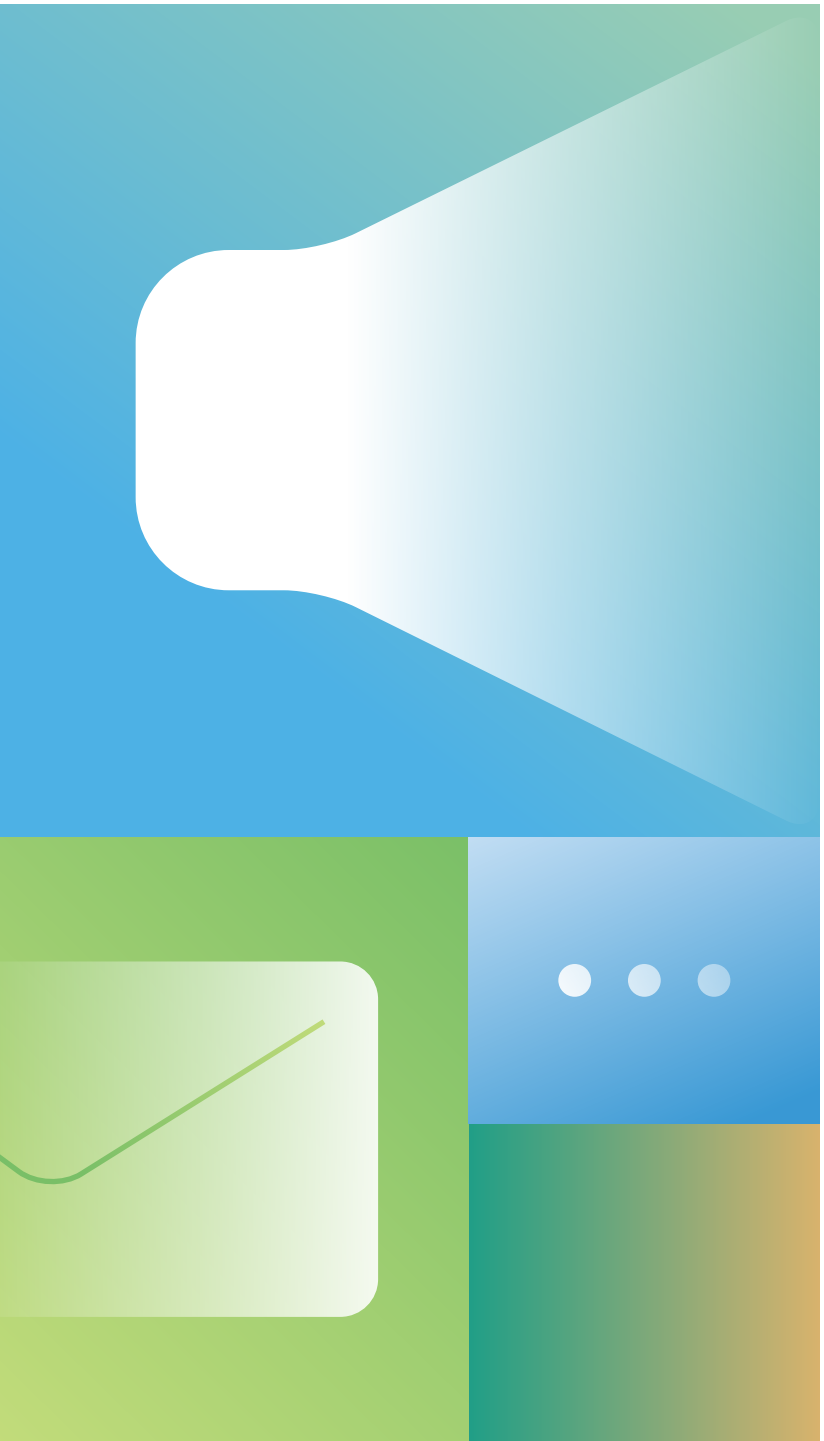
2024

Total Impact Measurement and Management Report

UN Sustainable Development Goals and
Sustainable Values Assessment

ASE HOLDINGS

Contents



Disclaimer

ASEH's Total Impact Measurement and Management Report assesses the transformation of the impact of ASE Technology Holding Co., Ltd. and its subsidiary companies' (hereinafter referred to as "ASEH") sustainable development into monetary value from a stakeholder's perspective. As this report has a different basis from ASEH's past, present, and future financial statement compilation and financial performance assessment, it cannot and should not be compared, analyzed, or forecast in conjunction with financial statements and financial performance. This report is therefore not a suitable basis for the assessment and determination of ASEH's past, present, or future stock trading value.

ASEH's Total Impact Measurement & Management Report was published in accordance with PwC's Total Impact Measurement & Management (TIMM) framework and the monetization framework in the Natural Capital Protocol and Social Capital Protocol, through data collection and identification of financial proxies, with the results expressed in monetary terms.

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ASEH's Total Impact Measurement and Management

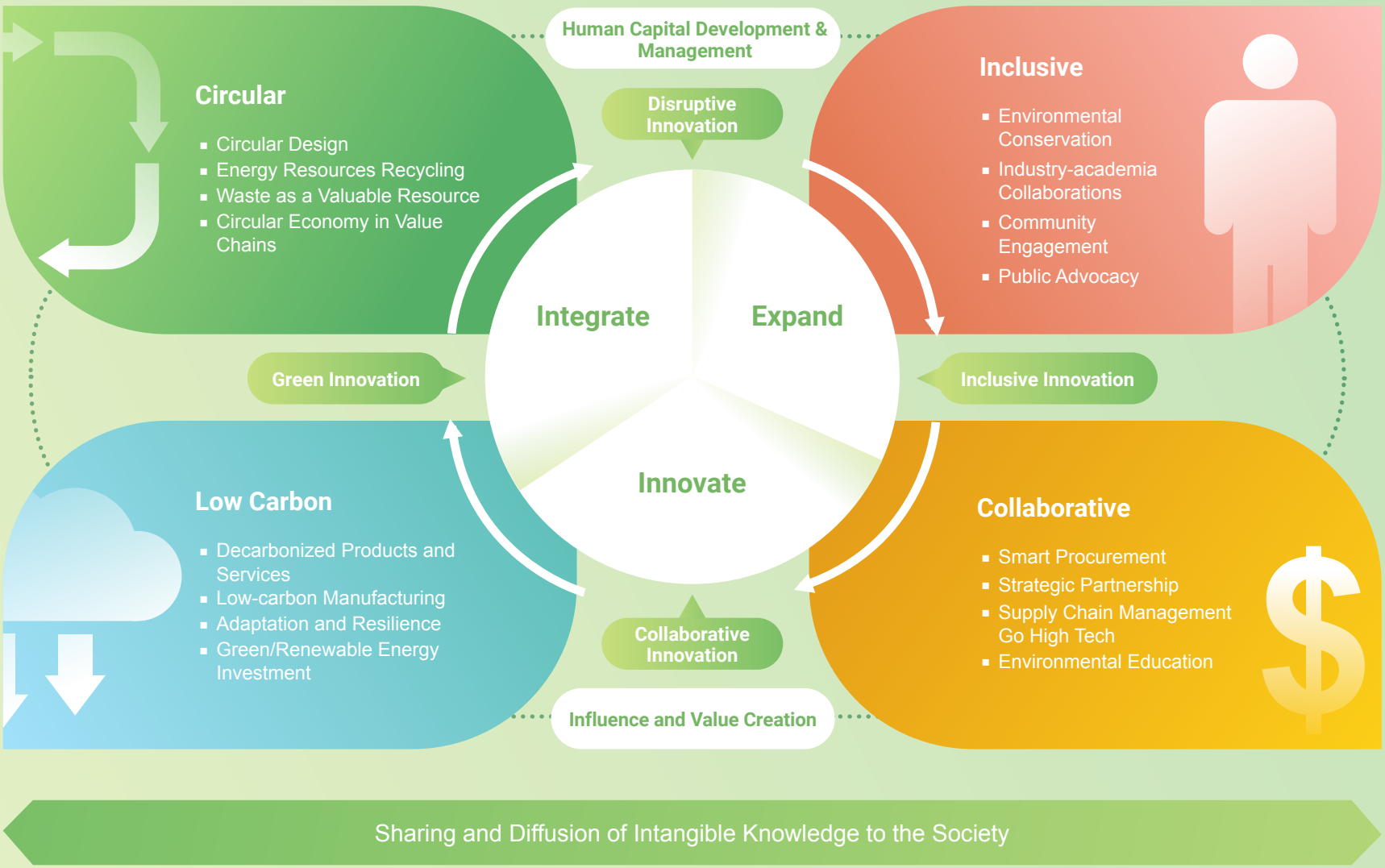
1.1 Why We Measure Our Impact Value

In an aim to develop a "Better Business, Better World", the UN Global Compact initiative and the Business and Sustainable Development Commission have rallied enterprises worldwide together to undertake responsibility in sustainability and help resolve social problems, so as to achieve the UN's 17 Sustainable Development Goals (SDGs) . On top of the company's obligation to maintain financial performance, we will incorporate holistic thinking in our business practice to set the pace for ASEH's sustainable development and value creation.

As a semiconductor industry leader on a growth trajectory, ASEH has formulated strategies to achieve long-term sustainability goals, and established clear sustainability management mechanisms, that promote sustainability and value creation for the industry. In response to various risks and challenges ranging from climate, energy, raw material and water supply, ASEH has drawn up four pillars of sustainability strategies: Circular, Low Carbon, Inclusive, and Collaborative. The Company hopes to find opportunities and growth momentum through the implementation of these strategies.

The Total Impact Measurement and Management (TIMM) framework developed by PwC was adopted to measure the sustainability impact of ASEH's operations to stakeholders in monetized values and also examine the effects of operations on stakeholders during decision making. The TIMM framework puts a value on impacts across the economic, tax, environment and social dimensions, and also references the monetization framework of the Natural Capital Protocol and Social Capital Protocol as a tool to analyze the source and results of sustainable value. We believe that sustainable value reporting that applies holistic thinking will facilitate corporate decision-making, performance assessment, and stakeholder communication. To that end, we have adopted a unified unit of measurement to express the combined corporate financial and ESG values in monetary terms. We hope to make use of resources that are limited to maximize sustainability value for stakeholders and reduce the negative impacts.

ASEH's Four Sustainability Strategy Pillars



1.2 Definition of Impact Value

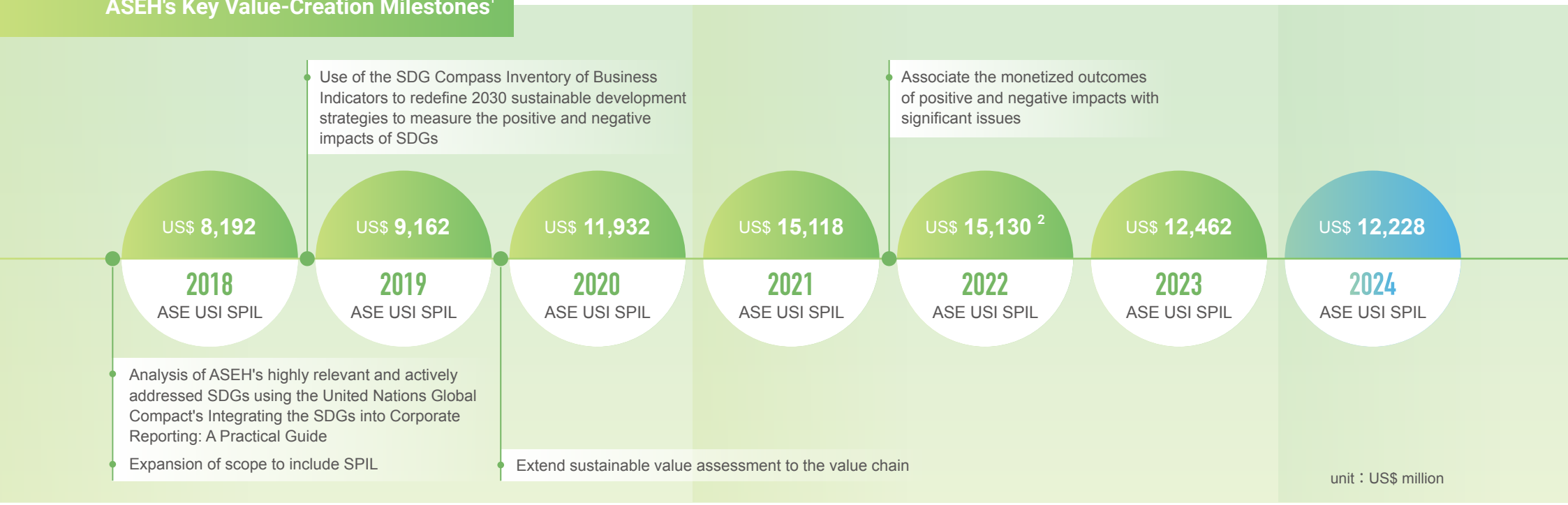
TIMM assesses the value of corporate operations from four dimensions - the economic impact, tax impact, social impact and environmental impact, and quantifies the impacts in monetary values. The TIMM framework is based on the perspective of the stakeholders involved in corporate operation, and not solely from the shareholders' viewpoint. It is therefore able to comprehensively portray the complete process of an enterprise's operations from resource input to the value of its production output. This has enabled the company to apply holistic thinking and tools to express the total impact and value of corporate operations to society on a timely basis. ASEH's sustainable value is hence measured by its total impact value from a stakeholder's perspective. In addition, we use the total impact value to identify potential risks and opportunities for ASEH's future sustainability performance and business operations.

Total Impact Value Model

1.3 Valuation Milestones

ASEH believes that the continued implementation of sustainable development as a long-term strategy not only enables the strategic creation of sustainable value and gives back to society, but more importantly contributes to the attainment of the UN SDGs for 2030. We began implementing TIMM and Social Return on Investment (SROI) in 2017, and applied monetization assessment tools to track the social impact and operational risks brought by the company's business activities. In 2018, we referenced Integrating the SDGs into Corporate Reporting: A Practical Guide, to examine SDGs and sub-goals, and issues of concern related to the company's operations. We then set and track key performance indicators on this basis. In 2019, we used the SDG Compass Inventory of Business Indicators to examine the positive and negative impacts of our four sustainability strategy goals and the outcomes of our actions. In 2020, we further 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. In 2022, we associate the monetized outcomes of positive and negative impacts with significant issues. This information will then be provided to the CSISC (Corporate Sustainability and Information Security Committee) 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. Moreover, through this report, ASEH impact assessment results will be disclosed comprehensively to ASEH stakeholders.

ASEH's Key Value-Creation Milestones[1]



[1] For more details on ASEH's sustainable values, please refer to ASEH's corporate sustainability report.

[2] Due to changes in the assessment basis of environmental indicators, the impact value for the year 2022 had been recalculated to facilitate comparison between the two years

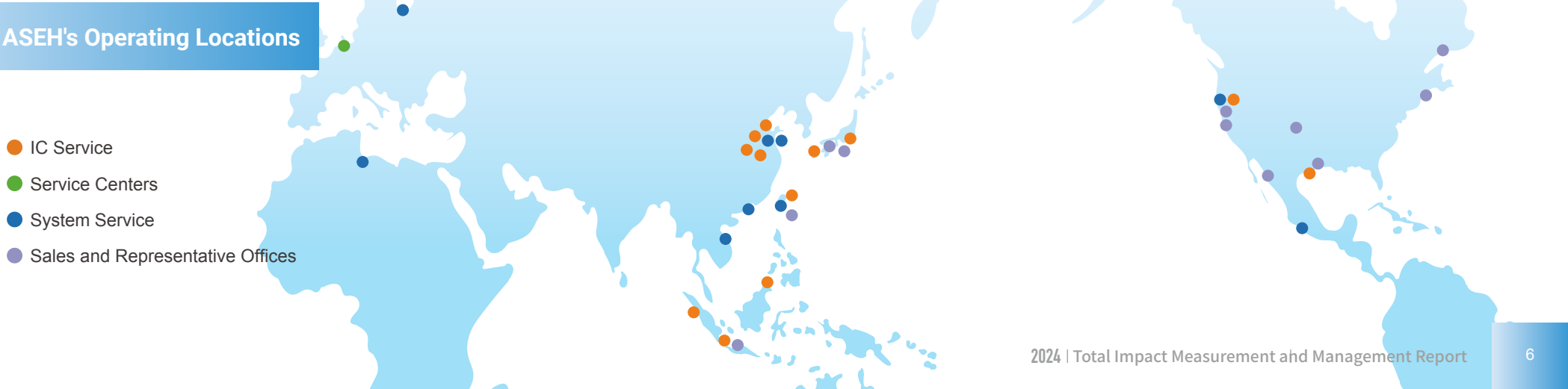
CH2

The Scope of Impact Valuation

2.1 Period and Scope

The report discloses ASEH's 2024 (January 1, 2024, to December 31, 2024) information according to the economic, tax, environment, and social impacts based on the TIMM framework. The report takes into consideration financial materiality, industry relevance and place of operation, and thereby includes ASEH entities - Advanced Semiconductor Engineering, Inc. and its subsidiary (hereinafter referred to as "ASE") , Siliconware Precision Industries Co., Ltd. and its subsidiary (hereinafter referred to as "SPIL"), and Universal Scientific Industrial Co., Ltd. and its subsidiary (hereinafter referred to as "USI"). ASEH's scope of operation includes Taiwan, China, Hong Kong, South Korea, Japan, Malaysia, Singapore, Philippines, Vietnam, Mexico, U.S.A., Tunisia and selected European countries.

ASEH's Operating Locations



2.2 Four Dimensions of Impacts

ASEH's sustainable value is measured by the impact value affecting stakeholder changes. Based on the UN's sustainability objectives, results of stakeholder engagement over the years and major sustainability-related issues, we measure ASEH's total impact value from four dimensions:

Dimensions	Stakeholders	Impact drivers[1]	Explanation of the production of impact value
Economic	▪ Shareholders ▪ Suppliers ▪ Customers ▪ Employees	▪ Profits ▪ Payroll ▪ Investment ▪ Intangibles ▪ Regulatory compliance	Economic value mainly consists of the creation of financial value for stakeholders and maintenance of their livelihoods through the five impact drivers.
Tax	▪ Government ▪ Local residents	▪ Profit taxes ▪ Other taxes	The various types of taxes incurred from operations are directly paid to the local government to support the government's fiscal policies, and the government's investments in public infrastructure to enhance the welfare of local residents.
Environment	▪ Employees ▪ General public ▪ Local community	▪ Greenhouse gases ▪ Air pollution ▪ Waste ▪ Water consumption ▪ Water pollution and recycle water ▪ Afforestation ▪ Biodiversity	The pollutant discharges and resource extrapolations from operating activities that affect the general public. Measuring the impact on the general public and the natural ecological environment through seven related environmental impact factors.
Social	▪ Employees ▪ Suppliers ▪ Local community	▪ Supplier Partnership ▪ Employee engagement and development ▪ Employee and contractor health and safety ▪ Education ▪ Social cohesion	The different impacts that our operations have on employees, suppliers, and local communities, demonstrate ASE's value to the society.

[1] Impact factors are the chief factors and sources of influence on stakeholders. Corporate operations involve multiple issues and therefore, we must first consolidate the activities and domains exerting the most important impact on stakeholders before we can effectively inventorize the changes and influence of various impact factors on stakeholders.

2.3 Responding to UN Sustainable Development Goals

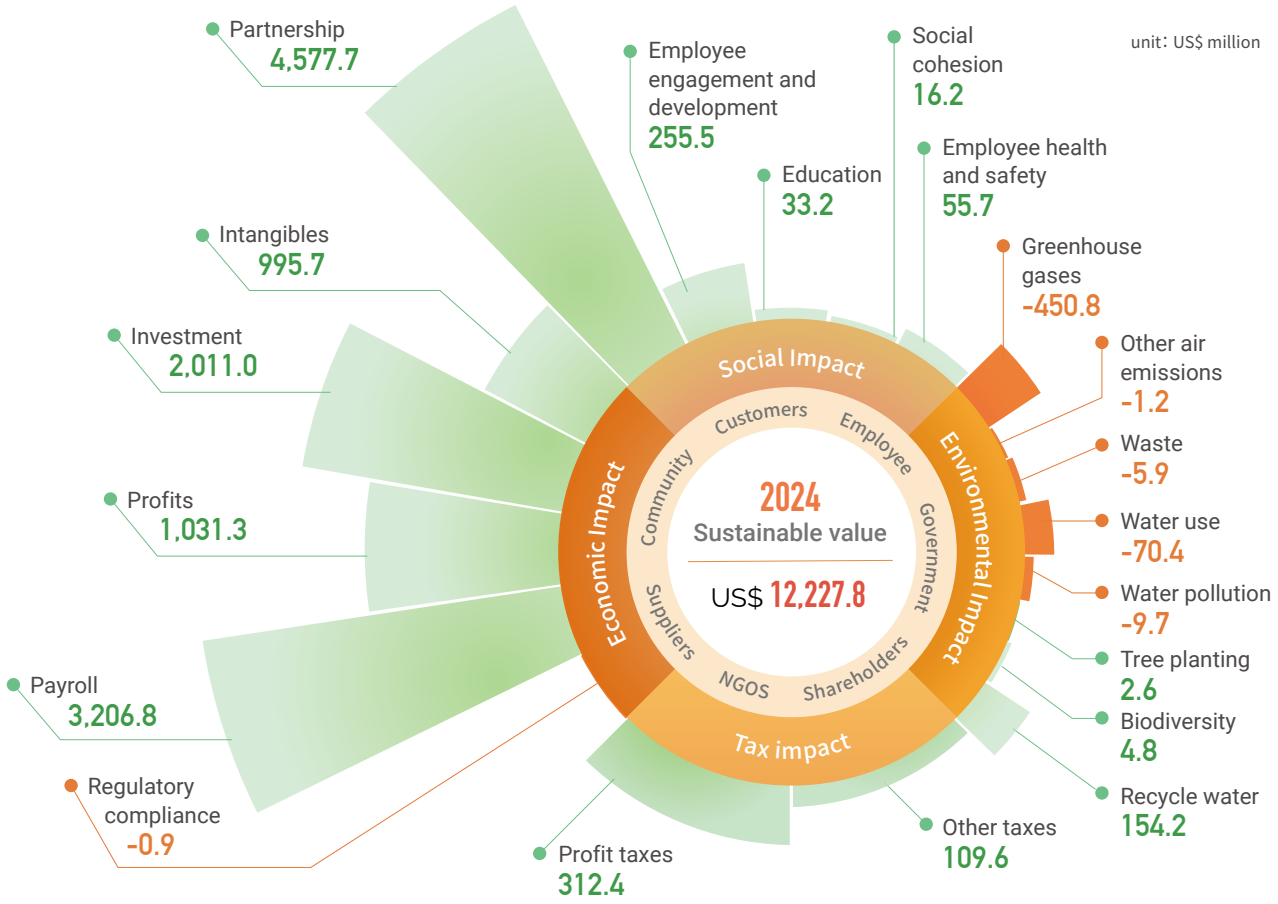
As a global leader in semiconductor assembly and testing, ASEH's approach to the UN SDGs is to closely align the goals with its core business. Since 2018, the company outlined five steps - Understanding SDGs, Defining Priorities, Goal Setting, Integration, and, Disclosure and Communication, to incorporate the SDGs into ASEH's core business strategy. ASEH re-examined the SDGs that are relevant to our industry and business operations, and took stock of SDGs and sub-goals that required our active involvement. We identified 6 Tier 1 SDGs: Quality Education (SDG 4), Clean Water and Sanitation (SDG 6), Affordable and Clean Energy (SDG 7), Decent Work and Economic Growth (SDG 8) , Responsible Consumption and Production (SDG 12), and Climate Action (SDG 13). In response to the results of international standards and norms, sustainable investment assessments, and issues of concerns to stakeholder, "biodiversity" is included in important evaluation items related to the company's long-term sustainability goals. Therefore, Life Below Water (SDG 14) and Life on Land (SDG 15) are added in our focus in 2022. On those SDGs that require active responses, we examined the correlation between our four sustainability strategies, KPI, and Tier 1 SDGs this year, then made adjustments and included SDGs into the long-term goals of our sustainability management. We are leveraging on our strengths to work together with both upstream and downstream partners to bring change and innovation to the industry and society.

ASEH Value Creation Model

CH3 ASEH's Contributed Value

3.1 ASEH's TIMM Results

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 2024, ASEH generated US$12,227.8 million worth of sustainable value for stakeholders.



Economic and tax dimensions

In 2024, ASEH experienced a slight 1% decrease in overall economic value. The decline was primarily attributed to the reversal in 2023 of the estimated additional income tax on unappropriated earnings as a result of the company's substantial profits in 2022. This led to a significant year-over-year increase in income tax expenses for 2023. Despite the decline in economic value due to higher tax expenses, other indicators reflect the company's continued commitment to its workforce. The company prioritized employee compensation, resulting in a positive shift in the "Payroll" indicator. Additionally, to maintain its leadership in the industry and meet the growing demand for advanced packaging services, we continued to increase investments in R&D. This contributed to a 4% growth in the value generated from intangible assets. On the tax front, the overall value declined by nearly 32%, mainly due to the tax payments reported and settled in 2023 based on the substantial profits earned in 2022. Furthermore, the South Korean subsidiary paid taxes in 2023 on gains from the disposal of its subsidiaries, resulting in a reduction in actual tax payments in 2024 compared to the previous year.

Environmental dimension

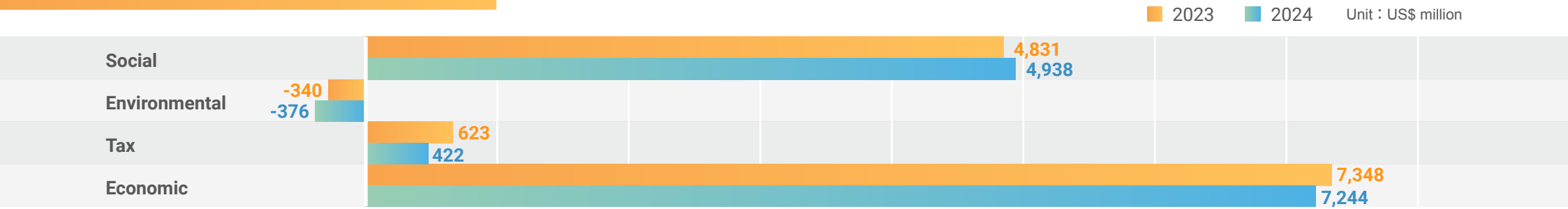
The two primary sources of environmental impact in our operations are water consumption during the production process and greenhouse gas emissions resulting from electricity usage. In 2024, renewable energy accounted for 19% of our total electricity consumption. ASEH adopted a strategic approach of reduction, reuse, and recycling water resources while continuing to invest in water recycling systems across our facilities to reduce the environmental impact of water withdrawal and enhance economic efficiency. Due to the inclusion of a new manufacturing site and increased operational activities in 2024, water consumption and wastewater pollution saw a slight increase of 5% compared to the previous year. Similarly, the overall negative environmental impact of our operations increased by 7% compared to 2023, driven by expanded reporting boundaries and business growth. To mitigate these impacts, we actively invested in environmental protection initiatives and fulfilled our green bond commitments by constructing green buildings for commercial operation, establishing water recycling and wastewater treatment plants, and deploying real-time wastewater monitoring systems. ASEH also continued to promote material conservation and circularity to reduce environmental impact and improve human health. In parallel, the company has remained committed to ecological conservation efforts. As a result, the positive impact of our ecological initiatives increased by 15% compared to the previous year.

Social dimension

The development of robust supplier partnerships was a key outcome along with the increase of our overall social impact value by 2.2% in 2024 compared to 2023. This improvement is primarily driven by a gradually recovering macroeconomic environment, and improved optimism about future development trends. As a result, local procurement spending showed a modest increase of approximately 2%. Additionally, the positive growth in employee headcount[1] contributed to improvements in two key impact indicators: "employee engagement and development" and "employee and contractor health and safety." In addition, we significantly reduced workplace injuries through effective occupational injury management, which enhanced the company's overall social value. The company continued to uphold its commitment to social responsibility by investing in social cohesion activities. In 2024, we focused on enhancing the impact and quality of two high-return categories—support for vulnerable groups and arts and culture sponsorships; furthermore, we also increased our investment in healthcare sponsorships, enabling more stakeholders to benefit. These efforts led to a 2% increase in the value of social cohesion activities compared to 2023, benefiting a broader range of stakeholders.

Explanations and management strategies for the various areas can be found in relevant sections of ASEH's 2024 ESG report, along with key dimensions of our ESG performance in conjunction with assessment and management.

2023-2024 ASEH Sustainable Values



[1] In addition to changes in employee headcount within each subsidiary, the 2024 scope for ASE also includes the addition of full-time employees from the holding company and from ASE Global Integrated Solutions Co., Ltd. (GIS)

3.1.1 Economic Impact

ASEH's export-oriented business operations is a major contributor to the country's GDP and economy. Within the TIMM framework, the economic dimension creates major positive impacts to ASEH's stakeholders. Based on stakeholders' (employees, shareholders, suppliers, and customers) perspective, economic dimensions include five main impact factors: profit, payroll, investment, intangibles, and regulatory compliance.

Profits

ASEH is publicly listed in Taiwan, Shanghai, and the United State. Shareholders include financial institutions, corporations, individuals and foreign investors. ASEH's profitability and earnings distribution bring financial satisfaction and livelihood maintenance to our shareholders. Hence, we use the net profit reported to the United States Securities and Exchange Commission (the "SEC") as a financial proxy for meeting shareholders' financial satisfaction and livelihood maintenance.

Payroll

ASEH employees are the main payroll stakeholder. Employees gain financial satisfaction and maintain their livelihood through salaries, and drive economic development through daily consumption. Adhering to the SROI[1] principle of not over-claiming, we use annual personnel costs, salary expenses, withheld labor and health insurance premiums, retirement pension and so on as our financial proxy.

Investment

ASEH plays a key role in the global semiconductor industry, and procures a sizable number of machinery and equipment, expands facilities and leases assets every year to maintain technology leadership and sufficient production capacity. Hence, the main stakeholders of our capital expenditure and operating leases are the suppliers of our property, plant and equipment, and the lessor of business assets. These stakeholders are financially supported by our capital expenditures and leasing activities, that further drive economic prosperity. To attribute the long-term impacts of machinery and equipment purchases and facility expansion over the span of each year, the annual real estate, plant and equipment depreciation expenses, depreciation expense charged on right-of-use assets and investment property, operating lease expenses and repair expenses are used as the financial proxy for the financial support received by our suppliers each year.

[1] Social Return on Investment Guide, 2012.

Intangibles

ASEH maintains a high standard of research and development to continue its innovation and leadership in the industry. Investments in research and development affect our supply chains, employees and customers, and the impact on each is as follows: acquire the latest technologies, increase workplace competitiveness, and acquire products with leading technologies. The amortization expense of intangible assets and, research and development expenses are used as the financial proxy for the contribution of intangible assets. In recent years, to encourage the R&D team to optimize key components, manufacturing processes, and product development technologies, our company has continued to increase its investment in R&D expenses and has provided cash rewards to employees who have made significant contributions to research efforts.

Regulatory Compliance

We conduct all our business activities in strict compliance with applicable laws and regulations. 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. Requiring our subsidiary companies to report immediately all incidences of non-compliance that resulted in penalties has become the key focus of risk management within company's internal control. Attorney fees for legal cases (excluding annual consulting fees), litigation costs and the amount of fines are identified as financial proxy for negative impacts.

Economic Impact Path Diagram

Impact Driver	Activity/Output	Outcome/Impact	Monetary Valuation
Profits	Profit distribution	▪ Stakeholders' financial satisfaction and livelihood maintenance	▪ Net profit reported on US Securities & Exchange Commission Form 20-F
Payroll	Payroll and welfare given		▪ Yearly personnel costs, salary expenses, withheld labor and health insurance premiums, and so on
Investment	Capital expenditure		▪ Yearly real estate, plant, and equipment depreciation expenses, depreciation expense charged on right-of-use assets and investment property, operating lease expenses, repair expenses, and so on
Intangibles	Research and development activities, and intellectual property purchase	▪ Improve quality of intellectual property and intangible assets	▪ Yearly intangible asset amortization expenses and research and development expenses
Regulatory Compliance	Attorney fees for legal cases, litigation costs, and the amount of fines	▪ Cause financial or reputational damage	▪ Litigation costs, legal consulting fees, fines, penalty and so on

3.1.2 Tax Impact

ASEH's global business operations are located in Taiwan, China/Hong Kong, South Korea, Japan, Malaysia, Singapore, Philippines, Vietnam, Mexico, U.S.A., Tunisia and selected European countries. We believe that it is our duty to pay taxes that contribute to promoting local economic growth and corporate sustainable development. As an indirect stakeholder, the local government allocates tax revenue to social infrastructure, addressing the needs of the local population, who are the direct stakeholders, and creating welfare for them. Hence, the tax payment is identified as a financial proxy for impacts and benefits that local residents derive from us. Since different types of taxes are associated with different operating activities, we classify taxes on the business activities into 2 categories – profit taxes and other taxes.

Profit Taxes

Profit taxes are incurred when the company's business activities generate profits, and are mainly income tax, the main tax used to support the expenditures of local governments, and contributes to the well-being of local residents. Hence, we include profit taxes as an influencing factor based on ASEH's ESG policy and management.

Other Taxes

In addition to profit taxes, we have also identified other taxes incurred by our business activities that affect local governments and residents. We included tax/charges and fees related to the holding and use of movable and immovable properties, and environment-related and human resources.

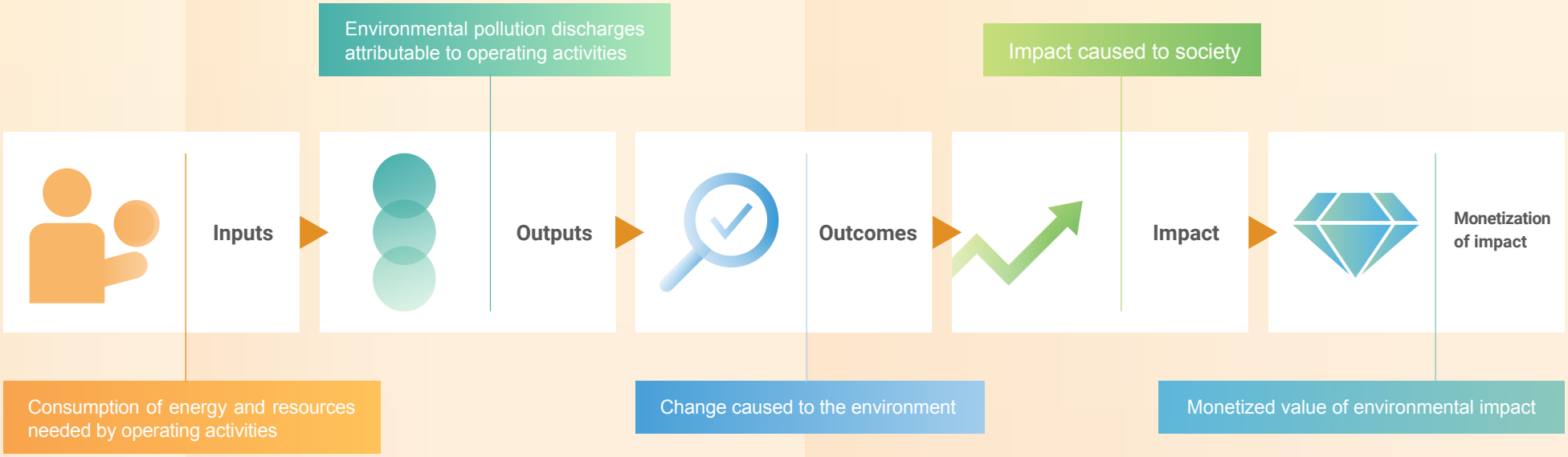
Tax Impact Path Diagram

Impact Driver	Activity/Output	Outcome/Impact	Monetary Valuation
Taxes	Tax payment	▪ Improve people's wellbeing	▪ Income tax paid, property and real estate related taxes, and environmental/personnel incurred tax/charges and fees

3.1.3 Environmental Impact

Apart from striving to reduce environmental impact by boosting our resource efficiency, and reducing greenhouse gases and wastewater discharges, waste production and chemical use, we also mitigate the negative impacts of our operation and value chain activities on the ecosystem through biodiversity monitoring and restoration such as afforestation, Chinese Box Turtle conservation, and marine conservation. We seek to actively comply with stakeholder requirements and expectations by quantifying the impacts of our operating processes. We apply the methodology in the 2015 PwC TIMM framework on monetized corporate environmental impact. We conducted our analysis of the environment dimension according to the natural capital impact assessment procedures in the Natural Capital Protocol issued by the Natural Capital Coalition in 2016. In 2024, ASEH's overall environmental impact of US$-376 million is mainly attributed to resource consumption and environmental emissions from its business activities. We further applied the sustainable value assessment method used internally to the value chain. In 2024, the monetized value of the environmental impact of our greenhouse gas emissions amounted to US$-4,511 million. The main sources of impact influencing our supply chain engagement were from product and service procurement, investments, capital goods, as well as upstream transportation and distribution.

Monetized Environmental Impact Assessment Procedures

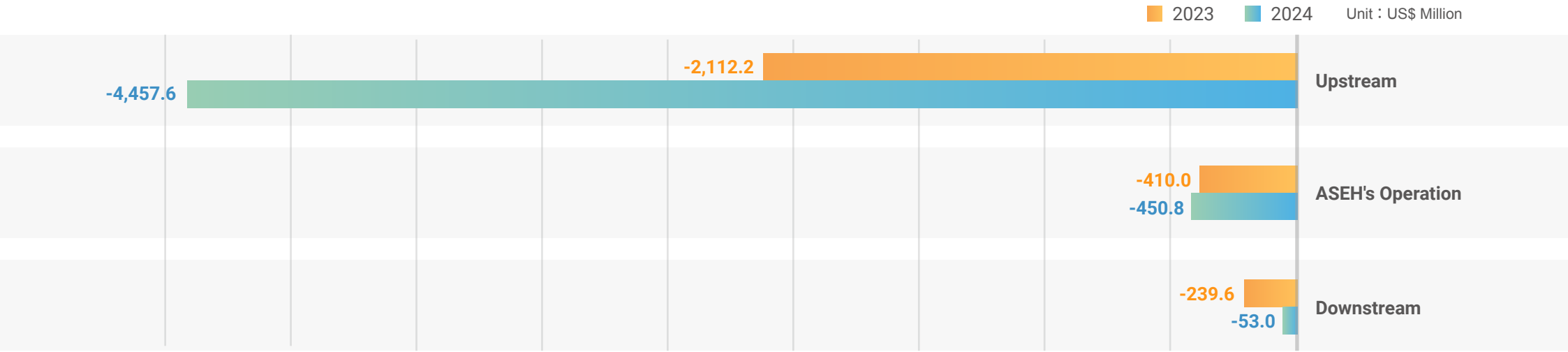


Greenhouse Gas Emissions

In 2024, ASEH's total Scope 1 and 2 (market-based) greenhouse gas emissions amounted to 1,805,579 metric tons of carbon dioxide equivalent (tCO_2e) . The 2024 emissions data was adjusted to reflect renewable energy consumption and the purchase of renewable energy certificate (REC) across facilities in Taiwan, China, Japan, Malaysia, the United States, Mexico, and Vietnam.

Besides conducting the inventory of Scope 1 and 2 GHG emissions, ASEH's Scope 3 emissions amounted to 18,067,529 tCO_2e. We cited the quantified effect of the social cost of CO_2e from Social Cost of Greenhouse Gases issued by the US EPA (2023). Social cost of carbon (SCC) is the monetization of the social cost of carbon emissions, and assessment items include health, building deterioration, economic losses, agriculture and timber loss, desertification and other ecosystem services. We selected the scenario of a 2% social discount rate in the SCC as the basis for calculation. After adjusting for inflation and conversion into USD using 2024 rates, the social cost of one ton of CO_2e is determined at US$249.67.

2023-2024 Greenhouse Gas Value Chain Outcomes



Greenhouse Gas Management Impact Pathway

Input	Measurement	Output	Environmental Benefits
USD 24.3 million	Greenhouse Gas Management Project	▪ Renewable energy consumption accounts for 19% of total electricity consumption, of which 10 facilities are RE100 compliant. ▪ 1,008 carbon reduction projects that resulted in a carbon reduction of 565,806 tCO_2e ▪ GHG emission (Scope 1+2) intensity reduced by 40% compared to the base year 2015 ▪ Absolute GHGs reduction (Scope 3) reduced by 8%[1] compared to the base year 2020	▪ Reduce the social cost of carbon emissions ▪ Reduce the risk of using unclean energy ▪ Reduce negative impacts on climate action

- ASEH drives its decarbonization initiatives through four key focus areas: reducing carbon in the manufacturing processes, reducing carbon in factories, use of low-carbon energy, and decarbonization across the value chain and our operations. These initiatives span multiple carbon reduction projects across Scopes 1, 2, and 3 greenhouse gas emissions. Our factories apply innovative solutions such as the smart energy management systems to increase energy efficiency, and we encourage internal energy reduction measures through technology sharing and competitions. At the same time, we have also incorporated clean production assessments into the manufacturing phase to pursue certification under the "Green Factory Label" to mitigate the carbon footprint of our business operation.
- Our self-developed digital IAI Platform integrates AI models, real-time data analytics, and image recognition technologies to optimize process efficiency, reduce carbon emissions, and minimize resource consumption. We also collaborate closely with suppliers across the value chain to co-develop low-carbon materials and energy-efficient equipment, thereby enhancing product carbon footprint performance and overall carbon reduction effectiveness.

[1] According to SEMI's guidance on "Scope 3 Category 11 GHG Assessment", it was determined that the Outsourced Semiconductor Assembly and Test (OSAT) industry mainly provides manufacturing services. From that perspective, the use or disposal of end products is typically not directly linked to the service provider. For more information on the Scope 3 Category 11 GHG Assessment, please visit SEMI's official website: https://discover.semi.org/scope-3-category-11-ghg-assessment-download-form.html

Air Pollution

In 2024, ASEH's total SOx, NOx, VOCs and Particulate Matter (PM) emissions was 206 tons. We determined the social cost of these emissions after referencing assessment items in the natural resource costs issued by Trucost in 2016, including human health, agricultural crops, forests, materials and acidification of water.

Waste

ASEH used landfill, incineration, solidification and other methods to handle 10,917 tons of hazardous waste and 9,624 tons of non-hazardous waste in 2024. We referenced the natural resource costs issued by Trucost in 2016, in which assessment items include local and global pollution, noise and visual disturbances.

Water Consumption

Total water withdrawal of ASEH factories was 21,886 megaliters in 2024. We referenced the natural resource costs issued by Trucost in 2016. In view of the possibility that the company's water consumption may indirectly cause displacement of other water consumption opportunities, the assessment items in this study consisted of direct non-consumer use and ecosystem services. The monetization coefficient of water resource consumption in 2024 was 1.79 (USD/ton) , and the monetization coefficient of ASEH in each place of operation is adjusted based on the purchasing power in different countries. Furthermore, we also included malnutrition and water-borne diseases into assessment items. Since there were no figures for Taiwan, the monetization coefficient we used is the loss of lives caused by malnutrition determined using the life cycle assessment (LCA) methodology proposed by Pfister et al. (Pfister, S., Koehler, A., Hellweg, 2009) . When assessing whether the use of water resources may cause poor nutrition, we have taken the scarcity of water resources in the geographical areas , the percentage of water consumption for agricultural purposes, and the human development index into considerations. We also referenced the LCA model of Motoshita et al., 2010 (Motoshita, M., Itsubo, N., Inaba. A., 2010) , which was used to determine the loss of lives in South Korea caused by water-borne diseases. The purchasing power of other regions is adjusted using coefficient in China to determine their respective monetization coefficient.

Disability Adjusted Life Years (DALY) was proposed by the World Trade Organization (WTO) and refered to the years of life lost due to illness or years of healthy life lost. DALY is now extensively applied in the fields of public health and health impact assessments. The Value of Statistical Life (VSL) is cited for the monetary value of DALY, and we referenced the VSL of OECD countries at US$3.4 million (USD in 2011) (OECD, 2012) . After considering life expectancy and the age of premature mortality, the value of DALY is calculated at US$185,990. Finally, we used a value transfer methodology to convert the values provided by the OECD to values for the regions where ASEH's plants are located. We employed an appropriate inflation conversion method and determined the monetization coefficient for malnutrition and water-borne diseases in each region to be 0.000265 (USD/ton) in 2023.

Water Pollution

Wastewater discharge of ASEH factories was 15,871 megaliters in 2024. Toxic substances that are hazardous to human health and nutrient salts that affect the ecosystem are factored into water pollution. With regard to toxic substances, due to limitations in data availability and current publications, we only consider types of pollutants that are regulated and actually discharged. Toxic pollutants may directly harm human health through polluted water sources or indirectly harm human health (e.g. eating contaminated fish) , and the health hazards may be divided into carcinogenic and non-carcinogenic. We relied on the USEtox LCA model to analyze the dose-response effects of different pollutants, and obtained the relative risk characterization factors and DALY values for water pollutants. We also employed the average carcinogenic and non-carcinogenic coefficients provided by Huijbregts et al. (Huijbregts, Rombouts LJA, Ragas AMJ, Van de Meent D., 2005) in calculations. We used a value transfer methodology to convert the values provided by the OECD to values for the regions where ASEH's plants are located, and employed an appropriate inflation conversion method to obtain monetization coefficients for the impact of water pollution on health in the various areas.

The excessive discharge of nutrient salts into water can cause massive algae growth which depletes oxygen and results in eutrophication. Besides the economic loss and higher cost of water consumption, this will also result in the loss of water recreational value, private property value (lower housing prices) , decreased catches, and affect the ecosystem (e.g. wetlands improve water conservation) . We referenced freshwater eutrophication in the LCA ReCipe (Hierarchist version) Midpoint method to assess the factors limiting freshwater eutrophication – phosphorus. The Willingness to Pay (WTP) approach by Swedish scholar Ahlroth (2009) is used for the monetization coefficient. The benefit transfer function is used to convert Swedish values into values for regions where ASEH factories are located, and suitable inflation has also been factored in.

Recycled Water

Total amount of water recycled by ASEH factories was 40,606 megaliters in 2024. The use of recycled water will simultaneously reduce water consumption displacement and wastewater pollution benefit. We referenced the LCA method proposed by Pfister et al. in 2009 (Pfister, S., Koehler, A., Hellweg, 2009) , to determine the loss of lives caused by malnutrition on this basis. To determine the effect of wastewater pollution in recycled water, we relied on the USEtox LCA model to obtain the relative risk characterization factors and DALY values for wastewater pollutants, and referenced freshwater eutrophication in the LCA ReCipe (Hierarchist version) Midpoint method to assess the factor limiting freshwater eutrophication – phosphorus. We also employed the average carcinogenic and non-carcinogenic coefficients provided by Huijbregts et al. (Huijbregts, Rombouts LJA, Ragas AMJ, Van de Meent D., 2005) in calculations.

Water Recycling and Reuse Impact Pathway

Input	Measurement	Output	Environmental Benefits
USD **347** million	Water Recycling Project	▪ 35 water conservation projects that saved a 1.50 million tons per year ▪ Enable a recycling rate of 80%	▪ Reduce the opportunity cost of using other water resources ▪ Reduce the consumption of water for agricultural use and the risk of water contamination ▪ Reduce the risk of water contamination due to water scarcity

- ASEH adopts three water use strategies: reduce, reuse, and recycle. The main source of water withdrawal is tap water. Total water withdrawals in 2024 amounted to 21,886 million tons, representing a 2% increase compared to the previous year.
- The wastewater reclamation recycling systems were established in ASE Kaohsiung, Chungli, Malaysia, and Singapore facilities to support wastewater treatment that meets local regulations. The wastewater reclamation recycling rate of ASE Kaohsiung is 76%, ASE Chungli is 70%, ASE Malaysia is 50% and ASE Singapore is 25%. Wastewater treatment in all facilities complies with local regulatory discharge standards. By employing regular and continuous monitoring of effluent quality combined with AI-assisted analytics, we optimize water output ,enhance water recycling, and reduce overall water consumption.

Afforestation Project

In 2024, ASEH planted more than 330,000 trees, covering a total afforestation area of 16.84 hectare in Taiwan, China (Inner Mongolia and Ningxia) and Vietnam. Afforestation has the benefits of conserving water sources, reducing soil erosion, sequestering carbon, and purifying the air. We use the replacement cost method[1] to calculate the forest ecosystem service value of the afforestation area. That is, we assess the value of forestland restoration through the expected savings in social costs such as water storage projects, sewage treatment, soil removal, dust filtration, industrial oxygen production, and carbon emissions, and suitable inflation has also been factored in.

[1] We refer to the Ecological Benefits of Vegetation Restoration in Yijinhuoluo Banner of Inner Mongolia published by Jiang Liwei et al. in 2019 (Jiang Liwei, Lu Zeyang, Gong Yinting, Yan Shiwei, 2019)

Biodiversity

To protect marine biodiversity, ASEH and the ASE Environmental Sustainability Foundation co-launched a marine conservation program in partnership with local governments, diving operators, and the general public to develop coastal cleanups and remove marine debris. In alignment with the UN World Oceans Day, we expanded the scale of activities with the organizing of the "ASE Ocean Day" on June 1, 2024 to raise public awareness and promote collaborative action for marine protection. The event brought together a total of 1,600 participants that included employees and their families from ASE, SPIL and USI in Taiwan as well as 22 supply chain partners, local residents, nonprofit organizations, and environmental groups. Synchronized beach cleanups were carried out across seven coastal locations, including Shimen Kite Park in New Taipei, Caota Sand Dunes and Chaoyin Coastal Trail in Taoyuan, Songbo South Dike and Songbo Port North Beach in Taichung, Qijin Beach and Sizihwan in Kaohsiung, and Wude Village Coastal Beach in Penghu. At the end of the event, a total of 2.8 metric tons of waste was collected. In the same year, we have also partnered with two diving centers—Taiwan Dive in Kenting and Water Player in Longdong, to conduct monthly beach and underwater cleanups. Over the course of the year, 18 beach cleanups and 32 underwater cleanups were organized, involving 2,356 participants and removing approximately 5 metric tons of marine debris. Additionally, we offer professional dive training and certification to interested employees and members of the public, equipping them with the expertise to support ongoing marine cleanup efforts. To date, we have added another 70 newly certified dive members, significantly boosting our efforts in marine conservation.

In addition to the above-mentioned terrestrial and marine ecological restoration and conservation actions, there are also initiatives such as the Reforestation Project and public tree planting programs. We promote the cooperation of the stakeholders including our employees, research institutions, local governments and local residents to enhance the awareness of environmental protection and the restoration of indicator species. We used the value transfer methodology to determine that the benefit of biodiversity projects was US$4.8 million.

Environmental Impact Pathway

Impact Driver	Activity/Output	Outcome/Impact	Monetary Valuation
Greenhouse gas emissions	GHG Emission (Scope 1 and 2)	▪ Human health, building deterioration, economic losses, agriculture and timber, desertification, and other ecosystem services	▪ Reference: Accredited publication on the social costs incurred by greenhouse gas emissions
Air Pollution	Emissions of pollutant (SOx)	▪ Human health, forestry, materials[1], and water acidification	▪ Reference: Accredited publication on the social costs incurred by air pollution
	Emissions of pollutant (NOx)	▪ Human health, crops, and forestry	
	Emissions of pollutant (VOCs)	▪ Human health, crops, and forestry	
	Emissions of pollutant (PM_{10})	▪ Human health	

[1] Impact on building materials.

Impact Driver	Activity/Output	Outcome/Impact	Monetary Valuation
Waste	Hazardous and non-hazardous waste (recycling and reuse are excluded)	▪ Local and global pollution, audio and visual nuisances	▪ Reference：Accredited publication on the social costs incurred by waste
Water consumption	Water consumption	▪ Direct non-consumptive uses, ecosystem service, malnutrition, and water borne disease	▪ Reference：Accredited publication on the social costs incurred by water use
Water pollution	Release of regulated contaminants [1]	▪ Human health	▪ Reference：Accredited publication on the social costs incurred by water pollution
	Release of nutrient (Phosphorus)	▪ Recreation, property values, and fish stock	
Recycled water	Reduce water consumption	▪ Mitigate crowding out of direct non-consumptive water use, ecosystem service, malnutrition and waterborne disease	▪ Reference：Accredited publication on the social cost generated by water consumption and wastewater discharge
	Reduce release of regulated contaminants [2]	▪ Reduce harm to human health	
Afforestation	Restore woodland vegetation	▪ Ecosystem services such as water conservation, soil erosion reduction, carbon sequestration, and air purification	▪ Reference：Accredited publication on social costs saved by forest ecosystem services
Biodiversity	Land and marine ecology restoration	▪ Ecology conservation awareness and species restoration	▪ Reference：Accredited publication on social costs saved by ecology restoration

[1] Impact on building materials.

[2] Regulated contaminants considered in this study: phenols, hexane extracts, cadmium, plumbum, chrome, hexavalent chromium, copper, zinc, nickel, arsenic, and silver.

3.1.4 Social Impact

Apart from direct financial impacts on stakeholders, ASEH's operating activities will affect different stakeholders and produce positive and negative impacts of varying social significance. We referenced assessment procedures in the Social Capital Protocol issued by the World Business Council for Sustainable Development in 2016 and the Social Return on Investment (SROI) issued by the UK government's Office of the Third Sector, in order to determine the sustainable value created in each aspect, including supplier partnerships, employee engagement and development, employee and contractor health and safety, and education and social cohesion. In 2024, ASEH's overall social impact totaled 4,938 million, with US$ 4,915[3] million directly resulting from the company's operations.

[3] The value of social impacts resulting directly from the company’s operations is calculated by excluding public welfare activities and non-industry-academia educational projects.

Supplier Partnership

As a key player in a high-tech industry, ASEH works with more than thousands of suppliers globally to manage a complex semiconductor industry supply chain and meet the needs of customers worldwide. Hence, the building of stable partnerships with suppliers to create a better business environment and achieve social cohesion form the core values of our sustainable development.

Based on the principle of materiality, we identified important activities in ASEH's business process that had an effect on the supply chain in 2024, including supplier sustainability audits, supplier training, local procurement, and supplier sustainability awards. We duly determined the material impact on suppliers and to measure financial proxy variables, we applied the educational and training costs conducted by external consultants, the contribution to revenue reported by suppliers, the mitigation of property losses due to improvements in audit shortcomings, contributions from local procurement, and the amount invested in supplier sustainability award.

We applied the cost approach valuation and contingent valuation methods to estimate a total generated value of US$4,577.7 million. The overall factor increased by approximately 2% compared to 2023, mainly driven by a slight industry recovery that boosted procurement spending. As a result, local procurement, representing the highest share of social impact value, grew by 2% year-over-year. In 2024, the number of nonconformities identified through supplier sustainability audits increased by 39% compared to 2023. These were primarily attributed to the lack of safety and warnings signs in high-risk areas, expired certifications of first aid responders, and incomplete tracking records for hazardous substances. Despite the rise in nonconformities, ASEH's robust internal audit process helped mitigate potential financial losses, driving a 151% increase in impact value generated through sustainability audits.

For supplier education and training, ASE implemented targeted training programs tailored to different supplier groups, resulting in a boost in supplier participation compared to previous years - a 57% growth in the value created through this dimension.

Employee Engagement and Development

Employees are key to maintaining ASEH's overall operations and we view them as a critical component of our core values and a major stakeholder.

In 2021, we introduced a new framework and new measurement indicators, restructuring the employee survey to a sustainability engagement survey which includes employee experience indicators and employee engagement indicators towards the company. Besides providing employees with financial satisfaction and taking care of their livelihood through salaries and benefits, we summarized the material impact generated, and focused on career development programs, work environment and healthcare programs. We consolidated performance bonuses, amount of company subsidies and allowances, mental wellbeing course fees, consensus building and motivational course fees, and professional management training course fees as the monetized value of the financial proxy.

We evaluated the number of employees affected through the employee engagement and alignment survey results. As the survey is conducted biennially, the 2023 survey results were used, with updates made only to the headcount and financial proxy variables (2023 overall employee engagement rate: 77%; employee coverage: 95%). Based on the survey results and subsequent impact value transfer, the influence generated by personnel management and employee training reached USD 255 million, benefiting from the growth in employee headcount. The outcomes included enhancing employees' sense of achievement and belonging, strengthening team cohesion and management capabilities, and improving mental well-being. Among these, recognition of strengthened team cohesion was the highest at 82%, followed by improved mental well-being at 78%. Moving forward, we will continue to focus on understanding the perspectives of direct employees across different dimensions and strengthen communication channels to foster a deeper sense of connection and identification with the company.

Employee and Contractor Health and Safety

Employee and contractor's health and safety is vital to maintaining good labor-management relations, operational efficiency and organizational commitment. ASEH promotes a healthy workplace and monitors workplace accidents to understand the positive and negative impacts on the work environment, and to also determine if the company is providing employees and contractors a safe and healthy work environment.

We used the occupational injuries of employees and contractors, health examinations and health insurance as influencing factors of employee engagement. The number of ASEH employees that received health examinations was 61,011 in 2024. A total of 97 occupational injuries and 9 occupational disease occurred, among which, 4 were contractor injuries. We then assessed the issue of employee health based on occupational accident subsidies, health examination expenses and health insurance premiums.

We calculated the social value of employees and contractors of positive effects at US$56 million, and outcomes included higher probability of recovery from illness and less financial pressure from medical expenses. With regard to negative effects, the harm to employees physically and mentally was assessed at US$0.4 million. We will continue to improve our occupational safety and health measures to effectively prevent injuries and illnesses caused by work, and eliminate the 1% negative effect it accounted for in the employees' and contractors' health and safety indicator.

Social Cohesion

ASEH has business operations located in various parts of the world. We engage actively with the local community where we conduct our business, and participate in various public welfare programs to ensure that we enhance the positive impact on the natural environment and society, while allowing the public to better understand ASEH's approach to sustainability.

ASEH invested approximately US$4.4 million in 201 social cohesion programs in 2024, including 5 public development programs; 33 community care programs;112 care for disadvantaged families programs; 11 healthcare sponsorship; 29 arts and culture sponsorships; 11 sports sponsorships. Due to the large number and complexity of stakeholders at each business location, we analyzed secondary data and referred to public SROI reports to match activities with the chain of events. We then use the value transfer methodology to assess the positive and negative effects on communities and residents.

Public welfare programs that boost social cohesion created US$16 million in social value, without taking into account the value contributed by corporate volunteers. Among which, care for disadvantaged families accounted for the highest percentage at 50%, followed by arts and culture sponsorships at 23% and community care at 14%. Overall, SROI was 3.63 with the top three outcomes as follows: increasing self-identity among disadvantaged children, improving resource utilization through community care , and enhancing public knowledge of the arts, contributing to the well-being of neighboring residents and the broader society.

In addition, corporate volunteer contributions increased by 41% in 2024 compared with 2023, with ASE recording the most significant growth through continued participation in environmental conservation, community development, and industry–academia education initiatives, underscoring ASEH's strong commitment to social good.

Care for Disadvantaged Families Impact Pathway

Social Impact Column - Care for Disadvantaged Families

unit： US$ million

Input	Activities	Output	Stakeholders	Outcome	Impact Value
USD 235.9	**Community Care Center for Disadvantaged Children and Youth**  We developed programs such as the "Three Bears Project" organized by the ASE Foundation to support underprivileged elementary and junior high school students. The "Baby Bear," "Happy Bear," and "Energetic Bear" initiatives provided counseling, mentorship, and scholarships for children and adolescents across different age groups to enable them to complete their studies. In 2024, we organized the "Three Bears Environmental Education Growth Camp" to nurture young ambassadors for water resource conservation.	▪ Provided assistance to 101 households, benefiting a total of 123 elementary and junior high school students from underprivileged families. ▪ Provided scholarships to 296 students	**Disadvantaged families**	Reduce financial burden Increase self-confidence	**Community Care Center for Disadvantaged Children and Youth** USD 741.6
			Disadvantaged children	Increase self-esteem Improve learning effectiveness Improve interpersonal skills Learn to help others with spirit and enthusiasm	
			Teachers	Gain a sense of achievement and fulfillment Improve teaching skills and experience	

Community Care Impact Pathway

Social Impact Column - Community Care

unit： US$ million

Input	Activities	Output	Stakeholders	Outcome	Impact Value
USD 240.8	**The 10th campus LED Installation Projects**  The LED light installation is a green energy initiative that improves the quality of lighting in rural schools, protecting the eyesight of schoolchildren, and creating a pleasant learning environment. Savings from electricity bills can be used to procure more teaching aids, plan more educational activities, or for the repair and maintenance of equipment. LED lighting creates a well-lit environment, improving the classroom environment while at the same time meeting energy conservation and carbon reduction goals.	▪ Deployed at 14 schools ▪ 12,778 LED light tubes installed ▪ 276,005 kWh of electricity can be saved, and 131 tCO_2e of carbon emissions be reduced per year	**Students**	Improve personal well-being through good lighting	**The 10th campus LED Installation Projects** USD 577.7
			Schools	Generate more funds for equipment and teaching aids through electricity cost savings. Improvements in the efficiency of campus funds utilization	
				Reduce carbon emissions by saving electricity, thereby enhancing social well-being	

Arts and Culture Sponsorships Impact Pathway

Social Impact Column - Arts and Culture Sponsorships

unit： US$ million

Input	Activities	Output	Stakeholders	Outcome	Impact Value
USD 43.6	**Short Film Series on Chinese Historical Culture and Western Art History**   ▪ Chinese Historical and Cultural Animation In collaboration with USTV, we produced the animated series 'When an anchorman meets historical figures," a program designed to promote Chinese ethics and moral values through engaging storytelling. In 2024, six episodes were completed,each highlighting a prominent historical figure-Su Wu, Guan Yu, Fan Zhongyan, Sima Guang, Wen Tianxiang, and Zhan Tianyou. The series is currently available on the official websites and YouTube channels of both the ASE Cultural and Educational Foundation and USTV, where it has garnered a total of 131,191 views. ▪ Short Film Series on the History of Western Art In partnership with TVBS, we produced the series "A Fantastic Journey Through Westem Art," with four episodes focusing on architecture, painting, music, and dance. The videos wereleased on the official websites, Facebook pages, and YouTube channels of the ASE Cultural and Educational Foundation and TVBS, with a total of 799,965 views.	▪ Number of episodes produced: 10 short videos, including the Chinese History and Culture series (6 episodes) and Western Art History series (4 episodes) ▪ Number of views: 931,156 ▪ Media production partners: 2	**Audience**	Broaden knowledge of history and the arts Foster a sense of connection with others Become more open-minded and respectful toward new things and experiences Feel inspired and motivated Strengthen critical thinking and communication abilities	**Short Film Series on Chinese Historical Culture and Western Art History** USD 205.7
			Video Production Crew	Gain greater control over career prospects Strengthen team cohesion within the production crew	

Education

Access to highly skilled human resource talent is key for ASEH to maintain its leadership in a competitive semiconductor industry. The semiconductor industry continues to experience strong demand for skilled workers and at ASEH, cultivating talent and semiconductor technologies are very important elements in our business process and strategy. Public values and consumption habits affect product demand and the direction of developments in the entire technology industry. Through public advocacy and active engagement with the community and in campuses, ASEH aims to influence consumer behavior to achieve growth and sustainable development for the company.

In 2024, ASEH worked together with many academic institutions and invested approximately US$7.2 million in a total of 153 education programs, including academia-industry research and development, career counselling and employment matching programs. These programs have allowed ASEH to strengthen its technological advantages and gain access to quality employment candidates. Furthermore, ideas of sustainability are incorporated into corporate operations through the promotion of environmental conservation, road adoption and other social welfare programs, in order to raise the green awareness of employees and the public.

We used the value transfer methodology to determine that the SROI of education programs was 4.63, and that US$33.2 million in social value was created, of which business-related industry-academia collaboration generated approximately US$26 million. Main outcomes include better operational efficiency and industry competitiveness. Approximately US$6.8 million was generated by environmental education, and main outcomes include better recognition and attitude towards environmental conservation of the public, as well as incorporating actions to protect the environment in their daily life.

Environmental Education Impact Pathway

Social Impact Column - Environmental Education

unit： US$ million

Input	Activities	Output	Stakeholders	Outcome	Impact Value
USD 164.7	**2024 Taoyuan City Environmental Education Promotion**  We promote environmental education in communities surrounding our facilities by organizing activities such as nature ecology and resource recycling activities at nearby elementary schools. These initiatives aim to foster environmental awareness from an early age and strengthen students' understanding of sustainability and ecological conservation.	▪ Held 10 environmental education activities at nearby elementary schools, with a total of 2,080 participants.	**Students**	Raise students' awareness of environmental protection and implementation of environmental sustainability actions in daily lives Cultivate students' attitude of respect for life and ecological care	**2024 Taoyuan City Environmental Education Promotion** USD 624.8
			Narration volunteer	Raise awareness of environmental protection through education and training and implementation of environmental sustainability actions in daily lives	
			Parents	Enhance public participation, volunteering and enthusiasm for charity Improve relationships with family, friends, and colleagues	

Social Impact Pathway

Impact Driver	Activity/Output	Outcome/Impact	Monetary Valuation
Supplier Partnerships	Supplier sustainability audit	▪ Improve supplier's competitiveness and optimize supplier's management system	▪ Property losses or external training fees
	Supplier training		▪ Perceived value according to supplier survey questionnaires
	Local procurement	▪ Create local job opportunity and promote local economic prosperity	▪ Local procurement value
	Supplier Sustainability Awards	▪ Support excellent suppliers to sustainable transition	▪ The cost of Supplier Sustainability Awards
Employee Engagement and Development	Employee career Development work environment Employee care	▪ Increase sense of belonging ▪ Increase mental health ▪ Enhance management capabilities ▪ Increase sense of achievement ▪ Enhance cohesion of employees	▪ Mental wellbeing course fees ▪ Company benefits and subsidies ▪ Training and development expenses ▪ Consensus building and motivational course fees
Employee and Contractor Health & Safety	Number of occupational injuries	▪ Employee and contractor physical/psychological injury	▪ Disability payments
	Employee health check	▪ Increase in recovery rate of employee with health issues	▪ Health screening expenses
	Health insurance expense	▪ Reduce financial impact to employee as a result of health issues	▪ Health insurance expenses
Social Cohesion	Public development	▪ Improvement in the knowledge and analytical abilities of public issues	▪ Converted using the value transfer methodology[1]
	Community care	▪ Improvement of resource usage benefits	
	Care for disadvantaged families	▪ Improvement of self-identity and education benefits	

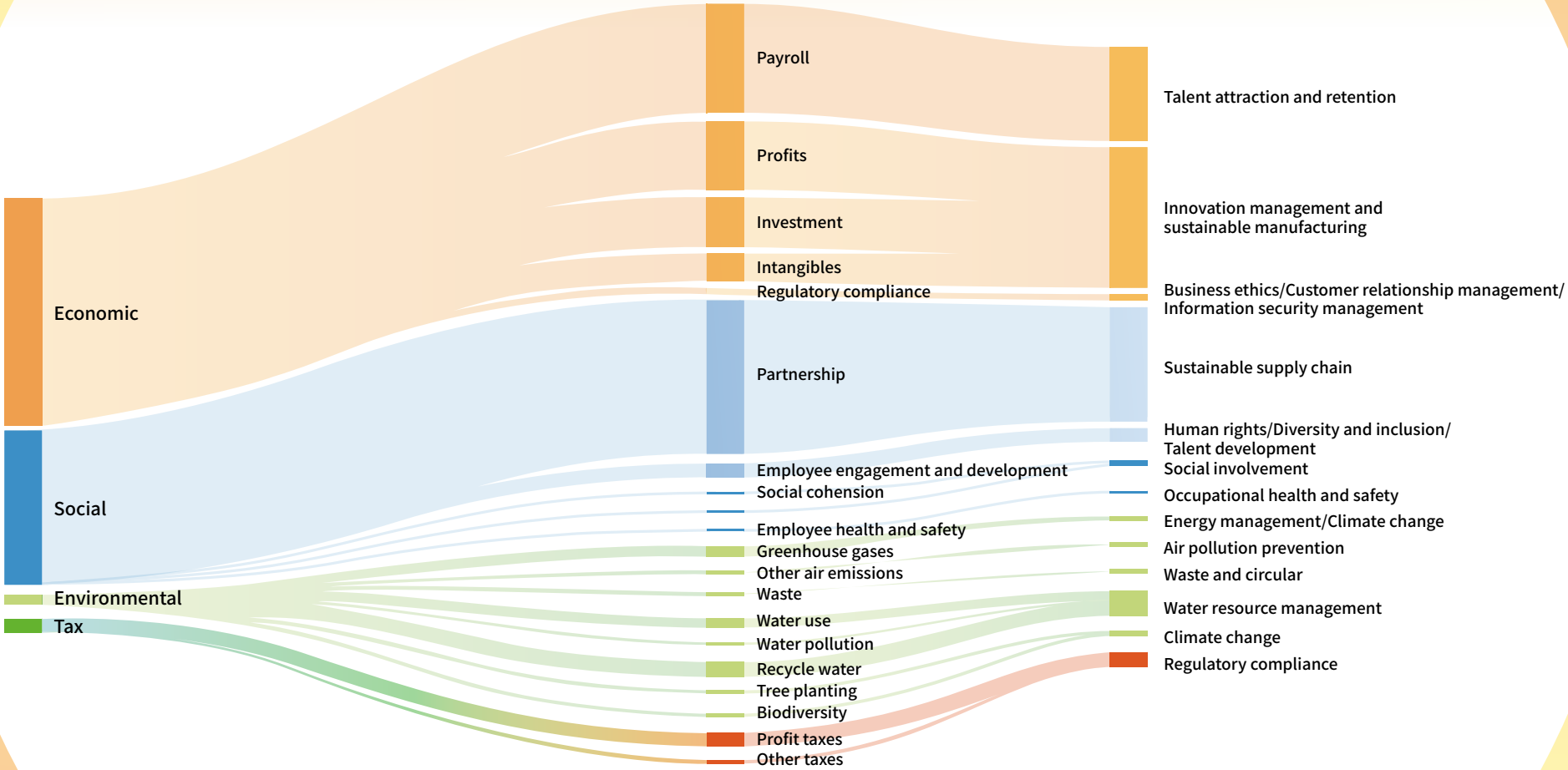
Social Impact Pathway

Impact Driver	Activity/Output	Outcome/Impact	Monetary Valuation
Social Cohesion	Healthcare sponsorship	▪ Increased healthcare resources and quality of life	▪ Converted using the value transfer methodology[1]
	Arts and culture sponsorship	▪ Improved artistic knowledge	
	Sports sponsorship	▪ Increased human interactions and group cohesiveness	
Education	Occupational education and training	▪ Increased employment opportunities for participants in industry-academia collaborations	
	Environmental education	▪ Improved environmental awareness and implementation in daily life	

[1] Based on the value transfer model described in the Social Capital Protocol, we benchmarked against SROI reports certified by Social Value International or SROI reports with similar topics from Taiwan. We have also reviewed impact pathways in the publications, and matched these pathways with ASE's social cohesion and educational programs. We then transferred the percentage of value attributable to the impact pathway to ASE's social cohesion and educational programs, which provided a basis for calculation of the SROI generated and the value to society.

3.2 ASEH's SDGs and Impact

ASEH has identified Sustainable Development Goals (SDGs) as our priorities. This year, we continued to evaluate our progress through the SDG common indicators of The SDG Compass Business Indicators database. The analysis showed that ASEH has created positive impacts and contributions for SDG 8 (Decent Work and Economic Growth) , SDG 4 (Quality Education) , SDG 12 (Responsible Consumption and Production) . These were mainly attributed to the establishment of supplier partnerships, and the increase in local procurement opportunities that benefited the local economy and created jobs in areas where we operate in. Through supplier education and training, and sustainability audits, we have improved the suppliers' understanding of sustainability issues and trends, reduced risks to occupational safety, optimized current management measures, driven overall supply chain improvements in economic productivity and resource efficiency, and provided the knowledge and skills needed for sustainable development. We also use operating profits, investments and intangible assets to drive the GDP and the local economy, further improving the dignity of labor and standard of economic productivity.



As our business grows, we understand that issues arising from the demand on environmental resources in our operations, and the social impacts we create due to our environment, could negatively affect SDG 7 (Affordable and Clean Energy) , SDG 13 (Climate Action) , SDG 6 (Clean Water and Sanitation) ,SDG 14 (Life below Water) and SDG 15 (Life on Land) . Therefore, we continue to increase environmental protection related investments, focus on improving resource efficiency and conversion rate, and actively develop diverse and clean energy sources. We have increased our renewable energy use ratio over the years in response to climate change and net zero requirements, allowing more efficient use of natural resources and sustainable management. We are also gradually improving the resource efficiency in consumption and production, and are actively minimizing the external social costs associated with these SDGs . To fulfill our global sustainability goals, we have formulated our 2030 performance goals embedded within the core of our business, in accordance with the company's four major sustainability strategies. Our SDGs responses will become strategic indicators of ASEH's periodic evaluation and management, that will enable the company to lead the industry and bring positive impacts to global sustainable development.

ASEH's Impact Value Creation Framework

Strategies Sustainability		2030 Target		SDGs
Low Carbon	▪ Decarbonized Products and Services ▪ Low-carbon Manufacturing ▪ Adaptation and Resilience ▪ Green/Renewable Energy Investment	**Environmental Performance**	▪ GHG intensity | ✓ 15% reduction compared with 2015 ▪ Renewable electricity ratio | ✓ 42% of total electricity consumption	**Have a positive influence on the society** 
Circular	▪ Circular Design ▪ Energy Resources Recycling ▪ Waste as a Valuable Resource ▪ Circular Economy in Value Chains	**Environmental Performance**	▪ Circular Design and Energy Resources Recycling | ✓ Water use intensity：52% reduction compared with 2015 ✓ General waste recycling rate > 90% ✓ Hazardous waste intensity：61% reduction compared with 2015	
Inclusive	▪ Environmental Conservation ▪ Industry-academia Collaborations ▪ Community Engagement ▪ Public Advocacy	**Social Value**	▪ Environmental Conservation | ✓ LED energy-saving fixtures installed at over 170 schools ✓ Over 150 environmental technology industry-academia collaboration projects ▪ Industry-academia Collaborations | ✓ Over 2,000 students attending semiconductor courses ✓ Over 450 innovative industry-academia collaboration projects ▪ Community Engagement | ✓ Over 2,000 disadvantaged students attending the after school program ▪ Public Advocacy | ✓ Over 25 legislative initiatives for issues related to the semiconductor industry and sustainability	
Collaborative	▪ Smart Procurement ▪ Strategic Partnership ▪ Supply Chain Management Go High Tech ▪ Environmental Education	**Supplier Partnership**	▪ Strategic Partnership | Completion of sustainability risk survey : ✓ 100% for all tier-1 suppliers ✓ Over 50% for Non-tier 1 suppliers ✓ Completion of sustainability audits conducted : 120 tier-1 suppliers	

CH4 Conclusion

Appendix

ASEH expresses its sustainability performance in monetary values, through the four sustainability strategic goals and results. The purpose of the valuation is to determine the economic, tax, environmental and social impact of our business process on stakeholders based on a uniform monetization standard. We hope to completely capture the impacts of our non-financial performance, and to generate positive value for our stakeholders through effective management and performance in sustainability.

ASEH generated US$12,227.8 million in sustainable value for stakeholders in 2024. On the economic impact, employee salary and benefits generated the highest monetized impact, demonstrating ASEH's substantial influence on the labor market where it operates. When it comes to taxes, ASEH continues to uphold its core value as an honest taxpayer and refrain from performing transactions solely for tax purposes.

On the environmental dimension, Scope 2 and Scope 3 greenhouse gas impacts increased compared with 2023, primarily due to higher emissions along the value chain from operational activities and from the procurement of goods and services, capital goods, and upstream transportation and distribution . Moving forward, we will continue to mitigate emissions from our operations and across the value chain through green manufacturing processes, procurement of low-carbon materials, construction of low-carbon facilities, and the adoption of sustainable transportation solutions.

In 2024, we continued to apply our sustainable value assessment methodology (TIMM-based) to quantify the impacts related to SDG 14 (Life Below Water) and SDG 15 (Life on Land) . On the social dimension, we focus on the sustainable values created through supplier partnerships, and employee engagement and development, that allow ASEH to further create extraordinary value for suppliers and employees through its operations. In response to the negative impacts created in 2024, ASEH will step up efforts to mitigate negative environmental and social impacts to stakeholders.

Item	Impact	Mitigation Action	2024 Key Outcome
 **Greenhouse gas emissions**	The social cost of human health, architectural and asset damages and economic losses caused by greenhouse gas emissions.	▪ Moving towards low-carbon energy transformations ▪ Establish and purchase renewable energy ▪ Execute energy-saving and carbon reduction solutions ▪ Expand investments in carbon reducing equipment ▪ Adopt low-carbon substitute materials	▪ GHG intensity (Scope 1+2) : 40% reduction compared to 2015 ▪ Scope 3 GHG emissions: 8% reduction compared to 2020[1] ▪ Renewable energy and certificate accounts for 19% of total electricity usage ▪ Executed 1008 cases to reduce 565,806 tCO_2e
 **Air pollution**	The social cost of threats to human health, agriculture loss, forest loss, resources depletion, and acidification of water caused by other air emissions.	▪ Introduce high-efficiency processing equipment ▪ Worked with academia to study the processing efficiency of air pollutants ▪ The closed negative pressure design increases the collection rate ▪ Substitute cleaning materials	▪ Our VOCs emissions have decreased 61% in 2024. We will strengthen our emission management to focus on source emissions and facility upgrades to reduce the environmental impact caused by the concentration of air pollution emissions.
 **Waste**	The social cost of local and global pollution, visual and auditory disruption caused by the hazardous and non-hazardous waste treatment process.	▪ Waste reduction at source ▪ Introduced circular economy operating models ▪ Adopted environmentally friendly substitute materials	▪ Non-hazardous waste recycling rate achieved 97% ▪ Hazardous waste intensity: 53% reduction compared to 2015 ▪ Implemented 38 circular economy projects, achieving a total annual material recovery of approximately 14,454 tons
 **Water consumption**	The social cost of ecosystem service devaluation, malnutrition, and waterborne diseases caused by water usage.	▪ Established a waste water recycling plant ▪ Promote water saving projects ▪ Invested in water recycling equipment ▪ Rainwater collection and utilization	▪ Water use intensity：43% reduction compared with 2015 ▪ Promoted 35 water saving projects which saved 1.5 million tons per year ▪ The recycling rate of process water increased to 80%

[1] According to SEMI's guidance on "Scope 3 Category 11 GHG Assessment", it was determined that the Outsourced Semiconductor Assembly and Test (OSAT) industry mainly provides manufacturing services. From that perspective, the use or disposal of end products is typically not directly linked to the service provider. For more information on the Scope 3 Category 11 GHG Assessment, please visit SEMI's official website: https://discover.semi.org/scope-3-category-11-ghg-assessment-download-form.html

Item	Impact	Mitigation Action	2024 Key Outcome
Water pollution	The social cost of threats to human health, decrease of recreation value, devaluation of real estate, and post-harvest fish losses caused by water pollution.	▪ Continuous monitoring of water quality/volume ▪ Wastewater recycling and reuse ▪ Distribution of chemicals ▪ Develop innovative processes and technologies through academia-industry cooperation	▪ Distribution of chemicals for 15 plants ▪ Wastewater treatment in all facilities complies with local regulatory discharge standards. By employing regular and continuous monitoring of effluent quality combined with AI-assisted analytics, we optimize water output and enhance water reclamation efficiency, reducing overall water consumption
Employee health and safety	The effect of work injuries on the physical and psychological wellbeing of employees.	▪ Established organizational structure, management guidelines and procedures, and periodic audit procedures in the OHS Management System ▪ Formulated management measures for occupational injury and accident reporting and investigation procedures ▪ Health screening for employees ▪ Stipulated combined disaster handling and recovery plans	▪ 61,011employees participated in health checkups, invested approximately US$3.1 million ▪ Completed 464 drills for earthquakes, fire and chemical disasters ▪ Accumulated over 300,000 hours of occupational health and safety education and training, reaching 295,217 participants

As we continue to improve our competitiveness, we will also continue to strengthen our corporate sustainability management. We apply financial and non-financial measurements, as well as evaluate operating and non-operating activities to analyze the positive and negative effects of external impacts on the operations of our subsidiary companies. The analysis allows site-level operational decision-making to make better business decisions, and the valuation results provide the basis for the Corporate Sustainability and Information Security Committee to plan our value creation path that formulates improvement actions and decisions that will reduce the impact of potential risks. In 2024, we continually expanded our sustainable value evaluation from our own operations to the value chain, that enables us to understand the environmental impact on the value chain from indirect greenhouse gas emissions. Our next step is to reflect the true value created by the value chain, and to that end, we will extend the scope of impact measurement upstream. We will leverage on our industry leadership to increase the influence on sustainability, and work together with upstream and downstream partners to bring about change and innovation for benefit of the industry and society.

Appendix 1 Methodology and Data Collection

This report was prepared according to the Natural Capital Protocol, Social Capital Protocol, and the monetization framework for SROI. The TIMM framework proposed by PwC was also employed as an analytical integration tool based on the GRI Standards and the International <IR> Framework. Data used in calculations are divided into primary data and secondary data. Primary data are raw data from ASEH, while secondary data are projections based on the databases, referenced from relevant publications or derived in this report.

Economic

Information on the distribution of financial resources was directly obtained from financial statements or the accounting system of ASEH.

	Payroll	Profit	Investment	Intangibles	Regulatory Compliance
Primary data	V	V	V	V	V
Extrapolated from Primary data	V	V	V	V	V

Tax

Information on tax was directly obtained from financial statements or the accounting system of ASEH.

	Profit taxes	Other taxes
Primary data	V	V
Extrapolated from Primary data	V	V

Environment

We studied the 2016 Natural Capital Protocol by the Natural Capital Coalition to monetize the environmental impact generated from greenhouse gas and air pollution , waste material, water resource and wastewater management.

1. Information collection：

The information collected during the compilation of this report included both primary and secondary data, and great effort was taken to ensure the reliability and validity of the collected data. However, due to geographical limitations or lack of reference data, it was impossible to obtain monetization information for some social impacts.

	Greenhouse gas emissions	Air Pollution	Water cinsumption	Water pollution	Waste	Recycled water	Afforestation	Biodiversity
Primary data	V	V	V	V	V	V	V	V
Extrapolated from Primary data	V	V	V	V	V	V	V	V
Secondary data	V	V	V	V	V	V	V	V
Extrapolated from Secondary data	V	V	V	V	V	V	V	V

2. Adjustment on the basis of purchasing power in different countries/areas：

The coefficient of monetization used in this project have always been based on the value transfer methodology, and we have collated monetization data from research reports by academic experts, international organizations and NGOs. In order to determine the monetized values in areas where our facilities are located, the basic monetized value was adjusted according to the PPP and GNI (purchasing power parity gross national income) . As Taiwan was not included in the World Bank database, we derived the values from data obtained through the Taiwan Directorate General of Budget, Accounting and Statistics, and the IMF (International Monetary Fund) .

3. Adjustment for inflation：

Apart from adjusting for regional differences using PPP and GNI[1] , we will adjust the data using the US dollar inflation rate[2] to reflect the monetized values for 2023.

Social

Primary data (including stakeholder interviews and surveys[3]) and secondary data (accredited documents and literature on social studies) obtained through stakeholder engagement were employed to assess the monetized value of the impact of ASEH's business activities on local residents. We also determined the social impact value on employees, suppliers, and the public using the value transfer methodology[4].

Our report employs mainly the input-output model, social return on investment (SROI) [5] and value transfer methodology. The input-output model was used in conjunction with stakeholder engagement to obtain the monetized value of the social impacts of ASEH's business activities on stakeholders. The SROI and value transfer methodology were used in conjunction with the materiality principle to select higher value activities as well as referring to SROI reports certified by Social Value International (SVI) to verify if these programs' stakeholders, chain of events, and outcomes were consistent with those in the SROI reports and use this basis to estimate the resulting value.

	Suppliers Partnership	Employee engagement and development	Employees health and safety	Social cohesion	Education
Primary data	V	V	V	V	V
Extrapolated from Primary data	V	V	V	V	V
Secondary data	V	V	V	V	V
Extrapolated from Secondary data	V	V	V	V	V

[1] GNI values for various countries were obtained from information published by the World Bank：https://www.imf.org/en/Publications/WEO/weo-database/2021/April

[2] USD inflation rate reference：http://www.usinflationcalculator.com/

[3] The analyzed information of the 2024 supplier education and training is based on the previous survey questionnaire. The SROI methodology related calculation parameters were recalculated based on the related questionnaires selected from the education and training of subsidiaries in 2024, and social impact was calculated based on average value per person.

[4] Social Capital Protocol, WBCSD, 2016, p51

[5] We converted the resulting values in accordance with the seven major principles found in the SROI methodology：Involvement of stakeholders, understand what changes, value the things that matter, only include what is material, do not over-claim, be transparent, and verify the result.

Appendix 2

Reference Reports for Value Transfer Methodology (Social Cohesion and Education)

Item	Reference Report
Public Development	The outcomes and value of SOUL's advanced SROI training course
Community Care	The Cedar Foundation Community Inclusion Programmes SROI
Care for Disadvantaged families	Social Return on Investment (SROI) Report of Taiwan Dream Project on Dahu Community
Care for Disadvantaged families (Non-children)	Analysis Report of "Banqiao Jing Si Hall" Social Return on Investment (SROI) - Community Care and Putting Localization into Practice
Medical Sponsorship	Healthwise Hull SROI Forecast
Arts Sponsorships	Turner Contemporary：Art Inspiring Change Social Value Report
Sports Sponsorships	Bums off Seats SROI Evaluation Report
Environmental Education	《Cherish the Earth, Spread Love Far SROI Report》 2018 SROI Report
Vocational Training	The Cornwall Exchange：A Social Return on Investment (SROI) Report
Biodiversity	Restore the Earth Foundation Cypress Reforestation Social Return on Investment Report

Appendix 3 References

1 AhlrothS. (2009). Developing a weighting set based on monetary damage estimates. Method and case studies.

2 Huijbregts, Rombouts LJA, Ragas AMJ, Van de Meent D. (2005). Human-toxicological effect and damage factors of carcinogenic and non-carcinogenic chemicals for life cycle impact assessment. Integrated Environmental Assessment and Management 1 (3) , p. 181-244.

3 Natural Capital Coalition. (2016). Natural Capital Protocol.

4 Social Capital Coalition. (2016). Social Capital Protocol.

5 The SROI Network. (2012) A guide to Social Return on Investment.

6 PwC. (2013) . Measuring and managing total impact: A new language for business decisions.

7 Trucost. (2016). Accounting for Natural Capital Costs Associated with Chinese Financial Institutions- Banking Sector Case Study.

8 Jiang Liwei, Lu Zeyang, Gong Yinting, Yan Shiwei. (2019). The Ecological Benefits of Vegetation Restoration in Yijinhuoluo Banner of Inner Mongolia.

9 The International <IR> Framework, Traditional Chinese version, December 2015.

10 《The outcomes and value of SOUL's advanced SROI training course 》, https://socialvalueuk.org/report/the-outcomes-and-values-of-souls-advanced-sroi-training-course/

11 《The Cedar Foundation Community Inclusion Programmes》, https://socialvalueuk.org/report/the-cedar-foundation-community-inclusion-programmes-sroi/

12 《Social Return on Investment (SROI) Report of Taiwan Dream Project on Dahu Community Supported by CTBC Holding and CTBC Charity Foundation》, https://socialvalueuk.org/report/sroi-taiwan-dream-project-dahu-community/

13 《Healthwise Hull SROI Forecast》, https://socialvalueuk.org/report/healthwise-hull-sroi-forecast/

14 《Turner Contemporary：Art Inspiring Change Social Value Report》, https://socialvalueuk.org/report/turner-contemporary-art-inspiring-change/

15 《Bums off Seats SROI Evaluation Report》, https://socialvalueuk.org/report/bums-off-seats-sroi-evaluation-report/

16 《The Cornwall Exchange：A Social Return on Investment (SROI) Report》, https://socialvalueuk.org/wp-content/uploads/2018/12/The-Cornwall-Exchange-SROI.pdf

17 《Cherish the Earth, Spread Love Far SROI Report》, https://corporate.fetnet.net/content/corp/tw/CSR/ReportDownload.html

18 《Supplier Guidance Project for the Implementation of ISO 14064-1 Greenhouse Gas Inventory Social Return on Investment (SROI) Report》, https://socialvalueuk.org/reports/supplier-guidance-project-for-the-implementation-of-iso-14064-1-greenhouse-gas-inventory-social-return-on-investment-sroi-report/

19 《Analysis Report of "Banqiao Jing Si Hall" Social Return on Investment (SROI)-Community Care and Putting Localization into Practice》, https://socialvalueuk.org/reports/tzu-chi-foundation-analysis-report-of-banqiao-jing-si-hall-social-return-on-investment-sroi/

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