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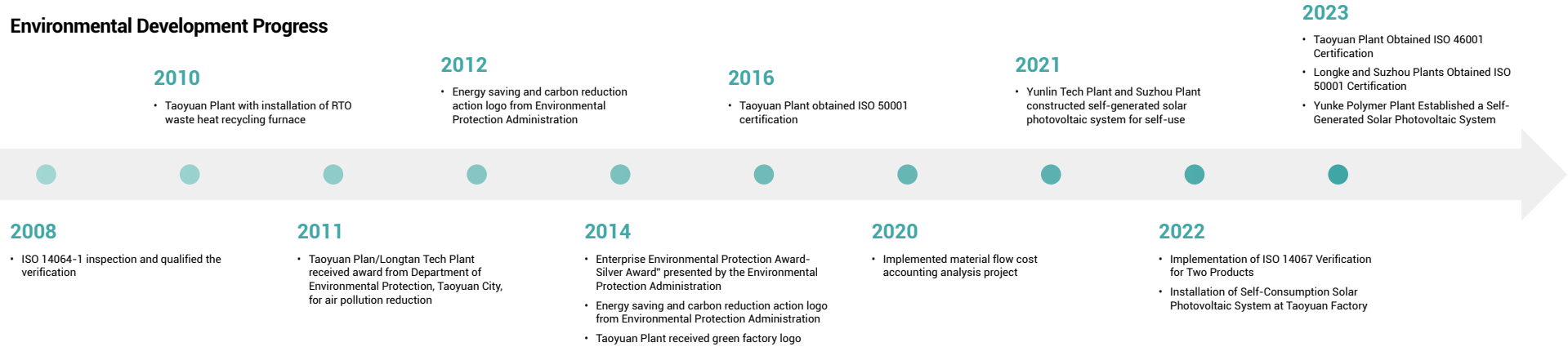
## Environmental Sustainability

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# Environmental Management

## Environmental Development Progress



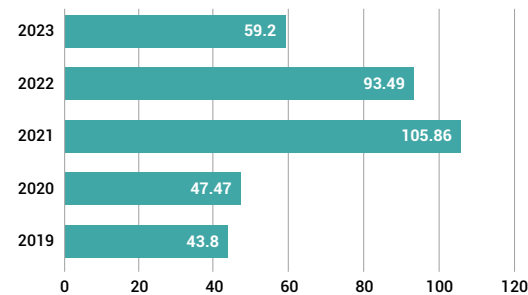
## Environmental Management Objectives

BenQ Materials has established a comprehensive environmental management mechanism, which includes management methods for energy and greenhouse gas management, water resource management, and waste management. The company actively manages the use of energy and resources in all aspects and has set environmental management goals. Additionally, BenQ Materials continuously monitors international environmental issues and trends, conducts internal audits and external third-party verifications annually to ensure the effective operation of its management systems. The company has obtained certifications at key operational sites, including ISO 46001 (Taoyuan Plant) in 2023, ISO 50001 (Longke Plant, Suzhou Plant), and ISO 14067 (polarizer products, textile products, battery products). [For details, please refer to Appendix 9-8: Overview of the Management Systems Implemented.](#)

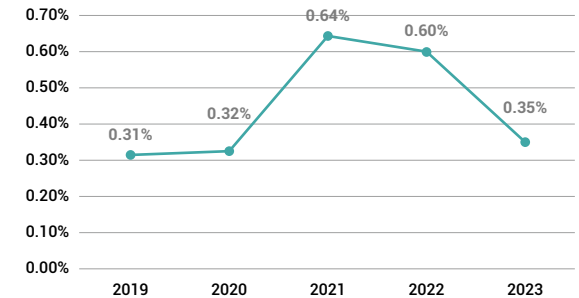
Item	Objectives
Climate Change Management	Reduce greenhouse gas emissions (Scope 1 and 2) compared to the baseline year (2020)
	Increase the share of renewable energy in the overall energy mix
Energy Management	Decrease energy intensity (non-renewable energy) compared to the baseline year (2020)
	Promote energy conservation among all employees (annually)
Water Management	Reduce water intake intensity (non-renewable water) compared to the baseline year (2020)
	Improve water resource reuse rate
Reduce, Reuse, and Recycle to Achieve Zero Waste Production	Increase waste recycling rate

## Environmental Investment Costs

Environmental Investments Over the Years (unit: NT\$ millions)



Environmental Investment to Revenue Ratio (%)



Note: Environmental investment costs include waste disposal fees, pollution control costs, and capital expenditures for equipment. In 2023, major expenses included the replacement of RTO regenerative materials, chemical dosing for the wastewater system, and maintenance of water treatment facilities, totaling 59.2 million NTD. The environmental investment to revenue ratio for the year was 0.35%.



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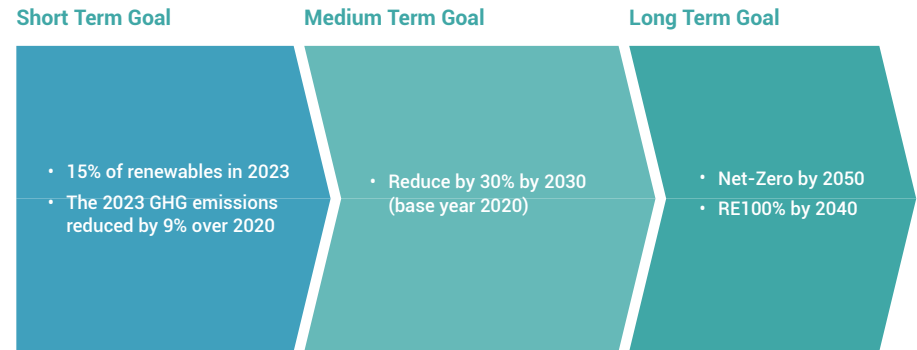
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# Climate Change Management

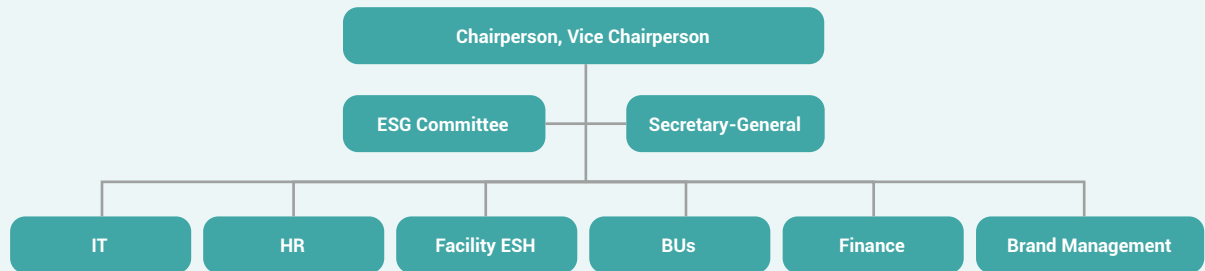
In 2021, BenQ Materials' ESG Sustainability Committee set a target of achieving net-zero emissions by 2050. Combining greenhouse gas inventory information and its own development trends, the company has formulated short-, medium-, and long-term carbon reduction targets and strategies. To mitigate and adapt to climate change, the company continuously promotes the ISO 14001 environmental management system, ISO 50001 energy management system, and various energy and resource conservation activities. In recent years, the company has also invested in new AI technology applications and new equipment to enhance production efficiency and transition to low-carbon production. This includes the installation of solar power generation systems within the plant to use renewable energy, active development of low-carbon green products, and collaboration with sustainable supply chain partners, all aimed at comprehensive development towards a low-carbon, green, and sustainable enterprise.

- Low-carbon production transformation
- Renewables use
- Low-emission green products
- Sustainable partnership



## Climate Change Management Working Team

BenQ Materials has established the "Climate Change Management Task Force," with the CEO and General Manager serving as Chairman and Vice Chairman, respectively. The first-level supervisors from each unit serve as committee members, and the CFO/Risk Management Unit serves as the Secretary General. This task force is responsible for promoting activities related to climate change management.



## Strategy and action plan for climate change management

BenQ Materials follows the Task Force on Climate-related Financial Disclosures (TCFD) framework to manage and identify the risks and opportunities associated with climate change. The company has identified five major risks and opportunities and, after comprehensive consideration of potential financial impacts, the urgency of risk plans, derived benefits, economic efficiency, and technical feasibility, it formulates and implements climate change adaptation action plans. The company holds internal management review meetings annually and integrates these activities with existing risk management systems. Each year, reports are submitted to the Audit Committee and the Board of Directors to review and guide the company's climate change strategy, targets, and action plans.



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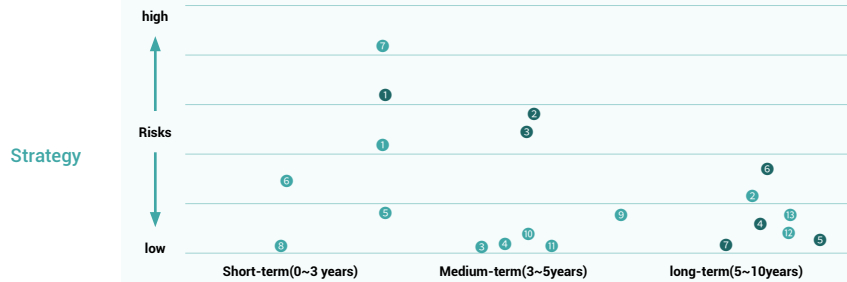
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## TCFD Operation and Management Framework

Aspect	BenQ Materials Strategy and Action Plan
Governance	<p>1. The Board of Directors regularly reviews climate change-related risks and opportunities:</p> <ul style="list-style-type: none"> <li>Starting from 2022, an annual report on the operation of climate change-related issues is presented to the Board of Directors and the Audit Committee. The report for 2023 was completed on November 2.</li> <li>The organization chart of the Climate Change Management Task Force is shown above. Each year, the task force identifies and evaluates climate change risks and opportunities, comprehensively considering potential financial impacts and other influences. It formulates climate change adaptation plans, with management review meetings chaired by the Chairman/Vice Chairman to ensure timely provision of resources and alignment of climate change adaptation actions with the company's strategic direction.</li> </ul>

1. According to the climate change risk and opportunity assessment methodology, the internal definitions are as follows:
- Time scales for potential impacts: short-term is defined as 0-3 years, medium-term as 3-5 years, and long-term as 5-10 years.
  - Risk impact considerations include the effects on assets and finances, product and service impacts, personnel impacts, and reputational impacts.
2. Through identification and assessment, five major risks and opportunities were focused on:
- Risks: Raw material shortages or cost increases (short-term), extreme weather events (short-term), average temperature rise (medium-term), changes in rainfall patterns (medium-term), strengthened carbon emission disclosure requirements/carbon pricing mechanisms (short-term).



### Transition Risks:

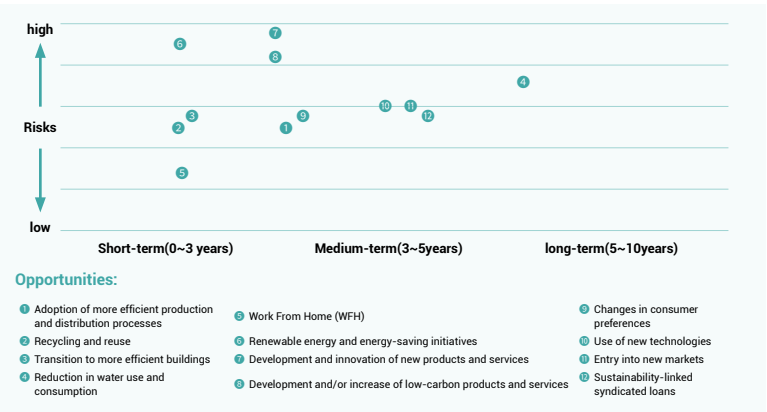
- Strengthened carbon emission disclosure requirements/carbon pricing mechanisms
- Requirements and regulations for existing products and services
- Mandatory use of renewable energy
- Insufficient training on new policies and regulations
- Low-carbon alternative products and services
- Stricter product regulations
- Raw material shortages or cost increases
- Labor market issues
- Changes in consumer preferences
- Increased stakeholder concerns
- Poor performance in international initiative evaluations
- Changes in consumer habits
- Industry stigmatization

### Physical Risks:

- Extreme weather events
- Average temperature rise
- Changes in rainfall patterns
- Wildfires
- Food shortages
- Increased likelihood of infectious diseases
- Rising insurance premiums

- Opportunities: Development and innovation of new products and services (short-term), related to renewable energy and energy saving (short-term), development and/or increase of low-carbon products and services (short-term), reduction in water use and consumption (long-term), use of new technologies (medium-term), and entry into new markets (medium-term).

## Strategy



### Opportunities:

- Adoption of more efficient production and distribution processes
- Recycling and reuse
- Transition to more efficient buildings
- Reduction in water use and consumption
- Work From Home (WFH)
- Renewable energy and energy-saving initiatives
- Development and innovation of new products and services
- Development and/or increase of low-carbon products and services
- Changes in consumer preferences
- Use of new technologies
- Entry into new markets
- Sustainability-linked syndicated loans

### 3. Scenario setting directions include:

- Transition scenarios: changes in regulations/policies/product demand/green inflation transition scenarios.
- Physical scenarios: referencing SSP5-8.5 (extreme high emissions scenario) from the IPCC Sixth Assessment Report (AR6); due to insufficient external literature, the IPCC Fifth Assessment Report (AR5) RCP8.5 scenario is used for mainland China facilities.

## Risk Management

1. Using the TCFD framework to establish a climate change identification process:
- Deploy the TCFD framework to identify and assess risks, including transition risks (current regulations, emerging regulations, legal, policy regulations, technology, market, reputation) and physical risks (immediate and long-term).
  - Prioritize and analyze the results of the identification and assessment, and report to the Climate Change Management Task Force during the annual management review meeting to ensure the effectiveness of operations.
2. Integration of climate-related issues into corporate risk management processes:
- Include high-risk issues in high-level meetings for management; annually review changes in transition risks and physical risks, and make rolling adjustments to adaptation action plans. [\(Refer to section 3-5 Risk Management in this report\)](#)

## Metrics and Targets

1. Climate Change Performance Management Targets:
- Renewable Energy Proportion: Set a target to increase the proportion of renewable energy to 100% by 2040.
  - Greenhouse Gas Emissions: Reduce greenhouse gas emissions by 30% by 2030 compared to the baseline year of 2020.
  - Achieve net-zero emissions by 2050 and meet key climate goals related to product design.
2. Conduct an annual greenhouse gas inventory through ISO 14064-1:2018 to assess company risks and formulate feasible mitigation strategies:
- Perform the inventory according to ISO 14064-1:2018 and obtain third-party verification statements.
  - Reduce greenhouse gas emissions by 30% by 2030 compared to the baseline year of 2020.
  - Achieve net-zero emissions by 2050 and meet key climate goals related to product design.
  - Detailed climate change adaptation action plans are provided in the table below.



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### Management Approach for Physical and Transition Risks

Category	Aspect	Management Policy / Plan Content
Physical	Extreme weather events.	<ul style="list-style-type: none"> <li>Enhance the resilience of the in-house power system.</li> <li>Enhance the resilience of the in-house water system.</li> <li>Consider extreme weather events at the design phase of new plant construction.</li> </ul>
	Policy and legal: including carbon pricing and compulsory renewables use.	<ul style="list-style-type: none"> <li>Build solar PV installations.</li> <li>Promote energy conservation and carbon reduction activities and enhance energy efficiency.</li> <li>Participate in the domestic green power market to introduce green energy.</li> </ul>
Transition	Market: Increased cost or shortage of materials.	<ul style="list-style-type: none"> <li>Alternative materials deployment and initiation.</li> <li>Energy conservation and carbon reduction guidance for suppliers.</li> </ul>
	Technology: Unsuccessful investments/R&D of low-emission substitution products.	<ul style="list-style-type: none"> <li>Design and development of low-emission products.</li> <li>Waste reduction in production and recycling for reuse.</li> <li>Reduction of packaging materials.</li> </ul>
	Changes in Consumer Habits	<ul style="list-style-type: none"> <li>Product adjustments to expand other application areas.</li> </ul>
Chance	Develop or increase low-carbon products and services.	<ul style="list-style-type: none"> <li>Introduction of low-carbon materials.</li> <li>Green production.</li> <li>Reduction of raw materials.</li> <li>Equipment optimization.</li> </ul>
	Research and innovate the development of new products and services.	<ul style="list-style-type: none"> <li>Application of innovative technologies to develop substitute materials.</li> </ul>
	Use more efficient production and distribution processes.	<ul style="list-style-type: none"> <li>Process optimization.</li> </ul>
	Recycling and reuse.	<ul style="list-style-type: none"> <li>Packaging recycling.</li> <li>Reuse of reworked consumables.</li> <li>Recycling and remanufacturing.</li> </ul>



### Greenhouse Gas Management

#### GHG inventory

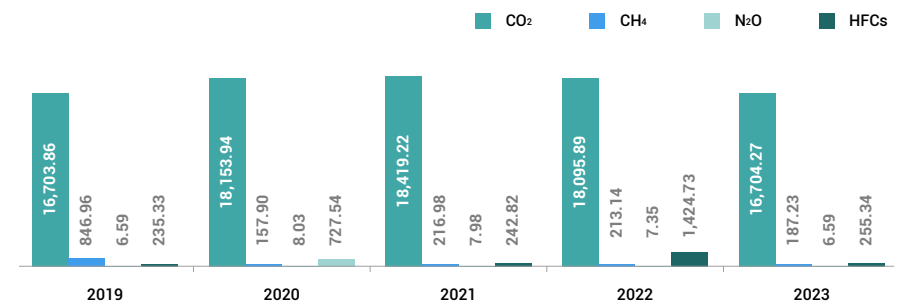
BenQ Materials, following the ISO 14064-1:2018 greenhouse gas inventory standards and the Greenhouse Gas Protocol published by the World Resources Institute (WRI), has established a greenhouse gas inventory mechanism. Since 2008, the company has gradually developed a comprehensive greenhouse gas emissions inventory for each manufacturing site, conducting annual greenhouse gas inventories. Starting in 2023, subsidiaries such as Shuochen and Jingjie have also introduced and implemented self-inventory operations.

BenQ Materials' greenhouse gas emissions originate from two major sources: primarily, the purchased electricity required for operations, which generates carbon dioxide during the power generation process, and secondarily, greenhouse gases produced by the use of gas and gasoline in internal operations.

In 2023, the company re-identified Scope 3 indirect emission items, evaluating the ease of collecting activity data and referencing coefficient sources. Selected Scope 3 indirect emission inventory items include upstream transportation and distribution, business travel, employee commuting, purchased goods and services, capital goods, and operational waste. New inventory items in 2023 included employee commuting and downstream transportation and distribution. Scope 3 items are expected to be fully inventoried by 2024.

In 2023, greenhouse gas emissions (Scope 1 + Scope 2) amounted to 41,744.00 tons of CO<sub>2</sub>e, a decrease of 21.12% compared to 2022 and a decrease of 27.45% compared to 2020. Analyzing the greenhouse gas emission intensity (Scope 1 + Scope 2), it has decreased annually since 2017. In 2023, the intensity was 2.44 (tons of CO<sub>2</sub>e per million NTD), a decrease of 28.43% compared to 2022 and a decrease of 36.25% compared to 2020. This reduction was mainly due to the introduction of renewable energy and energy-saving carbon reduction investment projects. In 2023, Scope 3 greenhouse gas emissions were 31,090.88 tons of CO<sub>2</sub>e, an increase of 222.35% compared to 2022 and an increase of 226.35% compared to 2020. The increase in Scope 3 emissions in 2023 was due to the additional inventory and quantification of employee commuting and downstream transportation and distribution items.

GHG Emissions (by emission by) (unit: t)





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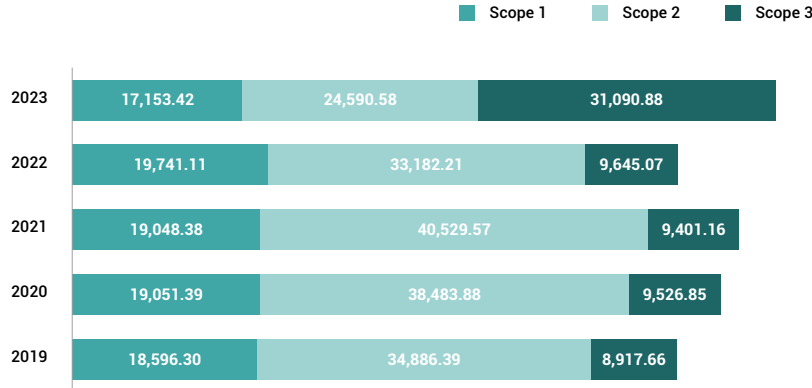
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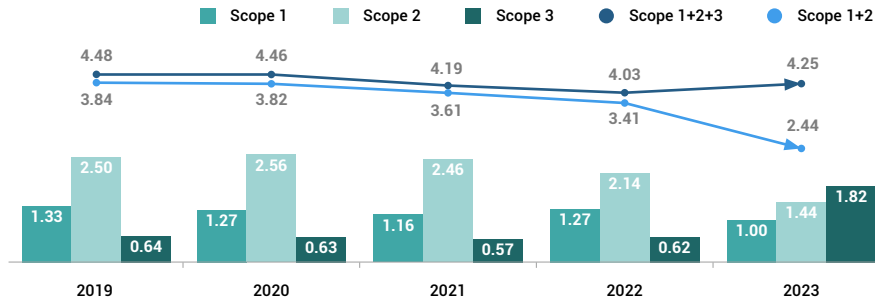
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GHG Emissions (by scope) (unit: tCO<sub>2</sub>e)



GHG Emissions Intensity Over the Years (unit: tCO<sub>2</sub>e/NT\$1 million revenue)



Note 1: Operational sites verified by third-party units include: BenQ Materials headquarters, Taoyuan Plant, Longke Plant, Yunke Plant, Suzhou Plant, Wuhu Plant, Lianhe Medical Materials, Hailu Plant, BMC (Dormitory), BMM, and DTB. Scope 3 inventories for headquarters and Taiwan plants began in 2019, while overseas plants began in 2022. Subsidiaries (Web-pro, Cenefom, and Genejet Biotech) have only completed self-inventories, and their data has not yet been included in the disclosure scope.

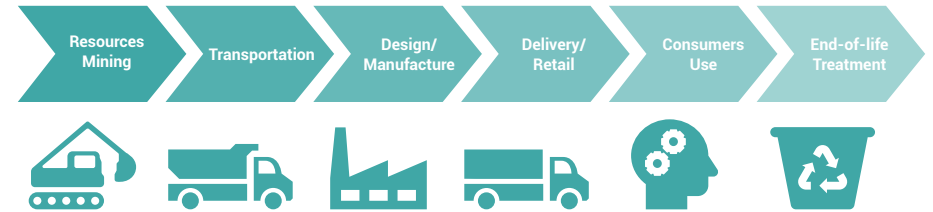
Note 2: The greenhouse gas inventory adopts the ISO 14064-1:2018 version. In 2023, all plants in Taiwan and China passed third-party verification by external verification bodies.

Note 3: The power emission coefficient for Taiwan sites is based on the 2022 power carbon emission coefficient of 0.495 tons CO<sub>2</sub>e per megawatt-hour (MWh) published by the Bureau of Energy in 2023.

Note 4: The power emission coefficient for China sites is based on the national grid average emission factor for 2022 of 0.5703 tons CO<sub>2</sub>e per megawatt-hour (MWh) published by the Ministry of Ecology and Environment of China.

### Product carbon footprint verification

In 2022, BenQ Materials began conducting product carbon footprint inventories, completing the carbon footprint inventories for three products by 2023: waterproof and breathable functional fabric, display materials (polarizers), and advanced battery separator membranes. Carbon footprint inventory statements (scope: cradle to gate) were obtained for these products. In 2024, another B to C product will be selected for a full life cycle assessment. By conducting full life cycle carbon footprint inventories, the company aims to better understand the carbon emissions during the consumer use and end-of-life disposal stages. This data will serve as a reference for the design and development of low-carbon products and the formulation of appropriate carbon reduction measures.



- Completed carbon footprint inventory and the proportion of carbon emissions at each stage for each product

Product Type	Raw Material Stage	Transportation Stage	Manufacturing Stage
Waterproof and Breathable Functional Fabric	92.68%	1.87%	5.45%
Display Material (Polarizer) Products	55.49%	0.48%	44.03%
Advanced Battery Separator Membrane Products	26.92%	0.17%	72.91%

### Internal Carbon Pricing and Carbon Fees

BenQ Materials has long supported national greenhouse gas reduction policies and actively participated in energy-saving and emission reduction actions. Since 2021, the company has introduced an internal carbon pricing mechanism to manage the future risks associated with carbon emissions and to raise internal awareness of carbon management. Each year, reduction targets are set and the execution of reduction efforts is reviewed through the ESG Committee's governance platform.

To accelerate the company's overall net-zero transition, promote internal carbon reduction actions, and optimize daily operational processes, BenQ Materials actively implements carbon reduction measures. In 2023, the company launched an internal carbon fee system, setting a unified rate for the carbon emissions of each business unit. Each month, carbon fees are collected based on the actual energy consumption and carbon emissions of each business unit. The collected carbon fees are pooled into a common carbon reduction fund, which is primarily used for investing in energy-saving and emission-reduction equipment within the plants, investing in renewable energy equipment, and purchasing renewable energy externally.



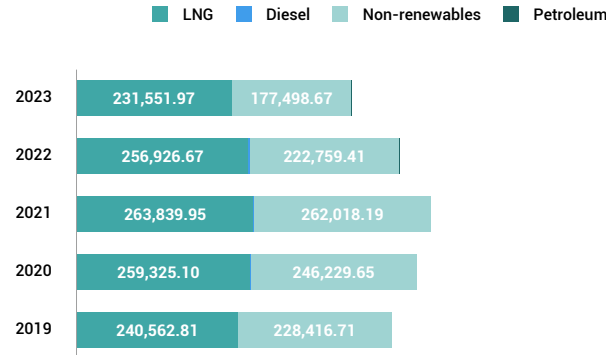
# Energy Management

## Energy consumption data

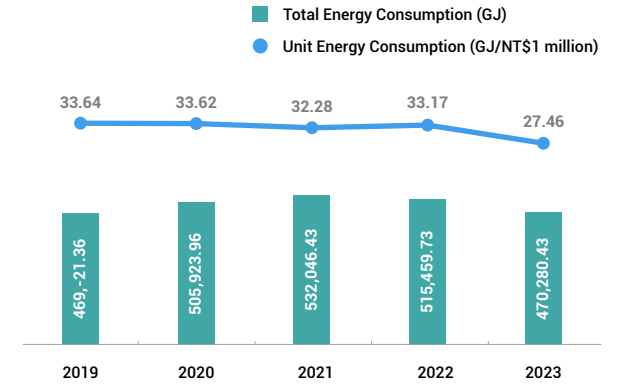
In 2023, the primary energy sources used were natural gas and non-renewable electricity purchased from external power companies, followed by diesel. The total energy consumption in 2023 was 6.1462 million cubic meters of natural gas, 63.3785 million kilowatt-hours of electricity (including both non-renewable and renewable electricity), 13,400 liters of gasoline, and 1,800 liters of diesel. Converted to energy units, this totaled 470,280.43 GJ (gigajoules), a decrease of 45,179.30 GJ (8.76%) compared to 2022.

When calculated per revenue, the total energy consumption in 2023 had an energy consumption intensity (energy consumption per million NTD revenue) of 27.46 GJ per million NTD, a reduction of 5.71 GJ per million NTD (17.22%) compared to 2022.

Energy Consumption Over the Years (non-renewables)  
Unit: Gigajoules (GJ)



Energy Consumption Intensity Over the Years



Note 1: The scope of energy management disclosure in 2023 includes the following operational sites: BenQ Materials headquarters, Taoyuan Plant, Longke Plant, Yunke Plant, Suzhou Plant, Wuhu Plant, Sigma Medical Materials, Hailu Plant, BMC (Dormitory), BMM, and DTB.

Note 2: The energy disclosure data for 2021-2022 has been updated (excluding subsidiaries). The disclosed data does not include subsidiaries (Web-pro, Cenefom, Genejet Biotech), which are expected to complete third-party verification and be included in the disclosure scope in 2024.

## Action and Performance of Reduction

To mitigate global warming and reduce the operational risks brought by climate change while enhancing green production effectiveness, we continue to take actions in energy saving, emission reduction, green manufacturing, and circular utilization. Through various means, we aim to reduce the use and consumption of energy resources.

In 2023, we implemented a total of 23 electricity-saving projects, with an annual electricity savings of 1.4136 million kilowatt-hours, reducing carbon emissions by 732.75 tons of CO<sub>2</sub>e. Additionally, we executed 5 natural gas-saving projects, with an annual natural gas savings of 87,800 cubic meters, reducing carbon emissions by 178.40 tons of CO<sub>2</sub>e.

In 2024, we will focus on introducing large equipment for steam boilers, waste heat recovery systems for air compressors, high-efficiency motors, replacing lighting fixtures with energy-saving LED types, and upgrading fan filter units to DC energy-saving motors. We will continue to promote energy-saving and carbon-reduction measures to reduce energy consumption.

## Main Energy-Saving Measures Implemented in 2023

- 1 AI intelligent control operation of chillers
- 2 Optimization of air conditioning unit startup and shutdown in clean rooms
- 3 Conversion of process hot water heating from electric to steam heating
- 4 Replacement of FFU AC with DC, optimization of air compressor system, recovery of waste heat from air compressors
- 5 Reuse of waste heat from steam
- 6 Flameless operation of RTO (Regenerative Thermal Oxidizer)

Year	Electricity conservation effectiveness (kWh)	Emissions reduction effectiveness (tCO <sub>2</sub> e)
2020	707,809	355.32
2021	779,358	391.24
2022	2,405,830	1,264.99
2023	1,413,562	732.75

Note: Scope 2 for all.

Year	Natural gas conservation effectiveness (m <sup>3</sup> )	Emissions reduction effectiveness (tCO <sub>2</sub> e)
2020	341,808	646.02
2021	505,615	950.05
2022	293,972	552.37
2023	87,777	178.40

Note: Scope 1 for all.

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### Renewables use

In 2023, BenQ Materials followed the renewable energy strategic goals of Qisda Group, advancing the target timeline for achieving RE100 from 2050 to 2040. The company has also developed a strategic pathway to achieve RE100, which includes investing in self-built solar power generation systems for internal use and collaborating with renewable energy electricity sellers to gradually obtain a larger amount of renewable energy electricity.

In 2023, BenQ Materials' total renewable energy usage reached 14.072 million kWh, with self-built solar power generation accounting for 2.796 million kWh, externally purchased renewable energy accounting for 3.656 million kWh, and the purchase of 7.62 million kWh of I-REC renewable energy certificates issued in China for the China plants. This was declared as the voluntary reduction of carbon emissions from the externally purchased electricity used in the operation of various plants during 2023.

Looking ahead to 2024, the company plans to continue increasing investments in self-built solar power generation systems and expanding the purchase and use of renewable energy externally, gradually achieving the RE100 targets set by the Group and the ESG Committee.

### Self-developed renewables

Since 2021, various plants have been constructing solar power generation equipment to supply electricity internally, thereby reducing external electricity purchases and carbon emissions. In 2023, new solar power generation equipment projects were completed and put into use at the Yunke Plant and the Taoyuan Plant. The total annual power generation for all plants reached 2.796 million kWh in 2023. In 2024, the company plans to continue expanding the solar power generation equipment at the Yunke Manufacturing Plant 1. It is estimated that the total power generation for all plants will reach 3.6 million kWh in 2024.

Year	Generation capacity (kWh)
2021	1,379,200
2022	2,530,591
2023	2,796,485

### Obtaining Carbon Offset Credits from the Environmental Protection Administration

As a participant in the 2050 net-zero emissions initiative, BenQ Materials not only continuously reduces carbon emissions through energy management and process improvements but also obtained carbon offset credits in 2023 through the "RTO Waste Heat Recovery Equipment Offset Project," continuing to make positive contributions to the environment.

The "RTO Waste Heat Recovery Equipment Offset Project" involves recovering waste heat generated by the regenerative thermal oxidizer (RTO) and converting it into steam to be used by the production line. This process reduces the need for natural gas in the incinerator, and the saved carbon emissions can be applied for carbon credits from the Environmental Protection Administration. This project represents the first successful case in Taiwan of obtaining carbon credits through non-electric energy conversion. The project allows the company to obtain 1,529 tons of carbon dioxide equivalent per year from the Environmental Protection Administration, surpassing the carbon offset achieved by 30 years of reforestation by the Water Resources Agency. For more details, please refer to [the BenQ Materials ESG website](#).



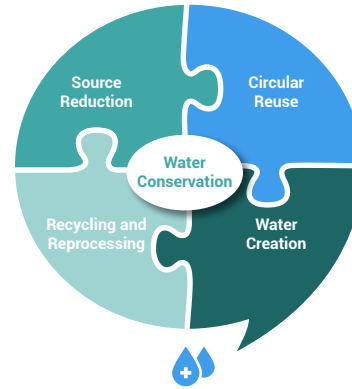


# Water Resource Management

Starting from the sustainable use of water resources, BenQ Materials follows three main principles: water inventory, water-saving measures, and recycling and reuse. These principles extend to four strategic stages: wastewater reduction, wastewater recycling, development of new water sources, and zero wastewater discharge. Wastewater reduction and recycling are approached from four main water usage areas: domestic, process, air conditioning systems, and boiler water. The company aims to gradually improve water use efficiency and strategies. In 2023, the Taoyuan Plant introduced the ISO 46001 Water Efficiency Management System and passed the verification.

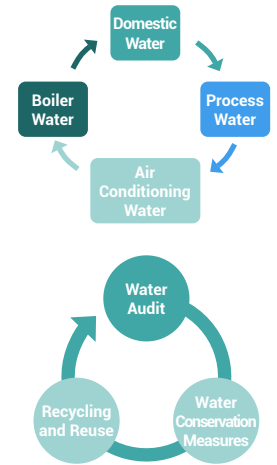
## Starting from Sustainable Water Resource Utilization, Implementing Four Major Water Usage Directions to Enhance Water Reuse Rate

- Using water-saving facilities, such as water-saving toilets and faucet aerators
- Improving the water production rate of the pure water system
- Utilizing rinsing in the production line to replace high water-consuming membranes to reduce water usage
- Classifying and recycling wastewater from production processes
- Recycling and reusing pure water system wastewater
- Recycling and reusing domestic wastewater



- Recycling steam condensate
- Filtering and circulating water in production line tanks
- Circulating water usage in cooling towers
- Recycling and using air conditioning condensate
- Storing and using rainwater/reclaimed water for toilet flushing and irrigation

## Water Principles and Directions



## Water Consumption Overview

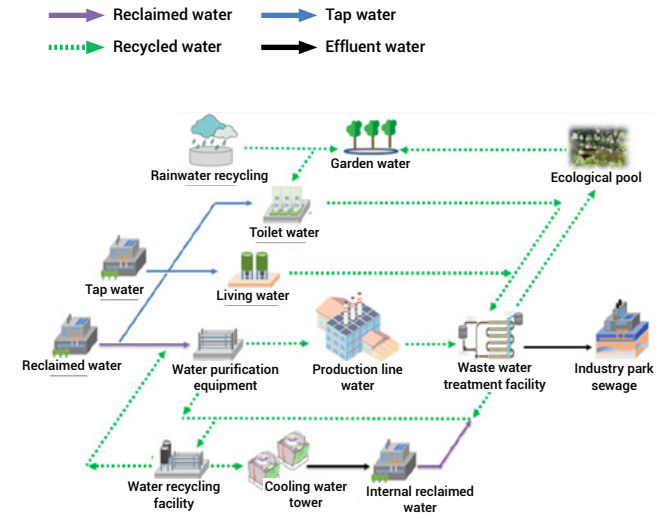
BenQ Materials' main water uses at each plant can be divided into process water, fire-fighting water, and domestic water. The water sources and supply units are specified according to their respective locations.

Currently, all Taiwan plants are equipped with wastewater recycling and treatment facilities. The discharged wastewater is 100% directed to the sewage treatment plants in the industrial zones where the plants are located for subsequent treatment. Each industrial zone's sewage treatment plant has established standards for the limits

of wastewater entering the plant, and discharge must comply with these standards. At the Suzhou Plant, domestic wastewater is discharged into the municipal sewage network and is uniformly treated by the municipal sewage center. At the Wuhu Plant, process wastewater, such as that from coating roller cleaning, is treated through flocculation, sedimentation, and filtration. Along with domestic sewage, it is processed through a septic tank before being discharged into the sewage network. In 2023, no water quality abnormalities were reported at any of the plants.

Business Location	Withdrawal Source	Usage			Supply Unit
		Process	Firefighting	Living	
Taoyuan Plant	Shihmen Reservoir, and some from groundwater	●	●	●	Taiwan Water Company
Longtan Tech Plant	Shihmen Reservoir	●	●	●	Taiwan Water Company
Yunlin Tech Plant	Hushan Reservoir and Jiji Weir	●	●	●	Taiwan Water Company
Suzhou Plant	Yangcheng Lake Area (Yangtze River water consumption scope)	▲	●	●	Suzhou Qingyuan Water Resource Ltd.
Wuhu Plant	Yangtze River	●	●	●	Wuhu Huayen Water Resource Ltd.

## Plant Water Consumption Process



Note: The scope of water resource disclosure for 2023 includes BenQ Materials headquarters, Taoyuan Plant, Longke Plant, Yunke Plant, Suzhou Plant, Wuhu Plant, Lianhe Medical Materials, Hailu Plant, BMC (Dormitory), BMM, and DTB.



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### Wastewater discharge standard and inspection items

Business Location	Wastewater Discharge Standard	Inspection Item
Taoyuan Plant	Sewage Water Quality Standard of Guishan Industrial Zone Service Center Sewage Treatment Plant	Water temperature, pH, BOD, COD, SS, boron, fluoride salts, copper, zinc, nickel
Longtan Tech Plant	Longtan Park Sewage Usage Fee Calculation Standard of Hsinchu Science Park Bureau, Ministry of Science and Technology	Water temperature, hydrogen ion concentration index (pH), biochemical oxygen demand (BOD), chemical oxygen demand (COD), SS, boron, fluoride salt, copper, zinc, nickel, anionic surfactant, ammonia nitrogen, nitrate nitrogen, cyanide, cadmium, total chromium, hexavalent chromium, total mercury, arsenic, lead, indium, gallium, molybdenum, true color
Yunlin Tech Plant	Sewage Water Quality Standard of Yunlin Technology Park	Water temperature, pH, COD, SS, ammonia nitrogen
Suzhou Plant	“Sewage Comprehensive Discharge Standard” GB8978-1996, “Sewage Water Quality Standard for Discharging Sewage into Cities and Towns” GB/T31962-2015	Animal and vegetable oils, pH, COD, SS, ammonia nitrogen, total phosphorus (TP)
Wuhu Plant	“Sewage Comprehensive Discharge Standard” GB8978-1996 Level 3 standard	Animal and vegetable oils, pH, BOD, COD, SS, ammonia nitrogen

In 2023, BenQ Materials (excluding subsidiaries) had a total water intake of 342.45 million liters (ML) across all plants, a decrease of 83.47 ML compared to 2022. The total discharge of wastewater was 269.24 ML, which was directed to the sewage treatment plants in various industrial zones, a reduction of 91.38 ML compared to 2022. The water consumption was 73.21 ML, primarily used for the evaporation of cooling tower water in the chilled water system.

In 2023, the discharge rate (discharge volume/total water intake) for BenQ Materials (excluding subsidiaries) was 78.62%. If the recycled water from internal process recycling, scrubbing tower recycling, process water treatment recycling, ROR cycle recycling, wastewater treatment recycling, and air conditioning water recycling is included, the R2 (reuse rate) was 87.62%. If the recycled water from cooling towers is also included, the R1 (overall plant recycling rate) could reach 97.82%.

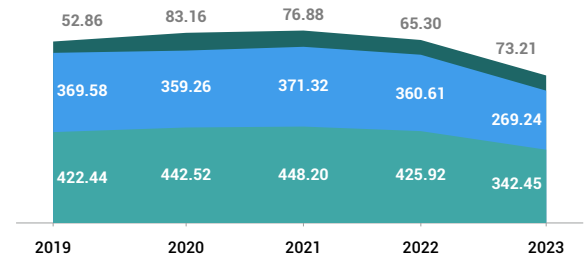
Statistics of Water Withdrawal Over the Years Unit: Megaliters (ML)

Withdrawal Source	Type	2019	2020	2021	2022	2023
Groundwater	Freshwater	0.26	0.16	9.17	0.07	0.10
Water from third party	Freshwater	422.18	442.36	439.02	425.85	342.35

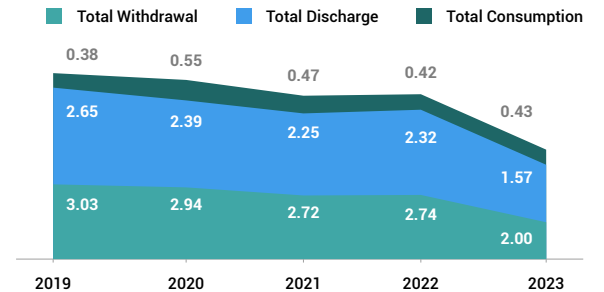
Statistics of Historical Water Discharge Amount Unit: Megaliters (ML)

Withdrawal Source	Type	2019	2020	2021	2022	2023
Discharge amount according to destination	Water from third party	369.58	359.36	371.32	360.61	269.24
Discharge amount according to water quality	Freshwater	369.58	359.36	371.32	360.61	269.24
Discharge by level of water quality treatment	Primary treatment	73.96	68.39	77.54	75.96	61.85
	Secondary treatment	188.16	204.66	203.75	207.89	136.69
	Tertiary treatment	107.47	86.32	90.02	76.76	70.70

Annual water resource utilization intensity (Unit: million cubic meters per hundred million dollars)



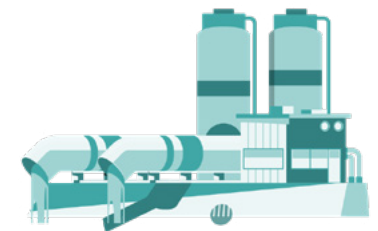
Annual water resource utilization overview (Unit: hundred cubic meters)



Note 1: BenQ Materials uses the WRI Aqueduct water risk scenario simulation tool to analyze the geographical locations of its operational sites. In the short term, only the Suzhou Plant in China is in a high water stress risk area, accounting for approximately 16.32% of the total water intake.

Note 2: The scope of water resource disclosure for 2023 includes BenQ Materials headquarters, Taoyuan Plant, Longke Plant, Yunke Plant, Suzhou Plant, Wuhu Plant, Sigma Medical Materials, Hailu Plant, BMC (Dormitory), BMM, and DTB.

Note 3: The energy disclosure data for 2021-2022 has been updated (reason for update: exclusion of subsidiaries). The disclosed data does not include subsidiaries (Weipu, Shuocheng, and Jingjie), which are expected to complete third-party verification and be included in the disclosure scope in 2024.





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## Water risk management

According to the World Economic Forum's (WEF) Global Risks Report 2023, natural resource crises, including water resource crises, rank as the sixth most severe risk among the top ten global risks for the next decade. Referring to the AQUEDUCT Water Risk Atlas data from the World Resources Institute, BenQ Materials has identified water-related risks at its operational sites. The identification results show that in the short term, only the Suzhou Plant in China is in a high water stress risk area, while other plants are at a low water risk level. However, considering long-term climate change factors, the water stress and water use risk at the Yunke Plant in Taiwan are expected to rise to a moderate risk level. It is necessary to formulate response strategies to enhance water resource risk resilience.

### Analysis of Significance of Water Impact

Business Location	Supplier	Supply Volume <sup>1</sup> (MI/day)	Consumption Volume <sup>2</sup> (MI/day)	Significance of Impact <sup>3</sup>
Taoyuan Plant	Danna Purification Plant	38.25	0.03	0.09%
Longtan Tech Plant	Longtan Purification Plant	13.76	0.04	0.28%
Yunlin Tech Plant	Yunlin Tech Purification Plant	1.6	0.002	0.14%
Suzhou Plant	Suzhou Qingyuan Water Resource Ltd.	45	0.008	0.02%
Wuhu Plant	Wuhu Huayen Water Resource Ltd.	87	0.002	0.002%

Note 1: Water supply data source: Official data published by the local government.

Note 2: Water consumption data source: Average water volume statistics from the plant.

Note 3: Usage impact = (Water consumption ÷ Regional water supply) × 100%

Water is one of the key global resources. Additionally, the risk and importance of water availability and use matter our operational activities and supply for the supply chain. In response to business disruption resulting from the potential risk of water suspensions and droughts due to climate change, we have established three major risk response strategies: external water information reporting system, internal water management system, and emergency response mechanism to enhance overall water risk resilience.

## Water risk management approaches

- Establish a plant-wide water conservation management program and implementation plan and set up a task force.
- Analyze, inventory, and calculate plant water consumption, establish feasible solutions, and implement water conservation plans.
- Take the water conservation awareness education courses and training organized by the government and professional organizations.
- Enhance awareness and enrich professional knowledge of water conservation through awareness education and internal training.
- Each department sends seed personnel to implement water conservation work.
- Establish the water incoming and suspension information management report system to enhance the warning and response capabilities of water risks.
- Establish the drought response mechanism according to the government's water condition indicator.

## Drought Response Mechanism

	Rationing Stage	Government Policy	BenQ Materials' Response Plan
<b>Condition Blue</b> Normal Water Conditions	NA	Water supply stabilization	Normal withdrawal for production use
<b>Condition Green</b> Slightly Tight Water Conditions	NA	Recommendation for following	Trial operation of the well water system every two weeks Notification of water tank contractors
<b>Condition Yellow</b> First Stage Water Restrictions Nighttime Reduced Pressure Supply	Stage 1 rationing	Supply with reduced pressure at off-peak hours and specific periods	Trial operation of the well water system every week Notification of water tank contractors
<b>Condition Orange</b> Second Stage Water Restrictions Reduced Supply of Non-Essential Water	Stage 2 rationing	1,000MT/month for industrial users Supply reduction by 5-20%	Initiation of the well system at Taoyuan Plant Notification of water tank contractors
<b>Condition Red</b> Third or Fourth Stage Water Restrictions Rotational Water Supply	Stage 3 rationing	Supply by region or time-based water suspension	Initiation of the well system at Taoyuan Plant Activation of water tank supply





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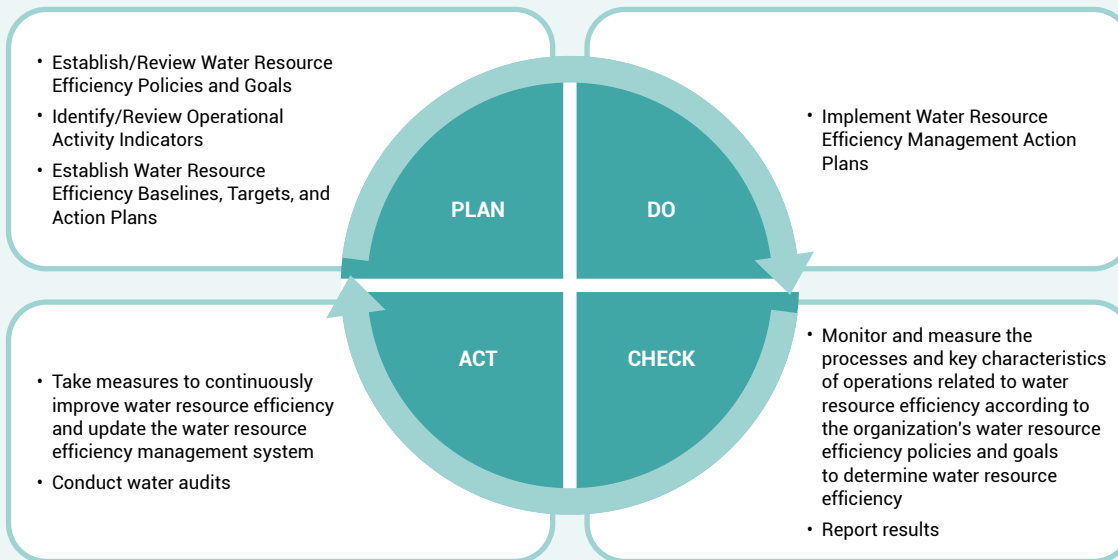
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### Establishment of the water efficiency management system

In 2023, the Taoyuan Plant began establishing the operational system for the ISO 46001 Water Efficiency Management System. By the end of 2023, the plant completed the verification and introduced a water use baseline. Daily audits of water use rationality were conducted to enhance the company's water resource management level and achieve environmental sustainability goals.



### Water Conservation Solutions

In 2023, we continued to promote water-saving initiatives, executing a total of eight water-saving projects. The main water-saving directions included the recycling of regenerated pure water discharge, improving the efficiency of wastewater recycling systems, enhancing process wastewater recycling, and recovering condensate water. These efforts resulted in an annual water savings of approximately 12.879 million liters, continuously reducing the water resources consumed in the processes.

Year	Effectiveness (m <sup>3</sup> )
2020	14,290
2021	49,439
2022	12,562
2023	12,879

### Major Water Conservation Measures in 2023

- Added resin tower washing wastewater recycling in the pure water system
- Improved MBR wastewater recycling equipment efficiency (parameter optimization)
- Added E-LINE etching line wastewater recycling
- Added RO concentrated water recycling and reuse at the Yunke Plant
- Added process discharge water recycling and reuse at the Yunke Plant



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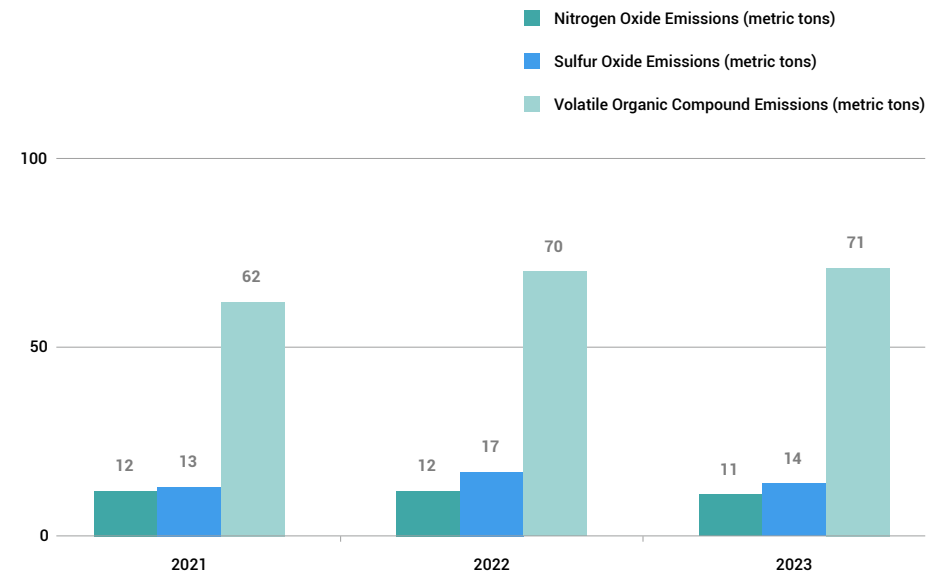
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## Air Population Control

BenQ Materials strictly adheres to environmental regulations by installing air pollution control equipment such as regenerative thermal oxidizers (RTO), scrubbers, and baghouse dust collectors to specifically handle process exhaust gases. This ensures that air pollutant emissions are minimized, reducing the environmental burden. All pollution control equipment is operated and maintained by dedicated personnel, and their operational status is jointly monitored by the central control system and inspection personnel to ensure the proper functioning of air pollution control equipment and to prevent any air pollution incidents. Additionally, through the ISO 14001 Environmental Management System, BenQ Materials manages and continuously improves environmental performance to reduce the risk of environmental pollution. In recent years, there have been no air pollution penalties.

2023 Air Pollutant Emissions



Note 1: The data source is the total from the Taoyuan Plant, Longke Plant, and Yunke Plant; the Suzhou Plant, Wuhu Plant, and subsidiaries Web-Pro, Cenefom, Genejet Biotech have no air pollution emissions.

Note 2: The average VOC treatment efficiency is maintained at over 98%, exceeding the environmental authorities' requirement of 92%.



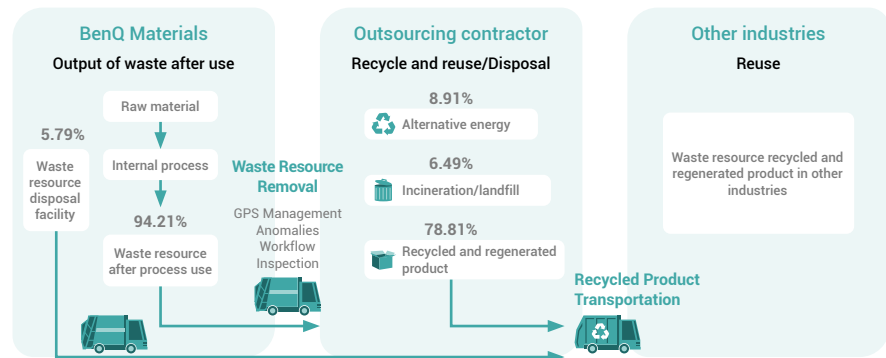
# Circular Economy

## Waste Management

Waste generated during business operations must be properly disposed of. Improper disposal can cause severe environmental pollution problems and indirectly affect local residents. BenQ Materials is committed to reducing the environmental impact of products throughout their life cycle—from raw materials, manufacturing, storage, transportation, and use to disposal—by fully implementing responsible production and achieving zero waste management through reduction and recycling.

BenQ Materials adopts a source management strategy, continuously assessing resource minimization (Reduce) at the production source, adjusting raw material usage parameters, and improving process technologies. By collaborating with the supply chain, the company aims to optimize and minimize raw material usage to avoid waste generation as much as possible.

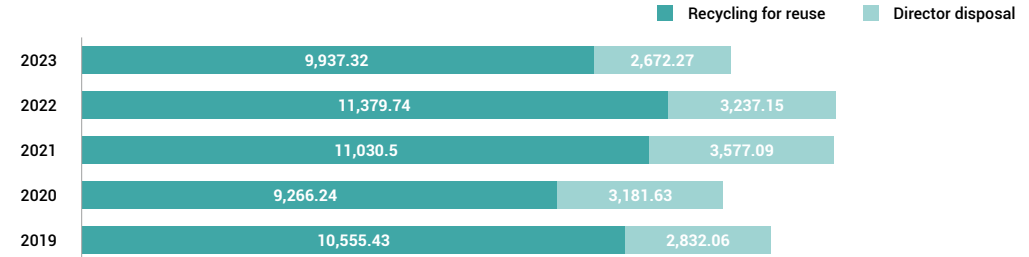
In addition to managing waste reduction of discarded resources, BenQ Materials implements the circular economy concept by recycling and classifying resources to achieve waste reduction targets. The company prioritizes "material recycling" and "energy recovery" for waste resources that cannot be reused within the plant, delivering them to qualified waste disposal companies. Incineration and landfill are considered the last resort.



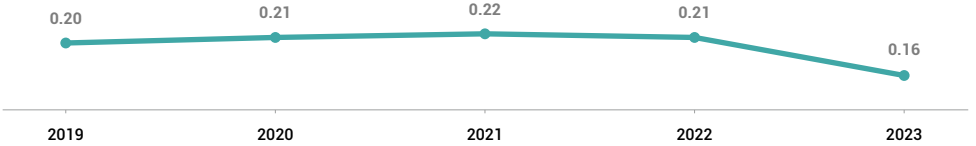
## Waste Production Volume

The types of waste at BenQ Materials' various plants can be categorized into seven main types: general industrial waste, potassium iodide, membrane waste, waste liquids and adhesives, recyclable waste liquids, solid waste, and recyclable materials. In 2023, the total waste generated was 12,609.83 tons, a decrease of 2,007 tons compared to the previous year. The recycling and reuse rate in 2023 was 78.81%, an increase of 0.95% from the previous year. The waste disposal and treatment costs in 2023 were approximately 39.75 million NTD, accounting for 0.23% of revenue. The waste disposal intensity (weight of directly disposed waste/revenue in millions of NTD) in 2023 was 0.16.

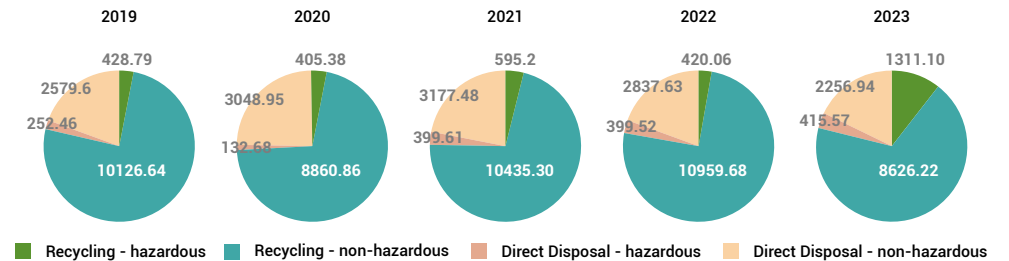
Waste Production Statistics (t)



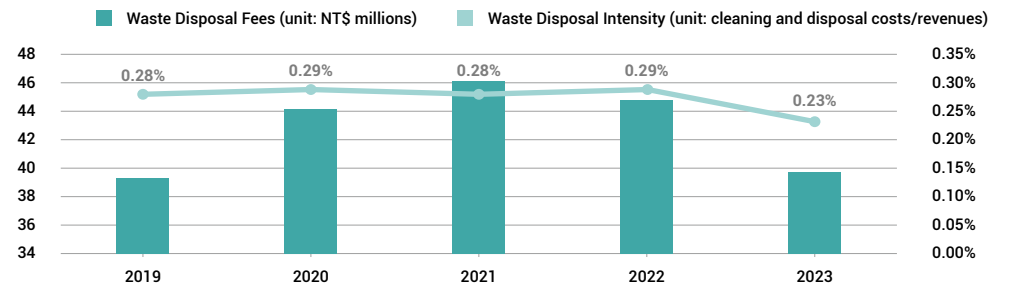
Waste Production Intensity (t/revenue NT\$1 million)



Waste Production Statistics-By waste type (unit: t)



Waste Disposal Fees and Intensity Over the Years



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### Waste Resource Recycling and Reuse

BenQ Materials conducts monthly inspections of the goals set for waste recycling to ensure that action plans are properly implemented. To increase the proportion of recyclable waste, BenQ Materials has established waste management procedures and recycling targets, reviewing action plans and goals quarterly in the ESG Sustainability Committee to achieve long-term monitoring effects.

Various types of waste are continually examined for reuse methods, developed into products, or recycled for reuse. Currently, the main focus is on reusing distilled ethyl acetate (EAC) within the plant to reduce raw material usage and waste generation, as well as collaborating with other industries to use distilled EAC as their raw material. Additionally, BenQ Materials seeks partners to use waste

white film (excluding iodine) as raw material for other industries and continues to explore alternative disposal methods for waste films besides using them as auxiliary fuel.

The highest revenue-generating product for BenQ Materials is polarizers, whose main material is the original film. Due to the current technical limitations, it is not feasible to reuse materials from recycled polarizers or other electronic products to remanufacture original films for polarizer production. Therefore, there is no related product recycling or recovery of other electronic waste, and recycling is managed internally or by outsourcing to other suppliers. In 2023, three recycling and reuse projects were completed.

#### Distilled EAC Internal Recycling

##### Management Method

- 1 Distill the waste material.
- 2 Confirm the quality of the distilled EAC.
- 3 Introduce the distilled EAC into the process for recycling.

##### Reduction Performance:

- Replace ingredients by about 10,300 kg each month.
- Recycle waste for reuse.

#### Waste White Film Used as Raw Material for Other Industries

##### Management Method

- 1 Collect, classify, and gather the waste film at the production line.
- 2 Ensure the recovered material meets customer requirements.
- 3 Confirm that the breakpoints and winding conditions of the recovered waste meet customer needs before shipping.

##### Reduction Performance:

- Reuse waste as raw materials for other industries.
- Reduce waste by 21 tons per month and lower waste disposal costs simultaneously.

#### 100% Recycling of Potassium Iodide

##### Management Method

- 1 Modify the pipeline to collect and reuse the discharged potassium iodide solution.
- 2 Purify the solution using low-temperature circulation filtration.
- 3 Concentrate and reuse the low-concentration solution after replacement.

##### Reduction Performance:

- Reduce potassium iodide usage by 3,100 kilograms annually.
- Reduce the discharge of waste solution by 1,014 tons.

### Waste to resource data

In 2023, the recycling and reuse rate was 78.81%, an increase of 1.23% compared to 2022. Efforts have been made to continuously optimize the distillation machinery, improving the distillation efficiency of PSA adhesives, enhancing their characteristics and quality, and integrating them into internal recycling processes. This has led to a 100% replacement of raw materials, reducing raw material purchase volumes and creating economic value. Since 2021, a total of 574.94 tons have been recycled within the plant, and efforts are ongoing to find more recyclable vendors to use waste as raw materials in other industries or reprocess it into products for reuse within the plant. For detailed historical waste data, [please refer to Appendix 9-1](#).

To advance towards a circular economy and achieve this through innovative production techniques, alternative materials, waste reduction, green supply chains, resource reuse, or "zero emissions" technology, it is planned to introduce SRF (Solid Recovered Fuel) manufacturing equipment in 2024. This equipment will convert plant waste into SRF, which can then be reused in the boiler processes of other industries. This not only promotes waste reuse but also reduces the use of coal in boilers. In addition to the SRF manufacturing equipment, we are exploring ways to create products from waste materials. Currently in the testing phase, this includes processing waste films into bricks, giving waste a "second life" and advancing the goals of the circular economy.

Accumulated Amount of Waste Recycled and Reused (tons)

