Ardenitec

2021

Climate-related Financial Disclosures

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About Ardentec

Company Profile

Ardentec Corporation is a semiconductor testing company listed on OTC. The total capital in 2021 is NTD 4.9 billion. The business includes testing, engineering development and product testing for various semiconductors. With the industry-leading engineering capability, quality system and IT technical service, and through the industrial vertical integration, Ardentec has established a long-term cooperative relationship with national and global large semiconductor manufacturers, as one of top three semiconductor testing service providers in Taiwan.

Ardentec located in Hsinchu Industrial Park, Hukou Township, Hsinchu County, Taiwan. It has a total of 4 sites and 5 factories, including Kaiyuan, Tingshin I and II, Gaosheng and Paoching.

Company Information

Company	Ardentec Corporation
Founded	1999-10-11
Corporate Address	No. 3, Gongye 3rd Rd., Hsin-Chu Industrial Park, Hukou Township, Hsinchu County, 303036, Taiwan, R.O.C
Stock Symbol	3264
Employees	1,600 people
Product Services	Memory IC wafer test Wafer and final test for Digital Signal IC, Mix-signal IC Wafer level burn in test
Corporate Executives	Chairman Dr. Chih-Yuan Lu President Dr. Chi-Ming Chang

Ardentec emphases importance to business ethics, corporate governance, complying to laws, regulations as well as international standards, and making transparent disclosures. With optimized business model, to provide professional and trustable service to customers, humane care and competitive benefits to employees and become a model company that creates a positive cycle of social and economic development. Ardentec believes that enjoyable aspect of corporate management is to engage employees, customers, suppliers and business partners with "passion" and create the right values through "rationality". These beliefs are the cornerstones of Ardentec.

In addition, Ardentec has incorporated topics of environmental protection, employee care, and society feedback into its corporate governance, and thereby ensure sustainable growth for the Company, the employees, the environment, and society alike.

Corporate Values

Pursue excellence,
To meet the needs of customers and the long term expectation of shareholders

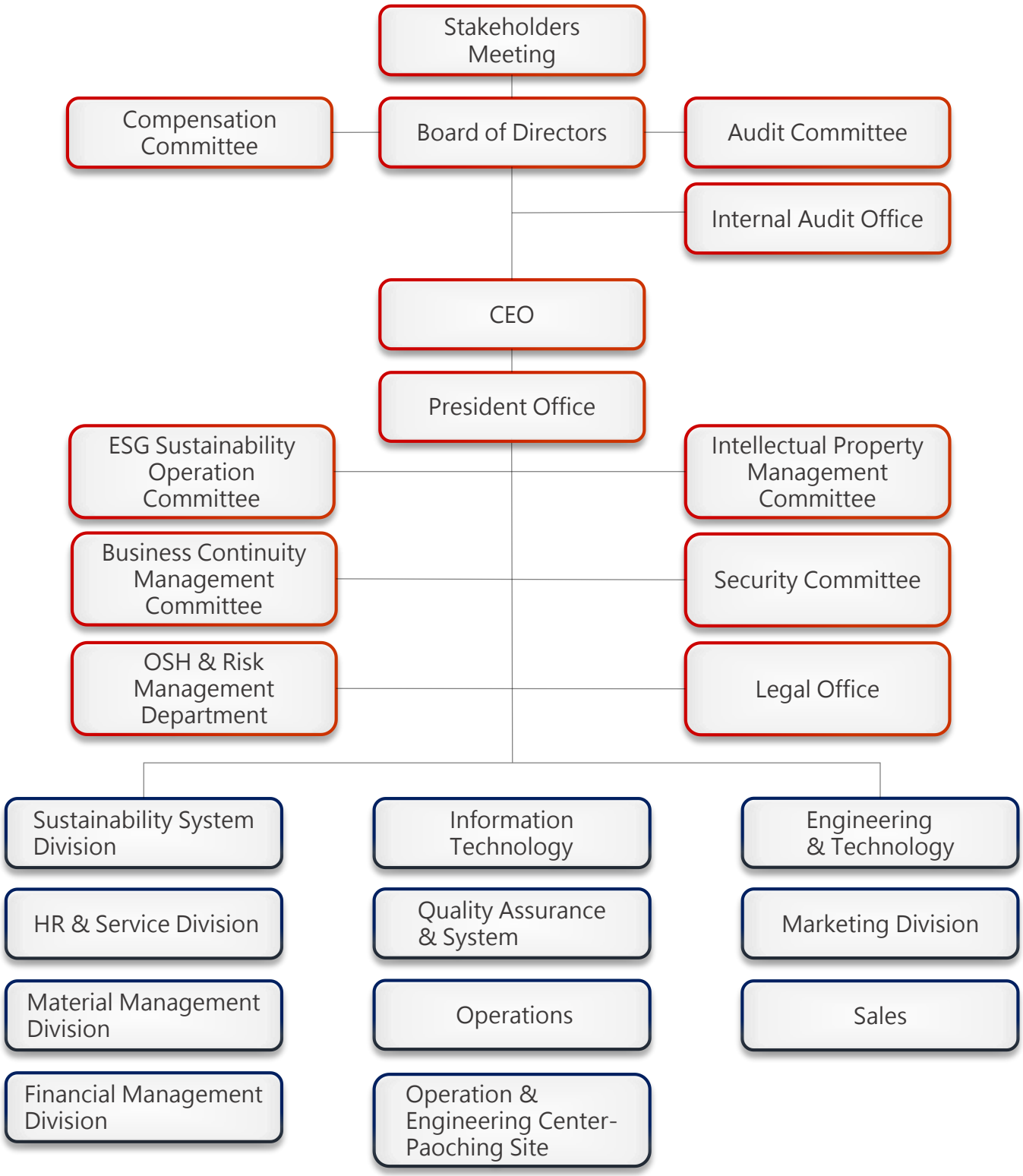
Innovate with passion,
To be the key contributor to the global semiconductor industry

Harmony in personal & professional aspirations,
To encourage the growth of both employee and employer

Uphold business integrity,
To promote social care and environmental sustainability

Organization

The organization structure of the company is below. The highest governance is the Board of Directors, the chairperson serves as the Chief Executive Officer (CEO) of the Company.



Report Principles

Guideline

Recommendations of the Task Force on Climate-related Financial Disclosures, hereinafter called the TCFD.

Purpose

Global warming caused by greenhouse gas emissions posed a huge risk to global economy and impacted many economic sectors. Regarding Ardentec's responsibilities and actions on this issue, as well as its long-term planning, we have prepared this report under the framework of the Recommendations of the Task Force on Climate-related Financial Disclosures (hereinafter referred to as TCFD), which describes the organization's risks and opportunities from exposure to climate change and the processes set up to identify, assess and manage them.

Report Scope and Period

This TCFD Report discloses the scope of Ardentec Corporation from January 1, 2021 to December 31, 2021.

Climate Change Driving Organization

Ardentec formed "ESG Sustainability Committee". The Board of Directors appointed the President as the chairperson of the committee, the senior vice president as the vice chairperson and the Chief Sustainability Officer(CSO). Chairperson appointed executives across functions as committee members. The committees are aligned to respond to Responsible Business Alliance (RBA) and to implement them in environmental, social, and governance aspects. The committee has seven task groups focusing on "Smart Manufacturing and Environment Management", "Health & Safety", "Human Right and Caring", "Social Caring", "Sustainable Supply Chain", "Ethics", and "Governance."

Topics of ESG Sustainability Operation Committee

Smart Manufacturing and Environment Management Group	Environmental Policy, Environment Management System and Certification, Climate Risk Assessment and Identification, Waste Management, Renewable Energy, Greenhouse Gas, Energy Management, Water Resource Management, Internal Carbon Pricing, Carbon Intensity, Total Product, Smart Manufacturing
Health & Safety Group	Occupational Safety & Health, Dormitory Arrangement
Human Right and Caring Group	Personnel Management/Diverse Talent Program, Freedom of Association Policy
Social Caring Group	Caring for Education, Caring for the Disadvantaged, Caring for Environment
Sustainable Supply Chain Group	Supply Chain Management/Communication, Scope Ⅲ Emissions, Material Purchasing, Customer Satisfaction, Customer ESG Conformance
Ethics Group	Conflict Minerals Policy, Whistleblower Program, Intellectual Property and Conflict Minerals Policy Competitive Behavior
Governance Group	Board Diversity/Independence, Climate Governance, Climate Change-related Business Strategy and Financial Planning, ESG Governance, TCFD Report and ESG Reporting Standards/Assurance

CSO is responsible for implementing action plans and guidelines of sustainability policies, goals of sustainability and climate change action approved by the Board of Directors.

The ESG Sustainability Operation Committee of Ardentec holds meetings every two months, and management review meetings every half year to review the progress and effectiveness of various projects on aspect of environment/climate change actions, society, and governance.

The Sustainability System Division is responsible for pushing forward and following up the progress of projects related to the resolutions and goals approved by the ESG Sustainability Operation Committee to ensure that the environment/climate change actions, social and governance goals are achieved in accordance with the plans .

Governance

Ardentec committed to fulfilling corporate social responsibility, sustainable development and to drive the comprehensive performance of CSR and ESG. Every effort is made to realize the Ardentec Corporation's sustainability goals during and after each phase. The chairperson of the ESG Sustainability Operation Committee reports to Board of Directors on the corporate's performance each year. The Board of Directors reviews the Sustainable Development Policy and evaluates the implementation performance of the environmental, social and governance topics annually to ensure key topics are properly communicated and processed and the Sustainable Development Policy is implemented.

On the increasing urgency of climate change actions, the Board of Directors reviews the progress and effectiveness of the projects on a quarterly basis. Among the approved capital expenditure projects at the 4th meeting of the 8th board of directors in 2021, the Company invested approximately NTD26 million in the solar power generation project at the T-site I and II of the Company. Consequently, 499 kW power of installed capacity was provided. In 2021, there were total 7 board meetings convened to oversee the management of economic, social, and environmental aspects of the business and review the internal control strengthening and corporate governance enhancement.

Action plans and targets for sustainability policy, ESG/climate change initiatives, etc. are reviewed at the 1st board meeting each year; from 2022, the board reviews environmental/climate change actions, social and governance performance on a quarterly basis.

In order to enhance the vision to sustainable development, a total of 6 course hours for board members were arranged on sustainability topics in 2021, including "Corporate Management Mindset—from CSR to ESG" and "Business Strategy and Corporate Governance for Unsustainable Risks in the World—in Light of COVID-19". The attendance, resolutions, course content and hours of Board of Directors, are disclosed on the Market Observation Post System of the Taiwan Stock Exchange and the current annual report of the Company in accordance with the regulations.

In accordance with the Corporate Governance 3.0—Sustainable Development Blueprint, the directors are actively planning to set up a sustainable development promotion process that is in line with the organizational and operational requirements of the Company for the environmental (E), social (S) and governance (G). In 2021, the external experts and professional organizations advised to upgrade the scope of CSR scope to be in line with international standards as well as the sustainability scope and objectives of domestic corporate governance, including: forming the ESG Sustainability Operation Committee, the Board of Directors appointed the chairperson, vice-chairperson and Chief Sustainability Officer(CSO). Besides, the Board of Directors approved the first change of the corporate social responsibility Practice Principles to the Sustainable Development Practice Principles, and the establishment of the Sustainability Development Policy and the management guidelines in 1st BoD Meeting of 2022.

Strategy

Short, Medium, and Long Term Climate-related Risks and Opportunities

In order to have a comprehensive grasp of the climate change impact on the Company, in 2021, we worked with external consultants to identify the potential impacts and risks associated with climate change on the Company's operations. Using the Sustainable Development Scenario (SDS)

and the Stated Policies Scenario (STEPS) discussed by the International Energy Agency (IEA), and the RCP 8.5 scenario proposed by the Intergovernmental Panel on Climate Change (IPCC), we have discussed the risks and opportunities that companies may face under different climate scenarios. The initial risk and opportunity periods based on the short term, medium term and long term are shown in the table below.

Climate Change Risk and Opportunity by Periods

Term	Interval	Period	Description
Short	0-2 years	2022 to 2023	Company set goals for short-term to medium-term. Ardentec has set 2022 to 2023 as short term.
Medium	3-10 years	2024 to 2030	According to the IEA's World Energy Outlook 2020, which describes the global energy transformation and carbon reduction path from now to 2030. Based on this report, Ardentec analyzed the transition risks of climate change and set medium-term goals.
Long	11-30 years	2031 to 2050	Most countries set 2050 as the target year for net zero emissions. Most of Ardentec global customers have set 2050 or earlier as the target year of net zero emissions. Ardentec has set 2050 as the target year for achieving net zero carbon emissions too.

Due to the multiple types of climate change risks and opportunities, each topic has different levels of impacts to Ardentec. In accordance with ISO 31000 Risk Management Principle and Guidelines, Ardentec uses the following methods to assess the level of impacts caused by each risk:

Impact Hazard Scale = Possibility of Occurrence × Impact Level

Possibility of Occurrence:

The Possibility of Occurrence was determined by professional experience of topic-related senior management, which was ranked as 5 levels: "extremely impossible", "impossible", "possible", "very possible" and "extremely possible".

Influence Level:

Set by relevant senior management by financial evaluation, which refer to the impact level of historical climate risk events.

Level of hazards is measured by "Possibility of Occurrence" and "Influence Level" assessment. Financial impact analysis is performed based on proportion of paid-in capital to rank the level of financial impacts.

Financial Impact Bracket by Climate Change

Impact Level	Estimated Financial Impact (NTD Million)	Approximate % of Capital
Extremely high	Above 105	3%
Material	50-105	1%-3%
High	15-50	0.3%-1%
Medium	5-15	0.1%-0.3%
Mild	Below 5	0.1%

In 2021, Ardentec identified 13 risk topics and 6 opportunity topics. Possibility of occurrence and influence level were identified through discussions with relevant departments. Risk classification is based on the following principles:

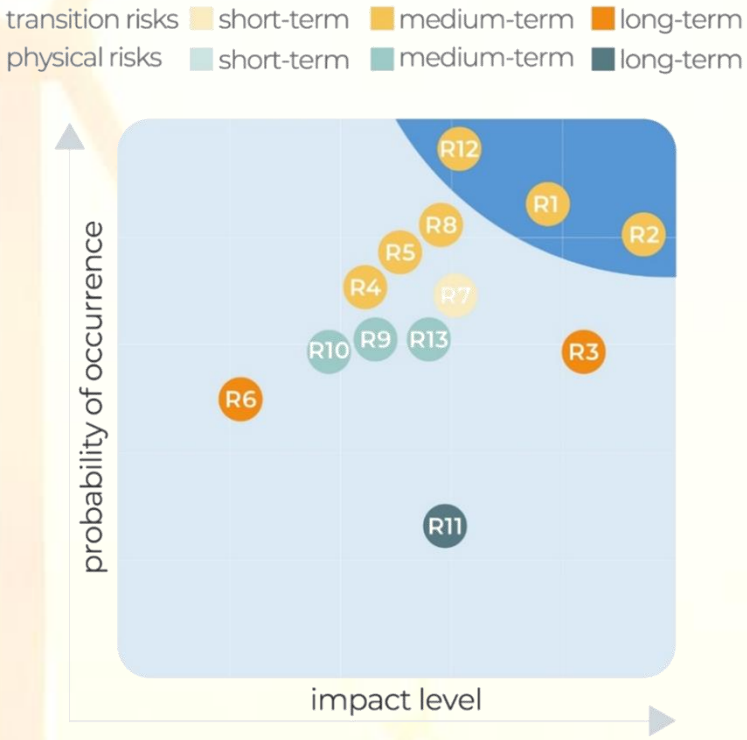
Principle 1：
Impact hazard scale: greater than or equal to 15 – high risk; less than 15 and greater than or equal to 7.5 – medium risk; less than 7.5– low risk.

Principle 2：
If the impact hazard scale of the risk topic is within 5% deviation of high risk impact hazard scale of the lowest impact hazard value that applies to principle 1, then it will be included in the high risk (i.e., high risk is greater than or equal to 14.25: 15 - 15*0.05 = 14.25).

Principle 3：
If the impact hazard scale of the risk issue is within 5% deviation of medium risk impact hazard scale of the lowest impact hazard scale that applies to principle 1, then it will be included in the medium risk (i.e., high risk is greater than or equal to 7.125, 7.5-7.5*0.05=7.125).

In 2021, 3 high risks, 7 medium risks and 3 low risks were identified among the risk topics; 3 high opportunities, 2 medium opportunities and 1 low opportunity were identified among the opportunity topics. Results of risk identification and opportunity identification are shown in the chart and table below. The ESG Sustainability Operation Committee developed strategies and plans to address the findings of the identification. Since 2022, the board of directors has been reviewing the progress and performance of the climate change action plan on a quarterly basis.

Climate Change Risk Metrics



Risk Topics and Level to Climate Change

Ranking	Code	Risk Topics	Term	Risk Level
1	R2	Failure to take proactive sustainability actions will result in losing investors' favor.	Medium	High
2	R1	Failure to take proactive sustainability actions will result in losing customers' favor.	Medium	High
3	R12	Rising temperature will increase power consumption of the production' cooling equipment, which will increase operating costs	Medium	High
4	R3	In response to requirements of regulations, customers and international initiatives, operating costs may increase due to increased use of renewable energy.	Long	Medium
5	R8	In response to the booming trend of smart production, the introduction of emerging technologies may increase operating costs.	Medium	Medium
6	R7	In response to the trend of low-carbon, the energy efficiency standards of various assets need be upgraded, which further increases the operating costs.	Short	Medium
7	R5	Due to power structure and policies changes, electricity price may increase, which in turn raises operating costs.	Medium	Medium
8	R4	Influenced by global warming, demand for electricity may increases rapidly, resulting in unannounced power outages, which further increases operating costs.	Medium	Medium
9	R13	Operating pressure and impact may be caused by the shortage of water resources.	Medium	Medium
10	R9	Increased frequency and severity of heavy rainfall and flooding may result in equipment inoperability and service interruptions.	Medium	Medium
11	R10	Climate change may delay the incoming and outgoing delivery for customers, thus affect Ardentec operation.	Medium	Low
12	R11	Inundation of low-lying coastal areas due to global sea level rise may result in asset damage.	Long	Low
13	R6	Owing to the tightening of regulations resulting carbon fee, which further increase the operating cost.	Long	Low

Climate Change Opportunities Metrics

Topics and Opportunity Level to Climate Change

Ranking	Code	Opportunity Topics	Term	Opportunity Level
1	O5	Adopting proactive and sustainability actions will consistently gain investors' favor.	Medium	High
2	O4	Adopting proactive and sustainability actions will consistently gain customers' favor.	Medium	High
3	O2	Introducing smart manufacturing processes will consistently improve production and distribution efficiency, reduce environmental impacts, and further reduce operating costs.	Medium	High
4	O6	Set emergency preparedness plan. When the frequency and severity of extreme weather (e.g., floods or droughts) increase, Ardentec may return to normal operating standards faster than the industry and gain the favor of customers and increase orders.	Medium	Medium
5	O3	Facing rising demand in the green consumer market, the continue low-carbon services may lead to higher market share.	Medium	Medium
6	O1	Reducing the risk of greenhouse gas emissions may improve resilience to changes in carbon fees.	Long	Low

The Impact of Climate-related Risks and Opportunities to Business, Strategy and Finance

In the ranking of climate change risk materiality of Ardentec, the high risks are all transition risks, including "Failure to take proactive sustainability actions will result in losing investors' favor", "Failure to take proactive sustainability actions will result in losing customers' favor", and "Rising temperature will increase power consumption of the production' cooling equipment, which will increase operating costs". In order to reduce the impact of climate change risk, Ardentec proposes corresponding management actions for the above three major climate risks as shown in the table below.

Climate Change Risk Description

Risk : Failure to take proactive sustainability actions will result in losing investors' favor

Description of the impact	Investors are gradually using ESG scores as a reference for investment decisions. If Ardentec does not actively set ESG goals and make improvements, it may lose investors' favor.
2030 potential financial impact (NTD million)	3,763
Calculation method of potential financial impact	We estimate potential impact on the Company's market values by 2030 based on the assumption that Ardentec does not take proactive sustainability actions. Using the path of greenhouse gas emissions from 2021 to 2030, the carbon fee (tax), and the cost of green power, we estimate the after-tax net income and earnings per share (EPS) in 2030, assuming no change in the number of shares outstanding. In addition, based on the assumption that no change in the P/E ratio, we obtain P/E ratio from Ardentec's year-end closing price and EPS in the previous year. Referring to the top 25% of MSCI ESG scores, the Company's cumulative return rate is 14% better than the general companies of MSCI Global Index. Using this percentage as a risk adjustment factor, we found that if Ardentec does not take proactive sustainability actions. In 2030, the potential impact on market value would be NTD 3,763 million, and the impact would be 14.85%.
Management cost/year (NTD million)	276
Calculation on method of management cost	Protection of shareholders' rights and interests is one of Ardentec six governance principles. Board of Directors reviews the implementation of corporate sustainable development and makes recommendations for improvement every year. Moreover, the Company was ranked in the top 5% of the OTC Corporate Governance Rating for the fifth consecutive year. Number of full time ESG staff * median salary of non-supervisors + number of ESG supervisors * median salary of supervisors + expected investment budget each year + self-construction cost of renewable energy + green power procurement cost.

Risk : Failure to take proactive sustainability actions will result in losing customers' favor

Description of the impact	Many companies are already requiring supply chains to reduce carbon emissions; failure to do so could result in loss of customers and difficulty in market access, which could reduce revenue.
2030 potential financial impact (NTD million)	19.81
Calculation method of potential financial impact	Base on the assessment of the senior management of the sales department, when 5% of orders from the top three customers are cancelled due to ESG issues, the annual impact may be approximately NTD 19.81 million.
Management cost/year (NTD million)	276
Calculation on method of management cost	We set up dedicated customer project for each customer, set up service systems to understand customers' long-term expectations, and actively respond to customers' ESG performance requirements through transparent disclosure of information and promotion of various energy saving and carbon reduction measures.

Risk : Rising temperature will increase power consumption of the production cooling equipment, which will increase operating costs

Description of the impact	Under the IPCC RCP 8.5 scenario, the average temperature across Taiwan is expected to rise continuously in the future, which will increase the use of energy for cooling and air conditioning equipment.
2030 potential financial impact (NTD million)	1.36
Calculation method of potential financial impact	Under the IPCC RCP 8.5 scenario, the average temperature in Hsinchu will increase by 0.93°C by 2030. Ardentec estimated the impact of the increase in external temperature on the electricity consumption of air-conditioning equipment by referring to the experimental data on the relationship between the input power of air-conditioning equipment and the external temperature from a collaborative research unit.
Management cost/year (NTD million)	1.54
Calculation on method of management cost	Ardentec introduced ISO 50001 energy management system, which is verified by a third party. Besides, a cross-site energy saving team was established to continuously improve the performance of energy use. 19 energy saving projects were implemented in 2021, and the total energy saving was 2,820,666 kWh.; 10,154 GJ, and GHG emissions by 1,425 metric tons CO_2e.

For high risk items, Ardentec conducts an initial financial impact valuation analysis; for medium risk items, it continues to monitor the issues and collects and analyzes their relevant trends; for low risk items, it keeps them in the risk issue database and re-evaluates climate change risks of these items in subsequent years.

In the ranking of materiality of Ardentec's climate change opportunities, the three major climate opportunities include "Adopting proactive and sustainability actions will consistently gain investors' favor", "Adopting proactive and sustainability actions will consistently gain customers' favor", and "Introducing smart manufacturing processes will consistently improve production and distribution efficiency, reduce environmental impacts, and further reduce operating costs". In response to the three major climate change opportunities, Ardentec plans corresponding management actions to grasp and follow up on climate change opportunities.

Climate Change Opportunity Description

Opportunity : Adopting proactive and sustainability actions will consistently gain investors' favor

Description of the impact	Major global investors are prioritizing companies that have committed to net-zero emissions and clean energy transition for agreement, and if Ardentec continues to refine its sustainability measures, it may gain further attention from investors.
2030 potential financial impact (NTD million)	3,263
Calculation method of potential financial impact	We estimate potential impact on the Company's market values by 2030 based on the assumption that proactive sustainability actions are not taken. P/E ratio is derived from closing price and EPS of the previous year. Referring to the top 25% of MSCI ESG scores, the Company's cumulative return rate is 14% better than the general companies of MSCI Global Index. Using this percentage as an opportunity adjustment factor, we found that if proactive sustainability actions are not taken, in 2030, the potential impact on market value would be NTD 3,263 million, equivalent impact of 12.88%.
Management cost/year (NTD million)	276
Calculation on method of management cost	We introduced the ISO 22301 Business Continuity Management System (BCMS), which was verified by a third party. We analyze the losses and potential risks caused by climate change from the aspects of regulations, production activities and goodwill, and develop strategies and action plans to deal with them.

Opportunity : Adopting proactive and sustainability actions will consistently gain customers' favor

Description of the impact	Many companies have asked their supply chains to reduce carbon emissions, and if Ardentec responds positively to the expectations, more business opportunities may be available
2030 potential financial impact (NTD million)	19.81
Calculation method of potential financial impact	According to the assessment of the senior management of the sales department, if the Company actively improves ESG issues, the top three customers who value ESG may have the opportunity to increase their orders by 5%, which may generate an annual revenue of NTD 19.81 million.
Management cost/year (NTD million)	276
Calculation on method of management cost	To address the rising demand for ESG from customers, Ardentec responds to the SDGs and customer expectations by introducing various international standards, energy saving measures, water management, and pollution prevention.

Opportunity: Introducing smart manufacturing processes will consistently improve production and distribution efficiency, reduce environmental impacts, and further reduce operating costs

Description of the impact	With Industry 4.0 becoming an important issue that attracts global attention, smart manufacturing has become the goal of industrial transition. Through the introduction of smart manufacturing, production efficiency may be greatly enhanced.
2030 potential financial impact (NTD million)	19.85
Calculation method of potential financial impact	The introduction of intelligent manufacturing effectively will reduce labor costs and costs caused by human error. According to the statistical information in 2021, it is calculated that the introduction of smart manufacturing can save about NTD 19.85 million per year.
Management cost/year (NTD million)	27.25
Calculation on method of management cost	Ardentec continues to promote information systems, logistics management, and automated production technologies to effectively improve production efficiency and monitor production processes and quality at a rapid pace.

Ardentec categorizes its climate change-related operations into five major dimensions including: products and services, supply and/or value chain, adaptation and mitigation activities, research and development investments, and business operations. In addition, Ardentec plans improvement actions and future strategic initiatives to address the issue of climate change based on the impact of each dimension on the Company's business and strategy.

Planning for Business and Strategy in Response to Climate Change

Business Sector	Planning
Products and services	Ardentec is the one of top three semiconductor testing service providers in Taiwan. The main energy consumption in the process of semiconductor testing is electricity. Hence, Ardentec is committed to promoting various energy saving projects, managing towards minimizing environmental consumption and optimizing costs in order to reduce the impact of climate warming, thereby enhancing competitiveness and achieving the goal of environmental sustainability. The details are as follows. To promote Green Service and Green Manufacturing, testing service carbon footprint verification was conducted, and verified by 3rd party according to ISO 14067 standard to ensure its credibility. The verification included Wafer Probing Services in Tingshin, Kaiyuan and Paoching sites, as well as Final Testing Service in Gaosheng site.
Supply chain and/or value chain	Ardentec adopted Responsible Business Alliance's(RBA) Code of Conduct to set a direction for upstream customers and downstream suppliers. Ardentec's 4 sites underwent the RBA Validated Audit Program (VAP) again in August 2020 and achieved the platinum rating with a full score of 200 in initial audit, expiring in August 2022. Semiconductor testing is proportionally correlated to the consumption of energy and water resources, waste generation and the amount of test equipment used. Ardentec establishes specific energy-saving and waste-saving projects and goals and includes them in long-term improvement strategies.

Business Sector	Planning
Adaptation and mitigation activities	**Adaptation** The business continuity management system was adopted by Ardentec to identify potential threats to business operations. A Business Continuity Management Committee was set up, and certification obtained for the ISO 22301 Business Continuity Management System (BCMS) international standard to establish an emergency response capability for protecting stakeholders, business reputation and brand image. Continuous improvements to the business continuity management system are also being made in accordance with applicable laws and regulations. By using the management approach of PDCA cycle, Ardentec plans, does, checks, and acts the business continuity management system to ensure the achievement of business continuity goals, thereby improving constantly. Through the results of business impact analysis and risk assessment, we develop business continuity plans including emergency response plans, recovery plans and business continuity strategies for high-risk impact events, such as typhoons, earthquakes, water disruptions, fires, major infectious diseases, energy shortages and cyber-attacks to reduce the impact caused by disasters. **Mitigation** Climate change and greenhouse gas reduction continue to receive close attention globally, and the use of low-carbon energy has become an indispensable part of the industry. Ardentec has gradually incorporated the installation and procurement of renewable energy into its objectives. 1. In early 2021, Ardentec planned to set up solar power generation facilities, which were completed in February 2022 and started to generate electricity. Consequently, 499 kW of installed capacity was provided. Ardentec started using renewable energy in October 2021, with a usage of 648 thousand kWh, which is 0.5% of the total electricity consumption in 2021. 2. The target of Adentec for total GHG scope 1 and scope 2 reductions is 2025: 10%; 2030: 20%; 2040: 60%; and 2050: to achieve carbon neutrality. The reduction method is mainly increase the use of renewable energy for electricity to reduce the emission of scope 2. 3. Ardentec is accredited with ISO 50001:2018 Energy management systems by a third party, and it started to upgrade its equipment, optimize its operation, and it upgraded its equipment, optimized its operations, and set up energy-saving controls in 2021. Ardentec has set an energy management target—the average energy saving rate from 2015 to 2024 will be no less than 1%.

Business Sector	Planning
R&D investment	Ardentec is promoting the automation production of Industry 4.0 project, and is committed to the automated probe system, RFID (radio frequency identification) system, AGV robot (automated guided vehicle) and ADC AI system (probe mark classification). By automated probers, RFID and AGV robot process integration, batch delivery, and loading/unloading machine that test batches with automatic setting of test parameters, the whole process has been upgraded to full system automation management, and these enhancements have increased productivity by about 40%.
Business management	**Business type** Ardentec's service includes testing, engineering development and product testing of various semiconductors. Providing wafer testing services for leading manufacturers at home and abroad has enabled Ardentec to establish core competitiveness in key technologies, such as advanced testing technology, test process analysis systems, and test production automation. Apart from providing long-term mass production testing service for numbers of professional IC manufacturers at home and abroad, we launch cooperation with upstream IC design houses to advance the development of product testing programs for customers at the product design phase to facilitate customers to quickly start mass production. In response to market trends in the industry, Ardentec has successfully developed technologies in recent years, including testing techniques for automotive ICs, security ICs, Internet of Things (IoT), third-generation green semiconductor devices, high performance computing (HPC) chips, and CMOS Image Sensor (CIS). These technologies have entered a harvest stage, and turnover will increase year by year.

Risk Management

Identification and Assessment Process of Climate-related Risk

Ardentec has proposed a framework in accordance with the Task Force on Climate-related Financial Disclosures (TCFD) and the Smart Manufacturing and Environmental Management Group of ESG Sustainability Operation Committee is responsible for it. The internal departments are invited to join the identification and analysis of risks, together with the drafting of countermeasures and plans. We refer to the research report of the Intergovernmental Panel on Climate Change (IPCC) of the United Nations for the physical risks, and refer to the report of the International Energy Agency (IEA) for the transition risks. The risks of climate change are expected to be re-evaluated every 3 years.

According to the TCFD framework, the risks associated with climate change on the industry are classified into transition risks and physical risks. Ardentec gathers risk management reports of industries across the globe and Taiwan's regulatory policies to establish a list of risk and opportunity issues. The SMARTER-ROC methodology was used to obtain the risk weight percentages for each department, and the analysis process is as follows:

Collection:

Reports on international trends related to climate change, domestic and international research reports, and analysis of benchmark companies are used for reference.

Identification:

Expert evaluation method is conducted through interviews, questionnaires, and employees of responsible departments are invited to give their opinions.

Assessment:

Risks are ranked according to possibility of occurrence and impact level, and weights are assessed using the SMARTER-ROC method.

Ranking:

The risk value is calculated by weighting the fore two factors. A risk value higher than 14.25 is considered high risk, and a risk value lower than 7.125 is considered low risk.

The identification of climate-related risks and opportunities is conducted every 3 years, and the identification mechanism and results are aligned with the company's risk management. Moreover, the management results are reviewed annually to confirm the reasonableness so as to ensure that the results of the identification are in line with the actual situation.
Management of transition risks are set up cross-site energy saving teams to actively seek energy saving and carbon reduction opportunities, establish specific energy saving and emission reduction targets, and work on climate change related risk mitigation. We continue to cooperate with external suppliers and contractors to achieve the goal of reducing carbon emissions in the industry chain. The ESG Sustainability Operation Committee regularly reviews climate change action plan performance. For management of physical risks, we set up a Business Continuity Management Committee. Besides, in 2016, we introduced the ISO 22301 Business Continuity Management System (BCMS), which was verified by a third party. Furthermore, we continue to conduct risk assessment, business impact analysis, internal system audits, and manage audit meetings every year in order to continuously improve our business continuity management system.

Management Process of Climate-related Risks

For the identified climate-related risks and opportunities, Ardentec has listed its response measures and financial impact assessment based on factors, such as policies and regulations, technology, market, goodwill, immediate and long-term factors, in the table below.

Risk Response Measures

Risk Assessment Type	Description
Policy and regulations	Ardentec complys with regulations and international standards to protect the environment, support energy-efficient procurement and design, promote energy conservation and carbon reduction, climate change mitigation and adaptation, and sustainable use of resources, as well as regularly review our targets to continuously improve eco-efficiency, thereby advancing sustainable environmental development. Ardentec pays close attention to changes in domestic and international laws and regulations. For example, with the international trend of sustainability and net-zero

Risk Assessment Type	Description
	emissions in recent years, Taiwan's Environmental Protection Administration has been keen on incorporating a carbon fee system into the draft "Climate Change Response Act". Although we are not yet affected by the Act, in order to respond in advance and to plan for our own reduction targets, when performing climate change risk and opportunity assessments, the Company also takes into account information on domestic regulatory trends and relevant laws such as, the Renewable Energy Law, etc., in order to review the company's response to an impact on the types of regulations and policies.
Technology	Industry 4.0 and environmental sustainability awareness are being promoted these years, and the scope of improvement covers automation, intellectual property protection, energy saving, carbon reduction, and green products. Moreover, we continue to devote our efforts to ensure that our customers receive sustainable and high-value services and products in return. Through reengineering, workshops, and BKM platform, we are able to sustain a team with quality management and analysis expertise. To promote Green Service and Green Manufacturing, testing service carbon footprint verification was conducted, and verified by 3rd party according to ISO 14067 standard to ensure its credibility. The verification included Wafer Probing Services in Tingshin, Kaiyuan and Paoching sites, as well as Final Testing Service in Gaosheng site.
Market	As the impact of global climate change intensifies, energy saving and carbon reduction measures have become an issue that stakeholders are concerned about. In the face of the trend of climate change, Ardentec also incorporated the trend factors requested by the stakeholders, such as the markets and the investors, into the risk assessment of climate change. Besides, Ardentec also strives to promote more green services, including measures such as introducing carbon footprint inventories, in order to enhance the competitiveness of the Company's services, thus making the Company's services become a great opportunity under climate change.
Goodwill	As technology evolves, name brand companies keep rolling out new products, and the chip market is booming. In the face of climate change, companies around the world expect to work together to achieve sustainability goals by requiring the supply chain to perform environmental acts. If the Company does not pay attention to climate change and other related issues, or if there is an environmental penalty, it may undermine Ardentec's images among its customers. Through the introduction of TCFD, Ardentec includes investors and customers in the identification of climate change risks and opportunities. In terms of financial quantification, we estimate the impact of Ardentec's future sustainability measures on orders and the company's overall revenue by the proportion of customers and investors that put emphasis on climate change issues.

Risk Assessment Type	Description
Immediacy	With the impact of global climate change, the extreme climate is happening more and more frequently. According to the IPCC AR6 assessment report, climate change will further enhance the global water cycle, and future global precipitation will be higher than that of 1995-2014; Moreover, according to the "Taiwan Climate Change Assessment Update Report" jointly released by the 5 organizations, including the Ministry of Science and Technology and the Research Center for Environmental Change of Academia Sinica, it is estimated that the average annual rainfall in Taiwan will increase by 15% in 2050 under the worst climate change scenario (SSP5-8.5), and the highest 1-day rainfall intensity in a year will increase by about 20%. Ardentec's operation site is located in Hukou Township, Hsinchu County. When facing extreme weather conditions, such as heavy rainfall and flooding, certain parts in the production have been raised to minimize damage to assets and equipment due to extreme weather conditions, and to ensure that the Company can respond more quickly to cope with climate change.
Long-term	According to the IPCC assessment report and the "Taiwan Climate Change Assessment Update Report" jointly released by the Ministry of Science and Technology and the Research Center for Environmental Change of Academia Sinica, etc., it is estimated that the average temperature in all regions will continue to rise, and in the worst climate change scenario (SSP5-8.5), the average temperature may increase by more than 1.8°C in 2050. Furthermore, regarding extreme high temperature events in the future, the number of days with high temperature above 36°C will also continue to increase. In order to maintain production operations at high temperatures, energy usage, such as related cooling equipment or air conditioning will increase, which in turn will also raise operating costs. Regarding the financial impact of long-term physical risks caused by climate change, the long-term climate instability in the future includes that an increase in average temperature may result in higher energy use, higher operating costs and depreciation of plants and equipment, and shorter service life, which in turn will increase overall operating costs. Ardentec introduced the ISO 50001 energy management system, which is verified by a third party. Besides, a cross-site energy saving team was established to continuously improve the performance of energy use.

Indices and Objectives

Index of Climate-related Risk and Opportunity Assessment

Ardentec has set key indices and targets, including energy management and greenhouse gas management targets, for the top three climate change risks— "Failure to take proactive sustainability actions will result in losing investors' favor", "Failure to take proactive sustainability actions will result in losing customers' favor", "Rising temperature will increase power consumption of the production' cooling equipment, which will increase operating costs"— and response measures are as follows.

Energy Management

Semiconductor testing is proportionally correlated to the consumption of energy and water resources, waste generation and the amount of test equipment used. Ardentec establishes specific energy-saving and waste-saving projects and goals and includes them in long-term improvement strategies. The following table shows the energy use of Ardentec for 2019-2021.

2019~2021 Energy Usage Trend

Energy	2019	2020	2021
Diesel (GJ) (1)	289	84	227
Grid power (GJ)	579,330	632,664	731,254
Renewable energy (GJ) (2)	0	0	2,334
Electricity intensity (GJ/revenue million)	71.56	64.79	63.73

(1)(2): Heating value refer to Energy Statistics Manual of 2018, ROC

In order to continuously improve the performance of environmental management, Ardentec corporate had implemented measures such as upgrade facilities, optimize operation, and set energy-saving controls in 2021. Ardentec use rolling planning method and set an energy management target of reducing average energy consumption by no less than 1% between 2015~2024.

Energy Saving and Renewable Energy Goal

	2021		Medium-term Goal	Long-term Goal
Power saving rate	Goal: 1%	Actual: 2.96%	2024: 1%	-
Renewable energy accounts for total power consumption	Goal: 0.4%	Actual: 0.5%	2025: 10% 2030: 20%	2040: 60% 2050: 100%

GHG Management

Climate warming actions have become an important concern for the world. Ardentec conducts GHG inventories of all fabs in accordance with inventory guidance, such as ISO 14064-1:2018 and GHG inventory protocols. The data-based indicators from the inventory results are used to understand the impact and influence of operational activities on the environment in order to plan GHG reduction strategies.

The following are the results of Ardentec's 2019-2021 greenhouse gas inventory. The main source of emissions is indirect carbon emissions of purchased electricity derivative scope 2 for 24-hour test machine operation. Direct emission scope 1 is related to HFCs from leaked refrigerant of air conditioning system and a small amount of PFCs gas (CF_4) used in the test machine, and CO_2 and CH_4 and N_2O emissions caused by the use of gas and diesel vehicles.

2019~2021 GHG Emissions

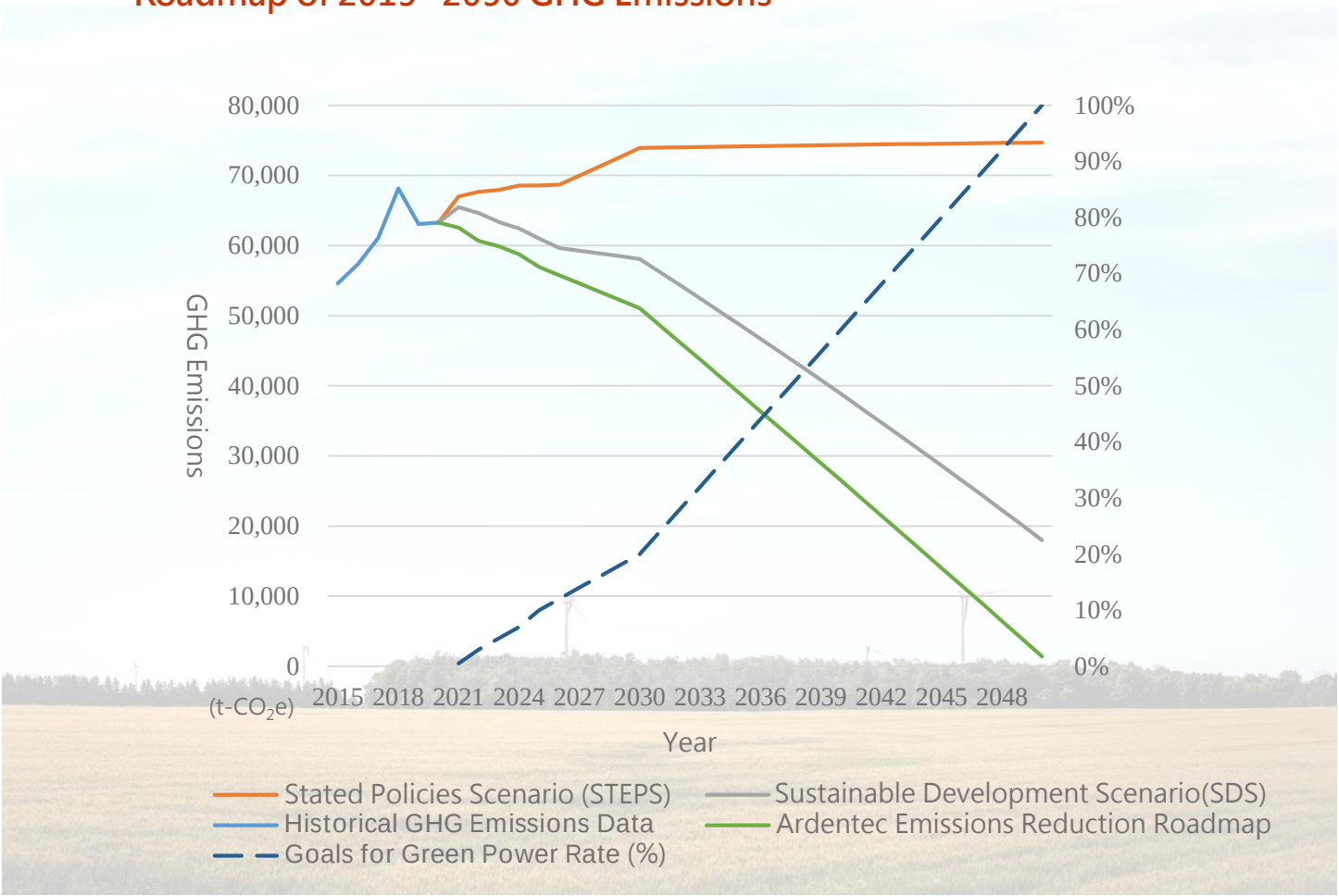
(unit: metric tons CO_2e)

Scope	2019	2020	2021
1	1,187	1,303	1,162
2	61,878	61,966	66,998
3	Not Significant	Not Significant	627
4	19,358	17,747	17,736
5	Not Significant	Not Significant	Not Significant
6	Not Significant	Not Significant	Not Significant
Total	82,423	81,016	86,523
Emissions intensity (metrics tons CO_2/NTD million revenues)	14.2	12.6	11.3

Ardentec's greenhouse scope 1 is mostly CO_2 emissions from fixed sources with a very small amount of PFCs that are mixtures for refrigerant filling, accounting for about 2% of the total emissions from scope 1 and scope 2. In 2021, Ardentec reduced 325 metric tons of CO_2-equivalent and purchased 7,000 tons of carbon rights from the use of renewable electricity in 2021, resulting in a 3% reduction in scope 1 and scope 2 emissions compared to 2020.

Taking 2020 as the base year, the target of Adentec for total GHG scope 1 and scope 2 reductions is 2025: 10%; 2030: 20%; 2040: 60%; and 2050: to achieve carbon neutrality. The reduction method is mainly based on the use of renewable energy for electricity to reduce the emission of scope 2. The following is the roadmap of estimated greenhouse gas emissions.

Roadmap of 2015~2050 GHG Emissions



Climate Change Topics and Compensation Management Mechanisms

Performance of the managers is determined by scope of authority and responsibility of their positions in each annual appraisal, their contribution to the company's environmental sustainability, social, economic, and operational goals and future risks. Environmental sustainability contributions include carbon reduction related to climate change actions, greenhouse gas management performance, and green power use, etc. The compensation of managers, including salary, bonus, employee compensation, etc. are linked closely to the annual performance in order to make the compensation management and the performance of the climate change action proportionally relevant.

Ardentec is committed to cultivating the spirit of continuous improvement on quality in order to form a quality culture of Zero Defect, Quality/Operation/Engineering Excellence, continues to strive for improvement in the domains of test technology, engineering services, and test processes. We encourage all employees to participate in the continuous improvement; therefore, from front-line production and service units to functional support units are able to participate in the improvement through different activities. For technology, production, departmental functions, green environment, information security, etc., we comprehensively expand the scope by reengineering, quality improvement team, quality control circle, and projects.

The QCC promotion committee started the annual QCC competition since 2011. In order to encourage employees to participate the activity and stimulate their creativity, participant who completed whole competition will be rewarded NTD 10,000; additional NTD 20,000~50,000 is rewarded to top 3 winners. Since 2017, we have been participating in the national CIA competition and have won 2 Silver Tower Awards and 4 Bronze Tower Awards. In addition, quality award projects/activities for all employees, such as QIT/Zero Defect, Stop and Fix, and My quality, are constantly increasing. Through the activities, our employees developed the ability to identify problems, improve logical thinking and problem analysis/solving skills. Besides, they can, further, learn from each other through teamwork, thus multiplying the growth.

Industry 4.0 and environmental sustainability awareness are being promoted these years, and the scope of improvement covers automation, intellectual property protection, energy saving, carbon reduction, and green products. Moreover, we continue to devote our efforts to ensure that our customers receive sustainable and high-value services and products in return. Through reengineering, workshops, and BKM platform, we are able to sustain a team with quality management and analysis expertise. In addition, we also encourage our employees to gather the aforementioned improvement items to participate in QCC competition activities and earn the honor vigorously.

Management Objectives and Performance of Risk and Opportunity

(1)2021 Energy Conservation Projects

Ardentec is committed to energy saving in order to cope with the climate change. 2021 Energy-saving result are listed below. 19 energy saving projects were implemented in 2021, and the total energy saving was 2,820,666 kWh.; 10,154 GJ, and GHG emissions by 1,425 metric tons CO_2e.

2021 Energy Conservation Projects and Outcomes

Projects	Project description	Power saving (GJ)	CO_2 emissions reduction (t)	Cost saving (NTD)
Facility update	Old or non-energy efficient equipment replacement	3,505	492	23,055,300
Operational optimization	Improve operation condition to be optimized	4,967	695	26,954,450
Energy saving control settings	Equipment energy saving improvement	1,682	238	290,830
Total		10,154	1,425	6,769,608

(2)Reduction of Lighting and Air-conditioning

Partitioning and time interval control and management of air conditioning and lighting, encouraging employees to turn off the area lighting and air conditioning when leaving the office in accordance with the control chart to conserve energy. Corridors with natural lighting have been equipped with light sensors to turn off automatically when light in the area is sufficient. Corridors people seldom visit have built-in infrared sensors to turn on lighting only when people pass through the area.

(3)Saving Energy on Management Information System

Energy-saving measures are taken for all information management devices. When computers are not in use, screens are shut down, dimmed and set to go into sleep mode under pre-configured circumstances to reduce energy consumption and CO_2 emission.

(4)Mitigating Global Warming Meat-free Monday for Loving the Earth

In 2021, "Meatless Monday" policy entered its 14th year. By having a meatless diet one day a week, the ozone layer damage caused by methane emissions from livestock farming will be reduced. All the employees love the earth from their plates. By reducing the consumption of livestock from daily diet, we can reduce the damage of global warming caused by livestock farming.

(5)Promoting Green Services and Green Processes

To promote Green Service and Green Manufacturing, testing service carbon footprint verification was conducted, and verified by 3rd party according to ISO 14067 standard to ensure its credibility. The verification included Wafer Probing Services in Tingshin, Kaiyuan and Paoching sites, as well as Final Testing Service in Gaosheng site.

Service item introduced with ISO 14067	2021 Revenues (NTD thousand)
Wafer Probing Service	6,746,295
Final Testing Service	902,719

Conclusion and Future Outlook

Conclusion

Ardentec is one of top three semiconductor testing service providers in Taiwan. While pursuing corporate economic performance, social justice, ecology and environmental sustainability are taken into account as well. We deeply rooted the concept of corporate sustainability in our operations. From the ethical management of corporate governance, supervision and guidance, risk management and response strategies to the setting of targets and goals, they are all improved and deepen constantly. On the other hands, the president supervises the practice and performance in person, and the board of directors regularly reviews the policy, development direction and implementation performance, as well as leads all employees and partners to implement it.

In 2021, Ardentec introduced the analysis of climate change risks and opportunities in accordance with the international "Task Force on Climate-related Financial Disclosures" (TCFD). Through scientific reports on climate change or the global energy outlook published by international organizations, such as the IPCC and the IEA to select climate related risks and opportunities that are directly or indirectly related to Ardentec's business activities, 13 climate change risks and 6 climate change opportunities were selected. Besides, after discussions with senior management of relevant departments to identify the likelihood and impact of each climate change issue, 3 material transition risks and opportunities were identified based on the analysis. For the material risks and opportunities of the ranking results, Ardentec used IEA WEO 2021's Stated Policies Scenario (STEPS), Sustainable Development Scenario (SDS), and IPCC AR5 RCP 8.5 scenarios to analyze their potential financial impacts on Ardentec in order to provide management with a reference for decision making when Ardentec is transforming towards a low carbon economy.

Ardentec will strengthen the results of the above evaluation and the information disclosure of the plan to meet the expectations of the government, evaluation units and our customers. We are moving to

be a key partner in our customers' zero-carbon supply chain and let stakeholders understand Ardentec's preparedness and actions in response to climate change. Through the identification results and planning, Ardentec will develop the best low-carbon strategies and practices for its own operations and create a resilient business model in response to climate change.

Future Outlook

With the increasing frequency of extreme weather around the world in recent years, many European countries have introduced legislation urging companies to make disclosures by following the Task Force on Climate-related Financial Disclosures (TCFD) framework, which has become an important and critical evaluation factor in international investment decisions. The numerous potential flooding areas in Taiwan, the frequent typhoon attacks each year, and the lagging progress of carbon emission reduction targets are all significant potential risks that Taiwanese companies are facing, and they may cause significant financial impact. The domestic Corporate Governance 3.0 Blueprint for Sustainable Development also sets out a clear timeline for companies to issue sustainability reports using the TCFD framework. Although Taiwanese companies started late, the pressure of low/zero carbon target from international customers is in line with the world trend.

The Carbon Disclosure Project (CDP) climate change questionnaire's "risks and opportunities" (C2) and strategies (C3) questions are highly compatible with the TCFD disclosure framework. By following the CDP disclosure framework and carrying out related activities, we can also effectively manage and disclose climate change risk opportunities, gain favors from investors, and create sustainable business opportunities by green energy.

Ardentec completed the identification of climate change risks and opportunities in 2021. In order to implement the identification and management of climate related risks and opportunities, we will continue to improve and manage risks as well as implement corporate governance. In the short-term (2021-2022), we will continue to plan paths to purchase renewable energy, perform carbon disclosure project and improve the discrepancy; in the medium-term (2023-2025), we will plan the initial internal carbon pricing, reveal the low carbon manufacturing plan, continue

to purchase solar energy and evaluate the opportunity to purchase wind power, and sign the Science Based Targets initiative (SBTi); in the long-term (after 2026), we will submit documents for the Science Based Targets, continue to promote a number of energy saving and carbon reduction plans, and push the supply chain for energy saving and carbon reduction, etc. The implementation schedule is shown below.

Short-term 2021~2022

- To conduct climate risk and opportunity analysis using TCFD as a framework
- To purchase renewable energy, to plan future paths, and to set up solar power equipment
- To reduce CO_2 emissions and future reduction path (power saving/green power/carbon rights)
- To reduce the discrepancy of SASB
- To implement carbon disclosure project (CDP) for climate change, to disclose water security questionnaire, and to reduce the discrepancy
- To join domestic advocacy organizations

Medium-term 2023~2025

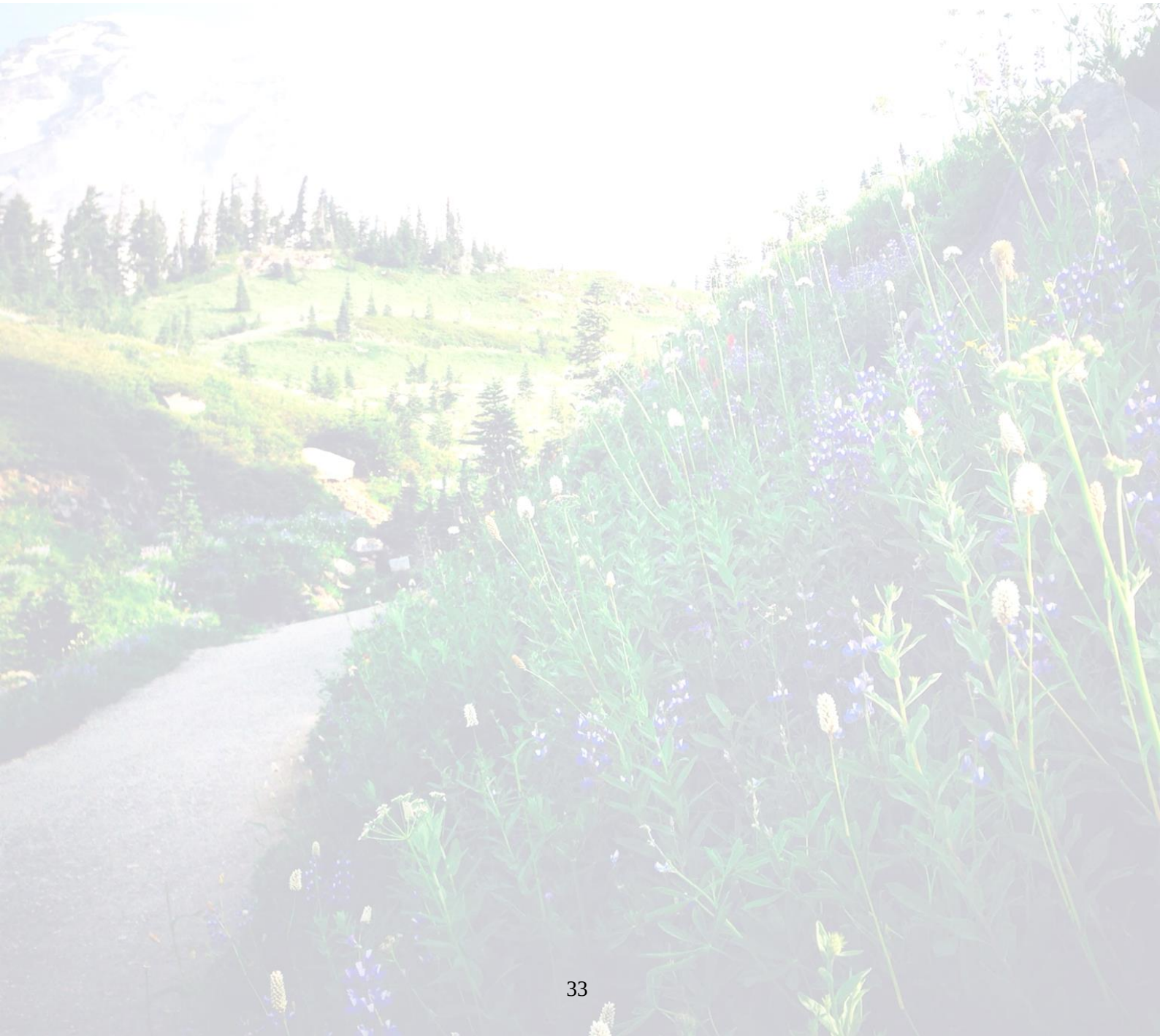
- To plan preliminary internal carbon pricing
- To plan an internal carbon pricing management system
- To disclose corporate low carbon manufacturing initiatives
- To increase the use of wind power
- To continuously set up solar power station
- To continue to disclose and improve on CDP
- To Sign SBTi Reduction Commitment

Long-term 2026~

- To submit the Goal for SBTi
- To continue implementing corporate low carbon manufacturing initiatives
- To implement an internal carbon pricing management system
- To assess and setup carbon reduction targets for the supply chain
- To plan for zero emissions timeline

Climate Change Related Report and Policy

- Ardentec Sustainability Report(2021)
- Sustainable Development Policy
- Environment Policy



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