永續華航
SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

2-4 Environment

HIGHLIGHTS

6th time received highest scores in environmental management report and climate strategy of DJSI

Received the highest score for the 2020 environmental management report and climate strategy of DJSI for six consecutive years.

8th time in TCSA Climate Leadership Award

Awarded the Climate Leadership Award for eight consecutive years since 2014.

10th consecutive year in response to CDP and awarded Leadership rating

CAL has responded to the CDP climate change questionnaire for 10 consecutive years since 2012 and actively promotes and implements supply chain / value chain management. Ranked Leadership in CDP Supplier Engagement Rating (SER) in 2021.

The only airline to receive the Excellence Award for Low-Carbon Products from the Environmental Protection Administration, Executive Yuan

CAL Group's Mandarin Airlines offers comprehensive low-carbon services which reduced its carbon footprint by more than 30% within 3 years and received a Carbon Label. It became the only airline company to participate in the GreenPoint program of the Environmental Protection Administration and it also received the Excellence Award for Low-Carbon Products from the EPA.

1st to use Sustainable Aviation Fuel (SAF)

CAL used SAF for the new energy-efficient aircraft A321neo after using SAF for new A350 aircrafts in 2017, becoming the first airline in Taiwan to use SAF.

1st to announce target for Net-Zero Carbon Emissions by 2050

CAL became the first airline in Taiwan to announce the target for net zero emissions by 2050 and create plans for reducing carbon emissions.

1st to the establishment of an environment, energy, and greenhouse gas inventory management system

First company in Taiwan's transportation industry to establish environment, energy, and greenhouse gas inventory (ISO 14001, ISO 50001, and ISO 14064-1) management system and continues to pass external third-party verification / certification each year.

Received awards for green procurement from Taoyuan City Government

CAL's maintenance divisions and Taoyuan International Airport Service won the 2020 Taoyuan City Green Procurement Award for the Private Sector.

The only airline group in Taiwan to promote green fares

Starting in 2021, Mandarin Airlines and Tigerair Taiwan followed CAL's footsteps and included all domestic and foreign flights into the scope of the ECO Travel carbon offsetting services and became only airline group in Taiwan to promote green fares.

永續華航
SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

Management Approach GRI 103-1, 103-2, 103-3

Topic of Concern

- Climate Change Mitigation and Adaptation
- Energy Management
- Environmental Risks and Business Efficiency Management
- Green Services and Sustainable Catering
- Resource Management

Importance of Material Issues

Extreme weather events, changes in consumer awareness, and increased global awareness of air pollution, waste, and noise derived from climate change continue to challenge the operating environment of the aviation industry. As a leading airline in Taiwan, China Airlines is committed to providing passengers and cargo clients with high-quality products and services while fulfilling its commitment to environmental sustainability.

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.

- **Long-term Goals**

2023

1. Improving annual aviation fuel efficiency by 1.5% and achieving carbon-neutral growth (CORSIA CNG2020) (net zero emissions by 2050)
2. Reducing carbon emissions in ground operations by 41% compared to 2009
3. Strengthening decision-making mechanisms to integrate climate-related financial disclosure (TCFD) information
4. Reducing general waste (non-recyclable) by 5% compared to 2018
5. Increasing Industrial waste recycling ratio to 43%
6. Reducing paper consumption by 14% compared to 2018
7. Reducing water consumption in ground operations by 5% compared to 2018
8. Embargoing transport of endangered species and prohibiting use of illegal species as food ingredients
9. Reducing total cabin waste by 25% compared to 2018
10. Reducing use of single-use plastic (SUP) for in-flight services by 50%
11. Reducing the per capita food waste of in-flight service by 5% compared with 2020

2025

1. Improving annual aviation fuel efficiency by 1.5% and achieving carbon-neutral growth (CORSIA CNG2020) (net zero emissions by 2050)
2. Reducing carbon emissions in ground operations by 44% compared to 2009
3. Implementing and optimizing internal carbon pricing
4. Reducing general waste (non-recyclable) by 7% compared to 2018
5. Increasing industrial waste recycling ratio to 45%
6. Reducing paper consumption by 30% compared to 2018
7. Reducing water consumption in ground operations by 7% compared to 2018
8. Embargoing transport of endangered species and prohibiting use of illegal species as food ingredients
9. Reducing total cabin waste by 50% compared to 2018
10. Reducing use of single-use plastic (SUP) for in-flight services by 90%
11. Reducing the per capita food waste of in-flight service by 10% compared with 2020

2030

1. Improving annual aviation fuel efficiency by 1.5% and achieving carbon-neutral growth (CORSIA CNG2020) (net zero emissions by 2050)
2. Reducing carbon emissions in ground operations by 50% compared to 2009 (net zero emissions by 2050)
3. Support the creation Taiwan's sustainable aviation fuel strategy
4. Reducing general waste (non-recyclable) by 12% compared to 2018
5. Increasing industrial waste recycling ratio to 50%
6. Reducing paper consumption by 50% compared to 2018
7. Reducing water consumption in ground operations by 10% compared to 2018
8. Embargoing transport of endangered species and prohibiting use of illegal species as food ingredients
9. Reducing total cabin waste by 65% compared to 2018
10. Eliminate all single-use plastic (SUP) products for in-flight services
11. Reducing the per capita food waste of in-flight service by 25% compared with 2020

Unit in Charge

Corporate Sustainability Committee — Environmental Task Force (Corporate Environmental Committee)

永續華航 SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

Management Mechanism

- The Board of Directors and its Risk Management Committee convene a meeting every quarter
- The Corporate Sustainability Committee convenes a meeting at least twice every year
- The Corporate Environmental Committee convenes a meeting every quarter on a regular basis
- Include environmental and energy risk issues in routine executive reports
- CAL conducts ISO 14001, ISO 50001, and ISO 14064-1 third-party audit and verification every year
- CAL responds to DJSI, FTSE and CDP on a regular basis

Grievance Mechanism

CSR — E-Mail: csr@china-airlines.com

Stakeholder Contact

Objectives and Plans

Task	2021			2022 Objectives
	Objectives	Performance	Achievement	
Optimizing Corporate Environment and Energy Management	Updated the energy management system and obtained ISO 50001:2018 certificate	Completed third-party verification	100%	• Establishing and fulfilling environmental objectives for in-flight service • Optimizing waste management operations • Improving water balance information and management operations • Implementing 69 action plans for environment and energy management
	• Optimizing energy and resource information management for outstations • Continuing to getting involved external evaluation and policy engagement	• Completed the environmental risk and opportunity assessment for outstations • Completed the responses and engagements for DJSI, CDP, Corporate Governance Review, TCSA, and other questionnaires on environmental issues	100%	
	Implementing corporate environmental management and launching 69 environmental protection and energy conservation action plans	Completed 71 environmental protection and energy conservation action plans	103%	
Consolidating Climate Risk Management and Carbon Reduction	Improving fuel efficiency to 0.2547 ton / 1,000 RTK	Achieved fuel efficiency of 0.2442 ton / 1,000 RTK	104%	• Improving fuel efficiency to 0.2406 ton / 1,000 RTK • Reducing GHG emissions in ground operations by 41% compared to 2009 • Implementing TCFD operating procedures and carbon reduction compliance • Continuous implementation of ISO 14064-1:2018 verification • Launching SAF usage and expand renewable energy facilities
	Target for ground operations Scope 1 GHG emissions 4,334 tons of CO_2e	Actual ground operations scope 1 GHG emissions 2,897 tons CO_2e	133%	
	Target for ground operations Scope 2 GHG emissions 17,545 tons CO_2e	Actual ground operations scope 2 GHG emissions 16,697 tons CO_2e	105%	
	• Increasing the TCFD disclosure capacity and execution of the Company • Promoting CORSIA, EU ETS, and UK ETS compliance • Completing ISO 14064-1:2018 transition • Expanding the Green Point Discount for Ticket Fare Program	• Published the TCFD report and organized 2 workshop sessions • Completed CORSIA / EU ETS / UKETS emission monitoring, reporting, verification (MRV) • Completed the ISO 14064-1 transition training and amendment of procedures • Incorporated Mandarin Airlines and Tigerair Taiwan into the ECO Travel Carbon Offsetting Program	100%	
Building Capacity for Value Chain Environmental Management	• Optimizing the mechanisms for value chain environmental management • Promoting the disclosure and communication on the performance of the value chain environmental management policies • Organizing value chain environmental management training programs and meetings	• Completed the annual value chain information survey • CSR information disclosure on value chain environmental performance • All value chain companies have set at least two goals for environmental management • Organized 1 value chain environmental management training program	100%	• Continuous implementation of the value chain risk survey • Continuous promotion of value chain environmental information disclosure • Continuous organization of value chain environmental management training programs
Strengthening Awareness and Brand Image of Corporate Environmental Protection	• Organizing professional corporate environmental and energy-management training • Organizing the 2021 environmental training and satisfaction survey for all employees • Continuing to encourage employee for environmental proposal • Promoting diversified channels of customer communication of environmental protection • Joining and implementing environmental protection initiatives	• Organized three sessions of environmental and energy management training • Organized 4 environmental protection activities for all employees • Posted 4 environmental protection advocacy posts on Facebook • Provided branch companies across the globe with environmental protection statements • Incorporated Group companies Mandarin Airlines and Tigerair Taiwan into the ECO Travel Carbon Offsetting Program	100%	• Organizing 3 professional corporate environmental and energy-management training programs • Organizing the 2022 environmental training and satisfaction survey for all employees • Implementing external environmental protection advocacy programs and engagement • Continuous participation in evaluations and implementation of environmental protection initiatives • Expand ECO Travel Carbon Offsetting Program to the cargo service platform

永續華航 SUSTAINABILITY WE CARE

Contents

Preface

1 Sustainability Management

2 Value Creation

2-1 Trust

2-2 Human Resources

2-3 Cooperation

2-4 Environment

2-5 Society

3 Corporate Governance

ESG Data and Appendix

2021 Environmental Performance

Item		Unit	Emissions / Consumption / Generated
Category 1 GHG Emissions (ORIG Scope 1)		Tons CO_2e	5,878,428
Category 2 GHG Emissions (ORIG Scope 2)		Tons CO_2e	16,697
Category 3-6 GHG Emissions (ORIG Scope 3)		Tons CO_2e	3,174,662
Air Pollutants (SOx)	**Passenger Aircraft**	Ton	27.43
	Cargo Aircraft	Ton	16.06
Air Pollutants (NOx)	**Passenger Aircraft**	Ton	34.18
	Cargo Aircraft	Ton	167.43
Aviation Fuel (Non-Renewable Energy)		Ton	2,321,341
Electricity		MWh	33,260

Item	Unit	Emissions / Consumption / Generated	Amount Renewed / Recycled	Percentage of Savings / Recycling
Renewable Power (Solar Photovoltaic)	MWh	-	127	-
Elevator Power Regeneration	kWh	-	889	-
Water Resources	Thousand tons	118.42	14.23	12%
Wastewater (Organic & Heavy Metals)	Thousand tons	16.94	2.81	17%
Cabin Waste	kg	501,124	84,426	16.85%
Ground Waste (Excluding Hazardous Industrial Waste)	kg	636,400	188,790	29.67%
Ground Waste (Including Hazardous Industrial Waste)	kg	649,560	188,790	29.06%

2-4-1 Governance of Environmental Sustainability

Improving the Policy and Structure of Environmental Governance

CAL has established the environmental and energy management principles (compliance with environmental laws and regulations, resource conservation, improvement in eco-efficiency, and fulfillment of corporate social responsibility) and the Environmental and Energy Policy Statement according to the China Airlines Sustainable Development Best Practice Principles promulgated by the Board of Directors; in addition, CAL has integrated UN SDGs into its instructional strategies to align future business operations with the sustainable development concepts of environmental friendliness, low-carbon emissions, and energy conservation for a better future.

CAL was the first Taiwanese airlines to establish the Corporate Environmental Committee in 2011. The President represents the top management, and the Corporate Safety Office acts as the executive secretary. Five environmental management committees were established under the Corporate Environmental Committee to take charge of environmental, energy, and climate risk and opportunity management pertaining to inflight service, maintenance, and cargo operations as well as the administration and operation of the headquarters and branches based on the risk management system established in line with the international standards. Based on the fact that aircraft fuel is a major energy source for the company, the aircraft fuel-saving group will be adjusted to an independent committee at the same level as the five major environmental management committees in 2021. And changed its name to "Aircraft Fuel Management Team", continued to monitor fuel efficiency, and implemented the goal of improving fuel efficiency. The Corporate Environmental Committee coordinates and integrates countermeasures and resources for environmental, energy, and climate risks and opportunities in the management meetings held every quarter and reports key resolutions to the Board of Directors in routine meetings of the Board and its committees. For specific issues, functional task forces, including the Carbon Management Task Force, the Sustainable Aviation / Alternative Fuels Task Force, and the TCFD Task Force (Note), have also been set up for cross- departmental cooperation and flexible deployment of resources.

The Company continues to uphold the six major strategies for sustainability including "Fleet and Network" and "Brand Awareness". CAL is committed to the creation of an efficient fleet network and resilient operations to combat extreme weather and changes in the business environment. We seek to create a sustainable brand that protects the environment and improves internal and external brand awareness. Overall, CAL has built a sound corporate environment and energy management model in the aspects of policy, organization and management system based on international trends and risk management practices. From a life cycle perspective, CAL takes into account the context of the organization operations (including day-to-day operations of the Company and existing or new products and services), internal / external issues, and needs and expectations of stakeholders and manages environmental, energy, and climate risks and opportunities appropriately. CAL aims to lead affiliate companies of the Group, suppliers, contractors, and other value chain partners to work together in promoting environmental protection operations and ensure that the environmental sustainability policy is implemented. In the future, CAL will introduce TCFD step by step to strengthen the connotation of environmental management.

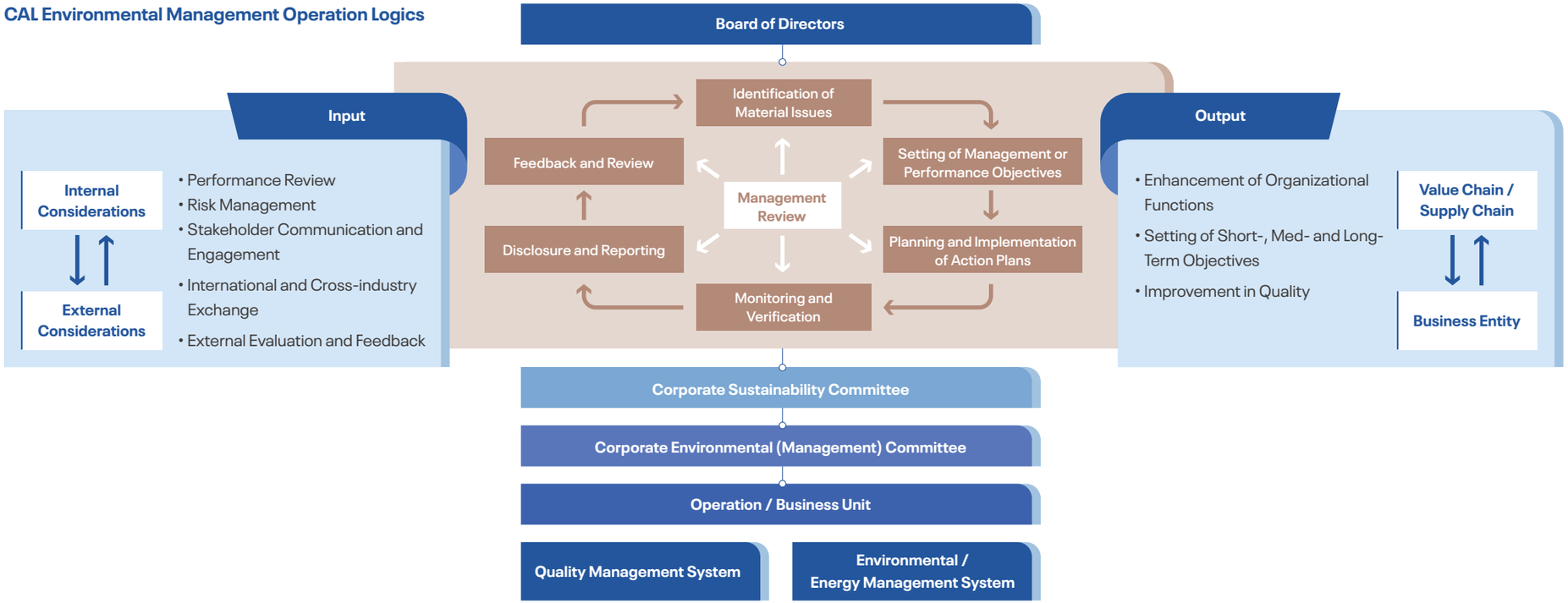
Note: TCFD refers to Task Force on Climate-related Financial Disclosures.

Refer to Environmental Governance — China Airlines Corporate Sustainability Website

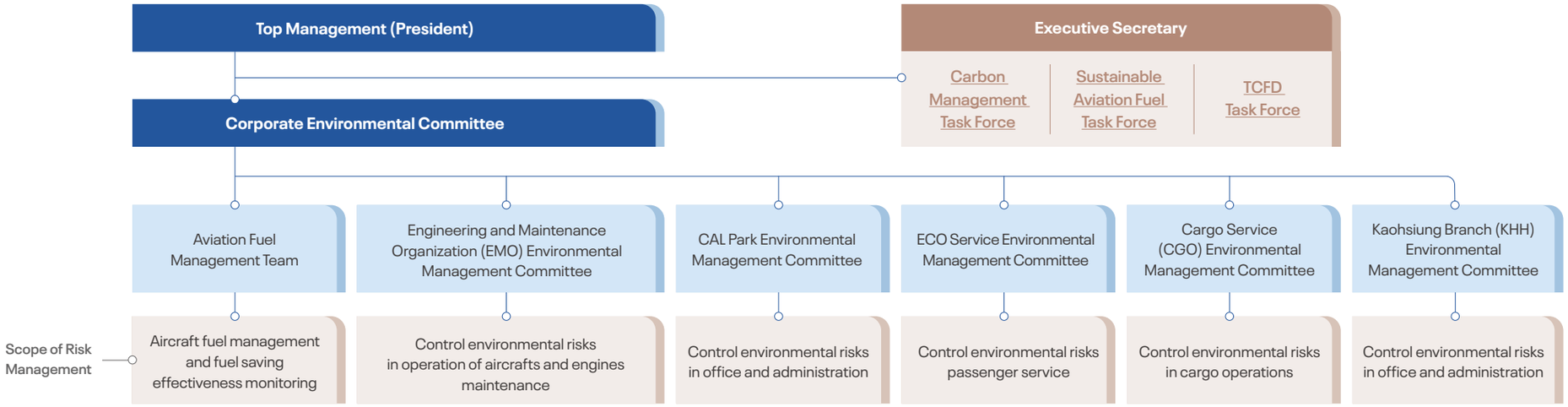
永續華航
SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

CAL Environmental Management Operation Logics



Corporate Environmental Committee Organization



永續華航
SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

Implementing Environmental and Energy Management Systems

CAL became the first airline company in Taiwan to set up corporate environmental risk management mechanisms. CAL has introduced many international standard management systems since 2009 to establish sound corporate environmental management mechanisms covering GHG, environmental management, and energy management. In addition, to fully integrate the benchmarking conceptualization for sustainable development of international enterprises, CAL has continued to introduce the life cycle perspective since 2017 to fully understand the context of corporate operations, include value chain risk management, take stakeholders' concern into account, and strengthen the identification and operational control of various environmental impacts and energy use.

Standards for CAL's Environmental Management Systems

Standard	Time of Introduction	Scope
ISO 14064-1 Greenhouse Gas Inventory Requirements	• Introduced ISO 14064-1:2006 in 2009 • Completed ISO 14064-1:2018 transition in 2021	• Global Aviation Fuel • Ground Operations in Taiwan, including CAL Park, EMO, Taipei Branch, Songshan Office, and Kaohsiung Branch
ISO 14001 Environmental Management System	• Introduced ISO 14001:2004 in 2012 • Completed ISO 14001:2015 transition in 2017	• Aircraft / Engine Maintenance • Flight Operations Management • Cargo Service • Passenger Service
ISO 50001 Energy Management System	• Introduced ISO 50001:2011 in 2013 • Completed ISO 50001:2018 transition in 2019	• Aircraft / Engine Maintenance • Flight Operations Management

Implementing Environmental and Energy Management Principles and Policies

China Airlines Sustainable Development Best Practice Principles

Environmental and Energy Principle

- Compliance with Environmental Laws and Regulations
- Conserving the Earth's Resources

Environmental and Energy Policy

- Performing compliance obligations and fulfilling environmental protection and energy conservation responsibilities
- Establish environmental and energy management systems, including performance indicators, to verify compliance with established policies

Strategy

Compliance with Environmental Laws and Regulations	Conserving the Earth's Resources
1. Keep abreast of the domestic and international trends and improve the channels and platforms for stakeholder engagement and communication 2. Actively participating in international cooperation and understanding the development of mainstream issues 3. Perfecting management / supervision and evaluation mechanism	1. Increase environmental performance and reducing environmental impact by operating and continuously improving corporate environmental and energy management systems 2. Declare 2050 net zero carbon emission objectives and creating carbon reduction plans 3. Create and implement rolling management of the Company's SDG targets 4. Develop environmental performance and carbon reduction targets-Increase and set targets for SDG 6, 12 for water resources,waste management, and SUP reduction

Action Plan

Compliance with Environmental Laws and Regulations	Conserving the Earth's Resources
1. Regular / irregular inventory of the comprehensiveness, timeliness, and compliance with regulations and voluntary commitments 2. Actively participate in meetings of the domestic and international industry (e.g., IATA, AAPA) and government meetings to keep abreast of domestic and international trends in environmental sustainability regulations; topics include climate change mitigation and adaptation, single-use plastics, waste management, renewable energy, and sustainable aviation fuel 3. Implementing regular / irregular internal and external audits to ensure that business operations comply with regulations and voluntary commitments 4. Respond to the international benchmark ratings such as DJSI, CDP and other public and private sector recognitions and competitions 5. Incorporate environmental protection and energy-saving management targets into audits and management reviews at all levels of the Company to ensure continuous improvement in the quality of operations	1. Understand updates to ISO standards and implement and improve enterprise environmental management systems (ISO 14001 / 50001 / 14064-1) 2. Establish and implement rolling reviews of the 2050 net zero carbon emissions strategies and performance 3. Monitor international trends in carbon management and disclosure, and refining corporate carbon management, including CDP, SBTi, and Task Force on Climate-Related Financial Disclosures (TCFD) 4. Set management goals and action plans for substantive issues such as climate change mitigation and adaptation, waste management (including SUP), energy use and renewable energy, air quality, water resources and wastewater management, toxic and chemical substance control, and noise prevention, and implement strict monitoring and evaluations 5. Establish an environmental management information system to keep track of environmental performance through systematic tracking and management

永續華航 SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

(In accordance with the "China Airlines Sustainable Development Best Practice Principles")

China Airlines Sustainable Development Best Practice Principles

Improving Eco-Efficiency

Promoting environmental and energy conservation education to foster employees' eco-awareness

1. Develop education materials and organize activities to promote environmental education for employees
2. Create diverse channels of communication for employees (including outstations) on environmental issues and improve the environmental protection awareness
3. Establish incentive plans to encourage employees to achieve and promote environmental protection

1. Organize environmental education for employees across the globe and new employees, and provide training (e-learning) for personnel responsible for environmental and energy management system operations
2. Communicate with units and employees whenever necessary to remind them of the environmental impact of their business activities and the Company's response measures
3. Organize internal and external professional training for environmental/energy management
4. Organize environmental protection seminars / contests, and charity events, and make good use of internal / external communication platforms (e.g., Employee Mailbox and official FB page) to promote environmental protection knowledge
5. Establish the Rules of Environmental Protection and Energy Conservation for Branch Offices and use channels such as DM conferences and KK meetings to strengthen outstation environmental management and increase the environmental protection awareness of employees in outstations
6. Organize activities such as quizzes for prizes and satisfaction surveys to increase employees' environmental protection awareness and reward them for providing creative environmental protection measures

Establish a green supply chain risk assessment and management system

1. Include environmental protection and sustainability clauses into supplier contracts
2. Establish a supply chain risk assessment system and implement audits from time to time to formulate improvement measures for environmental and energy risks
3. Set up a communication platform for product and service suppliers and implement environmental communication
4. Provide training resources to enhance environmental energy management capacity in the value chain

1. Incorporate the Supplier Code of Conduct and environmental sustainability clauses into outsourcing contracts to ensure that the environmental impact of services / products has been fully considered
2. Continue to execute the annual survey of environmental risks of the Group and key suppliers
3. Organize communication meetings and training courses for the Group to strengthen the capacity for environmental / energy management
4. Require companies of the Group to improve their environmental and energy management systems each year and formulate and disclose their environmental policies and performance targets
5. Organize supplier conferences and regular business meetings (e.g., monthly meetings of contractors) to communicate CAL's sustainability and environmental protection requirements

Fulfilling Corporate Social Responsibility

Creating a low-carbon operating environment to establish continual improvement of environmental protection and energy efficiency

1. Monitor trends in technological developments and regulatory developments in Taiwan and abroad. Target different business activities such as operation management / equipment maintenance, passenger / cargo transportation services, and maintenance operations to promote the following:
   (1) Set environmental performance targets to ensure continuous improvement in environmental performance
   (2) Promote corresponding environmental protection and energy conservation measures to reduce the impact on the environment
2. Use low-carbon and renewable energy

1. Optimize the operation data monitoring and management of equipment with high energy consumption
2. Continue to promote fuel-saving measures and expand services and digital operations
3. Strengthen the capacity for managing carbon assets and offsetting operations
4. Increase the installed capacity of renewable energy (e.g., solar power, etc.) and promote carbon sink projects such as afforestation
5. Continue to use SAF for the delivery flight of new aircrafts, share operational experience, and collaborate with Taiwan's industries, government, and research institutions to facilitate the formation of Taiwan's SAF development strategy

Supporting green design and procurement to promote sustainable development

1. Review and improve service procedures to promote environmentally friendly services
2. Actively promote green procurement to reduce the upstream and downstream environmental impact
3. Include environmental protection / energy saving performance as evaluation items for selection and procurement
4. Include environmentally friendly and sustainable products into the sales of duty-free products
5. Continue to promote the green consumer culture

1. Implement rolling reviews of services and related operating procedures for providing support, and continue to expand mobile, digital, and high-tech operations.
2. Search for SUP alternative products, control meal losses, and reduce cabin waste
3. Expand green procurement KPI and operational performance, use local ingredients / raw materials, environmental protection labels, and FSC-certified products to reduce raw material consumption and the environmental impact of logistics
4. Work with suppliers:
   (1) Increase the proportion of certified environmentally friendly products among the in-flight service products
   (2) Continue to develop environmentally friendly products
5. Continue to expand the scope of the "Green Fares - Carbon Offsetting Service" and strengthen marketing
6. Use diverse platforms such as in-flight videos, social media, and official websites to promote diverse events with themes that include corporate environmental sustainability ideas and performance, environmental and ecological conservation, and green consumption to increase customer awareness of environmental protection and green consumption

永續華航
SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

Identification of Environmental Risks and Opportunities GRI 201-2

CAL has completed the following environmental and risk opportunity matrix at the present stage through the aforesaid enterprise risk management framework and platform. CAL has included these nine issues in the scope of its key corporate environmental risk management for active control and response. Other issues will also receive attention through the operation of corporate environmental management system.

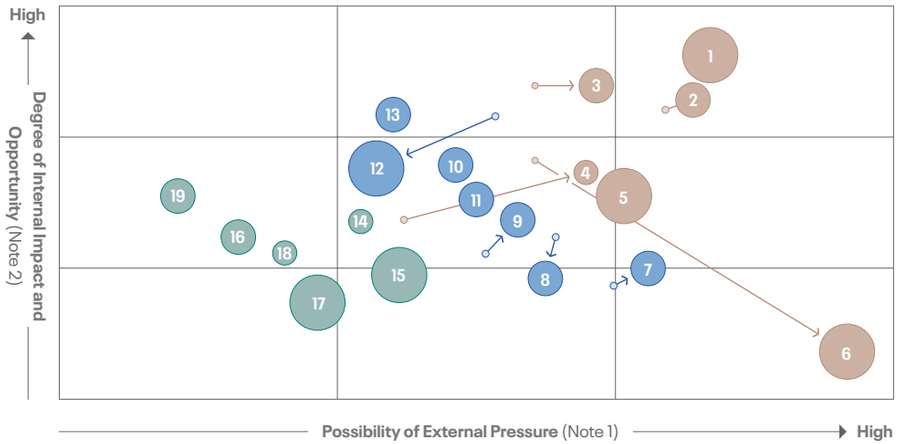
1. Aviation carbon emission management
2. Climate change adaptation
3. Aircraft energy efficiency improvement
4. New technology and energy development
5. Ground operation energy (carbon) management
6. Single Use Plastic (SUP)
7. Cabin waste control
8. Aircraft takeoff and landing noise control
9. Ground water resources management
10. Toxic and chemical substance control
11. Waste water and sewage control
12. In-flight drinking water management
13. Ground operation waste control
14. Green supply chain management requirements
15. Ground operation air pollution control
16. Aircraft air pollution control
17. Illegal wildlife transport control
18. Circular economy and innovation model
19. Passenger environmental protection awareness improvement

Material Environmental Risk Topic	Risk	Opportunity	Management Method
1. Aviation carbon emission management	Increasingly strict international carbon emissions regulations will increase the Company's operational costs	Grasp the development trend of carbon rights and manage properly to increase revenue	Actively participate in international conferences to keep abreast of latest developments; strengthen the management system and the carbon management team's response capabilities
2. Climate change adaptation	Increasing frequency of extreme weather events will impact the Company's daily operations	Proper response will strengthen corporate resilience and reputation	Continue to improve the Company's ability to predict and respond to climate change, as detailed in 2-4-2 Climate Change Mitigation and Adaptation
3. Aircraft energy efficiency improvement	Accelerate the introduction of new generation energy efficient aircraft and fuel-saving technologies which will increase operational costs	Improve aircraft fuel efficiency while reducing fuel consumption and carbon emissions, which will reduce operational costs	Replace aircraft, introduce fuel-saving technologies / sustainable fuels, improve the passenger load factor, as well as optimize routes and air traffic management operations, as detailed in the CSR website
4. New technology and energy development	The aviation industry is governed by strict regulations and certification requirements, and it takes a longer period of time to adopt new technologies and new energy sources	Effective reduction of fuel consumption and carbon emission volume can increase operations efficiency and reduce operating costs	CAL began preparation for introducing next-generation energy-efficient aircraft (e.g., A321neo) and fuel saving technologies, and use SAF to promote the development of sustainable aviation fuel in Taiwan
5. Ground operations energy management	Strict regulations on energy consumption will increase costs	Improve energy efficiency in office and ground operations, which will reduce operational costs	Formulate an annual improvement plan, and its effectiveness should be evaluated each quarter by the Environmental Committee. Expand the use of renewable energy and increase the installed capacity of renewable energy equipment
6. Single Use Plastic (SUP)	Restrictions on the use of single-use plastic products have been expanded from Europe to other countries / routes, which increase the compliance conditions and costs	Development of items made from sustainable materials can help us grasp opportunities in the circular economy and reduce the number of violations and cost of compliance	Continue to monitor changes in regulations, leverage supply chain and cross-industry cooperation, develop alternative solutions and set reduction targets, and conduct rolling reviews and continuous improvements while accounting for both the Company's operations and supply chain conditions
7. Aircraft takeoff and landing noise control	Stricter regulations will increase the cost of fees	Proper response will strengthen corporate resilience and reputation	Introduce new aircraft models and optimize aircraft approaches to reduce noise pollution
8. Cabin waste control	The use of single-use plastic products and food waste management has gained prominence in many countries while the complexity of operations has increased compliance cost and the response to the COVID-19 pandemic has created public sanitation and waste management issues	Systematic inventory and planning for alternative products and improvement of operating procedures to reduce the risks of violations of regulations and compliance cost, and improve company reputation	Establish a Task Force to monitor management trends and market development of alternatives to set reduction targets and management plans and engage suppliers to develop optimal response solutions; enhance source quality and quantity management and improve terminal processing standards during the disease prevention period
9. Ground water resources control	Lack of water resources affects the Company's operations, which will increase water purchase and replacement costs as well as the risk of operational disruption	Properly manage and use water resources to reduce operational costs and improve the resilience for continued operations	Improve water resources management mechanism, continuously optimize equipment and operating procedures / production processes, and increase the use of recycled rainwater and sewage and water usage efficiency Adopt water-saving technologies and products and reduce the use of water resources

永續華航
SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

CAL Environmental Risk and Opportunity Matrix



The size of the circle represents the adaptation of CAL to the issue (a larger circle means better action and 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.

Note 1: X-axis represents the possibility of the issue in the global trend of development and control.
Note 2: Y-axis represents the degree of impact and opportunity of the issue on CAL.

2-4-2 Climate Change Mitigation and Adaptation

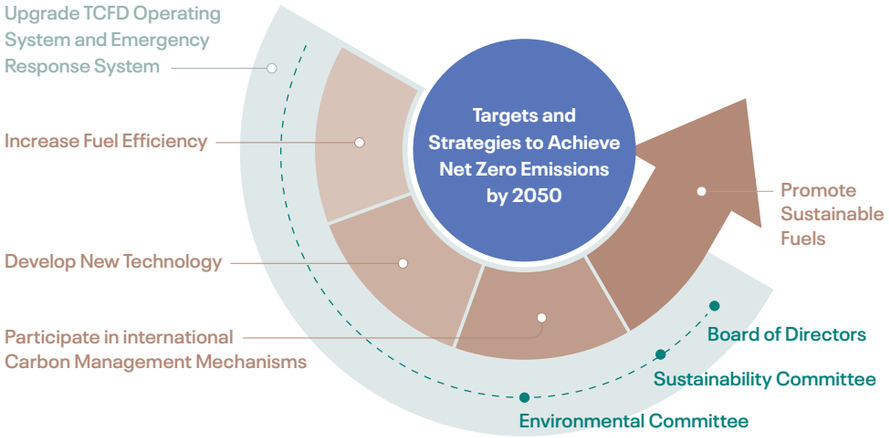
Recognizing the direct impact and importance of climate issues on the aviation industry, CAL actively promotes climate change mitigation and adaptation operations. CAL has set three objectives in flight operations and ground operations in response to the voluntary carbon reduction initiatives of the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA), and the Civil Aeronautics Administration (CAA) of the Republic of China (Taiwan). We also use it to develop carbon reduction strategies and take appropriate climate adaptation actions to reduce the negative impact of climate change on the Company and grasp opportunities derived therefrom. We conduct an overview of the climate risks and opportunities faced by the Company and optimize related software and hardware facilities, control measures, and response procedures. CAL supported international initiatives and became Taiwan's first airline to publicly sign and adopt the Task Force on Climate-Related Financial Disclosures (TCFD) in 2018. CAL works actively to make TCFD a part of the Company's management system. We assist and complete the translation of TCFD guidelines into traditional Chinese and participated in multiple advocacy campaigns with the industry, government, and academia. We have compiled an independent "Climate-Related Financial Disclosure Report" since 2020. It is reported to the Board of Directors each year and disclosed on the CSR website.

Concern for Climate Change

Declaration of the Net Zero Carbon Emission Target by 2050 and Formulation of the Carbon Reduction Strategy

CAL participated in discussions on IATA operations in 2021 and leads Taiwan aviation industry to declare its 2050 net zero carbon objectives in Q4. CAL later formulated 5 core strategies for carbon emission reduction (as shown in the figure below; the area of each strategy represents its contribution to carbon reduction). They include: Fuel efficiency improvement (e.g., implementation of various fuel saving and carbon reduction measures and continuous improvement of loading rates), 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), timely introduction of new technologies (e.g., continuous introduction of energy-efficient aircrafts, and the monitoring and evaluation of developments of hydrogen-fueled aircrafts / short-range electric aircrafts, cost of introduction, and timing).

Declaration of the Net Zero Carbon Emission Target by 2050



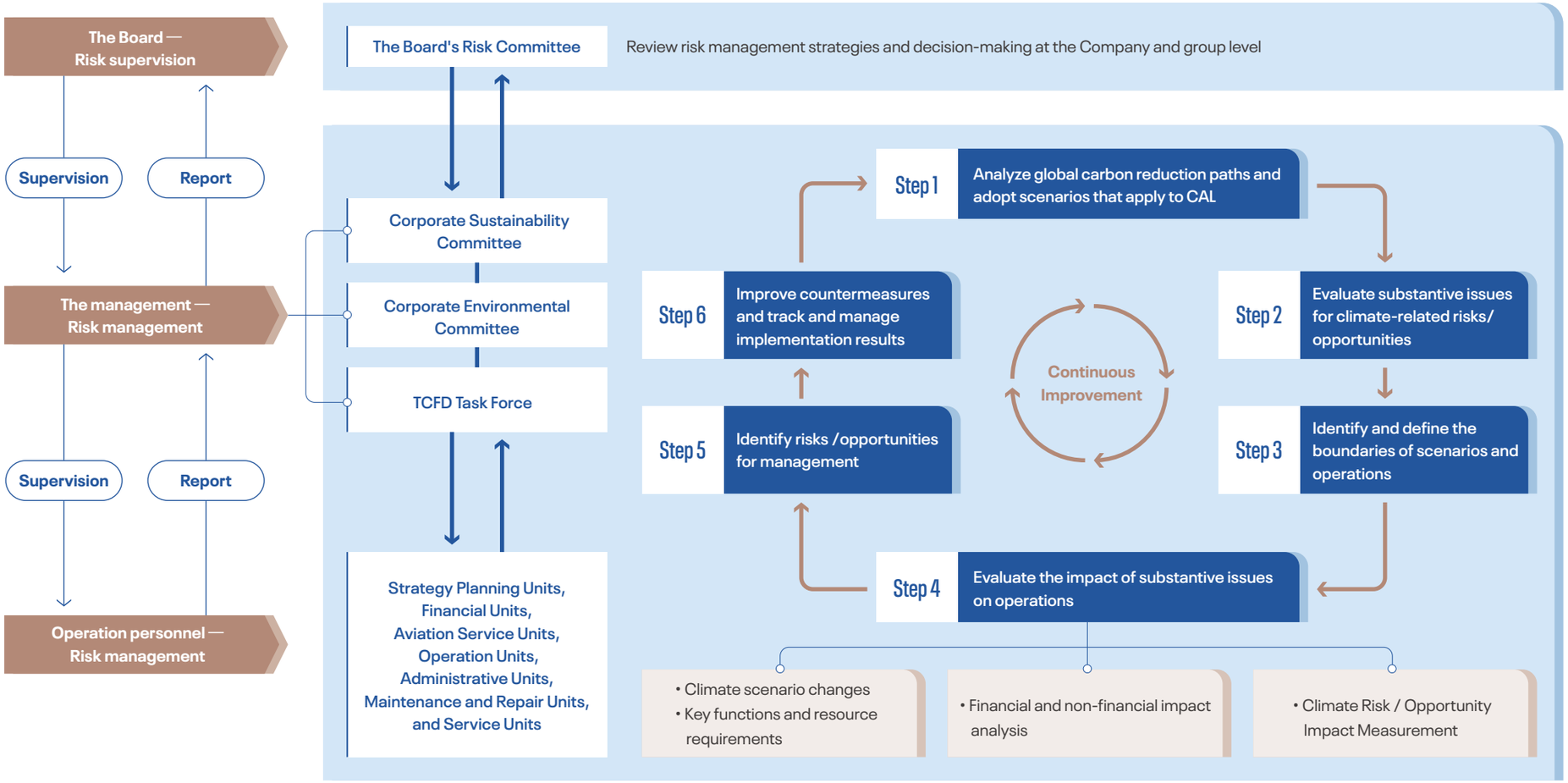
Climate Governance Framework and Risk Management Procedures

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. We report key results to the Board of Directors each year for supervision and management. CAL's climate governance framework is shown in the figure below.

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

CAL has incorporated TCFD operating procedures into the Company's management mechanisms and established internal TCFD operating procedures. We have formulated detailed implementation measures for governance, strategy, risk management, and indicators and targets to continue to improve management and enhance the management of overall climate-related risks and opportunities.

Climate Governance Framework



Analysis of the Impact of Climate Conditions on Business Operations

CAL has referenced the IPCC Sixth Assessment Report (AR6) and analyzed and identified related risks and opportunities that may affect the cost of operations or revenue under 1.5°C, 2°C, and 3°C scenarios based on global operations and destinations, company assets (including aircrafts, offices, and plants), upstream supply chain, and downstream customers. The analysis results are as follows:

永續華航 SUSTAINABILITY WE CARE

Contents

Preface

1 Sustainability Management

2 Value Creation

2-1 Trust

2-2 Human Resources

2-3 Cooperation

2-4 Environment

2-5 Society

3 Corporate Governance

ESG Data and Appendix

Analysis of Impact on Operations (under 1.5˚C scenario)

Governments and ICAO

Low-Carbon Transformation Policies, Regulations, and Agreements

- Promoting sustainable aviation fuels: EU Green Deal, Fit for 55 package, and SAF targets
- Introduce carbon tax and carbon offsetting requirements to achieve net zero emissions
- Introduction of mandatory renewable energy usage
- Collection of energy expenses and fossil fuel fees

Newcomers in the market — **Development of Electric Aircrafts** (lithium-ion Batteries / Hydrogen Fuel Cells)

Suppliers (Aircraft Companies) — **Increase Fuel Efficiency**

- Increased demand for next-generation aircrafts with better fuel efficiency
- Development of next-generation aircrafts

Supply Chain (Raw Materials) — **Rising Cost of Materials**

- Large electricity users (800 kW) are required to use renewable energy for 10% of their consumption and will see increased costs for suppliers

CAL

Increased Cost, Reduced Revenueor Impact to Company Image

- Carbon trading costs
- Sustainable aviation fuel (SAF) increases operating costs
- Increased cost for the supply chain
- Energy costs of air conditioning have increased due to extreme high temperatures and extended summers
- Increased awareness of sustainability or carbon issues in customers or consumers
- Collection of domestic carbon fees

Potential Opportunities

- Attract ESG investment, increase the Company's market value
- Implement fleet plans to effectively reduce operating costs
- Utilize sustainable fuel to satisfy international carbon reduction requirements
- Investment in renewable energy can provide opportunities such as generating carbon assets and reducing emissions
- SkyLink's system and cross-industry payment for seat selection services can help address extreme weather incidents
- Energy monitoring systems can identify consumption hot spots to increase energy efficiency
- Promote mass transit ticket packages to target green consumer groups
- Establish a water balance diagram to manage the flow of water resources
- Issue green government bonds to invest in renewable energy

Stakeholders — **Issues of Concern to Sstakeholders**

- Stakeholders increase their environmental awareness and promote replacement of air transportation with land transportation (including rail transportation)
- Increased demand in developing countries
- Population increase and economic growth expand the demand for logistics
- Increased frequency and intensity of extreme weather affect the normal operations of flights (torrential rain, lift, and rise in sea level)
- Development of ESG investment
- Consumers pay close attention to the development of low-carbon tourism

Alternatives — **Replacement by Land and Sea Transport**

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

CAL identifies, evaluates, responds, and reviews the critical climate risk matrix analysis for conditions under 1.5°C, 2°C, and 3°C (as shown in the figure below) and quantifies of financial impact in accordance with internal risk management mechanisms. Please refer to the "CAL Climate-Related Financial Disclosure Report" for the comprehensive short, medium and long-term analysis.

Opportunities

1. Fuel saving flight network
2. Reduce energy costs
3. Improve the Company's image and revenue
4. Increase resilience to extreme weather
5. Improve management of water resources
6. Issue green government bonds to invest in renewable energy
7. Invest in renewable energy to achieve net zero emissions targets

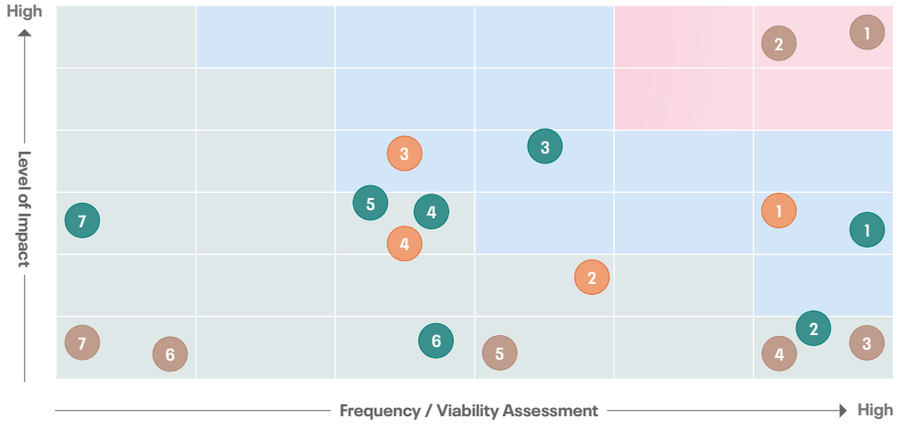
Physical Risks

1. Disappearance of routes (low terrain)
2. Flooding (torrential rain, rise in sea level)
3. Drought
4. Impact of extreme weather on aviation

Transformation Risks

1. Cost of sustainable fuels
2. Cost of carbon offsetting and trading
3. Cost of renewable energy
4. Supplier management
5. Issues of concern to stakeholders
6. Impact of high temperatures on increased energy costs
7. Impact of carbon tax on the cost of aviation materials

Risk / Opportunity Matrix



永續華航 SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

Climate Change Targets and Mitigation and Adaptation Strategy

Response Item		Objectives	Specific Actions in 2021
Governance	Strengthen Climate Governance	Continue to submit climate governance reports to the Board of Directors	Reported climate governance reports to the Risk Committee of the Board of Directors
	Enhance Management Supervision and Cross Departmental Operations	Meet corporate governance and green finance requirements	1. Introduced TCFD and SASB standards and requirements 2. Continuously implemented rolling management to improve the short, medium, and long-term ESG performance
Strategy	Enhance TCFD Capabilities	Increase the comprehensiveness and depth of quantified financial information	1. Established standard operating procedures (SOP) 2. Establish a cross-unit operation information platform
	Climate Response Strategies and Management	Increased resilience for responding to climate change risks	1. Incorporated climate risks and opportunities into the Company's overall strategies and plans and implement related response actions 2. Incorporated discussions of the impact of climate change in the Company's flight plans, business performance management, and other operations and formulate response strategies and business operation adjustments when necessary
	Participate in Important Engagements	Increase the understanding of international climate change issues and regulatory requirements	1. Participated in international and Taiwan's important climate policy engagement platforms, monitored policy development trends, and gained influence 2. Lobbied the industry, government, and academia to create a development strategy for sustainable aviation fuel in Taiwan
Risk Management	Strengthen the Risk Management Mechanisms for the Corporate Value Chain	Increase resilience for responding to climate change risks	Combined the CAL value chain and the environmental risk management mechanism, continue to implement and expand the GHG inventory and climate and energy risk assessments of key suppliers, strengthened the detection of climate risks and opportunities as well as management, and enhanced the capability of continuous operations in response to extreme weather
	Strengthen the Existing Enterprise Risk Management Mechanism	Implement risk management and strengthen emergency response mechanisms	Incorporated climate factors into the existing enterprise risk management mechanism to strengthen climate risk / opportunity detection, response, and control capabilities in all units
	Respond to International Carbon Transformation Risks	Meet ICAO, EU, and other international regulations for carbon reduction	1. Participated in the carbon offsetting and reduction plans of the international aviation industry 2. Continued to enhance MRV capacity for EU ETS, UK ETS, and CORSIA mechanisms 3. Studied and performed carbon rights / 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 renewal of high-energy-consuming facilities 3. Evaluated the installation of renewable energy facilities such as solar PV 4. Enhanced energy management systems and improvement of their effectiveness
Indicators and Targets	Continuously Optimize Green-house Gas Inventory	Expand the scope of the inventory to increase the quality of the data	Conducted an inventory of greenhouse gas emissions ISO 14064:2018 categories 1-6 greenhouse gas emissions inventory inside and outside the organization every year to increase the quality of the data on greenhouse gas emissions
	Implement Carbon Emission Reduction Targets and KPIs	Attain short, medium, and long-term GHG reduction targets and net zero emission target for 2050	Established approximately 71 KPIs in environmental protection and carbon emission reduction and the President convened quarterly meetings of the Environmental Committee to review the outcomes of implementation
	Attain Flight Carbon Reduction Objectives	Attain short, medium, and long-term GHG reduction targets and net zero emission target for 2050	1. Continued to promote plans for fleet update, aircraft weight reduction, flight optimization, and O&M improvement 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 loading rate, and focused on the development of new technologies and new low-carbon aircrafts for purchase at an appropriate time 4. Continued to promote SAF usage
	Increase Fuel Efficiency	Increase the efficiency of company operations and fuel consumption	1. Continued to promote aviation fuel-saving operations to increase 1.5% fuel efficiency each year 2. Optimized route planning and developed the most suitable passenger / cargo fleet in response to the epidemic and market development trends

永續華航
SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

2-4-3 Achievements in Environmental Sustainability

GRI301-1, 303-2, 303-3, 303-4, 303-5

CAL continued to focus on the following tasks: improving environmental and energy management, strengthening carbon management, building capacity for supply chain environmental management, and promoting environmental awareness. The Corporate Environmental Committee, its five environmental management committees, and functional task forces convened meetings regularly or from time to time to improve environmental performance and ecological efficiency. For more information on environmental performance.

Refer to Appendix Environmental Performance

Task 1 — Optimizing Corporate Environment and Energy Management

In 2017 and 2019, CAL completed the transition to the ISO 14001:2015 standards and ISO 50001:2018, incorporating the "life cycle thinking", "stakeholder engagement," and "risk and opportunity management" into day-to-day operations to continue to enhance environmental and energy performance tracking and management in order to attain the short-term goals for carbon reduction in ground operations and SDGs. However, the COVID-19 epidemic in 2020 to 2021 has affected environment and energy performance. We implemented measures to support disease prevention requirements such as increasing air-conditioning ventilation, organizing work in separate regions / periods, removing certain water conservation faucets, using disposable utensils, and canceling carpool measures, which exacerbated the burden of the environment in operations.

Nevertheless, CAL remains committed to the spirit of "no resource wasting and precision management" while prioritizing disease prevention. We implemented resource conservation operations across the Company including continuous replacement of lighting equipment, increasing the sources of intermediate water recycling, setting up regional for rotation demands and reduce the burden of the environment. In addition to continuous collection of data on outstation business activities, we also used the opportunity to strengthen resource management and performance evaluation of the system. We implemented measures included the decommissioning of 747-400 passenger aircrafts, installation of electricity meters for major energy usage, installation of water meters at water consumption points, tracking solar energy power generation efficiency, and full inventory and deployment of resource recycling facilities as we prepare for the recovery of demand in the future.

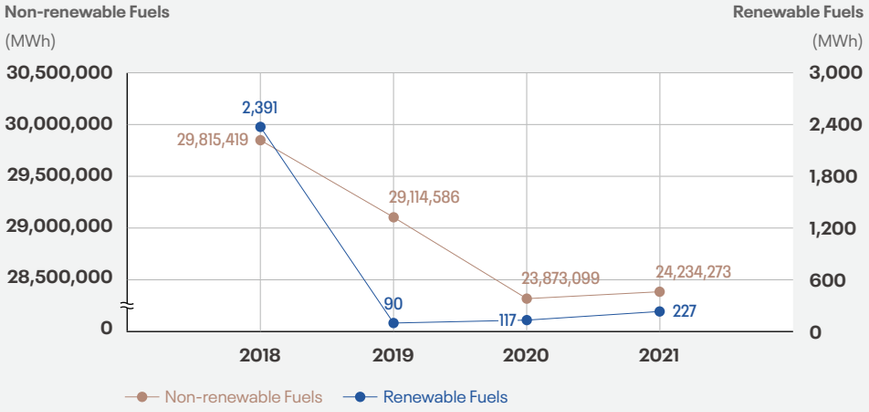
As a benchmark air transportation service provider in Taiwan, CAL is tasked with the critical mission of with supporting border security and strengthening disease prevention tasks for passengers and crew members. CAL complies with related regulations of the Central Epidemic Command Center (CECC) and provides passengers and crew members with suitable protective equipment and takes part in discussions and cooperation on IATA Guidance for Cabin Operations During and Post Pandemic. We process cabin waste in accordance with high standards in domestic and international regulations. CAL also works with suppliers to actively develop in-flight service products that meet disease prevention and environmental protection requirements to protect passengers' health and the environment.

Resource Management

Use of Energy

CAL carried out 59 environmentally friendly energy conservation measures and the fuel management team implemented 12 fuel-saving programs in 2021. The planed carbon reduction target was 48,762 tons. However, the reduced number of flights due to the epidemic resulted in a lower achievement rate for fuel conservation. The park air-conditioning / lighting equipment replacement project was also postponed. The actual carbon reduction in 2021 was 58,464 tons and the achievement rate was 120%. CAL consumed 33,260 thousand kWh of electricity in 2021, which was a 3.66% decrease from 2020 (34,523 thousand kWh). CAL continued to replace existing equipment and lighting equipment, enhanced the energy conservation awareness campaigns in the office, maintained the operation efficiency of the electricity recovery system of the elevators, and increased the efficiency of solar renewable energy equipment during the epidemic. We also obtained 127 renewable energy certificates issued by the Ministry of Economic Affairs in 2021 to maintain a certain level of building energy efficiency while satisfying disease prevention requirements.

Energy Consumption



永續華航
SUSTAINABILITY WE CARE

Contents

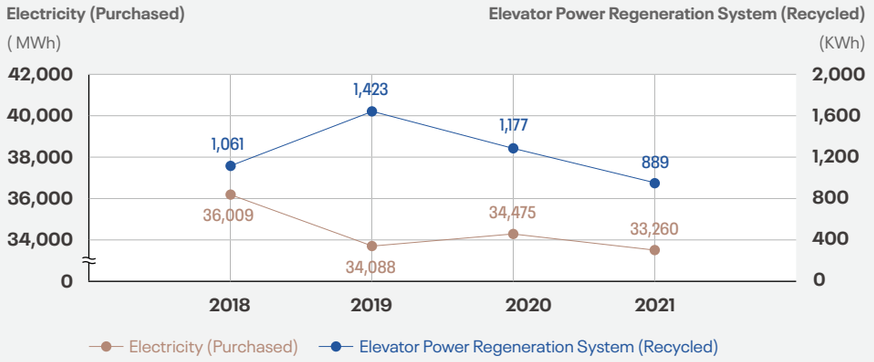
Preface

1 Sustainability Management

2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society

3 Corporate Governance

ESG Data and Appendix



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: Renewable fuels include sustainable aviation fuels and solar photovoltaic.

Note 3: The scope of purchased power covers park areas (China Airlines Park, Taipei Branch Office, Songshan Office), maintenance plants (Hangars 2 and 3, Engine Maintenance Plant), and Kaohsiung Office.

Noise Management

CAL takes the following measures to reduce the impact of noise on local communities and front-line employees during takeoff and landing without compromising flight safety:

1. All aircrafts in the fleet (A350-900, A330-300, A321neo, 777-300ER, 737-800, 777F, and 747F) have conformed to international noise standards (noise level for Chapters 3 and 4 of ICAO Annex 16); in particular, noise of A350-900 is 16 dB lower than the current standards and 20% less than that of the same model of competitors.
2. Implement flight takeoff and landing operations in accordance with the Noise Abatement Procedures announced by each airport.
3. Encourage the flight crew to employ the continuous descent approach (CDA) to continue low-noise operations, lower noise level, and reduce fuel consumption.
4. Pay noise charges according to regulations of each country's airports on noise prevention.
5. Collect international information through international exchange platforms, such as IATA to continue to carry out noise reduction.

Use of Water Resources GRI 303-1

CAL's water resources are supplied by Taiwan Water Corporation or Taipei Water Department based on the region. Both CAL and Engineering & Maintenance Organization (EMO) Parks are located in areas with medium to high water resource risks. We fully incorporated with water conservation label products and rainwater recycling systems into the initial design and construction of CAL Park. The system provides water for watering plants and toilet flushing in the Park and we also added multiple intermediary water recycling pipelines after the completion of construction, including condensed water from the air-conditioning system and drainage from training swimming pools as we seek to minimize the consumption of water resources. The water consumption in the in the EMO Park mainly occurs in the maintenance process, wastewater processing, and aircraft cleaning operations. The wastewater includes domestic sewage and industrial wastewater. The former is processed by the Taoyuan Airport Sewage Treatment Plant while the latter is processed by the two wastewater treatment plants in the EMO Park due to the nature of the wastewater. The treatment plants process organic and galvanization wastewater (including heavy metals such as chromium and cadmium). They are also regularly inspected to ensure that the effluent meets related regulations of the Environmental Protection Administration. We recycle and reuse the processed organic wastewater for washing cars and watering garden plants. The remaining effluent is discharged into Nankan River. Songshan Park and Taipei Branch Office are located in areas with low water resource risks.

Water Usage Area	Water Shortage Level 1	Water Supply Unit (Source Type)	Wastewater Processing Unit (Level)	Effluent Site	Effluent Standard
CAL Park	Located in Taoyuan City with high water resource risks	Taiwan Water Corporation (fresh water)	Domestic sewage: Taoyuan Airport Sewage Treatment Plant (secondary treatment)	Nankan River (River with Category C terrestrial surface water)	pH: 6 ~ 9 COD: <100 mg / L BOD: <30 mg / L SS: <30 mg / L
EMO Park			Industrial wastewater: CAL's first and second wastewater treatment plants (tertiary treatment)		pH: 6 ~ 9 COD: < 100 mg / L SS: < 30 mg / L Cadmium: < 0.03 mg / L Total chromium: < 2 mg / L
Taipei Branch	Located in Taipei City with low water resource risks	Taipei Water Department (fresh water)	Dihua Sewage Treatment Plant (secondary treatmen)	Tamshui River (River with Category D terrestrial surface water)	pH: 6 ~ 9 COD: < 100 mg / L SS: < 30 mg / L NH3: < 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 2021.

永續華航 SUSTAINABILITY WE CARE

Contents

Preface

1 Sustainability Management

2 Value Creation

2-1 Trust

2-2 Human Resources

2-3 Cooperation

2-4 Environment

2-5 Society

3 Corporate Governance

ESG Data and Appendix

With regard to water resources, the Company's water withdrawal volume in 2021 was 118,422 tons which was a 12% reduction from 2020. In response to disease prevention requirements in 2021, we adjusted facilities in certain areas to ensure cleaning effectiveness and risk management stipulated by government public health policies. However, the Company still actively installs internal water meters and intermediary water recycling pipelines and promotes conservation of water used for watering plants. We implement the ECO-SHINE and Callington environmentally friendly aircraft cleaning technologies that save water and other measures. We sought to minimize the consumption of water resources in the system while ensuring disease prevention.

(Unit: thousand tons)

Water Usage Area (Source Type)	Water Withdrawal (Note 1)				Water Consumption (Note 2)	Water Discharge (Note 3)	Water Recycling (Note 4)	Recycling Ratio
	2018	2019	2020	2021	2021	2021	2021	2021
CAL Park (tap water)	54.47	57.49	49.1	33.42	22.32	16.75	11.42	29.2%
CAL Park (rainwater)	11.48	15.34	8.05	5.65				
EMO Park (tap water)	75.88	70.25	59.78	65.4	36.17	Domestic: 12.29	NA	-
						Industrial: 16.94	Industrial: 2.81	4.3%
Taipei Branch (tap water)	5.8	5.83	5.41	4.56	2.43	2.14	NA	-
Songshan Office (tap water)	12.07	12.93	12.48	9.39	5.73	3.66	NA	-
Total	159.7	161.83	134.82	118.42	66.65	51.78	14.23	12%

Note 1: Scope covered by water meters: CAL Park, maintenance plants, Songshan Office, and Taipei Branch; rainwater recovery volume retroactively added in 2021.
Note 2: The water consumption volume of CAL Park is calculated based on the water consumption of the equipment.
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.

Pollution Prevention

Air Quality GRI305-7

Among the gases emitted by aircraft engines, nitrogen oxides (NOx) and sulfur oxides (SOx) have a significant impact on the local air quality. Despite the impact of the epidemic in 2020 on the Company's operations (RTK) and emissions performance, CAL continues to reduce the impact on ground air quality during aircraft takeoff / landing mainly through introducing low-pollution new aircraft, encouraging the shutdown of one to two auxiliary power units (APUs) during taxiing, and improving the efficiency of ground power units. CAL uses new aircrafts in its fleet to provide passenger and cargo transportation services. The 14 A350-900 aircrafts have been delivered and have replaced the A340-300 and certain 747-400 aircrafts in flights. We have purchased six 777F cargo aircrafts since 2020, with three aircrafts already been delivered, two aircrafts scheduled for delivery in 2022 and one aircraft scheduled for delivery in 2023. The Board of Directors resolved in the meeting in January 2022 to purchase four 777F cargo aircrafts which will be delivered by 2024. The first A321neo aircraft started operations in 2021 and the remaining 14 aircrafts will be delivered by 2027. Group fleet: Mandarin Airlines has fully updated its fleet and has purchased nine ATR72-600 aircrafts from 2017 to the end of 2020 to replace all ERJ aircrafts. Tigerair Taiwan already has eleven A320 aircrafts and will lease-purchase fifteen additional A320neo aircrafts.
By introducing these next-generation new fleets, CAL improved fuel efficiency and reduced NOx emissions at takeoff and landings.

To reduce air pollution caused by ground operations, CAL has adopted "environmentally friendly paint" to reduce the concentration of volatile organic compounds when aircrafts are painted. The emissions in the painting process are filtered to meet emission standards. The use of incineration facilities has thus been discontinued, which significantly reduces air pollution and fuel use. In addition, maintenance facilities also converted old supply vehicles to electric vehicles to reduce resource recycling rate and resolve the issue of vehicle exhaust.

永續華航 SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

SOx and NOx Emissions of CAL Group

Item			Unit	2018	2019	2020	2021
Passenger Aircraft	SOx	Emissions	Ton	58.28	58.95	30.41	27.43
		Emission Efficiency	g / RTK	0.0122	0.0122	0.0133	0.0150
	NOx	Emissions	Ton	607.47	614.49	317.03	34.18
		Emission Efficiency	g / RPK	0.0150	0.0149	0.0400	0.0538
Cargo Aircraft	SOx	Emissions	Ton	13.72	13.09	14.58	16.06
		Emission Efficiency	g / RTK	0.0029	0.0031	0.0030	0.0028
	NOx	Emissions	Ton	143.02	136.48	152.04	167.43
		Emission Efficiency	g / RTK	0.0301	0.0321	0.0317	0.0290

Item			Unit	2019	2020	2021	2019	2020	2021
Passenger Aircraft	SOx	Emissions	Ton	30.59	25.14	16.85	16.19	2.89	0.04
		Emission Efficiency	g / RTK	0.2001	0.5307	0.6549	0.0399	0.0486	0.0838
	NOx	Emissions	Ton	318.88	262.10	175.61	168.72	30.09	0.46
		Emission Efficiency	g / RPK	0.2086	0.5109	0.6802	0.0368	0.0454	0.0784

Note 1: SOx: is calculated based on the methodology of the American Environmental Protection Agency: Total annual emissions = Number of flights x 0.000891, where 0.000891 is the emission factor (Tons / LTO).

Note 2: NOx: is calculated based on the methodology of the American Environmental Protection Agency: Total annual emissions = Number of flights x 0.009288, where 0.009288 is the emission factor (Tons / LTO).

Note 3: LTO: refers to the landing take-off.

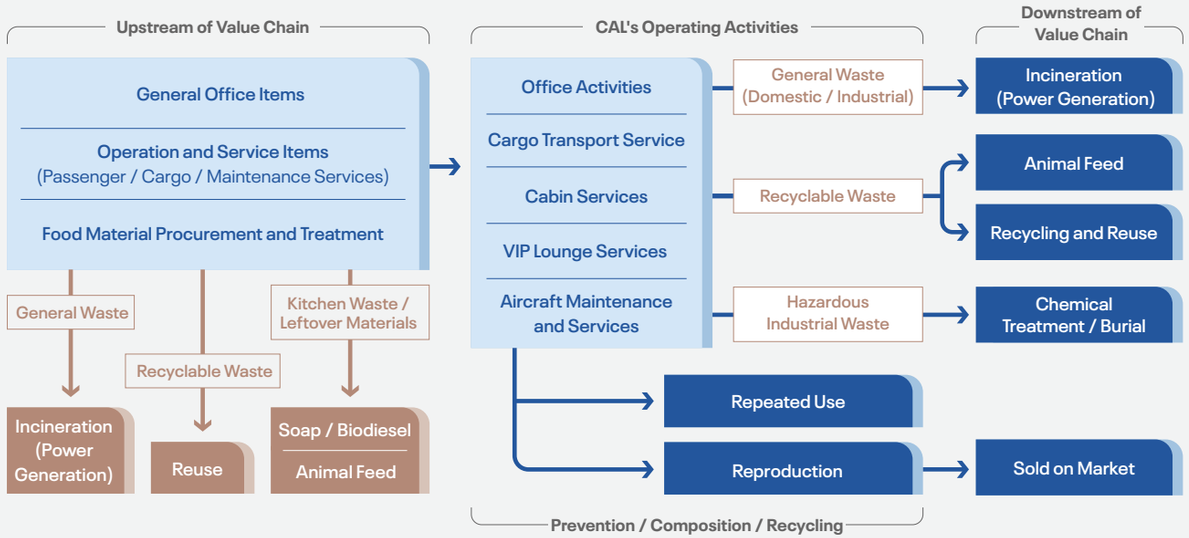
Note 4: Mandarin Airlines and Tigerair Taiwan have no cargo aircrafts.

Note:5: Mandarin Airlines revised the emission data from 2019 to 2020 in accordance with the adjustment of flight information system.

Waste Management GRI306-2

CAL considers the characteristics and output of the waste produced in the operation process, including general domestic waste from office operations, hazardous / general industrial waste in maintenance operations, and recyclable resources and kitchen waste from transportation services (as shown in the figure). The Company implements waste management in accordance with five major principles: refuse, reduce, reuse, recycle, and repair in the implementation of fuel conservation, water conservation, and paperless services. We seek to reduce waste of resources while reducing GHG emissions. We also established short, medium, and long-term management plans for waste derived from different types of operations. CAL's objective is to reduce waste volume, increase the waste recycling rate year after year, and recycle 100% of waste.

Waste Flowchart



永續華航
SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

Ground Operation Waste Management Objectives

Objecrives	2023	2025	2030
Recycle general recyclable waste	100%		
Reduce general unrecyclable waste output by (compared to 2018)	5%	7%	12%
Increasing industrial waste recycling ratio to	43%	45%	50%
Reducing paper consumption by (compared to 2018)	14%	30%	50%

Cabin Waste Management Objectives

Objecrives	2023	2025	2030
Reduce total cabin waste by (compared to 2018)	25% (Note 1)	50%	65%
Reduce use of single-use plastic (SUP) for in-flight services by	50%	90%	100%
Reduce the per capita food waste of in-flight service by (compared to 2020)	5% (Note 2)	10%	25%

Note 1: The scope of the cabin waste reduction objectives consists mainly of cabin waste for flights returning to Taiwan and does not include waste generated during meal preparation.

Note 2: As the meal format has been adjusted due to the pandemic, food waste of 2020 was adopted as the baseline year for the management targets.

Cabin Waste Reduction Objectives

Waste Management Principles	Actions
Refuse	1. Encourage the selection of products with environmental protection certification (e.g., environmental protection, FSC, energy conservation, and water conservation labels) for procurement applications 2. Work with suppliers to develop and purchase non-single-use plastic materials and environmentally friendly products (e.g., wooden stirrers)
Reduce	1. Promote the digitalization of all operating procedures to reduce paper consumption 2. Optimize maintenance processes and reduce end waste 3. Plan business and service supplies precisely to reduce consumption; strengthen waste meal management to reduce waste
Reuse	1. Increase the reuse of usable industrial waste (e.g., waste plastic buckets) 2. Develop and encourage passengers to use products with reusable materials to replace single-use products (e.g., foldable platinum silicone cups) 3. Create a friendly environment for bringing your own trays and encourage employees to reuse trays
Recycle	1. Support the Environmental Protection Administration's plastic wrap recycling platform to enhance the reuse of plastic wraps 2. Select suitable in-flight supplies / replacements to increase productivity and provide sales services (e.g., meal carts)
Repair	Repair passenger and cargo transport equipment (e.g., containers / pallet nets etc.) for reuse

Our business revenue was affected by the pandemic in 2021 and the overall waste output decreased significantly by 33% compared to 2020 while the recycling ratio increased slightly by 3%. The Company strengthened the collection of related data (onsite weighing or reports on statistics), compliance audits, and supply chain management during the epidemic to ensure adequate waste disposal. We also developed strategies to reduce plastic and surplus food through the Cabin Waste Task Force and prepare for the future recovery of the aviation industry.

永續華航 SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

Waste Information

(Unit: Tons)

Item	Service Segment			
	Waste Produced			Disposal Method
	2019	2020	2021	
General Domestic Waste	126	116	94	Incineration for power generation
	966	425	410	Delivered to the airport incineration plant in accordance with regulations (without power generation; recommended the installation of electricity generation facilities)
Recycling	779	581	509	Resource recycling
Kitchen Waste / Waste Materials	658	283	84	Compost / hog raising
	2,342	735	296	Incineration for power generation in accordance with quarantine requirements
Recycling of Hazardous Industrial Waste	18	13	12	Heat treatment (e.g., sludge from electroplating)
	1	1	1	Appoint a qualified contractor for professional disposal in accordance with regulations (e.g., batteries that contain cadmium)
Recycling of Non-hazardous Industrial Waste	113	100	100	Recycling and reuse (e.g., waste lubricants)
	120	85	64	Processed in accordance with regulations (e.g., waste paint)
Total	5,123	2,339	1,570	-

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: Scope of statistics from service segments: EMO, CAL Park, Kaohsiung Office, VIP rooms of four stations (Taoyuan, Songshan, Kaohsiung and Tainan), and in-flight services in Taoyuan International Airport. Cargo services included starting from 2020.

Note 3: Revised the items and quantities of waste delivered to the airport incineration plant in 2019 to 2020 in accordance with regulations.

Key Achievement

Food Waste Management and Packaging Reduction

CAL has formed the "Cabin Waste Task Force" in the third quarter of 2019, inviting services, supplies, planning, and quality assurance units, as well as supplier partners in catering and cabin cleaning, to actively respond to issues of concern to the international community and establish a regular communication platform. We adopted green design, waste reduction, and passenger communication as our three main operation guidelines and actively reduces the external environmental cost from inflight services and medium to long-term compliance risks.

Management of Cabin Food Waste

CAL actively responds to international food loss and waste issues, and has worked with the Group's supply chain for years to reduce food loss during preparation/processing and monitor the quantity of meals provided on flights to destinations across the world. The measures include:

1. Food material management at the source: We strictly control the operating procedures from recipe design, purchase and delivery, ingredient control, and low-temperature storage to loading to reduce food loss and waste. We also design recipes with high interoperability between the preferences of passengers in different regions and strictly implement management from procurement, inventory, and low-temperature storage to loading onto the aircraft to reduce food loss.
2. Precision meal ordering for reducing food waste: Business Class passengers can pre-select their main course on the website 14 days prior to departure. The Company then monitors the loading quantity based on the Smart Loading Ratio 24 hours prior to departure. The meal control team works closely with the flight catering service to perform at least 4 meal checks to accurately control the number of meals ordered to reduce food waste.
3. The food waste per capita for Taipei Airport was reduced by 30.6% in 2021 compared to 2020 and the amount of food waste was reduced by 92.5%.

Recycling and Reuse of Kitchen Waste and Waste Food Oil

100% of the waste oil produced in the preparation of meals by China Pacific Catering Services of CAL Group is recycled by qualified oil recycling companies for processing and conversion into biofuel or other products that can be recycled for sustainable reuse. The recycling volume from 2019 to 2021 was as follows:

China Pacific Catering Services Food Oil Statistics

(Unit: Tons)

Year	2019	2020	2021
Services Food Oil (Recycling Ratio)	80.4 (100%)	25.57 (100%)	7.53 (100%)

永續華航
SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

In-flight Environmental Services

CAL is keenly aware of the international support for environmentally friendly single-use plastics and packaging reduction. We work with our Group / supply chain partners to actively increase environmental benefits based on the principles of design at source, usage monitoring, customer communication, and consumption improvements. Important actions are as follows:

1. In-flight service supplies are prepared based on 4 basic principles (i.e., "inventory management", "operational impact", "regulatory trends", "enhancement of corporate image") + 3 innovations ("compliance with sustainability", "biocertification" and "eco design"). We develop new environmentally friendly products and transition toward a circular economy model. We also implement a plan for prioritizing repeated use, which is supported by recycling to increase the reuse of packaging materials.
2. In order to create an environmentally friendly and friendly service environment in the cabin, China Airlines has not only set a goal of reducing the amount of single-use plastic (SUP), but will also strengthen customer communication and promote customer participation. Such as earphones, green cups and tableware, reduce the use of disposable items on the plane, echoing the international trend of plastic restrictions.

- 100% of metal in-flight service supplies and equipment are recycled by qualified companies.
- Use recycled materials for 50% of the packaging in 2023; use recycled materials for 80% of the packaging in 2025; use recycled materials for 100% of the packaging in 2030.
- Enhance communication with customers and promote customer participation such as using in-flight magazines and videos to share environmental protection information and communicate environmental protection ideas. Encourage passengers to bring their own personal items such as headphones and environmentally friendly cups and utensils to reduce the use of disposable items on the aircraft.

Follow-up Operation Plans

The Waste Task Force shall continue to promote onsite waste quantity and composition inventory. It shall also continue to communicate with government authorities, international organizations, and suppliers based on the principles of food safety, convenience, exceptional services, and cost for seeking superior alternative products / materials and maximizing the resource recycling and reuse of waste.

Environmental Expenditure

CAL actively implements green procurement, invests resources every year, purchases environment-friendly equipment, promotes green maintenance and operation projects, and pays for waste cleaning and noise prevention expenses. The pandemic continued to reduce operations and green procurement of products in Category 1, 2, and 3 totaled 29 products. The amount was a decrease of TWD 3,744,000 compared to 2020.

CAL Investment in Green Facilities and Green Procurement

(Unit: TWD thousand)

Item	2018	2019	2020	2021
Environmental Protection Equipment and Maintenance Projects (Note 1)	23,106	22,805	21,774	27,922
Green Procurements (Note 2)	15,760	19,258	10,199	6,455
Waste Disposal	4,536	4,062	3,854	4,107
Noise Prevention	190,357	189,351	136,812	136,136
Air Pollution Control	1,007	753	819	589
Total Investment Amount	234,766	236,229	173,458	175,209

Note 1: Green facilities include the depreciation of pollution prevention equipment, operational maintenance, hardware investments, environmental testing, and related projects.
Note 2: Green procurement includes Category I, II, and III products prescribed in the Regulations for Priority Procurement of Eco-Products (dated January 15, 2001).

永續華航
SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

Task 2 — Consolidating Climate Risk Management and Carbon Reduction

GRI 302-1, 302-2, 302-4, 302-5, 305-1, 305-2, 305-3, 305-5

CAL introduced a complete ISO 14064-1 greenhouse gas management mechanism, and established a Carbon Management Task Force under the framework of the Environmental Committee to comprehensively manage the carbon risk issues of corporate operations and manage compliance with international carbon control schemes based on the structure of carbon rights and emissions management.

In order to achieve the carbon reduction target in the first stage in the aviation industry — improving fuel efficiency by 1.5% per year by 2020 — CAL has continued to strengthen its fuel efficiency measures and formulated four major fuel-saving strategies, namely, "promoting green-energy flights," "improving ground service control," "enhancing regular repair and maintenance," and "strengthening weight reduction of fuselages," and other specific implementation measures. However, due to the severe impact of the epidemic on flight plans and dispatches in 2021, although total aviation fuel consumption increased by 1.52% from 2020 (to be confirmed), the total number of flights was reduced by 3.4% and the performance of revenue ton kilometer (RTK) increased by 7.5%. The overall fuel efficiency was 0.2442 tons / 1,000 RTK, which met the 2021 target (0.2547 tons / 1,000 RTK). CAL has achieved the short-term carbon reduction target for ground operations (39% reduction in 2021 compared to 2009).

In 2021, CAL followed international trends and set a target for attaining net zero emissions by 2050. We continue to enhance flight and ground service carbon reduction. The fuel saving measures, the Group's GHG emissions, and its performance in the use of aviation fuel in 2021 are shown in the table below:

GHG Emissions of CAL, Mandarin Airlines, and Tigerair Taiwan

(Unit: Tons CO_2e)

Company	GHG Scope	Item	2018	2019	2020	2021
	Category 1	Flight Operations	7,229,903	7,059,083	5,787,751	5,875,531
		Ground Operations in Taiwan	3,511	4,981	3,051	2,897
		Ground Operations in Outstations (Note)	1,379	1,395	1,012	748
	Category 2	Ground Operations	19,949	18,169	53,624	16,697
	Categories 3-6 (Note)	Ground Operations	1,644,656	1,607,690	3,109,822	3,174,662
	Category 1	Flight Operations	242,325	237,701	106,600	63,987
	Category 2	Ground Operations	-	901	904	839
	Category 1	Flight Operations	336,684	362,794	53,514	988
	Category 2	Ground Operations	-	106	87	108

Note 1: The statistics contain 100% of the aviation fuels used by CAL, Mandarin Airlines, and Tigerair Taiwan.
Note 2: GHG emissions assessment agencies: BSI (2011-2013, 2015- 2016) and DNV GL (2014, 2017-2021).
Note 3: CAL calculated the emissions from the products purchased, capital goods, fuel- and energy-related activities not included in Scope 1 or 2, upstream and downstream transportation and distribution, waste treatment, employee commuting, upstream and downstream leased assets, and investments based on 15 classification requirements of the GHG Protocol Scope 3 Guidance. The emissions totaling 3,109,822 tons of CO2e was calculated in 2020 based on ISO 14064-1:2018, which was expanded to include Categories 3 to 6 (previously included in Scope 3). Only the emissions of ground operations in CAL outstations were not included in the 3rd-party verification. All other data in Categories 3 to 6 have passed third-party verification.

Key Achievement

CAL Continues to Introduce A321neo Next-Ggeneration Fuel-Efficient Aircrafts and Use SAF for Aircraft Delivery Flights

CAL actively improves its fleet structure by introducing the next-generation energy-efficient aircraft A321neo starting from 2021. This aircraft can reduce fuel consumption by 15-20%, noise footprint by 75%, and NOx emissions by 50% compared to the narrow-body aircrafts from the previous generation. CAL has also used sustainable aviation fuel for the delivery flights of the new aircrafts as it did for A350 to reduce carbon consumption by 8% compared to conventional fuel. CAL actively promotes the goal of "net zero carbon emissions" by 2050 through actual actions for fuel conservation and carbon reduction.

永續華航 SUSTAINABILITY WE CARE

Contents

Preface

1 Sustainability Management

2 Value Creation

2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society

3 Corporate Governance

ESG Data and Appendix

Key Achievement CAL Organized SAF Expert Seminar

To ensure that Taiwan's aviation industry meets international sustainable development trends, formulate Taiwan's strategy for sustainable aviation fuel, and increase the energy supply security and competitiveness in the international market and sustainability of Taiwan's aviation industry in face of future low-carbon regulations, CAL developed its SAF development statement in 2021 based on its experience in using SAF for A350 and A321neo as well as international SAF policies. CAL also convened the "Sustainable Aviation Fuel (SAF) Expert Seminar" on February 14, 2022, inviting nine experts from the Association of Atmosphere Protection in Taiwan, ITRI, National Taiwan University, National Tsing Hua University, Taiwan Institute for Sustainable Energy to exchange ideas on the SAF statement and the strategy for connecting the industry with government institutions.

Aviation Fuel Efficiency GRI 302-3, 305-4

CAL has commenced aircraft fuel saving and carbon reduction operations since 2001. We established a cross-unit fuel consumption management team in 2007 and the Senior Vice President personally oversees aircraft fuel conservation operations in operation planning, flight controls, aircraft maintenance, procedure management, and aircraft weight reduction. We manage various fuel conservation performance indicators including using only a single engine for taxiing, precision calculation of the APU activation time, use of GPU to reduce APU fuel consumption, precision refueling, precision calculation of the optimal center of gravity of the aircraft, increased precision in cargo weight measurement, and selection of the optimal backup airports and routes for landing. We have reduced carbon emissions with the hard work of all employees. According to the 12 fuel conservation performance indicators in 2021, we reduced fuel consumption by 23,035,997 liters which reduced 58,306 tons CO_2e emissions.

Item															
	2009	2018	2019	2020	2021	2021 VS. 2020	2021 VS. 2009	2018	2019	2020	2021	2018	2019	2020	2021
Fuel Consumption (Ton / GJ)	1,927,803 / 830.17	2,284,957 / 983.97	2,230,971 / 960.72	1,829,328 / 787.76	1,857,073 / 799.71	27,745 / 11.95	-70,730 / -30.46	80,667 / 34.74	98,910 / 42.59	35,395 / 15.24	26,614 / 11.46	106,406 / 45.82	114,658 / 49.37	21,178 / 9.12	308 / 0.13
CO_2 Emissions (Ton CO_2e)	6,099,820	7,229,839	7,059,083	5,787,751	5,875,530	87,779	-224,290	254,908	312,556	111,849	84,101	336,700	289,227	53,422	973
Transport Volume (Thousand RTK)	7,721,089	9,544,260	9,072,762	7,075,331	7,605,201	529,870	-115,888	149,542	152,905	47,373	25,723	373,185	405,262	59,347	521
Fuel Efficiency (Fuel / Thousand RTK)	0.2497	0.2394	0.2459	0.2586	0.2442	-0.0144	-0.0055	0.5394	0.6469	0.7472	1.0346	0.2851	0.2829	0.3569	0.5910
Carbon Emission Intensity (Ton CO_2e / Thousand RTK)	0.7900	0.7575	0.7781	0.8180	0.7726	-0.0454	-0.0174	1.7046	2.0441	2.3610	3.2694	0.9022	0.7137	0.9002	1.8676

Note 1: The lower the fuel efficiency and the carbon emission intensity, the better is the performance.
Note 2: Carbon emission intensity (ton CO_2e / thousand RTK) = GHG emissions / Total RTK.
Note 3: No alternative fuel or sustainable aviation fuel were used in 2020.

Contents

Preface

1 Sustainability Management

2 Value Creation

2-1 Trust

2-2 Human Resources

2-3 Cooperation

2-4 Environment

2-5 Society

3 Corporate Governance

ESG Data and Appendix

Task 3 — Building Capacity for Value Chain Environmental Management

In addition to strengthening its sustainable environmental management momentum, CAL also actively enhanced the sustainable value of the overall industrial value chain. CAL launched environmental management of the value chain in 2018, inviting the Group's partners to initiate the Eco Seed Development Plan, and using environmental / energy / carbon management workshops and environmental risk surveys to promote an understanding of the concepts and benefits that will accrue from environmental / energy / carbon management. In 2020, CAL started to ask interviewed value chain partners to organize quantified energy and resource information and records (tap water / wastewater and sewage / recycled water / waste / green procurement) and convene communication meetings each year. We invited contact persons from the value chain partners and their first-level supervisors to attend the meetings at which the results of risk survey and analysis were summarized and industry's excellent case studies were also shared to improve the environmental management quality of the supply chain, and implement the "lifecycle concept" management in the ISO 14001:2015 Environmental Management System. Starting from 2021, CAL also requested value chain partners to set up the Company's environmental policy and energy management targets, and continue to intensify environmental management and internal and external communication. CAL also encouraged them to set up environmental sustainability pages to disclose their environmental policies, annual operational targets, and performance.

Key Achievement

Leading Partners in the Value Chain to Continue to Improve Environmental and Energy Management Performance

- **Object:** 11 key value chain companies
- **Operational Highlights:** By surveying
  1. Assessment of the Group's operational and environmental risks
  2. Help partners of the Group manage key environmental opportunities / risks
  3. Continue to increase the environmental and energy management performance of partners of the Group
  4. Conduct communication meetings to consolidate the awareness of energy conservation and environmental protection in the value chain
- **Implementation Results:**

  All 11 value chain companies have used employee email, intranet, and bulletin boards to increase employees' awareness of the "Environment and Energy Policy". Certain partners have also used meetings with contractors, suppliers, and third-party service providers to communicate the "Environment and Energy Policy" or set up environmental sustainability webpages on their official websites and disclosed their environmental, energy, and resource management targets and performance. They considered environmental protection and energy conservation for new investment or equipment procurement. They assigned dedicated units to take charge of evaluating compliance obligations for the key environmental issues with direct impact on the company. The total Category 1 and Category 2 emissions of the 11 companies totaled 106,362 tons CO_2e.
- **Follow-ups:**

  We shall continue to expand CAL's environment and energy management experience and formulate and promote environment and energy management mechanisms that meet requirements for the Group's operation resources and sustainability targets while ensuring cost-effectiveness. We shall also strengthen environment and energy information disclosures of each company.

Task 4 — Strengthening Awareness and Brand Image of Corporate Environmental Protection

CAL organizes the environmental training campaign every year to develop employees' awareness of environmental protection. Training programs are organized online or offline to cultivate the attitude and actions of protecting the planet. To implement external communication, CAL communicates the corporate concept and performance of environmental protection with stakeholders through the official website, social media, and in-flight magazines in hopes of creating and spreading the awareness of green consumption.

永續華航 SUSTAINABILITY WE CARE

Contents

Preface

1 Sustainability Management

2 Value Creation

2-1 Trust

2-2 Human Resources

2-3 Cooperation

2-4 Environment

2-5 Society

3 Corporate Governance

ESG Data and Appendix

Item		Operation Description	2021 Achievements
Shape a Culture of Environmental Protection	Environmental Training for All Employees	Improve employees' identification and awareness of environmental sustainability and help develop good conduct and business habits	• **Environmental education** 1. CAL communicated with new employees regarding the corporate policies and approaches to environmental protection and energy conservation in the course "CAL and I". The achievement rate reached 100%. 2. CAL used the mandatory course "Environmental Management e-Learning for All Employees" to ensure that all employees fully understand the Company's environmental and energy policies and the management system. In 2021, we completed training for 5,296 ground service personnel and we will continue to provide training for cabin crew and employees across the world in 2022. • **Knowledge-based education** 1. Environmental knowledge: CAL published 18 articles and reports on environmental sustainability through internal communication platforms, such as employees' email, China Airlines newsletter, and the startup screen, in 2021. 2. Environmental protection contests and environmental protection satisfaction survey for all employees: The "Employee Environmental Knowledge Challenge" quiz, "Unlock Environmental Knowledge on e-Learning" event, and annual satisfaction surveys were attended by 2,779 employees and the overall satisfaction rate was 93.6%. 3. Environmental protection lectures: One environmental lecture was held, focusing on environmental issues related to marine ecological conservation, to raise the employees' awareness of environmental protection; 207 participants attended. CAL invited the researcher Ray Chin, a renowned ecological photographer and ecological educator, to share his ideas and experience in marine ecological conservation based on the theme of "Search for the Immense Deep Blue"
	Professional Environmental Training	Organize training on environmental and energy management for the related personnel of the Company and affiliates and appoint trainees to participate in external training and seminars as needed	Organized 9 professional training sessions on "environmental energy management systems", "GHG inventory management", TCFD climate-related financial disclosures for climate risks", and the Group's "Environmental Management Meeting" for 285 professional attendees.
Build an Image of Environmental Protection	Promote Awareness of Green Aviation	Promote environmentally friendly awareness and consumer behavior	• Continued the practice of closing windows during summer to lower the temperature of the cabin and thus reduce the cost of the use of the auxiliary power unit (APU) and airport energy use • Selected 12 environment and ecology-themed videos to play during flights • Published 4 environmental protection articles and reports via social media which reached 196,294 viewers • Added the warning of an embargo on transport of endangered species on the Company website • Continued to publish CAL's environmental practices and electronic and mobile approaches to carbon reduction for in-flight magazines • Marked the Taipei-Kinmen Carbon Label on the website of Mandarin Airlines, supplies, check-in counter, boarding passes, inflight magazines

永續華航 SUSTAINABILITY WE CARE

Contents

Preface

1 Sustainability Management

2 Value Creation

2-1 Trust

2-2 Human Resources

2-3 Cooperation

2-4 Environment

2-5 Society

3 Corporate Governance

ESG Data and Appendix

Item		Operation Description	2021 Achievements
Build an Image of Environmental Protection	Promote Awareness of Green Aviation	Promote green consumption	• Incorporated environment-friendly products and added the "Sustainability Logo" to the sales catalog of duty-free goods delivered home • Updated and shared the carbon footprint of routes • Enhanced the promotion of the voluntary ECO Travel Carbon Offsetting Program to passengers; Mandarin Airlines and Tigerair Taiwan provided ECO Travel service and disclosed information on the official website • Mandarin Airlines and Tigerair Taiwan set up the Environmental Sustainability Section on the official website to publish the "Environment and Energy Policy Statement" and the results of "Carbon Labeling", and "Carbon Reduction Labeling"
		Optimized service processes and reduce waste and waste processing costs	• Used 100% FSC paper for printing boarding passes • Adopted local ingredients for in-flight meals and Group catering and put a ban on food ingredients from endangered species • Implemented waste management • Promoted complete digitalization of menus • Incorporated the concept of environmental protection into design of in-flight meals and supplies • Continued the digitalization of in-flight magazines and weight and quantity reduction of in-flight service supplies to enhance weight reduction and fuel-saving benefits

Key Achievement

Mandarin Airlines Reduced Carbon Emissions by 30% and Received the Excellence Award for Low-Carbon Products from the Environmental Protection Administration, Executive Yuan

Mandarin Airlines of CAL Group was the first airline in the world to be awarded Carbon Footprint Reduction Label. It received the first EPA Carbon Label from the EPA and passed ISO 14067 International Carbon Footprint certification in 2017. The continuous implementation of carbon reduction operations and increased operating efficiency has significantly reduced the carbon footprint of Mandarin Airlines by 30%, which ensured its qualification for the basic requirement of the EPA for at least 3% reduction in emissions within three years. It became the first airline company in Taiwan to receive both the Carbon Label and the Carbon Footprint Reduction Label Certificate from the EPA in 2020. Mandarin Airlines also participated in the "Environmental Protection Point Collection (Green Point) event" of the EPA in 2019 and became the first and only domestic airline company to offer the "Green Point for offsetting ticket prices". It encouraged passengers to support domestic eco-friendly and low-carbon travel while enjoying actual rebates for green flight ticket discounts. In 2021, Mandarin Airlines received high praise from the EPA's Low-Carbon Review Team and received an Excellence Award for Low-Carbon Products from the EPA as recognition for its support of national carbon reduction policies.

Refer to Mandarin Airlines' Official Website — Environmental Protection

Key Achievement

Expanding the Green Point Discount for Ticket Fare Program

Since 2019, CAL has integrated the official website, the ticketing system, travel reminders, and a diversified electronic-friendly service platform to strongly encourage passengers to participate in the voluntary ECO Travel carbon offsetting program. In 2019, CAL added carbon offsetting links to the employee preferential ticket system and the business trip dispatching system to invite employees to jointly support carbon-offsetting actions. As of the end of December 2021, the amount of offset reached 299.77 metric tons, the best in the industry in Taiwan.

To continue to help domestic consumers learn about low-carbon travel and take action, CAL invited Mandarin Airlines and Tigerair Taiwan to join the "ECO Travel Carbon Offsetting Program" in 2021. It became the only domestic-route and low-cost airline company in Taiwan to support the carbon offsetting program. It provides consumers with the opportunity to participate in supporting international sustainable development initiatives and contribute to sustainability of the Earth's environment.

永續華航
SUSTAINABILITY WE CARE

Contents
Preface
1 Sustainability Management
2 Value Creation
2-1 Trust
2-2 Human Resources
2-3 Cooperation
2-4 Environment
2-5 Society
3 Corporate Governance
ESG Data and Appendix

Future Plans

1 Advance Operational Effectiveness of Management Systems

1. Advance the operation of ISO 14001 and ISO 50001 management systems and ISO 14064-1: 2018 MRV operations
2. Continue to improve environmental and energy target management and operation performance
3. Promote informatization of management systems
4. Participate in discussion on environmental management system planning in the industry

2 Expand the Scope of Environmental, Eenergy and Greenhouse Gas Management

1. Enhance the scope and intensity of climate change and environmental energy risk management of the value chain
2. Implement environmental risk assessment of outstations and suppliers
3. Assist the Group's enterprises to improve their carbon management

3 Comply with the Carbon Management Scheme for International Aviation

1. Continue to participate in the IATA and Taiwanese government's engagement for strategic planning of CORSIA operations
2. Follow CORSIA monitoring plan, process data verification, report to competent authorities, and improve data quality management
3. Optimize carbon emission management, reduction, offsetting, and carbon right management
4. Conduct carbon offset management in accordance with ICAO regulations

4 Consolidating the Financial Quantification Mechanism for Corporate Climate and Environmental Risks

1. Continue to strengthen climate and environmental governance of the senior management such as the Board of Directors
2. Build the momentum of financial disclosures relating to climate and environmental risks
3. Enhance the implementation knowledge of all units on climate issue management

5 Continue to Refine Carbon Reduction Targets

1. Implement the net zero emissions target by 2050 and continue to manage and improve air and ground carbon reduction targets
2. Strengthen energy-saving and carbon reduction measures, expand the use of renewable energy, continue to reduce the carbon footprint of operations, and improve ecological benefits
3. Participate in the preliminary research of SBT methodology for aviation and cooperation in the international aviation industry
4. Expand the use of renewable energy and promote afforestation projects

6 Continue to Improve the Utilization Efficiency of Environmental Resources

1. Improve water resources and waste management and expand and improve management targets
2. Continue to implement and improve environmental protection and energy-saving measures and increase resource utilization efficiency
3. Work with suppliers of in-flight service supplies to increase the ratio of products with environmental protection certification and continue to develop environmentally friendly products

7 Advance Sustainable Aviation Fuel (SAF) Application Strategy

1. Continue to keep abreast of developing trends in sustainable fuels
2. Continue to promote SAF trial operations
3. Encourage the implementation of domestic SAF policies and develop Taiwan's industrial and governmental SAF strategies

8 Create an Environmental Protection Culture Inside and Outside the Company

1. Continue to support environmental sustainability initiatives at home and abroad
2. Create diversified promotion channels and strengthen innovation and cooperation inside and outside the Company

Operational Focus
Future Development Plan