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The Effectiveness of Non-Production Resource Management

Item	Measures in 2024
 Water-Saving	● Priority was given to water-efficient equipment and rainwater reuse (e.g., for toilet flushing and plant watering) to reduce tap water consumption. ● In line with the Water Saving Normalization Action Plan, water-saving equipment was installed, and outdated equipment replaced in offices, at construction sites, and in dormitories. ● Leak inspections of pipelines and the reuse of rainwater, condensate, and rinse water were strengthened to enhance water conservation.
 Power-Saving	● Priority is given to the procurement of electrical appliances with energy efficiency labels or classified as level 1 or 2 in energy performance. ● Preference is given to air conditioning units with higher Cooling Seasonal Performance Factor (CSPF) values. ● Adjust the chilled water outlet temperature of central air-conditioning systems moderately to maintain cooling efficiency while reducing energy use. ● Establish energy management systems to enhance energy efficiency through monitoring and analysis of electricity usage. ● Actively replace outdated energy-intensive equipment, such as air conditioners and lighting, in office areas. ● Maintain indoor office temperatures at 26–28° C, supplemented with circulator fans. ● Shut down chiller units 30 minutes before the end of working hours, while maintaining water circulation and air flow. ● Prohibit the use of non-official electrical appliances in office spaces. ● Implement energy-saving operational modes for elevators and office equipment in all units.
 Fuel-Saving	● Promoted carpooling in vehicle dispatch and strengthened vehicle maintenance and inspection to reduce fuel consumption. ● Allocated budget resources to accelerate the replacement of fuel-powered vehicles with electric vehicles, while increasing the usage rate of existing EVs. ● Vehicle fuel consumption at the headquarters decreased by 831 liters in 2024 as compared to 2023.
 Paper-Saving	● Continued to implement paper-reduction initiatives through the use of official digital documents and online approval systems, achieving performance rates of over 70% and 85%, respectively. These figures are based on company-wide document statistics in accordance with the official formula for the Electronic Document Energy Saving and Paper Reduction Program. ● Additionally, double-sided printing was promoted among employees, resulting in the conservation of approximately 3.13 million sheets of paper.

Taipower will continue to phase out outdated and energy-intensive electrical equipment that has reached the end of its service life. With the goal of achieving zero growth in electricity consumption compared to the previous year, the Company will implement appropriate usage controls and introduce energy-efficient equipment to reduce energy consumption without compromising office environment quality. Additionally, Taipower has allocated a budget to expedite the replacement of fuel-powered vehicles with electric vehicles and to enhance the utilization of existing EVs.

3.2 Environmental Impact Management

3.2.1 GHG Emissions

Material Topic: Environmental Impact Management

Policy	● Taipower aims to reduce environmental impact and fulfill its corporate responsibilities through resource recycling and reuse, air pollution control, water conservation, and waste management practices.
Management Approach	● Resource Recycling: Reduce waste and promote reuse through the auction of discarded cables, the resale of iron reels, and online sales platforms. ● Air Pollution Control: Reduce thermal unit loads during periods of poor air quality and gradually upgrade pollution control equipment to balance electricity supply and environmental protection. ● Water Resource Management: Promote rainwater harvesting and wastewater recycling to reduce water consumption in power generation and support sustainable use. ● Waste Disposal: Classify, store, and remove waste in accordance with regulations, and rigorously track waste flow to prevent illegal dumping. ● Waste Reuse: Promote reuse of coal ash for land backfill and convert desulfurized gypsum into construction materials to improve resource utilization and reduce the environmental burden.
Action Plans	● Net GHG emission intensity from thermal power units ● Air pollutant emission intensity
Actual Performance in 2024	● Net GHG emission intensity from thermal power units decreased by 11.7% compared to 2016. ● Air pollutant emission intensity decreased by 71.9% compared to 2016.
Targets for 2030	● Reduce net GHG emission intensity from thermal power units by 20% compared to 2016. ● Reduce air pollutant emission intensity by 75% compared to 2016.

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Greenhouse Gas Emissions

Taipower is committed to developing high-efficiency power generation technologies in response to the global low-carbon energy transition. In recent years, the Company has actively pursued energy transformation by expanding the use of low-carbon power to reduce the carbon intensity of electricity generation. It has also promoted the use of cleaner energy sources to reduce greenhouse gas (GHG) emissions and provide cleaner electricity for both industries and households in Taiwan. For thermal power generation, Taipower focuses on two key strategies:



In 2024, the trend of using "gas as primary, coal as supplementary" continued, with the share of gas-fired generation exceeding that of coal-fired.

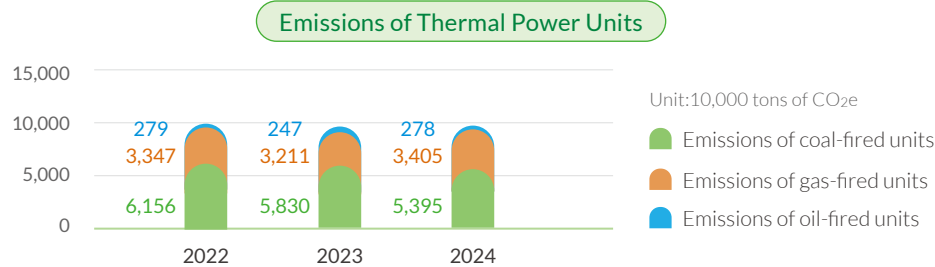


Older gas-fired combined-cycle units are gradually being replaced with newer, higher-efficiency combined-cycle gas turbines.

Taipower's GHG emissions originate from thermal power generation, coal storage yards, fuel-consuming equipment, insulating gases in electrical switches, and refrigerants in air conditioning systems. In compliance with the Climate Change Response Act and its relevant regulations, Taipower conducts annual GHG inventories that adhere to the "GHG Inventory and Calculation Guidelines." Each year, responsible units perform internal inventories and verifications, while third-party certification bodies are commissioned to conduct external verification. In 2024, Taipower disclosed that its total Scope 1 GHG emissions amounted to 91.45 million metric tons, with 90.78 million metric tons attributed specifically to emissions from coal, oil, and gas-fired thermal power units.

Greenhouse Gas Emissions							
Unit: 10,000 tons of CO ₂ e							
Year	CO ₂	CH ₄	N ₂ O	SF ₆	HFC	PFCs	NF ₃
2022	9,775	25	31	12	3	0	0
2023	9,286	27	26	8	1	0	0
2024	9,085	25	25	7	3	0	0

Note: As Taipower is the primary electricity provider in Taiwan, the Company's total emissions inventory includes only direct (Scope 1) emissions. Indirect emissions from purchased electricity (Scope 2) are excluded to avoid double-counting.



Strengthening Air Pollution Emission Reduction

Taipower employs a three-stage approach to reduce air pollution from thermal power plants: short-term load reduction, mid-term environmental upgrades, and long-term gas-fired unit development so that it can balance power supply stability with environmental protection.

1

Air Pollution Control Measures

During periods of poor air quality, Taipower implements environmental dispatching and load reduction to decrease emissions of PM, SO_x, and NO_x. Low-ash and low-sulfur fuels are prioritized, with a gradual shift toward cleaner energy sources. Continuous Emissions Monitoring Systems (CEMS) are installed at each plant to ensure compliance with emission standards.

3

The Gas Expansion and Coal Reduction Policy

Taipower is advancing the construction of new gas-fired units to accelerate energy transition efforts.

2

Air Pollution Improvement Plans

Of nine scheduled improvement projects, seven have been completed. Ongoing upgrades at the Taichung Power Plant include equipment modernization and indoor coal storage construction. Taipower aims to reduce coal use by 3 million metric tons starting in 2032 and fully phase out coal by the end of 2034.



The Actual and Regulatory Values of Major Air Pollutants

Year	PM		SO _x		NO _x	
	Actual Value	Regulatory Value	Actual Value	Regulatory Value	Actual Value	Regulatory Value
2022	5	60	84	277	169	359
2023	5	58	77	263	160	331
2024	6	53	66	212	144	269

Note: The Regulatory values are calculated by estimating the total air pollution emissions for each thermal power unit based on the emission standards, and then dividing the result by the gross electric power generation of all thermal power plants in the current year.

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Management of Stationary Emissions

● Short-Term Response – Load reductions for coal and oil-fired units during periods of poor air quality, with gas-fired units prioritized in dispatch

To demonstrate its commitment to environmental protection, Taipower has implemented voluntary environmental load reductions at coal and oil-fired thermal power plants since November 2017, on the condition that power system stability can be maintained. These measures include both proactive and friendly reductions. In 2024 alone, load reductions were carried out 1,727 times. By the end of December 2024, the cumulative number of load reductions had reached 10,653, with a total generation reduction of 99,059.91 GWh.

Principles for Load Reductions in Response to Air Pollution Levels

Reduction Action	Criteria for Taking Action	Action Planning
Voluntary Load Reductions	The Ministry of Environment's Air Quality Monitoring Network releases AQI forecasts daily at 4:30 p.m. If any area is forecast to reach a red level or higher (AQI > 150).	Provided that power supply is secure, coal-fired power plants located in or upwind of the affected air quality area will reduce their loads in advance during off-peak nighttime hours (e.g., 12:00 a.m.–7:00 a.m.).
Autonomous Load Reductions	When real-time data from the Environmental Protection Administration's Air Quality Monitoring Network shows that one-third or more of the monitoring stations within an air quality region have reached a red-level (Level 1) warning or above.	If the power supply is sufficient, coal or oil-fired power plants within the affected air quality area are scheduled for load reductions.
Mandatory Load Reductions	Air quality reaches severe deterioration levels (AQI > 200, 300, or 400).	Each power plant must comply with the Emergency Control Regulations for the Severe Deterioration of Air Quality, under which actual emission reductions must reach 10%, 20%, or 40% of the plant's daily permitted emission levels.

Load Reductions in 2024

Load Reduction Action	Frequency of Load Reductions (Times)	Reduced Load Amounts (10 MWh)		
		Annual Overhauls (Maintenance)	Non-Annual Overhauls (Maintenance)	Total
Voluntary Load Reductions	1,687	702,403	951,841	1,654,244
Autonomous Load Reductions	40	8,781	15,891	24,672
Mandatory Load Reductions	0	0	0	0
Total	1,727	711,184	967,732	1,678,916

Management of Mobile Emission Sources

According to analysis by the Ministry of Environment, large diesel trucks account for the highest share of emissions among mobile pollution sources. In response, Taipower has inventoried its phase-one and phase-two compliant large diesel vehicles and is cooperating with the Ministry to phase out outdated vehicles. Each decommissioned older vehicle is estimated to reduce PM2.5 emissions by approximately 67 kilograms per year. For large diesel vehicles that meet phase-three standards, Taipower has installed diesel particulate filters, which are expected to reduce PM2.5 emissions by about 10 kilograms annually per vehicle.

● Mid-Term Approach – Inventory, upgrade, and install high-efficiency air pollution control equipment

Taipower continues to carry out the comprehensive inventorying and upgrading of existing air pollution control equipment, while planning the installation of high-efficiency systems. Operational measures are also implemented to maximize pollutant removal efficiency.

Advanced and more efficient pollution control devices are installed in new power plants or integrated into upgrades at existing plants. To ensure emission transparency, continuous emission monitoring systems (CEMS) are installed on chimneys to facilitate real-time oversight.

Between 2017 and 2025, Taipower allocated a total of NT\$69.229 billion to upgrade air pollution control equipment. Upon completion of these initiatives, the improvements are expected to reduce annual emissions of particulate matter (PM) by 398 metric tons, sulfur oxides (SOx) by 7,118 metric tons, and nitrogen oxides (NOx) by 15,460 metric tons.

The installed systems include electrostatic precipitators (EPs) with 99.8% dust removal efficiency, NOx removal efficiencies of over 80%, and SOx removal efficiencies exceeding 95%.

● Long-Term Approach – A Power Source Shift from "Primarily Coal with Gas as Support" to "Primarily Gas with Coal as Support"

In line with national energy policy, Taipower is gradually shifting its thermal power generation from "primarily coal with gas as support" to "primarily gas with coal as support" in addition to increasing the share of renewable energy. According to the power development plan, all new thermal units will be gas-fired, aside from the ultra-supercritical coal-fired units at Linkou and Dalin. The new gas-fired thermal units are located at the Hsieh-ho, Tunghsiao, Datan, Taichung, and Hsinta plants. This approach ensures both improved air quality and a stable power supply.

Once the new gas-fired units at Taichung and Hsinta begin commercial operation, some of the existing coal-fired units will be decommissioned or converted to standby mode, contributing positively to air quality improvement.

Management of Fugitive Emission Sources

Taipower's fugitive emission sources include coal yards and construction sites. In addition to complying with the Management Regulations for Construction Project Air Pollution Control Facilities issued by the Ministry of Environment, Taipower has established guidelines for both Promoting Environmentally Friendly Measures at Green Construction Sites and for Penalties Imposed on Contractors for Violations of Environmental Protection Clauses in Contracts. These guidelines are incorporated into contracts based on project-specific conditions and are used to require contractors to carry out environmental measures accordingly, thereby reducing fugitive emissions during construction.

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3.2.2 Improving Water Resource Use Efficiency

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Water Resources Management

Taipower monitors the Ministry of Environment's wastewater discharge standards and regulatory updates in accordance with ISO 14001. For example, 24 new control items were added at the end of 2017. From 2021, ammonia nitrogen was gradually regulated, and limits on mercury, arsenic, and selenium in coal-fired flue gas desulfurization wastewater were tightened. From 2026 to 2031, water pollution fees will increase annually. In 2019, regulations were amended to require periodic testing and reporting, with penalties for violations. In response to regulatory changes, power plants increase testing frequency and reduce pollution in the short term, while optimizing wastewater treatment and equipment resilience in the long term.

During droughts, contingency measures include stopping irrigation, reducing domestic and miscellaneous water use, maintaining high storage tank levels, and reallocating agricultural water. Nuclear power plants have improved wastewater reuse efficiency, achieving a radioactive wastewater recovery rate over 99%, and strengthened chemical control and recycling.



Power Plant	Water Consumption for Power Generation at Thermal Power Plants in 2024 (Unit: m3)		
	Volume of Tap Water	Volume of Well, River, or Desalinated Water	Total
Hsieh-ho	273,519	6,790	280,309
Linkou	539,516	0	539,516
Datan	503,576.6	0	503,576.6
Tunghsiao	706,079	0	706,079
Taichung	5,283,908	0	5,283,908
Hsinta	1,163,606.2	0	1,163,606.2
Dalin	126,141	381,126	507,267
Nanbu	115,800	0	115,800
Jinshan	0	49,395.4	49,395.4
Tashan	0	26,012	26,012
Total	8,712,145.84	463,323.4	9,175,469.24

Taipower Water Consumption Statistics

Power Type		Unit	2022	2023	2024
Total Water Consumed	Thermal Power	m ³	9,503,885	8,488,819	9,175,469
	Nuclear Power	10,000 tons	63.7	25.43	18.03
Total Water Discharged	Thermal Power	m ³	3,239,482	2,699,166	2,878,480
	Nuclear Power	10,000 tons	7.11	3.49	3.37
Total Water Withdrawal	Thermal Power	m ³	12,743,367	11,187,985	12,053,949
	Nuclear Power	10,000 tons	70.81	28.92	21.40
Water Intensity	Thermal Power	ton /GWh	58.82	52.17	60.86
	Nuclear Power	ton /GWh	27.80	14.83	15.37

Note:Total water withdrawal = total water consumed (i.e., water used) + total wastewater discharge.

Wastewater Recycling and Reuse

Taipower promotes rainwater harvesting and wastewater reuse at thermal power plants to reduce water consumption. Reclaimed water is primarily used for landscape irrigation, dust suppression on roads and coal piles, boiler sealing and bottom ash handling, and other processes. Each plant monitors water usage monthly and quarterly in accordance with the "Water Management Procedures for Thermal Power Plants" under the Fossil-Fuel Power Department and uses water balance diagrams to control and track resource efficiency.

Recycled and Reused Water at Thermal Power Plants

Unit: tons

	2022	2023	2024
Rainwater Reuse	61,292.7	50,513	86,802
Wastewater, Process Water, and Boiler Blowdowns	2,385,843	2,037,828	2,100,816

Note:Wastewater from flue gas desulfurization (FGD) is not reused due to high salinity, which may cause equipment corrosion and soil salinization. It is therefore excluded from the reuse statistics.

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3.2.3 Waste Management

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Taipower implements mitigation and improvement measures to minimize the impact of major waste generated across all stages of its value chain, including power generation, transmission, distribution, and sales. The following outlines the measures taken for each type of power generation.

Mitigation and Improvement Measures for Major Waste by Power Generation Type

Generation Type	Main Waste	Environmental Impact	Materiality Narrative	Mitigation and Improvement Measures
 Thermal Power	Coal ash (fly ash, bottom ash)	Improper storage may result in environmental pollution	Thermal power accounts for approximately 78.5% of Taipower's total electricity generation. Waste and by-products from generation are properly managed or reused	Coal ash is managed in accordance with the Waste Disposal Act and handled by licensed contractors for reuse as concrete admixtures or backfill materials
 Nuclear Power	Low-level waste (resin, waste liquid, residues, protective clothing, components); high-level waste (spent nuclear fuel)	All nuclear waste is managed under the Ionizing Radiation Protection Act. To date, no environmental impact has been reported	Taipower strictly manages radioactive waste storage to ensure no harm to the environment or nearby communities	Waste is stored in temperature- and humidity-controlled facilities to ensure isolation. Reduction targets are set annually to lower low-level waste volumes
 Renewable Energy	Decommissioned equipment	No waste is generated during operations; equipment has a long lifecycle, and environmental impact is minimal	Hydropower, wind, and solar generation rely on natural resources and have long service lives. Some wind turbines are now reaching decommissioning	Taipower works with the Ministry of Environment to treat retired blades as cement kiln fuel, and explores other reuse options such as construction or plastic additive materials. Licensed contractors will handle waste removal and recycling to minimize impact

Taipower manages coal ash accumulation by controlling ash levels and evaluating the load of fly ash, taking into account factors such as wind force, seismic activity, soil pressure, silo wall stress, and temperature variations. The Company analyzes structural safety by assessing bearing capacity, deflection, displacement, subsidence, and angular variation to ensure silo integrity and minimize potential risks. The accumulation level of coal ash is classified based on its potential hazard. Details for each coal-fired power plant are provided below:

Diameter, Height, and Actual Controlled Ash Levels of Fly Ash Silos at Various Coal-fired Power Plants

Power Plant	Linkou	Taichung	Dalin	Hsinta
Number of Silos	2	10	2	4
Diameter (m)	16.5	15~16	16	17
Height (m)	28	16~18	26.6	24
Control Ash Level (m)	22	14	10	20

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Industrial Waste Management Mechanisms

Taipower classifies, stores, transports, and reports on industrial waste in accordance with the Waste Disposal Act. Waste is tracked using a triplicate manifest system to prevent illegal disposal. For radioactive waste, short, medium, and long-term treatment and disposal plans are developed based on waste type. Taipower also monitors the "idle material rate"and "idle waste processing rate"annually to ensure management effectiveness.

Nuclear Energy-Related Waste Disposal Methods

	Short-Term	Medium-Term	Long-Term
Storage and Disposal Processes for Low-Level Radioactive Waste	Before 1996:Temporarily stored at the Lanyu Low-Level Radioactive Waste Storage Site. Since 1996: Temporarily stored at low-level waste storage facilities at nuclear power plants.	A centralized temporary storage facility is being planned, and waste will be transported to this facility for storage.	Waste will be transported from short-term or medium-term temporary storage facilities to a final disposal site.
Storage and Disposal Processes for Used Nuclear Fuel	In keeping with international norms, used nuclear fuel is stored in a dry storage facility after temporary storage in a used nuclear fuel pool.		

Utilization of Industrial Waste

Reuse of Coal Ash and Desulfurized Gypsum in 2024

Waste	Coal Ash	Desulfurized Gypsum
Reuse Practice	Used in trench backfilling projects and sold as construction materials to increase reuse and reduce environmental impact.	Reused by the cement and fire-retardant board industries.
2024 Production	1,805 thousand tons	261 thousand tons
2024 Reuse Volume	1,754 thousand tons	261 thousand tons
2024 Reuse Ratio	97.2 %	100 %

Sale of Industrial Waste

Taipower disposes of waste cables and metal waste generated during operations through public bidding. In accordance with the relevant regulations, the Company commissions qualified vendors to handle removal and disposal, and all waste leaving the premises is tracked and reported online using the triplicate form system to ensure legal and compliant disposal. Pursuant to the Regulations Governing Determination of Reasonable Due Care Obligations of Enterprises Commissioning Waste Clearance, Taipower and the commissioned removal contractors bear joint responsibility for preventing illegal dumping. To further reduce the generation of industrial waste and minimize environmental impact, Taipower continues to promote online auctions of scrapped materials, thereby fulfilling its corporate environmental responsibilities.

Sales Volumes and Amounts for Taipower's Industrial Waste

Item	2022	2023	2024
Coal Ash Output (10,000 tons)	217.8	208.9	180.5
Volume of Scrap Cable and Other Metal (1,000 tons)	10.097	8.621	8.545
Value of Scrap Cable and Other Metal (NT\$100 million)	16.427	15.03	16.47