



Universal Scientific Industrial (Shanghai) Co., Ltd.

2020 TCFD Report

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Preface

The global warming caused by greenhouse gas emissions over the years has exposed the world economy to significant risks and has threatened many businesses around the world. It is always difficult for investors to know which companies are vulnerable to climate change, which companies are well prepared, and which companies are taking action. As a result, the Financial Stability Board (FSB) established a task force called Task Force on Climate-related Financial Disclosures (TCFD). The “TCFD report” was completed in June 2017 after consulting with a wide range of business and financial leaders over an 18-month period. The report provides a clear picture of how to address the risks and opportunities associated with climate change, and gives companies and investors a comprehensive assessment framework that can also be reflected in financial reporting.

Universal Scientific Industrial (Shanghai) Co., Ltd. (USI) would like to follow the international trend to disclose the risks and opportunities brought by climate change according to the TCFD report, and to demonstrate the corporate responsibility and strategy to allocate capital more reasonably and effectively in order to achieve the vision of low carbon economic transformation. The scope of this report reveals the operation information about Zhangjiang, Jinqiao, Shenzhen, Kunshan, Nantou Tsaotuen, Nantou Nankang, and Mexico Facilities.

TCFD Framework



Company Profile

USI is a global leader in electronic design and manufacturing as well as a leader in the field of SiP (System-in-Package) modules. USI provides D (MS)² product services: Design, Manufacturing, Miniaturization, Industrial software and hardware Solutions, and material procurement, logistics and maintenance Services. In 2020, USI acquired Asteelflash, the second largest EMS company in Europe, and established its first Southeast Asian production base in Vietnam. As a result of the resource consolidation, USI has 27 sales, production and service locations across four continents of Asia, America, Africa and Europe. USI and its subsidiary, Asteelflash, jointly offer customers diversified products in the sectors of wireless communication, computer and storage, consumer, industrial, medical and automotive electronics worldwide.

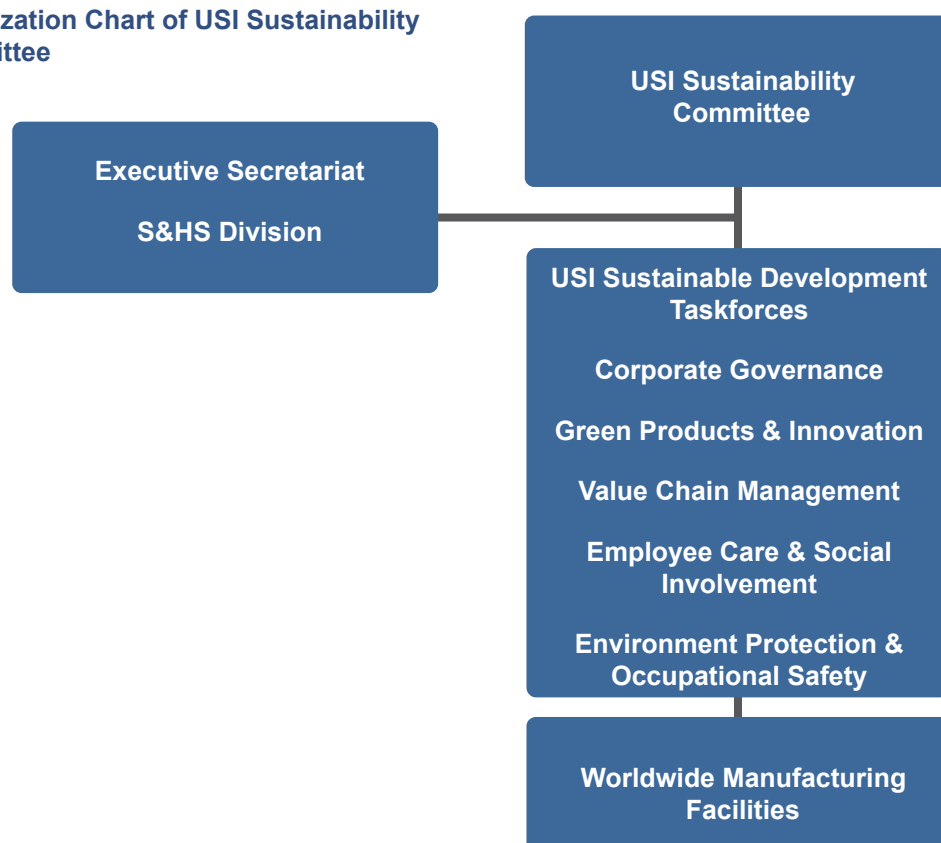
Governance

Climate Change Governance

USI believes that the fundamental aspects of corporate sustainability are related to the environment, society and governance. Therefore, the “USI Sustainability Committee”, chaired by the President, was established as the highest organizational unit to manage the Group's sustainable development, the scope of the Committee covers all worldwide manufacturing facilities. The Committee's mission has been divided into five taskforces, Corporate Governance, Green Products & Innovation, Value Chain Management, Employee Care & Social Involvement, and Environment Protection & Occupational Safety. Committee members are representatives from all administrative and business units. Vice Presidents and Division Heads are the Leaders and Coordinators, respectively, while the S&HS Division members are the Facilitators. The Committee effectively conveys the various tasks through the collaboration of its members to help promote corporate sustainability.

In addition, as climate change becomes an important issue for environmental protection, the Sustainability Committee prepares an annual sustainability report (including climate change-related issues) for the Board of Directors' review, and the Board will conduct discussions and planning for the Company's climate change-related activities.

Organization Chart of USI Sustainability Committee



Sustainable Development Management Organization Chart



Risk and Management

Climate Change Risk and Opportunity Management

The Sustainability Committee is dedicated to managing all aspects of climate change. To understand the international initiatives and corporate issues related to domestic and international sustainability and climate change, the Committee includes the key points and evaluation criteria related to international initiatives in consideration of the Company's environmental and greenhouse gas policies in order to meet international development trends and improve the Company's ability to respond to climate change.

Climate Scenario Data Collection

USI used the Worst-case Scenario for both the transition and physical risks according to the TCFD recommended criteria and incorporated the analysis results into the strategic resilience assessment.

The transition risk is referred to the IEA WEO 450 Scenario (2016) ¹ and the Nationally Determined Contribution (NDC) goal set for all manufacturing facilities, introduced after the Paris Agreement in 2015. In 2009, China decided to cut CO₂ emissions per unit of GDP by 40%-45% by 2020 as compared to 2005, and achieve 15% of non-fossil energy in primary energy consumption by 2020, and achieve carbon neutrality by 2060 at the United Nations Climate Change Conference. In addition, the energy mix will be dominated by non-fossil energy (75%) in 2060, followed by gas (11%), coal (8%) and oil (6%). In the report of the "Intended Nationally Determined Contribution" (INDC), Taiwan has set a 50% reduction in its greenhouse gas emissions in 2030 according to the Business as Usual (BAU) scenario. In this scenario, the power generated in 2025 will be 20% from renewable energy, 30% from coal and 50% from gas. The cost of electricity production per kWh will increase by 45% compared to 2020, and the carbon price will come to 98 USD per metric ton of CO₂ by 2030. The above scenarios are used to analyze the impact on the market, technology, reputation, finance, and operations of the Company in the future.

The physical risk is estimated by referring to the World Bank Climate Change Knowledge Portal and the Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP), to estimate the temperature increase and rainfall in 2020-2040 for RCP2.6, RCP4.5, RCP8.5², and other scenarios. The average temperature change in China under the RCP2.6 scenario is expected to be below the 1.5°C target set in the Paris Agreement; under the RCP8.5 scenario, the average temperature change in China is expected to be much higher than the global average (5°C). The average rainfall in China, except for the central part to the northeastern part of the Yunnan-Guizhou Plateau, will likely be increased under the RCP2.6, RCP4.5, and RCP8.5 scenarios. Therefore, under these three scenarios, we might consume more air-conditioning energy and more floods due to the temperature rise in the future; this will affect the production capacity in our facilities, resulting in financial losses and revenue decline.

- 1: The IEA WEO 450 Scenario (2016) refers to the scenario presented by the International Energy Agency in its World Energy Outlook to limit the rise in the long-term average global temperature to 2°C.
- 2: A "Representative Concentration Pathway" (RCP) is adopted in the IPCC Fifth Assessment Report to redefine the future change scenario (the pathway refers to the change in concentration trajectory). The radiative forcing differences between 2100 and 1750 are used as indicators to differentiate the RCPs. The RCP 2.6 scenario means the radiative forcing level will increase 2.6 watts per square meter by 2100; RCP 4.5, RCP 6.0, and RCP 8.5 mean the radiative forcing level will increase 4.5, 6.0, and 8.5 watts per square meter, respectively.

Climate Change Risk and Opportunity Management Process

Background Data Collection

- Collect background and scenario data from news, internet, other countries or company events.
- Consider the transition risks (policy and law / market / technology / reputation), the physical risks (chronic and acute) and the opportunities (resource efficiency, energy, products and services, markets and adaptation)

Risk/Opportunity Analysis of Possibility

- To analyze the targets in the value chain that are being affected (including direct operations, supply chain or customers)
- Impact duration (now within 0 to 1 year, short term 1 to 3 years, medium term 4 to 10 years and long term 11 to 30 years)
- Possibility (almost sure, highly possible, possible, unlikely, and extremely unlikely)

Analysis of Financial Impact

- Use impact on monthly revenue as an indicator (Tier 5: greater than \$390 million, Tier 4: \$195 million to \$390 million; Tier 3: \$39 million to \$195 million; Tier 2: \$3.9 million to \$39 million; Tier 1: less than \$3.9 million).

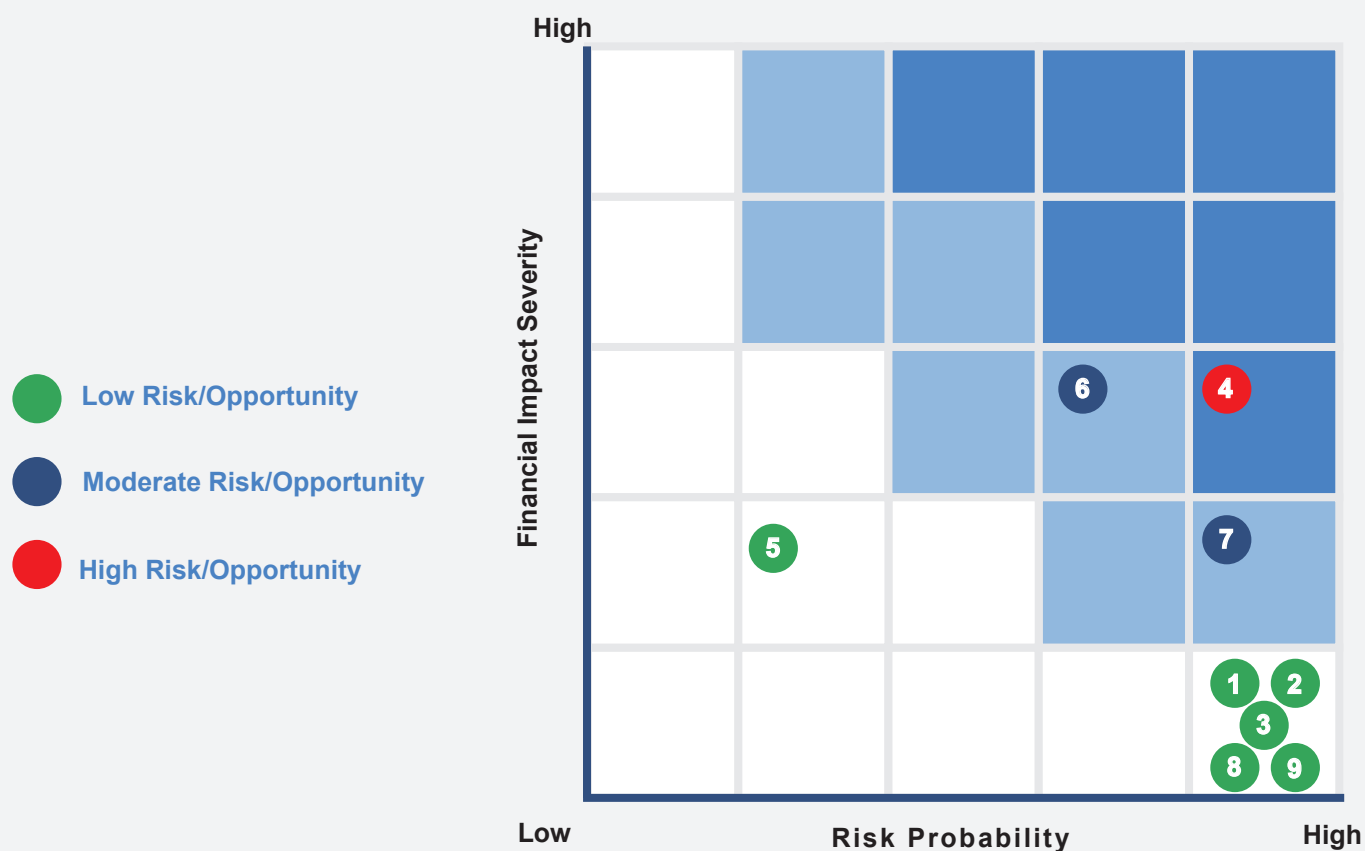
Risk Assessment

- Evaluate risk/opportunity indices based on the possibility and financial impact scales
- According to the risk/opportunity indices, it is classified as
Red: High risk/opportunity (for immediate action)
Blue: Moderate risk/opportunity
Green: Low risk/opportunity

Control Mechanism

- Review the existing control mechanism and set feasible control indices.

Climate Change Risk and Opportunity Matrix



Climate Change Risk and Opportunity Issues

Opportunity

- 6 Develop energy saving components
- 7 Demand for electric cars market
- 8 Introduce an energy management system to improve energy efficiency.

Transition Risks

- 3 Energy Transition
- 5 International carbon tax and emission quota requirements
- 4 Customer demand for green products

Physical Risks

- 1 Drought (Supply Chain)
- 2 Floods (Supply Chain)
- 9 Drought (USI)

The Financial Impact from Risk and Opportunity






Risk and Opportunity Types	Description of Risks and Opportunities	Potential Financial Impact	Countermeasures
Transition Risks	Energy Transition	Increase in energy costs	<ol style="list-style-type: none"> 1. To improve equipment efficiency, upgrade the power supply and replace power systems 2. Organize case sharing sessions regularly to share successful cases with our staff.
	Customer demand for green products	Additional carbon reduction equipment installation and R&D costs	<ol style="list-style-type: none"> 1. We have developed biodegradable plastics (emission reduction) that fit the customers' needs based on climate change issues to facilitate the energy-saving and carbon-reducing product applications for our customers. 2. To effectively meet customers' requirements for Energy Star and CoC Tier-2, we attend exhibitions and seminars through 3rd parties, study papers and visit customers.
	International carbon tax and emission quota requirements	Additional operating costs	<ol style="list-style-type: none"> 1. We propose the proposal to introduce eco-friendly materials in the early stage of product development, which can effectively reduce carbon emission in line with customers' product development plan for carbon neutral products. 2. We have developed a carbon supply chain management plan that will allow us to understand the carbon emissions from our supply chain in the future. 3. We have adopted green power gradually to minimize the carbon price impact.
Risk and Opportunity Types	Description of Risks and Opportunities	Potential Financial Impact	Countermeasures
Physical Risks	Drought (Supply Chain) Floods (Supply Chain)	The production was adversely influenced, resulting in financial losses and revenue decline.	<ol style="list-style-type: none"> 1. Establish a substitute mechanism for materials 2. Purchase mechanism for spot dealers 3. Inter-factory material transfer mechanism 4. Provide market information to prepare materials in advance (MPA) 5. When an emergency occurs that causes a lack of material, the emergency response management procedures will be activated according to the SOP.
	Drought (USI)	The production was adversely influenced, resulting in financial losses and revenue decline.	Please refer to P.9 for the strategies.

The Financial Impact from Risk and Opportunity

Risk and Opportunity Types	Description of Risks and Opportunities	Potential Financial Impact	Countermeasures
Transition Opportunity	Develop energy saving components	To meet customers' energy-saving product needs; therefore, we can increase the revenues.	<ol style="list-style-type: none"> 1. We are able to reduce the material and energy consumption by increasing the output per material unit through the miniaturization design; in addition, the energy consumption required for transportation is lower than that of other products. 2. We are able to meet the design requirements such as ERP, CEC, and DoE for different types of products to improve the overall power efficiency in the system.
	Demand for electric cars market	To meet customers' energy-saving product needs; therefore, we can increase the revenues.	<ol style="list-style-type: none"> 1. We have developed a series of flip-chip PECs to meet the high current density requirements of headlights, focusing on LED chip life, reliability, and brightness for the "car lights" . 2. For the "Powertrain", we continue to design and promote low energy consumption and high efficiency products to our customers. We also design and develop products to meet the IATF 16949 requirements.
	Introduce an energy management system to improve energy efficiency.	Reduce electricity cost for operation	We are able to identify the major energy consumption areas, develop and control energy performance indicators and energy saving plans through ISO 50001 energy management system, so that we can effectively save energy and reduce carbon emissions through PDCA Cycle every year.

Climate Change Physical Scenarios - Flooding and Drought Risks

We used the Climate Change Knowledge Portal (CCKP) to understand the historical and future climate data for the China and Mexico Facilities, and used the climate data from the TCCIP for the Nantou Facilities. In addition, we simulated the average monthly precipitation changes based on RCP2.6, RCP4.5 and RCP8.5 scenarios for the time periods of 2020-2039 and 2021-2040, respectively.

<div> <div>+</div> <div>/</div> <div>−</div> </div> <div>Risk/No Risk</div>						
<div>  <div>Facility</div> </div>	Zhangjiang Facility	Jinqiao Facility	Shenzhen Facility	Kunshan Facility	Nantou Facility	Mexico Facility
<div>  <div>Scenario Analysis</div> </div>	The average precipitation in January under the RCP 4.5 scenario and in September under the RCP 2.6, RCP 4.5 and RCP 8.5 scenarios exceeded the historical average by more than 20%,		While the average precipitation in March under the RCP2.6 scenario is less than 20% of the historical average.	If the average precipitation in the future does not exceed ±20%,		
<div>  <div>Drought risk</div> </div>	−	−	+	−	−	−
<div>  <div>Flood risk</div> </div>	+	+	−	−	−	−
<div>  <div>Countermeasures</div> </div>	1. USI has formulated Emergency Preparedness and Response Control Procedure which is regularly reviewed and revised 2. Has prepared sufficient emergency supplies (such as sandbags and drainage pumps).		We have formulated emergency contingency measures and arranged water trucks for supplying water.	We have established an emergency plan for flood prevention and purchased supplies for flood control to ensure that we can prevent floods in advance.	We have formulated emergency response measures to prevent water shortages at the NK Facility. In case of water shortages, the water truck will deliver water to the site.	We have formulated emergency contingency measures

10-year precipitation return period for each facility

The occurrence of the 10-year return period was analyzed for each facility based on the historical rainfall data from the period 1986 to 2005.

Facility Location	Precipitation records from 1986 to 2005 (mm/day)	No. of return periods from 2021 to 2030		
		RCP2.6	RCP4.5	RCP 8.5
Shanghai	3.74	0	1	7
Shenzhen	3.44	0	10	6
Kunshan	3.25	0	0	10
Nantou	5.84	0	0	0
Mexico	2.49	0	0	3

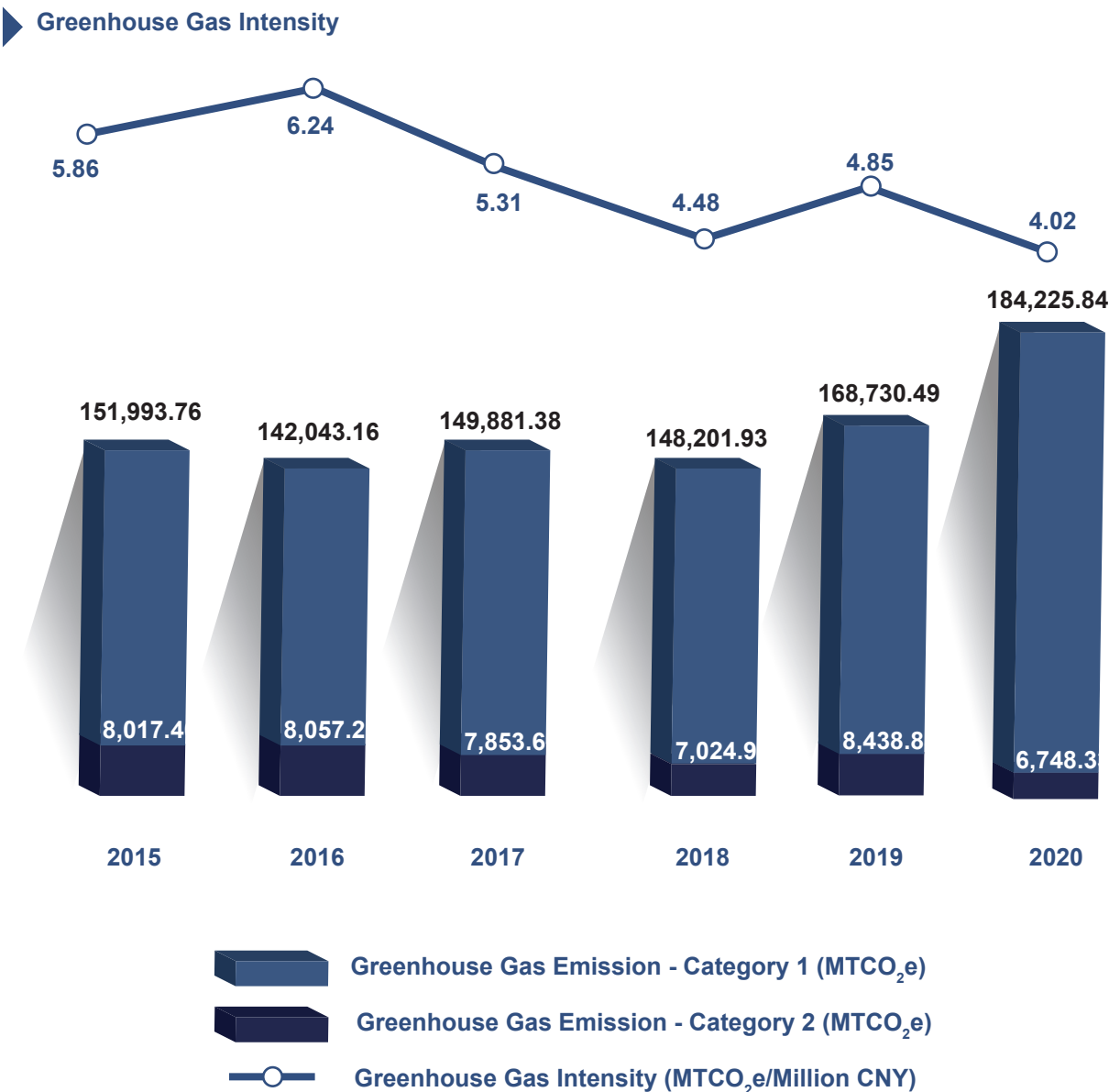
Strategies

Climate Change Strategies

Carbon Emissions Management

USI has been performing internal greenhouse gas emission inventory in accordance with ISO 14064-1 standard since 2007. In 2010, USI integrated the inventory at each manufacturing facility and verified it through a third-party verification agency to establish the basic data for USI's electronic inventory. Since 2018, we have started to introduce the category 3 inventory for the Nantou Facility, and we also introduced it for China Facilities. In 2020, we conducted more comprehensive and thorough inventory checks for all categories.

In addition, we will also establish an internal carbon pricing mechanism in 2022 to understand the influence of carbon and carbon risk on our business activities in order to reduce the risk of future carbon prices on our business operations.



▶ Indirect GHG emissions

Category	Contents	Greenhouse Gas Emissions (MTCO ₂ e)
Category 3	Indirect GHG emissions from transportation	3,225,655.68
	Emissions from upstream transportation and distribution of goods	3,114,667.56
	Emissions from downstream transportation and distribution of goods	24,825.98
	Emissions from employee commuting	85,946.72
	Emissions from business travel	215.42
Category 4	Indirect GHG emissions from products used by the organization	13,571,054.93
	Emissions from purchased goods	13,500,253.32
	Emissions from capital goods	65,529.11
	Emissions from solid and liquid waste disposal	1,205.29
	Emissions from the use of assets	4,067.21
Category 5	Indirect GHG emissions from the use of the organization's products	N/A
Category 6	Indirect GHG emissions from other sources	N/A
Total		16,796,710.61

Improve energy efficiency

About 92% of USI's greenhouse gas emissions come from electricity consumption, so the key to reducing carbon emissions is to conserve electricity use and maximize power efficiency. In order to reduce the energy consumption and cost incurred by the operations and production processes, we have chosen the external power supply units with low energy consumption and conducted evaluation tests during the product design process to ensure that the products meet the environmental protection and energy-saving design requirements. We have also implemented various energy-saving improvement programs for the air conditioning, lighting and major energy-consuming devices in our facilities to continuously reduce energy consumption and electricity expenses. For example, installing Variable-frequency Drive, adjusting air conditioning temperatures on a seasonal basis, replacing old equipment, and monitoring and managing electricity expenses.

2020 Energy Saving Achievements in Facilities

Sites	Energy Saving Projects	Contents	Power Saving (MWh)	Carbon Reduction (MTCO ₂ e)
Zhangjiang Facility	Replace old air conditioning system with a new system.	● The oil-free centrifugal air compressor replaces the existing oil-injected screw compressor, and establishes a heat recovery system for the compressor to reduce gas and electricity expenses.	619.8	491
	Refurbish compressor for reducing power consumption	● Install ventilation equipment on the louvers to help improve air circulation and heat exchange to ensure that the temperatures at the air inlet of the air compressor are consistent with those of the outside air.	22.4	17.7
Kunshan Facility	Improve lighting system in the manufacturing sites	● The 1.2M lamps used in the site were Philips 15W LED and 18W LED. The lamps were replaced by Philips MASTER 10.5W LED lamps with the same illumination and service life.	231.4	183.3
Nantou Facility	Replace water chiller with a new one for the 5F ultra water system	● Replace the TCA-10EK1D Chiller with a new Tatung Chiller (TCA/8NAK1A)	4.4	2.2
	Replace the B1F Chiller with a new one	● Add two new 500RT chillers to replace 6 old 300RT chillers (2 retired and 4 spares)	7,358.4	3,745.4
	Added H Line to replace the D Line in 3F	● Replace the JYI Diann wave soldering oven with Ersa IR reflow oven	27	13.7
	30HP pump with variable frequency drive	● The 30HP pump was originally running at full load. We decided to install a variable frequency drive to adjust its power pressure, considering that a high floor does not need a full load to operate.	52.9	26.9
	100HP air compressor with variable frequency drive	● The variable frequency drive is equipped to reduce the load capacity to save energy. The CDA is automatically loaded to prevent the production failure caused by the loss of pressure.	57.8	29.4

To increase the use of renewable energy

USI has been committed to using renewable energy by purchasing 199,916 MWh of International REC ("I-REC"; registered with the I-REC Registry) in 2021 to offset the CO₂ emissions from the conventional electricity consumed in 2020 (all of which are offset at the Zhangjiang, Jinqiao, Shenzhen and Kunshan Facilities and 20% of which are offset at the Mexico Facility). Based on the "Market-based Approach" quantitative criteria, we will start investing in/using green power in 2025.

Category	Items	Category 1	Category 2	Total emissions
Region	Greenhouse Gas Emissions (MTCO ₂ e/year)	6,748.33	184,225.84	190,974.17
	Percentage of the total emissions	4%	96%	100%
Market	Greenhouse Gas Emissions (MTCO ₂ e/year)	6,748.33	26,056.90	32,805.23
	Percentage of the total emissions	21%	79%	100%

R&D for Low Carbon Products

We follow the Design for Environment (DfE) process to consider the potential environmental impact when designing our products. We verify the potential environmental impact with our project developers and customers, and adopt the latest international energy consumption regulations, such as Energy Star and ErP, and other environmental indexes (such as material use, energy saving and carbon reduction, water use, pollution emission, resource waste and recyclability and more) to reduce the negative impact on the environment over the product life cycle.

Product Category	Green Design Highlights	Status
Built-In Power Supply Unit	<ul style="list-style-type: none"> ● Improve energy efficiency 	<ul style="list-style-type: none"> ● All built-in power supply units are 80 Plus Titanium certified.
Plug-In Power Supply Unit	<ul style="list-style-type: none"> ● Improve energy efficiency 	<ul style="list-style-type: none"> ● This meets the latest CoC Tier 2 and DoE specifications.
SSD	<ul style="list-style-type: none"> ● Reduce the power consumption in active and standby mode 	<ul style="list-style-type: none"> ● The products are designed to support low power consumption.
Wireless Communication Products (IMS* Products)	<ul style="list-style-type: none"> ● Reduce the power consumption in active and standby mode ● Use low-pollution materials ● Modularity & Compatibility ● Reduce material consumption 	<ul style="list-style-type: none"> ● USI uses the same design structure to design the circuit and PCB layout using a block approach to reduce the cost of testers and the energy used to provide the equipment services during the test phase. ● And adopt universal design to reduce the process development and material consumption.
WS* Products	<ul style="list-style-type: none"> ● Improve energy efficiency ● Reduce the power consumption in standby mode ● Modularity & Compatibility ● Miniaturization 	<ul style="list-style-type: none"> ● Using the Stack Wafer Technology to repack two chips into one, saving half of the substrate [MCU (10mm*10mm) and LPDDR2 (10mm*11.5mm) into One SiP (9mm*9mm)].
ICS* Products	<ul style="list-style-type: none"> ● Reduce material consumption 	<ul style="list-style-type: none"> ● Adopt smaller RF test head and antenna connector to reduce material usage by 30% as a result of reduced size
eAP* Products	<ul style="list-style-type: none"> ● Improve energy efficiency 	<ul style="list-style-type: none"> ● The product is designed to meet ErP Lot 26 network standby requirements (Standby mode is below 8W)
Automotive Electronics Products	<ul style="list-style-type: none"> ● Improve energy efficiency ● Miniaturization 	<ul style="list-style-type: none"> ● Evaluates to replace two 64mm² wafers (Belt Start & Generator, BSG) with 74mm² wafers for power supply modules in order to cut down on materials for parts and components

Notes: IMS, Integrated Mobility Solution; WS, Wearable Solutions; ICS, Intelligent Connectivity Solutions; eAP, enterprise Access Point

Metrics and Targets

Metrics and Targets related to Climate Change

Net-Zero Carbon Emission by 2050

USI has been performing internal greenhouse gas emission inventory in accordance with ISO 14064-1 standard since 2007. Besides setting greenhouse gas mitigation targets in the future, we will also include other climate-related targets to create sustainable value and continue to maintain close relationships with our customers to satisfy their needs.

Strategies	Target	Unit	2020	2025
Manage carbon emissions and improve energy efficiency	Greenhouse Gas Intensity (Category 1 & Category 2)	MTCO ₂ e/ Million CNY	4.02	Reduced by 2.5% per year
	Greenhouse Gas Emissions (Category 3 & Category 4)	MTCO ₂ e	16,796,710	Reduced by 1.5% per year

Strategies	Target	Unit	Current	Future
To increase the use of renewable energy	Percentage of Green Power Usage	%	0% in 2021	The 2035 Manufacturing Process 100%
	Percentage of green power certificate purchased	%	79% in 2021	2025 85%

Strategies	Target	Unit	2020	2025
R&D for Low Carbon Products	R&D costs for low carbon products	CNY	10,860,506	57,033,472
	Product Energy Efficiency	kWh	4,143,537	4,972,244
	Percentage of revenue from low-carbon products	%	24.3%	33.1%

Future Prospects

Based on the climate change risk and opportunity matrix analysis findings, the high risk for USI is customer demand for green products. In order to achieve the net-zero carbon emission goal, USI continues to implement climate change and energy management, water management, waste management, and air pollution prevention to help customers produce energy-saving and carbon-reducing products. The report is USI's first systematic disclosure framework to demonstrate its efforts and effectiveness in responding to climate change, to further raise awareness about the climate crisis, and to formulate related mitigation action plans and measures, to accelerate the implementation of risk management and climate change mitigation, and to build up the management capabilities for corporate sustainable development.

References

- Recommendations of the Task Force on Climate-related Financial Disclosures
- Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP)
- The Climate Change Knowledge Portal
- World Energy Outlook (WEO) 2016

TCFD Comparison Table

Perspectives	Recommended Disclosure Items for TCFD	Corresponding chapters and paragraphs	Corresponding page number
Governance	Describe the Board’s oversight of climate-related risks and opportunities.	Climate Change Governance	P2
	Describe management’s role in assessing and managing climate-related risks and opportunities.	Climate Change Governance	P2-3
Strategies	Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	Climate Change Strategies	P10-13
	Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	Climate Change Risk and Opportunity Matrix	P6
		Climate Change Risk and Opportunity Issues	P6
		The Financial Impact from Risk and Opportunity	P7-8
		Climate Change Physical Scenarios - Flooding and Drought Risks	P9
	Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	Climate Scenario Data Collection	P4
Risk Management	Describe the organization’s process for identifying and assessing climate-related risks.	Climate Change Risk and Opportunity Management Process	P5
	Describe the organization's process for managing climate-related risks.	Climate Change Risk and Opportunity Management Process	P5
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	Climate Change Risk and Opportunity Management Process	P5
Metrics and Targets	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	Metrics and Targets related to Climate Change	P14
	Disclose Scope 1, Scope 2, and Scope 3 greenhouse gas (GHG) emissions, and the related risks.	Carbon Emissions Management	P10-11
	Describe the targets used by the organization to manage climate-related risks, opportunities and performance.	Metrics and Targets related to Climate Change	P14