CH6
Green Environment

Target Formulation

	Targets for 2023-2024	Targets for 2025-2026	Targets for 2027 and beyond	Corresponding SDGs
Management of Energy Resources, Process Water, and Wastewater	• We set a target electricity saving rate of 1.5% for 2023, which will reduce electricity usage by an estimated 444,753 kWh and carbon emissions by 26,240 kg • The solar photovoltaic system at Longtan Factory was completed and began generating electricity for self-use on November 10, 2022, with an installed capacity of 180 kW. The system is expected to generate 183,960 kWh of electricity and reduce carbon emissions by 92,347 kg during the first year of operations • We plan to install charging stations on parking spaces near the Grape King Bio Tourist Factory; contracts were signed in 2022, and installations are scheduled to be completed in the second quarter of 2023 • Implement ISO14064 greenhouse gas inventories for all factory areas • Ensure all wastewater is discharged according to legal regulations and voluntarily exceed average Chemical Oxygen Demand (COD) standards for discharged water by 30% • Reduce composite wastewater discharge volumes by more than 3% • Actively obtain ISO14001 and other environmental management system verifications	• Continue to promote energy and carbon reduction measures, strengthen intensity of energy management, and set a target average electricity saving rate of 1.5% • Gradually increase usage of green electricity and achieve a target 3-4% of green electricity usage across all three factories • Assess and plan to recycle and reuse the heat of flash steam in each plant area to increase secondary energy usage • Ensure all wastewater is discharged according to legal regulations and voluntarily exceed average Chemical Oxygen Demand (COD) standards for discharged water by 35% • Reduce composite wastewater discharge volumes by more than 5% • Continue to implement pipeline inspections and increase water recycling programs	• Continue to promote energy and carbon reduction measures, strengthen intensity of energy management, and set a target average electricity saving rate of 1.8% • Gradually increase usage of green electricity and achieve a target 5-15% of green electricity usage across all three factories	
RE100	• Grape King Bio' s factories in Taiwan achieved 2% renewable energy usage in 2023 • Grape King Bio' s factories in Taiwan aim to achieve 3% renewable energy usage in 2024	• Grape King Bio's factories in Taiwan aim to achieve 4% renewable energy usage in 2025 • Grape King Bio's factories in Taiwan aim to achieve 5% renewable energy usage in 2026	• Grape King Bio' s factories in Taiwan aim to achieve 15% renewable energy usage in 2030 • Grape King Bio' s factories in Taiwan aim to achieve 100% renewable energy usage in 2035	
Management of Toxic Substances and Waste	• All waste disposal vendors hold legal licenses • Audit waste disposal and reuse vendors at least once every year • Actively obtain ISO14001 and other environmental certifications and environmental management system verifications	• Reuse food sludge as organic fertilizer and work with recycling vendors to test experimental uses; recycling vendors are currently awaiting environmental approval documentation • Initiate a new project to assess use of food sludge as renewable fuel • Aim to reduce domestic waste at all factories by 3%	• Achieve company-wide environmental protection targets and become an environmentally friendly enterprise • Obtain awards related to environmental protection	

COLUMN

RE100: Working with Global Enterprises to Achieve 100% Renewable Energy

"Grape King Bio is committed to RE100 targets and will continue to improve energy efficiency and use of renewable energies to generate value from waste, create positive environmental impacts, and maximize benefits from energy consumption."

RE100 is a global renewable energy initiative led by the Climate Group and the Carbon Disclosure Project (CDP), which gathers the most influential enterprises in the world and works to achieve environmental friendliness from an electricity demand perspective by increasing use of green electricity. Participating enterprises must publicly commit to 100% green electricity usage at a time between 2020 to 2050, as well as report annual progress.

Grape King Bio joined the international RE100 renewable energy initiative in 2019 and committed to the first stage of 15% usage of renewable energy by 2030 and the second stage of 100% usage of renewable energy by 2035. In June 2022, we began transferring solar power to our Pingzhen headquarters, and have transferred 300,000 kWh as of November 30.

Environmental Management

Director of Manufacturing Division
Yi-Ru Hu

Grape King Bio strives to co-exist with nature. Our product processes incorporate energy-saving, carbon-reduction, water-saving, and waste-reduction concepts into all production and product lifecycle stages to minimize environmental impacts.

The issue of climate change has become an operational focus for corporations seeking to achieve sustainable development. Green operations, environmental protection, and sustainable development are part of Grape King Bio's social responsibility and commitment. Our environmental safety and health management policies stipulate that we have a responsibility to implement environmental protection actions.

Grape King Bio adheres to the ISO14001 environmental management system and adopts the PDCA methodology for continued implementation of key environmental protection and management tasks. Our Pingzhen headquarters has already obtained ISO14001 environmental management system certification. We have also developed the following environmental management strategies:

Biodiversity

Formal assessments of potential biodiversity impacts from our operations (including assessments of environmental impacts prior to construction of factories in protected areas)

Local pollution

- Preventive actions in response to emergencies (for example, we installed overfill protection on diesel storage tanks and conduct regular inspections to avoid oil leakages)
- Minimize and reduce odors generated by our operating facilities
- Implement measures to reduce noise pollution (for example, we conduct autonomous noise assessments for our vehicles and production sites each year and adjust vehicle paths and operating times in accordance with the routines of neighboring communities)
- Implement measures to prevent dust and floating particles

Hazardous substances and waste materials

- Preventive actions in response to emergencies (for example, we installed overfill protection on diesel storage tanks and conduct regular inspections to avoid oil leakages)
- Minimize and reduce odors generated by our operating facilities
- Implement measures to reduce noise pollution (for example, we conduct autonomous noise assessments for our vehicles and production sites each year and adjust vehicle paths and operating times in accordance with the routines of neighboring communities)
- Implement measures to prevent dust and floating particles:

  1. Labeling, storage, processing, and transportation of hazardous substances throughout the Company adheres to established procedures: Waste containers and temporary storage areas are labeled in accordance with applicable regulations.
  2. Management of pollutants in exhaust emissions such as VOCs, heavy metals, nitrogen oxides, and sulfur oxides: We use clean energy (natural gas) in our boilers.
  3. Implement measures to reduce exhaust and air pollutants (such as by installing scrubbers and absorption systems): We regularly maintain the wet scrubbers at our wastewater plants.

Fulfill compliance obligations Reduce hazard risks
Implement environmental protection
Build friendly work environments
Support low-carbon energies
Enhance energy efficiency
Promote full employee participation
Improve sustainability cycles

Grape King Bio has implemented comprehensive environmental protection activities as well as formulated policies and executed practical actions for four main issues (energy and greenhouse gas management, water resource management, waste management, and green products) to build effective green operations. We actively establish sustainable development mechanisms, fulfill our corporate social responsibilities, work to achieve green operations, and make strides toward our sustainable development goals.

Grape King Bio Environmental Program Investments in 2022 (NTD):

Environmental Management Items	Zhongli Factory	Pingzhen Factory	Longtan Branch
Air pollution management costs	49,418	0	359,090
Wastewater management costs	34,520,950	578,438	1,637,415
Waste management costs	6,495,981	1,157,525	5,291,919
Noise management costs	0	0	0
Total	41,066,349	1,735,963	7,288,424

Environmental Management Plans for Grape King Bio Biotech Research Institute (Longtan Branch)

Our Biotech Research Institute was officially launched in 2019. We regularly repair and maintain all of our environmental protection equipment to ensure that they operate normally. To fulfill our corporate social responsibilities, we installed gas collection devices in our production areas and linked these to our gas processing equipment to improve environmental air quality. We began using food sludge as organic fertilizer in 2020 to enhance waste recycling rates and reduce related environmental burdens.

Our Biotech Research Institute has already passed Green Building label evaluations. To enhance overall production capacity and maximize resource usage rates, we continue to implement environmental management facilities such as HVAC designs, steam condensate recovery equipment, boiler economizers, and so on.

Carbon Reduction Measures

- The solar photovoltaic system at Longtan Factory was completed and began generating electricity for self-use on November 10, 2022, with an installed capacity of 180 kW. The system is expected to generate 183,960 kWh of electricity and reduce carbon emissions by 92,347 kg during the first year of operations. Cumulative generated power as of December 31 was 11,183 kWh and carbon emissions were reduced by 5,915 kg, equivalent to the annual electricity usage of three households and the annual carbon absorption capacity of 544 trees.
- In June 2022, we began transferring solar power to our Pingzhen headquarters, and have transferred 300,000 kWh as of November 30, meeting our first target.
- We continue to enhance circular recycling of water resources and accumulated 34,071 tons of ROR recycled water in our three factories as of 2022, reducing carbon emissions by about 5,110 kg, and increasing our water-saving rate by 2.7% compared with 2021.

6.1 Management of Energy Resources and Greenhouse Gases

The main energy sources used at Grape King Bio are electric power and natural gas. Electricity is mostly used to power common systems and production equipment, while natural gas is used for boiler fuel within factories.

6.1.1 Energy Management Measures

Grape King Bio completed re-evaluations of the ISO 50001 Energy Management System in August 2022 and continues to adhere to the PDCA energy management system in setting an energy-saving target of 1.3% in 2022 for all three factories. We use energy performance indicators and other tools to survey, track, and manage overall power usage of energy-consuming equipment and areas within our factories. We have also formulated internal training programs, implemented internal audits and management reviews, as well as compiled regularly updated documentation of internal and external risk issues. We executed the following strategies in 2022:

- We continued to adhere to the PDCA energy management system in setting an energy-saving target of 1.3% in 2022 for all three factories. We use energy performance indicators and other tools to survey, track, and manage overall power usage of energy-consuming equipment and areas within our factories.
- We have formulated internal training programs, implemented internal audits and management reviews, as well as compiled regularly updated documentation of internal and external risk issues. Achievements in 2022:

  (1) Optimized wastewater treatment processes and scheduled chemical treatment systems to achieve energy-saving benefits

  (2) The T5 lightweight steel lamps used in the storage area of Building A did not provide sufficient illumination and had higher power consumption, so were replaced with LED panel lamps

  (3) Installed scheduling controls on vertical air conditioners for the general packaging areas on each floor of the Manufacturing Division, saving around 84,057 kWh over the entire year

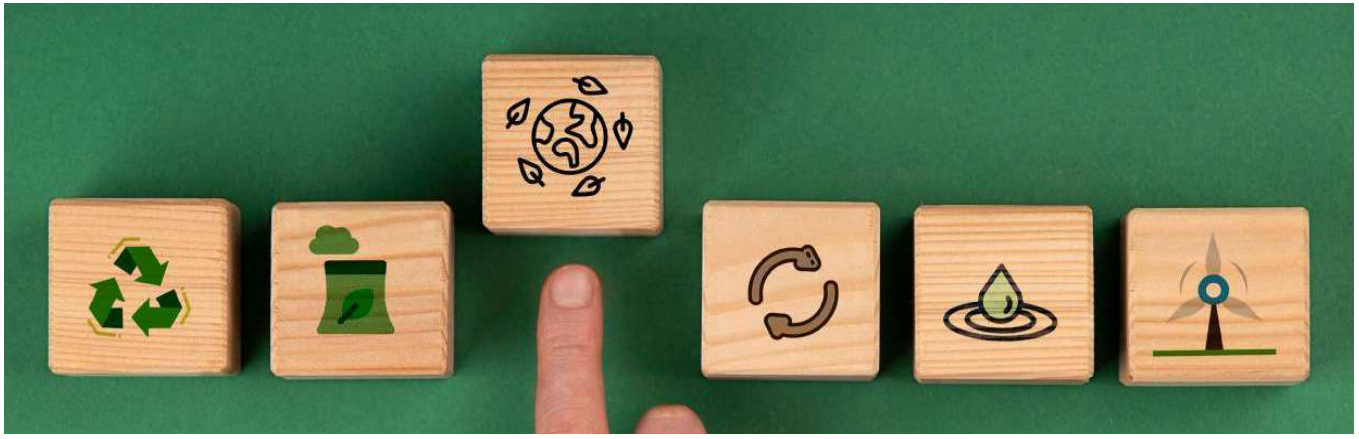
The following measures were formulated in 2022:

Factory	Measures
Pingzhen Factory	(1) Installed start-stop scheduling controls on vertical air conditioners for packaging areas of the Manufacturing Division, saving 84,057 kWh of electricity (2) Adjusted operation schedules for the chemical treatment systems in wastewater plants, saving 10,370 kWh of electricity (3) Installed energy-saving lighting equipment in the materials area of Building A, saving 4,602 kWh of electricity
Zhongli Factory	(1) Consolidated loading and adjusted scheduling of chilled water systems to enhance operational efficiency of compressors, saving 86,830 kWh of electricity (2) Enhanced efficiency of 200P brine systems on liquid formulation product lines and replaced old systems with high power consumption, saving 69,190 kWh of electricity (3) Adjusted frequency and speed of exhaust fans in wastewater and air pollution scrubbers, saving 27,370 kWh of electricity
Longtan Factory	(1) The solar photovoltaic system at Longtan Factory was completed and began generating electricity for self-use on November 10, 2022, with an installed capacity of 180 kW. The system is expected to generate 183,960 kWh of electricity and reduce carbon emissions by 92,347 kg during the first year of operations. (2) Adjusted operational schedules of air-conditioners in production line locker rooms and reduced energy consumption of cooling fans, saving 3,886 kWh of electricity (3) Adjusted night operational schedules of outdoor air-conditioners for laboratories on the fourth floor, reducing overall energy consumption of cooling fan motors, humidifiers, and heaters, saving 100,958 kWh of electricity (4) Adjusted outlet pressures of clean water and purified water supply pumps to reduce motor currents, saving 9,076 kWh of electricity

We convene EHS and Energy Management Committee meetings hosted by our Chairman every quarter to report on implementation status, project progress, internal and external issues, and follow-up items relating to ISO14001/ISO50001 systems.

Energy Saving Measures at Wastewater Plants

1. Adjusted operating times of 20HP blowers in wastewater plants. Originally, blowers were shut down at EOD (5pm) Monday to Thursday; shutdown times were changed to EOD Monday to Friday, and blowers were closed all day on Saturdays and Sundays, reducing the electricity required to operate blowers after EOD on work days and all day during holidays. A total of 41,563 kWh of electricity was saved over the entire year. (Pingzhen Factory)
2. Adopted energy conservation and management measures for mobile air compressors in wastewater plants, reducing electricity usage by an estimated 59,918 kWh each year. (Longtan Branch)
3. Actively implemented energy-conserving, carbon-reduction, and water-saving projects, saving 171,581 kWh of electricity and 9,060 cubic meters of water each year. (Zhongli Factory)
4. Gradually adjusted schedules of chemical treatment systems without affecting the quality of discharged water, reducing system operating times by a maximum of 35 hours per week and saving 19,259.2 kWh of electricity over the entire year.



6.1.2 Energy Usage

In 2022, we compiled energy usage data from our Headquarters (Pingzhen Factory), Zhongli Factory, Longtan Branch, and Pro-Partner. Total heavy crude oil, natural gas, electric power, diesel, and gasoline energy usage for the past three years is shown in the following table:

Item (Unit: MWh)		2020	2021	2022 Note1
Direct energy use	Natural gas energy consumption	19,410	19,477	18,434
	Diesel energy consumption	125	111	76
	Gasoline energy consumption	66	99	178
Indirect energy use	Electric power consumption	28,013	29,541	32,178
	Purchased renewable electric power (Power Purchase Agreement, PPA)	0	0	300
	Renewable energy (electric power) consumption	1	1	12
Total energy consumption		47,615	49,229	51,179

Note 1: We began incorporating energy usage data from Pro-Partner in 2022.

Energy Intensity

Production weight was used as a basis for calculating our energy intensity levels. Energy consumption by production weight at our Pingzhen Factory, Zhongli Factory, and Longtan Branch was calculated in kilograms. Our energy intensity levels for 2020-2022 are shown below.

Item	Unit	2020	2021	2022
Total energy consumption	GJ	171,317	177,177	184,186
Production weight	kg	4,919,029	5,384,000	7,835,000
Energy intensity	GJ/kg	0.0348	0.0329	0.0235

Greenhouse Gas Emissions

Grape King Bio implemented external ISO 14064-1:2018 inventories for the first time in 2022. The organizational boundaries encompass Grape King Bio's Taipei Operational Headquarters, Pingzhen Factory, Logistics Center, Zhongli Factory, Biotech Research Institute (Longtan Branch), telesales call center, Pro-Partner, and Rivershine Co. Ltd.

Item(Unit: tons CO2e)	2020	2021	2022
Scope 1 (Note 1)	3,753.74	3,862.04	5,633.7225
Scope 2 (Note 2, Note 4)	14,255.77	14,829.39	16,544.0541
Total	18,009.51	18,691.43	22,177.7766

Note 1: In 2020 and 2021, Grape King Bio used the "GHG Protocol" to conduct voluntary greenhouse gas inventories. Relevant parameters were taken from the Greenhouse Gas Emission Factor Table (version 6.0.4) released by the Environmental Protection Administration. The organizational scope of our voluntary inventory conducted in 2020 encompassed Grape King Bio, and the scope of our voluntary inventory conducted in 2021 encompassed Grape King Bio and Pro-Partner. Because we implemented external ISO 14064-1:2018 inventories for the first time in 2022, the base year was set as 2022.
Note 2: Electricity emission factors for 2022 referenced the electricity emission factor of 0.509 kg CO2e/kWh released by the Bureau of Energy.
Note 3: Electricity emission factors for 2021 referenced the electricity emission factor of 0.502 kg CO2e/kWh released by the Bureau of Energy.
Note 4: Electricity emission factors for 2020 referenced the electricity emission factor of 0.509 kg CO2e/kWh released by the Bureau of Energy.
Note 5: The Global Warming Potential (GWP) adopts the factors of Sixth Assessment Report (AR6) of Intergovernmental Panel on Climate Change (IPCC).

Greenhouse Gas Emissions Intensity

Item	Unit	2020	2021	2022
GHG emissions per unit of revenue	tons CO2 e / tons	1.9643	1.9076	2.1343
GHG emissions per product	tons CO2 e / tons	3.66	3.47	2.83

The significant increases in scope 1 emissions for 2022 was due to our comprehensive inventory of fugitive emissions, including emissions from air-conditioners, industrial refrigeration equipment, and other greenhouse gas sources. Additionally, we also calculated scope 3 emissions for the first time this year. In future, we will continue to expand inventories of scope 3 emissions and disclosure boundaries.

The final greenhouse gas emission values for Grape King Bio are as shown above. After obtaining verification of our ISO 14064 greenhouse gas inventory system in April 2023, we released the details on our website (Green Environment: Energy and greenhouse gas management). Please refer to our corporate website for more information.

6.1.3 Prevention of Air Pollution

Grape King Bio has installed and maintained air pollution prevention equipment to enhance and improve the environmental protection. All of our factories implement regular maintenance procedures for our equipment to ensure that they operate normally.

Results of Air Pollution Inspections at Zhongli Factory

Inspection Items	Standard Range (2022)	Boiler (E001)		
		2020	2021	2022
Particulate contaminants	<30mg/Nm3	-	-	-
Sulfur oxides	<150ppm	-	-	-
Nitrogen oxides	<100ppm	28	24	26
Inspection Items	**Standard Range (2022)**	**Boiler (E002)**		
		2020	**2021**	**2022**
Particulate contaminants	<30mg/Nm3	-	-	-
Sulfur oxides	<150ppm	-	-	-
Nitrogen oxides	<100ppm	55	52	67

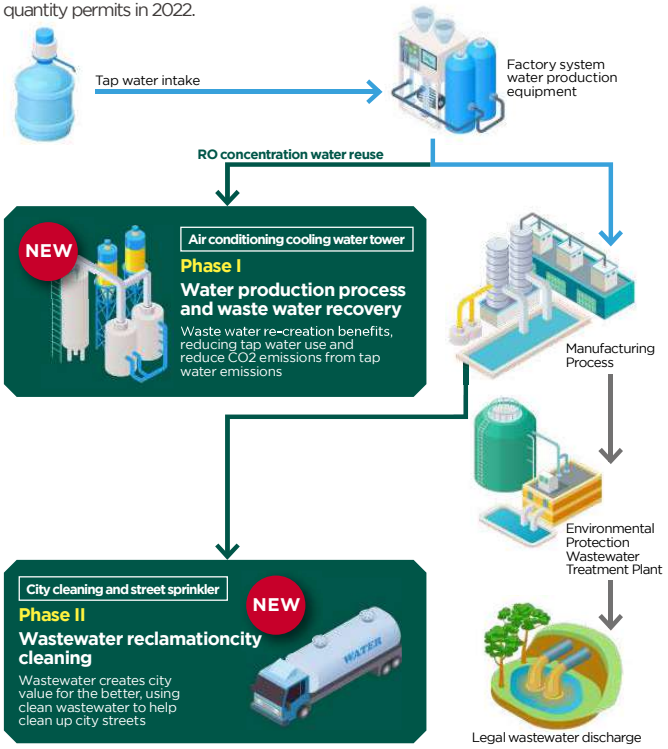
Results of Air Pollution Inspections at Longtan Branch

Inspection Items	Standard Range (2022)	Boiler (E001)		
		2020	2021	2022
Particulate contaminants	<30mg/Nm3		-	-
Sulfur oxides	<150ppm	-	-	-
Nitrogen oxides	<100ppm	34	37	42

Note: At present, all boilers at Grape King Bio use natural gas as fuel. We conduct inspections according to regulations, with regular inspections of nitrogen oxide emissions each year, and measurements of particulate contaminants taken in the years when permits are being renewed.

6.2 Management of Water Resources

Taiwan experienced an unprecedented level of drought in recent years. In appreciation of our precious water resources, we work to prevent wastage of water resources and ensure efficient use of energy resources. Grape King Bio developed a process water recirculation system based on a circular economy framework. By making simple adjustments to existing equipment and systems, our factories were able to recycle and reuse high-concentration process water originally discharged to wastewater plants, thereby reducing wasted water resources and wastewater volumes. We aim to recycle 5,000 tons of process water each year. We recycled 20,121 tons of process water in 2022, and have now cumulatively recycled 34,071 tons. Grape King Bio did not incur any violations of legal standards related to water quality/ quantity permits in 2022.



Year		2020	2021	2022	
				Manufacturing sites (Note4)	Office sites (Note5)
Water withdrawal (million liters) (Note 1)	Groundwater withdrawal (million liters)	66.39	72.00	119.40	0
	Water from third party-Tap water withdrawal (million liters)	258.35	208.43	206.33	12.38
	Total water withdrawal (million liters)	324.74	280.43	338.11	
Discharge amounts (million liters) (Note 2)		263.16	215.84	260.03	NA (Note 6)
Water consumption (million liters) (Note 3)		61.58	64.59	65.70	
Water use intensity (million liters/million dollars in revenue)		0.0354	0.0348	0.0325	
Wastewater disposal intensity (million liters/million dollars in revenue)		0.0287	0.0220	0.0250	

Note 1: All water was sourced from ground water and Water from third party-tap water, and was not taken from any other sources. All the water was taken from Taiwan, not from water-stressed sites.
Note 2: After the sewage treatment, it will be discharged into the sanitary sewer.
Note 3: Water consumption = Water withdrawal - Discharge amounts
Note 4: Manufacturing sites included Pingzhen Factory, Zhongli Factory, and Longtan Branch.
Note 5: Office sites included Logistics center, Taipei Operational Headquarters, Telesales call center, Grapeking Museum, Pro-Partner, and Rivershine Co. Ltd.
Note 6: Because the discharge amounts of office sites could not be calculated, discharge amounts and water consumption only included Pingzhen Factory, Zhongli Factory, and Longtan Branch.

6.2.1 Production and Related Inspections for Process Water

The pure water used in manufacturing processes at Grape King Bio passes through multiple stages to remove impurities and hazardous substances. We continually inspect and monitor water quality to ensure compliance with standards of raw materials used for health food manufacturing.

Pure water production process

1. Impurities are removed by quartz filter machines
2. Activated carbon is used to neutralize residual chlorine and absorb dissolved organic substances
3. Water softener machines are used to filter out calcium and magnesium ions
4. Finally, reverse osmosis and UV sterilizers are used to remove heavy metals, bacteria, hazardous substances, and dead bacteria to meet the requirements for pure water.

Pingzhen Factory

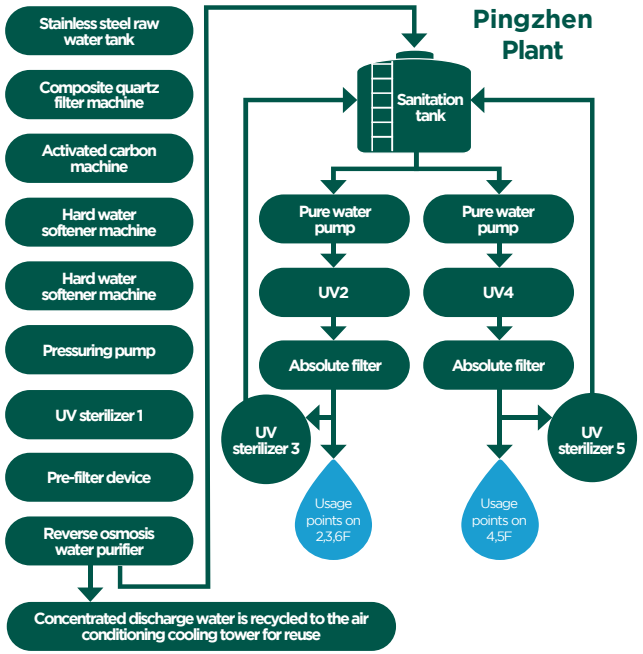
In 2022, Grape King Bio invested NT$ 400,000 in outsourced water quality inspections. Grape King Bio conducts internal monitoring procedures and also commissions external institutes to conduct periodic water quality inspections. A total of 518 items were inspected internally this year. Quality assurance specialists periodically collect water samples and perform multiple inspection procedures under relevant regulations (please refer to Appendix Table 3 for more information).

6.2.2 Wastewater Discharge Management

In order to expand green benefits, Grape King Bio adheres to the 3R principles (reduce, recycle, reuse) to further optimize waste classification processes for recyclable items while also working to create additional value from waste sludge. Grape King Bio has formulated comprehensive operational procedures for management of wastewater disposal. All discharged wastewater must pass through specific processing procedures, and water quality is inspected periodically to ensure compliance with governmental regulations. We incurred no violations of environmental protection laws and regulations in 2022. We implemented the following wastewater management measures:

1.Production EHS requirements:

For water pollution prevention and control management, in addition to compliance with laws and regulations, it is also oriented towards water-saving planning and management.



1. Daily tests of water quality: To strengthen wastewater management, we require our wastewater treatment plants to regularly inspect water quality at frequencies higher than that required by law, to ensure that the quality of our discharged water adheres to environmental regulations.
2. Water-saving improvements for process water: Installed new machinery and equipment with water-saving designs that can be used during planned periods to reduce water usage and wastewater volumes.
3. Reusing reclaimed water: Our Pingzhen and Longtan factories are respectively equipped with 690-ton and 400-ton rainwater storage tanks, which provide water not used in production process and which does not come into contact with our personnel.

2.Preventive maintenance procedures:

As part of our aim to become an eco-friendly company, we not only replace old equipment and pipelines from time to time, but also implement preventive maintenance procedures and regular internal water quality inspections to ensure that our discharged water adheres to relevant standards.

3.Upgrades to wastewater treatment equipment:

1. From time to time, we voluntarily sample and test the water discharged by our treatment vendors and also train professional technicians responsible for wastewater treatment
2. We work with our production units to segregate high- and low-concentration wastewater to enhance treatment efficiency
3. We optimize wastewater system settings to increase treatment capacity
4. Process wastewater which has undergone chemical treatment and biological decomposition processes can only be discharged when water quality adheres to legal standards. Additionally, hazardous industrial waste is collectively stored and managed before periodic disposal and treatment by government-approved vendors.

Wastewater Quality Inspections: Inspection Items for Discharged Water

Zhongli Factory							
Inspection Items	**Standard Range**	**2020(First half)**	**2020 (Second half)**	**2021(First half)**	**2021(Second half)**	**2022(First half)**	**2022(Second half)**
pH value	6-9	8.2	8.6	8.2	8	7.3	7.5
COD (Chemical oxygen demand)	<100mg/L	43.8	34.3	37.3	15	30.8	67.3
BOD (Biochemical oxygen demand)	<30mg/L	<1	<1	2	<1	2.9	17.5
True color	<400ADMI	50	63	30	35	<25	63
SS (Suspended solids)	<30mg/L	11.7	4.2	13.1	4.2	12.2	18.3
Water temperature	<38℃ (May to September) <35℃ (October to April)	29.8	28.8	36.7	24.4	28.9	31.9
Free available residual chlorine	<2.0mg/L	0.17	0.08	0.06	0.03	ND	0.03
Coliform levels	<200,000 CFU/100 ml	-	-	-	3,100	-	-

Pingzhen Factory							
Inspection Items	**Standard Range**	**2020(First half)**	**2020 (Second half)**	**2021(First half)**	**2021(Second half)**	**2022(First half)**	**2022(Second half)**
pH value	6-9	7.7	7.5	7.2	7.5	7.6	8.0
COD (Chemical oxygen demand)	<100mg/L	26.3	22.5	31.8	27	18.2	8.0
BOD (Biochemical oxygen demand)	<30mg/L	10.2	9.2	9.8	8.4	7.4	8.2
True color	<400ADMI	-	-	-	-	-	<1.0
SS (Suspended solids)	<30mg/L	9.2	7.9	9.5	10.9	7.8	<2.5
Water temperature	<38℃ (May to September) <35℃ (October to April)	29.8	29.9	28.6	27	32.4	28.6
Free available residual chlorine	<2.0mg/L	2.5	3.6	2.4	2.2	<0.5	<0.5
Coliform levels	<200,000 CFU/100 ml	-	-	57,000	310	57000	310

Longtan Factory							
Inspection Items	**Standard Range**	**2020(First half)**	**2020 (Second half)**	**2021(First half)**	**2021(Second half)**	**2022(First half)**	**2022(Second half)**
pH value	6-9	8.1	8.1	8.2	8.8	7.8	8
COD (Chemical oxygen demand)	<100mg/L	21.2	35.4	4.8	23.1	27.7	19.2
BOD (Biochemical oxygen demand)	<30mg/L	7.7	11.2	29.6	<1	1.5	1.3
True color	<400ADMI	17	81	57	112	69	44
SS (Suspended solids)	<30mg/L	11.1	8.4	2.9	1.4	< 2.5	10.2
Water temperature	<38℃ (May to September) <35℃ (October to April)	26.4	30.9	34.8	22.9	27.9	28.4
Free available residual chlorine	<2.0mg/L	1.4	1.4	1.3	0.6	< 0.5	0.8
Coliform levels	<200,000 CFU/100 ml	-	-	-	-	-	-

6.3 Waste Management

Grape King Bio conducts waste classification, collection, storage, management, and disposal to effectively manage industrial waste and other types of waste. Disposal, handling, and reuse of waste materials are conducted per environmental laws and regulations. Our Longtan Branch uses food sludge as organic fertilizer to enhance waste recycling rates and reduce waste disposal costs. We incurred one regulatory violation incident in 2022 and were fined NT$ 6,000 due to a violation of Paragraph 2, Article 28 of the Waste Disposal Act. Due to this incident, we hired a new Class B waste disposal technician.

Other relevant management measures included:

1. In accordance with environmental laws and regulations, our factories have formulated industrial waste disposal plans and implement waste management procedures in accordance with law.
2. In accordance with ISO 14001 environmental management system requirements, our factories have established waste management operational standards and implement waste management procedures in accordance with our management regulations.
3. We have signed waste disposal and treatment contracts with authorized public and private waste disposal and treatment companies to handle relevant procedures.
4. In accordance with laws and regulations, waste disposal and treatment processes are filed online, and tracking and confirmation of final processing statuses are implemented within required time limits.
5. Our environmental management personnel conduct irregular on-site inspections of waste treatment companies to ensure that waste disposal and treatment processes adhere to relevant regulations. Our Longtan Factory has completed 1 audit of waste treatment and reuse vendors (Recyigner) and our Pingzhen Factory has completed 4 audits of waste treatment and reuse vendors (Jack, Shimei, Lipu, Xinlong).

Waste disposal amounts for Grape King Bio in 2022 were as follows:

Types and disposal method Unit (ton)		2020	2021	2022
Non-Hazardous Waste	Reuse and recycling	1,008.00	1,517.71	2,407.39
	Incineration	104.13	37.52	112.091
	Landfill disposal	None	None	None
	Other disposal methods (physical treatment)	15.82	40.78	18.93
	Other disposal methods (thermal treatment)	641.43	366.53	276.69
	Total	1,769.38	1,962.54	2,815.101
Hazardous Waste	Reuse and recycling	None	None	None
	Incineration	1.60	7.02	10.81
	Landfill disposal	None	None	None
	Other disposal methods	None	None	None
	Total	1.60	7.02	10.81
Recyclable		194.85	105.47	94.68

Waste management highlights

1. Promoted classification and treatment procedures for sterilized non-infectious industrial waste (D-2101). (Zhongli Factory)
2. Promoted reuse of food sludge to generate green electricity. (Zhongli Factory)
3. Under the CSR “Bottles of Love” charity event, our environmental protection department collected and temporarily stored 200 kilograms of recycled bottles which are scheduled to be decomposed into reusable plastic pellets in June 2023 for recycling and reuse as part of our environmental protection initiative. (Pingzhen Factory)