6 Agent of Environmental Friendliness

Development Vision

Business operations inevitably have an impact on the environment. As an energy enterprise, Taipower must face the challenge of maximizing its benefits while minimizing its negative impacts. As the economy develops, Taipower must continue to pursue cleaner energy and a low-carbon transformation. The Company will continue to work with society and enterprises to seek more energy-efficient and eco-efficiency solutions as it pursues carbon value and environmental sustainability. In doing so, Taipower hopes to increase its environmental sustainability at a pace that is in step with economic development.

Taipower has responded to issues of air quality and climate change by adjusting its energy structure, increasing the energy use ratio of gas and renewables, and improving pollution prevention equipment, while increasing the efficiency of various energy resources. To achieve the goals outlined in its Environmental White Paper for 2025, Taipower will continuously the environmental impacts of various power facilities and work earnestly to live up to its commitment to environmental friendliness.

Performance Highlights

- In 2021, the capital expenditure on environmental protection was approximately **NT$4.217 billion**. Recurring expenses associated with environmental protection were about **NT$3.688 billion**.
- In 2021, the reuse rate for coal ash production and desulfurized gypsum were **86.2%** and **98.6%** respectively.
- In 2021, Taiwan's power plant loads were voluntarily and autonomously reduced **1,200 times**.
- In 2021, the **energy management systems** of the Linkou and Talin Plants were certified by external verification.
- System demonstration sites for climate risk assessment were completed for generation, transmission and distribution units.
- One **power facility ecological integration project** was completed in accordance with 2021's Environmental White Paper.
- Approximately **1.2 million** fish fry were released into the sea near power plants and offshore wind facilities in 2021.

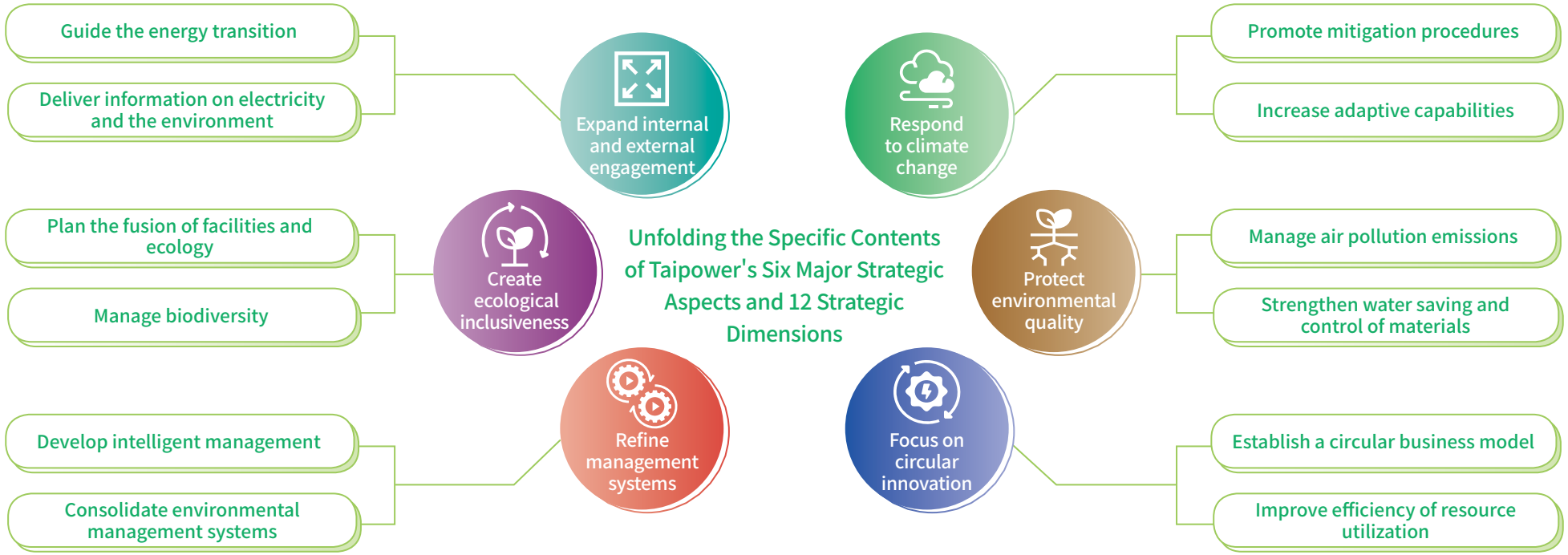
6.1 Strengthening Environmental Management

6.1.1 Environmental Policy and Goals 307

As the electric power industry pursues operations, it must consider energy quality, safety, and environmental sustainability. Taipower's corporate mission is to ensure a stable supply of electricity for the diversified development of society in a cost-effective and environmentally-friendly manner. The Company also aspires to transform itself into a prestigious, trustworthy world-class power utility group. As such, the Company is actively responds to the major environmental issues and development trends faced by the energy industry.

In alignment with the United Nations Sustainable Development Goals (SDGs) and the international vision for achieving a carbon-neutrality by 2050, Taipower has formulated a White Paper with a forward-looking mindset. The White Paper fully elaborates on Taipower's strategic objectives and outlook and seeks to maintain a consensus on sustainability and a commitment to environmental policy. It also presents a blueprint for environmental sustainability until 2030.

Through six major strategic aspects and 12 corresponding strategic development dimensions, Taipower's Environmental White Paper presents a basis for the follow-up promotion of sustainable environmental management. Through development goals and action plans, Taipower integrates its business divisions to achieve the benefits of "one integration" (internal and external), "two reductions" (carbon and emission reductions), and "three transformations" (intellectualization, ecological, and circularization). Through this multi-pronged approach, Taipower will create environmentally friendly power facilities, a comprehensive model of green environmental protection, and a sustainable and inclusive power generation, transmission, distribution, and sales enterprise system.



Environmental Sustainability Strategy Refinement

Taipower conducts a range of activities that are both environmentally friendly and neighborly. These include beach cleaning, fish fry releases, green space adoptions, and artificial reef developments. Additionally, in implementing its environmental policies, Taipower conducts environmental education, carefully evaluates environmental factors before power plant expansions and unit additions, and undertakes in-depth communication with local stakeholders to ensure legality and compliance. Through these measures, the Company achieves win-win situations for society, the environment, and Taipower.

Taipower Environmental Policy - Short, Medium, and Long-Term Goals

Strategy	Key strategic dimension	2021 goal (Short-term goal)	Achievements in 2021	2022 goal	Medium-term goal (by 2025)	Long-term goal (by 2030)
Respond to climate change	Promote mitigation procedures	Net emission intensity of thermal power units (greenhouse gas) will be reduced by 7% as compared to 2016 levels	Net emission intensity of thermal power units has been reduced by 6.3% as compared to 2016 levels[1]	Net emission intensity of thermal power units will be reduced by 7% as compared to 2016 levels	Net emission intensity of thermal power units (greenhouse gas) will be reduced by 25% as compared to 2016 levels	Net emission intensity of thermal power units (greenhouse gas) will be reduced by 20% as compared to 2016 levels
Protect environmental quality	Manage air pollution emissions	Air pollution emission intensity will be reduced by 30% compared to 2016	Air pollution emission intensity has been reduced by 65% compared to 2016 levels	Air pollution emission intensity will be reduced by 55% compared to 2016 levels	Air pollution emission intensity will be reduced by 60% compared to 2016 levels	Air pollution emission intensity will be reduced by 70% compared to 2016 levels
Focus on circular innovation	Establish a circular business model	Inventory of potential circular materials and pilots of viable business models	Completed the Coal Ash Marine Engineering Application Manual and held a briefing session to encourage Taipower's on-site and industrial engineering units to promote the use of coal ash in marine engineering[2]	Complete the pilot of a circular business model	Implement a circular resource supply model	Complete the establishment of a circular economy system
Refine management systems	Develop intelligent management	Intelligent management and service coverage will reach 52% (Including the cumulative deployment of smart meters in 1.5 million households, representing 69% of total national power consumption)	Intelligent management and service coverage reached 52% (Including the cumulative deployment of smart meters in 1.5 million households, representing 72% of total national power consumption)	Intelligent management and service coverage will reach 55% (Including the cumulative deployment of smart meters in two million households, representing 75% of total national power consumption)	Intelligent management and service coverage will reach 65% (Including the cumulative deployment of smart meters in three million households, representing 81% of total national power consumption)	Intelligent management and service coverage will reach 82% (Including the cumulative deployment of smart meters in six million households, representing 81% of total national power consumption)
Create ecological inclusiveness	Plan the fusion of ecology and facilities	Establish at least 1 ecologically inclusive plan for power facilities	Established 1 ecologically inclusive plan for power facilities	Complete the mid-term report for the second ecologically inclusive plan for power facilities	Establish at least three ecologically inclusive plans for power facilities	Establish at least five ecologically inclusive plans for power facilities
Expand internal and external engagement	Deliver information on electricity and the environment	Annual communication of environmental protection information will reach 560,000 people	Annual communication of environmental protection information reached 1.6 million people	Annual communication of environmental protection information will reach 560,000 people	Annual communication of environmental protection information will reach 700,000 people	Annual communication of environmental protection information will reach 750,000 people

Note: 1. According to economic growth and excessively high temperature, demand of electricity increases significantly, causing net emission intensity of Taipower's thermal power generator increases.

2. The Coal Ash Marine Engineering Application Manual expand the applications of coal ash in maritime engineering and is a pilot version of the circular business model.

Implementing Environmental Impact Assessments

To ensure a stable power supply, Taipower continues to develop and renovate various electrical facilities throughout Taiwan to ensure that the hardware is well appointed and sound. The development of power facilities is highly related to local environments and communities. Improper management may result in water, air and soil pollution, noise or vibrations, waste, damage to natural resources and social, cultural or economic landscapes.

Consequently, Taipower has always been cautious about the impacts of its operations on the surrounding environment and society. It has also adhered to a principle of minimizing its negative influence on the environment and sought to actively carry out effective environmental impact management. Through pre-development assessments and communication, public reviews, post-assessment improvements to plans, and a framework for continuous monitoring during construction, the impact of development activities on the environment and the surrounding community is minimized. Please refer to the QR Code for information on Taipower's achievements with development projects and environmental impact assessment implementations in 2021.

Adaptation Strategy and Climate Change Action

Taipower's power plants and transmission and supply systems are distributed throughout mountainous, coastal, and riverine basins throughout the country. As power infrastructure is spread over complex terrain, setting adaptation strategies and actions is critical. Taipower has actively conducted risk assessments for strong winds and flooding at 44 power generation (hydro and thermal power) units (excluding offshore islands) and for transmission, and distribution systems. Furthermore, the Company has voluntarily promoted and established demonstration sites showcasing adaptation strategies for power generation, transmission, and distribution systems since 2013. The demonstration sites were completed in 2021. Additionally, power equipment with a higher climate risk will be screened. Accordingly, Taipower has reinforced the protection capabilities of various hydro and thermal power plants as well as transmission and distribution systems to reduce environmental impact and strive for sustainable operation.

Taipower plans to expand the above-mentioned demonstration projects to each unit. For example, a parallel expansion plan for climate change adaptation of the generation system was launched in 2020. In the future, apart from continuing to cooperate with plans implemented by the Bureau of Energy, Taipower will launch relevant projects simultaneously and independently to enhance its capability for climate adaptation.

Environmental Accounting

To accurately evaluate Taipower's investment in environmental protection, the Company implemented an environmental accounting system (EAS) in 2008. Environmental accounting is divided into capital expenditures (depreciation and amortization of fixed assets related to environmental protection) and recurring expenses (reimbursement of environmental protection-related expenses) for the collection of environmental protection-related expenses. The system requires employees to input environmental accounting codes for specific tasks or activities such as purchase requisitions, purchasing, reimbursements, and so forth through their business or accounting systems.

All operations are managed and compiled by Taipower's EAS to compute the costs of environmental protection, occupational safety, and health for each unit. Information is also compiled in the environmental accounting management system to make reimbursements more convenient and to accurately evaluate Taipower's investments in environmental protection expenditures. This approach indicates that, in 2021, Taipower's environmental protection capital expenditure was approximately $4.217 billion and its recurring environmental protection expenses were about $3.688 billion. Taipower's EAS continues to be refined and optimized each year. In 2021, Taipower also made some major improvements to its environmental accounting process. These improvements are as follows:

Continuous Optimization of the Environmental Accounting System

In order to improve the environmental accounting mechanism and management system, Taipower analyzed the environmental accounting data from each business unit and compared it with the actual operation patterns. The Company selected various business units for interviews, and optimized the system based on those interview results to ensure the accuracy of Taipower's environmental expenditure statistics.

Conducting Environmental Accounting Advocacy Meetings

Taipower conducted six educational advocacy meetings in 2021, and distributed the new environmental accounting code promotion items. Through multiple sessions of education and training, the Company enhanced the accuracy of the information gathered from the submission of environmental accounting code by employees.

6.1.2 Developing High-efficiency Thermal Power Generation

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Along with many in the global energy industry, Taipower is committed to developing high-efficiency power generation technology. The Company has been actively engaged in the energy transition in recent years. Through the development of low-carbon power, Taipower continues to reduce its electricity carbon emission factors. The Company is also reducing greenhouse gas (GHG) by using cleaner energy and providing cleaner power for industries and individuals in Taiwan. For thermal power generation, Taipower currently focuses on three main directions:

Transformation from coal to gas	Elevated the proportion of gas and continued the pattern of primarily using gas with coal as support in 2021, making the gas ratio higher than that of coal
Coal-fired unit upgrade	Gradually replacing coal-fired units with ultra-supercritical units that have better generation efficiency
Gas-fired unit upgrades	Gradually phase out old gas-fired combined-cycle units and replace them with new-type combined-cycle gas-fired units that have better generation efficiency

The Efficiency (Gross LHV) of Taipower's Thermal Plants from 2019 to 2021 (%)

	2019	2020	2021
Efficiency (Gross LHV)	45.64	46.00	46.10

Power Consumption in Thermal Power Plants from 2019 to 2021

	2019	2020	2021
Plant power consumption (billion kWh)	5.494	5.569	5.904
Plant power consumption rate (%)	3.76 %	3.65 %	3.67 %

In-house Management of Thermal Power Plants

Taipower actively manages the power consumption in its plants. The Company sets annual consumption targets for its plants that do not exceed the average performances of the previous three years. Taipower is also gradually phasing out older units and replacing them with new ones. As it does so, it plans to introduce high-efficiency generating units and to enhance existing units through various operational and maintenance measures. Consequently, the efficiency of power generation has continued to improve in recent years, the current gross efficiency of lower heating values (LHV, gross) at thermal plants rose from 46% in 2020 to 46.1% in 2021. Taipower will continue to strengthen its international exchanges and cooperation efforts and to introduce related knowledge and technologies related to electricity and environmental protection.

Sulfur Hexafluoride (SF_6) Reduction

Sulfur hexafluoride (SF_6) is a greenhouse gas with an extremely high global warming potential. After long-term use, the gas gradually escapes into the atmosphere. Nevertheless, as it is an essential insulating material for power equipment it is widely used in Taipower's substation equipment for power generation, transmission, and distribution. In response to this issue, Taipower has continuously promoted reduction methods. Taipower units that manage substation equipment have SF_6 maintenance management procedures. Relevant units carry out SF_6 reclamation and purification work as part of procedures for overhauling substation equipment. After the equipment is overhauled, the purified SF_6 is backfilled to equipment to reduce greenhouse gas emissions. This allows recycling of SF_6 and mitigates climate change problems and achieves the goals of a circular economy and resource regeneration.

6.2 Reducing Use of Energy and Resources

6.2.1 Fuel Usage Management 302-4

In order to be environmentally friendly, Taipower has chosen to use fuels with low-ash, low-sulfur, and low-nitrogen content. The Company's policy seeks to stabilize the use of coal, and gradually shift from coal to gas. Taipower will also continue to build and upgrade gas-fired units and related facilities to minimize pollutant emissions from thermal power generation.

Taipower's Use of Fuels from 2019 to 2021

	2019	2020	2021
Gas (millions of cubic meters)	13,371	15,075	15,846
Coal (millions of tons)	27.443	26.937	28.295
Fuel oil (thousands of kiloliters)	1,103	758	961
Nuclear fuel (tens of thousands of pounds)	116.41	155.5	128.66

To reduce emissions in line with regulatory requirements, power plants need to add environmental protection equipment and facilities. Coal used must be high in calorific value, low in ash, and low in sulfur content. Since the properties of coal vary from mine to mine and country to country, power plants use blending methods to meet a power plant's requirements for coal ash, calorific value, and sulfur. Taipower has added additional quality requirements for its coal procurement. For example, the Company has decided to reduce the ash content of its Indonesian coal from 11% to 8% and sulfur from 1.1% to 0.9%. It has also decided to reduce the ash content of its Australian coal from 14-15% to 10%. Further restrictions on mercury content have been imposed, too. While Taipower exercises strict control of emissions from downstream power plants in its supply chain, the Company works even harder to deliver on its environmental commitments to upstream areas of its supply chain.

6.2.2 Enhancing the Energy Efficiency of Taipower's Operations

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Management of Productive Resources

Taipower's primary sources of greenhouse gas emissions included thermal power generation, coal storage yards, fuel-consuming equipment such as vehicles and engines, insulation gas for power switches, and refrigeration and air-conditioning equipment. Although there are no emission or disclosure regulations in Taiwan, the Company's has taken the initiative to limit greenhouse gas emissions by inviting relevant units to conduct inventories and internal verifications each year. Moreover, a third-party notary unit is invited to carry out external verification of thermal greenhouse gases and to publicly disclose the Scope 1 greenhouse gas emissions of Taipower and its thermal power units (coal, fuel, and gas). In 2021, emissions totaled 98.13 million tons of CO_2e.

In 2015, Taipower established an energy management system for its power plants. The Company has subsequently assisted six units, including the Taichung, Datan, Hsinta, NanPu, Dajia River, and Daguan plants, with successfully obtaining new verification certificates. Taipower also completed the setup of energy management systems for the NanPu, Dajia River, and Daguan plants. In 2020, the system was also installed in the Linkou and Talin plants. External validation was conducted in September and December 2021, and certificates were validated and obtained.

Taipower follows the methods and requirements for calculating greenhouse gases stipulated by the Environmental Protection Administration, and has completed its own Taipower's greenhouse gas calculation guidelines. The following emissions data were obtained from the GHG inventory and emission calculation statistics calculated by each unit of Taipower in accordance with those guidelines.

Greenhouse Gas Emissions from 2019 to 2021

	CO_2	CH_4	N_2O	SF_6	HFC	PFCs	NF_3
2019	9,082	25	31	10	2	-	-
2020	9,266	23	30	13	3	-	-
2021	9,808	26	32	8	3	0	0

Unit: 10,000 tons of CO_2e

Emissions of Thermal Power Units from 2019 to 2021

	2019	2020	2021
Emissions of coal-fired units	6,009	5,934	6,253
Emissions of oil-fired units	352	244	316
Emissions of gas-fired units	2,748	3089	3,244

Unit: 10,000 tons of CO_2e

Non-Productive Resource Management

In 2021, Taipower continued to give impetus to power-saving in conjunction with the Executive Yuan's Electricity Efficiency Management Plan for Government Agencies and Schools by setting a goal of zero growth in annual power consumption compared to the previous year. Moreover, in accordance with the Ministry of Economic Affair's Water Saving Normalization Action Plan, Taipower promoted water conservation. The General Management Office will coordinate these efforts while other branches and power plants will be driven through promotions to implement various measures that constitute a comprehensive energy-saving and carbon-reduction scheme. Taipower will also track its energy consumption (water, power, fuel, paper) on a monthly basis and conduct annual assessments to select units with excellent performance.

Taipower's Non-Productive Power Consumption from 2019 to 2021

	2019	2020	2021
Consumption (GWh)	119.6	118.1	112.9
Calculation Scope (The percentage of employees within the scope accounts for total employees of Taipower)	100 %	100 %	100 %

Taipower's Non-Productive Water Consumption from 2019 to 2021

	2019	2020	2021
Consumption (Tons)	1,302,211	1,328,077	1,236,818
Calculation Scope (The percentage of employees within the scope accounts for total employees of Taipower)	100 %	100 %	100 %

Taipower's Total Resource Recycled for Non-Productive Business Activities from 2019 to 2021

	2019	2020	2021
Consumption (Tons)	40,833.02	39,159.93	54,156.12

Note: 1. The statistical result of resources recycled from the Taipower headquarters building.

2. Recycled resource include: Paper, iron and aluminum cans, other metal products, plastic containers, glass containers, etc.

Results of Non-Productive Resource Management

2021 Measures

Water-savings

- Prioritizing the use of equipment with water efficiency labels was the first priority along with the effective use of rainwater resources (toilet flushing, watering plants) to reduce tap water consumption
- In line with the Water Saving Normalization Action Plan, Taipower actively promoted the installation of water-saving equipment and replacement of old, water-consuming equipment in offices, at construction sites, and in employee dormitories
- Promote water-saving measures at each unit such as water-saving advocacy, water management, pipeline facility leak inspection, and rainwater reclamation and reuse

Power-savings

- Prioritizing the purchase of appliances with an energy-saving labels or in the first or second class of energy efficiency
- Establish an energy management system to monitor and analyze electricity consumption data. Identify improvement items and plan solutions to improve energy efficiency
- In cooperation with the Electricity Efficiency Management Plan for Government Agencies and Schools, Taipower actively promoted the replacement of old energy-consuming equipment (air conditioners, lamps, etc.) in each unit to enhance electricity efficiency
- Indoor temperatures were kept between 26-28°C in each office and combined with circulating fans to increase comfort levels while reducing the use of air conditioning
- Energy-consuming equipment and business machines were operated in all offices in an energy-saving manner; for example, the power supply for water dispensers was turned off automatically during off-hours and on regular holidays to save standby power

Fuel-savings

- Promoted ride-sharing measures in vehicle dispatching and reinforced vehicle maintenance and inspection to reduce fuel consumption
- Drew up a budget to accelerate the replacement of old fuel-consuming vehicles and made good use of electric vehicles
- Saved 6,025 liters of fuel in 2021 compared to 2020

Paper-savings

- Continued to implement paper-reduction measures such as the electronic exchange of official documents and online approvals, with the performance reaching 70% and 85%, respectively
- Advocated for employee use of double-sided printing to save 2.48 million sheets of paper

6.3 Minimizing Environmental Impacts

6.3.1 Moving Towards Net Zero Emissions

An overview of the sectoral targets set in various countries that are moving towards net-zero emissions reveals that the energy and power sector is critical. The use of electricity accounts for about 56% of the Taiwan's greenhouse gas (GHG) emission and hence is a key item for carbon reduction.

As a state-owned power enterprise, Taipower is responsible for providing national power and promoting energy transition. Within a framework of "low-carbon first, zero-carbon next," Taipower is gradually moving from the three aspects of "supply side," "grid side," and "demand-side" towards net-zero emissions. By reducing coal combustion, increasing green energy and gas to achieve low-carbon, further maximize renewables, and developing carbon-free thermal generation technology, Taipower's goal is to complete the energy transition by 2030 and accomplish net-zero electricity emissions by 2050.

(I) Supply Side

To gradually achieve net-zero emissions in power generation, emerging carbon-free thermal power technologies are currently being developed internationally. Hydrogen and ammonia are being used to replace fossil fuels as a generation source. Carbon sequestration technology is being introduced to collect, store and reuse carbon dioxide emissions from the power generation process. Taipower is also planning to demonstrate and introduce co-firing hydrogen (gas-fired units) and ammonia (coal-fired units) and carbon capture, utilization, and storage (CCUS). Taipower will continue to work with leading international technology manufacturers to keep pace with the international community, deploy applications and introduce forward-looking technologies in advance. Taipower's short and mid-term strategy mainly responds to and implements the government's goals of promoting green energy, increasing the use of natural gas, reducing coal use, and eliminating the use of nuclear power. The long-term strategy is to develop revolutionary carbon-free thermal power technology, which is explained item by item as follows:

Promoting Green Energy

To achieve the goal of promoting green energy, Taipower aggressively promotes renewable energy and sets up offshore and land-based wind power, solar photovoltaic, geothermal, and small and micro hydropower facilities. In addition to its own development projects, Taipower continues to strengthen its construction of the grid to create a friendly grid-connection environment to encourage the private sector to join in the development of renewables, Taipower is cooperating with the private sector to push forward renewables, and contribute to the country's low-carbon energy structure.

Increasing Natural Gas

Taipower is striving to transform its power generation structure from the "primarily coal with gas as support" model of the past to a "primarily gas with coal as support" model. The Company is actively renewing and expanding power plant units by adding new gas-fired units that have lower carbon emissions and are cleaner than coal-fired units, and pursuing the construction of additional high-efficiency gas-fired combined-cycle units, so that the generation system can progress towards low carbon.

To ensure a stable supply of natural gas, Taipower has pursued the construction of a third gas receiving terminal with CPC. It is hoped this will aid in the unloading and storage of natural gas, stabilize the regional power supply capability, reduce air pollution, and improve energy supply security and overall power supply economy.

Reducing Coal Use

Considering the impact of coal-fired generation on air pollution and GHG emissions, Taipower plans to conduct a feasibility assessment on the renewal and retirement of environmental protection equipment in existing coal-fired power plants under the premise of ensuring a stable power supply. At the same time, eco-friendly coal is being adopted to effectively control the air pollution and carbon emissions of the generation process, so that coal-fired units can continue to serve as vital backups.

Eliminating the Use of Nuclear Power

According to the "long-term power development plan diagram," Taipower is pushing forward the decommissioning work at nuclear power plants. At present, reactors 1 and 2 of the Nuclear Power Plant 1 (NPP1) have officially entered the decommissioning stage and their operating licenses expired in 2018 and 2019, respectively. Taipower expects to complete decommissioning work on NPP1, NPP2, and NPP3 in 2025, thus achieving Taiwan's sustainable development goal of (T-SDG 18) as a non-nuclear homeland.

(II) Grid Side

In addition to developing grid connections through existing systems for extensive future renewables, Taipower has initiated Phase 1 of its Offshore Wind Power Grid Strengthening Project. The project will undertake grid reinforcement to accommodate potential offshore wind power projects. Additionally, solar power and an inventory of potential land sites are reviewed on a continuous basis by the Bureau of Energy, Ministry of Economic Affairs. These grid reinforcement projects utilize a case activation and adjustment approach.

Given the gradual and proportional increase in renewable generation, Taipower is actively promoting smart grids as a critical component of a stable power supply. The overall schedule is divided into three stages. The first stage consists of the ongoing deployment of infrastructure. The second stage entails practical operation, where promotion and expansion are the primary tasks. The last stage is to effectively integrate and achieve wide application. According to the national net zero-emission goal of 2050, the proportion of renewable energy will reach 60-70% in 2050. In response to the corresponding increase in green power equipment, Taipower's very long-term (post 2030) plan will evaluate and introduce long-term energy storage and build new pumped-storage variable frequency hydro units to maintain a stable power supply. The Company will introduce hydrogen production technology for hydrogen energy storage, produce green hydrogen from surplus renewable power, provide raw materials required by domestic industrial and transportation sectors, while maintaining the stability of the system.

In terms of energy storage, Taipower plans to achieve stability in the energy storage battery system by 2025 with a target capacity of 1,000MW (160MW self-built, 840MW procured). This will help the system to mitigate the effects of the intermittent characteristics of renewables. In the event of an outage, this will allow the system to withstand the tripping of a large unit without triggering a low-frequency relay action that trips off the user load. As of October 2021, Taipower has completed two energy storage batteries of 3.8MW (Kinmen) and 1.37MW (the Shulin Site of the Taiwan Power Research Institute). The Bureau of Energy, Ministry of Economic Affairs has also commissioned the Industrial Technology Research Institute to carry out a technology demonstration and validation plan for forward-looking regional energy storage equipment, and to complete the establishment of energy storage batteries with a total capacity of about 6MW at Taipower sites in Yongan, Longjing, Zhangbin, and other locations.

(III) Demand Side

Demand-side management typically entails demand response and energy conservation. Demand response can, in turn, be divided into two categories depending on the economic incentives: price-based or incentive-based. Price-based responses, such as seasonal electricity prices and time-of-use rates or providing time-zone differentiated rates, allow users to decide to reduce power consumption in specific periods according to price signals. In contrast, incentive-based responses, such as planned, temporary and demand-based bidding measures, provide tariff deduction incentives and agreed load shifting during periods of tight power supply or high cost. Taipower has actively implemented demand response through five mechanisms. These include holding large user forums and power-saving activities, screening target users, producing publicity materials, strengthening cooperation with government units, and cooperating with industrial and commercial conferences for publicity.

In the domain of energy conservation, Taipower has pursued energy-saving advocacy and promoted various activities in line with the government's policy. Measures include:

- Planning new power-saving measures: asking users to save electricity during specific hours through the Home Energy Saving Program with smart meters
- Advocating through multiple channels: continuously expanding the organization of various power conservation advocacy meetings, media exposures, and creative power conservation competitions, etc.
- Promoting energy-saving consumption diagnosis: providing users with power-saving recommendations
- Providing smart digital services: e-billing and the Taiwan Power APP
- Coordinating with government policies: the County-City Collaborative Electricity Saving Initiative for Residential and Commercial Users discloses information about residential, commercial, and industrial electricity consumption in each county and city on the website, and continues to optimize the data

6.3.2 Promoting Circular Economies

In responding to energy transition and the government's 5+2 Innovative Industries Plan, Taipower has pledged to create efficient and sustainable energy resource utilization with a circular mindset, to establish circular economies, and to carry out two the dimensions of developing a circular economic business model and improving resource efficiency. The Company hopes to transform from its traditional linear economic mindset into a circular economic model that gives increased consideration to sustainable development.

In view of this, Taipower celebrated May of 2021 as Environment Month. The Company used the event to publicly disclose its strategic blueprint for a circular economy. For the first time, the Company held an internal Citizen Cafe with the theme of circular economies. The event gathered the heads of various units to discuss and exchange ideas. At the meeting, more than 20 action plans were produced, and a circular economy strategic framework was established to push forward Taipower's dedicated circular economy plan. Taipower subsequently took the following specific measures to improve resource efficiency and reduce its environmental impact in 2021:

R&D and Promotion of Coal Ash Reuse and Recycling

Taipower's coal ash output in 2021 reached approximately 2.34 million tons. In response to the government's promotion of resource recycling and reuse, the Company actively invested in R&D and promoted coal ash reuse technology over the years. It has also reinforced coal ash production management. Moreover, since coal ash from coal-fired thermal power plants can be used to partially replace cement as a concrete cementing material. As a result, most of the Company's coal ash is sold for external reuse as a building material. It has become an excellent example of waste resource recycling.

In addition to improving the reuse rate and adding-value, the diversified reuse of coal ash is expected to be in line with the government's concept of reduction from source, recycling, and reuse.

Compilation and Promotion of the Coal Ash Marine Engineering Application Manual

To enhance the reuse rate of coal ash, Taipower has worked to promote the reuse of coal ash in industrial building materials and land reclamation. It has also fostered the use of coal ash as a controlled low-strength backfill material (CLSM) in pipe trench projects. Moreover, Taipower has compiled a Coal Ash Marine Engineering Application Manual as a reference that facilitates other applications of coal ash in various marine engineering projects.

The manual was reviewed and approved by the Industrial Development Bureau, Ministry of Economic Affairs in July 2021 and registered with the Public Construction Commission of the Executive Yuan. Subsequently, a briefing on the Coal Ash Marine Engineering Application Manual was held in October 2021 to explain the relevant coal ash applications in marine engineering and Taipower's actual field experience. Through exchanges and discussions with participating experts and scholars, Taipower gained valuable insights that will serve as reference in the Company's future application of various marine engineering products.

6.3.3 Response Measures to Air Pollution 103-2 103-3

Taipower has formulated air pollution management strategies for thermal power plants. These include load reductions during periods of poor air quality and sufficient power supply. The Company has also conducted a comprehensive inventory of existing control equipment, planned to set up high-efficiency air pollution control equipment, and continuously improved its air pollution improvement measures at thermal power plants over three stages: short, medium, and long-term. These measures ensure a balance is achieved between power supply and environmental protection.

In recent years, the issue of haze hazard has been of great concern to the public. As such, Taipower has continued to manage air pollution actively through various plans and management methods. Taipower coordinated its implementation of environmental protection dispatching during periods of poor air quality to voluntarily reduce loads. For sulfur oxides (SO_X), nitrogen oxides (NO_X), and particulate pollutants (PM), the best available control technologies have been applied.

To specifically control the air pollutant emissions generated by the operation of each power plant, Taipower chooses to use low-ash and low-sulfur fuels and is switching to clean energy in its fuel selection. In addition, continuous flue gas emission monitoring instruments have been installed in the smoke fontanels of various thermal power plants to accurately assess the concentration of pollutants in the flue gas, enabling equipment efficiency to be maintained in the best state, and minimizing the emission of pollutants in flue gas. Consequently, Taipower's flue gas pollutants are far lower than regulatory standard values.

The Actual and Regulatory Values of Major Air Pollutants from 2019 to 2021

	PM (kg/GWh)		SO_X (kg/GWh)		NO_X (kg/GWh)	
	Actual value	Regulatory value	Actual value	Regulatory value	Actual value	Regulatory value
2019	14	61	125	346	234*	283
2020	8*	60	102	303	203*	264
2021	6	60	98	309	188	254

*Note: Zhushan Power Plant is newly included in the category of air pollution statistics, so some historical data have been updated. This has created a discrepancy with data presented in last year's report.

Management of Stationary Emissions

Short-term Responses Coal-fired unit loads are reduced during periods of poor air quality and the dispatching of gas-fired units is prioritized

One example of Taipower's environmental commitment can be found in its reduction of coal use. When system supply is secure, coal-fired thermal power plants have undertaken environmental load reductions since 2015. Reductions include both voluntary and autonomous actions. In 2021, load reductions occurred 1,200 times, and the cumulative frequency of load reductions reached 4,382 times by the end of December 2021, with a total load reduction of 40,599.04 GWh.

Principles of Load Reduction in Response to Air Pollution Grading

Load Reduction Action	Criteria	Action Plan
Voluntary Load Reduction	Where next day air quality indicator pollutants are predicted by the EPA's air quality forecast to reach targeted "particulate matter ($PM_{2.5}$)" or "ozone hour value (O_3)," and the air quality indicator reaches the orange level (AQI> 100) or above	After evaluating power supply sufficiency, the thermal power plants in the upwind area will undertake load shedding according to the measures recommended by the EPA.
Autonomous Load Reduction	Following EPA notifications, where more than one-third of the stations in the air quality area on that day have detected air quality index pollutants of "particulate matter ($PM_{2.5}$)" or "ozone hour value (O_3)," and the air quality indicator reaches the orange level (AQI> 100) or above	After evaluating power supply sufficiency, the thermal power plants in the upwind area will undertake load shedding according to the order recommended by the EPA.
Mandatory Load Reduction	Following the issuance of air quality warnings or severe deterioration warnings by local authorities	When the national generating capacity available reaches 2.8 GWh and the reserve capacity ratio is more than 10%, the designated power plant must implement a certain percentage of production cuts or load reductions and issue emergency control measures following alerts of air quality deterioration.

Load Reductions due in 2021

All power plants in Taiwan	Frequency of load reductions (times)	Amount of load reductions (10 MWh)		
		Annual overhauls (maintenance)	Non-annual overhauls (maintenance)	Total
Voluntary load reduction	1,114	679,315	646,334.8	1,325,649.8
Autonomous load reduction	86	20,221.1	21,283	41,504.1
Total	1,200	699,536.1	667,617.8	1,367,153.9

Air Pollution Control and Improvement Plan

Air pollutant	Preventive measure
Particulate matter (PM)	• Install highly efficient electrostatic precipitators (EP) with a dust removal efficiency of 99.8% • Build dust-proof grids around coal yards and configure regular sprinkler systems • Use closed facilities for transportation and unloading of coal, frequently compact coal piles and clean roads
Nitrogen oxides (NO_X)	• Install low NO_X burners (LNB) and selective catalytic reduction (SCR) equipment
Sulfur oxides (SO_X)	• Install flue-gas desulfurization (FGD) equipment to remove more than 95% of sulfur oxide

Medium-Term Actions: Adopting end-of-pipe reductions and adhering to emission standards for gas-fired generating units

Taipower has conducted out a comprehensive inventory of its existing control equipment and plans to install high-efficiency air pollution control equipment, use overhaul periods to improve the local functions of control equipment, and enhance the removal efficiency of the control equipment as much as possible through operational practices.

Taipower will also introduce more advanced and efficient air pollution prevention and control equipment, install equipment in new power plants and renew equipment in existing plants to effectively reduce emissions. It will also set up continuous automatic monitoring equipment for flue gas emissions. In addition, Taipower's air pollution control improvement plans for particulate pollutants (PM), nitrogen oxides (NO_X), and sulfur oxides (SO_X) are shown in the following table. Taipower will invest a total of $69.229 billion between 2017 and 2025 in these initiatives. Together, the measures are expected to reduce particulate matter by 398 tons/year, sulfur oxides by 7,118 tons/year, and nitrogen oxides by 15,460 tons/year. For more information, please refer to the annual report of the Department of Environmental Protection.

Long-Term Action: A power source shift from "Primarily Coal with Gas as support" to "Primarily Gas with Coal as support"

The proportion of renewable energy has been increased in line with the national energy policy. In addition, the thermal generation structure has been adjusted from primarily coal with gas as support to primarily gas with coal as support. As a result, the future power generation fuel structure will be dominated by natural gas. According to the power development plan, all thermal plants, with the exception of the ultra-supercritical coal fired units at Linkou and Talin, will operate gas-fired units. Additional gas-fired units are being added at the Hsiehho, Datan, Taichung, and Hsinta plants. This measure will ensure both air quality and a stable power supply. After the new gas-fired units at the Taichung and Hsinta plants are completed and commercialized, some of the existing coal-fired units will be decommissioned or converted to standby, which will have a positive effect on air quality.

Taipower is committed to reducing air pollution. Apart from measures such as renewing and reconstructing generating units, improving the generation efficiency, and strengthening the efficiency of air pollution control equipment, the move towards reducing coal and increasing gas is also a vital emissions reduction strategy. Under Article 14 of the Air Pollution Control Act, Taipower submits Implementation Plans for Gas Adjustment during Periods of Air Quality Deterioration and Adoption of Emergency Control Measures. The plans explain the results of Taipower's environmental protection dispatching and evaluate the overall air pollution reduction benefits accordingly. Plans will be submitted annually to the EPA for approval so that when Taipower reduces loads of coal-fired units in response to poor air quality or is required by the competent authority to reduce coal-fired generation, gas-fired power generation can be used instead to ensure a stable power supply while achieving air pollution reduction.

Air Pollutant Emissions by Power Plants from 2019 to 2021

Unit: kg/GWh

Air Pollutant Type	2019	2020	2021
Nitrogen Oxides (NO_X)	234	203	188
Sulfur Oxides (SO_X)	125	102	98
Particulate Matter (PM)	14	8	6

Management of Mobile Emission Sources

According to Environmental Protection Administration (EPA) analysis, diesel trucks account for the largest proportion of emissions from among the various kinds of mobile pollution sources. This has led Taipower to make an inventory of its large diesel vehicles that meet phase one and phase two environmental protection standards. The Company is also cooperating with the EPA to replace older vehicles. It is estimated that 67 kg of $PM_{2.5}$ emissions will be eliminated for each old large diesel vehicle removed from service. Additionally, large diesel vehicles that meet phase three standards are equipped with smoke filters to reduce pollution. It is expected that this will reduce $PM_{2.5}$ emissions by about 10 kg per year for each phase three diesel vehicle.

Management of Fugitive Emission Sources

Taipower's fugitive emission sources include coal yards and construction sites. For construction projects, Taipower announced Promotion and Management Guidelines on Environmentally Friendly Measures for Green Construction Sites in 2018. The Company's projects now incorporate these guidelines. The appendix to the guidelines, Environmental Protection Construction Regulations of Taiwan Power Company, require contractors to formulate Environmental Protection Management Plans and position environmental protection management personnel, who should be full-time and have the qualifications of Class B air pollution control or above (one qualified employee is required for project contracts of NT$50 million, two are required for contracts above NT$200 million), to reduce air pollution from construction projects.

To reduce emissions from coal yards, Taipower set up dust-proof netting around older, open yard perimeters and uses sprinklers to inhibit the escape of coal dust. With technological progress and increasingly robust environmental quality requirements, Taipower's coal storage yards have gradually been converted from open to indoor storage. The Linkou, Hsinta, and Talin Power Plants have all built indoor coal bunkers, and the Taichung Power Plant is planning to construct indoor coal bunkers. Work on these projects is currently underway and will further restrain the escape of coal dust upon completion.

6.3.4 Effluent Recycling 103-2 103-3

Water Resources Management

Taipower tracks its wastewater discharge in accordance with Environmental Protection Agency rules, follows the progress of legal and regulatory revisions, and develops corresponding solutions for possible risks. For example, 24 new control items were added to the effluent standards for power plants at the end of 2017. New ammonia nitrogen control items were added in 2021, and control limits were tightened for the effluent of the flue gas desulfurization of coal-fired units on mercury, arsenic, and selenium. In 2019, the Water Pollution Control Measures and Test Reporting Management Regulations were also amended, requiring periodic test reporting of wastewater according to the announced items and frequency. If power plants violate the effluent standards, they will be punished according to law.

All of Taipower's power plants follow the ISO14001 management system and conduct regular compliance inspections. In view of the risks that may arise from ordinance revisions, relevant plans are developed for measures such as increasing the frequency of testing, decreasing pollution emissions at source by process control, and evaluating the need for additional treatment equipment to improve wastewater treatment efficiency over the long term.

Water Consumption for Generation at Taipower's Thermal Power Plants in 2021

Unit: m^3

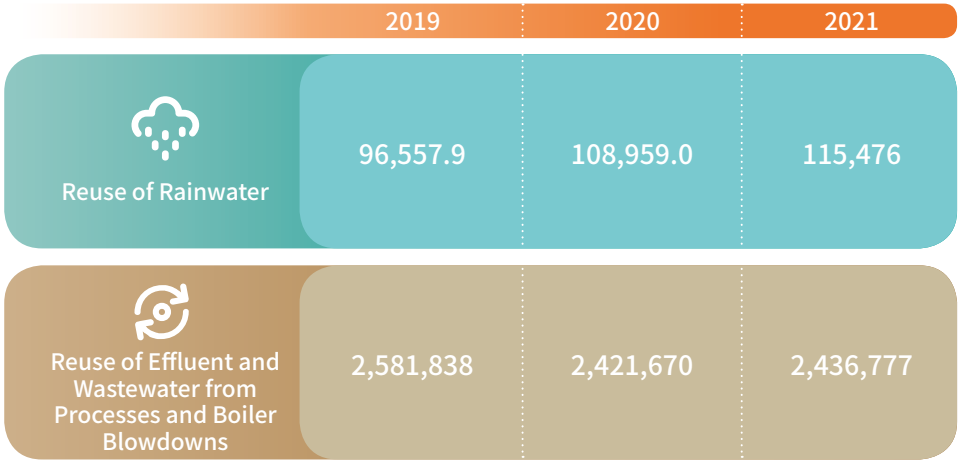
	Power Plant	Volume of Tap Water	Volume of Desalinated Water	Total
Thermal Power Plant	Hsiehho	320,997	4,181	325,178
	Linkou	532,320	0	532,320
	Datan	382,263	0	382,263
	Tunghsiao	562,315	0	562,315
	Taichung	4,542,933	0	4,542,933
	Hsinta	1,974,232	0	1,974,232
	Talin	179,677	402,986	582,663
	Nanpu	107,630	0	107,630
	Jinshan	0	52,163	52,163
	Tashan	0	24,584	24,584
	Total	8,602,367	483,914	9,086,281

Wastewater Reuse

Taipower actively pursues a goal of zero wastewater discharge. Rainwater collection (at power plants and dormitories) and wastewater reuse projects have been employed to reduce the use of tap water inside power plants through comprehensive planning. Through the utilization of various water-saving measures, the wastewater recovery results for 2021 are as follows:

Reclaimed and Reused Wastewater in Thermal Power Plants

Unit: Tons



Note: Flue gas desulfurization (FGD) wastewater is not reused as it contains a high salt content which is likely to cause equipment corrosion and soil salinization. As such it is not included in the calculation of wastewater volumes

Taipower's thermal power plants have implemented measures for rainwater reclamation and wastewater reuse for years. The main uses of the recycled water are green irrigation, furnace bottom sealing water, bottom ash water, and dust suppression for coal piles in coal yards. These measures have become normal water use principles for thermal power plants. Rainwater storage and utilization essentially provides an alternative water source. It is an economical and practical water source development model because it does not consume energy or cause pollution.

Taipower records the daily usage of demineralized water in unit operations. If there is any abnormality, Taipower investigates immediately, and advocates and implements water conservation. The Company encourages employees to sincerely cherish water resources and develop habits for water conservation.

Reclaimed Water Volumes of Taipower's Thermal Power Plants in 2021

Unit: m^3

	Power Plant	Reclaimed Volume of Rainwater	Reclaimed Volume of Wastewater	Total
Thermal Power Plant	Hsieh-ho	269	43,522	43,791
	Linkou	722	303,317	304,039
	Datan	1180.9	152,555	153,736
	Tung Hsiao	0	191,564	191,693
	Taichung	8,977	793,309	802,286
	Hsinta	104,272	447,929	552,201
	Talin	0	457,461	457,461
	NanPu	55	42,597	42,652
	Jinshan	0	4,392	4,392
	Tashan	0	131	131
	Total	115,476	2,436,777	2,552,382

6.3.5 Waste Management 103-2 103-3

Taipower has taken mitigation and improvement measures to minimize the impact of waste generated at various stages of power generation, transmission, distribution, and sale. The following outlines the measures exercised for each type of generation.

Type	Main Waste	Environmental Impact of Waste	Materiality Narrative	Mitigation and Improvement Measures
Thermal Power	Wastes and by-products are generated after fuel use, such as coal ash (fly and bottom ash) and desulfurized gypsum	Coal ash (fly and bottom ash) is the industrial waste generated after fuel combustion. Improper storage may affect air quality, human health and may also have an impact on nearby ecosystems	Thermal power (including gas and coal) accounts for approximately 78.5% of Taipower's total generated and purchased power. As such, industrial waste and by-products produced after fuel must be disposed of properly	1. Taipower has formulated an air pollution management strategy for thermal power plants. For example, coal-fired thermal power plants are equipped with dust collection equipment to remove particulate pollutants in their smokers, and flue gas desulfurization equipment is installed to remove sulfur oxides from flue gas and improve air quality 2. Sulfur oxides combined with a limestone slurry produce desulfurized gypsum ($CaSO_4 + 2H_2O$) through chemical reactions such as absorption, neutralization, oxidation, and crystallization. This can be reused in the cement and fireproof board industries
Nuclear Power	Main wastes can be divided by high and low-level radioactivity. Low-level radioactive wastes include radioactive waste resins, waste liquids, residues, radiation protection clothing, and parts that are generated during regular operations, equipment maintenance, or improvement projects at the nuclear power plant. High-level radioactive waste refers to the used nuclear fuel withdrawn after the operation of the nuclear power plant	Radioactive material has a long half-life. If it is released carelessly, it may affect human health and pollute the surrounding environmental, soil and water resources	If radioactive waste is improperly disposed of, the degree of harm and the scope of its impact may be enormous. Moreover, because radioactive material has a long half-life, the impact time may last for tens or hundreds of years	Taipower actively handles, disposes, and manages radioactive waste appropriately to effectively isolate it from the environment. Please refer to the Waste Management Mechanism section for Taipower's plans for high and low-level radioactive waste
Hydropower Wind Power Solar Power	Decommissioned units and equipment	There is no waste produced during the power generation process, and the product life cycle of units and equipment is enduring, resulting in low environmental impact	The power generation processes of hydro, wind, and solar power units rely on natural resources, and unit life cycles are lengthy, so there is no materiality at present	Regarding renewable energy equipment that may be decommissioned, Taipower will entrust a compliant disposal company to carry out waste cleaning and transportation and will evaluate the reuse of resources to minimize environmental impact

The accumulation of coal ash also has potential hazards. Taipower takes steps to control ash levels effectively. Fly ash is measured at the angle of repose of the full silo, and the load combination is carried out by considering wind force, seismic force, soil transverse force, silo wall ring stress, temperature stress, and other factors. The Company also considers the extreme situations, such as an empty silo with a full silo adjacent to it, by analyzing and confirming that the bearing force, deflection, displacement, subsidence, angular variables, and other items are sufficient to minimize potential hazards. Coal ash accumulation is classified according to the degree of potential hazard as follows:

Diameter, Height, and Level of Fly Ash at Coal-fired Power Plants

Power Plant	Linkou	Taichung	Talin	Hsinta
Number of Silos	2	10	2	4
Diameter (m)	16.5	12~15	16	17
Height (m)	36	20	26.6	24
Control Ash Level (m)	28	10	22	20

Waste Management System

Taipower established a By-Product Resource Utilization Steering Committee to develop strategies and response plans for maximizing utilization through cross-unit cooperation. The committees' responsibilities include developing and implementing coal ash and gypsum removal strategies, reviewing the current coal ash bidding specifications in power plants, making applications for green marks for fly ash and gypsum products, and planning related incentive mechanisms that enhance the utilization rate of fly ash concrete at all units. For nuclear energy-related waste, Taipower has completed short, medium, and long-term planning schemes in accordance with its responsibilities for the treatment, storage, and disposal of high and low-level radioactive waste.

Nuclear Energy-Related Waste Disposal Methods

	Short-term	Medium-term	Long-term
Storage and disposal processes for low-level radioactive waste	Before 1996, waste was sent to the Lanyu low-level radioactive storage yard for temporary storage. Since 1996, it has been temporarily stored in low-level radioactive storage depots at power plants.	A temporary storage facility is planned for the medium term and material will be transported to the facility for storage.	Transportation from short-term facilities or mid-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 2021

Waste	Reuse Practice	2021 Production	2021 Reuse Volume	2021 Reuse Ratio
Coal Ash	Taipower has encouraged its engineering units to use fly ash in civil construction projects and for filling trenches. This raises the volume and utilization rate of fly ash and reduces the environmental burden. Coal ash is also sold for use as a building materials.	2.34 million tons	2.018 million tons	86.2%
Desulfurized Gypsum	Desulfurized gypsum is by local cement and fire-retardant board makers.	302,700 tons	302,600 tons	99.5%

Other industrial wastes, such as waste wire and cables, or metal scraps generated during Taipower's operations, are recycled by waste disposal contractors that acquire the materials through an open bidding process. In accordance with regulations, bidders must be qualified Waste Disposal Organizations and perform their operations according to regulations to reduce the environmental risks involved in waste treatment.

Taipower's Industrial Waste Sales Volumes and Amounts from 2019 to 2021

Item	2019	2020	2021
Coal ash output (10,000 tons)	239	220	234
Coal ash sales volume (10,000 tons)	207	198	201.8
Sales volume of scrap cable and other metal (1,000 tons)	8.125	8.502	10.758
Sales amount of scrap cable and other metal ($100 million)	9.634	9.679	18.345

6.3.6 Creating Ecological Inclusiveness

Taipower is committed to minimizing its negative impact on the surrounding environment during operations while maximizing its positive influence on society and the environment. In addition to carrying out neighborhood activities at power plants, such as beach cleaning, fish fry releases, green space adoptions, and building artificial reefs, Taipower continues to conduct environmental education and carefully evaluates environmental factors before power plant expansions or the addition of units. Moreover, Taipower conducts in-depth communication with local stakeholders to ensure legality and compliance and to achieve win-win situations for society, the environment, and the Company.

In 2021, bat nest boxes were installed at wind power sites. These achieved the short-term goal of creating ecological inclusiveness as mandated in the Taipower Environmental Whit Paper. It is expected that two more power facilities will host ecological integration projects by 2025. As Taipower moves towards its vision of becoming a green corporate enterprise, it will continue to integrate "multi-featured, multi-green spots."

Cholan Plant – Firefly Ecological Conservation

The Cholan Plant site contains rich and diverse ecological features. The plant was completed and put into operation in 2003. During the plant construction, more than 6,000 native species of trees were planted to beautify the environment and enhance the stability of mountain slopes. Since then, the fishway ecology of the river dam has been continuously observed and recorded. Additionally, during the nearly two decades of plant operation, Taipower has carried out various maintenance projects including slope collapse remediation, pit and ditch management, pavement restoration, and regular soil and water conservation. Adhering to the spirit of environmental protection and ecological conservation, Taipower strives to reduce environmental impact and maintain the natural ecology. Maintenance work at the plant avoids firefly breeding season, and there is a total ban on the use of herbicides. Consequently, the site's soil and water resources are well maintained, and the ecological environment is intact. This has allowed for the gradual formation of a firefly habitat. When the firefly viewing season begins in late March every year, fireflies gradually appear in the grass on both sides of the road, making it a popular firefly viewing spot.

Linkou Plant – Lily Ecological Restoration

The *Lilium formosanum* is an iconic native plant of Taiwan. In the past, it could be found throughout the Linkou, Bali, and Northeast coastal areas. Collectively, these places were known as the "hometown of the wild lily." Now, the Linkou Plant has devoted its efforts to the local ecology and put forward a Linkou ecological vision with lily restoration at its core. Since 2013, restoration work has been ongoing and expanded from the heavy oil tank area of the plant to the water outlet trail along the mountainside. By connecting with the neighboring Hongfu Palace, Xingfu Community, Xingfu Elementary School, and the Linkou District Office, the lily has been promoted through environmental education. Since the beginning of restoration work on the *Lilium formosanum* habitat, there have been traces of *Lilium formosanum* inside and outside the plant. While restoring the ecology, the project has also struck and emotional chord with local residents.

Offshore Wind Facilities and Plant – Ecological Care of the Adjacent Seas

Taipower carries out fish fry releases in the adjacent seas near thermal power plants and offshore wind farms. A total of six releases were held in 2021, including activities in the waters near the Taichung, Datan, Linkou, Hsinta, and Tung Hsiao plants, as well as at offshore wind facilities. A total of about 1.2 million fry were released. Taipower has also invested funds in coral restoration, established heat-resistant coral nurseries in response to climate change, improved coral transplantation technology, and developed off-site coral cultivation.