencies 	<ul style="list-style-type: none"> Recruitment agencies are to immediately cease the policy of collecting fees from foreign employees and to refund any payments that were collected to employees
	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
Health and Safety	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.
Environment	Environmental Permits and Reporting	<ul style="list-style-type: none"> Documentation for permits were not updated timely 	<ul style="list-style-type: none"> Establish standard operating procedures to update and revise documentations for environmental permits according to on-site conditions
	Water Resource 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"> Failure to establish an anonymous reporting mechanism 	<ul style="list-style-type: none"> Establish anonymous reporting and complaint channels, as well as follow up mechanisms to protect the identities and rights of persons filing the report or complaints.
Management System	Risk Assessment and Risk Management	<ul style="list-style-type: none"> Failure to establish a comprehensive risk evaluation mechanism 	<ul style="list-style-type: none"> Incorporate labor and ethics standards into risk management and perform periodic risk identification and management
	Training	<ul style="list-style-type: none"> Failure to provide regular RBA-related training to employees 	<ul style="list-style-type: none"> Include RBA-related curricula into the annual employee training programs for new hires and existing employees
	Supplier Responsibility	<ul style="list-style-type: none"> Failure to establish supplier risk evaluation procedures and conduct supplier audits Failure to conduct audits in accordance with RBA principles, on the next tier of suppliers 	<ul style="list-style-type: none"> Identify key suppliers and establish associated risk evaluation procedures and audit mechanisms

Sustainable Supply Chain Development Program

To strengthen the sustainability of ASEH's supply chain and tackle an evolving environment, we continue to invest in programs that enhance our suppliers' sustainability knowledge and standards through training courses, seminars and supplier outreach.

Eliminating the Risk of Forced Labor and Bonded Labor in the Supply Chain

ASEH is committed to upholding the dignity of work and protecting the rights of workers across our global business operations. We recognize that there may be some levels of inadequacy in local regulatory protection for workers coupled with complex hiring procedures within our supply chain that may contribute to forced labor or labor exploitation. In 2018, we worked with our suppliers to conduct a thorough review of the recruitment process of migrant workers and eliminate unethical practices. ASEH does not tolerate any human rights violations in our supply chain and, we will continue to ensure that the risks of exploitation are eliminated and that migrant workers receive fair and decent treatments.

Supplier Engagement Guidance Program

We have allocated resources to support our suppliers in establishing GHG and product carbon footprint management systems that accelerate their efforts to meet emission regulatory requirements. In 2022, we will be collaborating with third party consultants on a medium to long term supplier low carbon guidance program which will be conducted both online and in-person. The program will not only support suppliers to attain ISO 14064-1:2018 certification and carbon footprint verification but also facilitate carbon inventory management across the supply chain. A thorough understanding of the supply chain GHG emissions and carbon footprint allows ASEH to step up its carbon reduction plans and increase our competitiveness.

Supplier Sustainability Forum and Training

We have organized sustainability forums and training conferences at multiple facilities to demonstrate to our suppliers how much ASEH values sustainability and to communicate our sustainability systems and ESG performance requirements. As in-person sessions were difficult to hold in 2021 due to the global COVID-19 pandemic, we held three virtual sessions instead.

ASE- Sustainability Forums

- ASE Kaohsiung: An online sustainability forum for suppliers was held in 2021. We shared and exchanged knowledge and information about global sustainability trends. A total of 79 people from 44 suppliers attended.
- ASE Shanghai (Material): We organized workplace safety training for suppliers to strengthen the prevention of on-site workplace safety incidents and reinforce their response capabilities. A total of 245 people from 31 suppliers attended.

USI-Sustainability Seminar

- We hosted a Supplier Sustainable Supply Chain Information Conference via online video conference due to the pandemic. A total of 276 participants attended.
- During the session, we shared USI's sustainability experiences and results as well as the ESG requirements and future goals that we require of our suppliers. We strengthened supply chain management so that it conforms to environmental regulations and can adapt to changes in clients' environmental requirements. We also invited SGS Taiwan to talk about issues related to Net Zero Emissions Trends and Responses and global trends in general, so that suppliers could gain at least a basic understanding of carbon management for carbon emissions reductions and the goal of net zero emissions.

ASEH Supplier Sustainability Awards

As part of our strategic efforts to build a stable and more sustainable supply chain, we established the Supplier Sustainability Awards in 2017, which recognizes 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, for reviewed by ASEH and independent third parties. The submitted projects undergo a rigorous selection process based on the implementation timeframe and efficacy, and selected projects will be funded by the ASE Environmental Protection and Sustainability Foundation.

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.

In 2020, one supplier project for Low Carbon and two supplier projects for the Circular category were selected respectively, and their implementation progress in 2021 is as follows:

Sustainability Strategies	Selected Supplier	Partnership Project	Expected Outcomes and Benefits	Progress in 2021
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 	<ul style="list-style-type: none"> All suppliers submitted sustainability partnership projects of between 1-3 year duration, including project description, project schedule, executive team, expected financial and non-financial benefits, future monitoring plans, etc. An independent third party conducted on-site audit of the three suppliers. The ASE Environmental Protection and Sustainability Foundation provided funds to three suppliers in accordance with the contracts and the actual progress in 2021.
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 	

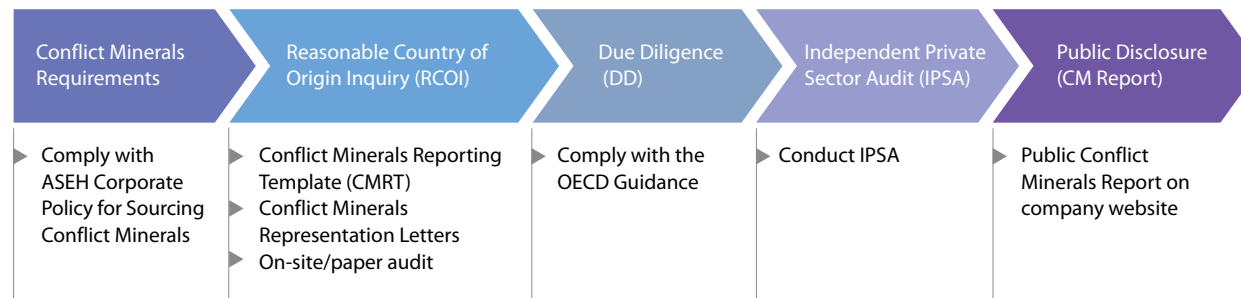
7.4 Conflict Minerals Compliance

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/csr/responsible-procurement/conflict-minerals-compliance/>

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.

¹ ASE took the initiative to join the RMI in 2015 and has continued its participation as ASEH to this day.

Reasonable Country of Origin Inquiry (RCOI)

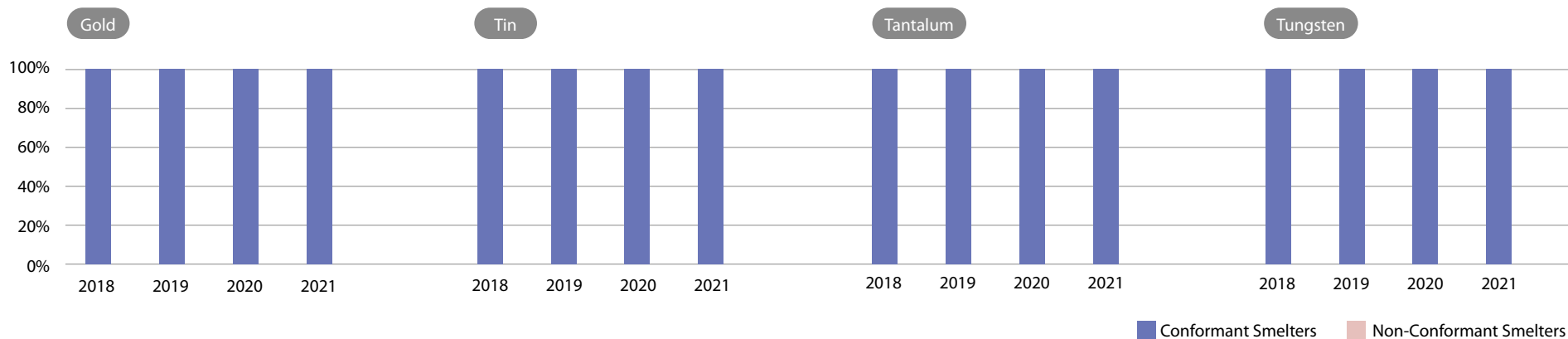
Each year, ASEH performs RCOI to identify and validate the sources of 3TG in our packaging and material services and electronic manufacturing services and products, and whether they come from conflict-affected regions.

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 2011, 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 2021, we have identified 269 SoRs from more than 600 suppliers. According to the supplier survey we conducted in 2021, 100% of our suppliers are compliant with ASEH's requirement for sourcing DRC conflict-free minerals.

In addition to 3TG, we have expanded the scope of the investigation by conducting proactively the supply chain survey for Cobalt and Mica since 2018 and 2021 respectively, and disclosed the source of smelters to our customers. In 2021, 105 suppliers used cobalt from 77 smelters, and no suppliers used mica.



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/remote and off-site audits to help suppliers set up management mechanisms that complied with OECD Guidance.

Independent Private Sector Audit (IPSA) and Public Disclosure

We undertake an IPSA 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 publicly¹. Based on our RCOI analysis and DD measures in 2021, 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.

2018~2021 Conflict Minerals Compliant Suppliers

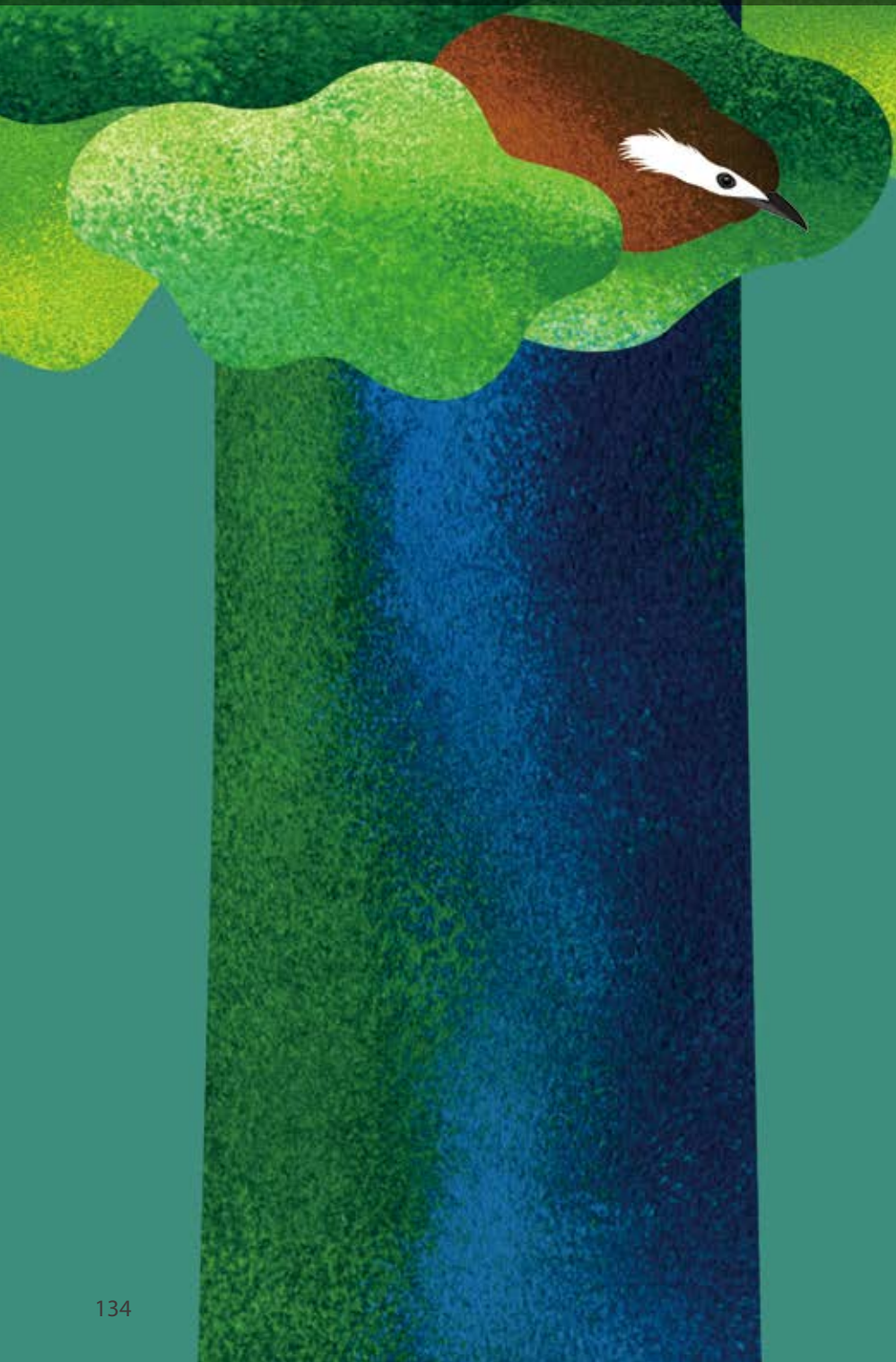


Continuous Improvements

Going forward, we will continue to improve in three aspects:

- **Management Mechanism:** be aware of regulatory changes and adjust our policy in a timely manner, improve our validation process and requirements to new suppliers and existing suppliers, optimize internal management systems, etc.
- **Due Diligence:** improve the accuracy and completeness of data, assess suppliers' due diligence processes through on-site audits so as to assist suppliers to build up internal management systems, etc.
- **Communication:** hold supplier seminars, actively participate in the RMI and other key industry associations' initiatives, etc.

¹ For complete file of ASEH SEC Conflict Minerals Filing, please visit our website at <https://www.aseglobal.com/en/pdf/2021-aseh-cm-report.pdf> or SEC's website at https://www.sec.gov/Archives/edgar/data/1122411/000095010322009651/dp173253_sd.htm

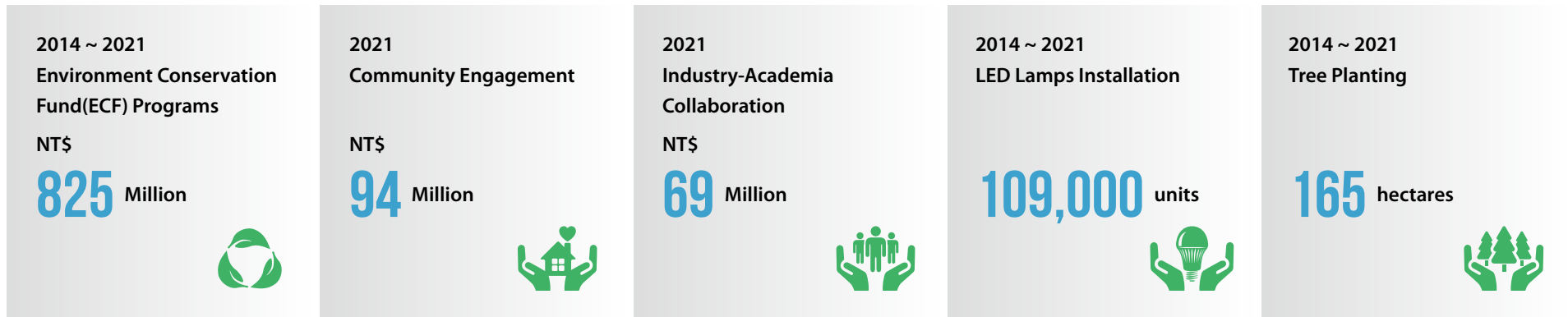





CORPORATE CITIZENSHIP

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. An active participant in charitable activities, education planning, and social work, ASEH's optimal allocation of resources allows it to continuously give back to the community and spread positive impacts.

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.

2021 Key Performance



SDGs	Business Actions	2021 Material Aspects	KPI	2021 Target	Status	2021 Performance	2022 Target	2030 Target
	Promote climate conscious behavior and build capacity for climate action		<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 17,000 LED light tubes installed at 17 schools 13 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 150 industry-academia collaboration projects on environmental technology LED light tubes installed at 170 schools 250 hectares planted with trees
	Implement programmes to support higher education and access to free, equitable, and inclusive primary and secondary education	Social Involvement	<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"> 862 students attended semiconductor courses 254 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"> 2,000 students attending semiconductor courses 2,000 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"> 66 innovative industry-academia collaboration projects 8 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"> 450 innovative industry-academia collaboration projects 25 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 and improve climate literacy <p>2030 Targets:</p> <ul style="list-style-type: none"> Over 150 collaborative academic research projects on environmental technology US\$6.5 million reduction in outsourced waste management costs 	<p>Improvements to environmental technology R&D and production efficiency in 2021 :</p> <ul style="list-style-type: none"> 10 research projects on environmental technology in collaboration with academic or research institutes The research and development of liquid waste and plastic waste reuse technologies can facilitate the recycling of 2,400 tons of liquid waste per year, and improve the recycling and regeneration of waste by 240 tons per year Electroplating waste treatment technology can help reduce 396 tons of harmful sludge and increase sludge value by 276 tons per year, saving about US\$509,000 annually Research on the establishment of optimal operation indicators for wastewater systems can help reduce use of chemicals and sludge output, saving approximately US\$147,000 annually High-concentration organic liquid waste treatment technology can help reduce outsourcing cost, saving an estimated US\$425,000 in costs annually <p>2015-2021</p> <ul style="list-style-type: none"> 72 research projects on environmental technology in collaboration with academic or research institutes; resulted in a total cost reduction of US\$4.9 million <p>* More information refer to appendix(Social Data - K. Social Involvement Key Performance)</p>	<p>Reducing environmental impact, improving quality of life, and raising environmental awareness in 2021 :</p> <ul style="list-style-type: none"> 17,260 LED light tubes installed at 17 schools reduced energy use by approximately 373,000 kWh and carbon emissions by approximately 187 tons CO₂e A tree planting area totaling 13.42 hectares, reducing 200 tons of CO₂e Assisted Da-Gang Elementary School in building a 100% green energy-powered aquaponic farm to promote education on sustainable food production and sustainable farming. Aquaponic farming can cut carbon emissions by 80%, reduce demand for land by 83%, and save water by 99% compared with traditional farming methods Assisted Junyi School of Innovation in Taitung with the implementation of a smart energy conservation and environmental education project. By adopting the recommended electricity-saving measures, the school can save 6.6% or 78,000 kWh of electricity annually, reducing roughly 40,000 kg of CO₂e Implemented 45 environmental education courses; 1,770 students participated; 20 promotional videos on environmental education were produced Transferring successful environmental projects from industry-academia cooperation to 15 other semiconductor businesses <p>2015-2021</p> <ul style="list-style-type: none"> Replacing and installing 108,890 energy-saving LED tube lights in 109 schools, saving approximately 10,113,300 kWh in electricity and reducing about 5,060 tons of CO₂e over the years A total tree planting area of 165.47 hectares, reducing 2,465 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: 26 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.
		<p>Community Engagement</p>		<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>2030 Targets</p> <ul style="list-style-type: none"> Reach 30,000 volunteers Afterschool care for over 2,000 students from disadvantaged households Providing over 95,000 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 2021:</p> <ul style="list-style-type: none"> 8,500 volunteer service hours 3,810 volunteers <p>2015-2021</p> <ul style="list-style-type: none"> 58,800 volunteer service hours 15,970 volunteers <p>* More information refer to appendix(Social Data - K. Social Involvement Key Performance)</p>

Focus	SDGs Alignment	Business Drivers	Business Benefits & KPIs	Social/Environmental Benefits & KPIs	Impacts
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>2030 Targets</p> <ul style="list-style-type: none"> • Participate in over 450 collaborative academic projects on semiconductor materials and advanced technologies • Recruit over 6,000 interns 	<p>Fostering semiconductor talents to promote technological innovation and development in the semiconductor industry in 2021:</p> <ul style="list-style-type: none"> • 66 industry-academia cooperation projects on research topics that include assembly and testing processes, product application, smart manufacturing, behavior prediction, and information security • 862 students participated in the semiconductor courses <p>2015-2021</p> <ul style="list-style-type: none"> • Participated in 261 industry-academia projects involving semiconductor assembly, advanced materials, manufacturing automation technologies, etc. • 1,876 students participated in the semiconductor courses * More information refer to appendix(Social Data - K. Social Involvement Key Performance) 	<p>Talent development via cooperative education, internship, and technological collaborations in 2021:</p> <ul style="list-style-type: none"> • Recruited 224 interns • 101 students participated in collaborative academic research projects • Awarded scholarships to 67 students • Collaborated with over 80 schools <p>2015-2021</p> <ul style="list-style-type: none"> • Recruited 4,394 interns * More information refer to appendix(Social Data - K. Social Involvement Key Performance) 	<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.
		<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. 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>2030 Targets</p> <ul style="list-style-type: none"> • 25 sustainability initiatives 	<p>Driving innovation and development in semiconductor and electronic technologies and improving ASEH's leadership status in sustainable development 2021</p> <ul style="list-style-type: none"> • Collaborated with 39 external organizations in areas related to core business • Joined SEMI committees to promote the development of technology and industries. These committees include the Assembly and Testing Committee, SEMI-Flextech Committee, Smart Manufacturing Committee, MEMS & SENSORS Committee, High-Tech Green Manufacturing Committee, Materials Committee, Testing Committee, and Information Security Committee. <p>2015-2021</p> <ul style="list-style-type: none"> • Collaborated with 435 external organizations in areas related to core business 	<p>Advancement of sustainability topics to help formulate CSR initiatives for the semiconductor industry 2021</p> <ul style="list-style-type: none"> • Collaborated with 83 external organizations in sustainable development • 8 legislative initiatives: net zero emission initiative, SEMI's sustainability initiative, SEMI E187 - Specification for Cybersecurity of Fab Equipment, PV public advocacy, air pollution control initiative, waste disposal initiative, chemical management initiative, and initiative on laws and regulations for water body discharge <p>2015-2021</p> <ul style="list-style-type: none"> • 21 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. • Improve the sustainable development and environment of the semiconductor industry: By participating in relevant initiatives, we improve the sustainable development and environment of the semiconductor industry, and pursue technological progress and economic benefits while maintaining the sustainable development of the earth.
Public Advocacy					

8.1 Social Involvement Overview

To achieve the common good for society, ASEH harnesses its power to stimulate positive social change, bringing about an increase in awareness and positive impacting behavioral change, skills development, and quality of life. Established as ASEH's highest level of organization for social involvement, The Corporate Sustainability Committee (CSC) is responsible for the planning, formulation, and implementation of social involvement policies and regulations, among which the "Public Affairs Engagement Policy"¹ is a set of guiding principles that provides foreign policy directions for all subsidiaries as well as support to organizations with similar ideologies as ASEH. Accordingly, ASEH has also established a supervision mechanism to evaluate the project performance of such foundations and social organizations to ensure that the investment of support and resources results in an actual impact.

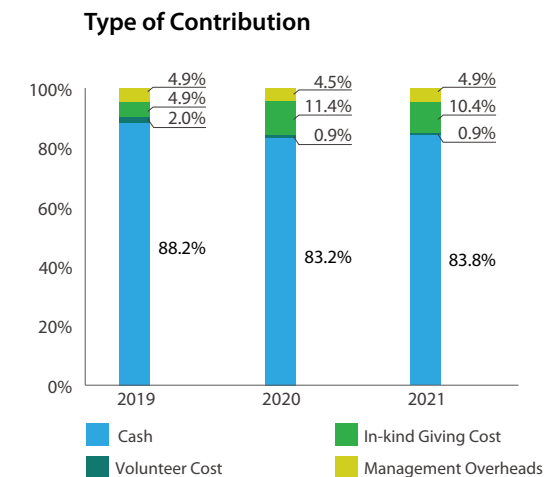
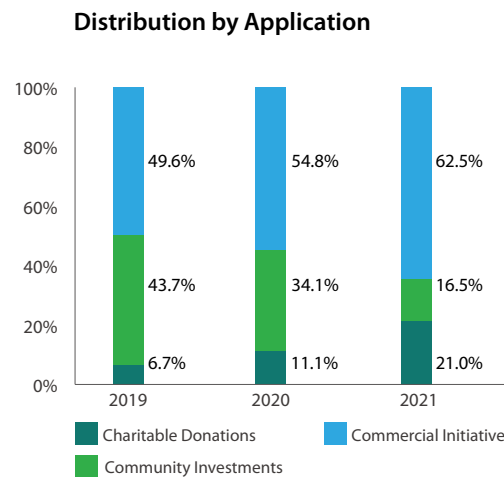
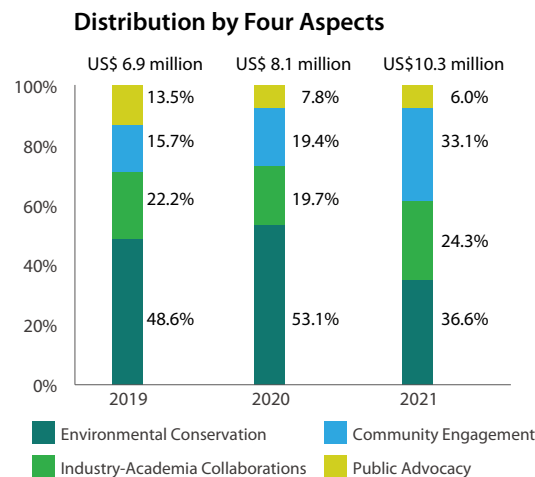
ASEH conducts annual reviews to evaluate its campaigns and performance based on four development strategies—environmental conservation, industry-academia collaboration, community engagement and public advocacy. The CSC Social Involvement Taskforce is responsible for implementing social involvement policies 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. For ASEH's social engagement programs (conducted by the ASE Cultural and Education Foundation and

the ASE Environmental Protection and Sustainability Foundation), we performed analyses of the social return on investment (SROI) and established a social investment performance evaluation system to optimize the evaluation of our social involvements and more effectively manage social engagement programs.

In 2021, we spent US\$10.3 million on social involvement activities, accounting for 0.36² percent of the group's pre-tax net profit. Compared with 2020, we maintained environmental conservation as the main focus of our social involvement, and invested more resources in industry-academia collaboration and community engagement. Our goal is to further cultivate industrial and academic talents, increase the capacity of our technological innovation, and at the same time strength our ties to community development and care for disadvantaged individuals. We recorded over 8,500 hours of voluntary service performed by over 3,800 volunteers.

1. ASEH Public Affairs Engagement Policy (https://www.aseglobal.com/en/pdf/aseh_public_affairs_policy.pdf).
 2. The 2021 pre-tax net profit was NT\$80,193.8 million (for more information, please refer to ASEH Form 20-F).



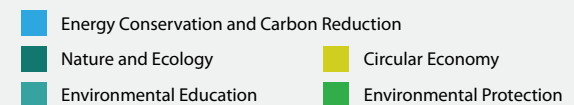
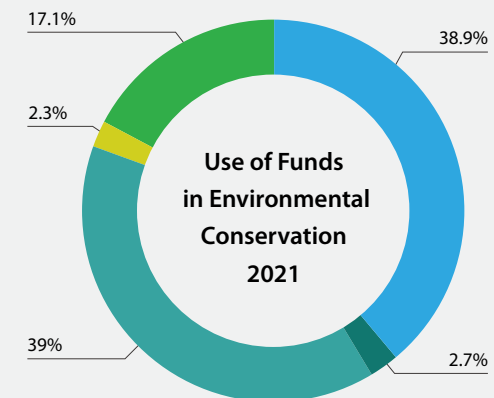
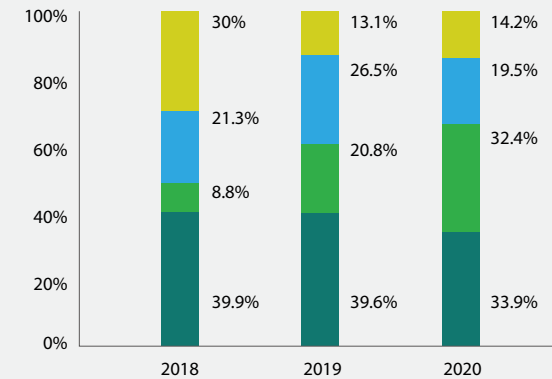
8.2 Environmental Conservation

In 2014, we committed to a 30-year contribution of at least NT\$100 million per year, for environmental conservation efforts in Taiwan. In 2021, we allocated NT\$100 million to the ASE Environmental Protection and Sustainability Foundation for the implementation of environmental protection projects based on the topics of energy conservation and carbon reduction, nature and ecology, environmental education, circular economy, and environmental protection. A total of 32 environmental protection projects were implemented in 2021, the outcomes of which are provided on our website (<https://www.aseepsfund.org.tw/>).

2021 Accomplishments of ECF Programs

Programs	Major Projects
Energy Conservation and Carbon Reduction	<ul style="list-style-type: none"> National forest adoption and forestation projects Campus LED installation projects Smart grid research projects Junyi School of Innovation energy management project Waste reduction technology R&D projects
Environmental Education	<ul style="list-style-type: none"> Shanlin Junior High School smart microgrid installation project: environmental planning Da-Gang Elementary School aquaponic farming project Funding for master's theses and doctoral dissertations on environmental protection issues Proposal selection for the 'Smile Taiwan' creative teaching project 'Paradise' Project on the development of age-friendly sustainable environment education in Taoyuan Community environmental education projects
Environmental Protection	<ul style="list-style-type: none"> Coastal and marine environment maintenance programs Academic research projects on environment-related technologies Installation of solar-powered flashing lights for road safety in communities near Kaohsiung Nanzih Technology Industrial Park
Nature & Ecology	<ul style="list-style-type: none"> Restoration and conservation of yellow-margined box turtles Survey and conservation of protected and endemic species of Taiwan
Circular Economy	<ul style="list-style-type: none"> Supplier Sustainability Award

Use of Funds in Environmental Conservation



Campus LED installation projects

The ASE Environmental Protection and Sustainability Foundation continued to promote campus LED light installation projects. By assisting elementary and junior high schools in rural areas and communities surrounding ASE facilities to replace fluorescent tubes and light bulbs with LED lights, the projects help to protect the eyesight of schoolchildren. Since the project was first launched eight years ago, we have installed 108,890 LED tube lights in 109 schools in the Nantou and Kaohsiung areas. Over the years, the LED projects have helped schools to save 10,113,300 kWh¹ of electricity and reduce 5,060 tons of CO₂e. LED lighting also helps to create a well-lit environment, in turn improving teaching quality and at the same time achieving energy conservation and carbon reduction.

	School	LED Lamps	Electricity saved annually (kWh)
2018	4	8,900	192,240
2019	17	14,050	303,480
2020	25	15,360	331,776
2021	17	17,260	372,816



Campus LED installation projects

¹ Because of adjustments to our energy saving calculation method, data on yearly energy saving and cumulative amount of energy saved over the years will change accordingly.

Da-Gang Elementary School Aquaponic Farming Project



Da-Gang Elementary School Aquaponic Farming Project

The ASE Environmental Protection and Sustainability Foundation collaborated with Ming Chuan University to assist Taoyuan Da-Gang Elementary School in building an aquaponic farm and develop a sustainable food production and farming education plan. Located near ASE Chungli, Da-Gang Elementary School is dedicated to being an “urban forest school” and places emphasis on environmental education. The school features an age-friendly learning center to connect the driving forces of community development, which is why it became the pilot school for us to promote aquaponic farming practices.

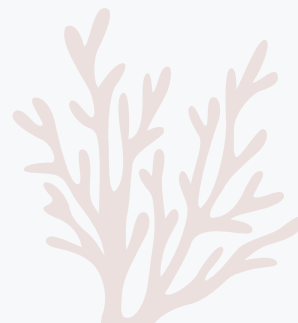
Aquaponic farming is recognized as a new way of farming that can mitigate extreme climate change and ensure food safety. It is environmentally friendly, water-efficient, safe, and free from toxic substances, and aligns with the U.N. sustainable development goals (SDGs) 2, 6, 13, and 15, making it water positive. Compared with traditional farming practices, aquaponic farming can reduce carbon emission by 80%, demand for land by 83%, and water by 99%. We built basic facilities such as a greenhouse, installed smart grids that ASEH has spent years developing, and set up a smart microgrid system and solar panels in order to build a farm that uses 100% renewable energy. We also assisted Da-Gang Elementary School in designing environmental education courses on aquaponic farming to introduce farming practices and enable schoolchildren to gain different experiences in sustainability education.

Coastal and Marine Environment Maintenance Programs



Coastal and Marine Environment Maintenance Programs

To protect Taiwan's marine environment, the ASE Environmental Protection and Sustainability Foundation has donated a total of NT\$12 million between 2021 and 2023 to the Taoyuan City Department of Environmental Protection for the carrying out of coastal and marine environment maintenance work. We invited employees to receive scuba diving training, become certified scuba divers, and together form the "ASE Scuba Diving Team for Environmental Protection" to jointly participate in ocean cleanup activities. Our environment maintenance programs are focused on enhancing ocean cleanup capacities, developing monitoring systems, and setting up river trash interception nets, and organizing various types of awareness-raising activities. In order to safeguard the marine environment and resources, our target is to remove 500 metric tons of coastal and marine debris within three years. Although our target in 2021 was to remove 150 metric tons of coastal and marine debris, we actually cleaned up 308 metric tons of debris, surpassing our target by a large margin.




8.3 Industry-Academia Collaborations

ASEH understands that a talent pool is the foundation of technology and industrial development. For a long time, we have engaged in industry-academia collaborations with reputable universities and offered various industry-specific classes and internship programs to facilitate the integration of learning and practice, enabling students to prepare for their transition from student life to a working life and to cultivate employability. In addition, we launched industry-academia collaboration projects to promote deeper industry-academia exchange, improve R&D capacity, and develop advanced technologies, thereby strengthening the competitiveness of the semiconductor industry.

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 2021, ASEH continued its collaborations with local schools, contributing over US\$2.5 million, including US\$1.8 million towards 66 technology research collaborations and US\$0.3 million for scholarships. We also recruited 224 interns and enrolled 862 students in the semiconductor master's degree program. Nearly 80 schools and research institutions in Taiwan, China, Singapore, Malaysia, South Korea, Japan, etc. were involved in these collaborations.


	2018	2019	2020	2021
Number of interns	366	1,183	638	224
Number of people with a master's degree in semiconductor	158	230	169	862
Number of technological research collaboration projects	42	38	74	66
Investments in technological research collaboration projects	US\$1.3 million	US\$1.2 million	US\$1.4 million	US\$1.8 million
Scholarships	US\$0.2 million	US\$0.1 million	US\$0.06 million	US\$0.3 million
Total invested in industry-academia collaborations	US\$1.6 million	US\$1.5 million	US\$1.6 million	US\$2.5 million

2021 Accomplishments of Industry-Academia Collaboration Programs




Programs

- Cooperative education and internships
- Academic research collaborations
- Scholarships




Projects

- ASE Industry-Academia Career Development Project/ Employment Orientation Project
- Semiconductor Assembly and Manufacturing Education Program
- ASE Internship and Company Visits
- Artificial Intelligence Colleges
- Corporate Mentorship
- USI University
- Semiconductor Assembly Technology Research Projects
- Manufacturing Automation Research Projects
- Advanced Semiconductor Materials R&D Projects



Stakeholders

- University Students
- Academic Institutions and Research Institutes
- Semiconductor Industry



Achievements

- Improving Career Prospects and Competitiveness of Students
- Improving Academic R&D Capabilities
- Cultivating Talented Personnel for the Semiconductor Industry

Industry–Academia Research in Automation Technologies for Smart Manufacturing and Digital Transformation

ASEH is committed to building a smart semiconductor assembly and testing factory. 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 41 projects in order to cultivate the technical and practical skills of students and conduct research on automation technologies. In 2021, we launched six industry–academia research projects that focused on three aspects: smart manufacturing, behavior prediction, and information security, thus using cross-regional academic research to deeper exchange and harness the power of technology to promote digital transformation.

In smart manufacturing, we adopted strip map analysis of the substrate in the chip bond process of the semiconductor equipment to accurately identify process anomalies and improve problem-solving skills. We employed Scanning Acoustic Tomography (SAT) or X-ray machines and automatic defect detection technology, which enable factory production machines to monitor and intercept defective items. We effectively improved the security and efficiency of information control by identifying abnormal behaviors and monitoring digital fences. We introduced a TRF robot dialogue technology to solve problems with artificial intelligence and improve job efficiency. We constructed an employee turnover prediction model



Automation Technology Forum



Assembly Technology Forum

by using big data analytic; the results generated enable us to take immediate actions, such as employee care, to retain talents and minimize production losses. Because digital response is key to building digital resilience, in response to the increasing information security requirements of the international market and customers, we installed optical character recognition on our computer systems to safeguard our trade secrets and prevent information security crises.

ASEH ushered in the era of AI in 2018 when it established its first smart factory. In 2020, ASEH built the world's first private corporate network smart factory—5G mmWave, successfully initiating a digital transformation. In 2021, we continued to invest in an industrial artificial intelligence (IAI) platform, integrating the results of AI research into industrial applications to accelerate toward digital transformation and indirectly promote industry upgrade and innovation in Taiwan.

Semiconductor Packaging Technology Research

ASEH, National Cheng Kung University, and National Sun Yat-sen University jointly organized the 9th ASE Semiconductor Packaging Technology Industry–Academia Conference. At the conference, nine projects were presented and industry practices were shared to promote the commercialization of research results and showcase impressive research achievements.

We continued to invest in the research and development of key technologies. Because the selection of packaging structure and materials may influence the reliability of results, we resolved the issues that we encountered through technological cooperation. For example, we used nanoimprint lithography to improve the incident angle of optical grade coatings; employed stress analysis to solve the non-wire bonding problem of quad-flat no-leads (QFN); identified optimal process parameters for buttress dam and glass materials to mitigate the issue of product defects caused by

molding; and removed mold residuals in packaging process applications. Thus during the process of identifying problems, the research and development capabilities of the academic community were leveraged to improve efficiency and enhance the overall process capacity.

To strengthen the composition and resilience of ASEH's turnkey solutions, ASEH has focused on the following: developing a high-density fine-line shell warpage module to perform predictive maintenance on packaging products; testing high-temperature solder paste used in optical sensor modules by using the tin/antimony system and ensuring that the resulting intermetallic compound meets the product's high-temperature requirement; and solving the stress problems in fan-out chip on substrate packaging. The integration of the results of industry-academia collaboration research into chip packaging, testing, and system assembly highlights the technological capacity of the academic community and effectively addresses key mechanical problems in hardware devices, thereby making new operation models a possibility.

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 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



Corporate Mentorship



USI University

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. SPIL expanded the scope of collaboration to include the College of Engineering and Science of Feng Chia University. For the first time in 2021, two corporate mentorship activities were organized, which were participated by 62 students for a total of 954 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. Through courses, we shared our knowledge on the management and training of skilled talents, CIP, and smart manufacturing applications, and engaged with industry peers. Through university newsletters and forums, we shared relevant knowledge and research results (e.g., 5G mobile communication physical layer and radio frequency designs, user scenarios, and data, etc.) with university students to show them how to apply theory to produce results. A total of 19 classes attended by 1,350 participants were offered in 2021, recording a total participation 2,343 hours. Moving forward, USI University will continue to invest in education and contribute actively to enhancing youth employability.

8.4 Community Engagement

ASEH recognizes the importance of co-existence and mutual prosperity with local communities, and is committed to community engagement programs with a particular focus on community growth, charitable care, and emergency relief. We have established robust communication platforms to ensure uninterrupted communication with the local communities in which each of our global sites is located with the goal of promoting a welcoming, sustainable society where everyone works together to serve the common good.

In addition to continuously creating economic value, we also hope to exert and amplify positive impacts on society by committing to long-term projects that promote community welfare and working in tandem with the ASE Charitable Foundation, ASE Cultural and Educational Foundation, and the Chang Yao Hong-Ying Social Welfare and Charity Foundation. In 2021, we contributed over US\$3.4 million for community engagement activities. We provided afterschool care for 254 students and financial assistance to 8,963 students from disadvantaged families, and made donations to 42 charities.

	2018	2019	2020	2021
Community Engagement	US\$1.9 million	US\$1.1 million	US\$1.6 million	US\$3.4 million
Beneficiaries	About 7,800	About 7,900	About 8,200	About 9,200
No. of students from disadvantaged households receiving afterschool care	123	143	316	254
No. of students from disadvantaged households receiving financial aid	7,706	7,718	7,879	8,963

Afterschool Care for Students from Disadvantaged Households in Nantou

ASEH, the ASE Charitable Foundation, and the Chang Yao Hong-Ying Social Welfare and Charity Foundation each view care for the well-being of disadvantaged students in rural areas as an important part of their mission. In 2018, we began supporting an afterschool care program for students from disadvantaged households. The program was organized by the Nantou County Family Care Association and the Taiwan Holistic Education Association (THEA) to provide after-school tutorial classes for indigenous students and elementary/junior high school students from disadvantaged households. It focuses on character education and academic counseling, and provides meals and accommodations for students who live in remote areas so that they may learn with peace of mind. The program has been ongoing for four years, in that time assisting nearly 350 teenagers and other students from disadvantaged households in rural areas. By providing professional guidance and companionship, we hope to supplement family functions, ingrain correct values in the students, improve their performance at school, and protect them against environmental adversity, thus bringing them more opportunities and hope for their future.



Afterschool Care for Students from Disadvantaged Households in Nantou

SPII's 100 Dollar Family Care Club

Upon witnessing the tragic losses endured by families in the aftermath of the 1999 Jiji earthquake, our subsidiary SPII called on its employees to establish the "100 Dollar Family Care Club," whose goal is to collect individual monthly donations of at least NT\$100, which are then pooled to create a charity fund. The fund is used to support the living expenses of disadvantaged households and individuals and alleviate their financial burden, so that children from disadvantaged households can live a stable life and attend school without worry. These children are also encouraged to engage in active learning, maintain positive friendships, respect their elders, and lend a helping hand to others, among other positive attitudes and values. As of 2021, more than US\$2.8 million has been donated to lend support to over 87,000 disadvantaged households and children.



SPII's 100 Dollar Family Care Club



Poverty Alleviation through Technology-Driven Education

Poverty Alleviation through Technology-Driven Education

The United Nations believes that increased digital literacy is necessary to alleviate social exclusion in the digital era. Recognizing the technology gap in rural areas, our subsidiary USI launched a new program called Technological Support for Education in Rural Areas. In 2018, we built computer classrooms in five schools, three in Gansu and two in Qinghai, and donated 150 computers to improve the learning environment, enrich educational resources, and help students in rural areas access better educational opportunities. Our program benefited 961 students in 2021 and 1,614 students in total over the years. In 2021, USI continued to keep abreast of how the teachers and students are using the computers in class. To that end, we specifically established a team of professional social workers, IT specialists, project executives, and local workers in charge of poverty alleviation to visit these schools and ensure that everything is in working order. Based on these visits, in 2022, we will ramp up our efforts to launch projects that support the technological empowerment of teachers in rural areas so that school teachers are able to effectively teach computer courses and in turn maximize the benefits of our projects.



8.5 Public Advocacy

As a leading global provider of semiconductor assembly and testing services, ASEH strives to be an active participant in both domestic and international non-profit organizations with links to the industry. Our goal is to advance the semiconductor industry through joint efforts with the international community. We are fully committed to promoting initiatives and work relevant to our core business focus and areas of sustainable development (environmental, social, and economic aspects). These include technological innovation and development, corporate sustainability and economic development, environmental projects, climate change, human rights and the supply chain, and industrial park development. This year, ASEH joined the Taiwan Alliance for Net Zero Emissions as a way of responding to global trends in carbon emissions reductions. The Alliance was founded by the Taiwan Institute of Sustainable Energy (TAISE) to support the United Nations' and global initiative to reduce carbon emissions by 2030 and achieve net zero emissions by 2050. As a member of the Alliance, we will promote the Net Zero 2030/2050 Initiative and assist with relevant policy recommendations and implementation to advance toward the net zero vision. In 2021, ASEH contributed US\$0.62 million and was active in over 120 external organizations, allowing ASEH to share our value system with industry peers and supply chain partners, and extend a broader social impact.



Taiwan Alliance for Net Zero Emissions Kick-off Ceremony



Semiconductor Industry ESG Sustainability Initiative Ceremony

Participation in Major Industry Associations in 2021:

Association	Major Activities	Resources invested (US\$)
<p>Semiconductor Equipment and Materials International (SEMI)</p>	<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. As an active SEMI member, ASEH also plays a key role on several SEMI committees, including chair of the Assembly and Testing Committee and SEMI-Flextech Committee, deputy chair of the Smart Manufacturing Committee, and member of the MEMS & SENSORS Committee, High-Tech Green Manufacturing Committee, Materials Committee, Testing Committee, and Cybersecurity Committee. The key SEMI initiatives of 2021 are as follows:</p> <ol style="list-style-type: none"> SEMI established the Global Sustainability Committee in 2021. The committee is tasked with (a) building a sustainability roadmap for the semiconductor industry; (b) developing high-tech material evaluation mechanisms; (c) designing a balanced sustainability scorecard; and (d) maintaining the integrity and accuracy of data and information generated by semiconductor manufacturers and suppliers. All of these actions will assist semiconductor manufacturers in Taiwan and worldwide in keeping pace with new global trends and building a green ecosphere together. Semiconductor Industry ESG Sustainability Initiative: Industry leaders, government officials, academic scholars, and researchers under this initiative declare their commitment to communicating the core sustainable development goals of the semiconductor industry. ASEH joined the initiative, vowing to bolster the industry's global competitiveness while still staying true to the principles of sustainability. With a focus on the strategies on integration, expansion, and innovation, we encourage key subsidiaries and business units to practice ESG and devote themselves to becoming sustainability leaders in semiconductor assembly and testing. We strive to generate a positive impact with the hope that semiconductor suppliers in the ecosystem can be a part of building a better future for society. SEMI E187: Specification for Cybersecurity of Fab Equipment: SEMI's Taiwan Cybersecurity Committee has published SEMI E187: Specification for Cybersecurity of Fab Equipment. This Standard sets basic requirements in four areas: Operating system (OS) support, network security, endpoint protection, and security monitoring. ASEH has joined the Semiconductor Supply Chain Cybersecurity Alliance, whose goal is to bring together industries, government agencies, academia, and research communities to build a resilient semiconductor supply chain and ensure the information security of industries in Taiwan and around the world. SEMI PV Public Advocacy: This initiative is a response to domestic and international trends in carbon neutrality policy in industrial development. With the aim of developing a sound environment for Taiwan's net zero transition, the initiative covers three major topics on the sustainable development of solar photovoltaics: how green electricity can take into account both societal and environmental needs; the credibility and feasibility of a symbiosis between agriculture, fisheries, and electric power; and capacity development and industrialization for PV transformation. Through this initiative, we are able to continuously take stock of material issues related to the development of the solar photovoltaic industry, and have put forth 5 major declarations on 13 topics. 	<p>132,000</p>
<p>Taiwan Semiconductor Industry Association (TSIA)</p>	<p>ASEH is one of the founding members of the Environmental Safety and Health (ESH) Committee–Assembly and Test Working Group, which is affiliated with the Taiwan Semiconductor Industry Association (TSIA). The committee was formed to address industrial safety and environmental issues and provide references for government agencies to formulate policy and regulations related to the outsourced semiconductor assembly and testing (OSAT) industry. It actively participates in international industrial safety and environmental protection organizations and activities, and assists the regulatory authorities in formulating regulations and articles that closely reflect industry and social trends. We are a TSIA member and hold a director position in the association. The key initiatives and programs promulgated by TSIA in 2021 are as follows:</p> <ol style="list-style-type: none"> Discussing and advocating laws to reduce the impacts of the assembly and testing industry: The committee discusses and advocates laws governing air pollution control, waste management, chemical management, and water discharge; and summarizes and analyzes laws on occupational safety and health, pollution control, and RoHS enforced in South Korea, the United States, Mainland China, Japan, and the European Union to provide references for the government. Conducting GHG inventories: We adopted CNS 14064-1 to conduct the Assembly and Testing Working Group GHG inventory, complete joint GHG verification, meet customer and government requirements, and obtain a verification statement; and wrote a GHG emissions report to explain the GHG emissions of the semiconductor assembly and testing industry in Taiwan and demonstrate the TSIA's management strategy and determination to reduce the GHG emissions of the assembly and testing industry. Promoting the auditing of industrial waste disposal plants and sources of waste generation: An audit of 2 waste disposal plants and 7 sources of waste generation in the assembly and testing industry was completed in 2021. Assisting with the promotion of a cooperative platform for supply chain sustainability and circular economy: We host Asia's Sustainable Supply and Circular Economy Conference and Exhibition, support the Financial Supervisory Commission's Green Finance Action Plan 2.0 and Corporate Governance 3.0, spearhead companies addressing environmental, social, and corporate governance (ESG) issues, and promote a virtuous cycle of investment in and industrial pursuit of sustainable development. 	<p>130,000</p>

Association	Major Activities	Resources invested (US\$)
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. In 2021, the RBA announced a new policy and approach to protect workers from exposure to hazardous process chemicals during manufacturing, which includes the establishment of an Industry Focus Process Chemicals List (IFPCL).</p>	35,000
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 2021 projects:</p> <ol style="list-style-type: none"> 1. Establishment and implementation of a free COVID-19 test center in collaboration with Paju City Health Center. 2. Implementation of regular quarantine activities in the Industrial Park Area. 3. Red Cross donation to help the needy neighbors. 4. Upgrade of landscaping in the Industrial Park Area. 5. Additional installation of street lights around ASE KOREA. 	28,000
Institute of Electrical and Electronics Engineers (IEEE)	<p>IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. Through its highly cited publications, conferences, technology standards, and professional and educational activities, IEEE is the trusted voice in a wide variety of areas ranging from aerospace systems, computers, and telecommunications to biomedical engineering, electric power, and consumer electronics. As a member of IEEE, ASEH actively engage with members of the international community on the latest technological trends and attend conferences and professional activities. In 2021, the IEEE conducted a global research survey of 350 technology giants in the United States, the United Kingdom, China, India, and Brazil whose results showed that artificial intelligence, machine learning, cloud computing, and 5G will be critical technologies in 2022.</p>	27,000

APPENDIX

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	2018	2019	2020	2021
Waste	Total general and hazardous waste	ton	67,004	69,795	75,814	82,158
	General waste production	ton	40,839	41,841	45,139	52,618
	Recycled and reused	ton	36,770	38,744	42,255	49,856
	Non-recycled and reused	ton	4,141	3,098	2,884	2,762
	Recycled and reused rate	%	90	93	94	95
	Hazardous waste production	ton	27,838	27,954	30,675	29,540
	Recycled and reused	ton	13,240	16,104	19,788	19,235
	Non-recycled and reused	ton	12,924	11,850	10,887	10,305
	Recycled and reused rate	%	51	58	65	65
	Total recycled and reused	ton	50,011	54,847	62,043	69,091
	Total non-recycled and reused	ton	16,993	14,948	13,771	13,067
	Total recycled and reused rate	%	75	79	82	84
Water	Water withdrawal	m ³	21,571,571	24,177,331	24,961,039	25,872,192
	Water withdrawal intensity	m ³ /thousand USD revenue	1.784	1.755	1.468	1.259
	Ultra-pure water usage	m ³	26,148,689	25,113,761	26,304,664	28,600,692
	Water recycled and reuse	m ³	22,934,123	28,158,345	34,437,950	37,817,390
	Process water recycle rate	%	64	68	72	72
	Wastewater discharge	m ³	17,303,186	18,778,265	19,454,037	19,569,329
	Total fresh water consumption	Million m ³	24.02	24.08	24.71	24.45

Category	Environmental Performance Index	Unit	2018	2019	2020	2021
Energy	Electricity consumption ¹	MWh	3,130,150	3,588,896	3,900,915	4,285,155
	Renewable electricity	MWh	397,766	512,067	706,105	1,030,137
	Non-renewable electricity	MWh	2,732,384	3,076,829	3,194,810	3,255,018
	Electricity intensity	MWh/ thousand USD revenue	0.259	0.260	0.230	0.209
	Liquefied Petroleum Gas (LPG)	GJ	2,802	3,094	16,770	2,273
	Liquefied Natural Gas (LNG)	GJ	354,857	255,582	324,214	332,561
	Motor gasoline	GJ	9,141	8,956	6,593	5,972
	Diesel	GJ	15,653	18,892	73,337	27,231
	Heavy oil	GJ	29,325	31,906	32,534	34,703
	Total non-renewable energy consumption	MWh	3,207,383	3,208,516	3,352,289	3,416,482
	SCOPE 1	tCO ₂ e	99,504	98,880	93,996	90,591
	SCOPE 2 (Market-based)	tCO ₂ e	1,735,097	1,695,223	1,658,606	1,612,049
	SCOPE 1 + SCOPE 2 (Market-based)	tCO ₂ e	1,630,159	1,794,103	1,752,602	1,702,640
	GHG intensity (Market-based)	tCO ₂ e/thousand USD revenue	0.135	0.130	0.103	0.083
	PFC emissions / number package output	kgCO ₂ e/kPCs	0.00081	0.00086	0.00077	0.00062
Air Emission	VOC (Volatile organic compounds)	ton	207	208	219	262

¹ The electricity consumption in 2021 was 15,426,557 GJ, with grid (imported) electricity accounting for 73.28% of the total consumption and renewable energies accounting for 23.17%.

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)	133	121
	Groundwater (total)	5,083	0
	Third-party water (total)	20,656	6,557
Water withdrawals by source of water³	Freshwater (TDS ≤ 1,000 mg/L)	19,752	4,402
	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	10,367	0
	Groundwater	0	0
	Marine water	1,141	0
	Third-party water	8,061	5,665
Total water discharge	Surface water + groundwater + marine water + third-party water	19,569	5,665
Water discharge by source of water⁴	Freshwater (TDS ≤ 1,000 mg/L)	259	0
	Other sources of water (TDS > 1,000 mg/L)	2,757	0
Total water consumption		6,303	1,013

¹ Areas in water stress (Stress>40%): Water withdrawal in these areas accounted for 25.81% of the overall water withdrawal. Water consumption accounted for 18.42% of the total water consumption.

² Water-stressed regions (Stress>40%): (1) ASE: Shanghai Advanced Semiconductor, Shanghai Materials, Kunshan, Suzhou, Weihai, ISESH (2) USI: Kunshan, Zhangjiang, Mexico (3) SPIL: Suzhou

³ Facilities that measure TDS in the water: ASE (Kaohsiung, Shanghai Advanced Semiconductor, Shanghai Material, Wuxi, Korea, Malaysia, Singapore, ISE Labs), USI (Zhangjiang, Jinqiao, Kunshan, Shenzhen, Nantou, Mexico), SPIL (Taiwan, Suzhou); TDS is not measured at other facilities.

⁴ Facilities that measure TDS in the water: ASE (Kaohsiung, 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	6.6~8.2	6~9	7.2~8.2	6~9	6.5~8.9	5.8~8.6	5.8~8.6	-	5.8~8.6	7~8.5	5.5~9.0	7.1~7.9
COD concentration ²	mg/L	<100	3.2~43	<280	9.8~75.5	500	0.8~476	160	-	-	90	2.8~7.6	200	1~28
BOD concentration	mg/L	-	<1~12.5	<100	<1~28.9	300	<0.5~254	160	25	2~7	80	0.2~6.4	50	<2~7
Suspended Solid(SS) concentration	mg/L	<30	<1~13.2	<100	<1~40	400	1~246	200	60	0.5~8	80	0.14~2.92	100	<1~8
Cu ²⁺ concentration ³	mg/L	<1.5	0.018~0.64	<2	0.024~0.52	1	0~0.58	3	1	0.1~01	3	0.006~0.079	1	<0.05~0.3
Ni ²⁺ concentration	mg/L	<0.7	ND~0.22	<1	ND~0.050	0.5	0.002~0.03	-	-	-	3	-	1	<0.1

D. Environmental Violations

	2018	2019	2020	2021
Number of significant violations of legal obligations/ regulations ⁴	2	0	0	0
Amount of fines/ penalties related to the above (Unit: US\$)	93,499 ⁵	0	0	0
Environmental liability accrued at year end (Unit: US\$)	0	0	0	0

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.

⁴ Fine/penalty individually costs more than US\$10,000 is defined as significant.

⁵ In addition to implementing improvement measures for problems encountered in individual cases, ASEH improved its overall systems including (1) interpreting environmental protection-related laws and inspecting company compliance with said laws; (2) re-examining and introducing more complete environmental protection-related policies and procedural documents; (3) establishing environment management task forces to provide environmental protection-related education and training to employees of all levels; (4) upgrading environmental treatment equipment and strengthening air pollution, wastewater, and waste management models; (5) optimizing internal emergency response procedures and hosting regular drills; and (6) performing regular internal cross-inspections to identify opportunities for self-improvement.

Social Data

A. Global Workforce Structure by Nationality/Race

Nationality ¹	Total Employee		Total Employee of Management Level	
	Number	Percentage of Total Employee (%)	Number	Percentage of Total Management Level (%)
Taiwan	48,627	51.24%	4,154	65.68%
China	26,865	28.31%	1,685	26.64%
Philippines	10,582	11.15%	25	0.40%
Malaysia	2,559	2.70%	147	2.32%
Mexico	2,465	2.60%	133	2.10%
Korea	1,885	1.99%	37	0.58%
Indonesia	1,050	1.10%	0	0%
Japan	398	0.42%	86	1.36%
Singapore	234	0.25%	45	0.71%
Nepal	115	0.12%	0	0%
Vietnam	76	0.08%	0	0%
Myanmar	21	0.02%	0	0%
U.S.A	13	0.01%	7	0.11%
India	11	0.01%	2	0.03%
United Kingdom	3	0.00%	3	0.05%
Canada	1	0.00%	1	0.02%
Thailand	1	0.00%	0	0%
France	1	0.00%	0	0%
Total	94,907		6,325	

Race ²	Total Employee		Total Employee of Management Level	
	Number	Percentage of Total Employee (%)	Number	Percentage of Total Employee (%)
Asian	114	67.06%	26	63.41%
White	24	14.12%	12	29.27%
Hispanic or Latino	14	8.23%	2	4.88%
Native Hawaiian or Other Pacific Islander	12	7.06%	1	2.44%
Two or More Races	4	2.35%	0	0%
Black or African American	2	1.18%	0	0%
Total	170		41	

¹ The global workforce by nationality do not include ISE Labs employees.

² The global workforce by race only includes ISE Labs employees.

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	12,101	15.97%	
		Contract	0	0%	
	Gender	Male	1,742	2.30%	
		Female	10,359	13.67%	
	Total			12,101	
	Employment Visa	Gender	Male	1,401	1.85%
			Female	10,133	13.37%
	Total			11,534	
	Electronic Manufacturing Service (EMS)	Employment Type	Regular	613	3.18%
			Contract	0	0%
Gender		Male	108	0.56%	
		Female	505	2.62%	
Total			613		
Employment Visa		Gender	Male	108	0.56%
			Female	505	2.62%
Total			613		

C. New Hire Employee

Category	Group	Number	Percentage of Total New Hire Employee (%)
Gender	Male	24,256	65.69%
	Female	12,668	34.31%
Nationality	Native	35,881	97.18%
	Foreign	1,043	2.82%
Disabled	Male	76	0.21%
	Female	45	0.12%
Position	Management	266	0.72%
	Engineering	5,530	14.98%
	Administration	1,337	3.62%
Age	Skill Job	29,791	80.68%
	<30	25,283	68.47%
	30-50	11,432	30.96%
Education	>50	209	0.57%
	Ph.D	14	0.04%
	Master	1,030	2.79%
	Bachelor	8,667	23.47%
Other Higher Education/High School and below		27,213	73.70%
Total		36,924	

D. Turnover Rate

Category	Group	2018		2019		2020		2021	
		Number	Percentage of Group (%)	Number	Percentage of Group (%)	Number	Percentage of Group (%)	Number	Percentage of Group (%)
Gender	Male	11,887	53.0%	10,225	53.0%	8,485	55.3%	10,339	57.3%
	Female	10,551	47.0%	9,052	47.0%	6,851	44.7%	7,695	42.7%
Position	Management	437	1.9%	1,396	7.2%	346	2.3%	433	2.4%
	Engineering	3,745	16.7%	3,189	16.5%	3,163	20.6%	3,956	21.9%
	Administration	925	4.1%	716	3.7%	685	4.5%	843	4.7%
	Skill Job	17,331	77.2%	13,976	72.5%	11,142	72.7%	12,802	71.0%
Age	<30	14,902	66.4%	12,247	63.5%	8,840	57.6%	9,995	55.4%
	30-50	7,003	31.2%	6,649	34.5%	6,080	39.7%	7,591	42.1%
	>50	533	2.4%	381	2.0%	416	2.7%	448	2.5%
Education	Ph.D	17	0.1%	17	0.1%	17	0.1%	21	0.1%
	Master	817	3.6%	652	3.4%	699	4.6%	909	5.0%
	Bachelor	3,882	17.3%	3,463	18.0%	3,306	21.6%	6,420	35.6%
	Other Higher Education/ High School and below	17,722	79.0%	15,145	78.6%	11,314	73.8%	10,684	59.3%
Total		22,438		19,277		15,336		18,034	

E. Full-time Employees in Non-executive Positions

Category	2018	2019	2020	2021	Difference of 2020-2021
Number of Employee ¹	46,885	46,493	47,753	48,013	260
Average Compensation (NT\$)	744,918	759,968	799,730	914,627	114,897
Median Compensation (NT\$)	-	627,111	670,687	726,063	55,370

F. Parental Leave

Category	Group	Number	Percentage of Group (%)	Total
Employees Qualified for Parental Leave in 2021	Male	5,113	56%	9,105
	Female	3,992	44%	
Employees that Applied for Parental Leave in 2021	Male	243	23%	1,050
	Female	807	77%	
Application Rate (%)	Male		5%	12%
	Female		20%	
Employees Expected to Return to Work in 2021 After Parental Leave	Male	188	23%	829
	Female	641	77%	
Employees Return to Work in 2021 After Parental Leave and Returned as Scheduled or In Advance	Male	130	25%	522
	Female	392	75%	
Return Rate (%)	Male		69%	63%
	Female		61%	
Actual Number of Employees Returned to Work in 2020	Male	144	24%	595
	Female	451	76%	
Employees that Returned to Work in 2020 and Still in Service in 2021	Male	101	23%	448
	Female	347	77%	
Retention Rate (%)	Male		70%	75%
	Female		77%	

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.

G. Employee Engagement Survey

Category	Total Employee	Gender		Age							Management Level		
		Male	Female	<20	20-24	25-29	30-34	35-39	40-45	>45	Junior	Middle	Senior
Employee Experience Indicators(%)													
Inspiration	78	77	83	58	78	76	78	78	78	80	80	87	87
Inclusion	82	81	85	59	83	81	82	81	82	82	83	89	88
Understanding	82	81	85	58	80	80	81	82	84	84	84	90	90
Drive	80	79	83	58	79	78	80	79	81	83	83	88	89
Voice	79	78	83	51	78	78	79	79	78	81	82	88	89
Organization	84	84	87	57	82	83	84	84	84	86	87	89	91
Growth	72	71	76	51	74	72	73	71	71	74	75	82	85
Capability	72	72	74	55	73	71	72	71	72	73	76	82	84
Fair Rewards	70	70	71	61	72	69	70	69	70	70	72	79	81
Trust	70	69	75	49	72	69	70	69	69	73	72	81	84
Collaboration	79	78	83	51	79	79	80	79	79	80	82	86	86
Support	85	86	86	73	87	86	86	84	84	84	88	92	92
Employee Engagement Indicators(%)													
ESG	81	80	83	80	81	79	80	80	82	84	84	88	91
Retention	71	69	72	55	66	66	68	70	75	80	74	78	85
Sustainable Engagement	79	78	81	79	81	79	79	78	79	82	82	87	91

H. Training Hours and Training Spent

Category	Group	Number	Percentage of Group (%)	
Training Hour (Hour)	Gender	Male	4,625,414	56%
		Female	3,703,669	44%
	Total		8,329,083	
	Position	Management	479,217	6%
		Engineering	2,176,238	26%
		Administration	334,047	4%
		Skill Job	5,339,581	64%
	Training Type	Mandatory Trainings ¹	4,337,959	52%
		Non-mandatory Trainings ²	3,991,124	48%
	Training Spent (US\$)	Gender	Male	7,141,743
Female			4,991,855	41%
Total		12,133,598		
Age		<30	4,514,959	37%
		30-50	7,147,307	59%
		>50	471,331	4%
Management	Senior	575,501	54%	
	Middle	378,513	36%	
	Junior	105,908	10%	
Training Type	Mandatory Trainings	3,010,857	25%	
	Non-mandatory Trainings	9,122,741	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 and quality related courses.

I. Human Capital Return on Investment

Year	2018	2019	2020	2021
Human Capital Return on Investment (ROI)	1.38	1.31	1.42	1.63

J. Workers³ Occupational Health and Safety

Category	Group	Employee	Contractor	
Category of Occupational Injuries	Number of Physical Injuries		117	3
	Number of Chemical Injuries		1	0
	Number of Ergonomic Injuries		5	0
	Number of Biological Injuries		0	0
	Number of Psychosocial Injuries		0	0
	Total		123	3
Occupational Injuries	Rate of Occupational Injury ⁴		0.589	0.277
	Number of Disability Cases		7	0
	Rate of Disability ⁵ Cases		0.034	0
	Number of Fatalities		0	0
	Rate of Fatalities ⁶		0	0
	Occupational Diseases	Number of Occupational Diseases		3
Number of Fatalities		0	0	
Rate of Fatalities ⁷		0	0	
Total Number of Working Hours (Hour)		208,896,892	10,840,360	

³ The Workers include employee and contractor (exclude visitors)

⁴ Rate of occupational injury= (number of occupational injury *1,000,000)/ total hours of actually worked

⁵ 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

⁶ Rate of fatalities from occupational injuries= (number of fatalities from occupational injuries *1,000,000)/ total number of working hours

⁷ 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

	2018	2019	2020	2021
No. of project	9	11	10	10
Cost-saving of outsourced waste management (US\$)	2,140,000	348,000	566,000	1,096,000

Industry-Academia Collaboration Programs

	2018	2019	2020	2021
No. of interns	366	1,183	638	224
No. of semiconductor master's degree students	158	230	169	862
No. of semiconductor assembly technology research projects	42	38	74	66

Afforestation Projects

	2018	2019	2020	2021
No. of planting area (hectares)	13.18	13	18.05	13.42

Volunteer

	2018	2019	2020	2021
No. of volunteers participating in the event	2,130	2,300	2,822	3,810
No. of volunteer hours	12,000	9,200	5,918	8,500

Environmental Education Program

	2018	2019	2020	2021
No. of courses	20	24	31	45
No. of participation	2,100	2,500	2,700	1,770
No. of seed teachers	170	120	238	42
No. of training materials/films	2	10	38	27

Supply Chain Data

A. Supplier Sustainability Audits

Category	2018	2019	2020	2021
On-site/ Remote	61	78	51	64
RBA VAP	46	37	52	61
Total	107	115	103	125

B. Critical Direct Material Suppliers Completing RBA SAQ (%)

Category	2018	2019	2020	2021
Critical Direct Material Suppliers Completing RBA SAQ (%)	66%	70%	64%	71%

C. Non-tier 1 Suppliers Conduct Risk Assessment

Category	2018	2019	2020	2021
Non-tier 1 Suppliers Conduct Risk Assessment (by tier-1 procurement amount) (%)	44%	58%	56%	61%

D. Critical Suppliers Obtaining GHG Certification (%)

Category	2018	2019	2020	2021
Critical Suppliers Obtaining ISO 14064-1 Certification (%)	-	-	45%	51%

E. Conflict Minerals

Category	2018	2019	2020	2021
DRC Conflict-Free Product Lines of Packaging and Material Services (%)	100%	100%	100%	100%
DRC Conflict-Free Product Lines of Electronic Manufacturing Services (%)	100%	100%	100%	100%

Critical Supplier List

ASEH Critical Supplier List (ATM) in 2021

3M	Advanced Recycling Co., Ltd.	ADVANTEK	Air Liquide Far Eastern Ltd.	Air Products and Chemicals, Inc.
ASE (Shanghai) Inc.	ASE Electronics Inc.	ASE Tray Plant	ASIA PAL PRECISION INDUSTRIES CO., LTD.	Ato Tech
Chang Wah Electromaterials Inc.	CHAR MAY ADVANCE CHEMICAL CORPORATION	Chemleader Corporation	Zhejiang Crystal-Optech Co., Ltd.	DAEDUCK ELECTRONICS CO., LTD.
Daewon Semiconductor Packaging Industrial Co., Ltd.	Daewon-Peak	DDP Specialty Products Taiwan Co., Ltd.	DISCO Corporation	Dou Yee Enterprises
Dream Chip Co., Ltd.	ISHIHARA CHEMICAL CO., LTD.	E.PAK RESOURCES (S) PTE LTD.	EHWA DIAMOND	FUJIFILM Electronic Materials Co., Ltd.
Furukawa Electric Co., Ltd.	Fusheng Electronics Corporation	GTA MATERIAL CO., LTD.	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.	INNOX ADVANCED MATERIALS CO., LTD.
ITW Meritex Sdn Bhd	Jentech Precision Industrial Co., Ltd.	JINAN JIH LONG TECHNOLOGY 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	MACDERMID PERFORMANCE SOLUTIONS TAIWAN LTD.	Merck Performance Materials Ltd.	Microelectronics Technology Company	Mitsubishi Chemical Corporation
Mitsui Chemicals Inc.	Mitsui High-tec, Inc.	MK ELECTRON Co., Ltd.	Murata Manufacturing Co., Ltd.	NAMICS Corporation
Nan Ya PCB Corporation	Nippon Micrometal Corporation	NITTO DENKO CORPORATION	NU-GEN INTERNATIONAL CORP.	Opto Tech Corporation
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.	Shinko Electronics Co., Ltd.	SHINON LIMITED
SHOWA DENKO K.K.	SIMMTECH Co., Ltd.	Small Precision Tools, Inc.	SUMITOMO BAKELITE CO., LTD.	Sun Surface Technology Co., Ltd.
SUNBRIGHT APPLIED MATERIALS CORP.	SUNRISE PLASTICS INDUSTRY CO., LTD.	Taihong Circuit Ind. Co. Ltd.	TAIWAN TOKUYAMA CORPORATION	TAIXING YONGZHI ELECTRONIC DEVICE CO., LTD.
Tanaka Kikinzoku Kogyo K.K.	Technic Inc.	TOK Taiwan Co., Ltd.	TOKYO OHKA KOGYO CO.	Tongren Industrial Automation Equipment Co., Ltd.
TOPPAN Printing Co., Ltd.	UBoT Incorporated Limited	Umate Electronic Co., Ltd.	Unimicron Technology Corporation	UNION TOOL GROUP
Yantai Zhaojin Kanfort Precious Metals Co., Ltd.	Zhen Ding Tech. Group			

Third Party Assurance Statement

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INDEPENDENT AUDITORS' LIMITED ASSURANCE REPORT

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

We have performed a limited assurance engagement on the Sustainability Report ("the Report") of ASE Technology Holding Co., Ltd. ("the Company") for the year ended December 31, 2021.

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 Sustainability 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.

Auditors' 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 Auditors' 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.

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- 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 this report.

The engagement partner on the limited assurance engagement resulting in this independent auditors' limited assurance report is Wu, Shih-Tsung.

Deloitte & Touche
Taipei, Taiwan
Republic of China

July 29, 2022

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102-10	Significant changes to the organization and its supply chain	1.1 Company Profile ASE Advanced Semiconductor (Shanghai), ASE Kunshan, ASE Suzhou, and ASE Weihai were disposed of in December 2021, the disposed entities were in scope of this report.	10-11 -
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102-31	Review of economic, environmental, and social topics	3.1 Board of Directors	38-39
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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102-48	Restatements of information	There is no restatement of information from previous report.	-
102-49	Changes in reporting	2.4 Materiality Assessment and Stakeholder Communication	31-35
102-50	Reporting period	2021.01.01 ~ 2021.12.31	-
102-51	Date of most recent report	The previous report was published in August 2021.	-
102-52	Reporting cycle	We publish ESG Report annually.	-
102-53	Contact point for questions regarding the report	ABOUT OUR REPORTING	4
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		For further details on financial performance, please refer to our consolidated financial report: http://ir.aseglobal.com/html/ir_financial_overview.php	-
201-2	Financial implications and other risks and opportunities due to climate change	5.7 Environmental Expenditures and Investment TCFD Reopet: https://www.aseglobal.com/en/pdf/2021-tcdf-report-en.pdf	99 -
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 140-143 of the ASEH 2020 Annual Report (English version) and page 39 Financial Report (English version)	106-107 -
201-4	Financial assistance received from government	ASEH is entitled to tax incentive. Please refer to page 80 of our Financial Report (English version).	-
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	31-35
103-2	The management approach and its components	6.1 Talent Attraction and Retention	102-103
103-3	Evaluation of the management approach	6.1 Talent Attraction and Retention	102-103
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).	38 -

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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)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-35
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103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
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103-3	Evaluation of the management approach	3.3 Business Ethics	43-45
206-1	Legal actions for anticompetitive behavior, antitrust, and monopoly practices	In 2021, 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	31-35
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302-1	Energy consumption within the organization	5.1 Climate leadership - Fossil (nonrenewable) fuel, Electricity and the Use of Renewable Energy	85-87
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GRI 305: Emissions 2016 (GRI 103: Management Approach 2016)			
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305-1	Direct (Scope 1) GHG emissions	5.1 Climate leadership - Greenhouse gas emissions management	83-85
305-2	Energy indirect (Scope 2) GHG emissions	5.1 Climate leadership - Greenhouse gas emissions management	83-85
305-3	Other indirect (Scope 3) GHG emissions	5.1 Climate leadership - Greenhouse gas emissions management	85
305-4	GHG emissions intensity	5.1 Climate leadership - Greenhouse gas emissions management Appendix: 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	84 151

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
305-5	Reduction of GHG emissions	5.1 Climate leadership - Greenhouse gas emissions management 5.1 Climate leadership - Major Energy Saving and Carbon Reduction Projects	84 87
305-6	Emissions of ozone-depleting substances (ODS)	5.4 Air Emissions Control	95
305-7	Nitrogen oxides, sulfur oxides, and other significant air emissions	5.4 Air Emissions Control	95
GRI 306: Waste 2020 (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies 2.4 Materiality Assessment and Stakeholder Communication 5.3 Waste Management	20-23 31-35 92-94
103-3	Evaluation of the management approach	5.3 Waste Management	92-94
306-1	Waste generation and significant waste-related impacts	5.3 Waste Management	92-94
306-2	Management of significant waste-related impacts	5.3 Waste Management	93-94
306-3	Waste generated	5.3 Waste Management Appendix: 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	92 150
306-4	Waste diverted from disposal	5.3 Waste Management Appendix: 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	93-94 150
306-5	Waste directed to disposal	5.3 Waste Management Appendix: 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	93-94 150
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	31-35

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication	31-35
		3.6 Regulatory Compliance	60
103-3	Evaluation of the management approach	2.2 Sustainability Strategies – Sustainability Vision 3.6 Regulatory Compliance	21-23 60
307-1	Non-compliance with environmental laws and regulations	Appendix: Environmental Data-D. Environmental Violations	153
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	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication	31-35
		7.3 Sustainable Supply Chain Management - Sustainability Risk Assessment	126-128
103-3	Evaluation of the management approach	7. Responsible Procurement - 2021 Key Performance	121
308-1	New suppliers that were screened using environmental criteria	7.3 Sustainable Supply Chain Management - Sustainability Requirement / Sustainability Risk Assessment	126-128
308-2	Negative environmental impacts in the supply chain and actions taken	7.3 Sustainable Supply Chain Management - Sustainability Requirement / Sustainability Risk Assessment	126-128
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	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication	31-35
		6.1 Talent Attraction and Retention	102-103
103-3	Evaluation of the management approach	6.1 Talent Attraction and Retention	102-103
401-1	New employee hires and employee turnover	6.1 Talent Attraction and Retention Appendix: Social Data – C. New Hire Employee, D. Turnover Rate	102-105 155-156

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
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.	-
401-3	Parental leave	Appendix: Social Data – F. Parental Leave	157
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	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication	31-35
		6.1 Talent Attraction and Retention	110-112
103-3	Evaluation of the management approach	6.1 Talent Attraction and Retention – Employee Communication	110-112
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	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication	31-35
		6.3 Occupational Health and Safety	116-117
103-3	Evaluation of the management approach	6.3 Occupational Health and Safety	116-117
403-1	Occupational health and safety management system	6.3 Occupational Health and Safety	116
403-2	Hazard identification, risk assessment, and incident investigation	6.3 Occupational Health and Safety	116-118
403-3	Occupational health services	6.3 Occupational Health and Safety	118-119
403-4	Worker participation, consultation, and communication on occupational health and safety	6.3 Occupational Health and Safety	116-119

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
403-5	Worker training on occupational health and safety	6.3 Occupational Health and Safety	116-119
403-6	Promotion of worker health	6.3 Occupational Health and Safety	119
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	6.3 Occupational Health and Safety	116-119
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	116-119 159
403-9	Work-related injuries	6.3 Occupational Health and Safety Appendix: Social Data – J. Workers Occupational Health and Safety	117-118 159
403-10	Work-related ill health	6.3 Occupational Health and Safety Appendix: Social Data – J. Workers Occupational Health and Safety	117-118 159
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	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication 6.2 Talent Cultivation and Development	31-35 113-115
103-3	Evaluation of the management approach	6.2 Talent Cultivation and Development	113-115
404-1	Average hours of training per year per employee	6.2 Talent Cultivation and Development	113-114
404-2	Programs for upgrading employee skills and transition assistance programs	6.2 Talent Cultivation and Development	113-115
		ASEH does not provide terminated employees with any continued employability or career transition assistance.	-
404-3	Percentage of employees receiving regular performance and career development reviews	6.1 Talent Attraction and Retention	110
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	31-35

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication 6.1 Talent Attraction and Retention - Diversity in Human Resources	31-35 102-103
103-3	Evaluation of the management approach	6.1 Talent Attraction and Retention - Diversity in Human Resources	102-103
405-1	Diversity of governance bodies and employees	3.1 Board of Directors	39
		6.1 Talent Attraction and Retention - Diversity in Human Resources	102-103
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	31-35
103-2	The management approach and its components	3.5 Human Rights Management	54-59
		7.3 Sustainable Supply Chain Management	126
103-3	Evaluation of the management approach	3.5 Human Rights Management 7.3 Sustainable Supply Chain Management	54-59 126
408-1	Operations and suppliers at significant risk for incidents of child labor	3.5 Human Rights Management 7.3 Sustainable Supply Chain Management	54-59 126
		No significant risk of hire child labor and young workers exposed to hazardous work.	-
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	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication 3.5 Human Rights Management 7.3 Sustainable Supply Chain Management	31-35 54-59 126
103-3	Evaluation of the management approach	3.5 Human Rights Management 7.3 Sustainable Supply Chain Management	54-59 126

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	3.5 Human Rights Management 7.3 Sustainable Supply Chain Management Non-significant risk for incidents of forced or compulsory labor either.	54-59 126 -
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	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies 2.4 Materiality Assessment and Stakeholder Communication 3.5 Human Rights Management	20-23 31-35 54-59
103-3	Evaluation of the management approach	3.5 Human Rights Management	54-59
412-1	Operations that have been subject to human rights reviews or impact assessments	3.5 Human Rights Management	54-59
412-2	Employee training on human rights policies or procedures	3.5 Human Rights Management All employees trained in human rights policies procedures concerning.	54-59 -
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	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies 2.4 Materiality Assessment and Stakeholder Communication 7.3 Sustainable Supply Chain Management - Sustainability Requirement / Sustainability Risk Assessment	20-23 31-35 126
103-3	Evaluation of the management approach	7. Responsible Procurement - 2021 Key Performance	121
414-1	New suppliers that were screened using social criteria	7.3 Sustainable Supply Chain Management - Sustainability Requirement / Sustainability Risk Assessment	126-128
414-2	Negative social impacts in the supply chain and actions taken	7.3 Sustainable Supply Chain Management - Sustainability Requirement / Sustainability Risk Assessment	126-128

GRI Standard	Disclosure	Related Section / Explanatory Notes	Page No.
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	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies 2.4 Materiality Assessment and Stakeholder Communication 3.7 Information Security Management	20-23 31-35 61-63
103-3	Evaluation of the management approach	3.7 Information Security Management	61-63
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	3.5 Human Rights Management We don't have any substantiated complaints regarding breaches of customer privacy and losses of customer data in 2021.	59 -
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	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies 2.4 Materiality Assessment and Stakeholder Communication 3.6 Regulatory Compliance	20-23 31-35 60
103-3	Evaluation of the management approach	3.6 Regulatory Compliance	60
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 2021. (By "significant violations", we mean the fine / penalty individually costs more than US\$ 10,000)	-

Customized Standard

Standard	Disclosure	Related Section / Explanatory Notes	Page No.
Innovation Management and Sustainable Manufacturing (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication	31-35
		4.1 R&D and Innovation	65-71
		4.2 Sustainable Manufacturing	72-75
103-3	Evaluation of the management approach	4.1 R&D and Innovation 4.2 Sustainable Manufacturing	65-71 72-75
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	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication	31-35
		4.3 Products and Services - Customer Service	76
103-3	Evaluation of the management approach	4.3 Products and Services - Customer Service	76
Information Security Management (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication	31-35
		3.7 Information Security Management	61-63
103-3	Evaluation of the management approach	3.7 Information Security Management	61-63
Social Involvement (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-35
103-2	The management approach and its components	8. Corporate Citizenship	134
103-3	Evaluation of the management approach	8. Corporate Citizenship - 2021 Key Performance	135

Standard	Disclosure	Related Section / Explanatory Notes	Page No.
Local Communities (GRI 103: Management Approach 2016)			
103-1	Explanation of the material topic and its Boundary	2.4 Materiality Assessment and Stakeholder Communication	31-35
103-2	The management approach and its components	2.2 Sustainability Strategies	20-23
		2.4 Materiality Assessment and Stakeholder Communication	31-35
		8.1 Social Involvement Overview	138
103-3	Evaluation of the management approach	8.1 Social Involvement Overview	138

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	83-84
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	83-84
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: 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	86-87 151
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: Environmental Data-B. The amount of water withdrawals and discharge in water-stressed regions	90-91 152
Waste Management			
TC-SC-150a.1	Amount of hazardous waste from manufacturing, percentage recycled	5.3 Waste Management	92
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	116-118
TC-SC-320a.2	Total amount of monetary losses as a result of legal proceedings associated with employee health and safety violations	In 2021, ASEH was fined approximately US\$7,800 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	3.5 Human Rights Management 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 38% of the total ASEH employees.	54-59 155
Materials Sourcing			
TC-SC-440a.1	Description of the management of risks associated with the use of critical materials	7.3 Sustainable Supply Chain Management	126-129
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 2021, 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: Environmental Data-B. The amount of water withdrawals and discharge in water-stressed regions	90-91 152
Waste Management			
TC-ES-150a.1	Amount of hazardous waste from manufacturing, percentage recycled	5.3 Waste Management	92
Labor Practices			
TC-ES-310a.1	(1) Number of work stoppages and (2) total days idle	In 2021, 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 Sustainable Supply Chain Management	126-129
Activity Metrics			
TC-ES-000.C	Number of employees	Total number of USI employees is 19,290	-

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