



中華電信
Chunghwa Telecom

2023 TCFD

氣候相關財務揭露報告書
Task force on Climate-related
Financial Disclosures



Table of Contents

I.	About the Report.....	4
II.	Introduction.....	5
III.	Sustainable Climate Governance	7
IV.	Assessment of Climate Risk and Opportunities	14
	(I) Process for Identifying Climate-related Risks and Opportunities	14
	(II) Process for Assessing Climate-Risks and Opportunities	15
	(III) Climate-related Risks and Opportunities Management Process	18
V.	Scenario Analysis for Climate Change Risks	38
	(I) Climate-related Scenarios Adopted by CHT.....	38
	(II) Physical risks	39
	(III) Transition Risks	48
VI.	Climate change adaptation strategies.....	53
	(I) Climate change mitigation management strategies.....	53
	(II) Climate change adaptation management measures.....	67
	(III) Upstream-Supply Chain Carbon Reduction Management Strategies	79
	(IV) Downstream-Opportunities for innovating climate products	82
VII.	Conclusion	86
Appendix I.	TCFD Index	87
Appendix II.	Third-Party Conformity Statement	89

Chart Index

Figure 1	Organizational Structure of CHT Sustainable Development Committee	8
Figure 2	Division of Labor of Environmental Group (E) of CHT’s Sustainable Development Committee	11
Figure 3	2023 TCFD Climate Risk Matrix.....	17
Figure 4	CHT Risk Management Organization Structure	18
Figure 5	Map of Potential Flooding Risks in CHT’s Primary Data Centers	41
Figure 6	Taiwan’s Pathway to Net-Zero Emissions in 2050-GHG Emissions.....	48
Figure 7	Taiwan’s Pathway to Net-Zero Emissions in 2050-Key Milestones.....	49
Figure 8	Diagram of carbon reduction pathway for GHG Scope 1 and 2 emissions .	56
Figure 9	Diagram of carbon reduction pathway for GHG Scope 3 emissions	60

Table Index

Table 1.	CHT Climate Change Management Framework.....	5
Table 2.	CHT’s Road to Low-Carbon Transition.....	6
Table 3.	Operational Framework of CHT Sustainable Development Committee	8
Table 4.	Time frame of Climate Change Risks and Opportunities	14
Table 5.	Risks and Corresponding Time Frame.....	14
Table 6.	Definition of Impact Level.....	15
Table 7.	Definition of Occurrence Frequency.....	16
Table 8.	Results of TCFD’s Analysis of Individual Climate Risks	17
Table 9.	Mechanism for Promoting Risk Management	19
Table 10.	Process for Assessing Climate-Risks and Opportunities and Response Measures	20
Table 11.	Impact of Climate Change on the Business Sector	28
Table 12.	Elements of Financial Planning for Climate-Related Risks and Opportunities.....	35
Table 13.	Climate-related Scenarios Adopted by CHT in Risk Assessment.....	38
Table 14.	Analysis of Comprehensive Water Risk in Base Year for CHT	40
Table 15.	Analysis of Comprehensive Water Stress between 2030-2040 for CHT ...	40
Table 16.	Analysis of Comprehensive Water Risk in Base Year for Key Suppliers..	43
Table 17.	Analysis of Comprehensive Water Stress in 2030 for Key Suppliers.....	45
Table 18.	Analysis of Comprehensive Water Stress in 2050 for Key Suppliers.....	46
Table 19.	Analysis of Comprehensive Water Stress in 2080 for Key Suppliers.....	47
Table 20.	Metrics Adopted by Climate Change Mitigation Management Strategies.	54
Table 21.	Diagram of carbon reduction pathway for GHG Scope 1 and 2 emissions	55
Table 22.	Scope 1 and 2 Emissions of CHT Over the Past Three Years.....	58
Table 23.	Diagram of carbon reduction pathway for GHG Scope 3 emissions	59
Table 24.	Scope 3 Emissions of CHT Between 2021-2023	63
Table 25.	Targets for PUE in IDCs	65
Table 26.	Internal Carbon Fee Data (2023)	67
Table 27.	Metrics Adopted by Climate change adaptation Management Strategies..	67
Table 28.	Climate Change Adaptation Plans and Implementation Results in 2023...	68
Table 29.	Requirements of CHT for Suppliers	81
Table 30.	Metrics Adopted by Climate Opportunities	83

I. About the Report

The impact of climate change on the Earth and human life is becoming increasingly significant and has become a global concern. As the leader of Taiwan's telecommunications industry, Chunghwa Telecom (hereinafter known as CHT) shoulders the responsibility of promoting Taiwan's sustainable development. To this end, CHT launched the TCFD project in 2020 to identify, analyze and assess climate risks and opportunities for the Company, so as to transition towards low-carbon and net-zero emission by 2050. Continuing to build on the results of the existing TCFD project, CHT has re-examined and assessed climate risks and opportunities this year (2024), as well as publishing this report based on the Recommendations of the Task Force on Climate related Financial Disclosures (hereinafter known as TCFD) as the tool for examining the results of TCFD implementation this year (2024), so as to help the Company stay updated with the impact of climate change and explore future business opportunities in a timely manner.

The scope of this report covers CHT's sites and businesses all over Taiwan from January 1, 2023, to December 31, 2023.

II. Introduction

(I) Overview of TCFD Implementation by CHT

To manage the impact of climate change on the Company, CHT launched the TCFD project in 2020. The Company focuses on four major areas to mitigate and adapt to climate change while inviting international third-party organizations to verify our TCFD implementation efforts. As a result, for the fourth consecutive time, CHT once again obtained a conformity statement with the highest level of “Level 5+: Excellence grade,” making it the world’s first telecommunications company to obtain TCFD verification.

- The Board of Directors is responsible for overseeing the Company’s approach to climate change and making operational management decisions;
- Develop CHT’s strategy for addressing climate change, with a focus on both mitigation and adaptation;
- Identify, analyze, and assess the risks associated with climate change, as well as analyze the financial impact of potential risks;
- Set climate change mitigation and adaptation goals, and regularly review the progress towards achieving these goals.

Table 1. CHT Climate Change Management Framework

Governance	With a dual management mechanism consisting of the Sustainable Development and Strategy Committee and the Sustainable Development Committee, combined with existing internal control and risk management mechanisms, reports are made to the Board of Directors quarterly, strengthening the Board’s supervision over climate change issues.
Strategies	Strategies and initiatives for climate change mitigation and adaptation have been formulated, including: Mitigation: Taking actions towards improving energy efficiency, adopting renewable energy, engaging in the research and development of emerging technologies. Adaptation: Strengthening the climate resilience of our communication equipment and facilities to reduce the impact of natural disasters on the Company.
Risk Management	Following the ISO 31000 Risk Management - Guidelines to set up climate change risk management processes. The impact of climate change is assessed every year.
Metrics & Targets	The target of 2050 net zero emissions have been set. The Company’s climate change adaptation targets align with that of the National Climate Change Adaptation Action Plan.

(II) Review of CHT's Road to Low-Carbon Transition

Table 2. CHT's Road to Low-Carbon Transition

Year	Description
2023	<ul style="list-style-type: none"> ● Committing to the establishment of long-term Science-Based Targets (SBTs) to achieve net zero emissions. ● Passing the review of SBT's near term targets: ● Joining RE100 and committing to using 100% renewable energy by 2040.
2022	<ul style="list-style-type: none"> ● Proposing targets for mitigating climate change, including: <ul style="list-style-type: none"> - Chunghwa Telecom commits to reduce absolute scope 1 and 2 GHG emissions 50% by 2030 from a 2020 base year. - Chunghwa Telecom also commits to reduce absolute scope 3 GHG emissions 22.5% by 2030 from a 2021 base year. - Achieving the target of RE100 by 2040
2021	<ul style="list-style-type: none"> ● Proposing the net-zero emissions target for 2050 ● Developing a Science Based Target (SBT) commitment ● Joining the Taiwan Alliance for Net Zero Emission ● Launching the BS 8001 circular economy project ● Setting up the Sustainable Development Committee
2020	<ul style="list-style-type: none"> ● Obtaining the TCFD conformity statement ● Launching the TCFD project ● Building the largest photovoltaic power station in Yilan as part of the BT model
2019	<ul style="list-style-type: none"> ● The Syntrend store passed ISO 14067 and PAS 2060 carbon neutrality standard
2018	<ul style="list-style-type: none"> ● Becoming a TCFD supporter
2017	<ul style="list-style-type: none"> ● Becoming a CDP Supply Chain member
2011	<ul style="list-style-type: none"> ● Introducing ISO 50001 energy management systems
2008	<ul style="list-style-type: none"> ● Launching the GHG inventory project ● Developing and launching the EARTH system

III. Sustainable Climate Governance

(I) Board of Directors' Oversight of Climate-related Risks and Opportunities

1. Board Governance

To enhance the functions of the Board of Directors and strengthen its supervision of sustainable business development, on August 9, 2023, CHT approved the integration of the Sustainable Development Committee and the Corporate Strategy Committee into the Sustainable Development and Strategy Committee. As a result of the integration, the committee was elevated to the level of a functional committee of the Board of Directors, and became the highest governing body for the sustainable development of CHT.

The Sustainable Development and Strategy Committee consists of five to nine directors; committee members are recommended by the Chairman and appointed by the Board of Directors. Among committee members, more than half are Independent Directors of CHT, and one is selected as the Convener and meeting chairperson, a position currently held by Chairman Shui-Yi Kuo. The committee convenes quarterly to offer strategic guidance on the vision for sustainable development, long-term policies, management principles, and medium to long-term goals. It also monitors and evaluates the performance of the Sustainable Development Committee.

In addition, from company managers, CHT has set up the Sustainable Development Committee for coordinating and promoting the Company's effort in aspects including environmental (E), social (S) and governance (G). The Sustainable Development Committee is chaired by the Chairman of the Board (concurrently the Chief Sustainability Officer), with the President serving as the Vice Chairperson; the 4 ESG subgroups: Environmental Group (E), Social Groups (S1, S2), and Governance Group (G), are led by the Company's four SEVPs. The Sustainable Development Committee holds monthly subgroup meetings, quarterly cross-group meetings, and semi-annual committee meetings. Furthermore, it provides quarterly reports to the Board of Directors on significant matters, stakeholder communication results, achievements in promoting sustainable development, and goal attainment. Please refer to Figure 1 for CHT's organizational chart for sustainable development.

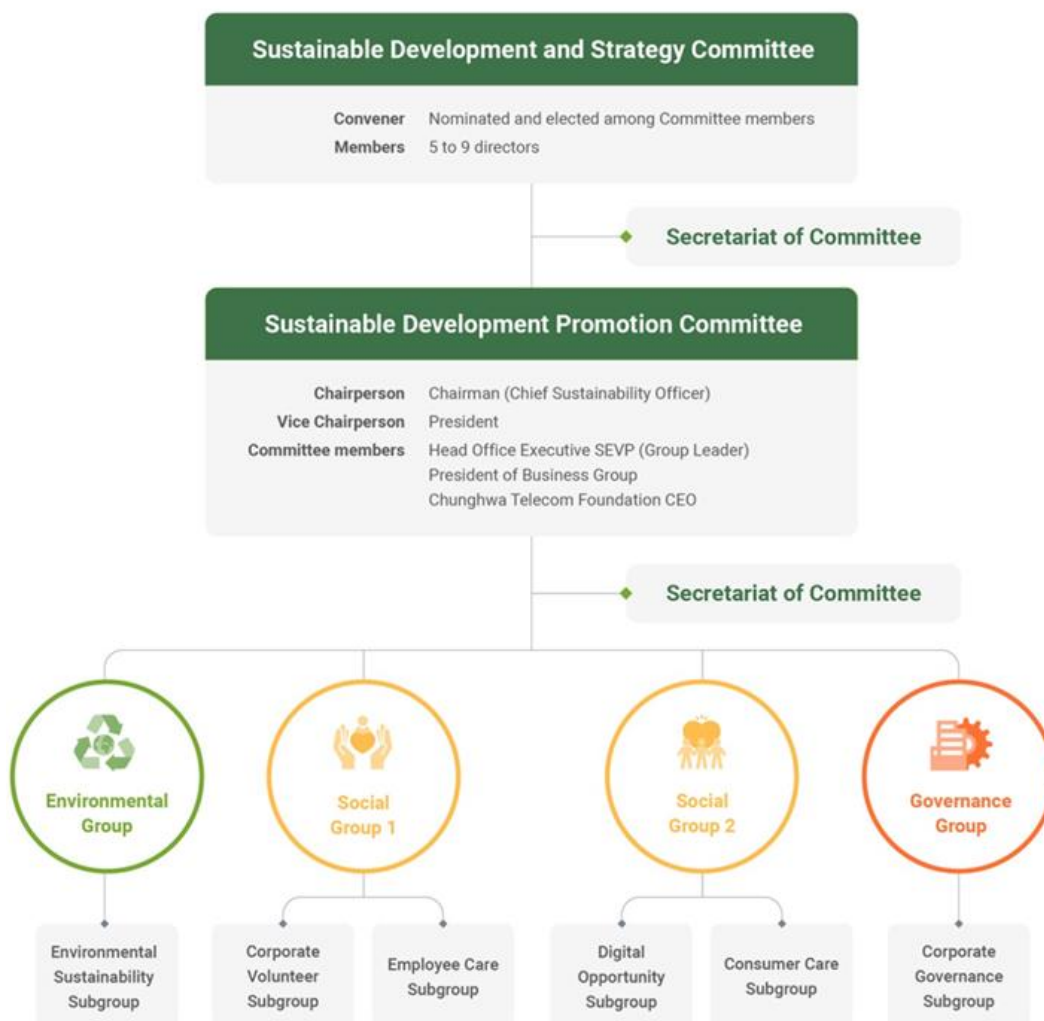


Figure 1 Organizational Structure of CHT Sustainable Development Committee

Table 3. Operational Framework of CHT Sustainable Development Committee

Item	Description
Board Representative	Chairman Shui-Yi Kuo (Chief Sustainability Officer)
Mechanism	The Sustainable Development Committee implements strategies set by the Sustainable Development and Strategy Committee, promoting various action plans, coordinating work division, and overseeing the implementation progress. Every quarter, the committee reports key issues, stakeholder communication results, and sustainability achievements to the Board of Directors; regular updates on the promotion of sustainability initiative are also provided to the Board’s Sustainable Development and Strategy Committee.

Implementation	<ul style="list-style-type: none"> • The Secretariat is responsible for supervising the Corporate Communications Department and the Corporate Planning Department. • The Secretariat is responsible for preparing ESG annual reports, disclosing information, conducting various evaluations and awards, organizing exhibitions, and handling external media communication. Within the Company, it oversees cross-departmental collaboration, target management and tracking, as well as the design of performance evaluations. • Subgroups, along with their subsidiaries and affiliated institutions, set annual goals and KPIs to promote and implement various sustainable development initiatives.
Meeting frequency	Committee meetings are held twice a year, cross-committee meetings once every quarter, and subgroup meetings once a month

2. Functions of the Board of Directors

According to CHT’s Corporate Governance Principles, the composition of the Board of Directors should prioritize diversity and expertise. In the context of climate change emerging as a major risk for all companies, the Company seeks Board members who possess experience in managing various types of risks, including climate change, to guide its response to risk-related matters. This factor is prominent among those considered when CHT appoints Board members, however, the selection criteria also encompass experience in Environmental, Social, and Governance (ESG). Among the 13 Directors of CHT, seven possess expertise in risk management, specifically in the area of climate change, while eleven have experience in sustainable development (ESG). Furthermore, they actively participate in professional courses on climate change and sustainable development (ESG) on a regular basis.

In addition, the Company has developed and implemented the “Regulations Governing the Performance Evaluation of the Board of Directors of Chunghwa Telecom Co., Ltd.” to regularly assess the performance of the Board of Directors, functional committees, and individual Directors. Since 2019, an external professional organization has been appointed every three years to evaluate the Board’s performance, with the evaluation results and recommendations subsequently presented to the Board and used as a basis for selecting or nominating future directors. Moreover, CHT integrates expertise on climate change and sustainable development (ESG), as well as continuing education, into the evaluation criteria for Directors, ensuring that Board members are equipped to guide the Company on climate change and ESG matters.

In addition, to ensure that members of the Board are well-informed about the latest developments in climate change and ESG issues, CHT has included courses on climate change and ESG as part of the Board members’ training program. The courses cover topics

such as “Risks and Opportunities of Climate Change and Net Zero Emission Policies for Business Operations” (February 16, 2022), “Enterprise Digital Transformation and Risk Management” (August 5, 2022), and “Enhancing Director Competence in Implementing Corporate Sustainable Governance” (October 19, 2022).

(II) Assessment and Management of Climate-Related Risks and Opportunities by the Sustainable Development Committee

(III) The Environmental Group (E), led by the SEVP of Technology, operates under CHT’s Sustainable Development Committee and is responsible for coordinating climate change issues company-wide, including the management of climate change-related goals. Under the guidance of the Sustainable Development and Strategy Committee, the subgroup is responsible for formulating CHT’s climate change strategy and initiatives, which include climate change mitigation and adaptation, as well as climate-related financial disclosure (TCFD). In particular, following TCFD recommendations, the E Group has conducted the identification, analysis, and assessment of climate change risks and opportunities. It has also established a target of achieving net-zero emissions by 2050, long-term (net-zero) targets and short-term targets aligned with SBTs, as well as climate adaptation goals for the short-, medium-, and long-term. The E Group has also developed mitigation and adaptation strategies in accordance with approved climate change goals and commenced annual implementation plans.

(IV) The Environmental Group (E) convenes monthly meetings to provide updates and discuss climate change issues with the SEVP. In addition, the subgroup also regularly reports on the progress of climate change targets, achievements, and future plans at quarterly cross-group meetings and biannual Sustainable Development Committee meetings, aiding senior management in monitoring climate change initiatives and facilitating informed decisions. In addition, Group E also adheres to Sustainable Development Roadmap set by the Financial Supervisory Commission, submitting to the Board a schedule for greenhouse gas inventory and verification, as well as quarterly progress reports.

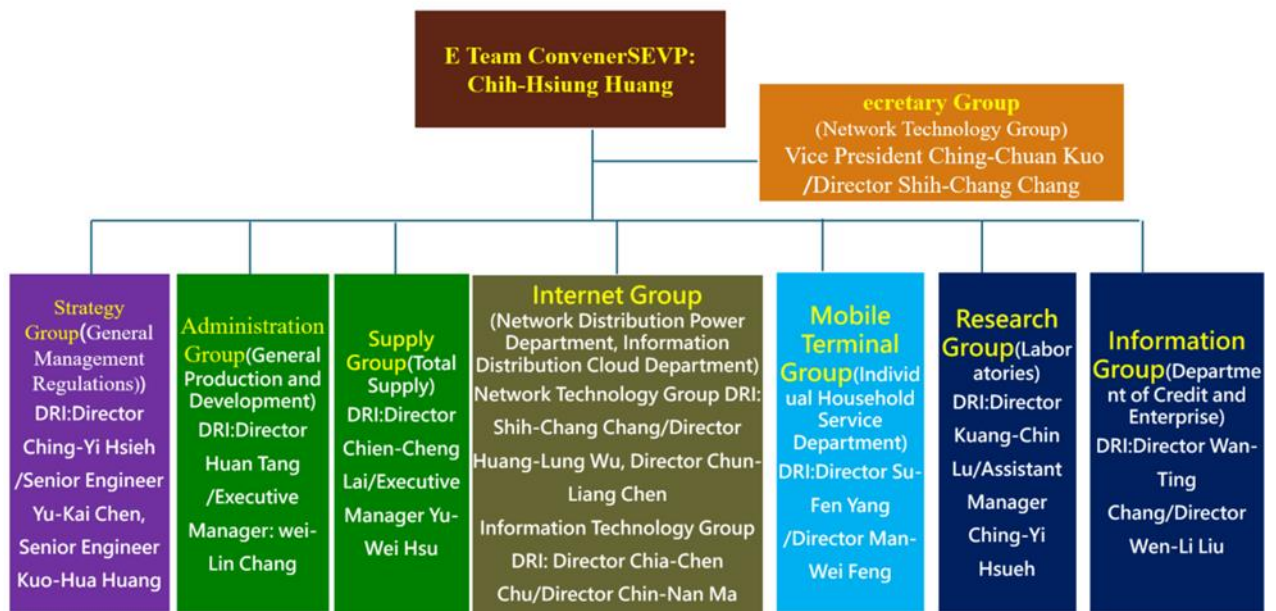


Figure 2 Division of Labor of Environmental Group (E) of CHT’s Sustainable Development Committee¹

¹ The organizational structure of the Environmental Group (E) was adjusted in August 2023, with the primary change being the reallocation of responsibilities among senior executives.

(V) Connection between the Remuneration of Directors, Executives and Employees and Sustainability Performance

To foster climate change awareness and culture, the Company has tied the compensation of Directors and employees with corporate sustainability/climate change issues, so as to encourage both Directors and employees to engage in climate change effort and help the Company move towards a low carbon transition.

1. Directors

All Directors of CHT are nominated by the Board of Directors and shareholders with shares of statutory percentage, and are elected by the shareholders general meeting. To tie the Directors' performance with the corporate vision for sustainability and the short-, medium-, and long-term strategic targets, assess the required core competencies, strengthen accountability, link performances with compensation, retain and attract key talents to the Board of Directors, the Compensation Committee incorporates sustainable management strategic targets in the indicators for Directors' compensation with a degree of flexibility to tie it with the variable compensation in accordance with regulations such as the Articles of Incorporation and achieve a win-win situation.

2. Executives

CHT has implemented ESG management mechanisms to establish a range of sustainable policies and is dedicated to implementing sustainable actions throughout the Company. The Company's sustainable development strategy is to utilize distinctive resources and expertise to address sustainable issues, including promoting social inclusion, digital inclusion, eco-friendly ICT products and services, green brand management, energy conservation, and carbon reduction.

The Sustainable Development Committee will align the accomplishments of sustainable development with the variable remuneration of senior executives, increasing the linkage from 10% in 2022 to 30% by 2025 to encourage the integration of ESG into daily management.

In line with the "Performance Management Guidelines for Executives of Chunghwa Telecom," the sustainability indicators for CHT's executives and variable compensation include: (1) risk management, (2) codes of ethical conduct, (3) IT network security, (4) climate change, (5) stakeholder engagement and inventory, as well as (6) social participation.

CHT is committed to ESG and has established targets for carbon emissions, renewable energy utilization in IDCs, diversity and integration, digital empowerment, and linking ESG with executive compensation. In particular, the performance and assessment of promoting ESG are linked to the remuneration of senior executives, with the proportion

of senior executive KPIs linked to remuneration increasing year by year.

3. Employees

To ensure environmental sustainability and promote employee participation, CHT has developed the “Guidelines for Environmental Sustainability Incentives”, which are integrated into individual annual performance evaluations, with the goal of fostering a corporate culture of net-zero sustainability. According to the “Guidelines for Environmental Sustainability Incentives”, the top 5 departments will receive major administrative rewards (as in a significant increase in the department’s annual bonuses) and high-quality accommodation vouchers. The winning departments and employees’ effort will be publicly acknowledged so as to encourage department employees to participate in energy conservation and carbon reduction. The evaluation criteria are as follows:

- (1) Energy Savings (50%): Reduction in electricity and water consumption by the department compared to the previous year.
- (2) Procurement (20%): Percentage of the department’s total annual green procurement amount, including the procurement of Eco Label, Energy Label, Water Label, Green Building Material Label, or eco-friendly products certified by the Environmental Protection Administration.
- (3) Activities (15%): Performance in promoting environmental education, ecological activities, and environmental protection of the department.
- (4) Innovation (15%): Performance in renewable energy management, water resource recycling, and waste recycling of the department.

4. Procurement Personnel

In order to ensure compliance with the Company’s ESG standards, CHT has implemented the “Operational Guidelines Supplier Management of Chunghwa Telecom Co., Ltd.” to effectively manage and evaluate suppliers. Additionally, the “Guidelines for Promoting Sustainable Development Practices Among Suppliers” have been established to provide procurement personnel with a comprehensive understanding of supply chain compliance.

Furthermore, to ensure that supplier performance meets set targets, CHT has also implemented the “Guidelines for Instant Reward of Special Performance of Chunghwa Telecom Co., Ltd.”, which include a financial incentive mechanism for procurement personnel based on their supplier management performance, granting incentives once targets are achieved.

IV. Assessment of Climate Risk and Opportunities

CHT follows TCFD recommendations to divide risks for the industry into transition risks and physical risks, and subdividing transition risks into policy and legal, technology, market and reputation, the acute and chronic of physical risks, as well as subdividing opportunities into resource efficiency, energy source, products and services, markets and resilience. Processes for identifying and assessing climate change risks and opportunities are also conducted. As a principle, CHT implements an assessment at least once a year, covering CHT, its upstream and downstream, as well as all existing operating sites.

(I) Process for Identifying Climate-related Risks and Opportunities

CHT collects global industry risk management reports, local regulations and policies and peer reports based on TCFD recommendations to identify relevant issues for each category of risks and opportunities. The associated short-, medium-, and long-term climate risks and opportunities (Table 5) are identified based on the definition of short-, medium-, and long term.

Table 4. Time frame of Climate Change Risks and Opportunities

Time frame	Period	Description
Short-term	2023-2025 (1-3 years)	2025 has been set as the target year for phased control targets and renewable energy generation, referencing the “Climate Change Response Act” and the “Renewable Energy Development Act”.
Medium-term	2026-2030 (4-8 years)	Based on its goals, CHT aims to (1) reduce carbon emissions by 50%, compared to 2020, by 2030 and (2) achieve 100% use of renewable energy in IDCs by 2030. Therefore, 2030 has been selected as the medium-term benchmark.
Long-term	2031-2050 (9-28 years)	With reference to Taiwan’s plan to achieve net-zero emissions by 2050, as well as the net-zero emissions target set by CHT for 2050, 2050 has been designated as the long-term benchmark.

Table 5. Risks and Corresponding Time Frame

Number	Risk Category	Name	Time frame
R1	Policy and regulations	2050 Net Zero Emission Policy	Short-term, medium-term, long-term

R2	Policy and regulations	Rise in electricity prices due to the shift in Taiwan's energy structure	Short-term
R3	Policy and regulations	Increase in costs associated with greenhouse gas emissions (e.g. additional carbon fees due to regulations)	Medium-term
R4	Technology	Failure to invest in low-carbon transformation technologies, or foregoing the opportunity to invest in low-carbon R&D	Medium-term
R5	Market	Changes in customer behavior (e.g. increased consumer awareness of climate change, or shifting demands for products and services)	Medium-term, long-term
R6	Reputation	Supplier's subpar carbon reduction performance affecting CHT's reputation	Medium-term, long-term
R7	Reputation	Litigation risks that may affect CHT's reputation	Medium-term, long-term
R8	Acute	Increase in frequency and severity of typhoons/rainstorms resulting in damage to facilities/equipment	Short-term, medium-term, long-term
R9	Acute	Disruption and delay in product supply due to extreme weather events impacting suppliers' operations and production	Short-term, medium-term, long-term
R10	Chronic	Increase in energy consumption due to rising average temperatures	Medium-term, long-term
R11	Chronic	Asset losses due to the flooding of low-lying coastal areas in Taiwan, as a result of rising sea levels	Long-term

(II) Process for Assessing Climate-Risks and Opportunities

CHT references ISO 31000 Risk Management Guidelines in the development of its own climate risk assessment procedures. To assess the severity of harm caused by each risk, the following method is used: Harm Value = Probability of Occurrence × Degree of Impact. Risks with a harm value above 16 are classified as high risks; those with a value between 14-16 are classified as moderate risks; and those with a value below 14 are considered low risks. For the impact, frequency of occurrence, and their corresponding definitions.

Table 6. Definition of Impact Level

Level	Impact	Financial valuation (NT\$)	As Approximate % of Paid-in Capital
5	Extreme	Over 3.879 billion	Over 5%
4	Significant	2.327 billion-3.879 billion	3%-5%

3	High	776 million-2.237 billion	1%-3%
2	Moderate	77.57 million-776 million	0.1%-1%
1	Low	Under 77.57 million	Under 0.1%

Table 7. Definition of Occurrence Frequency

Level	Likelihood	Description	Probability
5	Extremely likely	Will most likely occur within the specified time frame	Over 90%
4	Highly likely	Will likely occur within the specified time frame	65-90%
3	Likely	Might occur within the specified time frame	35-65%
2	Unlikely	Might not occur within the specified time frame	10-35%
1	Extremely unlikely	Will most likely not occur within the specified time frame	Under 10%

In 2023, CHT identified a total of 11 risks, the time point of occurrence, likelihood of occurrence, and degree of impact of which, as well as the degree of risk hazard, were identified and analyzed through discussions with relevant internal departments of the Company. After the assessment, a total of three high-risk, three medium-risk, and five low-risk items were identified. The E subgroup is responsible for coordinating risk management and formulating strategies; they report to the Sustainable Development Committee and provide timely updates to the Board of Directors.



Figure 3 2023 TCFD Climate Risk Matrix

Table 8. Results of TCFD’s Analysis of Individual Climate Risks

Number	Name	Risk Level
R1	2050 Net Zero Emission Policy	High
R2	Rise in electricity prices due to the shift in Taiwan’s energy structure	High
R3	Increase in costs associated with greenhouse gas emissions (e.g. additional carbon fees due to regulations)	Medium
R4	Failure to invest in low-carbon transformation technologies, or foregoing the opportunity to invest in low-carbon R&D	Medium
R5	Changes in customer behavior (e.g. increased consumer awareness of climate change, or shifting demands for products and services)	Medium
R6	Supplier’s subpar carbon reduction performance affecting CHT’s reputation	Low
R7	Litigation risks that may affect CHT’s reputation	Low
R8	Increase in frequency and severity of typhoons/rainstorms resulting in damage to facilities/equipment	High

R9	Disruption and delay in product supply due to extreme weather events impacting suppliers' operations and production	Low
R10	Increase in energy consumption due to rising average temperatures	Low
R11	Asset losses due to the flooding of low-lying coastal areas in Taiwan, as a result of rising sea levels	Low

(III) Climate-related Risks and Opportunities Management Process

CHT reports regularly to Board of Directors and its functional committees. Through the aforementioned measures, the Company ensures the effective implementation of risk response and control.

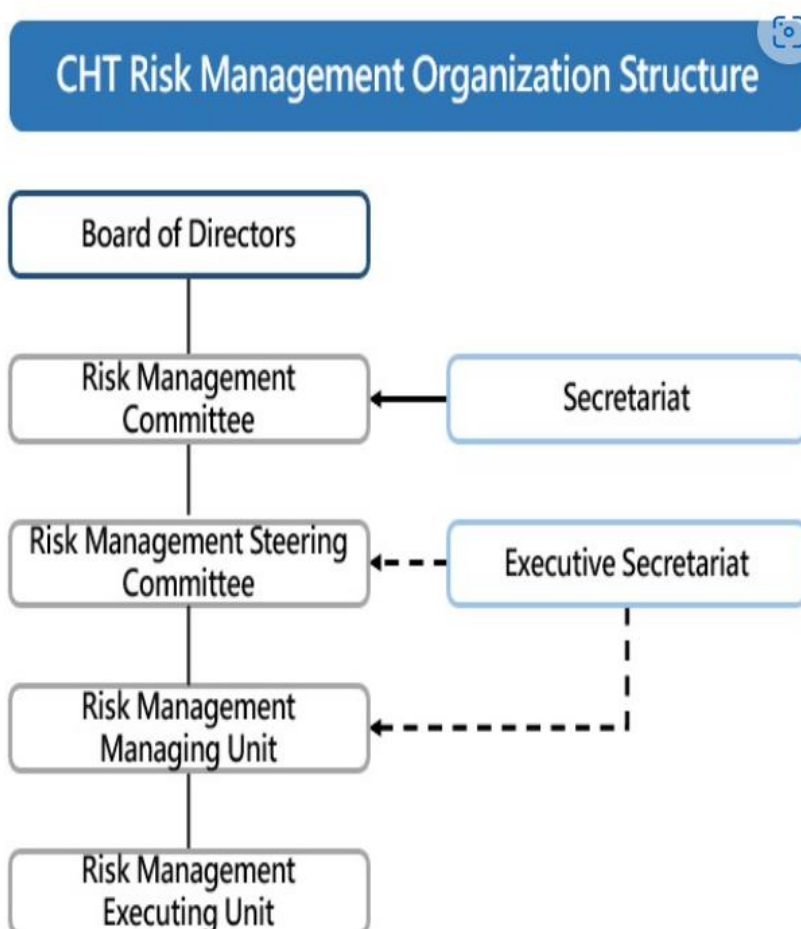


Figure 4 CHT Risk Management Organization Structure

To implement a risk management culture, CHT has set up an enterprise risk management (ERM) system to control the risks of various businesses, and has linked the results of risk management with the performance evaluation of senior management.

Table 9. Mechanism for Promoting Risk Management

Dimension	Description
Organization	<ul style="list-style-type: none"> • Establish the Risk Management Committee, a functional committee at the Board level, to oversee the operational mechanism of risk management. • The Risk Management Steering Committee is responsible for facilitating interdepartmental communication and coordination, as well as enforcing risk management policies and operations.
Policies	<ul style="list-style-type: none"> • The Board of Directors has established the “Risk Management Policy” and risk management framework • The “Chunghwa Telecom Risk Management Rules” serve as the basis for all employee conduct
Management system	<ul style="list-style-type: none"> • Utilize the ERM system to regularly manage business risks and track them on a rolling basis
Employee evaluation	<ul style="list-style-type: none"> • Using the Risk Analysis Matrix as an assessment tool to evaluate operational, strategic, compliance and reporting risks. • Formulate various procedures to identify and assess possible risks in daily operations.
Appraisal	<ul style="list-style-type: none"> • The Risk Management Steering Committee promotes the implementation of corporate risk management actions and evaluates the performance of risk management • The Audit Department conducts an independent internal audit and reports directly to the Board of Directors • Incorporate risk management results into performance evaluation indicators
Feedback and improvement	<ul style="list-style-type: none"> • Track risk status on a monthly status, convene regular Risk Management Steering Committee meetings, and report to the Risk Management Committee, as well as the Board of Directors • Based on resolutions from the aforementioned meetings, enhance risk management mechanism to ensure the process aligns with the requirements of operational risk management
Implementation Results in 2023	<ul style="list-style-type: none"> • Convened 3 management-level meetings, focusing on the enterprise-level risks tied with business plans objectives, and deliberating on directions of material risk issues • Submitted a total of 4 reports to the Board of Directors regarding the implementation of risk management

Dimension	Description
	<ul style="list-style-type: none"> Tracked and implemented various risk mitigation measures to effectively confine remaining risks within the overall risk tolerance.

The Environmental Group (E) reports the assessment and analysis results to the Risk Management Committee. After the committee has conducted a comprehensive evaluation of climate-related risks along with other risks faced by the Company, necessary mitigation measures will be taken according to the risk level.

Table 10 below summarizes measures to be taken by CHT and methods of assessing the financial impacts related to risks and opportunities associated with climate change.

Table 10. Process for Assessing Climate-Risks and Opportunities and Response Measures

Risk/Opportunity	Type	Description
Transition Risks	Policy and regulations	<p>CHT pays close attention to laws and regulations at home and abroad, and actively engages with stakeholders. CHT is subject to policies and regulations including the “Climate Change Response Act” (including Taiwan’s 2050 net-zero emission policy and carbon fee), the “Renewable Energy Development Act”, and disclosure requirements for information on climate change by the stock exchange in Taiwan and the United States. Investment of resources was necessary for CHT to comply with the aforementioned regulations, resulting in an increase in the Company’s operating costs.</p> <p>CHT has taken corresponding measures accordingly, including setting the target of net-zero emission by 2050, achieving RE100 in 2040, fully adopting renewable energy in IDCs by 2030, and implementing GHG inventory and reduction plans.</p> <p>When calculating climate-related policy and regulatory risks, CHT includes information relevant regulations (e.g. renewable energy</p>

Risk/Opportunity	Type	Description
		regulations and GHG emission controls) and conducts financial impact assessments based on international reports or public data.
	Technology	<p>According to the IEA report, the best way for enterprises to save energy and reduce carbon emissions is to improve energy efficiency; in this vein, technological improvement will help save energy and cut down on carbon emissions. The ICT industry, with its professional technologies and advantages, can propel the development of emerging technologies such as 5G, AI, big data analysis, and the Internet of Things (IoT), which will in turn help customers save energy and decrease their carbon footprint. If CHT does not actively research and develop relevant emerging technologies, the Company's ICT technology may lag behind its peers and create negative impact on its market share.</p> <p>In recent years, CHT has invested considerable resources into the research and development of emerging technologies such as 5G, AI, big data analysis, and the Internet of Things (IoT) to master key technologies in the ICT industry and enhance the competitiveness of its core products. CHT has formulated long-term business development plans as follows:</p> <p>(1) Actively expand emerging businesses; utilize R&D resources of Chunghwa Telecom Laboratories and the capacity of strategic partners to build the industrial ecosystem; promote smart services and solutions for corporate customers and consumers; improve operational efficiency of corporate customers; enhance consumer well-</p>

Risk/Opportunity	Type	Description
		<p>being, and expand domestic and overseas markets to become the leader of smart life and the enabler of the digital economy.</p> <p>(2) Simultaneously strengthen operating costs and procurement benefits through smart technologies, digitalization, network virtualization, software-defined networking and other similar technologies; increase resource output/input ratios, and effectively optimize investment and construction costs.</p> <p>When calculating climate-related technological risks, CHT evaluates R&D expenses for its products and services and conducts financial impact assessments based on public information.</p>
	Market	<p>As the impact of climate change becomes more and more significant, customers' awareness of carbon reduction and environmental protection has also been enhanced, driving the market's transition towards low-carbonization. Thus, with the rapid development of the ICT industry, failing to stay updated with the current situation and market trends will have adverse effects on CHT's operations.</p> <p>Nonetheless, CHT sees opportunities in its products and services amid the global shift to a low-carbon economy, driven by climate change and the COVID-19 pandemic, which has spurred ICT and online telecom opportunities. Moreover, CHT's core business aligns with the Taiwanese government's launching of the 5+2 Industry Innovation Plan, including the Asia Silicon Valley Development Agency, which focuses</p>

Risk/Opportunity	Type	Description
		<p>on the establishment of an innovative IoT ecosystem. Such development is also one of CHT’s core businesses, allowing the Company to have a firm grasp on business opportunities brought about by climate change. In particular, as promotion for the policy 5+2 Industrial Innovation Plan, CHT places “Smart City” at the center, leveraging network advantages, innovative ICT technology, and environmental protection solutions, to assist local enterprises in taking actions towards low-carbon transition.</p> <p>When calculating climate-related market risks, CHT evaluates factors such as customer preferences, changes in operating costs, and fluctuations in raw material prices, and conducts financial impact assessments based on international reports or public data.</p>
	<p>Reputation</p>	<p>Climate change has become an issue of global concern. As a leader in the telecommunications industry, CHT may lose the favor of the public if proactive actions are not taken, which could lead to impacts on the Company’s business performance and reputation.</p> <p>In September 2021, CHT officially pledged its net zero emission target by 2050. It will actively assist the entire value chain in engaging in zero carbon work with its professional expertise, such as emerging technologies including 5G, AI and big data analysis.</p> <p>The operations of CHT’s data centers and base stations are vulnerable to extreme weather, such as typhoons, heavy rains, and other natural disasters, which may lead to severe damage to the Company’s mobile communication network equipment.</p>

Risk/Opportunity	Type	Description
Physical risks	Acute	<p>CHT's equipment and base station operations are susceptible to extreme weather conditions, such as typhoons, heavy rains, and other natural disasters, which can cause serious damage to the Company's mobile communications network equipment.</p>
	Chronic	<p>CHT has also formulated short-, medium- and long-term climate change adaptation plans, which span 1-3 years for short-term, 3-8 years for medium-term and over 8 years for long term, covering 100% of existing and newly-built operating sites and communication equipment. CHT's climate change adaptation plan has three sub-items, including short-, medium- and long term core tasks, namely:</p> <ol style="list-style-type: none"> (1) Action plan for flood and disaster prevention for telecommunications equipment and building facilities in data centers; (2) Adaptation action plans for network facilities in response to climate change; (3) Network adaptation action plan in response to climate change for mobile communication base stations <p>When evaluating physical risks, CHT considers factors such as heavy rain, typhoon, and flooding; international reports and public information are also used to assess financial impact.</p>
Opportunities	Resource efficiency	<p>According to the results of CHT's GHG inventory, Scope 2 emissions account for more than 97% of the total Scope 1 and 2 emissions. As a result, not only will a more efficient operating model reduce GHG emissions, it will also cut down on energy costs.</p> <p>CHT's highly efficient operating model</p>

Risk/Opportunity	Type	Description
		<p>covers equipment replacement in data centers, base stations and buildings, baseband unit integration for C-RAN architecture, 2G gateway switch phaseout, 3G-F2 cell shutdown, 4G Sleep Mode, RRU relocation for base stations, adopting natural ventilation or exhaust fans, IP conversion to SVG for PSTN equipment, replacing old electric air conditioners with hot and cold aisles and high sensible heat air conditioning, as well as NG SDH elimination and so on.</p> <p>When calculating resource efficiency, CHT takes into account energy savings from the aforementioned items for financial impact assessment.</p>
	Energy Source	<p>According to the results of CHT's GHG inventory, Scope 2 emissions account for more than 97% of the total Scope 1 and 2 emissions. According to the IEA report, the second best path for companies to save energy and reduce carbon emissions is using renewable energy, in order to reduce GHG emissions and cut energy costs.</p> <p>73,575,813 kWh of renewable energy was used in 2023 (equivalent to a carbon reduction of 37,450 tCO₂e); CHT will continue to deploy and procure renewable energy.</p> <p>When calculating resource efficiency, CHT takes into renewable energy used in the aforementioned items for financial impact assessment.</p>
	Products/Services	<p>As society's awareness of climate change continues to heighten, the demand for low carbonization is also becoming more significant. Thus, if CHT can respond to customers' demand for low-carbon products and services in time, the Company's market</p>

Risk/Opportunity	Type	Description
		<p>share can be stabilized and increased.</p> <p>According to the “Manual for Applied Energy-Saving Technology: Telecom Network Data Centers” published by the Energy Administration of the Ministry of Economic Affairs, the average actual measured PUE of Taiwan’s data centers is about 1.9, and data centers with PUE below this standard are regarded as low-carbon. CHT’s IDCs are green data centers with high energy efficiency (PUE 1.657), of which the goal is to increase efficiency to reach PUE 1.5 by 2030.</p> <p>When evaluating its products/services, CHT considers factors such as market conditions and product/service revenue; international reports and public information are also used to assess financial impact.</p>
	Market	<p>The International Telecommunication Union (ITU) points out that, in order to achieve climate goals set by the Paris Agreement, the ICT industry can contribute to global energy conservation and carbon reduction by leveraging its technological advantages and capabilities. Thus, the low-carbon economic transition, coupled with the impact of the global COVID-19 outbreak in early 2020, have given rise to business opportunities in the ICT industry. To speed up industrial transformation and upgrading, the Taiwanese government proposed the 5+2 Industrial Innovation Plan, which includes building an innovative IoT ecosystem, a product which happens to be one of CHT’s core businesses. CHT adheres to national policies and employs advanced ICT technologies, including 5G, IoT, and data innovation, to offer low-carbon solutions and support the</p>

Risk/Opportunity	Type	Description
		<p>energy-efficient transformation of smart cities, factories, and buildings, thereby aiding customers in the transition to a low-carbon economy and driving CHT’s revenue growth. Take AIoT as an example, as the biggest in Taiwan, CHT’s IoT platform currently has 8,300 users and 710,000 devices, with fields of application spanning smart energy, construction, transportation, tourism and agriculture.</p> <p>When evaluating its products/services, CHT considers factors such as market conditions and product/service revenue; international reports and public information are also used to assess financial impact.</p>
	Resilience	<p>The IPCC predicted that the number of tropical cyclones (typhoons) will decrease in the future, but the strongest are expected to occur more frequently, referring to cyclones of Category 4 (with a wind speed of 58-70 meters per second, which is equivalent to a severe typhoon) and Category 5 (with a wind speed greater than 70 meters per second, which is equivalent to a severe typhoon). If the frequency and severity of severe typhoons increase, CHT’s operating sites, data centers and base stations will face risks of damage. On the other hand, if CHT implements good climate change adaptation measures and strengthens the adaptability of assets and equipment, it can avoid damage and ensure uninterrupted operations.</p> <p>CHT has also formulated short-, medium- and long-term climate change adaptation plans, which span 1-3 years for short-term, 3-8 years for medium-term and over 8 years for long term, covering 100% of existing and newly-built operating sites and</p>

Risk/Opportunity	Type	Description
		<p>communication equipment. CHT’s climate change adaptation plan has three sub-items, including short-, medium- and long term core tasks, namely:</p> <p>(1) Action plan for flood and disaster prevention for telecommunications equipment and building facilities in data centers;</p> <p>(2) Adaptation action plans for network facilities in response to climate change;</p> <p>(3) Network adaptation action plan in response to climate change for mobile communication base stations.</p> <p>When evaluating resilience, CHT considers factors such as heavy rain, typhoon, and flooding; international reports and public information are also used to assess financial impact.</p>

CHT compiles improvements related to climate change issues across various aspects (products and services, supply and/or value chain, adaptation and mitigation actions, R&D investment, operational methods, capital acquisition), as well as future strategic planning, as shown in Table 11. As the Company is not in the financial industry, it does not have business areas involving acquisitions or divestments.

Table 11. Impact of Climate Change on the Business Sector

Business Sector	Impact
Products and services	<p>As the impact of climate change becomes more and more prominent, customer awareness of low-carbon and eco-friendly practices is increasing. Consequently, the market is shifting towards decarbonization, and with the rapid development of the ICT industry, CHT anticipates that this trend will gain momentum, with customers placing greater emphasis on low-carbon and eco-friendly products/services in the short-, medium-, and long-term.</p> <p>CHT sees opportunities in its products and services amidst the global shift to a low-carbon economy driven by climate change and the COVID-19 pandemic, which has spurred ICT and online telecom</p>

Business Sector	Impact
	<p>opportunities. In addition, CHT’s core business aligns with the Taiwanese government’s launching of the 5+2 Industry Innovation Plan, including the Asia Silicon Valley Development Agency, which focuses on the establishment of an IoT innovation ecosystem.</p> <p>Chunghwa Telecom has developed the following products and services:</p> <ul style="list-style-type: none"> ● For enterprise use: Intelligent Environment Network (iEN) CHT offers comprehensive energy-saving services for businesses, managing electrical equipment across eight domains (power management, water supply and drainage management, solar photovoltaic, water conservation, lighting, environmental monitoring, heat pumps and boilers, and air conditioning management) and systems (real-time monitoring, demand control, program control, scheduling management, alarm notification, electricity cost simulation analysis, system management, and statistical analysis and reporting), optimizing energy management, enhancing operational efficiency, and reducing operational costs. ● For public use: CHT Smart Home Provide comprehensive smart home service encompassing a smart central monitoring system, multimedia intercom, residential energy management, scenario control, home protection, and security alerts. <p>In response to future corporate integration, Chunghwa Telecom, in collaboration with the 5G Office of the Department of Industrial Technology, Ministry of Economic Affairs, the Industrial Technology Research Institute, and the Institute for Information Industry, has formed the “Taiwan 5G Development Alliance - CHT Pilot Team.” This team extends lab testing to hands-on 5G trials and training sites, creating an environment suitable for emerging application platforms and innovative development. The aim is to help Taiwanese businesses accelerate transformation, adopt AIoT and IoT technologies, and expedite the development of Industry 4.0, smart cities, and smart buildings, thereby reducing energy consumption.</p>
Supply chain and/or value	In February 2023, Taiwan amended the “Greenhouse Gas Reduction and Management Act” to the “Climate Change Response Act.” The

Business Sector	Impact
chain	<p>amendment emphasizes the policy for net-zero emissions by 2050; corporate customers of CHT have also unveiled their own policies for net-zero emissions. In order to comply with national policies, as a leader in the Taiwanese telecommunications industry, CHT has a responsibility to promote energy-saving and carbon reduction among suppliers in the supply chain. As for customers, the Company must provide low-carbon and environmentally friendly products/services to meet their net-zero emission requirements, ensuring the maintenance and improvement of its market share. CHT anticipates that this time frame will be in the medium- to long-term.</p> <ul style="list-style-type: none"> ● Supply Chain: CHT has integrated climate issues into its supplier evaluation standards, and has become a member of the Carbon Disclosure Project (CDP) Supply Chain Program. Moreover, by establishing a Sustainable Partner Certification and requiring suppliers to fill out the CDP questionnaire, CHT evaluates and audits partners, encouraging them to actively lower carbon emissions. ● Customers: Chunghwa Telecom has developed the following products and services: <ul style="list-style-type: none"> ■ For enterprise use: Intelligent Environment Network (iEN) CHT offers comprehensive energy-saving services for businesses, managing electrical equipment across eight domains (power management, water supply and drainage management, solar photovoltaic, water conservation, lighting, environmental monitoring, heat pumps and boilers, and air conditioning management) and systems (real-time monitoring, demand control, program control, scheduling management, alarm notification, electricity cost simulation analysis, system management, and statistical analysis and reporting), optimizing energy management, enhancing operational efficiency, and reducing operational costs. ● For public use: CHT Smart Home Provide comprehensive smart home service encompassing a smart central monitoring system, multimedia intercom, residential energy management, scenario control, home protection, and security alerts.

Business Sector	Impact
Adaption and mitigation	<p>The International Telecommunication Union (ITU) points out that, in order to achieve climate goals set by the Paris Agreement, the ICT industry can contribute to global energy conservation and carbon reduction by leveraging its technological advantages and capabilities. With the announcement of the 2050 net-zero emissions target by various countries, governments, and businesses worldwide are focusing on low-carbon technologies in the ICT industry. Taiwan’s government roadmap for achieving net-zero emissions by 2050, which includes Strategy 3: Creating Green Growth, emphasizes the commitment to nurturing green startups and developing business models in the smart energy industry. This involves integrating technologies such as AIoT, big data analytics, and Energy-as-a-Service (EaaS) to provide innovative energy services. CHT anticipates this trend to gain momentum, as customers increasingly prioritize low-carbon and environmentally friendly products and services in the short-, medium-, and long-term.</p> <p>In recent years, CHT has invested considerable resources into the research and development of emerging technologies such as 5G, AI, big data analysis, and the Internet of Things (IoT) to master key technologies in the ICT industry and enhance the competitiveness of its core products. In 2023, CHT invested NT\$3.891 billion in R&D, accounting for approximately 1.74% of the consolidated revenue.</p> <p>CHT has formulated long-term business development plans as follows:</p> <ol style="list-style-type: none"> (1) Actively expand emerging businesses; utilize R&D resources of Chunghwa Telecom Laboratories and the capacity of strategic partners to build the industrial ecosystem; promote smart services and solutions for corporate customers and consumers; improve operational efficiency of corporate customers; enhance consumer well-being, and expand domestic and overseas markets to become the leader of smart life and the enabler of the digital economy. (2) Simultaneously strengthen operating costs and procurement benefits through smart technologies, digitalization, network virtualization, software-defined networking and other similar technologies; increase resource output/input ratios, and effectively optimize investment and construction costs.

Business Sector	Impact
Investment in R&D	<p>In February 2023, Taiwan amended the “Greenhouse Gas Reduction and Management Act” to the “Climate Change Response Act.” The amendment specifies the policy for net-zero emissions by 2050, requiring Taiwanese enterprises to achieve net-zero emissions by 2050, which will be a major climate risk for CHT. Moreover, the imposition of carbon fees on major carbon emitters was also mentioned in the amendment. The fees shall be imposed on domestic direct or indirect sources of emissions as well as imported products with high carbon content. Industries initially targeted for the fees include steel, petrochemicals, cement, and semiconductors; the proposed carbon fee rate is approximately NT\$300/MT carbon, with collection expected to commence in 2025. Although CHT is not included in the initial collection targets, the Taiwanese government has also announced a net-zero emissions policy by 2050, indicating that the scope of collection targets may be expanded in the future, and economic measures will be implemented to achieve net-zero emissions. Therefore, carbon fees are regarded by CHT as a potential risk of climate change. The time frame for such impacts will range from short-, medium-, to long-term.</p> <p>The Company, referring to the WEO and ETP reports published by the IEA, clearly understands that the most effective methods to reduce carbon emissions are (1) improving energy efficiency and (2) using renewable energy. CHT’s carbon reduction plan includes, but is not limited to: enhancing energy efficiency of IDC equipment, replacing and repairing old equipment to optimize existing facilities, constructing and purchasing renewable energy projects, procuring pure green electricity, renewable energy certificates, and developing energy storage devices. In 2021, CHT implemented projects that included the replacement of equipment in data centers, base stations, and buildings, integration of C-RAN architecture baseband modules, decommissioning of 2G gateway switches, shutdown of 3G-F2 cells, implementation of Sleep Mode for 4G, and relocation of Remote Radio Units (RRU) from base stations. Natural ventilation or exhaust fans were introduced as response measures, resulting in a reduction of the Company’s electricity usage from 1.509,09 billion kWh in 2020 to 1.389,3 billion kWh in 2022 (including 24.05 million kWh of green energy). According to the inventory results of ISO 14064-1</p>

Business Sector	Impact
	<p>and GHG Protocol, CHT’s carbon emissions in Scope 1 and Scope 2 in 2023 were 664,367.017 tCO₂e, representing a reduction of 15.94% compared to the baseline year (2020), exceeding the established carbon reduction target.</p>
<p>Operating model</p>	<p>As the impact of climate change becomes more and more prominent, customer awareness of low-carbon and eco-friendly practices is increasing. Consequently, the market is shifting towards decarbonization, and with the rapid development of the ICT industry, CHT anticipates that this trend will gain momentum, with customers placing greater emphasis on low-carbon and eco-friendly products/services in the short-, medium-, and long-term.</p> <p>CHT sees opportunities in its products and services amidst the global shift to a low-carbon economy driven by climate change and the COVID-19 pandemic, which has spurred ICT and online telecom opportunities. In addition, CHT’s core business aligns with the Taiwanese government’s launching of the 5+2 Industry Innovation Plan, including the Asia Silicon Valley Development Agency, which focuses on the establishment of an IoT innovation ecosystem.</p> <p>Chunghwa Telecom has developed the following products and services:</p> <ul style="list-style-type: none"> ● For enterprise use: Intelligent Environment Network (iEN) Provide comprehensive energy-saving services for businesses, managing electrical equipment across eight domains (power management, water supply and drainage management, solar photovoltaic, water conservation, lighting, environmental monitoring, heat pumps and boilers, and air conditioning management) and systems (real-time monitoring, demand control, program control, scheduling management, alarm notification, electricity cost simulation analysis, system management, and statistical analysis and reporting), optimizing energy management, enhancing operational efficiency, and reducing operational costs. ● For public use: CHT Smart Home Provide comprehensive smart home service encompassing a smart central monitoring system, multimedia intercom, residential energy management, scenario control, home protection, and security alerts.

Business Sector	Impact
	<p>In response to future corporate integration, Chunghwa Telecom, in collaboration with the 5G Office of the Department of Industrial Technology, Ministry of Economic Affairs, the Industrial Technology Research Institute, and the Institute for Information Industry, has formed the “Taiwan 5G Development Alliance - CHT Pilot Team.” This team extends lab testing to hands-on 5G trials and training sites, creating an environment suitable for emerging application platforms and innovative development. The aim is to help Taiwanese businesses accelerate transformation, adopt AIoT and IoT technologies, and expedite the development of Industry 4.0, smart cities, and smart buildings, thereby reducing energy consumption.</p>
<p>Obtaining capital</p>	<p>In February 2023, Taiwan amended the “Greenhouse Gas Reduction and Management Act” to the “Climate Change Response Act.” The amendment specifies the policy for net-zero emissions by 2050, requiring Taiwanese enterprises to achieve net-zero emissions by 2050, which will be a major climate risk for CHT. Moreover, the imposition of carbon fees on major carbon emitters was also mentioned in the amendment. The fees shall be imposed on domestic direct or indirect sources of emissions as well as imported products with high carbon content. Industries initially targeted for the fees include steel, petrochemicals, cement, and semiconductors; the proposed carbon fee rate is approximately NT\$300/MT carbon, with collection expected to commence in 2025. Although CHT is not included in the initial collection targets, the Taiwanese government has also announced a net-zero emissions policy by 2050, indicating that the scope of collection targets may be expanded in the future, and economic measures will be implemented to achieve net-zero emissions. Therefore, carbon fees are regarded by CHT as a potential risk of climate change. The time frame for such impacts will range from short-, medium-, to long-term.</p> <p>CHT, referencing the WEO and ETP reports published by the IEA, clearly understands that the most effective methods to reduce carbon emissions are (1) improving energy efficiency and (2) using renewable energy. Given that the Company’s primary capital expenditure is on ICT-related equipment, energy efficiency will be</p>

Business Sector	Impact
	prioritized when procuring new ICT-related equipment to minimize GHG emissions and promote energy conservation.

To gain insight into financial planning aspects associated with climate-related risks and opportunities, CHT conducted an analysis of the impact of these risks and opportunities on various financial elements, including revenue, direct costs, indirect costs, capital expenditure, capital allocation, acquisitions and divestments, financing channels, assets, and liabilities. The findings are subsequently presented in Table 12.

Table 12. Elements of Financial Planning for Climate-Related Risks and Opportunities

Elements of Financial Planning Impacted	Description of Impact
<ul style="list-style-type: none"> ● Revenue ● Direct Cost ● Capital expenditure 	<p><u>Risks</u></p> <p>In February 2023, Taiwan amended the “Greenhouse Gas Reduction and Management Act” to the “Climate Change Response Act.” The amendment emphasizes the policy for net-zero emissions by 2050, requiring Taiwanese enterprises to achieve net-zero emissions by 2050, which will be a major climate risk for CHT. Moreover, the imposition of carbon fees on major carbon emitters was also mentioned in the amendment. The fees shall be imposed on domestic direct or indirect sources of emissions as well as imported products with high carbon content. Industries initially targeted for the fees include steel, petrochemicals, cement, and semiconductors; the proposed carbon fee rate is under NT\$300/MT carbon, with collection expected to commence in 2024. Although CHT is not included in the initial collection targets, the Taiwanese government has also announced a net-zero emissions policy by 2050, indicating that the scope of collection targets may be expanded in the future, and economic measures will be implemented to achieve net-zero emissions.</p> <p>The Company, referencing the IEA’s published WEO and ETP reports, clearly understands that the most effective methods to reduce carbon emissions are (1) improving energy efficiency and</p>

Elements of Financial Planning Impacted	Description of Impact
	<p>(2) using renewable energy. CHT’s carbon reduction plan will affect both direct costs (e.g. procurement of pure green power, renewable energy certificates, and development of energy-storage equipment) and capital expenditures (enhancing energy efficiency of IDC equipment, replacing and repairing old equipment to optimize existing facilities, constructing and purchasing renewable energy projects).</p> <p><u>Opportunities</u></p> <p>The International Telecommunication Union (ITU) points out that, in order to achieve climate goals set by the Paris Agreement, the ICT industry can contribute to global energy conservation and carbon reduction by leveraging its technological advantages and capabilities. With the announcement of the 2050 net-zero emissions target by various countries, governments, and businesses worldwide are focusing on low-carbon technologies in the ICT industry. Taiwan’s government roadmap for achieving net-zero emissions by 2050, which includes Strategy 3: Creating Green Growth, emphasizes the commitment to nurturing green startups and developing business models in the smart energy industry. This involves integrating technologies such as AIoT, big data analytics, and Energy-as-a-Service (EaaS) to provide innovative energy services. CHT anticipates this trend to gain momentum, as customers increasingly prioritize low-carbon and environmentally friendly products and services in the short-, medium-, and long-term.</p> <p>In recent years, CHT has invested considerable resources into the research and development of emerging technologies such as 5G, AI, big data analysis, and the Internet of Things (IoT) to master key technologies in the ICT industry and enhance the competitiveness of its core products. In 2023, CHT generated NT\$16.798 billion in revenue from its main green products, which include IDC, cloud services, IoT (including iEN, IVS, ITS, and smart buildings), and MOD. It is projected that the average annual growth rate over the next three years will exceed 3%,</p>

Elements of Financial Planning Impacted	Description of Impact
	leading to a cumulative revenue of NT\$53.256 billion.

V. Scenario Analysis for Climate Change Risks

(I) Climate-related Scenarios Adopted by CHT

CHT's climate change strategy is divided into mitigation and adaptation. The climate change mitigation strategy prioritizes achieving net zero emissions by 2050 as the main mission, as well as leading upstream and downstream partners to achieve the 1.5°C target set in the Paris Agreement. On the other hand, the climate change adaptation strategy prioritizes strengthening the climate resilience of the Company's infrastructure and communication equipment, ensuring that the Company's business operations remain uninterrupted.

CHT follows the TCFD framework to set a baseline scenario and a 1.5°C scenario to identify and analyze short-, medium- and long-term climate risks and opportunities in the Company's scope of business, upstream and downstream, and the entire life cycle of assets. In particular, the climate change mitigation strategy (transition risk) adopts IEA STEPs (baseline scenario) and IEA NZE (1.5°C scenario) climate scenarios, while the climate change adaptation strategy (physical risk) adopts IPCC SSP5-8.5 (baseline scenario) and IPCC SSP1-2.6 (1.5°C scenario) as climate scenarios. Please refer to Table 13 for more details.

Table 13. Climate-related Scenarios Adopted by CHT in Risk Assessment

Risk Category	Climate-related Scenario	Description
Transition Risks	IEA STEPs	Under the Stated Policies Scenario (STEPS), the Taiwanese government has set the base year as 2005 to comply with the Paris Agreement and COP26 requirements, and to fulfill the commitment to net-zero emissions by 2050. The carbon reduction targets include a 10% reduction by 2025, 24% by 2030 with a margin of $\pm 1\%$, and net-zero emissions by 2050, while maintaining other policies. In this scenario, CHT uses parameters to reduce the investment costs of Scope 1 and Scope 2, and to anticipate financial impact in future scenarios where the Company will be required to achieve net-zero emissions.
	IEA NZE	Under the IEA's Net Zero Emissions (NZE) scenario, the Taiwanese government, in order to comply with the Paris Agreement and COP26 requirements, and to fulfill the commitment to net-zero emissions by 2050, assumes that further legislative amendments will set the base year as 2020. Carbon reduction targets are revised to a 21%

		<p>reduction by 2025, 42% by 2030, and achieving net-zero emissions by 2050, while simultaneously strengthening relevant policies.</p> <p>In this scenario, CHT uses parameters to reduce the investment costs of Scope 1 and Scope 2, and to anticipate financial impact in future scenarios where the Company will be required to achieve net-zero emissions.</p>
Physical risks	IPCC SSP1-2.6	<p>The National Science and Technology Council has conducted a comprehensive analysis of the potential physical risks that Taiwan may encounter based on the various climate scenarios proposed by the IPCC. Under the IPCC SSP (Shared Socio-Economic) 1-2.6 scenario, the Taiwan Climate Change Projection and Adaptation Knowledge Platform (TCCIP) of the Science and Technology Council has analyzed extreme climate events, including typhoons and heavy rain, and found that while the overall number of typhoons impacting Taiwan is projected to decrease in the future, the proportion of strong typhoons is expected to increase. Furthermore, there will be an increase in rainfall intensity, as well as a rise in the frequency and intensity of heavy rain.</p> <p>In this scenario, CHT uses parameters for operating costs and assumes that typhoons will cause damage to its equipment, necessitating the Company to invest in repairs.</p>
	IPCC SSP5-8.5	<p>The National Science and Technology Council has conducted a comprehensive analysis of the potential physical risks that Taiwan may encounter based on the various climate scenarios proposed by the IPCC. Under the IPCC SSP5-8.5 scenario, in the absence of any measures taken by countries, temperatures will continue to rise, resulting in a further intensification of climate extremes.</p> <p>In this scenario, CHT uses parameters for operating costs and assumes that typhoons will cause damage to its equipment, necessitating the Company to invest in repairs.</p>

(II) Physical risks

1. Climate Risks Faced by CHT

To stay updated with physical risks faced by CHT and facilitate the formulation of

relevant response plans, CHT conducts assessment with tools developed by UN’s WRI and Taiwan’s National Science and Technology Center for Disaster respectively.

For the tool developed by UN’s WRI, in addition to the overall water risk of the baseline year, two different years (2030 and 2040) are also adopted for future assessment paired with pessimistic, BAU (business-as-usual) and optimistic scenarios for risk analysis targeting overall water stress. The analysis results presented in Table 14 and Table 15 show that, under any scenario, more than 85% of CHT’s operating sites are medium-high risk or below.

Table 14. Analysis of Comprehensive Water Risk in Base Year for CHT

	Risk Level				
	Low	Low to Medium	Medium to High	High	Extremely High
Base year	100%	0%	0%	0%	0%

Table 15. Analysis of Comprehensive Water Stress between 2030-2040 for CHT

Year	Risk Level of Comprehensive Water Stress				
	Low	Low to Medium	Medium to High	High	Extremely High
Pessimistic Scenario					
2030	19.33%	35.20%	31.42%	0.63%	13.41%
2040	54.53%	0.00%	31.42%	0.63%	13.41%
BAU Scenario					
2030	19.33%	35.20%	30.35%	1.70%	13.41%
2040	54.53%	0.00%	31.42%	0.63%	13.41%
Optimistic Scenario					
2030	19.33%	35.20%	31.42%	0.63%	13.41%
2040	54.53%	0.00%	31.42%	0.63%	13.41%

Regarding the equipment at the National Science & Technology Center for Disaster Reduction, risks faced by each operational site are analyzed individually for flood rainfall

(Level 1 alert)², slope hazard alert value, and debris flow hazard alert value during heavy rain³. Considering that the Taiwanese government currently only provides future estimates for heavy rainfall without including analyses for torrential and extreme torrential rains⁴, if the government releases information on occurrences of such rains under different climate scenarios in the future, the analysis process and results will have to be further revised and updated. According to the analysis results, the level of flood alerts, slope hazard alerts, and debris flow hazard alerts at each of CHT's operating site is all higher than the amount of rainfall during heavy rain; this indicates no flooding, slope hazards, debris flows, or other disasters during heavy rain, creating minimal impact on the Company in any climate scenario.

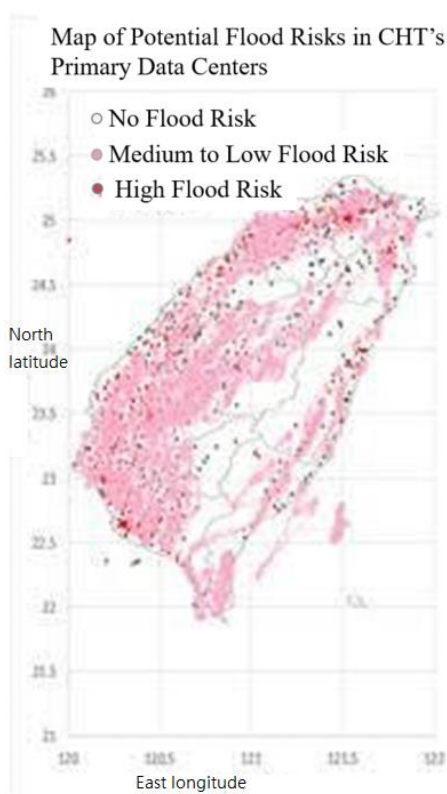


Figure 5 Map of Potential Flooding Risks in CHT's Primary Data Centers

² According to the definition provided by the National Science & Technology Center for Disaster Reduction, heavy rainfall (Level 1 alert) is characterized by the issuance of flood alerts in towns and cities, which are triggered when there is a 70% probability of flooding in vulnerable villages should rainfall persists.

³ According to the definition provided by the Central Weather Administration, MOTC, heavy rain is defined as rainfall that reaches or exceeds 200 millimeters within a 24-hour period, or 100 millimeters within a 3-hour period.

⁴ According to the definition provided by the Central Weather Administration, MOTC, extremely heavy rain is defined as rainfall that reaches or exceeds 350 millimeters within a 24-hour period, or 200 millimeters within a 3-hour period.

2. Analysis of Significant Climate Risks

According to CHT's assessment of climate change risks and opportunities, acute risks have the highest weight as material risks among physical risks. As climate change becomes more and more significant, IPCC predicted that the number of tropical cyclones (typhoons) will decrease in the future, but the strongest Category 4 (with a wind speed of 58-70 meters per second, which is equivalent to a severe typhoon) and Category 5 (with a wind speed greater than 70 meters per second, which is equivalent to a severe typhoon) cyclones are expected to occur more frequently. If the frequency and severity of severe typhoons increase, CHT's operating sites, data centers and base stations will face the risk of damage. Taiwan's TCCIP also specifically pointed out that the intensity of typhoon rainfall will increase by 20% to 40%, meaning that some areas may be flooded, especially the central region and the central and northern mountainous areas. If there are areas of flooding or typhoon-induced landslides at CHT's operational sites, data centers, or base stations, it could cause damage to the Company's assets.

Should a severe typhoon damage its assets and equipment, the Company shall be obligated to repair the damaged equipment, leading to an increase in operating costs. Furthermore, if data centers and base stations are unable to function properly, the quality of CHT's communication services will be affected, leading to reduced customer satisfaction and a decline in revenue.

The IPCC report pointed out that in the 1.5-2°C scenario, the number of tropical cyclones (typhoons) is expected to decrease with a higher frequency for the most intense Category 4 and 5 cyclones (severe typhoons). This projection is roughly consistent with a higher temperature increase (i.e. greater than 2°C scenario). Based on such assessment results, under the climate scenarios of SSP 5-8.5 and SSP 1-2.6, the potential annual financial impact of severe typhoons on the Company is at least NT\$77.3 million.

CHT adopted the tool developed by UN's WRI to conduct assessments for data centers and base stations throughout Taiwan. In addition to the overall water risk of the base year, two different years (2030 and 2040) are also adopted for future assessment, paired with pessimistic, BAU and optimistic scenarios for risk analysis targeting overall water stress. The result of the analysis falls in the low-medium range, indicating that CHT's base stations, operating sites and data centers remain in safe locations before 2040.

CHT has also formulated short-, medium- and long-term climate change adaptation plans, which span 1-3 years for short-term, 3-8 years for medium-term and over 8 years for long term, covering 100% of existing and newly-built operating sites and communication equipment. The annual budget will be allocated in accordance with the

progress of climate change adaptation plans. Moreover, the Company has been increasing its investment in the Internet every year, in order to maintain communication quality even in the event of natural disasters. Ongoing investment projects include mobile base stations (including vehicles), mobile core networks, mobile portable satellites, microwave and broadband equipment. Additionally, last mile network equipment and cables are being updated and adjusted to strengthen the resilience of the communication network. Over the past three years (2021-2023), the average expenditure on climate change prevention has been NT\$64.9 million.

CHT’s climate change adaptation plan has three sub-items, including short-, medium- and long term core tasks, namely:

- (1) Action plan for flood and disaster prevention for telecommunications equipment and building facilities in data centers
- (2) Adaptation action plans for network facilities in response to climate change
- (3) Network adaptation action plan in response to climate change for mobile communication base stations

3. Physical risks in supply chain

To stay updated with physical risks faced by the supply chain and formulate relevant response plans, CHT has analyzed the physical risks of key suppliers (suppliers with an annual transaction amount of more than NT\$50 million), with the key suppliers’ procurement amount accounting for 83.64% in 2023. CHT adopted the tool developed by UN’s WRI to conduct assessments. In addition to the overall water risk of the base year, two different years (2030 and 2040) were also adopted for future assessment, paired with pessimistic, BAU and optimistic scenarios for risk analysis targeting overall water stress. Furthermore, the degree of risk faced by each category is categorized into financial, commodity, general labor, and construction and repair, based on the procurement amount. The analysis results show that, under any scenario, more than 90% of CHT’s procurement items are low-medium risk or below.

Table 16. Analysis of Comprehensive Water Risk in Base Year for Key Suppliers

	Risk Level				
	Low	Low to Medium	Medium to High	High	Extremely High
Financial	0.56%	16.95%	0%	0%	0%
Commodity	0%	21.47%	1.13%	0%	0%
General labor	0.56%	18.64%	0%	0%	0%
Construction and repair	0%	40.68%	0%	0%	0%

Total	1.13%	97.74%	1.13%	0%	0%
-------	-------	--------	-------	----	----

Table 17. Analysis of Comprehensive Water Stress in 2030 for Key Suppliers

	Risk Level of Comprehensive Water Stress														
	Pessimistic Scenario					BAU Scenario					Optimistic Scenario				
	Low	Low to Medium	Medium to High	High	Extremely High	Low	Low to Medium	Medium to High	High	Extremely High	Low	Low to Medium	Medium to High	High	Extremely High
Financial	0%	17.51%	0%	0%	0%	0%	17.51%	0%	0%	0%	0%	17.51%	0%	0%	0%
Commodity	0%	21.47%	0.56%	0.56%	0%	0%	22.03%	0%	0.56%	0%	0%	21.47%	0.56%	0.56%	0%
General labor	0.56%	18.64%	0%	0%	0%	0.56%	18.64%	0%	0%	0%	0.56%	18.64%	0%	0%	0%
Construction and repair	0%	40.68%	0%	0%	0%	0%	40.68%	0%	0%	0%	0%	40.68%	0%	0%	0%
Total	0.56%	98.31%	0.56%	0.56%	0%	0.56%	98.87%	0%	0.56%	0%	0.56%	98.31%	0.56%	0.56%	0%

Table 18. Analysis of Comprehensive Water Stress in 2050 for Key Suppliers

	Risk Level of Comprehensive Water Stress														
	Pessimistic Scenario					BAU Scenario					Optimistic Scenario				
	Low	Low to Medium	Medium to High	High	Extremely High	Low	Low to Medium	Medium to High	High	Extremely High	Low	Low to Medium	Medium to High	High	Extremely High
Financial	0%	17.51%	0%	0%	0%	0%	17.51%	0%	0%	0%	0%	16.95%	0.56%	0%	0%
Commodity	0%	21.47%	0.56%	0%	0.56%	0%	22.03%	0%	0.56%	0%	0%	21.47%	0.56%	0%	0.56%
General labor	0.56%	18.64%	0%	0%	0%	0.56%	18.64%	0%	0%	0%	0.56%	18.64%	0%	0%	0%
Construction and repair	0%	40.68%	0%	0%	0%	0%	40.68%	0%	0%	0%	0%	40.68%	0%	0%	0%
Total	0.56%	98.31%	0.56%	0%	0.56%	0.56%	98.87%	0%	0.56%	0%	0.56%	97.74%	1.13%	0%	0.56%

Table 19. Analysis of Comprehensive Water Stress in 2080 for Key Suppliers

	Risk Level of Comprehensive Water Stress														
	Pessimistic Scenario					BAU Scenario					Optimistic Scenario				
	Low	Low to Medium	Medium to High	High	Extremely High	Low	Low to Medium	Medium to High	High	Extremely High	Low	Low to Medium	Medium to High	High	Extremely High
Financial	0%	16.95%	0.56%	0%	0%	0%	17.51%	0%	0%	0%	0%	16.95%	0.56%	0%	0%
Commodity	0%	21.47%	0.56%	0%	0.56%	0%	22.03%	0%	0.56%	0%	0%	21.47%	0.56%	0%	0.56%
General labor	0.56%	18.64%	0%	0%	0%	0.56%	18.64%	0%	0%	0%	0.56%	18.64%	0%	0%	0%
Construction and repair	0%	40.68%	0%	0%	0%	0%	40.68%	0%	0%	0%	0%	40.68%	0%	0%	0%
Total	0.56%	97.74%	1.13%	0%	0.56%	0.56%	98.87%	0%	0.56%	0%	0.56%	97.74%	1.13%	0%	0.56%

(III) Transition Risks

According to CHT’s assessment of climate change risks and opportunities, risks induced by policies and regulations have the highest weight as material risks among transition risks. After the United Nations passed the Paris Agreement, countries around the world have set climate change mitigation targets. In March 2022, the Taiwanese government published “Taiwan’s 2050 Net-Zero Emission Path and Strategies,” providing the trajectory and path to net-zero emissions by 2050. In addition, the “Climate Change Response Act” passed the third reading in January 2023, in which the target of net zero emissions in 2050 is clearly stipulated. Therefore, all enterprises in Taiwan are regulated by the “Climate Change Response Act” to achieve net zero emissions by 2050.

According to the Climate Change Response Act, a net zero emissions target for 2050 has been established, along with the implementation of a carbon fee as an economic incentive. Regulations for the carbon market regulations will also remain in place, and the government will implement additional measures to support the achievement of the net zero emissions target in the future, which include the “Regulations for the Management of Setting up Renewable Energy Power Generation Equipment of Power Users above a Certain Contract Capacity” under the Renewable Energy Development Act.

1. 2050 Net-Zero Emission Target: The long-term goal is to reach net zero emissions by 2050, using 2005 as the base year. The targets are to reduce carbon emissions by 10% by 2025 and by 24±1% by 2030. At the same time, a goal is also set for renewable energy to make up 20% of electricity generation by 2025, 27-30% by 2030, and 60% by 2050.

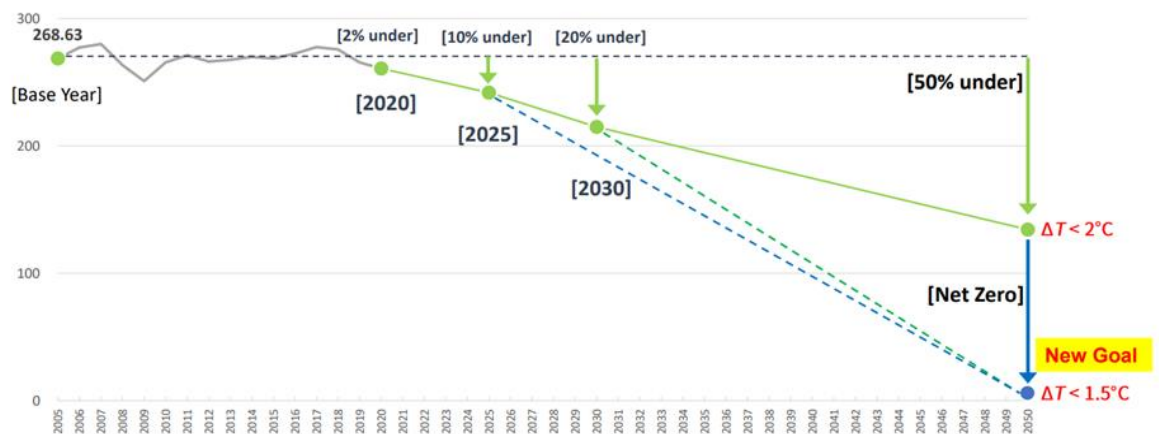


Figure 6 Taiwan’s Pathway to Net-Zero Emissions in 2050-GHG Emissions⁵

⁵ Source: National Development Council, Taiwan’s Pathway to Net-Zero Emissions in 2050

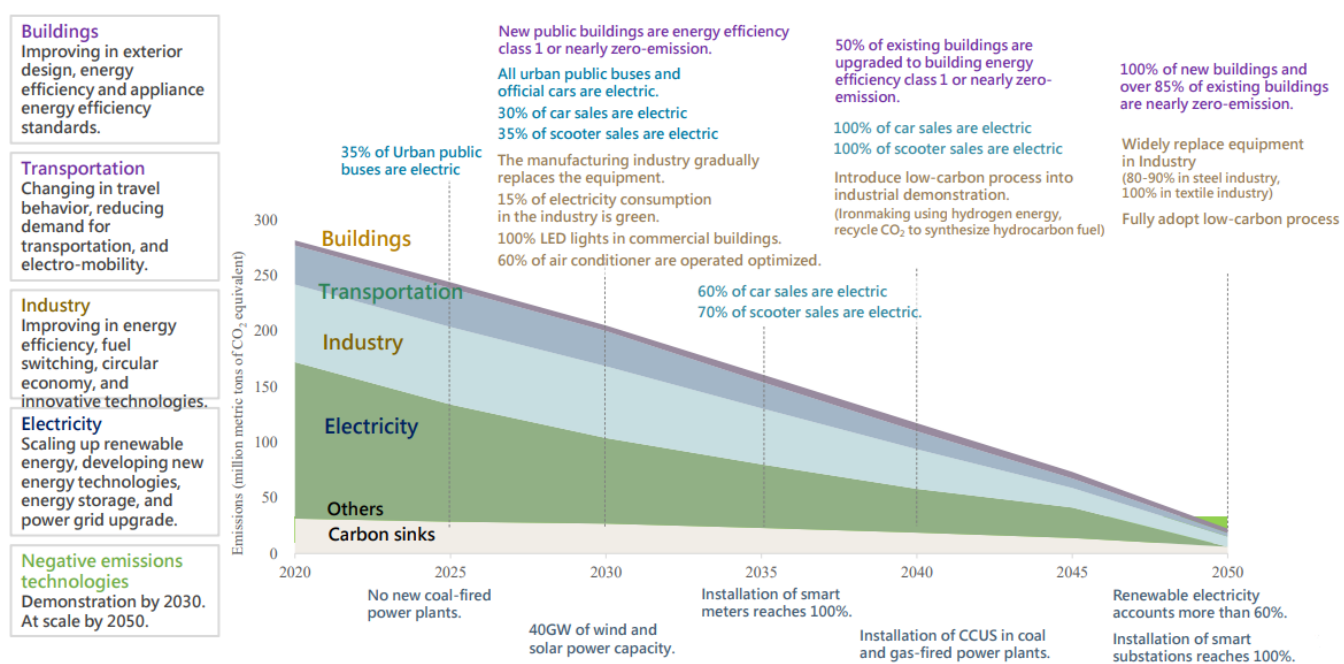


Figure 7 Taiwan's Pathway to Net-Zero Emissions in 2050-Key Milestones⁶

2. Carbon Fee Collection: The Company's implementation of the carbon fee shall include multiple phases. The first phase shall target major carbon emitters (e.g. power industry, steel industry, petroleum refining industry, cement industry, semiconductor industry, thin-film transistor liquid crystal display industry, and other specific sectors), and factories with annual emissions exceeding 25,000 MTCO₂e, totaling approximately 500 factories. Additionally, the collection is expected to commence in 2025, however, the exact price has yet to be determined, with the current plan being to collect around NT\$300/MT carbon.
3. Carbon Market: Taiwan has not yet established a clear operating mechanism for the carbon market. However, the maximum penalty for violations has been set at NT\$1,500/MT carbon.
4. Renewable Energy Development Act: The initial focus is placed on electricity users with a contracted capacity of 5,000 kW or more, who are required to use a minimum of 10% renewable energy. Subsequently, according to the law, relevant measures shall be reviewed every 2 years, potentially expanding their scope.

In the IEA STEPs scenario, it is assumed that the Taiwanese government achieves the 2050 net zero emission targets and the corresponding milestones, that is, a 10% reduction in 2025 and a 24%±1% reduction in 2030. To this end, CHT must invest in net-zero actions including buying electric company vehicles for Scope 1, the purchase of

⁶ Source: National Development Council, Taiwan's Pathway to Net-Zero Emissions in 2050

renewable energy in Scope 2, etc. The remaining carbon emissions may be written off by purchasing carbon rights. Regarding Scope 1, CHT has over 6,000 company vehicles, with an assumed electric vehicle cost of NT\$1.65 million each (referencing Confused.com). As for Scope 2, In 2020, the Company's total electricity consumption was 1,509.09 million kWh. Assuming all electricity used was renewable, with the current green energy shortage causing prices to rise to NT\$5.0/kWh, the net additional cost would be NT\$2.1542/kWh. For the remaining carbon emissions of 6,172 MTCO₂e from fixed and fugitive sources, carbon credits will be purchased for cancellation at an assumed cost of NT\$300/MT carbon. The estimation shows that in order to achieve the trajectory of net zero emissions in 2050, assuming that both carbon emissions and energy consumption remain at the 2020 level, in 2025, 2030, 2040 and 2050, additional expenses will reach NT\$120 million, NT\$3.374 billion, NT\$7.799 billion and NT\$4.322 billion.

In the IEA NZE scenario, assuming that the Taiwanese government achieves the 2050 net zero emission target and further amends the law to set the baseline year as 2020, the carbon reduction target is revised upward to 21% in 2025, 42% in 2030, and net-zero in 2050. At the same time, policies are strengthened to reach 60% of renewable energy by 2030 and 90% by 2050, with the carbon fee being adopted at NT\$300/MT carbon. In addition, accounting for the rise in international fuel costs, it is assumed that from 2020 onward, Taiwan's electricity price will increase by 30%, the share of electric vehicles in the market will reach 60% in 2030, and the carbon fee will be NT\$300/MT carbon. To this end, CHT must invest in net-zero actions including buying electric company vehicles for Scope 1, the purchase of renewable energy in Scope 2, etc. The remaining carbon emissions may be written off by purchasing carbon rights. Regarding Scope 1, CHT has over 6,000 company vehicles, with an assumed electric vehicle cost of NT\$1.65 million each (see: Confused.com). As for Scope 2, the electricity price in 2020 was NT\$2.6253 per kWh, with a 30% increase projected by 2025 to NT\$3.4129 per kWh, while the price of renewable energy is about NT\$5.0 per kWh. Therefore, after 2025, CHT will be facing an increase in general electricity prices and cost of purchasing green electricity (due to the NT\$1.5871/kWh price difference between renewable energy and general electricity). The Company's total electricity consumption in 2020 was 1,509.09 million kWh, the price of which is expected to remain stable in the future. For the remaining carbon emissions of 6,172 MTCO₂e from fixed and fugitive sources, carbon credits will be purchased for cancellation at an assumed cost of NT\$300/MT carbon. The estimation shows that in order to achieve the trajectory of net zero emissions in 2050, assuming that both carbon emissions and energy consumption remain at the 2020 level, in 2025, 2030, 2040 and 2050, additional expenses will reach NT\$1.066 billion, NT\$7.377 billion⁷, NT\$5.756

⁷Additional expenditure in 2030 will mainly come from the replacement of 60% of the 6,000 company vehicles with electric vehicles (EVs).

billion⁸ and NT\$8.22 billion⁹.

CHT, referencing the WEO and ETP reports published by the IEA, clearly understands that the most effective methods to reduce carbon emissions are (1) improving energy efficiency and (2) using renewable energy. Therefore, two major strategies were proposed: technological carbon reduction and the use of renewable energy. Additionally, an annual budget of NT\$600 million will be allocated annually for the carbon reduction strategies mentioned above.

Significant developments in the field of carbon reduction in technology include: the introduction of the new 5G C-RAN architecture, which significantly improves base station power consumption, with 85% of base stations currently converted to C-RAN; the phasing out of the 3G network (estimated to save 74million kWh); the independent development of an intelligent centralized energy monitoring system (EOC), which collects/analyzes power data on a comprehensive and automatic basis, saving energy; introducing AI and Big Data analytics to intelligently analyze and adjust the power usage of various network equipment (including mobile base stations) based on actual traffic conditions; developing smart operation and maintenance solutions, analyzing fault data, predicting base station degradation trends, improving online troubleshooting rates and reducing the need for field repairs; actively phasing out old energy-consuming equipment and enhancing the PUE of IDCs. Furthermore, CHT is actively investing in cutting-edge technologies, co-launching IOWN GF with global tech giants, vigorously promoting all-optical network technology, and committed to achieving the sustainable goals of “increasing energy efficiency by 100 times; enhancing transmission capacity by 125 times; reducing transmission delay by 200 times.”

In terms of using renewable energy, CHT has adopted a dual approach of self-construction and external procurement. In 2023, the Company purchased 73,496,813 kWh, and with self-generated and self-used energy amounting to 79,000 kWh, the total comes to 73,575,813 kWh, which is equivalent to a carbon reduction of 37,450 tCO₂e. The Company is also in the process of signing long-term Corporate Power Purchase Agreements (CPPA) to increase the proportion of renewable energy used every year.

As a result of the aforementioned carbon reduction measures, the Company’s electricity usage decreased from 1,590.09 million kWh in 2020 to 1,377.59 million kWh in 2022 (including 73.49 million kWh of green power). According to the inventory results of ISO 14064-1 and GHG Protocol, CHT’s carbon emissions in Scope 1 and Scope 2 in

⁸Additional expenditure in 2040 will mainly come from the replacement of 40% of the 6,000 company vehicles with EVs.

⁹Assuming a 20-year lifespan for electric vehicles, 60% of the EVs purchased in 2030 will have reached their end of life by 2050. Therefore, the additional expenditure in 2050 will mainly stem from replacing 60% of the 6,000 company vehicles with new electric vehicles.

2023 were 664,367.017 tCO₂e, representing a reduction of 15.94% compared to the baseline year (2020), exceeding the established carbon reduction target.

VI. Climate change adaptation strategies

(I) Climate change mitigation management strategies

SBT published the “GUIDANCE FOR ICT COMPANIES SETTING SCIENCE BASED TARGETS” in 2020, requiring the ICT industry to set short-term SBTs accordingly, with 2020 as the base year, and that the ICT industry must reduce carbon by 45% in 2030. This version of the SBTs for the ICT industry is based on the following methodology, and is in line with the 1.5°C target of the UN Paris Agreement.

- IPCC 1.5°C P2 scenario requiring a halving of emissions between 2015 and 2030
- SBTi 1.5°C trajectory demanding 42% reduction over 10 years
- A 1.5°C scenario, carbon budget approach based on the ICT sector maintaining a fixed share of overall electricity usage (based on IEA ETP)

In 2021, SBT published the “CORPORATE NET ZERO STANDARD”, which mandates that companies establish long-term carbon reduction targets based on this standard. Moreover, in the ICT industry, the absolute contraction method is required, demanding that companies achieve absolute reduction. Additionally, emissions from Scope 1 and 2, as well as Scope 3, must be reduced by 90% by 2050 (emissions from the three scopes may be combined in calculation). This standard is in line with the 1.5°C target of the UN Paris Agreement.

Based on SBT ICT’s new carbon reduction scenarios and targets (i.e., IEA NZE scenario), in setting a carbon reduction pathway for 2020-2030, CHT proposed using 2020 as the base year for Scopes 1 and 2, projecting a 50% carbon reduction by 2030; 2021 was used as the base year for Scope 3, projecting a 22.5% carbon reduction by 2030. CHT has established carbon reduction targets that encompass the entire company, in compliance with SBT ICT requirements. In 2023, the Company also committed to setting long-term Science-Based Targets (SBT) for net-zero emissions and planned to submit the review application in January 2024. In particular, carbon reduction targets were set as follows: using 2020 as the base year, a 95% reduction by 2040 has been set for Scopes 1 and 2; for Scope 3, using 2021 as the base year, a 90% reduction by 2045; the ultimate goal is to achieve net-zero emissions by 2050. If net-zero cannot be reached through industry measures alone, the Company will follow the standards for long-term SBTs and utilize carbon capture, storage technology, or high-quality carbon sinks, to offset the remaining emissions.

The Taiwanese government also announced the 2050 net-zero emission target in 2021. As the largest integrated telecommunications company in Taiwan, CHT has the responsibility to coordinate with national policies and the global net zero trend by proposing a net zero emission target. To this end, CHT took the initiative to join the

Taiwan Alliance for Net Zero Emission as one of the founding members, and promised to achieve net zero emissions at the organization’s head office and branch offices by 2030, and for the entire company by 2050, as the Company’s long-term vision and target for carbon reduction.

Table 20. Metrics Adopted by Climate Change Mitigation Management Strategies

Response to Significant Risks	Metrics	Description
R1 2050 Net Zero Emission Policy R2 Rise in electricity prices due to the shift in Taiwan’s energy structure	GHG emissions (Scopes 1, 2, 3)	According to risk identification results, most climate risks faced by CHT are related to GHG reduction, thus, if the Company fails to effectively reduce GHG emissions, impacts from climate risks will be aggravated.
	Usage of renewable energy	According to risk identification results, most climate risks faced by CHT are related to GHG reduction, thus, through the use of renewable energy, the Company can effectively reduce carbon emissions and comply with regulatory requirements.
	Power Usage Effectiveness (PUE) for Internet Data Centers (IDCs)	Due to industry characteristics, CHT operates in the high power consumption sector, particularly its data centers. Failure to improve the energy efficiency of data centers will indirectly affect GHG emissions and expose the Company to climate risk.

1. GHG Scope 1 and 2 emissions

A. Targets

CHT has estimated its electricity usage for the years 2021-2030 according to its corporate strategy and business volume. Subsequently, Scope 1 and 2 emissions have been projected (assuming that Scope 2 emissions account for 97% of the total), from which the Company’s carbon emissions trajectory has been determined to be under the BAU (business-as-usual) scenario. The Company’s data center business volume continues to grow, leading to a steady increase in the carbon emissions of data centers. In the mobile network sector, as 5G is being deployed and expanded, and with 3G expected to be phased out by 2025, the carbon emissions from mobile networks will continue to grow until 2025, after which they will begin to decrease and stabilize.

However, based on the carbon reduction SBTs of the ICT industry, CHT has proposed

to reduce carbon emissions by 50% by 2030, and by 95% by 2040, compared to 2020. The Company also plans the annual carbon reduction amount and set carbon emissions trajectory from 2020 to 2030 under the 1.5°C scenario. Furthermore, based on long-term (net-zero) SBTs, CHT has charted a carbon emissions trajectory for 2031-2040. In the future, the Company will follow this trajectory to carry out energy conservation and carbon reduction efforts. According to the inventory results of ISO 14064-1 and GHG Protocol, CHT’s carbon emissions in Scope 1 and Scope 2 in 2023 were 664,367.017 tCO₂e, representing a reduction of 15.94% compared to the baseline year (2020), exceeding the established carbon reduction target.

Table 21. Diagram of carbon reduction pathway for GHG Scope 1 and 2 emissions

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
BAU Scenario-carbon emission (10,000 MTCO ₂ e)	79.03	78.00	79.81	77.70	75.20	66.47	68.18	69.18	70.18	71.18	72.19
Reduction target	-	1.7%	3.4%	5.3%	7.5%	10%	13.1%	17.6%	26%	37%	50%
1.5°C Scenario-carbon emission (10,000 MTCO ₂ e)	-	77.69	76.35	74.84	73.10	71.13	68.68	65.12	58.48	49.79	39.52

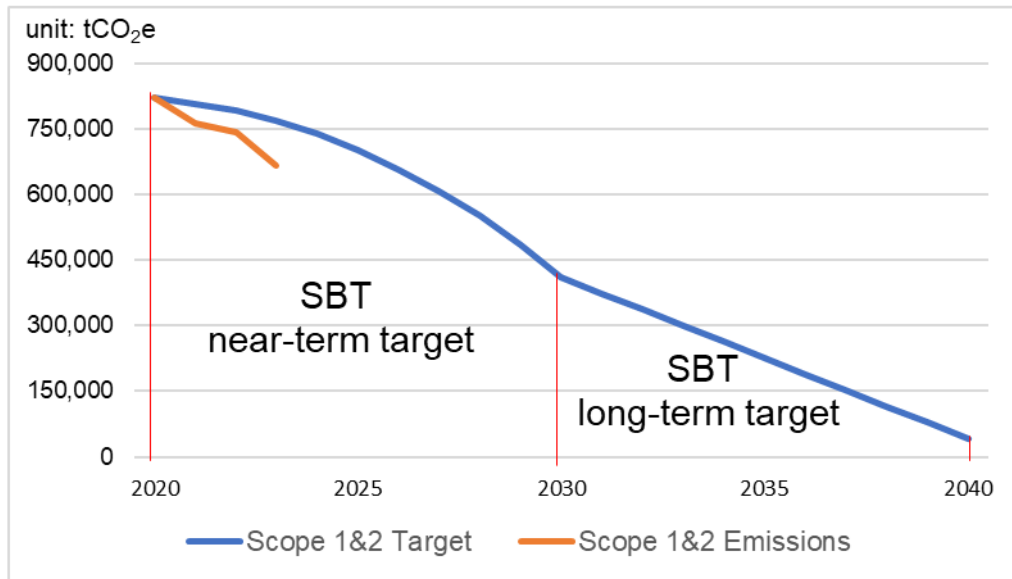


Figure 8 Diagram of carbon reduction pathway for GHG Scope 1 and 2 emissions

B. Strategies

(A) Short-term SBTs

CHT, referencing the WEO and ETP reports published by the IEA, clearly understands that the most effective methods to reduce carbon emissions are (1) improving energy efficiency and (2) using renewable energy. Therefore, two major strategies were proposed: technological carbon reduction and the use of renewable energy.

Significant developments in the field of carbon reduction in technology include: the introduction of the new 5G C-RAN architecture, which significantly improves base station power consumption, with 85% of base stations currently converted to C-RAN; the phasing out of the 3G network (estimating to save over 74million kWh by 2030); the independent development of an intelligent centralized energy monitoring system (EOC), which collects/analyzes power data on a comprehensive and automatic basis, saving energy; introducing AI and Big Data analytics to intelligently analyze and adjust the power usage of various network equipment (including mobile base stations) based on actual traffic conditions; developing smart operation and maintenance solutions, analyzing fault data, predicting base station degradation trends, improving online troubleshooting rates and reducing the need for field repairs; actively phasing out old energy-consuming equipment and enhancing the PUE of IDCs. Furthermore, CHT is actively investing in cutting-edge technologies, co-launching IOWN GF with global tech giants, vigorously promoting all-optical network technology, and committed to achieving the sustainable goals of “increasing energy efficiency by 100 times; enhancing transmission capacity by 125 times; reducing transmission delay by 200 times.”

In terms of using renewable energy, CHT has adopted a dual approach of self-construction and external procurement. In 2023, the Company purchased 73,496,813 kWh, and with self-generated and self-used energy amounting to 79,000 kWh, the total comes to 73,575,813 kWh, which is equivalent to a carbon reduction of 37,450 tCO₂e. The Company is also in the process of signing long-term Corporate Power Purchase Agreements (CPPA) to increase the proportion of renewable energy used every year. At the same time, CHT has joined the RE100 initiative and aims to achieve the RE100 target by 2040. Furthermore, a goal has been set for IDCs to utilize 100% renewable energy by 2030.

(B) Long-term SBTs (Net Zero)

According to the Company's GHG inventory results, Scope 2 GHG emissions account for more than 97% of the total, hence, reduction of Scope 2 emissions will be the focus of long-term SBTs.

CHT has announced its participation in RE100, with the goal of achieving 100% renewable energy usage by 2040. If successful, this would result in a 97% reduction in Scope 1 and Scope 2 emissions, aligning with the Company's long-term SBTs.

Regarding the use of renewable energy, CHT has already begun to formulate plans for both self-generation and external procurement. Additionally, in the 2023 annual shareholders' meeting, "power generation" was proposed as a motion to invest in projects related to renewable energy, which was passed by a vote. After incorporating new power generation business ventures, CHT will actively engage in investments in large-scale power plants with a capacity of 2MW or higher. In addition to developing solar photovoltaic power plants and energy storage, charging piles, agrivoltaics, and integrated photovoltaic and storage projects, the Company will also undertake construction, maintenance, and operational guarantees, with the expectation to make significant contributions to the long-term goals of RE100 and SBT by 2040. As for Scope 1 emissions, including stationary, mobile, and fugitive sources, CHT will adopt measures such as using low-carbon fuels, electric vehicles, and eco-friendly refrigerants to reduce emissions. For the remaining emissions that cannot be reduced, the Company will follow SBTi guidelines to implement offsetting measures to achieve net-zero emissions.

C. Performance over the years

CHT regularly adopts international standards to conduct GHG inventory each year to stay updated with the Company's GHG emissions and structure as the basis for formulating effective energy-saving and carbon-reduction strategies and achieving the target of net zero emissions by 2050.

In 2023, the total Scope 1 and Scope 2 emissions of the Company was 664,365.54 t-CO₂e. As the Company is not involved in the production of products, its GHG emissions mainly come from energy use (Scope 2 accounts for about 97.3% of the total). As a result, CHT addresses the issue by investing in improving energy efficiency of the equipment and replacing old equipment, such as introducing high-efficiency equipment to IDCs and low carbon base stations, as well as procuring low-carbon equipment with green labels issued by the government to reduce carbon emissions. Moreover, GHG emissions in 2022 decreased by 15.94% compared to the base year (2020).

Table 22. Scope 1 and 2 Emissions of CHT Over the Past Three Years

Year	Scope 1 emissions (t-CO ₂ e)	Scope 2 emissions (t-CO ₂ e)	Total emissions (t-CO ₂ e)	Annual Increase/Decrease Rate (%)	Carbon Reduction Rate Compared with the Base Year (%)
2020 (Base year)	22,192.93	768,128.07	790,321.00	-	-
2021	17,887.47	716,979.26	734,866.73	-7.02%	7.02%
2022	19,185.32	694,912.72	714,098.04	-2.83%	9.64%
2023	18,874.89	645,490.65	664,365.54	-6.96%	15.94%

2. Scope 3 GHG emissions

A. Targets

SBT published the “GUIDANCE FOR ICT COMPANIES SETTING SCIENCE BASED TARGETS” in 2020, requiring the ICT industry to set short-term SBTs accordingly. The new version of the SBT ICT standard does not set Scope 3 carbon reduction standards and targets for the ICT industry, instead, they require the ICT industry to set the Scope 3 carbon reduction targets in accordance with the SBT Criteria for general industries. According to the latest SBT Criteria (published in October 2021, Version 5.0), if Scope 3 emissions exceed 40% of total emissions, at least 66% of Scope 3 reduction targets must be set, and at least a 2.5% annual carbon reduction must be achieved based on the Well-Below 2°C scenario. As a result, in accordance with the new SBT ICT standards and SBT Criteria (Version 5.0), CHT has set a goal to reduce Scope 3 GHG emissions by 22.5% by 2030, with 2021 as the base year.

The “CORPORATE NET ZERO STANDARD” published by SBT also requires companies to set long-term carbon reduction SBTs (net-zero) accordingly; thus, following

its requirements, the Company adopted the absolute contraction method to set a target of 90% reduction of Scope 3 emissions by 2045, with 2021 as the base year.

In addition, to conduct a complete inventory of 15 items in GHG Scope 3 emissions for the base year (2020), the Company initiated the 2020 GHG Scope 3 audit project in 2022, using the GHG Protocol Scope3 Evaluator for quantification, and has passed the limited assurance level. In the same year, CHT also completed the 2021 GHG Scope 3 inventory, using a mix of screening and inventory to quantify Scope 3 carbon emissions. According to the results of the biennial audit, the main categories of Scope 3 greenhouse gases are Category 1: Purchased goods and services, Category 2: Capital goods, Category 3: Fuel- and energy-related activities, Category 11: Use of sold products, and Category 13: Downstream leased assets. Therefore, these items will be the focus of CHT's future carbon reduction efforts. Additionally, the Company will gradually increase the proportion of audits used, as well as reduce the use of screening, in order to further reflect actual Scope 3 carbon emissions.

Table 23. Diagram of carbon reduction pathway for GHG Scope 3 emissions

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Reduction target	-	2.5%	5%	7.5%	10%	12.5%	15%	17.5%	20%	22.5%
Well-Below 2°C Scenario-carbon emission (10,000 MTCO _{2e})	192.61	187.8	183	178.2	173.4	168.5	163.7	158.9	154.1	149.3

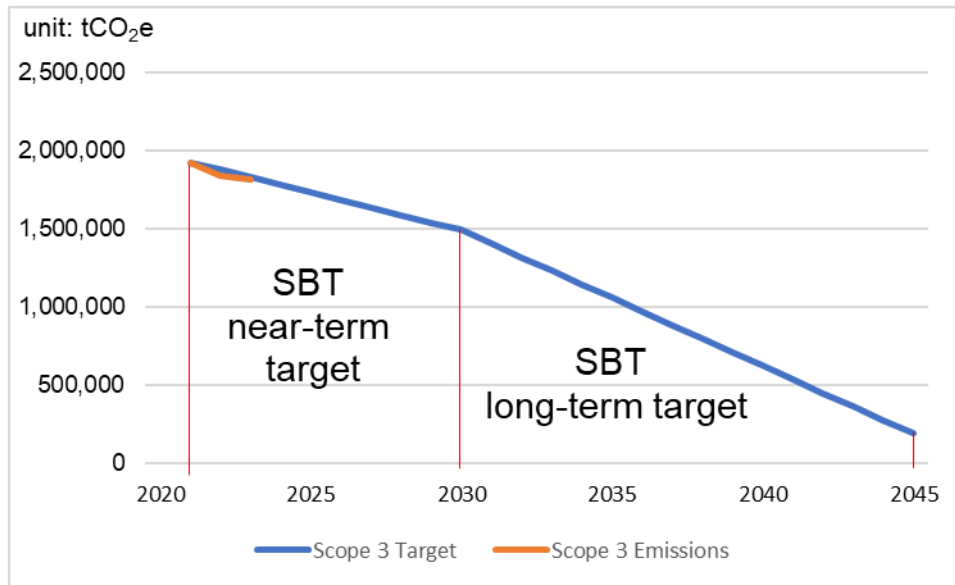


Figure 9 Diagram of carbon reduction pathway for GHG Scope 3 emissions

B. Strategies

(A) Short-term SBTs

CHT refers to the recommendations of the new version of the SBT ICT standards to focus Scope 3 carbon emissions on the purchased goods and services from the upstream and the use of sold products sold at the downstream, as well as expanding to capital goods, fuel- and energy-related activities and downstream leased assets which account for a high proportion of Scope 3 with a total of 5 categories. CHT will first expand the scope and number of suppliers to be inventoried to enhance their awareness of GHG, as well as focusing on reduction of Scope 3 emissions for the aforementioned 5 categories.

- (1) Purchased goods and services, capital goods: Prioritizing the procurement of green products and encouraging suppliers to reduce carbon emissions
- (2) Fuel- and energy-related activities: Improving energy efficiency of the Company to reduce the consumption of fuel and energy
- (3) Use of sold products: Optimizing the energy efficiency of the Company's products to reduce energy consumption
- (4) Downstream leased assets: In view of the fact that the Company has many assets and lessees, CHT will encourage lessees to save energy and reduce carbon

To further promote Scope 3 reduction and to comply with the United Nations and national policies, CHT and its 35 key suppliers launched the net zero initiative "Carbon Reduction, Hand in Hand". Key suppliers of CHT are those with an annual procurement

volume exceeding 50 million, their procurement accounts for more than 80% of the total volume. Therefore, promoting reduction among key suppliers will greatly benefit the reduction in Scope 3 emissions. Upon invitation, 35 key suppliers responded to the initiative. Consequently, this will help CHT to achieve short-term SBTs, as well as Scope 3 reduction for the net-zero emission target. The Company will subsequently track the carbon reduction performance of these 35 key suppliers through the CDP Supply Chain project, comparing it with CHT's Scope 3 reduction pathway (reducing 2.5% annually), and using it as an indicator to measure the achievement of annual targets.

(B) Long-term SBTs (Net Zero)

CHT's Scope 3 inventory results (with 2021 as the base year) show that the top two sources of emissions are the procurement of products and services at the upstream end and the use of sold products at the downstream end, accounting for 64.62% of the total volume of Scope 3. This is in line with facts stated in the new version of the SBT ICT standard: the three major sources of emissions in Scope 3 of the ICT industry are the procurement of products and services at the upstream end, as well as the use of sold products at the downstream end. In addition, the Company the direction for reduction of Scope 3 emissions outline in short-term SBTs, i.e., expanding to include three additional items, namely capital finance, fuel- and energy-related activities, and downstream leased assets, by considering them as significant sources of emissions and reduction directions. Moreover, as these five items account for 98.47% of the total emissions in Scope 3 in the base year 2021, they are also the key Scope 3 carbon reduction directions of CHT's long-term SBTs.

- (1) Purchased goods, services, and capital goods: Urge suppliers to conduct carbon inventories and reduce carbon emissions. Beyond launching the net-zero initiative "Carbon Reduction, Hand in Hand" with 35 key suppliers, CHT has also been planning to launch a supplier-focused SBT program, assisting suppliers in setting SBTs and reducing emissions in a scientific manner.
- (2) Fuel- and energy-related activities: Electricity is the primary energy source used by CHT, thus, Scope 1 and 2 carbon reduction strategies (e.g. technological carbon reduction, and the use of renewable energy) are expected to enhance the Company's energy efficiency and reduce electricity consumption. Moreover, reduction efforts are also aided by the lower upstream emissions due to the use of renewable energy, as opposed to fossil fuels.
- (3) Use of sold products: Optimizing the energy efficiency of the Company's products to reduce energy consumption. To scientifically track carbon reduction, the 2023 MOD set-top box has also obtained the ISO 14067 certification, and there are plans to

gradually obtain product carbon labels for other products/services.

- (4) Downstream leased assets: CHT mainly leases office space to lessees, with emissions coming mainly from electricity consumption (e.g., lighting and air-conditioning). Therefore, lessees will be advised to prioritize the replacement of lighting and air-conditioning with those bearing energy-saving labels, as well as the use of renewable energy.

For the remaining categories within Scope 3 (1.53% of the total volume), CHT will make efforts to synchronize the implementation of carbon reduction by consumers, employees, waste and transportation suppliers, and invested subsidiaries. Remaining carbon emissions that cannot be reduced will be offset by neutralization measures in accordance with SBTi guidelines, in order to achieve the net-zero emission goal.

C. Performance over the years

In addition to regularly conducting comprehensive audits of the Company's GHG emissions, Chunghwa Telecom has been following the GHG Protocol and ISO 14064-1:2018 since 2020 to fully audit all Scope 3 GHG emissions. In 2020, the GHG Protocol's official tool, the Scope 3 Evaluator, was used for quantification, and from 2021 onward, actual audits started covering only certain items. Since 2021 is the base year, Scope 3 emissions in 2020 are not presented, and a verification statement from an international verification institution has been obtained, as shown in Table 14.

Table 24. Scope 3 Emissions of CHT Between 2021-2023

Item		2021 Emissions (MTCO ₂ e)	2022 Emissions (MTCO ₂ e)	2023 Emissions (MTCO ₂ e)
ISO 14064-1:2018	GHG Protocol Value Chain Scope 3			
Category 3: Indirect GHG emissions from transportation	4.Upstream transportation and distribution	1,167.47	646.60	1,332.55
	9.Downstream transportation and distribution	1,469.46	901.86	56.59
	6.Business travel	4,771.10	1,174.65	2,948.24
	7.Employee commute	8,665.22	10,203.88	6,550.97
	Subtotal	16,073.25	12,926.99	10,888.35
Category 4: Indirect GHG emissions from products used by an organization	1.Purchased goods and services	754,637.02	752,416.69	721,023.74
	2.Capital goods	364,752.98	344,733.39	471,191.29
	3.Fuel- and energy-related activities	135,568.03	124,456.91	130,772.70
	5.Waste generated in operations	1,359.40	943.59	936.19
	8.Upstream leased assets	18,492.14	13,045.93	17,728.19
	Subtotal	1,274,809.57	1,235,596.51	1,341,652.11
Category 5: Indirect GHG emissions associated with the use of products from the organization	11.Use of sold products	472,310.54	460,657.59	449,619.64
	12.End-of-life treatment of sold products	3,167.79	1,403.50	594.91
	13.Downstream leased assets	145,217.43	115,519.72	10,346.95
	14.Franchises	-	-	-
	15.Investments	1,668.34	1,956.57	1,560.31
	Subtotal	622,364.10	579,537.38	462,121.81
Category 6: Indirect GHG emissions from other sources	Others	-	-	-
Total		1,913,246.92	1,828,060.89	1,814,662.26

3. Renewable Energy

A. Targets

In view of the industry characteristics, CHT is high in energy consumption with

Scope 2 emissions accounting for over 97% of Scope 1 and 2 emissions. According to the IEA WEO 2019 report, renewable energy is one of effective method for carbon reduction. To this end, CHT refers to international reports to set the targets of 40% of renewable energy in 2030 and 100% of renewable energy in 2040, while applying for RE100.

B. Strategies

The IEA report points out that the most effective ways to reduce carbon emissions are (1) improving energy efficiency and (2) using renewable energy. Therefore, CHT adopts two recommendations for carbon reduction from IEA, including:

- (1) Reducing energy consumption from the source by improving energy efficiency, including but not limited to improving energy efficiency in equipment in IDCs, replacing old equipment, and maintaining and optimizing existing equipment and facilities;
- (2) Actively sourcing renewable energy, including the construction and purchase of renewable energy fields, pure green energy procurement, renewable energy certificates, energy storage equipment development and other projects.

In terms of the core element-renewable energy use, CHT has adopted a dual approach of self-construction and external procurement. In 2023, the Company purchased 73,496,813 kWh, and with self-generated and self-used energy amounting to 79,000 kWh, the total comes to 73,575,813 kWh, which is equivalent to a carbon reduction of 37,450 tCO₂e. The Company is also in the process of signing long-term Corporate Power Purchase Agreements (CPPA) to increase the proportion of renewable energy used every year. Additionally, in the 2023 annual shareholders' meeting, "power generation" was proposed as a motion to invest in projects related to renewable energy, which was passed by a vote. After incorporating new power generation business ventures, CHT will actively engage in investments in large-scale power plants with a capacity of 2MW or higher. In addition to developing solar photovoltaic power plants and energy storage, charging piles, agrivoltaics, and integrated photovoltaic and storage projects, the Company will also undertake construction, maintenance, and operational guarantees, with the expectation to make significant contributions to the long-term goals of RE100 and SBT by 2040.

C. Performance over the years

CHT used 24,048 MWh of renewable energy in 2022, accounting for 1.73% of the Company's total consumption.

	2020	2021	2022	2023
Total Power Consumption (MWh)	150,909	142,825	138,930	137,759
Renewable Energy	11	11	2,405	7,357.5

Consumption (MWh)				
Ratio of Renewable Energy (%)	0.01%	0.01%	1.73%	5.34%

4. Power Usage Effectiveness (PUE) for Internet Data Centers (IDCs)

PUE (Power Usage Effectiveness) is the standard for calculating IDC energy conservation. It is determined by dividing the total power consumption of the IDC by the power supply to IT equipment. Lower PUE values indicate that the data centers' air conditioning and non-IT equipment consume less electricity; the ideal PUE ratio is 1.0. In practice, there is a substantial amount of electricity and air conditioning usage in the data center that is unrelated to IT equipment. IT equipment generates a significant amount of heat when running, and without a proper cooling system, the equipment would overheat and cease to function. Energy is also required in IDC facilities for lighting and other devices. As a result, the PUE ratio of IDCs must exceed 1.0.

A. Targets

In view of industry characteristics, CHT's data centers are high in energy consumption with high Scope 2 emissions from IDCs. After considering the overall carbon reduction strategy, the target for PUE in IDCs is set to decrease to 1.5 by 2030, meaning that the power consumed by air-conditioning, lighting and other power-consuming equipment in the IDCs will decrease. This will help the Company reduce carbon emissions and meet the requirements of SBT ICT carbon reduction targets.

B. Strategies

CHT will reduce the PUE and the need for power in IDCs. Currently, there is an energy-saving plan for telecommunications IDC rooms, including the procurement of facilities and equipment with energy-saving/green labels. The Company is also effectively utilizing the self-developed iEN, as well as the Power Operation Supervisory System for IDCs (POSS), to achieve the benefits of carbon reduction and environmental protection via technology. In addition, CHT requires that the PUE value of newly built IDCs be lower than 1.5. Combined with other energy-saving plans for IDCs, the target of reducing PUE to 1.5 is expected to be achieved in 2030.

C. Performance over the years

CHT's PUE value of IDCs for the baseline year (2020) is 1.67, which decreased to 1.626 in 2023.

Table 25. Targets for PUE in IDCs

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
PUE	Base	1.66	1.65	1.63	1.61	1.59	1.57	1.55	1.53	1.51	1.50

Target value	year										
PUE Actual value	1.67	1.657	1.647	1.626	-	-	-	-	-	-	-

5. Carbon pricing

To effectively promote CHT’s carbon reduction targets, enhance awareness of energy conservation and carbon reduction for all units, improve energy efficiency, and change internal behaviors, CHT has formulated an internal carbon pricing system by setting NT\$1,600/MT carbon, covering Scope 1 and 2 emissions in all operating sites and branches. CHT’s carbon pricing is implemented in three phases. The first phase was launched on July 1, 2022 with Scope 2 emissions as part of the pilot program. Carbon pricing was provided to each unit for reference, with no charge determined for the time being. The second phase started on January 1, 2023, covering Scope 1 and 2 emissions, calculated with the carbon fee collected, and was included as a KPI. The third phase covers Scope 3 emissions, but only when it is practically feasible. As each unit takes carbon fees and KPI assessment into consideration, internal carbon pricing must be factored in future operations and procurement decisions, encouraging energy saving, carbon reduction, and transition towards low carbon operations.

CHT has set up a carbon fee fund to cover costs of promoting energy conservation, carbon reduction, and the R&D for low-carbon technologies, including encouraging all units to propose innovative carbon reduction measures, purchasing renewable energy, and replacing high-efficiency and energy-saving equipment. In 2023, a total of 100 relevant proposals were submitted within CHT, out of which 67 were approved, with a budget allocation of NT\$620 million.

Table 26. Internal Carbon Fee Data (2023)**Unit: \$1,000**

Internal Carbon Fee	Q1	Q2	Q3	Q4	2023 Total
Consumer Business Group	3,969	4,403	5,050	4,441	17,863
Enterprise Business Group	590	671	908	848	3,017
International Business Group	102	148	244	199	694
Network Technology Group	102,634	99,705	111,644	106,416	420,399
Information Technology Group	26,908	29,293	33,967	32,869	123,038
Chunghwa Telecom Laboratories	1,093	1,218	1,790	1,446	5,547
Headquarters	2,843	3,172	3,403	2,851	12,269
Branches	93,438	96,932	110,618	99,622	400,610
Total	231,578	235,542	267,624	248,692	983,435

(II) Climate change adaptation management measures

In view of the fact that CHT's communication equipment and facilities are all over Taiwan, and the impact of climate change will become more and more significant, CHT has formulated short-, medium-, and long-term climate change adaptation plans since 2020 to avoid the impact of long-term climate events on communication equipment and facilities. Short-term plans last 1-3 years, medium-term 3-8 years and long-term over 8 years, with adaptation plans covering 100% of the existing and newly-built operating sites and communication equipment.

Table 27. Metrics Adopted by Climate change adaptation Management Strategies

Metrics	Description
Degree of climate disaster	Due to the nature of the industry, the Company's facilities/equipment are vulnerable to extreme weather events with damage to the facilities/equipment. In addition to maintenance costs, damages may also lead to interruptions in operations and impact revenue.

CHT’s climate change adaptation plan consist of three subitems, including short-, medium- and long term core tasks, their contents, as well as implementation results in 2023.

Table 28. Climate Change Adaptation Plans and Implementation Results in 2023

Adaptation Plans	2023 Operational Results/Progress
(1) Flood and Disaster Control Action Plans for Telecommunication IDCs, Telecommunication Equipment, and Buildings	
Short-term adaptation plans (1-3 years)	
<p>Continue monitoring and analyzing climatic disasters (including droughts, tsunamis, floods, wind storms, slope failure, and lightning). At the same time, reduce disaster risk, improve disaster preparedness, disaster recovery drills, disaster response measures, and optimize standard operating procedures for telecommunication IDCs, equipment, buildings, and facilities.</p>	<ul style="list-style-type: none"> ● Units responsible for the management of telecommunication data centers have each established measures for preventing natural disasters, formulated plans for business continuity and emergency response, and carried out planned data evacuation/data backup and recovery drills. <ul style="list-style-type: none"> ■ Conducted disaster resilience drills for six outlying islands and three transportation networks, including highways and mobile communications. ■ Completed the construction of fixed network transmission backup trailers and conducted disaster drills. ■ Conducted two key infrastructure protection exercises, including a live-fire drill in Taipei CIP and a wargame simulation in Taichung CIP. ■ Passed ISO 27001/27011 with third-party verification. ● All telecommunications equipment is equipped with a 24/7 monitoring mechanism. In the event of a sudden disaster, the network status can be quickly assessed to prepare disaster relief and repair resources based on the scale of the disaster, while constantly monitoring the situation’s development. ● Drought prevention drills are carried out each year at CHT’s Taipei Aiguao Facility. These drills cover the flood proof doors installed on four exits, one each at the car path, the motorcycle path, the basement stairwell, and the basement emergency exit, as well as

Adaptation Plans	2023 Operational Results/Progress
	that on the exit leading from the outdoors area on the first floor to the basement level.
<p>Reduce electricity reliance of company equipment and facilities, conduct carbon inventory of operational processes to identify areas where GHG emissions can be reduced, and improve the ability to save energy and reduce emissions. (For example, accelerate the phasing out of older and less energy-efficient data center equipment and improve data platforms to move towards a fully-online service model).</p>	<ul style="list-style-type: none"> ● Based on a statistical analysis, we managed to conserve the most electricity in these three areas in 2023: <ol style="list-style-type: none"> 1. Electricity conserved by fixed network server rooms Replacement of old energy-consuming equipment; PSTN IP transformation; replacement of old air conditioning equipment and SMR equipment; NG SDH-UT decommissioning; reduction of ERI load; replacement of ADSL DSLAM, V1 DSLAM, and 7342 GPON OLT, and integration of broadband AGG-E. In 2023, branches in the region collectively reduced energy consumption by 47.44 million kWh. 2. Electricity conserved by mobile network server rooms (including base stations) Replacement of old and energy-consuming equipment, adoption of C-RAN architecture for base stations, gradual replacement of old and energy-consuming equipment at base stations, implementation of energy-saving measures for base station air conditioning, decommissioning of 2G gateway switches, closure of 3G-F2 cells, nighttime dormancy of 4G, optimization of dismantling and energy-saving in building equipment rooms. A total of 12.99 million kWh of power was saved in 2023. 3. Energy saving in Internet Data Centers (IDCs) Procured high-efficiency, low energy consumption, and high heat tolerance communications equipment, reducing electricity consumed by air conditioning. Replaced electrical equipment, and adopted high-efficiency transformers and UPS, as well as inverter air conditioners (such as magnetic centrifugal cold water mainframes, EC fans, and variable-frequency drives).
Medium-term adaptation plans (3-8 years)	
Based on climate monitoring and analysis	<ul style="list-style-type: none"> ● Continuous improvement of the business continuity plan and emergency response plan, as well as

Adaptation Plans	2023 Operational Results/Progress
<p>results, and accounting for other factors such as potential risks and impact to business operations, CHT has taken measures to make telecommunications data centers, equipment, buildings, and facilities more resilient to climate change. These measures include implementing flood prevention and water drainage infrastructure, as well as establishing backup routing.</p>	<p>conducting backup and communication diversion drills for remote areas and outlying islands.</p> <ul style="list-style-type: none"> ● To enhance network resilience and minimize the impact of submarine cable failures on national security, public livelihood, and industries, a triple network backup architecture between Taiwan and Matsu will be established, consisting of submarine cables, microwave links, and satellite connections. ● To improve the resilience of data centers in mountainous and remote areas in the eastern part of the country, new microwave stations will be established and existing stations will be upgraded. ● To improve emergency disaster response and rescue efficiency, mobile transmission backup equipment will be established, and the Company will conduct integrated disaster rescue drills for both mobile and fixed networks. ● Complete construction of the Hualien Guanfu, Hualien Yuli, Hualien Fengbin, Taitung Chenggong, and Taitung Guanshan OTNs, providing dual routing for both the mountain and coastal lines, addressing the issue of long electrical circuit paths with only a single route in the Hualien and Taitung regions. ● Complete construction of the Taichung Fushou and Nantou Puli OTN, providing dual-route enhanced circuit availability for vulnerable mountain areas.
<p>In order to reduce electricity reliance, CHT will gradually standardize types of locations where the electrical equipment in telecommunications data centers are installed to avoid rooftops and other areas which heat up easily. At the same time, the Company will adjust the cold and hot aisles in data</p>	<ul style="list-style-type: none"> ● IDC reliability is of utmost importance, however, PUE value is limited by customers' IT power usage after occupancy. By phasing out two old and small data centers in 2023, the overall power consumption efficiency of IDCs have been improved. ● With reference to IDC operators in regions with similar climate patterns, the PUE of CHT's IDCs have been improved, with the PUE for all IDCs in the region gradually decreasing from 1.67 in 2020. Consequently, the mid-term goal is to reduce it to 1.59 by 2025, while the long-term goal is 1.50 by 2030; the target for 2023 was 1.63, and the actual value was 1.626.

Adaptation Plans	2023 Operational Results/Progress
<p>centers and procure more energy-efficient equipment, with the goal of improving the PUE of CHT's data centers from bronze (PUE of 1.94) to silver level (PUE between 1.43-1.67). Due to reliability limitations, and the rate of customers' IT electricity usage, the PUE target has been set to 1.5 by 2030.</p>	<ul style="list-style-type: none"> ● Adopted more efficient and energy conserving air conditioning equipment, and continued the replacing of older, less efficient equipment, in order to improve the electricity utilization rates in data centers.
<p>Considering the risk that a climate disaster might cause a blackout, leading to business interruption, and in cooperation with the government's policy encouraging citizens to generate their own electricity, CHT will develop energy storage technologies and expand the capacity of its energy storage infrastructure. The Company will increase the proportion of renewable energy used by its data centers, reducing the reliance on electricity generated by petrol, and allowing for the maintenance of a stable electricity supply in case of intermittent blackouts in the future.</p>	<ul style="list-style-type: none"> ● To mitigate the risk of interrupted communication caused by intermittent power outages, resulted from climate change, and improve call resilience, a backup battery technology has been developed for distribution boxes, where the voice equipment is deployed. Complete the pilot evaluation of 13 light boxes with 48V-30Ah lithium iron battery modules, which can effectively support 288-port voice devices for more than 5 hours of backup power, and can also optimize battery room space in distribution boxes, enhancing backup power lifespan and strengthening call resilience. CHT also proposes the mechanism of thermal runaway of lithium batteries and contingency measures in case of fire to provide reference for disaster relief. ● Following the policy of self-built solar power, the Company finalized the bidding for the construction of a 1MW energy storage system in Taipei in 2023. At current, the project is under active construction, it is expected to be completed and put to use in 2024.
<p>Long-term adaptation plans (Over 8 years)</p>	
<p>Integrate national and</p>	<ul style="list-style-type: none"> ● The Company has launched scientific research projects

Adaptation Plans	2023 Operational Results/Progress
<p>private resources, combine telecommunications technologies, collaborate with different business, nation and academic organizations, agencies, and institutions to develop disaster analysis and prevention technologies, allowing for faster warnings for climate change disasters and reducing the risk of significant impact. (such as the Earthquake Public Warning Cell Broadcast Service)</p>	<p>on climate change in collaboration with government and public agencies for disaster analysis; for example: The Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (http://tccip.ncdr.nat.gov.tw). In the future, the Company may integrate and collaborate with industry academia-government organizations, and apply climate change disaster analysis data to develop technologies for preventing these disasters, reducing the impact of climate change risks.</p>
<p>(2) Adaptation action plans for network facilities in response to climate change</p>	
<p>Short-term adaptation plans (1-3 years)</p>	
<p>Underground data center infrastructure: Continue making improvements and inspections (e.g. of the drainage systems), and gradually replace older equipment to prevent accidents from occurring due to aging equipment.</p>	<ul style="list-style-type: none"> ● Conducted regular maintenance inspections based on the specific requirements for different buildings and equipment, and conduct regular (quarterly/annually) inspections of the Mobile Communication Building (Xing Tong Building)'s facilities, e.g. its electrical system/miscellaneous facilities/plumbing system. Based on the inspection results, a rolling management approach was adopted to implement continued improvements and inspections. ● Established the “Operating Guidelines for Underground On-Site Self Inspections” according to the “Chunghwa Telecom Main Criteria for Assessing External Network Equipment Maintenance”. Inspection items include 20 operations and equipment categories, including network equipment, disaster prevention, and rescue operations, which focus on maintaining the safety of underground cables, preventing disasters, and ensuring sound rescue operations.

Adaptation Plans	2023 Operational Results/Progress
	<ul style="list-style-type: none"> ● Conducted regular self-inspections each quarter, and during the annual Mid-Term Inspection and External Network Equipment Maintenance Assessment, carried out inspections and performance assessments. ● In the 2023 External Network Equipment Maintenance Assessment, 17 issues were discovered across 4 inspection items in the Company’s overall underground system assessment, and were corrected within 20 days.
<p>Above ground telecommunications infrastructure: Continue building cable splicing boxes, wire distribution cabinets, telecommunication enclosures, and other infrastructure supporting FTTH; gradually phase out switching equipment in existing cross-connection cabinets, preventing damaged equipment from causing internet outages.</p>	<ul style="list-style-type: none"> ● The Company fully commits to building further facilities to improve FTTH network coverage, planning to increase FTTH coverage to above 90% across all regions by 2026. In 2023, total FTTH facilities were increased by 5.00%, achieving 86.39% network coverage. ● Removed V2 equipment used in consolidated cross-connection cabinets. In 2023, CHT implemented plans to reduce 4,696 pieces of such equipment, reducing the usage of cross-connection equipment and reducing the probability of network obstructions. ● Worked together with customers to change from V to H cable networks, reducing the use of cross-connection cabinets.
<p>Underground cable infrastructure: Optimizing gas-filled cable software for laying cables in manholes, handholes, and underground tunnels, in order to discover and address problematic areas in advance.</p>	<ul style="list-style-type: none"> ● Continued to optimize filled gas monitoring software, and gradually update to smart gas filling machines. In 2023, CHT replaced 54 gas filling machines, and removed 19,267 detected cable obstructions, planning to gradually replace 60 machines in the next 2 years, and improving the obstruction advance warning system to prevent cable obstructions.
<p>Overhead cable infrastructure: Optimize the surveying software used for transmission towers and cables, in order to inspect</p>	<ul style="list-style-type: none"> ● The automated workflow process for patrol of line equipment was established in 2023, POC verified on July 15, and is now available for use by field inspection personnel. ● In 2024, CHT plans to optimize the GIS trajectory

Adaptation Plans	2023 Operational Results/Progress
<p>any power cables or transmission tower equipment experiencing issues more effectively and make improvements, preventing cable obstructions.</p>	<p>patrol software through redevelopment, and plans to submit an inspection report titled “Data on Overhead Cable Lines Spanning Across Roads” in order to improve the safety of telecommunications infrastructure.</p>
<p>Medium-term adaptation plans (3-8 years)</p>	
<p>Underground data infrastructure: Update center network technologies, reduce the use of copper cables, and begin converting cable systems to fiber-optic cables, leveraging these technological updates to reduce the number of exchanges.</p>	<ul style="list-style-type: none"> ● By using copper reduction equipment MSAN and OE1 MUX for mass cutover, the usage of copper trunk cables from the main office to the distribution box can be significantly reduced, and, coupled with asset revitalization targets, can generate external benefits. <ul style="list-style-type: none"> ■ Cat 1 cable (relay copper cable): Reduced copper by 501 hundred pairs (coverage: 97.85%), withdrew 43 copper cables (coverage: 93.48%). ■ Cat 2 cable (SVG construction and removal of cables between virtual office and main office): Reduced copper by 296 hundred pairs (coverage rate: 100%), withdrew 11 copper cables (coverage rate: 100%). ■ Cat 3 cable (MSAN & VOBB conversion and removal of cables): Reduced copper by 1,149 hundred pairs (coverage rate: 86.72%), withdrew 31 copper cables (coverage rate: 59.62%). ● Replacement of copper cables with fiber-optic cables as PoC: Copper cables have been reduced by a total 1,149 pairs (coverage rate: 84.80%), and 31 cables (coverage rate: 59.62%) in 7 PoC offices. ● Refinement results of replacing copper cables with fiber-optic cables as PoC: <ul style="list-style-type: none"> ■ Development and testing of the heat dissipation module for distribution boxes: Maintain the temperature of the junction box at below 60°C; utilize PWM fans in order to reduce 162kg of CO₂e annually with each box. ■ Lithium-iron battery inspection and testing results: The lifespan of lithium iron batteries is 5

Adaptation Plans	2023 Operational Results/Progress
	<p>times that of lead-acid batteries, and the backup capacity is 1.3 times that of lead-acid batteries. Due to their low self-discharge rate, lithium-iron batteries save energy, reduce carbon, and are more environmentally friendly.</p> <ul style="list-style-type: none"> ■ Continued implementing the POC project for reducing the use of copper cables in server rooms. We plan to be able to complete consolidation operations for the Taoyuan International Airport server room by 2025, with consolidation and conversion progress in 2023 reaching 71.87%.
<p>Ground telecommunications facilities: Accelerate fiber-optic conversion in cable splicing boxes, wire distribution cabinets, and telecommunication boxes, gradually remove copper cables and switching equipment from distribution boxes.</p>	<ul style="list-style-type: none"> ● Implement fiber-optic coverage construction (Fiber To The Home, FTTH), with the goal of achieving over 90% fiber coverage in the entire area by 2026. In 2023, there was a net increase of 5.00% in construction completed, reaching a fiber coverage rate of 86.39%. ● Reduced V2 equipment in consolidated cross connection cabinets. Plans implemented in 2023 helped conserve 2.223 million kWh of electricity, with empty cross connection cabinets being re-utilized. In the past 8 years, CHT has worked with exchange points to reduce and consolidate operations, and have worked together with customers to continue converting older cables to fiber-optic cables.
<p>Underground cable infrastructure: Accelerate converting all cables laid in manholes, handholes, and underground tunnels to fiber-optic cables, reducing the number of copper cables used.</p>	<ul style="list-style-type: none"> ● To increase revenue and reduce cable maintenance costs, CHT's branches have set a total target amount for the sale of scrap cables, motivating the active dismantling and selling of old copper cables, with results in 2023 being as follows: <ul style="list-style-type: none"> ■ Through the promotion of replacing copper cables with fiber-optic cables, the usage of copper trunk cables from the main office to distribution boxes has been greatly reduced. In addition, the dismantled waste cables are able to be sold or used as maintenance materials (Type A), to reduce maintenance costs and generate revenue. ■ 1,195,368 kg of copper was removed from the entire region in 2023, creating an auction

Adaptation Plans	2023 Operational Results/Progress
	<p>performance of approximately NT\$239 million, equivalent to freeing up 118.82 kilometers for fiber optic cable deployment, and reducing pipeline construction costs by about NT\$107 million.</p> <ul style="list-style-type: none"> ■ Replacement of copper cables with fiber-optic cables as PoC for Cat 1, Cat 2, and Cat 3 cables in 2023: <ul style="list-style-type: none"> (1) Cat 1 cable (relay copper cable): Removed 52,320m of copper. (2) Cat 2 cable (SVG construction and removal of cables between virtual office and main office): Removed 23,943m of copper. (3) Cat 3 cable (SVG construction and removal of cables between virtual office and main office): Removed 38,190m of copper. ● Launched the server room’s POC cable conversion and copper cable removal project, which plans to remove 2,611 km of copper trunk cable by 2026. In 2023, 89.9km of copper cable were removed, bringing the total to 292km. ● Implemented project to replace copper cable with fiber-optic cable; across all regions, established and implemented annual schedules for removing 66.9km of underground cables from 2022 to 2026.
<p>Overhead cable infrastructure: Wireless networks shall gradually replace wired networks for transmission towers and overhead cables. This replacement process shall begin being implemented in mountainous and more remote regions.</p>	<ul style="list-style-type: none"> ● Prioritized installing FWA in regions where fiber-optic cables cannot be easily laid, substituting fixed broadband networks with mobile networks, and reducing construction costs. In 2023, 27 routes for MOD HD have been installed. ● Evaluate the use of fixed wireless access (FWA) solutions to address Internet connectivity needs. In 2023, 26 locations across the region that meet the conditions for 5G FWA were selected for proof-of-concept (POC) verification of Internet connectivity, future testings will be carried out with the collaboration between terminal equipment suppliers and the Wireless Institute at Telecom Laboratories.

Adaptation Plans	2023 Operational Results/Progress
Long-term adaptation plans (Over 8 years)	
<p>Promote smart maintenance by transforming traditional manual maintenance operations and decentralized management mechanisms into systematic, automated, intelligent, and centralized systems, in order to ensure constant awareness of potential climate disaster risks, strengthen adaptation plans, and enable an immediate response.</p>	<ul style="list-style-type: none"> ● Develop related maintenance management systems, each in charge of the maintenance of related facilities and equipment. Refine management and testing systems according to the continuous evolution and updating of network technology and equipment; set development goals of systematization, automation, intelligence, and centralization to avoid duplication of investment in resources. ● Continue optimizing innovative system features and enhance the centralized and intelligent capabilities of the system. Starting in 2023, CHT has been reviewing the integration of relevant operational management systems, with a goal to integrate systems such as FORCE, GIS, and CEMIS to facilitate on-site operations and ensure safe line maintenance. The integrated system is expected to be operational by August 2024.
(3) Network adaptation action plan in response to climate change for mobile communication base stations	
Short-term adaptation plans (1-3 years)	
<p>Improve safety: Periodically inspect and repair base stations' cell towers/equipment/electrical supply equipment, and gradually replace older electrical equipment to prevent accidents from occurring due to aging equipment.</p>	<ul style="list-style-type: none"> ● Established the "Main Criteria for Assessing Mobile Communications Equipment", inspecting and repairing base stations every six months. These procedures include an external alerts test, battery discharge test, firefighting equipment inspection, inspection of air-conditioning system operation, and fan filter cleaning. CHT completed inspection and repair of all of base stations in 2023, achieving a successful inspection and repair rate of 100%, and completing all improvements.
<p>Improve electricity supply: Convert base stations into C-RAN architecture, install stable electricity supply and sufficient backup electricity sources in data centers.</p>	<ul style="list-style-type: none"> ● By 2023, the number of 5G base stations in the region has exceeded 21,600. In order adapt to the expansion of 5G network coverage, C-RAN equipment rooms has been built to make room for base stations, and the proportion of C-RAN stations in the entire network is now nearly 90%.

Adaptation Plans	2023 Operational Results/Progress
<p>Reduce electricity demand: Natural ventilation/exhaust fans shall be introduced at base stations, and RU radio frequency equipment shall be installed outdoors, reducing electricity consumption. CHT shall also halt support for its 3G systems, reducing electricity needed, as well as operational and maintenance costs.</p>	<ul style="list-style-type: none"> ● Power saving measures include the adoption of C-RAN architecture for base stations, gradual replacement of old and energy-consuming equipment at base stations, implementation of energy-saving measures for base station air conditioning, decommissioning of 2G gateway switches, closure of 3G-F2 cells, dismantling of 3G extension modules, nighttime dormancy of 4G, optimization of dismantling and energy-saving in building equipment rooms. In 2023, a total of 11,690,000 kWh of power was saved as a result.
<p>In line with the construction of 5G N2100 base stations, shut down 3G F2 cells, and effectively utilize the 3G U2100 frequency. Extend 5G signal coverage to achieve the twin goals of reducing electricity requirements, as well as maintenance and operational expenses.</p>	<ul style="list-style-type: none"> ● Aligning with the 3G Sun Set plan, the Company optimizes 3/4G network selection parameters to reduce 3G network dependency, continues 5G N2100 base station construction to achieve effective use of 3G U2100 spectrum strategy, and has gradually shut down all 3G F2 cells in 2023 to remove high-capacity extension modules, saving 1.9 million kWh of electricity. In the future, the 3G base station will be phased out in accordance with the 3G Sunset plan to reduce base station energy consumption.
Medium-term adaptation plans (3-8 years)	
<p>Promote smart maintenance by transforming traditional manual maintenance operations and decentralized management mechanisms into systematic, automated, intelligent, and centralized systems, in order to ensure constant awareness of potential climate disaster risks, strengthen adaptation plans, and enable an</p>	<ul style="list-style-type: none"> ● Relying on the multi-band properties of 4G, CHT has implemented smart electricity-conserving measures for its 4G base station cells (reducing the number of usable frequencies) during the low-traffic nighttime hours. In 2023, these measures were in place for 14.37 million cell hours, saving 690 thousand kWh of electricity. The Company plans to implement these efforts on a larger scale in the future in order to reduce energy consumption.

Adaptation Plans	2023 Operational Results/Progress
immediate response.	
Long-term adaptation plans (Over 8 years)	
<p>Improve the ability of base stations to survive disasters, with a primary focus on maintaining electricity supply. A secondary concern is the stability of transmission cables, and strengthening backup systems. Establish systems for protecting transmission cable networks, such as establishing backup routing and equipment redundancy.</p>	<ul style="list-style-type: none"> ● In 2023, CHT successfully installed wind power, photovoltaic power, and energy storage systems in green base stations in remote areas of high mountains, seashores, and outlying islands, generating a total of 113.8kW of power (12kW of wind power and 101.8kW of solar power) for self-consumption at the base stations. ● Equip 5G base station transmission circuits with MSER, providing backup protection mechanisms through dual routing; currently, 4G base station circuits are gradually being equipped with MSER and backed up by dual routing ● 5G Mobile network Adopt the C-RAN architecture for base stations, and the modules and routes important for MBH (Mobile Backhaul) transmission aggregation equipment are to be protected by backup recovery mechanism. Continue to develop maintenance and operational tools to promote smart management and maintenance, improve the network monitoring system, and Access network Cyber resilience. ● In order to ensure reliable transmissions from base stations, CHT has not only considered the appropriate adoption of FSO (Free-Space Optical Communication) to replace the older narrowband microwaves that cannot be used for 4G or higher transmissions, but may also in the future adopt the use of commercial low earth orbit satellites, using the properties of these broadband signals to serve as an important backup transmissions method for its base stations.

(III) Upstream-Supply Chain Carbon Reduction Management Strategies

With the Paris Agreement in place, the path for the era of low-carbon economy has been set. As part of the IT&C industry, CHT has to understand and respond to the potential impact of climate change issues, and has to formulate appropriate response strategies and actions in a timely manner.

CHT's supply chain carbon management has three targets: 1. Improving suppliers' knowledge of climate change, 2. Collecting information on GHG emissions, and 3. Communication and incentives (to change supplier behavior). First of all, CHT took the lead in joining the CDP Supply Chain program in 2017, allowing suppliers to start from understanding climate change and move towards effective carbon management. The "Sustainable Partner Certification" was launched at the same time to grade suppliers into 4 levels based on their category and importance, and according to the audit results, including gold, silver, bronze, and participation. Those who fail to qualify will receive guidance by way of the improvement mechanism within a certain period of time. Graded suppliers can obtain corresponding labels, which bring additional points during future tenders. In the future, CHT will also promote incentive mechanisms to encourage suppliers to develop products and services that mitigate climate impacts.

In addition, the Company plans to introduce product carbon footprints with the ultimate target of drawing attention to the Company's products with reduced carbon. Carbon footprint life cycles of products include carbon emissions of the supply chain, thus, in order to quantify products' carbon footprint and promote carbon reduction, CHT needs to work with suppliers to promote the Company's business opportunities for low-carbon products.

Furthermore, CHT recognizes the importance of promoting energy conservation and carbon reduction throughout the entire industry chain. To achieve this, the Company first focused on large suppliers, and gradually extended the scope to include all suppliers. As part of Scope 3 inventory, suppliers with a significant procurement amount were included. While conducting Scope 3 GHG inventory, CHT provides guidance and explanations to all selected suppliers to ensure that they are capable of providing data on GHG, indirectly assisting suppliers in understanding GHG inventory requirements and building inventory capabilities. In the future, CHT will continue to expand the scope of supplier inventories and hold individual meetings for guidance and explanation.

Suppliers reported a total of 9.58 million tons of CO₂e emissions reduced in 2022 due to energy conservation and carbon reduction. In 2023, the CDP Supply Chain Project invited 91 suppliers to complete a questionnaire, reaching a response rate of 78% with 71 suppliers filling out the questionnaire, but the results have not yet been published.

Table 29. Requirements of CHT for Suppliers

Climate-related Requirements	Description
<ul style="list-style-type: none"> ● Climate-related disclosures through public platforms 	<p>CHT is the first telecommunications provider in Taiwan to join the CDP Supply Chain Program. In 2018, the Company’s supply chain carbon management initiative was launched, aiming to encourage suppliers to disclose comprehensive GHG information and plan carbon reduction actions.</p> <p>Moreover, suppliers with a procurement amount of at least NT\$50 million are required to participate in the CDP Supply Chain Project, which involves completing the CDP questionnaire and providing climate change information to CHT.</p>
<ul style="list-style-type: none"> ● Implementation of carbon reduction initiative 	<p>CHT is an important service provider of Taiwan’s telecommunications network, and is responsible for the construction of critical infrastructure. Therefore, the Company commissions specialized contractors to provide and construct pipelines, cables, and installations for customers.</p> <p>The Company also promotes carbon reduction among its suppliers. Prior to procurement and supplier selection, CHT incorporates ESG factors, including carbon reduction performance, as a bonus criterion in supplier evaluation, accounting for 33% of the evaluation weightage.</p>
<ul style="list-style-type: none"> ● Measuring product emission level 	<p>CHT is at the downstream end of the ICT industry and is not responsible for the production of ICT equipment, which is procured externally.</p> <p>To assist suppliers in understanding CHT’s procurement system for low-carbon development, the Company has introduced the ISO 14067 carbon footprint certification requirement for client network equipment (Wi-Fi Mesh AP and MOD). In the next phase, the procurement terms will also include the carbon reduction label from the Ministry of Environment and expand the scope to include Home Gateway.</p>
<ul style="list-style-type: none"> ● Product carbon footprint (PCF) reduction ● Obtain the Company’s sustainable 	<p>CHT has established the “Operational Guidelines Supplier Management of Chunghwa Telecom Co., Ltd.” that are used for managing and evaluating suppliers. Suppliers are evaluated according to the guidelines, with suppliers scoring below 50 being classified as high-risk suppliers and having their partnership with the Company terminated, while those</p>

supply chain audit and provide any environmental- related certificates	scoring above 80 are classified as strategic partners. Strategic partners will be exempt from bid bonds, performance guarantees, and other requirements. In the supplier evaluation, extra points will be given to those who have obtained the Company’s sustainable supply chain audit, or environment-related systems such as ISO 140001 and ISO 50001.
---	--

(IV) Downstream-Opportunities for innovating climate products

2. Significant opportunity-Green products and services

As governments and corporations around the world set net-zero emission targets and emphasize the transition to a low-carbon economy, the Taiwanese government proposed the 5+2 Industrial Innovation Plan to speed up industrial transformation and upgrading; included among its contents is the building of an innovative IoT ecosystem, which is one of CHT’s core businesses. CHT adheres to national policies and employs advanced ICT technologies, including 5G, IoT, and data innovation, to offer low-carbon solutions and support the energy-efficient transformation of smart cities, factories, and buildings, thereby aiding customers in the transition to a low-carbon economy and driving CHT’s revenue growth.

The Company has designated green products and services to account for 20% of its total revenue. In recent years, CHT has invested considerable resources into the research and development of emerging technologies such as 5G, AI, big data analysis, and the Internet of Things (IoT) to master key technologies in the ICT industry and enhance the competitiveness of its core products. In 2023, CHT invested NT\$3.891 billion in R&D, accounting for approximately 1.74% of the consolidated revenue.

CHT has formulated long-term business development plans as follows:

- (1) Actively expand emerging businesses; utilize R&D resources of Chunghwa Telecom Laboratories and the capacity of strategic partners to build the industrial ecosystem; promote smart services and solutions for corporate customers and consumers; improve operational efficiency of corporate customers; enhance consumer well-being, and expand domestic and overseas markets to become the leader of smart life and the enabler of the digital economy.
- (2) Simultaneously strengthen operating costs and procurement benefits through smart technologies, digitalization, network virtualization, software-defined networking and other similar technologies; increase resource output/input ratios, and effectively optimize investment and construction costs.

In 2023, CHT generated NT\$16.798 billion in revenue from its main green products, which include IDC, cloud services, IoT (including iEN, IVS, ITS, and smart buildings), and MOD. It is projected that the average annual growth rate over the next three years will exceed 3%, leading to a cumulative revenue of NT\$53.256 billion.

Table 30. Metrics Adopted by Climate Opportunities

Response to Major Opportunities	Indicators	Description
Products/Services	Revenue from green products and services	Being on the final end of the industry chain, CHT provide services directly to general consumers and other corporate clients. Thus, by setting goals for green products and services, the Company will help customers transition to a low-carbon economy while achieving revenue growth.

3. Others

(1) Energy Source

After the UN passed the Paris Agreement, countries and companies have paid increasing attention to climate change issues and set carbon reduction targets. International companies have further included upstream suppliers to take actions towards carbon reduction. For example, Microsoft has set the target of achieving negative carbon emissions by 2030 by including suppliers in the scope. Therefore, for IDC services CHT provides, some customers have expressed the demand for IDCs to use renewable energy.

To respond to the needs of all stakeholders, CHT set the target of fully adopting renewable energy in IDCs by 2030. This will help CHT stabilize or improve the business of IDC services. According to the international organization Statista, the projected Compound Annual Growth Rate (CAGR) for the IDC market between 2023 and 2027 is 4.66%, expected to reach US\$342.1 billion in 2023 and eventually US\$410.4 billion in 2027.

In light of the net-zero emission targets set by various countries and key international clients, under the IEA STEPs and IEA NZE climate scenarios, CHT can achieve growth in the IDC business by aiming for comprehensive use of renewable energy in IDCs by 2030; assuming an estimated annual growth rate (CAGR) of 4.66%, CHT anticipates that by 2027, the revenue from IDCs would increase by NT\$1.5 billion. On the other hand, estimating the demand for renewable energy in IDCs, and assuming the cost of purchasing

renewable energy is NT\$5, the actual cost of purchasing renewable energy is NT\$2.1542, minus the general electricity fee. To meet the renewable energy target for IDC rooms by 2027, an additional expenditure of NT\$300 million is required, thus projecting an increase of approximately NT\$1.2 billion in net profit for 2027.

To achieve this target, CHT adopts two major carbon reduction proposals from the IEA, namely improving energy efficiency and adopting renewable energy. Projects that can improve energy efficiency and reduce power consumption from the source include, but are not limited to: improving the energy efficiency of IDCs; replacing old equipment; repairing and optimizing existing equipment and facilities, and actively sourcing renewable energy, including the construction and purchase of renewable energy fields, pure green energy procurement, renewable energy certificates, and energy storage equipment development, to gradually increase the proportion of renewable energy.

(2) IDCs and cloud services

CHT's IDCs are green data centers with high energy efficiency (PUE 1.657), and its power consumption efficiency is much higher than that of traditional data centers (PUE 1.9). The Company manages more than 9,000 cabinets for users, many of which are international brands, and some which have set Scope 3 reduction targets. Therefore, the Company will help customers reduce Scope 3 GHG emissions by improving the energy efficiency of IDCs.

As the leading service provider Taiwan's telecommunications industry and IDCs, CHT insists on providing excellent service quality. To this end, it obtained a number of domestic and foreign professional certifications such as TIA-942 Rated 3, Uptime Institute M&O, ISO 27001, ISO 45001, ISO 50001 and ISO 14001, covering data center design/maintenance/safety management, environment, safety and health, energy conservation and environmental protection, payment card security, cloud services, etc. In the meantime, it continues to plan multiple data centers across the country, adhere to the service philosophy of "achieving excellence with professional expertise," so that the customers can concentrate developing their business, accelerating business development, staying updated with business opportunities and achieving excellence.

(3) MOD services

MOD provides customers with multimedia services such as on-demand video, applications and program channels provided by operators. CHT provide MOD set-top boxes with the subscription of MOD services, and the set-top boxes work as a medium that allows users to watch programs on different channels. The Company is actively improving the energy efficiency of MOD set-top boxes, which will reduce the power consumption at the user end. In addition, the number of MOD users reached 2.06 million

in 2021. After multiplying the amount of energy saved by the number of all users, the amount of carbon reduced would be substantial.

CHT introduced BS 8001 circular economy in 2021, with MOD service as the target. It passed the BS 8001 circular economy assessment in October 2021 as the first telecom operator in Taiwan to pass such assessment, hoping the industry chain can drive the development of the circular economy business model and move towards a sustainable cycle.

In order to improve MOD service quality, CHT has been consistently enhancing and developing the functionality and energy efficiency of MOD set-top boxes, with the 5th generation of development currently in progress. In addition to reducing the size of the MOD set-top box to minimize the use of raw materials, CHT also focuses on improving energy efficiency. The first-generation MOD set-top box consumed 9W of power, which is used as a benchmark for comparison with the Company's 5th generation MOD set-top box. According to company statistics, the 9W operating capacity of CHT's first-generation MOD set-top box has the average usage time per user of 4 hours, each box using an estimated 13.14 kWh per year. Improvements made with the 5th generation MOD set-top box include reducing the power from 9W to 4.3W, with the same average usage time per user of 4 hours, power consumption per year for each set-top box is 6.28 kWh, 2.09 times and 6.86 kWh less than that of the first-generation box. Data gathered by the Company also shows that the number of MOD subscribers in 2021 was 2.06 million, with all users' MOD set-top boxes upgraded to the 5th generation. As a result, energy-saving measures has been implemented across Taiwan, leading to an annual energy saving of 14,197 MWh, equivalent to an annual reduction of 7,127 tCO₂e.

VII. Conclusion

As the leader of Taiwan's telecommunications industry, CHT shoulders the responsibility for the sustainable development of Taiwan and the industry chain. Climate change has become a topic that the industry, government, academia, and research circles need to face. The Secretary-General of the United Nations has also called on governments and enterprises around the world to step up their work on climate change.

CHT took the lead in calling for the telecommunications industry to introduce TCFD in 2018 and became a supporter of TCFD. In 2020, CHT introduced TCFD and became the first telecom operator in the world to obtain the TCFD conformity statement of the highest level, hoping to encourage Taiwan and the industry chain to attach great importance to the issue of climate change.

In 2023, CHT continued to implement the TCFD project by building up on the results already achieved previously, re-examining and assessing risks and opportunities associated climate change faced by the Company, before deciding material risks include "2050 Net Zero Emission Policy", changes in Taiwan's energy structure resulting in electricity tariffs, and the increase in the frequency and severity of strong typhoons and rainstorms, resulting in damages to facilities and equipment; on the other hand, climate-related opportunities include green products and services. Therefore, the Company must proactively manage the risks and opportunities to enhance CHT's financial performance. After the audit by a third-party international organization, the British Standards Institution, CHT once again obtained the conformity statement of the highest level (Level 5+: Excellence grade), showing that the Company's climate change management framework is in line with the recommendations and requirements of TCFD.

CHT plans to incorporate the review of major capital expenditures into climate change issues in the future. For example, when purchasing data center equipment, energy efficiency and eco-friendly materials will also be included in the review of major capital expenditures. Moreover, CHT will continue to optimize the TCFD management framework and conduct climate risk and opportunity analysis on the value chain, so as to stay updated with the risks and opportunities brought about by climate change, plan in advance and reduce the operational and financial impact, helping CHT achieve a resilient business model as part the effort to transition towards a low-carbon economy. Furthermore, the introduction of TCFD also helps CHT communicate with internal and external stakeholders by disclosing information on climate change on the official website and CSR report, as well as filling in the international ESG questionnaire, etc. This allows stakeholders to understand CHT's climate change management policies and strategies, making the Company a transparent and reliable telecom operator.

Appendix I. TCFD Index

Core Element	Disclosure	Chapter	Page No.
Governance	a) Describe the board’s oversight of climate-related risks and opportunities.	<ul style="list-style-type: none"> ● III-(I) Board of Directors’ Oversight of Climate-related Risks and Opportunities 	7
	b) Describe management’s role in assessing and managing climate-related risks and opportunities.	<ul style="list-style-type: none"> ● III-(II) Assessment and Management of Climate-Related Risks and Opportunities by the Sustainable Development Committee 	10
Strategy	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	<ul style="list-style-type: none"> ● V-(II) Physical risks ● V-(III) Transition risks 	39 48
	b) Describe the impact of climate related risks and opportunities on the organization’s businesses, strategy, and financial planning.	<ul style="list-style-type: none"> ● V-(II) Physical risks ● V-(III) Transition risks ● VI-(I) Climate change mitigation management strategies 	39 48 53
	c) Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	<ul style="list-style-type: none"> ● V. Climate-related Risks Management Scenario Analysis 	38
Risk management	a) Describe the organization’s processes for identifying and assessing climate-related risks.	<ul style="list-style-type: none"> ● IV-(I) Process for identifying climate-related risks and opportunities ● IV-(II) Process for assessing climate-related risks and opportunities 	14 15
	b) Describe the organization’s processes for managing climate-related risks.	<ul style="list-style-type: none"> ● IV-(III) Process for Assessing Climate-related Risks and Opportunities 	18
	c) Describe how processes for	<ul style="list-style-type: none"> ● IV-(III) Process for Assessing 	18

	identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	Climate-related Risks and Opportunities	
Metrics and Targets	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	<ul style="list-style-type: none"> ● VI-(I) Climate change mitigation management strategies ● VI-(II) Climate change adaptation management measures ● VI-(IV) Opportunities for innovating climate products 	53 67 82
	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	<ul style="list-style-type: none"> ● VI-(I) Climate change mitigation management strategies 	53
	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	<ul style="list-style-type: none"> ● III-(II) Assessment and Management of Climate-Related Risks and Opportunities by the Sustainable Development Committee ● VI-(I) Climate change mitigation management strategies ● VI-(II) Climate change adaptation management measures ● VI-(IV) Opportunities for innovating climate products 	10 53 67 82

Appendix II. Third-Party Conformity Statement



Conformity Statement

Climate related Financial Disclosure

This is to conform that

Chunghwa Telecom Co., Ltd. No. 21-3, Sec. 1, Xinyi Rd. Zhongzheng Dist. Taipei City 100012 Taiwan	中華電信股份有限公司 臺灣 台北市 中正區 信義路一段 21-3 號 100012
--	--

Holds Statement Number CFD 801257

As a result of carrying out conformity check process based on TCFD requirement, BSI declares that:

- Chunghwa Telecom Co., Ltd. follows the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) Guidance to disclose climate-related financial information which is clear, comparable and consistent against its organizational risks and opportunities as well as its financial impacts. The disclosure covers the four core elements of the TCFD and is prepared based on the seven guiding principles for effective disclosures.
- The maturity model for the Climate-related Financial Disclosures is **Level 5+ : Excellence** grade.
- 與氣候相關的財務揭露的成熟度模型為【第五級 Plus : 優秀】等級。

For and on behalf of BSI

Managing Director BSI Taiwan, Peter Pu

Latest issue: 2024-03-15

Expiry date: 2025-03-14

Page 1 of 2

...making excellence a habit.™

The British Standards Institution is independent to the above named client and has no financial interest in the above named client. This Conformity Statement has been prepared for the above named client only for the purposes of verifying its statements relating to its climate related financial disclosures more particularly described in the scope. It was not prepared for any other purpose. The British Standards Institution will not, in providing this Conformity Statement, accept or assume responsibility (legal or otherwise) or accept liability for or in connection with any other purpose for which it may be used or to any person by whom the Conformity Statement may be read. Any queries that may arise by virtue of this Conformity Statement or matters relating to it should be addressed to the above name client only.

Taiwan Headquarters: 2nd Floor, No. 37, X-Hu Rd., Nei-Hu Dist., Taipei 114700, Taiwan, R.O.C.
BSI Taiwan is a subsidiary of British Standards Institution

Statement number: CFD 801257

Location:

Chunghwa Telecom Co., Ltd.
No. 21-3, Sec. 1, Xinyi Rd.
Zhongzheng Dist.
Taipei City
100012
Taiwan
中華電信股份有限公司
臺灣
台北市
中正區
信義路一段 21-3 號
100012

Conformity Check Overall Result:

The maturity model for the Climate-related Financial Disclosures is **Level 5+: Excellence** grade.

與氣候相關的財務揭露的成熟度模型為[第五級 Plus：優秀]等級。



Latest issue: 2024-03-15

Expiry date: 2025-03-14

Page 2 of 2

The British Standards Institution is independent to the above named client and has no financial interest in the above named client. This Conformity Statement has been prepared for the above named client only for the purposes of verifying its statements relating to its climate related financial disclosures more particularly described in the scope. It was not prepared for any other purpose. The British Standards Institution will not, in providing this Conformity Statement, accept or assume responsibility (legal or otherwise) or accept liability for or in connection with any other purpose for which it may be used or to any person by whom the Conformity Statement may be read. Any queries that may arise by virtue of this Conformity Statement or matters relating to it should be addressed to the above name client only.
Taiwan Headquarters: 2nd Floor, No. 37, Ji-Hu Rd., Nei-Hu Dist., Taipei 114700, Taiwan, R.O.C.
BSI Taiwan is a subsidiary of British Standards Institution