2.3 Environment

✦ Highlights

First Transportation Company in Taiwan to Pass SBTi Validation

In June 2024, CAL became the first transportation service provider in Taiwan to officially pass the review of the Science Based Targets initiative (SBTi), setting a 1.5°C-aligned emissions reduction pathway. This target aligns with the global climate goals under the UN Paris Agreement and demonstrates CAL's commitment to science-based climate action and the transition to net-zero emissions.

CDP SER A List Recognition

CAL has responded to the CDP climate change questionnaire for 12 consecutive years since 2012, and actively promotes and implements supply chain/value chain management. After receiving a Leadership-level A- rating for five straight years, CAL was named to the CDP SER A List in 2024 for its active efforts in climate action and supply/value chain management.

11th Time Receiving TCSA Climate Leadership Award

CAL has received the Climate Leadership Award for eleven consecutive years since 2014, an unrivaled feat in Taiwan's transportation service industry.

Co-create Carbon Reduction Value with Customer Partners through Sustainable Aviation Fuel (SAF)

CAL is the first in the Taiwanese aviation industry to introduce a SAF procurement cooperation model, providing traceable and verifiable carbon reduction reports. Leading the way in collaborating with passenger and cargo enterprises to use SAF, collectively reducing aviation carbon emissions and the carbon footprint of customer employees traveling by air and transporting goods, driving cooperation with industry supply chains to promote the aviation industry's energy transition.

Conducting Cabin Waste Investigation to Explore the Possibilities of Innovative Circular Economy

Through ongoing communication among cabin service, in-flight supply operations, and ground handling teams at CAL, we continuously optimize our operational processes to create opportunities for recyclable materials to re-enter the circular economy.

Supporting Reforestation Initiatives to Foster a Shared Journey Toward Ecological Sustainability

CAL hosted the "Exploration of the Mountains' Beauty" Event, bringing corporate resources to Indigenous tribal communities, with the aim of setting an example for others and inviting business partners to join in experiencing eco-friendly journeys together.

Best Practices

To reduce cabin waste, China Airlines partnered with its ground handling agent in December 2019 to collect and analyze waste from selected short- and long-haul flights. In August 2024, CAL further optimized waste audit procedures and task allocation, referencing Aviation Sustainability Forum (ASF) practices to strengthen pre-flight data collection, post-flight analysis, and strategic feedback.

The 2024 Cabin Waste Weighing Project found per-passenger waste averaged 0.5 kg on short-haul and 0.81 kg on long-haul flights—both lower than 2019 levels and ASF benchmarks. Analysis identified future focus areas including flight duration, passenger schedules, and packaging design to balance customer experience with waste reduction.

2024 Cabin Waste Weighing Project: Figure A - Weighing of Cabin Cleaning Waste; Figure B - Weighing of Cabin Catering Waste.

Management Approach

Material Issues

- Ⓔ Climate Change Mitigation and Adaptation
- Ⓔ Energy Management
- Ⓔ Environmental Operational Efficiency and Resource Management
- Ⓔ Green Services and Sustainable Catering
- Ⓔ Biodiversity

Importance of Material Issues

According to the latest Global Risks Report 2025 published by the World Economic Forum, various industries, including the aviation sector, have faced diverse and rapidly changing operational challenges over the past two years. These challenges include extreme weather events, geopolitical shifts, and cyber espionage activities. In addition to addressing short-term risks, as time goes on, high concentrations of greenhouse gases will exacerbate the intensity of extreme weather events, disrupt biodiversity, and lead to ecosystem collapse, resulting in the irreversible degradation of living conditions such as shortages of natural resources. As a sustainability leader in the aviation industry, China Airlines recognizes that achieving long-term sustainability goes beyond continuously improving internal management practices and optimizing operational processes. It also requires integrating both internal and external resources, building collaborative models, and fostering a shared sustainability vision across the value chain. This is a key strategy that demands ongoing attention and investment, aiming to deepen sustainability and environmental awareness. Through collective collaboration, we can unlock even greater possibilities.

Commitment and Long-term Goals

Commitment

CAL is committed to abiding by relevant regulations in civil aviation, environmental protection, and energy strengthen risk management mechanisms, actively participating in environmental sustainability-related organizations and initiatives both domestically and abroad, and implementation of the Company's environment and energy policies. CAL continues to strengthen and optimize its own environmental sustainability as its momentum, reducing environmental impact and cherishing the limited resources on the planet. With its own role, CAL will lead the Group and the aviation industry to jointly protect our planet for the sustainable development of future generations.

Commitment and Long-term Goals

2025	2030	2040
- Improving annual aviation fuel efficiency by 1.5% and achieving carbon-neutral growth (ICAO CORSIA CNG2020) - Use 0.5% SAF - Reducing carbon emissions in ground operations by 5% compared to 2023	- Improving annual aviation fuel efficiency by 1.5% and achieving carbon-neutral growth (ICAO CORSIA CNG2020) (An additional SBTi target is set to improve fuel efficiency by 26% compared to the 2019 baseline.) - Use 5% SAF - Reducing carbon emissions in ground operations by 15% compared to 2023 - With renewable energy installed capacity reaching 10%(Note 1) of the contract capacity	- Improving annual aviation fuel efficiency by 1.5% and achieving carbon-neutral growth (ICAO CORSIA CNG2020) (net-zero emissions by 2050) - Used 40% SAF - Reducing carbon emissions in ground operations by 60% compared to 2023 (net-zero emissions by 2050) - With renewable energy installed capacity reaching 15% of the contract capacity (Note 1)
Reducing tap water withdrawal by 7% compared to 2018	Reducing tap water withdrawal by 10% compared to 2018	Reducing tap water withdrawal by 12% compared to 2018
- Reducing general waste (non-recyclable) by 7% compared with 2018 - Increasing industrial waste recycling ratio to 45% - Reducing paper consumption by 30% compared to 2018 - Use a 10% of sustainably certified paper/wood items for air/ground service needs - Reducing total in-flight waste by 50% compared to 2018 - Reducing use of single use plastics items and packaging for in-flight services by 90%	- Reducing general waste (non-recyclable) by 12% compared with 2018 - Increasing industrial waste recycling ratio to 50% - Reducing paper consumption by 50% compared to 2018 - Use a 50% of sustainably certified paper/wood items for air/ground service needs - Reducing total in-flight waste by 65% compared to 2018 - Reducing use of single use plastic items and packaging for in-flight services by 100%	- Reducing general waste (non-recyclable) by 15% compared with 2018 - Increasing industrial waste recycling ratio to 58% - Reducing paper consumption by 52% compared to 2018 - Use 80% of sustainably certified paper/wood items for air/ground service needs - Reducing total in-flight waste by 70% compared to 2018 - Reducing use of single use plastic items and packaging for in-flight services by 100%
- Embargoing transport of illegal wildlife and prohibiting use of illegal species as food ingredients - A total of 2 biodiversity conservation-related activities or initiatives have been participated in and implemented since 2023	- Embargoing transport of illegal wildlife and prohibiting use of illegal species as food ingredients - A total of 4 biodiversity conservation-related activities or initiatives have been participated in and implemented since 2023	- Embargoing transport of illegal wildlife and prohibiting use of illegal species as food ingredients - A total of 10 biodiversity conservation-related activities or initiatives have been participated in and implemented since 2023

Note 1: This is not the proportion of electricity use. This is an additional target beside the Taiwan national power grid target (https://www.ndc.gov.tw/en/Content_List.aspx?n=2D918002A913582A). China Airlines expects to use 40% renewable energy by 2030 if Taiwan National Grid target is included

Note 2: The target for reducing average food waste produced per person for in-flight services has been incorporated into the overall in-flight waste reduction goal, and "over-catering rate" is used as a performance indicator for monitoring and evaluation purposes.

Unit in Charge	Corporate Sustainability Committee - Environmental Task Force (Corporate Environmental Committee)		
Management Mechanisms	▪ The meeting of the Board of Directors and Sustainability and Risk Management Committee, every quarter ▪ The meeting of the Corporate Sustainability Committee, at least twice a year ▪ The meeting of Corporate Environmental Committee and Environmental Management Committees, every quarter on a regular basis ▪ Environmental/energy/risk issues are included into routine executive reports ▪ Yearly execution of ISO 14001, ISO 50001, and ISO 14064-1 third-party verification ▪ Regularly response and review of important international sustainability and environmental protection questionnaires		
Grievance Mechanism	Corporate Sustainable Development: Corporate Sustainability Center ✉ csr@china-airlines.com		Stakeholder Contact

Objectives and Plans

Issue	KPI	2024			2025
		Objectives	**Performance**	**Achievement Rate**	**Objectives**
Climate Action and Renewable Energy	Enhancing Aviation Fuel Efficiency	Increase by 1.5%	Increased by 3.7%	>100%	Increase by 1.5%
	Using SAF	Use 0.001%	0.0011%	100%	Use 0.5% (Note)
	Reducing Carbon Emissions from Ground Operations	Decrease by 3% compared to 2023	Reduced by 2%	Not achieved	Decrease by 5% compared to 2023
Water Resource Conservation	Reducing tap water withdrawal	Decrease by 6% compared to 2018	Reduced by 23%	>100%	Decrease by 7% compared to 2018
Responsible Consumption and Waste Manage-ment	Reducing general waste	Decrease by 6% compared to 2018	Increase by 5%	Not achieved	Decrease by 7% compared to 2018
	Reducing in-flight waste	Decrease by 33% compared to 2018	Reduced by 20%	Not achieved	Decrease by 50% compared to 2018
	Reducing the use of paper	Decrease by 22% compared to 2018	Reduced by 30%	>100%	Decrease by 30% compared to 2018
	Reducing use of single use plastic items and packaging for in-flight services	An 80% reduction compared to the baseline scenario.	Reduced by 81%	>100%	An 90% reduction compared to the baseline scenario
	Increasing industrial waste recycling ratio	44%	61%	>100%	45%
	Increasing the proportion of sustainably certified paper and wood products	5%	20.9%	>100%	10%
Ecological Conser-vation Action	Participate in biodiversity conservation activities/initiatives	A cumulative total of one event since 2023	A total of three events	>100%	A cumulative total of two events since 2023

Note: Due to early-stage global SAF supply and cost challenges, China Airlines adjusts its phased SAF usage target to 0.5% while maintaining its long-term commitment to SAF development and net-zero carbon goals.
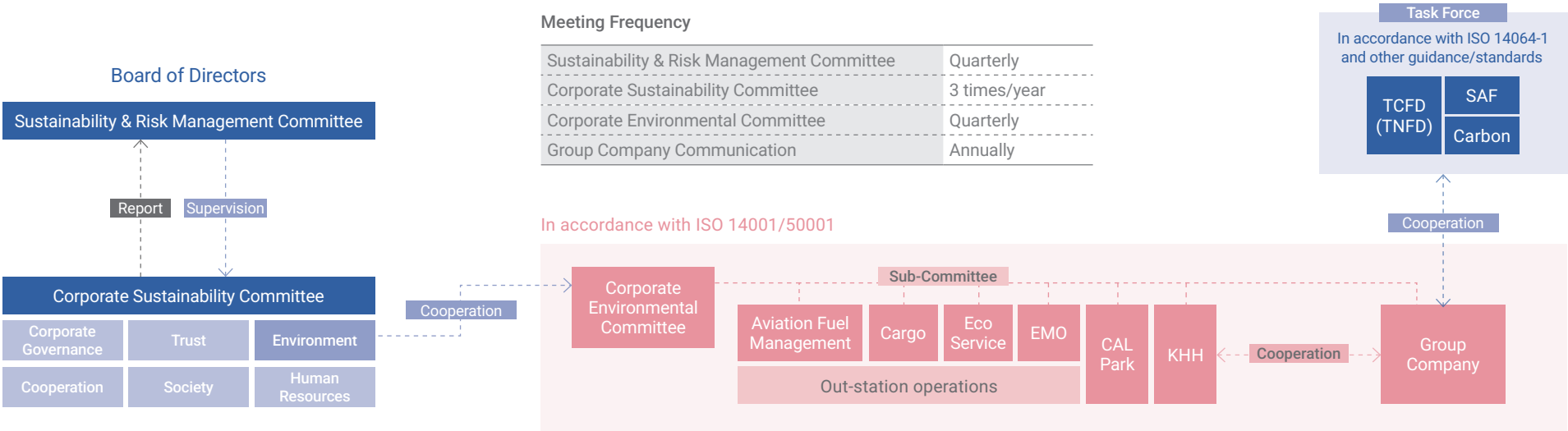
2.3.1 Governance of Environmental Sustainability

Achieving "Net-zero carbon emissions by 2050" has become a global priority. In line with Taiwan's proposed 2030 target of a 28±2% reduction from 2005 levels, China Airlines is transforming its service models, operations, and corporate values to reduce raw material consumption and carbon emissions. China Airlines also committed to enhancing ecological benefits in its operations and promoting a circular economy to minimize environmental impact and foster ecological harmony in a collective effort to combat climate change.

Policy and Structure of Environmental Governance

China Airlines, guided by the "Sustainable Environmental Development" principles outlined in its Board-approved "Sustainable Development Best Practice Principles," has established the "Environmental and Energy Management Principles," committing to legal compliance, resource conservation, eco-efficiency, and social responsibility. CAL has developed and updated its "Environmental and Energy Policy Statement" and "Forest and Biodiversity Conservation Commitment," extending their scope beyond internal operations to include suppliers, joint ventures, and business partners. With a focus on minimizing resource use and environmental impact across the value chain, CAL seeks to give back to nature while providing quality services. Through a Circular Economy Management Approach, it aims to achieve a fair, just, and net-zero (or near-zero) business model that fosters ecological prosperity.

To implement these commitments, CAL adheres to ISO 14001, ISO 50001, and ISO 14064-1 standards. Led by the President, the Corporate Environmental Committee regularly identifies and manages environmental, energy, and climate-related risks across all operations-including headquarters, branches, maintenance, passenger and cargo services, and the supply/value chain—enabling the implementation of appropriate environmental and energy-saving measures. Internal audits and third-party validations ensure continuous improvement in areas such as energy, water, and waste management.

In August 2024, CAL established the "Sustainable Development Center" and appointed a Chief Sustainability Officer (CSO) to oversee group-wide sustainability governance. Acting as Executive Secretary of the Corporate Environmental Committee, the Center coordinates with five business-function-based Environmental Management Committees and the Aviation Fuel Management Team. The Center also regularly reports environmental and sustainability risks and corresponding actions to the Board's Sustainability and Risk Committee, reinforcing the effectiveness of the CAL Group's environmental governance and risk management.

Carbon Management | Sustainable Aviation Fuel | TCFD

Meeting Frequency	
Sustainability & Risk Management Committee	Quarterly
Corporate Sustainability Committee	3 times/year
Corporate Environmental Committee	Quarterly
Group Company Communication	Annually

CAL Environmental and Energy Policy

CAL commits to achieve the 2050 net-zero, No Gross Deforestation and net positive impact (NPI) on biodiversity targets, also continues to optimize environmental and energy management system, incorporates the life-cycle concept to examine our corporate context, including but not limited to global operations, air transport, passenger/cargo services, upstream and downstream distribution and logistics activities. Furthermore, we will endeavor to understand the needs and expectations of interested parties, assess related environmental risks and opportunities, establishes and reviews performance indicators and allocates sufficient resources to the implementation and ongoing improvement of the following environmental and energy policies as well as management measures.

Environmental and Energy Policy	Policy Framework
Enforcing compliance obligations to fulfill the Company's responsibilities in environmental protection and energy conservation	▪ Through regular and irregular compliance review and internal and external auditing mechanisms to perform a zero-penalty target ▪ Acted as a member of the IATA SEAC, monitoring global environmental trends to effectively implement risk and opportunity management
Improving environmental and energy management systems, setting and achieving management objectives to verify compliance with established policies	▪ Continuously optimized the environmental and energy management systems ▪ Set and tracked environmental sustainability targets and commitments, driving ongoing performance improvement ▪ Held the 2024 "Excellent Environmental Management Committee Competition," with awards personally presented by the President and supported by incentives
Promoting environmental and energy conservation education to foster employees' eco-awareness	▪ Encouraged employees to submit suggestions through platforms such as "Employee Proposals" and "Fuel-Saving Proposals" and offered corresponding monetary rewards ▪ Provided diverse training channels to raise awareness of the environmental impacts of job functions
Supporting green design and procurement to increase overall eco-efficiency	▪ Implemented green design, sustainable/local procurement, and due diligence in mergers and acquisitions, investment, vendor selection, and procurement operations ▪ Invested in R&D activities focused on environmentally sustainable services and products ▪ Promoted and fostered awareness and culture of green consumption
Fostering a low-carbon operating environment to establish continual improvement of environmental and energy efficiency performance	▪ Implemented environmental and energy-saving measures according to business activities (including products, services, transport, and administrative support) to reduce environmental impact ▪ Increased use of low-carbon and renewable energy in facilities and transportation across the value chain
Practicing waste management and circular economy to minimize resource consumption and negative environmental impacts	▪ Minimized energy and resource consumption while maximizing their efficiency and effectiveness ▪ Adopt circular economy principles to realize waste-to-resource conversion by increasing the recycling rate, reducing packaging materials and food waste, phasing out single-use plastic, and promoting the use of recycled materials. ▪ Inventorying energy and resource consumption and environmental impact hotspots, and devised corresponding strategies and mitigation measures
Strengthening suppliers and partners engagement to optimize green supply chain management	▪ Managed and audited environmental risks in the supply chain via the Supplier and Group Code of Conduct ▪ Promoted environmental initiatives and enhanced stakeholder awareness through communication, consultation, and collaboration

Management Tools, Objectives, and Management Organization for the Environmental Task Force

Topic	Management Tools*	Objectives	Management Authority/Organization
Climate Change	ISO 14001, ISO 50001, ISO 14064-1, TCFD, CDP, SBTi	Attain net-zero emissions by 2050 and increase resilience for responding to climate change	Corporate Environmental Committee, each Environmental Management Committees, Carbon Management Task Force, TCFD Task Force
Aviation Fuel (Including SAF)	ISO 14001, ISO 50001, ISO 14064-1	Increase aviation fuel efficiency and establish efficient fleets and networks	Aviation Fuel Management Team, Sustainable Aviation Fuel Task Force
Environmental Issues	ISO 14001, ISO 50001, DJSI, TNFD, and domestic and international sustainability evaluation indicators	▪ Improve business eco efficiency, create an environmental sustainability brand ▪ Enhance the sustainable value of the supply chain and value chain, including business partners	Corporate Environmental Committee, Five Environmental Management Committees

Note 1: With coverage based on group revenue—including stations and group operations—100% of entities successfully passed external verification under the ISO 14001 environmental management system. For certification details, please visit the Corporate Sustainability website: https://calec.china-airlines.com/csr/en/index.html
Note 2: TCFD refers to Task Force on Climate-related Financial Disclosures

Identification of Environmental Risks and Opportunities

GRI 201-2

CAL provides passenger and cargo services as well as aircraft maintenance services, involving issues such as climate change mitigation and adaptation, resource consumption, pollution prevention, waste and food waste management, toxic and chemical substances, reduction to single-use plastic products, and biodiversity conservation. By actively engaging with stakeholders both domestically and internationally and staying abreast of environmental trends, CAL has identified six major environmental issues relevant to its operations. These have been integrated into key points of the Company's environmental risk and opportunity management, with proactive measures put in place to address them. Additionally, other issues are continuously being improved through the operation of the Company's environmental management system.

2024 Ranking			
1	Aviation carbon emission management (3)	11	New technology and energy development (1)
2	Climate change adaptation (3)	12	Control of toxic and chemical substances (2)
3	Green supply chain management (2)	13	In-flight drinking water management (3)
4	Aircraft energy efficiency improvement (2)	14	Control of waste and sewage (3)
5	Single Use Plastic (SUP) (2)	15	Ground operation waste management (2)
6	Ground operations energy (carbon) management (3)	16	Ground water resources management (3)
7	Biodiversity conservation (2)	17	Aircraft takeoff and landing noise control (3)
8	Circular economy and innovation model (2)	18	Ground operation air pollution control (3)
9	Cabin waste and food waste management (3)	19	Aircraft air pollution control (2)
10	Environmental Awareness (2)		

Note: The numbers in parentheses represent adaptivity, i.e., the size of the circles in the following diagram.

Environmental Issues	Risk	Opportunity	Management Method
Aviation Carbon Emission Management	International carbon emission regulations and public awareness are increasingly stringent, adding pressure on carbon reduction actions and compliance costs.	By reducing carbon emissions and creating carbon credits, costs can be saved and revenue increased.	▪ China Airlines has established a "Net Zero Carbon Reduction Pathway" along with corresponding strategies, which include enhancing fuel efficiency in flight operations, fleet renewal, and the promotion of sustainable aviation fuel.
Climate Change Adaptation	Increasing frequency of extreme weather events such as heat waves and heavy rainfall will impact the Company's daily operations.	Proper response will strengthen corporate resilience, reduce impact costs, and maintain reputation.	▪ China Airlines has partnered with supply chain manufacturers and cargo corporate clients to participate in the Sustainable Aviation Fuel (SAF) collaboration project to jointly reduce the carbon footprint, as SAF emits over 90% less carbon compared to conventional jet fuel. 🔍 For detailed information, please refer to Section 2.3.3 regarding Net Zero Carbon Emissions
Green Supply Chain Management	The international financial system is highly focused on sustainability issues, continuously enhancing governance and disclosure requirements to promote sustainable investment, resulting in increased regulatory risks and operating costs.	It enhances the sustainability competitiveness in terms of the value chain of the industry and promotes green business opportunities and new business models.	▪ Continuously promote the Supplier Code of Conduct, strengthen sustainable risk management, and enhance collaboration and project cooperation to improve the achievements in environmental sustainability of suppliers and value chain partners. ▪ To enhance the integrity and performance of environmental and sustainable governance within the CAL Group, CAL convened the "Group Sustainability Governance Communication Conference" in 2024, bringing together the general managers of various group companies to build consensus across the Group. ▪ CAL has supported its group companies in building capabilities for greenhouse gas inventory, including inventory tools, internal verification, and management mechanisms.
Aircraft Energy Efficiency Improvement	Accelerate the introduction of new generation energy-efficient aircraft and fuel-saving technologies as well as expand the proportion of sustainable aviation fuel utilized, which will increase operational costs.	Improve aircraft fuel efficiency while reducing fuel consumption and carbon emissions intensity, which will reduce operational and regulatory costs.	Implementing fleet renewal, introducing fuel-saving technologies and sustainable aviation fuels, enhancing passenger load factors, and optimizing flight routes and air traffic management operations. 🔍 For further details, please refer to sections 2.1.2 Passenger Service and 2.1.3 Cargo Service
Single Use Plastic (SUP)	Restrictions on the use of the Single Use Plastic products have been expanded from Europe to other countries/routes, and there is also a focus on packaging reduction, leading to increased regulatory costs.	Systematically inventorying and planning alternatives, considering performance in fuel consumption, waste and plastic reduction, etc., to reduce compliance risks and regulatory costs, thus adding value to sustainable services.	▪ Monitoring regulatory trends and the market development of alternatives, integrating with supply chain and cross-industry collaborations, devising alternative solutions and setting reduction targets, continuously reviewing and improving with consideration of both the Company's operations and supply chain conditions. ▪ Economy class tableware has been fully upgraded to 100% certified recycled stainless steel, reducing the use of plastic products.
Ground Operations Energy (Carbon) Management	The domestic carbon fee mechanism is currently being implemented, while the Financial Supervisory Commission (FSC) is expanding the scope of GHG inventory and verification requirements. It is anticipated that there will be increased regulatory efforts on carbon emissions control in the future, leading to higher operating costs.	Early deployment of renewable energy facilities and related resilient infrastructure in line with international trends can help save on electricity costs and alleviate long-term regulatory costs.	In addition to implementing an energy efficiency monitoring system that exceeds regulatory requirements, CAL continues to expand its renewable energy installations and EV charging infrastructure. As of December 2024, three solar power facilities with a total installed capacity of 469 kW have been established across the CAL Park and EMO Park. EV charging stations have also been installed in employee parking lots, accompanied by preferential parking programs to encourage their use. The EMO Park is gradually advancing the electrification of operational equipment and vehicles, in conjunction with the utilization of charging facilities at both the airport and EMO Park, to progressively establish an electrified operational environment at the airport.

☆ Best Practices

2024 Group Sustainability Governance Communication Conference

During the meeting, the China Airlines Group reaffirmed its commitment to continuously improving its environmental and energy performance and objectives. The Group will implement and expand its environmental management system in phases, considering factors such as corporate scale, environmental risks, and competitive advantages, to build Group's consensus on sustainability and enhance the value.

Economy Class 100% Recycled Stainless Steel Tableware Set

China Airlines' economy class tableware embodies the concept of green design, by upgrading the original plastic cutlery set (a set of three pieces: knife, fork and spoon) to 100% certified recycled stainless steel. The innovative "spork" design combines the functions of a spoon, fork, and teaspoon, used alongside the dinner knife, effectively reducing the weight on board.

Dedicated charging area in the EMO Park

China Airlines continues to expand infrastructure such as renewable energy power generation capacity and charging stations to support the electrification of vehicles/equipment operations.

CAL Environmental Risk and Opportunity Matrix

Y-axis: Degree of Internal Impact and Opportunity (Note2) — Low to High
X-axis: Possibility of External Pressure (Note1) — High
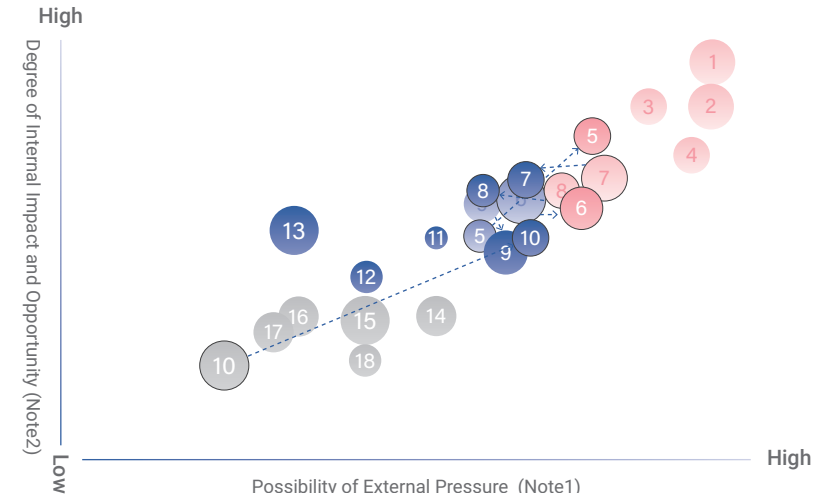
X-axis : represents the possibility of the issue in the global trend of development and control

Y-axis : represents the degree of impact and opportunity of the issue on CAL

◯ : The size of the circle represents the adaptation of CAL to the issue (a larger circle means better actionand adaptation)

◯ : Light circles represent data from the previous year and darker circles represent data from this year

⇢ : The arrow indicates the difference in displacement from last year

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2.3.2 Natural and Climate Change Mitigation and Adaptation

Management Mechanisms for Natural and Climate Change

CAL became the first airline in Taiwan to adopt the Task Force on Climate-Related Financial Disclosures (TCFD), and has published the independent "Climate-Related Financial Disclosure Report" on an annual basis. In 2024, CAL further integrated the principles recommended by the "Task Force on Nature-related Financial Disclosures (TNFD)" with the existing TCFD operational mechanisms, enhancing the scope of management for issues related to nature and climate change, resonating with the "Kunming-Montreal Global Biodiversity Framework".

Concern for Climate Change

Governance Framework and Risk Management Processes for Nature and Climate Change

CAL established a TCFD Task Force composed of multiple units in 2019 and the Corporate Sustainability Committee and Environmental Committee have monitored climate-related risks and opportunities. In 2024, further integration of nature and climate-related issues has been undertaken, incorporating considerations within the TNFD scope. Key achievements will also be reported annually to the Board of Directors for supervision and management.

The Nature and Climate Governance Framework

Continuous Improvement

Risk Supervision

Board of Directors / Sustainability and Risk Management Committee
Review risk management strategies and decision-making at the Company and Group Level

Report | Supervision

Riks Management

Corporate Sustainability Committee
Identify and manage ESG risks for the Company/group, and develop corresponding response strategies

Corporate Environmental Committee
Identify and manage environmental risks for the Company/group, and develop corresponding response strategies

TCFD Task Force
Identify and manage climate and natural risks for the Company/group, and develop corresponding response strategies

Report | Supervision

Operational Control

- Strategy Planning Units
- Service Units
- Financial Units
- Sales and Marketing Units
- Aviation Operations Units
- Administrative Maintenance and Repair Units

Implement and promote risk/opportunity control measures to enhance ESG performance

Caption: CAL has integrated the topics of nature and climate change into the Company's management mechanisms by adopting the operational processes of TCFD and TNFD. It has established internal operating procedures and devised specific execution measures for governance, strategy, risk management, and metrics and targets. With a spirit of continuous improvement, the Company aims to enhance overall management of nature and climate-related risks and opportunities.

Analysis of the Impact of Climate Scenarios on Business Operations

CAL TCFD Task Force evaluates the impact of various factors on its global operations and destinations, company assets (including aircraft, offices, and facilities), upstream supply chain, and downstream customers, with reference to reports such as the IPCC Sixth Assessment Report (AR6) SSP1-1.9, SSP2-4.5, and SSP5-8.5, IEA B2DS and B2DS, and national NDCs, etc. Scenarios at 1.5°C, 2°C, and 4°C are considered, taking into account factors such as regulatory requirements, market demands and changes, technological developments and trends, market competition, and natural environmental factors. This analysis helps assess the short, medium, and long-term impacts on the Company's global operations, financial situation, resources, and reputation. The process and results of the analysis on the impact of climate scenarios are as follows:

★ Best Practices

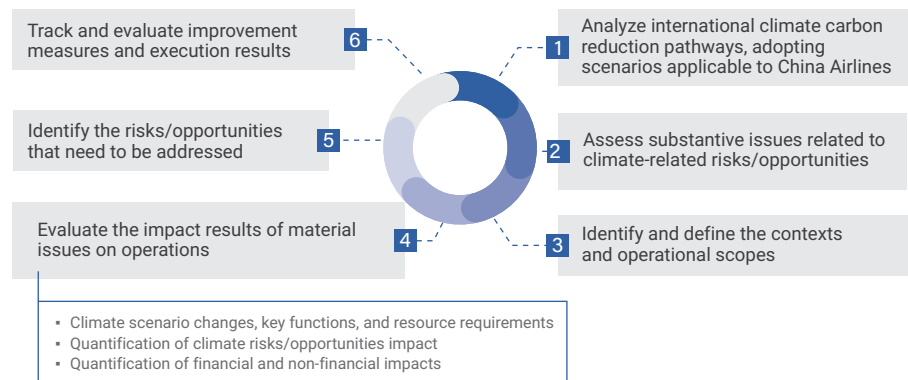### Aviation Support for Ecological Conservation

Mandarin Airlines is dedicated to support conservation through its flight operations and has been a long-term participant in the Taipei Zoo's Blue-tailed Bee-eater Conservation Program. In 2024, research teams collected abandoned Blue-tailed Bee-eater eggs from their natural habitat in Kinmen. Mandarin Airlines carefully and safely transported the eggs from Kinmen to Taipei, where they were subsequently incubated and cared for by the Taipei Zoo. Mandarin Airlines has been actively and consistently involved in wildlife conservation efforts, contributing to the preservation of nature. Through cross-departmental collaboration and corporate support, the program has gradually achieved remarkable results—successfully incubating and raising 12 adult Blue-tailed Bee-eaters, which now thrive and fly freely within the Taipei Zoo Pangolin Dome.

Mandarin Airlines assisted in the transportation of abandoned eggs of the Blue-tailed Bee-eater.

Mandarin Airlines customized special incubator boxes for the transportation of these delicate passengers, equipped with insulation bags and shock-absorbing materials.

1. Analyze international climate carbon reduction pathways, adopting scenarios applicable to China Airlines
2. Assess substantive issues related to climate-related risks/opportunities
3. Identify and define the contexts and operational scopes
4. Evaluate the impact results of material issues on operations
5. Identify the risks/opportunities that need to be addressed
6. Track and evaluate improvement measures and execution results

- Climate scenario changes, key functions, and resource requirements
- Quantification of climate risks/opportunities impact
- Quantification of financial and non-financial impacts

Issue	Risk Type	Scenario Analysis	Impact Timelines (Severity)	Impact Level	Risks and Financial Impacts	Opportunities and Financial Benefits	Response Management Methods
International Environmental Protection, Energy Conservation, and Carbon Management Regulations	Transition Risk — Current Legal Risk	▪ IEA 2DS (Aligning with the Paris Agreement Goals to Limit Global Warming to Below 2°C) ▪ IEA B2DS (Aligning with the Paris Agreement Goals to Limit Global Warming to Close to 1.5°C) ▪ NDCs (According to the Paris Agreement, Taiwan's nationally determined contribution includes the goal of achieving net-zero carbon emissions by 2050)	Short, medium and long term (High/Impact on EBITDA approximately 1.9~3.7 %)	⬡	Tighter international carbon regulations (e.g., ICAO CORSIA, EU ETS, etc.), leading to increased compliance costs	▪ Enhance fuel efficiency to reduce the Company's energy procurement, carbon offset trading, and regulatory compliance costs ▪ Revenue derived from carbon credit sales	▪ Continue to enhance MRV capacity for CORSIA and EUETS mechanisms ▪ Research and implementation of carbon credit/quota trading mechanisms ▪ Planning and implementation of various carbon reduction measures
			Short, medium and long term (High/Impact on EBITDA approximately 5.6 %)	⬆⬡	The EU ReFuelEU Aviation regulation mandates that EU airports gradually increase the share of Sustainable Aviation Fuel (SAF) from 2% in 2025 to 70% by 2050, impacting the Company's fuel procurement strategy and costs	▪ Using more fuel-efficient aircraft effectively reduces operational costs ▪ Using SAF to meet ICAO requirements and respond to carbon reduction policies of various countries ▪ Opportunities to generate carbon assets through renewable energy investments	▪ Establish SAF procurement and partnership agreements to ensure fuel supply and price stability ▪ Promote domestic collaboration on SAFinitiatives by engaging with the government and suppliers to facilitate the development of the SAF and mitigate supply risks ▪ Invite corporate clients to participate in the SAF collaboration project
	Transition Risk — Emerging Legal Risk		Medium and long-term (Low/Impact on EBITDA < 0.1%)	⬆⬡⬇	▪ Countries continue to adopt environmental/ energy and carbon fees or taxes, resulting in increased operating costs ▪ The environmental protection authority has implemented carbon emission reporting and regulations for the transportation sector, leading to increased administrative costs	▪ Increasing passenger load factor as part of the Company's operational strategy, creating opportunities to increase revenue ▪ Implementing digitized operations in response to carbon emissions reporting can improve operational efficiency and reduce administrative costs	▪ Implement environmental and energy management system, set annual goals for environmental protection, energy conservation, and energy efficiency ▪ Promote the greenhouse gas inventory and management within the Group companies
			Medium and long-term (Medium/Impact on EBITDA < 1%)	⬆⬡⬇	Large electricity users are required to use renewable energy for 10% of their consumption, along with rising supplier costs	Opportunities to generate carbon assets through renewable energy investments	Continuously plan to expand renewable energy facilities
Energy Transition	Transition Risk Technology Risk		Medium and long-term (Medium/Impact on EBITDA < 1%)	⬆ ⬡ (Passenger Service, Cargo Service, Flight Safety) ⬇	▪ Limited SAF supply and high prices ▪ Hydrogen and electric aircraft technologies are still under development	▪ Participate in the development of technologies aimed at enhancing flight efficiency ▪ Invest in Sustainable Aviation Fuel (SAF) and innovative energy-saving technologies	▪ Continuously evaluate the effectiveness of SAF, new technologies (new energy-saving aircraft, fuel-saving technologies) ▪ Accelerate the procurement of more efficient, low-carbon aircraft models; engage in technology research and development; and reduce fuel consumption and carbon emissions through optimized flight planning and operations

Issue	RiskType	Scenario Analysis	Impact Timelines (Severity)	Impact Level	Risks and Financial Impacts	Opportunities and Financial Benefits	Response Management Methods
Corporate Reputation and Low-Carbon Environmental Image	Transition Risk — Legal Risk	• IEA 2DS (Aligning with the Paris Agreement Goals to Limit Global Warming to Below 2°C) • IEA B2DS (Aligning with the Paris Agreement Goals to Limit Global Warming to Close to 1.5°C) • NDCs (According to the Paris Agreement, Taiwan's nationally determined contribution includes the goal of achieving net-zero carbon emissions by 2050)	Short and medium-term (Low/Impact on EBITDA < 0.1%)	⇧ ⬠ ⇩	• Environmental penalties in various countries have become stricter, increasing financial risks • Increasing pressure from environmental groups over greenwashing, leading to potential greenwashing lawsuit risks	Provide transparent ESG information to establish credibility and attract ESG investors and customers	Implement a robust third-party carbon emission verification mechanism to ensure the transparency and credibility of ESG communications
	Transition Risk — Market Risk		Medium and long-term (Medium/Impact on EBITDA < 1%)	⇧ ⬠ (Passenger Service, Cargo Service) ⇩	• High carbon emission flights may face additional costs and restrictions • Increasing market demand for low-carbon transportation, such as replacing short-haul flights with land transportation	• Shifting consumer preferences, with low-carbon travel becoming a trend • Offer customers carbon offset options, allowing travelers to select their preferred carbon reduction solutions	• Develop various new products and innovative service models (such as direct flights) to enhance service efficiency and meet market demand • Offering customers carbon offset options and SAF partnership programs to reduce customers' Scope 3 Greenhouse Gas Emissions
	Transition Risk — Reputational Risk		Short and medium-term (Low/Impact on EBITDA < 0.1%)	⬠ (Passenger Service, Cargo Safety)	• Growing consumer emphasis on low-carbon and eco-friendly practices affects brand trust and may reduce revenue • Regulatory violations may result in penalties	• Strengthen communication with stakeholders to build recognition and support for environmental actions, enhancing reputation and brand value • Align with government environmental policies to foster industry collaboration and boost competitiveness	• Support scientific research, engage with external stakeholders, and participate in ESG rankings to elevate corporate image • Collaborate with domestic and international low-carbon product suppliers to improve supply chain sustainability
Increased Frequency of Extreme Weather Events Leading to Aviation Safety Risks	Physical Risk — Acute Physical Risk	• Referring to the IPCC Sixth Assessment Report Scenarios, such as:RCP 1.9 / SSP1 1.9 (Global Temperature Increase ≤ 1.5°C by 2100) • RCP 4.5 / SSP2 4.5 (Global Temperature Increase of 2.4-2.6°C by 2100) • RCP 8.5 / SSP5 8.5 (Global Temperature Increase of 4.3-4.8°C by 2100)	Short and medium term (Medium/Impact on EBITDA < 1%)	⇧ ⬠ (Business Development, Passenger Service, Cargo Service, Flight Safety) ⇩	• Impacts of extreme weather events such as flooding, strong winds, heavy rain, and fog can lead to flight disruptions or cancellations, hinder passenger connections, and cause delays in cargo transport, resulting in increased operational costs (diversion, passenger arrangements) • Extreme weather disrupts raw material supply, impacts market cycles, and reduces load factor and revenue	• Enhance risk forecasting and emergency response capabilities to effectively address customer needs and travel arrangements, improving service quality and reputation • Manage customer needs effectively during disruptions to boost loyalty, retention, and revenue • Enhance integration and scheduling of passenger and cargo operations to improve efficiency and revenue	• Expand operational procedures and emergency mechanisms, enhance staff training, and improve cross-department coordination • Introduce a professional meteorological team to improve weather forecast accuracy and to facilitate timely aircraft scheduling operations • Enhance the coordination of supply chain and partnership collaboration to ensure the safety and smooth flow of cargo and personnel transportation

Issue	Risk Type	Scenario Analysis	Impact Timelines (Severity)	Impact Level	Risks and Financial Impacts	Opportunities and Financial Benefits	Response Management Methods
Impacts of Rising Average Temperatures and Uneven Rainfall Intensity on Businesses	Physical Risk — Chronic Physical Risk	▪ Referring to the IPCC Sixth Assessment Report Scenarios, such as:RCP 1.9 / SSP1 1.9 (Global Temperature Increase ≤ 1.5°C by 2100) ▪ RCP 4.5 / SSP2 4.5 (Global Temperature Increase of 2.4-2.6°C by 2100) ▪ RCP 8.5 / SSP5 8.5 (Global Temperature Increase of 4.3-4.8°C by 2100)	Long-term (Low/Impact on EBITDA < 0.1%)	⇧ ⬠ (Business Development, Passenger Service, Cargo Service, Flight Safety) ⬇	▪ Rising average temperatures lead to increased energy demand and costs ▪ Shifts in rainfall patterns and prolonged droughts affect water supply, service quality, hygiene, and food safety, leading to higher response costs	▪ Changes in operational processes and behaviors to reduce cost expenditures ▪ Plan and adopt renewable energy to lower fossil fuel reliance, reduce power shortage risks, and control costs ▪ Implement water-saving measures in operations to cut water usage and related costs ▪ Improve service processes and tools; develop eco-tourism offerings to boost revenue and competitiveness	▪ Set annual reduction targets and apply energy/resource-saving strategies to reduce waste ▪ Plan renewable energy facilities and apply for renewable energy certificates ▪ Improve water-saving, water storage equipment, and rainwater harvesting measures ▪ Strengthen drinking water management procedures and quality ▪ Enhance service processes and innovate business models

Financial Impact Analysis of Short, Medium and Long-Term Climate-Related Risks and Opportunities

Through the internal risk management mechanisms, CAL conducts identification, evaluation, responses, and review processes for the aforementioned climate issues. This includes risk matrix analysis for the short (by 2025), medium (by 2030), and long term (by 2040 to 2050) periods, as illustrated in the figure below, along with quantification of financial impacts. Please refer to the "CAL Task Force on Climate-Related Financial Disclosures (TCFD)" for the comprehensive analysis.
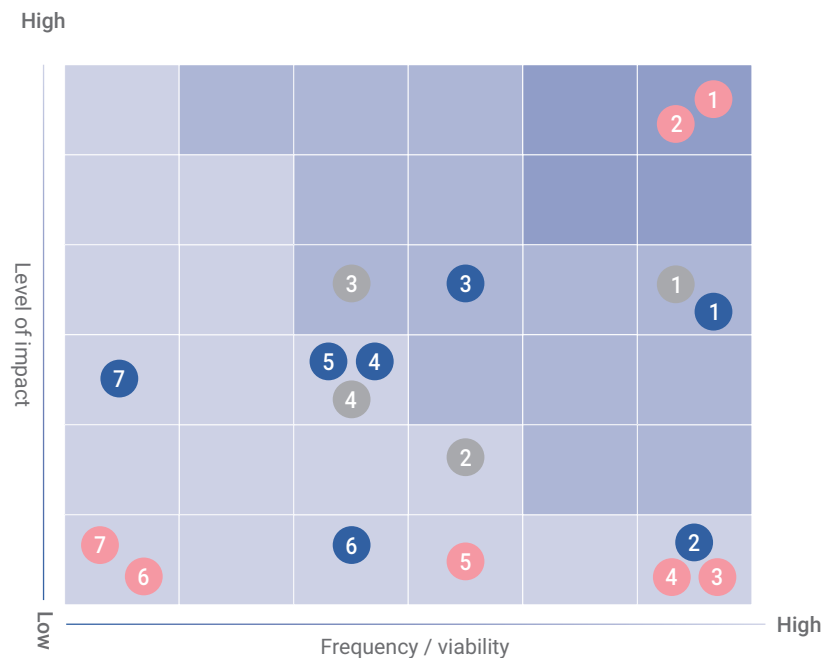
Opportunities
- Fuel saving flight network
- Reduce energy costs
- Improve the Company's image and revenue
- Increase resilience to extreme weather
- Improve management of water resources
- Issue green bonds to invest in renewable energy
- Invest in renewable energy to achieve net zero emissions targets

Transition risks
- Cost of sustainable fuels
- Cost of carbon offsetting and trading
- Cost of renewable energy
- Supplier management
- Issues of concern to stakeholders
- Impact of high temperatures on increased energy costs
- Impact of carbon tax on the cost of aviation materials

Physical risks
- Disappearance of routes (low terrain)
- Flooding (torrential rain, rise in sea level)
- Drought
- Impact of extreme weather on Flight operation

Climate Change Targets, Mitigation and Adaptation, Strategy and Actions

|	Item	Objective	Actions in 2024
Governance	Strengthen climate governance	Continue to submit climate governance reports to the Board of Directors	1. Submitted climate governance reports—covering natural resources and biodiversity issues—to the Board Risk Management Committee (renamed the Sustainability and Risk Management Committee in 2025) 2. Reported quarterly to the Board on the progress and performance of corporate and group greenhouse gas management
	Enhance management supervision and cross-departmental operations	Meet corporate governance and green finance requirements	1. Implemented the promotion of TCFD and the introduction of related standards and guidelines such as SASB, IFRS S2, and TNFD 2. Implemented continuous management of short, medium, and long-term ESG performance
Strategy	Enhance TCFD capabilities	Increase the comprehensiveness and depth of quantified financial information	1. Implemented standard operating procedures (SOP) 2. Continued to implement the cross-unit information platform
	Climate response strategies and management	Increase resilience for responding to climate change risks	1. Incorporated issues of climate risks and opportunities into the Company's overall strategies and plans and executed related response actions 2. Integrated climate change impact issues into route planning, operational performance review, and other operations to develop timely contingency strategies and adjust operational planning accordingly 3. Formulated policies and management measures on the Forest and Biodiversity Conservation, integrating them into supply chain management
	Participate in important engagements	Increase the understanding of international climate change issues and regulatory requirements	1. Participated in key international and domestic climate policy platforms to monitor regulatory trends and enhance influence 2. Advanced domestic SAF strategy by promoting industry-government-academia collaboration and engaging in the national SAF pilot program 3. Continued active involvement in the IAGOS-PGGM international scientific research program on climate change 4. Participated in and implemented forest and biodiversity conservation initiatives
Risk Management	Strengthen the risk management mechanisms for the corporate value chain	Increase resilience for responding to climate change risks	1. Integrated environmental risk management across the value chain by expanding GHG inventories and environmental (including natural resources) and energy risk assessments of key suppliers, strengthening climate risk and opportunity detection and management, and enhancing business continuity in response to extreme weather 2. Complied with Financial Supervisory Commission requirements by extending GHG inventories to overseas branches and supporting subsidiaries in the Consolidated Financial Statements to gradually build GHG management capabilities
	Strengthen the existing enterprise risk management mechanism	Implement risk management and strengthen emergency response mechanisms	1. Integrated climate factors into the enterprise risk management system to enhance climate risk and opportunity detection, response, and control across all units 2. Combined IAGOS-PGGM project data with outputs from the 777F turbulence detection algorithm to contribute to UN climate research and IATA's global turbulence studies, while strengthening climate resilience in route management and operations

	Item	Objective	Actions in 2024	
Risk Manage-ment	Respond to international carbon transition risks	Comply with ICAO, EU, and other international regulations for carbon reduction	1. Participated in the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) mechanism 2. Continued to enhance MRV capacity for EU ETS, UK ETS, and CORSIA mechanisms 3. Studied and performed carbon allowance /credit transactions	
	Implement carbon reduction and energy transformation	Net zero emissions in operating activities by 2050	1. Enhanced monitoring of electricity consumption and installed dedicated electricity meters on equipment/processes with high energy consumption 2. Continued to perform replacement and retrofitting of high-energy-consuming facilities 3. Installed renewable energy facilities such as solar PV, set and implemented installed capacity targets	4. Enhanced energy management systems and improvement of their effectiveness 5. Collaborated with international oil companies on Sustainable Aviation Fuel (SAF) promotion initiatives
Metrics and Targets	Continuously optimize GHG inventory	Expand the scope of the inventory and increase the quality of the data	1. Continued to conduct energy resource surveys at global operational sites, implemented GHG inventory and verification processes in accordance with ISO 14064:2018 Categories 1−6, and enhanced the quality of greenhouse gas emissions data 2. Deepened and expanded GHG inventory and verification operations for group companies and overseas branches	
	Implement carbon emission reduction targets and KPIs	Attain short, medium, and long term GHG reduction targets and net zero emission target for 2050 and pass SBTi certification	1. Achieved Science Based Targets initiative (SBTi) approval: By 2030, improve fuel efficiency by 26% compared to the 2019 baseline. The targeted emissions include Scope 1 (Category 1) and Scope 3 emissions related to fuel and energy-related activities (Category 4) 2. Established approximately 89 KPIs in environmental protection and carbon emission reduction, which are reviewed quarterly by the Environmental Committee chaired by the President	
	Attain flight carbon reduction targets	Attain short, medium, and long term GHG reduction targets and net zero emission target for 2050	1. Continued to promote fleet renewal, aircraft weight reduction, flight optimization, and O&M improvement plans 2. Implemented fleet plans in accordance with medium and long-term business growth and carbon reduction trends 3. Continued to improve aviation fuel efficiency, increased load factor, and focused on the development of new technologies and new low carbon aircraft for purchase at an appropriate time 4. Continuously promoted SAF usage and invited corporate customers to support and participate	
	Increase fuel efficiency	Increase the efficiency of corporate operations and energy usage	1. Continued to promote aviation fuel-saving operations, thereby increasing fuel efficiency year by year 2. Optimized route planning and developed the most suitable passenger/cargo fleet in response to the epidemic and market development trends	

Strategies and Risk Management Related to Natural Impact Mitigation

China Airlines (CAL) recognizes that humanity shares the Earth with wildlife, plants, and other species, and that we are only one part of this interconnected ecosystem. In fulfilling its "Forest and Biodiversity Commitment," CAL has adopted the TNFD framework and LEAP approach, using biodiversity databases and risk analysis tools to assess spatial risks across its own stations and outstations, directly managed Group companies, the top 10% of Tier-1 suppliers by procurement value, and downstream partners such as airport hotels.

With reference to tools like the Natural Capital Protocol and Science Based Targets Network, CAL has identified high-impact commodities across its operations and supply chain. The Company evaluates biodiversity impacts and dependencies under different scenarios, identifies related risks and opportunities, and sets corresponding strategies, indicators, and objectives.

To manage high-risk upstream products and services, CAL enforces its "Supplier Code of Conduct" and implements sustainable procurement mechanisms. Looking ahead, CAL will further refine its biodiversity risk assessment through tools such as ENCORE, IBAT, and Aqueduct to determine the most suitable application scenarios or tool combinations. These efforts aim to align with the lates trends, tools, and industry practices, and to explore collaborative solutions with partners.
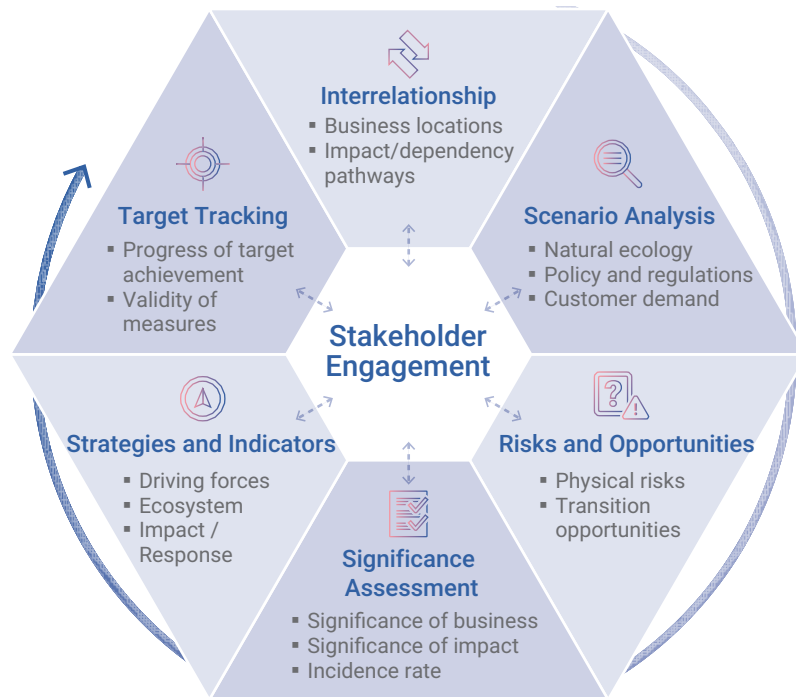
All findings are reported through CAL's climate risk reporting mechanism, submitted to the Corporate Sustainability Committee and the Environmental Committee for control and oversight, and summarized for the Board of Directors for governance and supervision.

1. Identification Results of Areas, Supplier Products and Services with Significant Impacts

CAL uses the Biodiversity Risk Filter (BRF), developed by WWF, alongside mapping tools from Taiwan's Forestry and Nature Conservation Agency to assess biodiversity risks. These tools overlay biodiversity hotspots, wildlife habitats, protected and conservation areas, and state-owned forests for validation. Findings show that none of CAL's operational sites in Taiwan fall within or near these sensitive areas. However, about 3% of overseas outstations are located in areas classified as high biodiversity risk.

It is important to note that the BRF currently groups the aviation industry under the broader "transport services" sector, which may not fully reflect the specific nature of airline operations. CAL's detailed assessment confirms that high-risk overseas locations operate within tightly regulated airport zones subject to government oversight. Most operational activities are within airport boundaries, while sales offices are located in urban commercial areas with minimal impact on local ecosystems—leading to a low overall biodiversity impact.

In line with the Science Based Targets Network (SBTN) guidance, CAL has identified high-impact commodities in its supply chain. Paper, wood products, and coffee beans have been prioritized for initial monitoring and response. CAL continues to engage with key suppliers to reduce ecological disturbance from their operations and is investing in enhanced risk identification and mitigation measures, including avoidance, minimization, restoration, and compensation strategies.

2. Impact/Dependency and Risk/Opportunity Assessment Results

CAL has selected its headquarters located in the Taoyuan Airport Zone as the target site for identifying and assessing its overall transportation service processes, including planning, procurement, supply of materials, flight, maintenance, and other upstream and downstream business processes. Using ISO 14001 life cycle perspective and environmental considerations, taking into account the scenario setting of the TNFD framework, LEAP analysis tools, and ecological realms classification, CAL distinguishes between short-term and medium- to long-term scenarios, with a division set for 2035. This approach involves considering the changes in natural ecosystems, national policies and regulations, the scale of actions, and customer awareness as scenario conditions. This includes Scenario 1 - "Ahead of the game" and Scenario 2 - "Go fast or go home," analyzing direct drivers and potential impacts and dependencies on ecosystem services, identifying and assessing resulting risks and opportunities, and their significance. Summary of Material Short-term and Medium- to Long-term Risks/Opportunities is as follows.

Short-term				
Material Issues	Impact/ Dependency	Risk/ Opportunity	Response Strategies	Targets
Aircraft technology enhancement can reduce greenhouse gas and air pollutant emissions	Impact	Transition Opportunity	1. Participating in international collaborative platforms to enhance dialogue 2. Considering fuel efficiency and ESG performance when purchasing aircraft 3. Engaging in ESG-related dialogues and collaborations with aircraft and equipment manufacturers	
Utilizing Single Use Plastic products or packaging materials	Impact	Transition Risk	1. Inviting suppliers to sign the Supplier Code of Conduct 2. Packaging reduction, single-use plastic alternatives, recycling and reuse, usage of recycled materials	
Illegal transport of wild animals and plants	Impact	Transition Risk	Implement the Buckingham Palace Declaration and action plan	
Emissions of greenhouse gases, air pollutants (GHG/SOx/NOx) and noise during aircraft takeoff, landing, and flight processes	Impact	Physical Risk	1. Continue to promote fuel-saving and noise-reduction operations 2. Using SAF 3. Continue to promote fleet renewal 4. Promote eco-friendly carbon offsetting projects 5. Support for bird conservation and restoration initiatives	

Medium to Long-Term				
Material Issues	Impact/ Dependency	Risk/ Opportunity	Response Strategies	Targets
Damage to stations due to loss of ecosystem protection, leading to impact on operations	Depen-dency	Physical Risk	1. Implementation of climate change mitigation and adaptation measures 2. Appropriately promote TCFD and TNFD operations 3. Monitor changes in operational conditions at the stations and implement appropriate response measures	
Deterioration of ecosystems affecting the demand for passenger/cargo services	Depen-dency	Transition Risk	1. Implementation of climate change mitigation and adaptation measures 2. Appropriately promote TCFD and TNFD operations 3. Monitor trends in passenger/cargo volume changes and implement appropriate response measures	
Domestic and international ecosystem changes have led to the emergence of new ecotourism destinations and demands	Depen-dency	Transition Opportunity	1. Monitor changes in passenger travel intent and implement appropriate response measures 2. Strengthening supplier/industry chain collaboration 3. Enhance awareness of ecotourism and implement supportive maintenance measures	
Passenger/cargo operations mistakenly purchasing high biodiversity risk ingredients, products, or packaging that contribute to deforestation or ecosystem destruction	Impact	Physical Risk	1. Request suppliers to adhere to the Supplier Code of Conduct 2. Strengthen traceability management and implement due diligence in procurement 3. Enhance the percentage of sustainable procurement 4. Increase the percentage of resource recycling and reuse, and the use of recycled materials 5. Strengthening supplier/industry chain collabo-ration	
Supply of agricultural products and packaging materials from ecosystems	Depen-dency	Physical Opportunity	1. Collaborating with local small-scale farmers to implement the Satoyama Initiative 2. Promoting sustainability certifications to implement local procurement practices 3. Strengthening collaboration with suppliers on eco-friendly design and product development	
Ecological degradation leading to large-scale outbreaks of infectious diseases, resulting in decreased demand for transportation	Depen-dency	Transition Risk	1. Improving cabin cleanliness 2. Improving the preparation and drills of epidemic prevention 3. Support ecological conservation, enhance diverse ecosystems, and strengthen ecological resilience	

Note: If it is a short-term material issue, it is not listed again in this table for response strategies and management targets and indicators.

To effectively manage the progress and performance of response strategies and actions, China Airlines also refers to the objective/indicator recommendations from the TNFD, the Natural Capital Protocol, and the Science Based Targets Network (SBTN) in formulating corresponding management indicators and operational objectives.

Indicator Category	Indicator Content	Operational Objectives
Driver Indicators	Carbon emissions and fuel procurement volume	1. Improve annual aviation fuel efficiency by 1.5% 2. Attain net zero emissions by 2050 3. Reduce carbon emissions in ground operations by 5%, 15%, and 60%, compared to 2023 levels, by 2025, 2030, and 2040, respectively 4. Use 0.5%, 5%, and 40% of SAF by 2025, 2030, and 2040, respectively
	Use of food ingredients, products, and wood/paper packaging materials	Reduce use of Single Use Plastic (SUP) for in-flight services by 90% by 2025, and by 100% by 2030. Embargoing transport of illegal wildlife and prohibiting use of illegal species as food ingredients
Impact Level Indicators	Changes in operational conditions at stations (such as flooding, rainfall, high temperatures), including the frequency of abnormalities, exposure to physical risks of enterprise locations, production lines, facilities, and equipment	A total of 2, 4, and 10 biodiversity conservation-related activities or initiatives have been participated in and implemented since 2023 by 2025, 2030, and 2040, respectively
	Asset value and annual revenue from ecotourism operations in areas affected by physical risks	
Key Performance Indicators	The proportion of locally sourced ingredients/products and procurement of sustainable labels/certifications	Use 10%, 50%, and 80% of sustainably certified paper/wood items for air/ground service needs by 2025, 2030, and 2040, respectively

Stakeholder Engagement

China Airlines (CAL) is dedicated to sustainable development, emphasizing environmental coexistence and social prosperity. Recognizing the close link between climate change and biodiversity, CAL balances climate mitigation efforts with ecological conservation and community well-being. Biodiversity considerations have been integrated into risk management processes across CAL's group operations, outstations, and suppliers, covering analysis, assessment, and response throughout the entire value chain.

In 2024, CAL supported the Forestry and Nature Conservation Agency and Saisiyat tribal elders in attending a side event at COP16 hosted by the International Partnership for the Satoyama Initia-

tive (IPSI). The event highlighted successful co-management cases of forests between indigenous peoples and the government, fostering multi-stakeholder dialogue and shared growth. CAL also leveraged the collaborative reforestation site in Nanzhuang to organize ecological tours for business partners, promoting firsthand forest experience.

Adhering to the Company's human rights policy, CAL safeguards stakeholder rights and requires employees and suppliers to conduct due diligence through education, training, and the Supplier Code of Conduct.

⭐ Best Practices

Supporting Civic Collaboration to Co-Create an Ecological Journey

China Airlines recognizes the critical importance of ecological resources in addressing climate change and providing economic, service, informational, and psychological values to human society. In 2022, CAL partnered with the Taoyuan City Government to plant hundreds of native Taiwanese saplings at the cultural landmark "Hengshan Calligraphy Art Park". In 2023, CAL further engaged in a national-level afforestation project initiated by the Forestry and Nature Conservation Agency under Ministry of Agriculture (FANCA), adopting nearly 2 hectares of forest land in Nanzhuang, Miaoli, where 4,250 native tree species "Taiwania" were planted with the collaboration of the local Saisiyat tribe, who also supported the site's afforestation and nurturing efforts. CAL also supports sustainable tourism by commissioning the local Saisiyat tribe to maintain the Jiali Mountain Trail, demonstrating its commitment to forest co-existence and shared prosperity with indigenous communities.

The Senior Vice President of China Airlines led core members of the Corporate Environmental Committee to the national-level afforestation project site, which has been designated as a key development case by the International Partnership for Satoyama Initiative (IPSI), to conduct tree planting.

In 2024, CAL expanded its collaboration with the Hsinchu Branch of the FANCA. This initiative includes the adoption of an additional 5.25 hectares of forest land, as well as new responsibilities for maintaining and upgrading facilities along the Daping Section (0−0.3K) of the Jialishan Trail. Led by the Senior Vice

President, core members of the Corporate Environmental Committee joined the FANCA and the Saisiyat Indigenous Forestry and Labor Cooperative in exploring the beauty of the mountains. On April 15, 2025, China Airlines took a further step by inviting business partners to "breathe with the forest" and explored this site which was certified under the Forest Stewardship Council (FSC) "Sustainable Forest Management Standards". This initiative aims to spark broader participation and raise sustainability awareness, embodying the spirit of the Satoyama Initiative. By uniting diverse forces, CAL seeks to realize a sustainable vision that balances social, economic, and forest resource preservation—a win-win-win for all.

China Airlines invited business partners to explore the beauty of the mountains and forests, actively supporting forest co-existence and mutual prosperity with Indigenous communities. The initiative also aimed to raise sustainability awareness and embody the spirit of the Satoyama Initiative.

2.3.3 Net Zero Carbon Emissions

Net Zero by 2050 and SBTi Objectives

CAL complies with the IATA and national carbon reduction targets by leading the industry in announcing the "target for achieving net-zero carbon emissions by 2050" in October 2021. Following this declaration, CAL outlined short, medium, and long-term objectives for flight operations, ground operations, and use of sustainable aviation fuel. China Airlines has been actively involved in discussions on carbon reduction technologies since 2017 and continues to engage in dialogues regarding reduction strategy targets for the aviation industry through the International Air Transport Association (IATA) platform. Building on this operational foundation, CAL officially signed onto the Science Based Targets initiative (SBTi) in 2022, setting a target to improve fuel efficiency by 26% by 2030 compared to the 2019 baseline. This target encompasses Scope 1 (Category 1) and Scope 3 emissions, as well as fuel and energy-related activities (Category 4). This target was approved by the Science Based Targets initiative (SBTi) in 2024, ensuring compliance with the global carbon reduction goals outlined in the United Nations Paris Agreement.
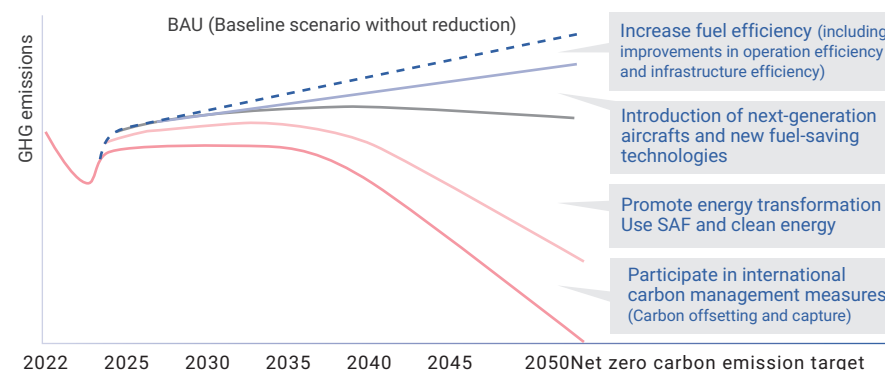
Strategy, Approach, and Carbon Reduction Pathway for Attaining Net Zero Carbon Emissions

CAL implements 5 core strategies to achieve long-term carbon emission reduction targets, including fuel efficiency improvement (e.g., implementation of various fuel saving and carbon reduction measures and continuous improvement of load factor), upgraded TCFD operations and emergency response systems, promotion of the use of sustainable aviation fuel (SAF), timely participation in international carbon control mechanisms (e.g., CORSIA, EU TS, and UK ETS), timely introduction of new technologies (e.g., continuous introduction of energy-efficient aircraft, and the monitoring and evaluation of developments of hydrogen-fueled aircraft/short-range electric aircraft, aiming to strive for the best price and timing of entry introduction).

In addition, China Airlines has introduced an internal carbon pricing mechanism, incorporating cost-benefit analysis of factors such as compliance with domestic and international GHG regulations (such as international carbon regulations and the operational costs of SAF), promotion of energy efficiency and low-carbon investments (such as the use of renewable energy), and encouragement of internal behavioral changes. The proposed carbon pricing is set at a shadow price of €100 per ton of carbon, serving as a reference point for risk analysis, operational decision-making on carbon reduction initiatives and planning for low-carbon investments. China Airlines has established a climate governance framework through its Sustainability Committee, Environmental Committee, and TCFD operational platform. Each year, the results of these efforts will be reported to the Board of Directors for oversight and management, ensuring continued progress in accordance with the carbon reduction pathway.

CAL Carbon Reduction Path

BAU (Baseline scenario without reduction)

GHG emissions

Increase fuel efficiency (including improvements in operation efficiency and infrastructure efficiency)

Introduction of next-generation aircrafts and new fuel-saving technologies

Promote energy transformation Use SAF and clean energy

Participate in international carbon management measures (Carbon offsetting and capture)

2022 2025 2030 2035 2040 2045 2050 Net zero carbon emission target

CAL's Net Zero Carbon Emission Targets and Key Strategies

Strategies	Contribution to 2030 Targets	2024 Key Initiatives
Increase fuel efficiency	2-4%	1. Implemented 11 initiatives for saving aviation fuel and reducing carbon emissions, with a total carbon reduction of approximately 47,477 metric tons 2. Enhance passenger and freight load factors
Develop new technology	10-15%	Continued to introduce A321neo and 777F cargo aircraft, along with the launch of the new generation of fuel-efficient 787 aircraft starting in 2025
Promote sustainable aviation fuels	3-5%	1. Conducted sustainable flight and became Taiwan's first airline to use SAF on commercial flights 2. Implement SAF collaboration project with corporate passenger and cargo customers 3. Participated in SAF negotiations and cooperation between the government and oil companies 4. Supported the government's SAF pilot program
Participate in international carbon management mechanisms	2-11%	1. Completed the CORSIA international flight carbon emissions MRV operation 2. Evaluated the purchase and management of carbon credits

Best Practices

Engaging in international collaboration to support global carbon reduction initiatives.

In 2023, CAL and IATA have signed the CO2 Connect collaboration program, which involves sharing and collaborating on aviation carbon footprint emission data to enhance the application of information on aviation carbon emissions.

In addition, China Airlines continues to deepen its international cooperation with the IAGOS-PGGM Pacific Greenhouse Gases Measurement Project. By integrating the collected data and information, CAL not only contributes to international climate change research led by the United Nations but also enhances its own route management and operational climate resilience.

SAF Collaboration Project – Invite Customers to Jointly Support the SAF Collaboration Project

Promoting energy transition is essential for the aviation industry to achieve net-zero carbon goals, requiring collaboration across the entire industry chain. As a sustainability leader in transportation, China Airlines (CAL) was the first Taiwanese airline to incorporate Sustainable Aviation Fuel (SAF). Since 2017, CAL has used SAF on delivery flights for new A350-900 and A321neo aircraft, remaining the only Taiwanese airline utilizing SAF from 2017 to 2022. In 2024, Mandarin Airlines, part of the CAL Group, continued this commitment by using 30% SAF on its new ATR aircraft delivery flight.

In 2023, CAL became the first Taiwanese airline to join an international SAF program initiated by oil companies and blockchain platforms, pioneering a corporate SAF procurement collaboration model with traceable carbon reduction reports. Partnering with supply chain vendors and corporate customers, CAL's SAF Collaboration Project uses SAF that reduces carbon emissions by over 90% compared to traditional jet fuel, collectively lowering the Group's carbon footprint.

During 2023–2024, China Airlines operated commercial demonstration flights using SAF as part of SkyTeam's "The Aviation Challenge" campaign, reducing both our direct (Scope 1) and client transportation-related indirect (Scope 3) GHG emissions by approximately 72 metric tons of CO2e. CAL will continue collaborating with supply chain partners to support the global sustainable energy transition and drive joint carbon reduction efforts.

Looking ahead to 2025, China Airlines will closely monitor domestic and international SAF technologies and markets. Leveraging global sourcing experience, CAL will assess supply feasibility, policy developments, and operational conditions to advance its SAF procurement strategy. Active participation in government and supplier initiatives will support the achievement of CAL's short-, medium-, and long-term sustainability goals.

China Airlines has partnered with corporate customers to adopt SAF. In 2024, it collaborated with Morrison Express Corp. to operate Taiwan's first cargo flight incorporating SAF, and worked with CTBC Bank to implement SAF on the passenger flight, effectively reducing carbon emissions during the transportation process.

Mandarin Airlines' new aircraft, during its delivery flight from the ATR Delivery Center in France back to Taiwan, utilized fuel containing 30% Sustainable Aviation Fuel (SAF).

2.3.4 Achievements in Environmental Sustainability

While delivering quality services, China Airlines leverages its Corporate Environmental Committee to plan and promote a range of environmental and energy-saving initiatives tailored to each business unit, continuously improving ecological efficiency. In 2024, CAL introduced one leased A350-900, four A321neo passenger aircraft, and two 777F cargo aircraft. In 2025, CAL will continue introducing A321neo aircraft and welcome the new Boeing 787 fleet, laying the foundation for enhanced fuel efficiency. The aviation fuel management team monitors fleet performance and implements fuel-saving measures across planning, operations, maintenance, and management to minimize the environmental impact of passenger and cargo services. CAL applies a lifecycle approach across headquarters and outstation operations, integrating environmental considerations from design and procurement to use, maintenance, and disposal. Through a robust environmental and energy management system, CAL aims to achieve operational goals without significant penalties, enhance energy efficiency, reduce waste, and advance circular economy practices.

In 2024, CAL implemented 78 environmental and energy-saving measures and 11 flight fuel-saving initiatives, reducing carbon emissions by 47,477 tons with an achievement rate of 146%. In 2025, 76 measures are planned, with an expected reduction of 38,926 tons.

Management Target	Strategies/Measures	2024 Outcomes and Performance
Zero Penalties and Implementation of the Environmental Management Cycle (PDCA)	1. Identify compliance obligations and assess conformity quarterly. 2. Implementation of Environmental Management Audits in accordance with ISO 14001/50001 Standards, including two internal audits and one external audit annually. Each Environmental Management Committee/Aviation Fuel Management Working Group also conduct audits of outstations and suppliers based on their business functions.	No significant environmental penalty events (Note 1)
Increase Aviation Fuel Efficiency	**Promoting energy efficient flights** 1. Continuously enhance fleet renewal by acquiring additional Airbus A350-1000 passenger aircraft, Boeing 777-9 passenger aircraft, and Boeing 777-8F cargo aircraft, with deliveries starting in 2029 for long-haul routes to North America and Europe	

Management Target	Management Strategies/Measures	2024 Outcomes and Performance
Increase Aviation Fuel Efficiency	**Promoting energy efficient flights** 2. Adopt environmentally friendly, fuel-efficient flight operations where software, hardware, and weather conditions permit, such as reducing APU activation time and implementing engine-out taxi 3. Optimize fleet fuel efficiency monitoring and measurement mechanisms to identify improvement opportunities 4. Implement station audit to enhance the execution rate of fuel-saving measures 5. Engage on intermodal transport to achieve low-carbon journeys	CAL carried out 11 fuel saving measures and saved 18,649 kiloliters of fuel with an achievement rate of 147%
	Improving ground service control 1. Improve fuel efficiency from the planning stage by incorporating fuel use into flight planning, optimizing routes and alternate airport selection, and refining aircraft center of gravity 2. Refine ground operations such as using trailer power supply and airport ground power supply instead of APU to save aircraft fuel consumption	
	Fortifying regular repair and maintenance 1. Continue to monitor and maintain aircraft performance and manage and improve fuel conservation measures 2. Regularly clean critical equipment to maintain optimal conditions of aircraft 3. Maintain good communication channels with the original manufacturer to obtain information on the latest technology developments and performance optimization solutions 4. Select environmentally friendly paint or paint remover, ensuring a balance between fuel efficiency and the reduction of air pollution 5. CAL's A350 fleet uses the BC/CC paint system and will apply to newly purchased 787 aircraft as well	
	Aircraft weight reduction 1. Reduce aircraft loading and fuel consumption with precision measures. For example: Precision refueling, precision water supply, and weight reduction for in-flight supplies 2. Implement the digitization of pilot paper manuals	

Management Target	Management Strategies/Measures	2024 Outcomes and Performance
Increase Building Energy Efficiency	Maintain Green Building certification, expand the installation of renewable energy facilities, fully implement regenerative power systems in headquarters elevators, and replace outdated high-energy-consuming equipment as part of energy-saving measures. Additionally, assess energy resilience facilities	Saved 261,000 kilo-watt-hours of electricity, achieving 78% of the target (Note 2)
Increase Ground Vehicle Fuel Efficiency	Fuel conservation measures such as enhancing the management of the use and efficiency of company vehicles, promoting electrification of transportation and equipment, establishing charging infrastructure to support electric vehicles, promoting ride-merging/ride-sharing mechanisms, and the idling shutdown policy	Reduced 8 kiloliters of fuel and reduced carbon emissions by 20 tons with an achievement rate of 175%
Increase the Percentage of Renewable Energy	Develop diverse cooperation plans to promote the use of Sustainable Aviation Fuel and to increase the installation of solar power facilities	Added 26.6 kiloliters of Sustainable Aviation Fuel (SAF); generated 297,000 kWh of solar power, reducing approximately 214 metric tons of carbon emissions; installed an additional 371 kW of solar energy capacity, achieving a 100% implementation rate Mandarin Airlines added 30% SAF during the delivery flight of their ATR aircraft
Reduced Resource Consumption and Increase Environmental Protection Awareness	Continuously enhance digitalization in cargo, flight, cabin, and administrative operations. Implement environmental measures including food waste processors, upgraded wastewater treatment, energy-saving photocopiers, and recycling of paper containers and slurry for reuse	Reduced 28 tons of paper consumption and waste and reduced carbon emissions by 120 tons with an implementation rate of 100%

Note 1: Environmental penalties exceeding USD 10,000 are considered significant. No such penalties were recorded during 2021–2024.

Note 2: The installation of solar power facilities was delayed due to weather factors, resulting in the energy-saving measures not achieving the expected benefits.

Note 3: Source of the carbon emission factor: 2020 electricity emission factor, Greenhouse Gas Inventory v.6.0.4 (gasoline/diesel).

Carbon Emissions from Air and Ground

GRI 305-1.305-2. 305-3.305-5

Greenhouse gas emissions from aviation fuel combustion account for over 90% of China Airlines' total emissions. In response, CAL continues to promote fleet renewal (see section2.1.2) and improve fuel efficiency through the dedicated Aviation Fuel Management Team, which develops targeted measures spanning planning, management, and execution.

On the ground, CAL systematically operates ISO 50001 and ISO 14001 management systems to promote energy-saving and environmental initiatives. These include reducing electricity and fuel use, digitizing operations, managing waste, sourcing local ingredients, and encouraging ride-sharing—efforts aimed at reducing Scope 3–6 emissions. Following the GHG Protocol Scope 3 guidelines, CAL calculates emissions across 15 categories, including purchased goods, capital goods, energy-related activities not included in Scope 1 and 2, transportation and distribution, waste disposal, commuting, leased assets, investments, and others. To ensure robust GHG management, CAL has engaged third-party verification bodies accredited by the IAF system since 2009. Verifications are conducted annually based on ISO 14064-1 (reasonable assurance) and ISO 14064-3 standards.

In 2024, despite a 15% year-over-year increase in flight operations, CAL's total GHG emissions rose only 2.93%, reaching 7,677,233 tons CO_2e. Ground operation emissions decreased by 2.06% to 18,408 tons, continuing a downward trend.

Scope of GHG	Company	Item	2019	2021	2022	2023	2024
Category 1		Flight Operations	7,059,083	5,875,531	5,435,050	6,048,568	6,224,228
		Ground Operations in Taiwan	4,981	2,897	4,041	3,028	3,328
		Ground Operations in Outstations (Note)	362	197	497	1,242	806
		Carbon Intensity (ton CO_2e/Million NTD)	48.26	44.49	38.56	37.44	35.55
		Flight Operations	237,701	63,987	89,500	126,743	119,492
		Flight Operations	362,794	988	31,306	289,358	399,684
Category 2		Ground Operations	18,169	16,697	16,468	15,767	15,079
		Ground Operations in Outstations (Note)	1,033	551	863	1,072	1,045
		Carbon Intensity (ton CO_2e/Million NTD)	0.13	0.13	0.12	0.10	0.09
		Ground Operations	901	839	805	742	735
		Ground Operations	106	108	265	220	240
Categories 3-6 (Note)	CAL's Operating Activities	Ground Operations	1,607,690	1,364,016	1,240,935	1,389,211	1,432,790
		Carbon Intensity (ton CO_2e/Million NTD)	10.98	10.32	8.80	8.59	8.18

Note 1: The statistics contain 100% of the aviation fuels used by China Airlines (including both domestic and overseas branches, outstations), Mandarin Airlines, and Tigerair Taiwan.

Note 2: Of the total greenhouse gas emissions of China Airlines in 2024, 7,677,277 metric tons of CO_2e (accounting for 100% of total emissions) were verified by an independent verification organization in accordance with the ISO 14064-1:2018 inventory standard, the certification and verification criteria of ISO 14066:2011, ISO 14065:2020, and ISO 14064-3:2019. The verification was conducted at a reasonable assurance level, and the conclusion was that the data passed verification. Prior to 2022, only the ground operations data from outstations (accounting for less than 0.03% of the total emissions) were not subject to external verification.

Note 3: CAL adheres to ISO 14064-1:2018 and the GHG Protocol Scope 3 guidelines, 15 categories of emissions are calculated, including emissions from purchased goods, capital goods, fuel and energy-related activities not included in Scope 1 and 2, upstream and downstream transportation and distribution, waste disposal, employee commuting, upstream and downstream leased assets, investments, and others.

Note 4: Carbon intensity(ton CO_2e/Thousand RTK) = GHG emissions/Total RTK; (ton CO_2e/Million Dollars) = GHG emissions/Revenue.

Note 5: In 2024, other Group Subsidiaries reported total emissions of 590,061 tons of CO_2e for Categories 1 and 2, and 134,347 tons of CO_2e for Categories 3-6.

★ Best Practices

Solar Power Supporting the Airport's Net-Zero Transition

To steadily achieve carbon reduction targets in ground operations, CAL has installed a 276 kW solar photovoltaic (PV) system at CAL Park. The Maintenance Division is also phasing in additional systems, with 193 kW installed in 2024 and 197 kW planned for 2025. CAL is actively phasing out outdated equipment and promoting vehicle and equipment electrification. In 2024, 14 electric units were added, including 2 small tow tractors, 8 supply vehicles, and 4 forklifts. Dedicated charging areas were also installed to support airport-wide net-zero efforts alongside existing airport infrastructure.

(left) CAL continues to procure various types of electric vehicles and equipment, including small tow tractors, supply vehicles; a total of 14 units were introduced in 2024.

(right) CAL EMO Park has completed the first phase of its solar photovoltaic system in 2024, with the second phase scheduled to begin power generation in Q3 of 2025.

Aviation Fuel Efficiency Performance `GRI 302-3.305-4`

In 2024, the overall aviation fuel efficiency was 0.2284 tons per thousand Revenue Ton Kilometers (RTK), achieving approximately 102% of the target value of 0.2338 tons per 1,000 RTK. In 2024, the total fuel consumption increased by 2.9% compared to 2023, while the performance per RTK saw an increase of 3.02%. In the future, we will continue to refine and implement fuel-saving measures to achieve the objectives and plans of increasing fuel efficiency by 1.5% annually.

Item		Fuel Consumption (tons/PJ)	CO₂ Emissions (tons CO₂e)	Transport Volume (thousand RTK)	Fuel Efficiency (tons/ thousand RTK)	Carbon intensity (ton CO₂e/ thousand RTK)
	2019	2,230,971/98	7,059,083	9,072,762	0.2459	0.7781
	2021	1,857,073/82	5,875,530	7,605,201	0.2442	0.7726
	2022	1,717,758/76	5,435,050	6,949,143	0.2472	0.7821
	2023	1,911,669/84	6,048,568	8,359,335	0.2287	0.7236
	2024	1,967,183/87	6,224,228	8,611,404	0.2284	0.7228
	2021	26,614/1.17	84,101	25,723	1.0346	3.2694
	2022	29,709/1.31	93,881	41,169	0.7216	2.2804
	2023	39,903/1.76	126,093	66,367	0.6012	1.8999
	2024	37,676/1.66	119,055	69,250	0.5441	1.7192
	2021	308 /0.01	973	521	0.5910	1.8676
	2022	9,895/0.41	31,268	27,129	0.3647	1.1526
	2023	91,738/4.04	289,892	380,879	0.2409	0.7611
	2024	125,882/5.55	397,787	560,068	0.2248	0.7102

Note 1: The lower the fuel efficiency and carbon intensity, the better the performance.
Note 2: The aviation fuel calorific value is calculated using the IPCC-announced coefficient, source: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, TABLE 1.2.

Best Practices

Applying PDCA to Enhance Fuel-saving Efforts

In 2024, the Aviation Fuel Management Team implemented 11 fuel-saving initiatives, with the use of Ground Power Units (GPU) instead of Auxiliary Power Units (APU) at outstations proving especially effective. By using GPUs to supply electricity and air while aircraft are on the ground, APUs can be shut down, improving energy efficiency and reducing carbon emissions.

To increase GPU usage, the team conducted a comprehensive outstation assessment and issued Threat and Error Management (TEM) guidelines to flight crews. A Level 1 internal audit revealed lower-than-expected GPU use at the Hong Kong station. In response, on-site inspections were carried out, and the team worked with the local ground handling agent to introduce targeted improvements, including increased staffing, enhanced training, incentive programs, and detailed operational tracking.

As a result, GPU usage at Hong Kong improved by approximately 30%, leading to annual fuel savings of about 429,000 pounds.

Replacing APU with GPU via Jet Bridge for Enhanced Efficiency and Emission Reduction

Energy Usage `GRI 302-1.302-2.302-4.302-5`

CAL continues to implement ISO 50001 Energy Management by fully considering energy-saving and carbon reduction benefits into decision-making during the design/procurement stages of significant energy use, and by establishing energy monitoring systems that exceed regulatory requirements. CAL also optimizes fuel management for official vehicles, implements internal audits, and integrates concerns from stakeholders (such as the reporting requirement of major energy users and adjustments to electricity-saving targets, and evaluations of energy storage system benefits) to comprehensively enhance energy management integrity and implementation. This effort aims to create a low-carbon operational and office environment. In response to the upgrade of energy monitoring system in 2023, CAL launched the "Energy Management System Enhancement Project" in 2024. External consultants were invited to share recent trends and regulatory developments in domestic and international energy management. They also assisted in reviewing and optimizing the energy review forms. Additionally, through targeted training sessions, practical approaches to establishing energy performance indicators, tracking estimated energy consumption results,

and implementing improvements were introduced. These initiatives aimed to enhance employee awareness of energy conservation and promote energy use efficiency.

In 2024, CAL's total electricity consumption was 31,921 kWh, representing a decrease of 1.5% compared to 2023 (31,972 kWh). As of March 2025, China Airlines has established three solar photovoltaic power generation facilities, including a 276 kW facility at CAL Park and a 193 kW facility at the EMO Park. The installed capacity represents approximately 6% of the contracted capacity, and the solar power generation efficiency is maintained at 9,800 kWh/kW. In 2025, we will continue to plan for the installation of a 194 kW solar photovoltaic power generation facility. Additionally, to support the electrification of vehicles and equipment, charging stations are being continuously installed across the CAL Park and EMO Park, thereby enhancing the foundational infrastructure for electric operations. In addition, with respect to enhancing building energy efficiency, CAL Park will commence elevator renovation operations in 2025, opting for innovative technology in the regenerative power system to consistently adhere to green building standards and principles.

Regarding ground operations, despite the increase in operational flight numbers in 2024, which led to a rise in back-end support demands, total gasoline and diesel consumption was 886 kiloliters, --a 4% reduction compared to 921 kiloliters in 2023. Fuel efficiency also showed a positive trend. Going forward, we will continue to enhance the management of fuel consumption for company vehicles, implement a reminder system, and accelerate the replacement of aging vehicles and electrification operations. Furthermore, 26.6 kiloliters of SAF was continuously used to the aviation sector.

To achieve the 2050 net-zero target, CAL will continue to inventory and increase the install renewable energy equipment, alongside green office practices, and aims to achieve 10% renewable energy installation capacity by 2030 and 15% by 2040.

Energy Consumption Data					
Types of Energy	Unit	2021	2022	2023	2024
Non-renewable Fuels	MWh/GJ	22,761,510 / 81,934,882	21,053,443 / 75,786,331	23,429,847 / 84,340,702	24,109,748 / 86,788,148
Renewable Fuels (SAF)	MWh/GJ	94 / 338	181 / 650	299 / 1,076	261 / 938
Electricity (purchased)	MWh/GJ	33,260 / 119,728	32,354 / 116,465	31,853 / 114,662	31,813 / 114,518
Solar PV system generation (self-consumption)	MWh/GJ	127 / 457	110 / 396	119 / 428	108 / 389
Elevator Power Regeneration System (recycled for own use)	KWh/GJ	889 / 3.20	11,213 / 40.36	12,111 / 43.60	11,304 / 40.69

Note 1: Non-renewable fuels include gasoline, diesel, liquefied petroleum gas (LPG), liquefied natural gas (LNG), and aviation fuel. All CAL aircraft are counted as part of the calculation of aircraft fuel consumption.

Note 2: The scope of purchased electricity covers park areas (CAL Park, Taipei Branch, Songshan Office), maintenance divisions (Hangars 2 and 3, Engine Maintenance Plant), and Kaohsiung Branch. It included purchased electricity which accounted for 11.6% or approximately 3,690MWh of renewable energy in 2024 (source: https://reurl.cc/eXMEr7)

Note 3: The 98.21 kW solar project in CAL Park obtained 108 renewable energy certificates in 2024.

Note 4: The calorific value of aviation fuel is calculated using the IPCC-announced coefficients, while the calorific values for natural gas and sustainable aviation fuel are derived from the actual values provided by the suppliers. The calorific values for residual fuel oil and diesel are calculated using the latest energy product unit calorific value table from the Energy Bureau.

Water and Wastewater

CAL conducts a water balance survey to identify hotspots of water resource consumption, including water consumption from cleaning aircraft, domestic water consumption, and air-conditioning water consumption. Subsequently, we improve facilities and optimize operating procedures to reduce water resource consumption and adequately process sewage and wastewater.

1. Water source development (Increasing supply)

The water recycling concept was included in the scope of green building design of CAL Park in the preliminary development process. We set up a rainwater recovery system with a capacity of 1,300 tons and updated pipelines afterwards to direct wastewater from the central drinking water system and the condensate from the chiller into the rainwater recovery system for use in plant watering and flushing in CAL Park, achieving a recycling rate of 48%. We carried out optimization of the pipelines and wastewater treatment facilities in the EMO Park for industrial (organic) wastewater treatment and reuse the water for cleaning vehicles and watering plants according to regulations and permit measures. We recycled approximately 3,753 tons of water in 2024, achieving a recycling rate of 6.5%.

2. Conservation (Reducing consumption)

We fully incorporated water conservation label products into the CAL Park. We also selected equipment with water conservation label and water-saving functions for subsequent equipment replacements or upgrades.

EMO Park implements process and management improvements to reduce the water consumption in maintenance and repairs and domestic water consumption. The measures include adoption of environmentally friendly water-saving cleaning solutions, which reduce aircraft cleaning water consumption by 90%. We also installed water meters comprehensively to monitor the consumption of water resource and implement hotspot inventory and management.

3. Strengthening management

CAL is dedicated to water stewardship, and has actively set short, medium, and long-term water conservation targets and annual performance targets and management plans for water resource management. We have been placed under the management of the Corporate Environmental Committee. We also continued to invest and upgrade wastewater treatment equipment to enhance the treatment performance, and by implementing internal/external audits and emergency response and evacuation drills, we aimed at enhancing processing

efficiency and preventive measures. To maintain the capacity and stability of the wastewater treatment plant, the domestic wastewater from the EMO park undergoes grease traps and pre-treatment facilities to reduce the BOD concentration, before being discharged into the wastewater treatment plant.

In the first quarter of 2024, there was an abnormal and significant increase in water usage at the CAL Park. After investigation, it was determined that this rise was due to higher irrigation demand for plant maintenance. Following a detailed review, adjustments were made to the irrigation schedule, and horticultural maintenance training

was conducted. As a result, water usage stabilized starting from the second quarter. In 2024, CAL's tap water withdrawal totaled 114,367 cubic meters, a 3.2% reduction compared to 2023. This also achieved the Sustainable Development Goal (SDG) of reducing water consumption by 6% in 2024 compared to 2018. CAL will continue to raise awareness of water conservation, improve wastewater treatment efficiency, upgrade technologies, reinforce change management, among other initiatives. CAL is committed to achieving its targets of reducing water consumption by 7%, 10%, and 12% compared to 2018 levels by 2025, 2030, and 2040, respectively.

Water Usage Area	Water Shortage Level	Water Supply Unit (Water Type)	Wastewater Processing Unit (level)	Effluent Site	Effluent Standard	
CAL Park	Located in Taoyuan City with high water resource risks	Taiwan Water Corporation (freshwater)	Domestic sewage	Nankan River (River with Category C water bodies)	pH: 6 ~ 9 COD: <100 mg / L	BOD: <30 mg / L SS: <30 mg / L
			Taoyuan Airport Sewage Treatment Plant (secondary treatment)			
			Domestic sewage			
			Taoyuan Airport Sewage Treatment Plant (secondary treatment)			
EMO Park			Industrial wastewater		pH: 6 ~ 9 COD: < 100 mg / L SS: < 30 mg / L	Cd: < 0.03 mg/L Total chromium: < 2 mg/L
			CAL's first and second wastewater treatment plants (tertiary treatment)			
Taipei Branch	Located in Taipei City with low water resource risks	Taipei Water Department (freshwater)	Dihua Sewage Treatment Plant (secondary treatment)	Tamsui River (River with Category D water bodies)	pH: 6 ~ 9 COD: < 100 mg / L	SS: < 30 mg / L NH₃-N: < 10 mg / L
Songshan Office						

Note 1: Source: A study on the adaptation indicators for the high water resource risk area in Taiwan, Water Resources Agency, Ministry of Economic Affairs, 2016.
Note 2: There were no violations of regulations regarding wastewater or sewage in 2024.

Water Usage Area (Source Type)	Water Withdrawal (Note 1)(Kilotons)				Water Consumption (Note 2)(Kilotons)	Water Discharge (Note 3)(Kilotons)	Water Recycling (Note 4)(Kilotons)	Recycling Ratio (%)
	2021	2022	2023	2024	2024	2024	2024	2024
CAL Park (tap water)	33.42	28.70	36.46	40.82	19.97	30.50	19.43	38.5%
CAL Park (rainwater)	5.65	9.35	6.07	9.65				
EMO Park (tap water)	65.4	55.81	61.55	58.11	30.71	Domestic: 12.10	NA	-
						Industrial: 15.30	Industrial：3.75	6.5%
Taipei Branch (tap water)	4.56	4.02	4.18	3.91	2.17	1.74	NA	-
Songshan Office (tap water)	9.39	10.68	15.97	11.53	5.13	6.40	NA	-
Total	118.42	108.56	124.23	124.02	57.98	66.04	23.18	18.69%

Note 1: Scope covered by water meters: CAL Park, EMO Park, Songshan Office, and Taipei Branch.
Note 2: The water consumption volume of CAL Park is calculated based on the water consumption of the equipment. The water consumption volume of Taipei Branch and Songshan Office is calculated proportionally based on the ratio of water consumption of CAL Park.

Note 3: Wastewater treatment for the EMO Park includes industrial wastewater from Taiwan Aircraft Maintenance and Engineering Co., Ltd.
Note 4: Water recycling includes rainwater and intermediate water recovery in the Park and wastewater recycled in the EMO Park.

Emissions

Emissions from aircraft engines, particularly nitrogen oxides (NOx) and sulfur oxides (SOx), significantly affect local air quality. China Airlines is actively engaged in reducing emissions and enhancing emission efficiency through initiatives such as fleet renewal, optimized flight operations, and operational enhancements, striving to minimize environmental impact. In addition, a small amount of volatile organic compounds (VOCs) is also emitted during aircraft painting processes. CAL actively communicates with the manufacturers of aircraft to increase and promote the use of new environmentally friendly paint and environmentally friendly paint remover for reducing the concentration of VOC and toxicity in the work environment and atmosphere and reducing the toxicity of wastewater and the burden of treatment plants. CAL also continues to invest in improvements of the air pollution prevention facilities of the maintenance and repairs hangars to increase energy efficiency and exhaust efficiency. In 2024, the emissions of VOCs from maintenance were approximately 19 tons, representing a 5% reduction compared to 2023. In addition, CAL established the workplace environment monitoring plan and operating procedures to track changes in CO_2 concentration in office spaces, ensuring a safe and healthy environment. CAL also.

Item		Unit	2021	2022	2023	2024	2022	2023	2024	2022	2023	2024
Passenger Aircraft	SOx — Emissions	Ton	27.43	29.59	38.36	46.17	24.99	26.58	27.81	1.24	11.56	15.17
	SOx — Emission Efficiency	g/RTK	0.0150	0.0130	0.0094	0.0104	0.6070	0.4004	0.4016	0.0458	0.0304	0.0271
	NOx — Emissions	Ton	34.18	120.64	400.60	482.23	260.49	277.54	290.45	12.95	120.77	158.41
	NOx — Emission Efficiency	g/RPK	0.0538	0.0183	0.0119	0.0130	0.5908	0.3863	0.3933	0.0434	0.0279	0.0285
Cargo Aircraft	SOx — Emissions	Ton	16.06	13.03	11.37	11.02						
	SOx — Emission Efficiency	g/RTK	0.0028	0.0028	0.0027	0.0026						
	NOx — Emissions	Ton	167.43	135.84	118.79	115.14						
	NOx — Emission Efficiency	g/RTK	0.0290	0.0291	0.0278	0.0276						

Note 1: The emissions of SOx and NOx are calculated using the formula "Total annual emissions = Number of flights x SOx/NOx Emission Factor (Tons/LTO)," where the emission factors are based on the latest numerical values announced by the Environmental Protection Agency (EPA) of the United States for that year.

Note 2: LTO: refers to the landing take-off.

Note 3: Mandarin Airlines and Tigerair Taiwan have no cargo aircraft.

Note 4: Amendment of calculation method and coverage on CAL's NOx emissions from 2021 to 2022, excluding the pandemic's effect on flight dispatch.

Circular Economy

CAL's waste mainly comes from industrial waste (general/hazardous) from ground operations, domestic waste, and food and toilet waste from catering service companies and cabin service (refer to the waste flowchart). To achieve zero waste to landfill, CAL follows a hierarchical waste management strategy: refuse, reduce, reuse, and recycle. CAL implements various waste reduction initiatives, which include proper sorting processes, promoting detoxification measures, actively collaborating with recycling vendors, and establishing recycling and reuse workflows. These efforts ensure that packaging and other waste generated from the Group's operations are effectively recycled and reused, thereby minimizing the volume sent for incineration or disposal in landfills. As for the waste destined for the incineration plant, opt for waste to energy (WTE) treatment whenever possible. In response to growing international attention on issues such as packaging, restrictions on single-use plastics, and food waste management, CAL—though not directly involved in manufacturing or product production—actively engages with suppliers to address emerging environmental trends. Embracing circular economy principles, CAL collaborates on the development and design of several eco-friendly and plastic-reducing in-flight service items.

In 2024, CAL installed a food waste processing machine at its headquarters to convert canteen leftovers into plant maintenance resources, demonstrating zero food waste practices. Onboard, CAL implements in-flight waste sorting on twin-aisle aircraft using eco-carts. For detailed procedures and outcomes, please refer to The Story Behind Twin-Aisle Cabin Waste Recycling section.

CAL also resumed waste weighing and auditing programs following IATA and ASF guidelines to optimize meal planning and supply by improving waste categorization and comparing results with those from 2019. Training sessions were conducted for relevant colleagues and partner vendors prior to the project's execution to communicate goals, workflows, and expected contributions, ensuring operational quality and maximizing the effectiveness of feedback for planning and design. For detailed results, please refer to the 🔍Focus Story section.

CAL partners with China Pacific Catering Services to promote sustainable catering through energy saving, food waste reduction, and eco-friendly packaging. The catering partner holds ISO and HACCP certifications and conducts regular inspections and audits to maintain quality and safety. Beyond aviation, they are expanding into frozen meals, takeout, and corporate catering to extend sustainability into everyday life.

Energy Conservation and Carbon Reduction

Implement green procurement by selecting environmentally friendly refrigerant food carts and introducing high-energy efficiency facilities to improve operational efficiency and sustainability outcomes
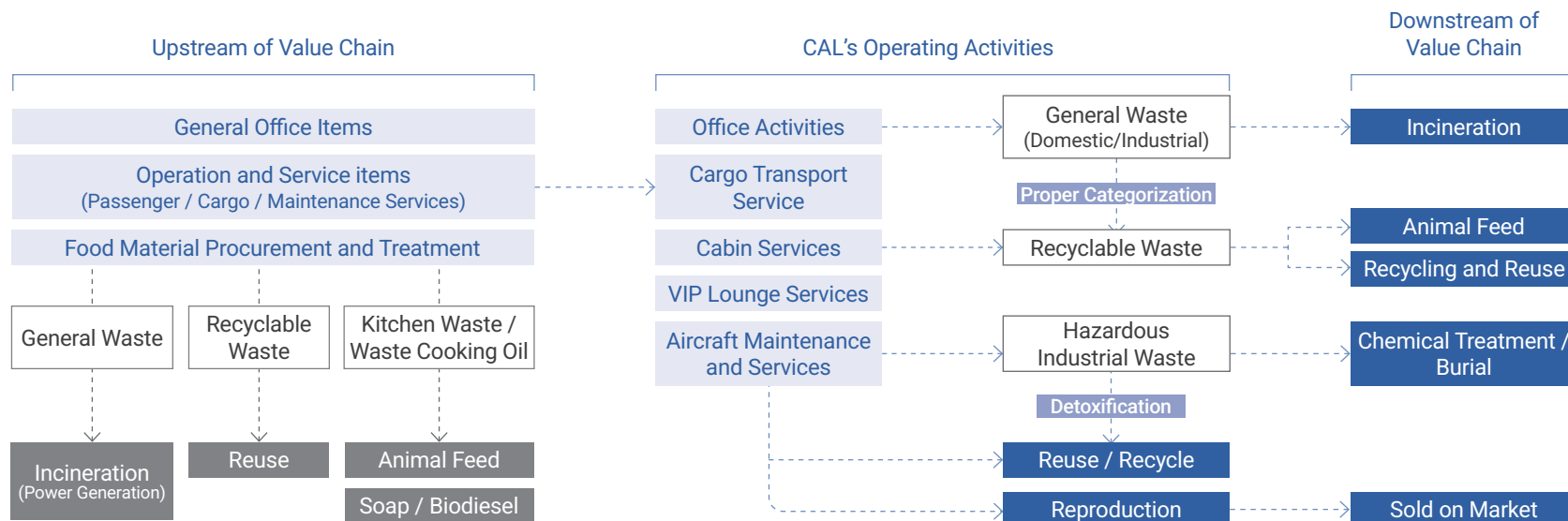
Food Waste Reduction

- By implementing an intelligent analytics system, CAL accurately forecasts passenger meal demands, effectively reducing excess production and food waste. Special meals are available by reservation, ensuring that every meal prepared can be cherished and enjoyed
- 100% recycling of waste cooking oil, process sludge, and kitchen waste, transforming them into energy or renewable resources, thereby achieving waste-to-resource conversion

Environmentally Friendly Packaging

Implement green design by collaborating with suppliers to develop and select environmentally friendly packaging materials that meet international standards, thereby reducing the carbon footprint from the source

Waste management Flowchart

Upstream of Value Chain | CAL's Operating Activities | Downstream of Value Chain

Upstream of Value Chain
- General Office Items
- Operation and Service items (Passenger / Cargo / Maintenance Services)
- Food Material Procurement and Treatment
  - General Waste → Incineration (Power Generation)
  - Recyclable Waste → Reuse
  - Kitchen Waste / Waste Cooking Oil → Animal Feed / Soap / Biodiesel

CAL's Operating Activities
- Office Activities
- Cargo Transport Service
- Cabin Services
- VIP Lounge Services
- Aircraft Maintenance and Services

- General Waste (Domestic/Industrial) → Incineration
- Proper Categorization → Recyclable Waste → Animal Feed / Recycling and Reuse
- Hazardous Industrial Waste → Chemical Treatment / Burial
- Detoxification → Reuse / Recycle
- Reproduction → Sold on Market

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In 2024, China Airlines improved its ground waste recycling rate from 22.9% in 2023 to 32.41% through on-site inspections, strengthened advocacy, source control, and the reduction of project-based/non-routine waste. The total waste generated in 2024 was 2,491 tons, maintaining the level of 2023. CAL will continue to collaborate with its suppliers to explore more opportunities for environmentally sustainable designs at the source, resource recycling and reuse, and waste management. Additionally, it will persist in implementing and expanding resource recycling mechanisms to achieve zero landfill waste, thereby advancing towards the sustainable vision of zero waste.

In response to the growing international attention on food waste issues, China Airlines began individually calculating, tracking, and reviewing food waste management performance starting in 2024. In 2024, with the installation of food waste machines at the CAL Park headquarter and the implementation of twin-aisle aircraft waste recycling operations, the food waste generated from ground operations decreased by 15% compared to 2023. The amount of meal waste produced per passenger-meal on return flights was 0.31 kg, reflecting an improvement of nearly 6% from 0.33 kg in 2023. Furthermore, to mitigate meal waste resulting from changes in passenger itineraries, CAL adjusted economic incentives, reducing the per capita meal waste from 1.15 grams in 2023 to 0.93 grams, successfully achieving the annual control target. Considering differences across cabin classes, CAL plans to use the over-catering rate (ranging from 0.09% to 0.28%) for each class as a control indicator for managing in-flight food waste in 2025.

Waste Information

(Unit: metric tons)

	Waste Produced				Disposal Method
	2021	2022	2023	2024	
General Domestic Waste	94	113	122	118	Incineration - with Energy Recovery
	410	629	986	948	Incineration - without Energy Recovery (Delivered to the airport incineration plant, and the installation of energy recovery facilities has been recommended.)
Recycling and reuse	507	622	973	1,111	Recycling and Reuse
Hazardous Industrial Waste	12	12	11	7	Other treatment - chemical treatment (e.g., electroplating solutions)
	1	2	1	1	Other treatment - Offshore Treatment (e.g., Nickel-cadmium batteries)
Non-hazardous Industrial Waste	100	147	194	193	Recycling and Reuse (e.g., waste lubricants)
	64	47	127	113	Other Treatment - Heat Treatment (e.g., waste paint)
Total	1,188	1,572	2,414	2,491	--

Note 1: Third-party contractors were appointed for removing and offsite processing of waste for disposal. CAL implements inspections in accordance with the contract to ensure compliance with regulations.
Note 2: The scope covers waste generated from the EMO Park, CAL Park, Kaohsiung Branch office operations, VIP lounge services across Taiwan, return flights to TPE, as well as meal preparation and cargo services at TPE.
Note 3: In 2024, 99.32 tons of non-hazardous industrial waste-waste wood (recycled) were newly included due to reporting process changes.

Food Waste Management

Source of waste	Performance Indicators	Waste Produced (Note 2)				Disposal Method
		2021	2022	2023	2024	
VIP Lounge, Employee Canteen, and In-flight Meal Preparation	Amount Generated (ton)	68	142	541 (Note1)	461	Recycling: Composting and Pig Farming
	Per Capita Generation – VIP Lounge (kg/person)	--	0.017	0.034	0.032	
In-Flight Meal Service	Amount Generated (ton)	177	632	1,610	1,863	Incineration - with energy recovery (in accordance with quarantine requirements) (Note3)
	Per Capita-meal Generation – In-flight Service (kg/person-meal)	1.73	0.65	0.33	0.31	
Total		245	774	2,151	2,324	

Note 1: Corrected data entry error for 2023..
Note 2: The scope covers waste generated from the EMO Park, CAL Park, Kaohsiung Branch employee canteen, VIP lounge services across Taiwan, return flights to TPE, as well as meal preparation at TPE. The amount of food waste generated by the employee canteen at the CAL Park has been deducted starting from August 1, 2024, as it has already been processed into soil materials by the food waste machine.
Note 3: Food waste incinerated in accordance with quarantine regulations, along with most general domestic waste that cannot be recycled, is used for power generation through the cogeneration system at the incineration plant (Waste To Energy, WTE). It is estimated to contribute 1,010 MWh of electricity, based on the power generation efficiency of Taiwan's incinerators in 2024.

In response to the global trend of reducing plastic pollution, China Airlines continuously allocates dedicated R&D resources to explore and implement sustainable packaging alternatives, and began gradually replacing its in-flight cutlery sets with stainless steel materials starting in November 2024. The new cutlery sets featured a combined fork and spoon design, prioritizing both practicality and oil efficiency. Regarding packaging material reduction, CAL continue phasing out plastic products and packaging, while increasing the proportion of sustainably certified paper and wood-based service items and packaging. Corresponding reduction goals and measures have been established, including the development of recycled stainless steel cutlery sets in collaboration with suppliers, eco-friendly toothbrush sets for economy class, eco-friendly dental floss sticks for business class, recycled plastic (RPET) headrest paper, pillowcases, plastic cups, and salad bowl lids. In-flight trash bags are also made from 100% recycled materials. Additionally, to reduce the impact of product consumption on biodiversity, the disposable eco-friendly cutlery kits, face/hand wipes, napkins, eco-friendly paper cups, and playing cards provided on board have all been sourced from sustainably certified products.

For cargo packaging materials, CAL has adopted a mixed rain cover made from 40% to 60% recycled materials, which is recycled and reused alongside with the plastic wrapping. Cargo pallets and containers are regularly maintained in compliance with safety regulations. If deemed necessary, those that require replacement are sold in batches for recycling and reuse.

Packaging Material Information

Materials	Item	2021	2022	2023	2024
Plastic	Packaging Weight (kg)	1,420,971	1,694,954	1,900,168	1,749,973
	Proportion of Recycled Materials (%)	42.69%	39.46%	40.20%	45.05%
	Proportion of Recycling and Reuse(%)	97.6%	94.9%	87.7%	82.1%
Wood and Paper	Packaging Weight (kg)	40,045	84,198	241,753	340,917
	Proportion of Recycled and Certified Materials (%)	82.55%	72.12%	78.35%	74.65%
Metal	Packaging Weight (kg)	55,351	288,802	126,988	133,982
	Proportion of Recycled and Certified Materials (%)	100%	100%	100%	100%
Glass Materials	Packaging Weight (kg)	139	44,614	169,307	200,256
	Proportion of Recycled and Certified Materials (%)	100%	100%	100%	100%

Note: The scope covers the proportion of 100% in-flight passenger and cargo service item procurement.

Best Practices

The Story of "Waste Recycling in Twin-Aisle Cabins"

In alignment with China Airlines' Environmental and Energy Policy, and to provide opportunities for the development of a circular economy, recycling operations for twin-aisle aircraft were implemented in phases on transoceanic and regional routes in 2023 and 2024, using dedicated recycling carts "ECO CART".

Workflow

Flight Preparation
- Confirm that the flight is loaded with ECO CART for recycling. The designated kitchen crew member shall verify that there is no waste inside the ECO CART.
- Confirm that the recycling bags (green eco-friendly vest bags) are loaded into the trolley, and that the quantity is correct and sufficient.

During Flights
- Crew members are required to execute the classification and recycling process as specified, using eco-friendly vest bags or transparent plastic bags to load and categorize recyclable items. The bags are securely tied and placed into the ECO CART.
- Priority order for recyclable items (excluding VIE station): PET bottles > metal and aluminum cans > paper (e.g., empty oolong tea boxes, empty cartons for milk balls, empty juice boxes) > clear glass bottles.
- Glass bottles should be placed at the bottom of the ECO CART to prevent breakage and avoid affecting other recyclable items.

After Landing
- If the cleaning staff does not proactively clean the cart during the kitchen cleaning operation, the crew members are required to remind them to unload the recyclable items from the ECO CART.

Challenges and Responses

All colleagues have reached a consensus on the operations of " recycling." However, due to limitations in service processes, operational space, and travel time, numerous challenges were encountered during the implementation process. Through repeated communication among the cabin crew, Cabin service product team, and ground handling agents, the operation processes were continuously optimized. Ultimately, the challenges were overcome, providing an opportunity for recyclables to re-enter the circular economy.

Cabin Waste Recycling on board

Obstacles Encountered	Methods for Overcoming
For short-haul flights or when flights are full, recycling may not be completed in time.	Optimize recycling procedures to enable recycling operations to run concurrently with meal collection activities, thereby reducing the operational burden.
The limited cabin space causes conflicts between the ECO CART and the meal/galley carts.	Optimize the ECO CART by using it to load service items, which are retrieved and used after takeoff, allowing for more efficient use of cabin space.
Differences in national regulations affect the consistency of recycling practices.	Adjust the standards according to station-specific regulations to ensure that recyclable items comply with local laws.

★ Best Practices

Eco-Friendly and Stylish In-Flight Amenity Kit

In line with CAL's commitment to environmental sustainability, the airline invested in the development of sustainable in-flight service items in 2024, collaborating with luxury brand MOSCHINO and Canadian lifestyle brand Roots, offering a compact and convenient travel pouch. The contents are provided in collaboration with the highly acclaimed brand Moroccanoil, featuring a selection of practical skincare products. Furthermore, every element—from the pouch and contents to the packaging materials—is designed with environmental sustainability in mind. Recycled plastic is used in the production of the pouch, skincare bottles, eye mask, comb, and luggage tag. The toothbrush is made from wheat-based materials, while the outer bags for skincare products are composed of PLA material, and the outer bags for travel pouches utilize CPE biodegradable plastic. Additionally, the paper belly bands, wax paper for the dental kits, kraft paper box for earplugs, and informational cards are all made from FSC-certified materials sourced from legally and responsibly managed forests, reducing the environmental impact of both the products and their packaging.

A newly designed, eco-friendly in-flight amenity kit for Premium Economy Class

A newly designed, eco-friendly in-flight amenity kit for Premium Business Class

★ Best Practices

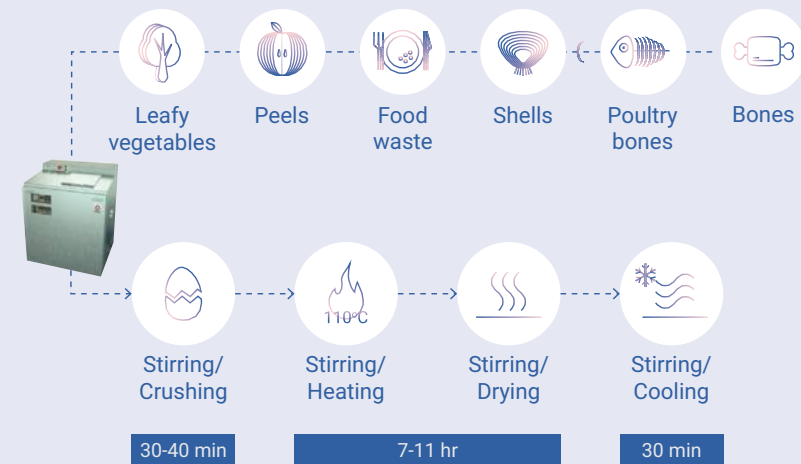### Achieving Zero Food Waste in the Park

China Airlines invested in two commercial food waste machines in mid-2024, which have been in operation since August 1, effectively handling food waste generated in the park. This commercial food waste machine employs heating, dehydration, and grinding methods for processing, as opposed to traditional enzyme degradation or chemical decomposition techniques. This approach further reduces environmental impact, and the process generates almost no odor. The food waste residue after processing is reduced by approximately 90% in volume compared to the original food waste. It is primarily utilized for composting and enhancing horticultural soil within the park, effectively achieving the goals of waste reduction and resource maximization.

The food waste machine helps achieve zero waste.

The processed food waste residue is applied on-site for horticultural activities.

Leafy vegetables — Peels — Food waste — Shells — Poultry bones — Bones

Stirring/Crushing — Stirring/Heating (110°C) — Stirring/Drying — Stirring/Cooling

| 30-40 min | 7-11 hr | 30 min |

Treatment Flow of Food Waste Machine
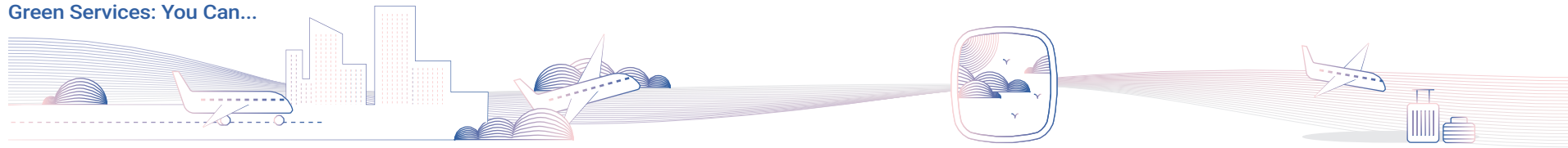
Green Services and Communication

With passenger support as a key driver,. China Airlines offers a diverse range of eco-friendly services and invites passengers to join in supporting environmental sustainability. Through various channels and formats, CAL communicates environmental knowledge, corporate environmental initiatives, and outcomes to different audiences, fostering an internal culture of environmental conservation and shaping an eco-friendly brand. Additionally, each year, through prize-winning questionnaires, CAL conducts surveys to assess employee satisfaction with environmental information dissemination and gathers suggestions for improvement. In 2024, a total of 3,749 employees participated, with an overall satisfaction rate of 95.2%.

Targets	Key Points	Communication Channels	Performance in 2024	
New Employees and All Employees	Cultivate sustainability awareness of employees and shape a culture of environmental protection	New Employee Training "China Airlines and Me"' Company email, China Airlines newsletter, startup screen, questionnaires, and quizzes	▪ A total of 23 mandatory in-person training courses for new employees were conducted, achieving a 100% execution rate. ▪ 20 articles on environmental sustainability and related activities. ▪ 3 sessions of environmental knowledge quiz events were held, attracting 3,749 participants with a satisfaction rate of 95.2%.	
	Organized experience activities to consolidate environmental protection and sustainability consensus	Environmental Lectures	One environmental seminar titled "The Seasonal Variations of Taiwan's Forests: Lessons from the Mountains" was held, with a total of 98 employees participating. Instructor: Shu-Han Yang, Section Chief of Forest Recreation Division, Hsinchu Branch, Forestry and Nature Conservation Agency, Ministry of Agriculture. Group photo of the instructor with colleagues both physically present and joining online	
Environmental/ Energy/Carbon Management Personnel (including partners of the Group)	Increase environmental protection and energy conservation knowledge and improve management capacity	In-person courses/ workshops and online e-learning courses	▪ 8 sessions of professional training on climate and sustainability governance to help mitigate negative effects of industrial and climate translation changes. The total number of participants was 610. ▪ One session of the Group's "Sustainability Governance Communication Meeting and Environmental Management Communication Meeting".	
Passengers and Shippers	Share new knowledge on environmental sustainability and increase green consumption awareness	In-flight entertainment system, in-flight magazine (Dynasty), official website, and social media posts	▪ A selection of 12 in-flight environmental and ecological films. ▪ 12 environmental feature articles and reports were shared on social media, reaching a total of approximately 255,641 people.	▪ Continue to disclose information of carbon footprint of routes. ▪ Set up the "Green Life Select section" on CAL's eMALL website.
Group (joint venture) Companies and Business Partners	▪ Expand sustainable influence by adding value to products and services ▪ Enhance environmental risk and opportunity management, strengthen carbon management, and build adaptive capacity	Regular/periodic risk and opportunity surveys, invitations to physical/online courses, annual management communication meetings, etc.	▪ CAL Group subsidiaries implemented and expanded the environmental management system in phases. ▪ 14 Group partners have completed 100% of the carbon inventory system implementation; in 2024, total greenhouse gas emissions for Categories 1 and 2 were 590,061 tons CO_2e, and for Categories 3-6 were 134,347 tons CO_2e.	▪ 12 Group partners have set 24 energy and resource management goals, of which 19 have been 100% achieved. ▪ The up-to-date "CAL Group Code of Conduct" and "Supplier Code of Conduct".

Green Services: You Can...

Ground Operations	Takeoff/Landing Process	During Flights	Preparing for the Next Journey
1. Use the China Airlines app for online check-in (if a paper boarding pass is still needed, paper boarding passes will be printed on FSC-certified paper), pre-select meals.(Note 1) 2. Utilize the e-menu service available in the VIP lounge at Taoyuan Airport. 3. Participate in the voluntary carbon offset program, "ECO Travel Carbon Offset." 4. Not to illegally transport endangered species of plants and animals. 5. Use "Eco Points (Green Points)" to offset the fare of the Mandarin Airlines Taipei-Kinmen flight.	1. (In summer) Close the sun-facing window shades to help conserve energy. 2. Experience fuel-efficient flight operations, such as executing continuous descents to achieve fuel savings.	1. Enjoy in-flight meals made with locally sourced or seasonal ingredients. 2. (Business class passengers) Place the order using the electronic menu. 3. Browse a variety of publications in the cloud bookstore to support weight reduction and fuel savings in the cabin. 4. Support recycling operations on twin-aisle aircraft. 5. Enjoy and support eco-friendly in-flight service items, use your own headphones to listen to music.	1. Apply the eMALL e-commerce platform to support sustainable procurement. 2. Support and follow China Airlines' participation in the "Pacific Greenhouse Gases Measurement (PGGM)" initiative and the SkyTeam The Aviation Challenge Campaign (Note2).

Note 1: In 2024, the pre-selection rate for Business Class increased by 0.11% compared to 2023, reaching 23.67%. Additionally, starting from July 2024, the pre-selection service has been available for Premium Economy Class on regional routes.

Note 2: In 2024, CAL was honored with the Future Proofing Strategies Award.

Future Plans

Optimize Climate Governance

Strategy
1. Steadfastly implement the carbon reduction pathway
2. Effectively address climate change

Plans
1. Strengthen the management and implementation of the carbon reduction pathway, including Science-Based Targets (SBTs): Robustly advance net-zero carbon measures based on the customized carbon reduction pathway, in alignment with international climate regulations and market expectations.
2. Promote low-carbon technologies and green innovation: Expand the installation of renewable energy facilities and energy storage systems, invest in emerging low-carbon technologies such as Sustainable Aviation Fuel (SAF) and new aircraft models, and continue to advance flight operations and innovative fuel-saving measures.
3. Deepen climate risk management and adaptation strategies: Optimize the climate risk assessment mechanism based on practical operational needs, continuously enhance the climate resilience of the supply chain and business model, and ensure the stable development of the Company.

Support Environmental Sustainability

Strategy
1. Steadfastly Enhance environmental sustainability across the value chain
2. Deepen communication on sustainability awareness

Plans
1. Promote the green transformation of the supply chain: Engage with suppliers through various channels to ensure compliance with environmental regulations or standards, and collaborate to improve environmental performance, including encouraging the use of renewable resources and carbon-reducing processes, while establishing green procurement and collaboration mechanisms.
2. Strengthen internal and external sustainability education: Deepen employees' environmental sustainability awareness and professional skills internally, while collaborating with suppliers and enhancing communication with passengers and shippers externally to jointly promote sustainable actions.
3. Expand green initiatives and collaborate with stakeholders: Work with governments, NGOs, and industry partners to jointly promote environmentally friendly policies and actions, enhancing the Company's impact.