

3. Commitment to Environmental Sustainability



3.1 Environmental Management Responsibility

3.2 Climate Change and Energy Management

3.3 Water Resources Management

3.4 Pollution Prevention and Management

3.5 Packaging Materials Management

3.1 Environmental Management Responsibility

(GRI 3-3、GRI 301-1、GRI302-3)

Material Topic	Operational Environment Management
 <p>Policy and Commitment</p>	<p>Develop environmental management policies covering six aspects of "Legal Compliance, Pollution Prevention, Green Procurement, Performance Management, Communication Mechanism, and Continuous Improvement" as the highest guidelines of environmental management.</p>  <p>Environmental Policy Uni-President Enterprises Corporation</p> 
 <p>Goal</p>	<p>Develop annual management targets based on the management projects concerning energy conservation, carbon reduction, waste reduction, and wastewater discharge to minimize their impact on the operating environment. ※See the "Sustainable Value Chain" chapter for the annual management goals and the goal-fulfilling status.</p>
 <p>Action Plan</p>	<ul style="list-style-type: none"> • Introduce ISO 14001 and make all documents and operating processes subject to verification by a third-party certification unit on a regular basis. • Perform greenhouse gas (GHG) inventory annually in accordance with the ISO 14064-1 inventory process. • Regularly track the revision of government environmental laws and regulations and update the same, and formulate response plans. • Establish a sustainable procurement system and clearly state in the procurement policy that green products should be given priority and gradually introduce sustainable raw materials. • Each plant to take the initiative to introduce energy conservation, carbon reduction, water saving programs and waste recycling programs to reduce the environmental impact arisen from the production process.
 <p>Evaluation Mechanism</p>	<ul style="list-style-type: none"> • Continue to maintain the effectiveness of the ISO 14001 management system. • Comply with environmental laws and regulations. • Review the annual achievement rate for energy conservation, carbon reduction, waste reduction, and wastewater management targets.
 <p>Grievance Mechanism</p>	<p>Establish environmental communication and management processes, and make the Administrative Service Division and the Environmental Protection Team responsible for internal and external communication affairs. Stakeholders may report environment related matters via the contact number of each production plant. As the plant receives the relevant information, the communication management process will be initiated to handle the issue according to the type of the issue.</p>



Material Topic

Packaging Material Management



Policy

Introduce and develop optimal environmentally friendly and functional packaging materials; proactively promote lightweight packaging materials and reducing plastic packaging using in our products.



Goal

Use eco-friendly materials and implement plastic packaging reduction.

※ See the "[Sustainable Value Chain](#)" chapter for the annual management goals and the goal-fulfilling status.

Responsibility
and Resource

Create a Packaging Material Technology Team within the Commercialization R&D Institute to improve and advance product packaging materials.



Action Plan

- Use FSC-certified paper materials as paper-based packaging materials, and continue to evaluate the feasibility of putting them in use in the production line.
- Collaborate further with external organizations on researching and developing technologies for the decomposition or recycling of plastic to explore more application opportunities.

Evaluation
Mechanism

- Continue to implement the project to reduce plastic components in packaging materials, thereby reducing plastic consumption.
- Persist in advancing lightweight packaging technology to lessen the weight of product waste.

Grievance
Mechanism

The Consumer Service Center receives comments from our consumers via multiple channels (0800 hotline, official website, service mailbox, retail feedback). Gain insight into customers' thoughts regarding product packaging materials, and then provide feedback to the Packaging Material Technology Team; convert feasible suggestions into actions of packaging material reduction and plastic reduction through systematic management.

Environmental Management Performance for the Past 3 Years

Environmental Management Performance	Unit	2020	2021	2022
Water Consumption (Water Withdrawal) Intensity	Thousand cubic meters / \$10 million	1.00	0.99	0.90
Waste intensity	Metric tons / \$10 million	9.05	8.39	7.80
Air pollution emission intensity	Metric tons / \$10 million	0.017	0.014	0.011
Self-Operating GHG emission intensity ^{Note2}	Metric tons of CO ₂ e / \$10 million	37.72	36.25	35.52
Power intensity	GJ / \$10,000	0.35	0.35	0.34

Note:

1. The denominator of each type of environmental management performance is the sales revenue of Uni-President for the current year
2. The numerators for the self-operating GHG emission intensity of Uni-President are GHG emissions of Scope 1 and Scope 2 for past years

3.1.1 Environmental Management Mechanism

(GRI 103-2 、GRI 103-3)

At Uni-President, we adopt a group management approach, taking into account the development trends of global environmental issues and the direction of Taiwan's environmental policies, while combining key issues faced by Uni-President and each of our affiliated company. Our environmental management is based on the ISO 14001 environmental management system, and we entrust a third-party verification company to conduct an inspection on documents and operating procedures to ensure correct implementation of the plant's internal environmental management system. We have established a management team for environmental risks that require proactive management such as GHG emissions, energy usage and water resource issues for project-based management.

Uni-President has formulated six major aspects of the environmental management policies as the highest principle guiding environmental management. Currently, all general plants in Taiwan have passed the new environmental management system ISO 14001:2015 certification. Moreover, each general plant has set further annual targets and management plans as the Company's priorities in order to continuously improve environmental management performance.



Uni-President Environmental Management Policies



Legal Compliance:

- We abide by the government's environmental regulations and stakeholder concerns and formulate the Company's environmental regulations.
- Supervisors at all levels lead by example and perform supervisory duties to ensure that the Company is on par with regulatory requirements.



Pollution Prevention:

- We implement source management right at the product development stage to implement waste reduction, energy conservation, waste to resources, recycling, clean production, and green logistics and transportation, in order to reduce emissions and mitigate ecological and environmental impacts.
- We also establish the environmental management system (ISO 14001), implement greenhouse gases (GHGs) inventory (ISO 14064-1), and quantify and communicate the carbon footprint of products (PAS2050 or ISO 14067).



Green Procurement:

- By establishing a green procurement mechanism, implementing supply chain management, and prioritizing green material procurement, we help suppliers reduce wastage and pollution.



Performance Management:

- We establish objectives for environmental improvement, implement active and passive performance indicator management, improve management performance, and disclose relevant information regularly.



Communication Mechanism:





- We establish communication and consultation channels and communicate our environmental policy to all members within the organization and stakeholders for them to understand their responsibilities.
- We also disclose environment-related information, raise the environmental awareness of stakeholders, and make improvements based on the opinions of stakeholders.



Continual Improvement:

- To popularize environmental training and strengthen the awareness of all employees.
- To implement the environmental protection system and standards as well as systemic management for continuous improvement.

Main targets, subjects and introduction programs for ISO 14001 in 2022

Management Target	Introduction Program	Annual Management Achievement
 Enhancement of environmental protection awareness	To provide environmental and general training and education	180 employees – hours/year
	Monthly environmental texts	12 sessions/year
 Meet regulatory requirements	To implement level 3 auditing on environmental protection parameters	23 deficiencies identified in internal audit and 1 violation on environmental protection
	Carbon emissions inventory guidance and verification	Complete Uni-President's greenhouse gas inventory and obtain external verification
	Shaft odor control	Yungkang General Plant The restaurant has installed air pollution control devices to reduce the smell to less than 500.
	Improvement in aeration efficiency of biological treatment system	Chungli General Plant Maintained the dissolved oxygen level in the wastewater treatment system to meet the requirement
 Reduction of wastewater/waste	Sludge treatment optimization and reduction	Yangmei General Plant Completed installation of a sludge dryer in the wastewater treatment facility to treat the biomass resource derived from food sludge Hukou Park Optimization of sludge concentration treatment
	Waste plastic packaging for food recycled and reused	Hukou Park Reinforced the separation and classification of waste plastic food-packaging materials to lower the possibility of inclusion of unwanted materials.
	Optimization of the pickling temperature during the CIP process for semi-finished barrels in the sterilization area	Xinshih General Plant Reduced annual steam consumption by 60 tons Reduced annual water consumption by 4,000 tons
Improvement in recycling and reuse of process water		
 Reduction of energy consumption	Project of energy efficiency improvement for air compressor systems and chilled water mainframes in the plants	A total of 1,877,154 kWh/year electricity of all general plants was saved
	Project to improve the energy efficiency of in-plant cooling towers	
	Project to improve the efficiency of in-plant freezers and motors	

2022 Uni-President Environmental Footprint

Increased utilization of raw materials



Fresh milk production rate reached **96.80%**



Soybean production rate increased to **98.98%**



Tea leaves wastage reduced by **5.17%**

Ingredients/materials input(tons)

• Milk, powdered milk	143,902
• Soybeans (nongenetically modified beans + for feed)	9,721
• Tea leaves	1,974
• Coffee beans	8,653
• Sugar	27,986
• Flour	42,623
• Beef	1,064
• Palm oil	5,860
• Pork	3,661
• Wheat	110,992
• Corn	82,104



Energy saving



Reduced electricity by **7,349.08** thousand kWh



Reduced **531.38** natural gas by thousand cubic meters

Energy consumption (GJ)

• Purchased electricity	1,601,648
• Fuel oil	
• Diesel	
• Biodiesel	
• Petroleum	
• Natural gas (NG)	
• Liquefied petroleum gas (LPG)	347
• Self-generated green electricity	



Water saving

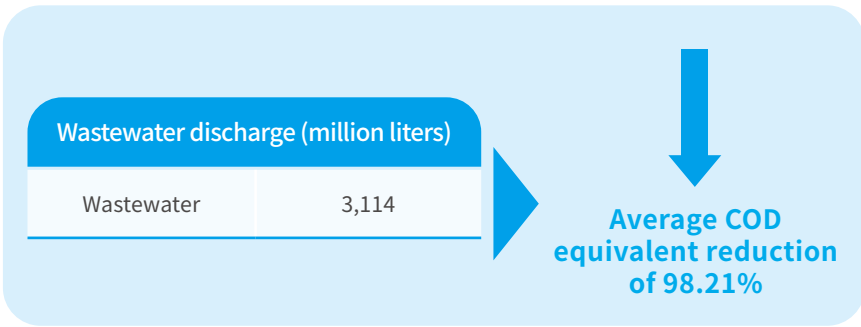
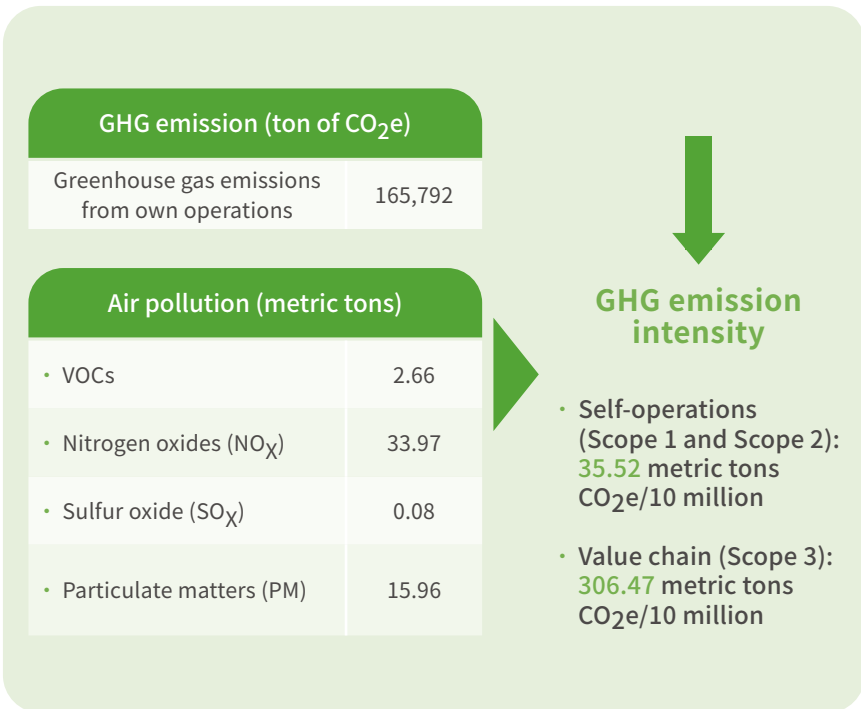
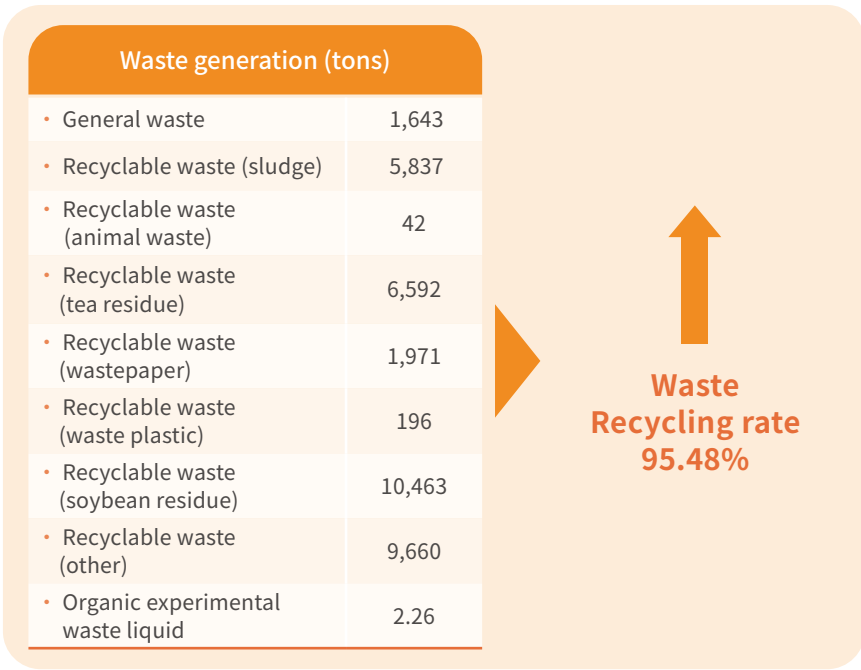


Reduced by **39.15** million liters

Water resources consumption (million liters)

• Total water withdrawal	4,198
• Surface water	365
• Municipal water	3,676
• Underground water	157





3.1.2 Green Procurement and Sustainable Materials

In Uni-President's environmental management policy, green procurement and sustainable materials are important responsibilities and commitments to sustainable development. We give priority to green products upon procurement and emphasize on environmental protection, energy conservation and carbon reduction of the supply chain. By putting our green procurement mechanism into good use, we hope to gradually reduce the environmental impact caused by our operations. Since 2013, Uni-President has been awarded the Private Enterprise Green Procurement Excellence Award by the Environmental Protection Administration of the Executive Yuan. Our total green procurement amount totaled NT\$1.318 billion in 2022, an increase of 10.94% compared to the previous year. In addition, since 2019, Uni-President has been purchasing paper-based packaging materials bearing the FSCTM mark. The ratio of FSCTM procurement amount accounted for 38.50% of the total procurement amount of paper packaging materials in 2022.

Note: FSCTM (Forest Stewardship CouncilTM), founded in 1993, is an independent non-governmental organization (NGO) established by global environmental groups, timber trade organizations, foresters, local residents and certification institutions. FSCTM forest certification is one of the most recognized forest certification standards in the world.

Year	2020	2021	2022
Amount of green procurement (Unit: NT\$ million)	1,162	1,188	1,318



With respect to raw materials, we continue to keep a close eye on domestic and international material trends, while gradually introducing the procurement of relevant certified raw materials for our key ingredients. Summarized as follows:

Category	Certification content	Certification mark
Paper packaging materials	FSC TM certification	
Soybean	Non-GMO Project Verified	
Palm oil	Roundtable on Sustainable Palm Oil (RSPO) certification	

Sustainable Soybean Procurement

The U.S. Soybean Sustainability Assurance Protocol (SSAP) is a system for sustainable soybean production widely used in the U.S and is audited and certified by a third party. The SSAP can further reduce the impact of soybean production on land use, reduce soil erosion, increase energy efficiency and reduce GHG emissions. As soybeans are an important raw material for our products, the proportion of SSAP soybeans purchase amount in the past 3 years accounted for more than 30% of all soybeans purchased. The purchase volume in 2022 was 3,519 metric tons, up 23.19% from 2021.

Sustainable Palm Oil Procurement

As a means to improve the use of sustainable palm oil, Uni-President makes inventories on the products that use palm oil, while also ensuring the source of main suppliers. At present, the inventory results show that the main product that uses palm oil is instant noodles. As palm oil is mainly supplied by our affiliated company President Nisshin, and as a member of the RSPO, President Nisshin has attained a certification by a third party certification company. Uni-President has been purchasing RSPO palm oil since 2022, and will continue to pay attention to this issue to improve product sustainability.

Sustainable Tea Management and Local Procurement

Consumers have a deep affection for the tea products of Uni-President. To ensure food safety and fulfill its commitment to sustainability, Uni-President has its Commercialization R&D Institute formulate rules for purchasing tea leaves, and actively promotes local procurement to reduce the carbon footprint resulting from transportation of raw tea leaves. In 2022, Uni-President's local procurement amounted to about 1,200 tons.

In terms of tea leaves management, Uni-President adopts multiple measures that ensure the safety, quality, and stable supply of tea leaves and the health of consumers. By adhering to the MOHW's "Standards for Pesticide Residue Limits in Foods", Uni-President manages its tea leaves. To protect food safety for consumers, it keeps track of changes in regulations at all times to provide the needed aid to vendors and farmers, thus helping to ensure rational management of tea raw materials. In addition, Uni-President has implemented a complete traceability system; all tea leaves can be traced back to the tea garden. Uni-President will continue to improve the sustainability of our tea products while safeguarding consumer health through our strict food safety inspection mechanism.

Note: Local procurement is defined as first-tier suppliers in Taiwan, without taking in account the location of second-tier suppliers.

Sustainable coffee beans management and procurement

Over the last few years, the worldwide craving for coffee drinks has been on the rise. To guarantee the quality of its coffee beans and remain committed to sustainability, Uni-President has established principles for the purchase of green coffee beans. The main point of the principles is to ensure food safety and consistency in quality, so as to give consumers safe and dependable products. When it comes to specific measures, each batch of green beans must be inspected for pesticide residue to meet food regulations.

Uni-President's actions to procure coffee beans are as follows:

By purchasing Taiwan's local green coffee beans, we not only reduce the carbon footprint resulting from raw material procurement, but also promote the growth of Taiwan's coffee supply chain.



By establishing a traceability system for purchased specialty coffee beans, we can fully trace them back to the processing plant or estate in the production area, thereby ensuring product quality.



Uni-President continues to pay attention to Rainforest Alliance-certified coffee production regions or estates and evaluates the purchase of Rainforest Alliance-certified coffee beans, aiming to provide consumers with more sustainable coffee drinks.



In the future, Uni-President will continue to enhance green coffee beans procurement management, promote the concept of green production, and ensure the food safety of coffee beans through the production and sales history of green coffee beans; doing so safeguards food safety for consumers while providing them with quality and sustainable coffee products.

3.1.3 Environmental Protection Expenditure

We strive to alleviate the burden on the environment during the process of producing and providing services. For the past 3 years, the average environmental expenditures were NT\$442.589 million. The amount of expenditure in 2022 increased by 6.29% from 2021, mainly due to the purchase of a new sludge dryer worth NT\$13.633 million in the Yangmei General Plant. For the data of environmental expenditures for the past 3 years, Please refer to Appendix – ESG Information.

3.1.4 Raw Material Utilization Rate Improvement

(GRI 301-1)

To promote a green economy, we continue to optimize raw material utilization rate. We introduced a number of technologies in the product process in 2022. These technologies included wear and tear reduction in the production line of raw materials for fresh milk and improvements in soybean and tea extraction technology. In doing so, production capability has improved compared to past years, to further reduce resource consumption.



Fresh Milk

In 2022, the production rate of fresh milk was 96.80%, a 0.01% improvement from the same period in 2021, avoiding a loss of 12.07 tons of milk. Our objective for 2023 is to maintain a 96.85% raw material production rate, and improve it further through our batch production loss reduction project.



Soy Milk

This year, by continuing to improve soybean extraction technology, we achieved an optimal production efficiency of 98.98% after adjusting the parameters of the bean grinder and the ratio between water and beans. The goal of achieving a soybean extraction rate of 98.40% by 2025 has been surpassed ahead of time.



Tea leaves

With respect to the improvement of the tea extraction rate, the production line and research personnel jointly tested different tea extraction conditions by making adjustments to the extraction parameters of the tea extraction rate and the ratio of water volume and tea leaves (tea-water ratio), while also extending the stirring time. Different combinations were tested to gain the best extraction conditions. The experiment in 2022 revealed that the amount of tea leaves lost could be further decreased by 5.17%.

Established smart production lines

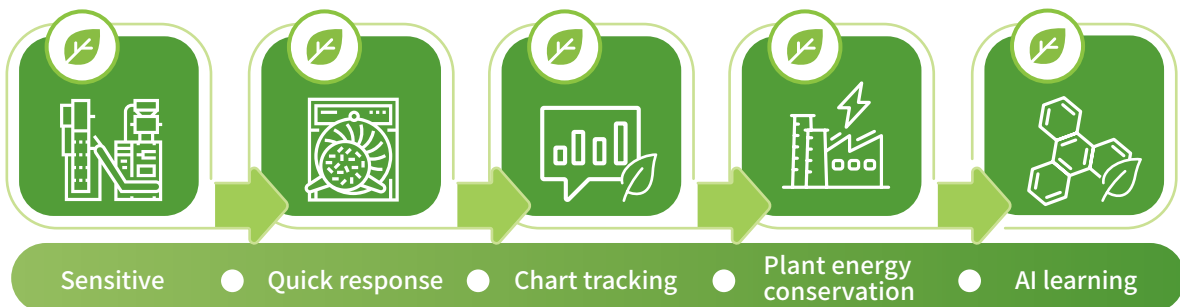
At Uni-President, we keep a close eye on smart production to improve the efficiency of product manufacturing. We have applied for the pilot program to the Ministry of Economic Affairs for testing the smart production of the tea drink production line. The main items for the smart production system cover: electronic in-plant forms and energy-saving control mechanism, which are expected to constantly innovate and improve the production technology of products and achieve the effect of proper utilization of energy resources. We expect to gradually promote this experience onto other production lines once the program is proven to be successful. By doing this, we will fully facilitate transformation of production lines with Industry 4.0 smart production systems. Our primary establishment scheme has two primary concentrations.



Connect data at the raw material end, the process end, and the quality control end to the monitoring system

Guarantee that the actual operational parameters at the end of the process can be implemented accurately in line with the standards

Uni-President smart production lines



3.2 Climate Change and Energy Management

(GRI 302-1、GRI302-2、GRI302-4、GRI 305-1、GRI 305-2、GRI305-3、GRI 305-4、GRI 305-5)

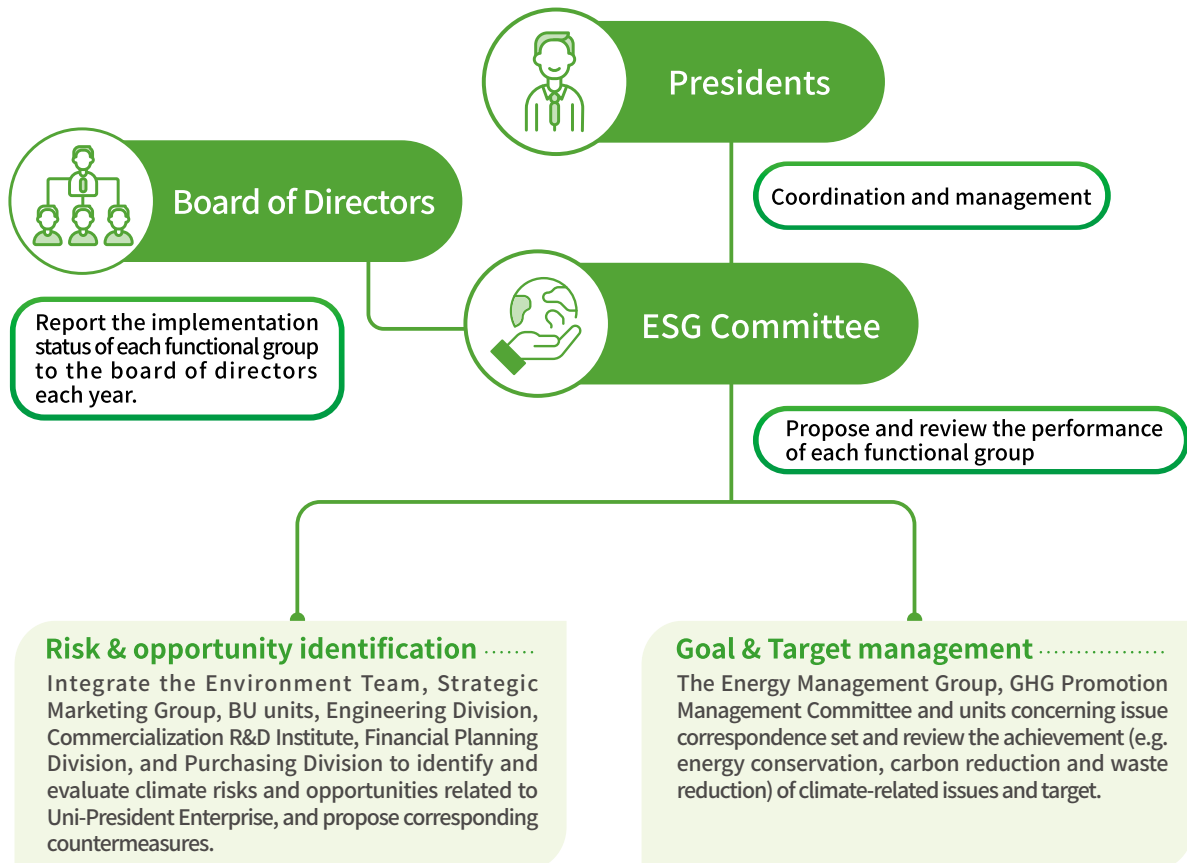
Many climate-related natural disasters have occurred in recent years, including forest fires in Western U.S., heavy rainfall and severe flooding in Western Europe, heat waves in North America, and floods in Henan Province, China. Not only have these natural disasters caused operational losses for many companies, but they also directly affect the daily lives and properties of many people. According to the 2022 report of the Intergovernmental Panel on Climate Change (IPCC), climate change has caused widespread adverse impacts on both the natural environment and human society. We must not only do our utmost to stop the continuous global warming through practical actions such as carbon reduction, but we also must improve our ability to adapt to present and future shocks.

When it comes to climate change risk challenge, no one should step aside, and that includes Uni-President. In the past, not only have we done our utmost to save energy and reduce carbon in our plants, but to reinforce our climate risk control mechanism, we adopted the disclosure and management framework prescribed in the task force on climate-related financial disclosures (TCFD) in 2020. This assess and reviews the impact posed by climate change, which enables us to develop short-, medium- and long-term governance strategies for climate changes issues in order to respond to the impact brought by climate change.

3.2.1 Climate Risk Governance

At present, the governance structure for our climate change issues is coordinated and monitored by the President. The ESG Committee controls and manages related issues and assesses their impact. Each year, the Committee reports to the Board meeting on the implementation status of each functional group. Based on the business scope and management development of Uni-President, the Committee conducts an overall assessment of the risks and opportunities arising from climate change in order to propose appropriate response strategies. By doing so, the impact brought about by climate issues on the business is reduced and the operational resilience in climate-related issues enhanced.

Uni-President Climate Change Risk Governance Framework



Note: BU units include Dairy and Beverage Group, Baking Business Group, Provisions Group, General Foods Group, and Food-for-Life Group.

3.2.2 Assessment and management of, and response to, climate risks and opportunities

In an attempt to understand the impact of climate change on company business, strategies and financial planning, through a three-stage approach, we have identified five major climate risks and one major opportunity. For a detailed methodology of the assessment, please refer to our 2020 CSR report. We re-analysis of industries and issues in 2022 and further review and adjust our response to and management of issues arising from climate risks and opportunities.



Response and Management of Climate Risk and Opportunity Issues

Climate risks and opportunities	Potential impact to Uni-President	Time interval
 <p>Physical risks</p> <p>Increase of severity of extreme weather events such as typhoons, floods and droughts</p>	<p>Faced with increasing probability of extreme weather events, our supply chain for raw materials may lead to disruption, or we may need to increase the number of days for storage of raw materials and products due to droughts or water scarcity. In addition, extreme weathers may cause damage to our plant equipment, raw materials or products, and road disruptions may result in difficulties in transporting raw materials or power or water outages, which may affect the production.</p>	<p>Short-term (less than three years)</p>
 <p>Transformation risk</p> <p>Requirements and monitoring of existing products and services</p>	<p>As there is growing emphasis on sustainable products, we may begin to impose related regulations on products, or require reducing plastic used for packaging and product carbon footprint investigation. If our products are not labeled in accordance with related regulations, fines may be imposed due to violation, while the plastic reduction plan for product packaging and carbon management tool introduction will increase our R&D and product carbon management costs.</p>	<p>Mid-term (three to five years)</p>
 <p>Transformation risk</p> <p>Climate-related policy</p>	<p>The government is gradually amending its regulations for greenhouse gas emissions and renewable energy sources in response to the worldwide net-zero transformation. In 2023, Taiwan promulgated the Climate Change Response Act, setting the precedent for the imposition of carbon fees from 2024 to 2025. It is anticipated that Uni-President will be influenced by the effect of carbon fees, leading to a rise in production costs. In addition, big energy users are subject to renewable energy regulations, plus the self-government ordinances promulgated by Tainan City, Taichung City, and Taoyuan City as they pursue a low-carbon city; the ordinances stipulate that big energy users install a certain proportion of renewable energy capacity locally. Having production factories in all three cities, Uni-President expects itself to face increased equipment installation cost and production cost.</p>	<p>Mid-term (three to five years)</p>






Financial impact

Adaptive management strategy

Management Target

<ul style="list-style-type: none"> Increasing the number of days for storage of raw materials/products requires additional rented warehouses results in an increase in costs Disruptions in the transportation of raw materials or products results in an increase in warehousing costs Equipment damage results in asset value damage Damages in raw materials or products results in an increase in operational costs and decrease in revenue 	<ul style="list-style-type: none"> Production process adjustment, change the order of production according to material shortage and water shortage time For intermittent production of products, the priority is to produce products with a short shelf life of raw materials. Establish a Water Resources Response Team to monitor the water consumption efficiency in the plant Sign a water supply agreement with water suppliers to give priority to supplying water to the plant in the event of water shortage In the event of a Level 1 water shortage, initiate response measures such as switching plants for production or production reduction Rent generators for power outages Avoid flooding areas when selecting plant locations Take out disaster insurance policy for plants to reduce financial impact Plan emergency response mechanisms and regularly conduct risk assessments Purchase raw materials from different production areas to diversify risks 	<ul style="list-style-type: none"> Monitor water conditions and continue to optimize response measures and management mechanisms Continue to optimize the efficiency of water consumption in each plant and introduce water saving projects Diverse tea raw material supply establishment Stable high quality and quantity of domestic and overseas dairy sources Refine source safety management and reduce procurement risks of raw materials Maintain a good relationship with large international suppliers by obtaining quotations and procuring from them Enhance the ability to procure outsourced services
<ul style="list-style-type: none"> Fines imposed due to violation of regulations results in an increase in operating expenses Product carbon footprint verification expenditures results in an increase in operating expenses Alternative materials and packaging R&D increase operating costs; at the same time, due to the light weight of products, waste treatment expenses are decreased 	<ul style="list-style-type: none"> The Commercialization R&D Institute, FSC and Production Units immediately grasp new product packaging label policies, while making new labeling requirement in advance The "Packaging Label Review Process" has been set up. Each business unit, R&D unit, the Strategic Marketing Group, the Production Plant and the QC Unit of the FSC work together to prevent improper labeling and marketing There is also a "Packaging Materials Technology Team" in place for the research and development of lightweight packaging materials and material substitution 	<ul style="list-style-type: none"> Product labelling is in compliance with regulatory standards Introduction of most suitable, environmental and functional packaging materials
<ul style="list-style-type: none"> Paying a carbon fee causes production costs to rise. Payment of violation fees results in an increase in operating expenses Due to renewable energy regulations, depreciation of equipment is increased (installation of renewable energy equipment), operating costs increased (procurement of renewable energy power certificates), or operating expenses increased (payment of allowance) 	<ul style="list-style-type: none"> Inventory and performance evaluation of annual energy consumption and greenhouse gas emission of the organization Product carbon footprint introduction Energy conservation and carbon reduction project introduction Set up a biogas power generation equipment Installation of solar photovoltaic (PV) system 	<ul style="list-style-type: none"> The annual average power saving rate of each general plant is >1% for 2020–2024. Uni-President manages each plant by their carbon emission intensity. If a plant has met the target for the current year, then its following year's target for carbon emission intensity reduction will be 1% lower than the current year's level. If a plant fails to meet the target for the current year, then its following year's target for carbon emission intensity reduction will be 2% lower than the current year's level.

Climate risks and opportunities	Potential impact to Uni-President	Time interval
 <p>Transformation risk</p> <p>Stakeholder concerns</p>	<ul style="list-style-type: none"> To increase consumers' awareness of sustainability, NPO and NGO organizations proactively promote carbon reduction, plastic reduction products and related actions to change consumption behaviors of consumers. If we do not make a timely response or launch related products, it may affect our product sales. Faced with the pressure of many sustainability ratings, a poor sustainability rating may affect the willingness as to whether an investor will make an investment, as well as the consumers' sense of brand identity. 	<p>Mid-term (three to five years)</p>
 <p>Transformation risk</p> <p>Raw materials management resilience</p>	<p>Climate change may affect the stability of raw material supply, resulting in an increase in raw material costs or raw material supply chain disruption. Given this, we must improve the versatility of raw material resources to increase the stability of supply chain sources to respond to different risks.</p>	<p>Mid-term (three to five years)</p>
 <p>Opportunity</p> <p>Improve resource utilization efficiency</p>	<p>We continue to enhance product yields and reduce food waste through process improvement. At the same time, we promote waste recycling and reduction to improve waste treatment efficiency. By doing this, we increase the opportunities to create new markets while reducing waste treatment costs.</p>	<p>Short-term (less than three years)</p>



Financial impact	Adaptive management strategy	Management Target
<ul style="list-style-type: none"> If sustainability performance is poor, it may lower an investor's willingness for investment, further increasing borrowing costs A consumer's purchasing willingness is affected due to sustainability brand image or lack of sustainable products, resulting in a decrease in revenue 	<ul style="list-style-type: none"> Continue to invest in the R&D of new types of bakery, fresh food, and high nutrition products and processes Proactively develop and expand lightweight and optimal packaging materials Carry out surveys on a regular basis to get hold of issues concerned by stakeholders Continue to invest in the research of the possibility of plastic reduction while maintaining the quality of products 	<ul style="list-style-type: none"> Continue to refine quality products Introduction of most suitable, environmental and functional packaging materials
<ul style="list-style-type: none"> Unstable supply prices of raw materials result in an increase in operating costs Alternative material selection and R&D results in an increase in operating costs 	<ul style="list-style-type: none"> Stable management of raw material sources Come up with different formulas to handle short-term shortages of raw materials. Frequently assess the availability of goods to bolster the stability of the supply chain. 	<ul style="list-style-type: none"> Seek an alternative supplier of raw materials and a mechanism for substitute materials. Stable high quality and quantity of domestic and overseas dairy sources Refine source safety management and reduce procurement risks of raw materials
<ul style="list-style-type: none"> Waste treatment expenses are reduced as a result of the promotion of waste recycling and reduction of the weight of waste Due to the improvement of production efficiency, raw material consumption is reduced, decreasing operating costs 	<ul style="list-style-type: none"> Installing sludge dryers and expanding the possibility of resource utilization of tea residue in the future Evaluate utilization of soybean residue and set up biogas power generation Resale of anaerobic sludge Carry out product process improvement through the technologies to reduce raw material consumption 	<ul style="list-style-type: none"> Waste recycling rate over 95.0%



3.2.3 Energy Consumption and GHG Emissions Management Performance

(GRI 302-1、GRI302-2、GRI302-4、GRI 305-1、GRI 305-2、GRI305-3、GRI 305-4)

Due to the rising global demand for carbon management while facing the global and domestic net-zero trend, we formally introduced the new ISO 14064-1:2018 inventory in 2021. By taking this approach, not only have we expanded the inventory scope, the internal GHG promotional team was also adjusted. Furthermore, through comprehensive inventory process and stringent external verification mechanisms, the management for direct and indirect GHG emissions is strengthened and the carbon management of Uni-President moves towards a new milestone.

In addition, we have an Energy Management Team in place to set management targets for each plant and to evaluate energy management incentives in groups. Evaluation is carried out based on the daily management achievements and annual energy-saving efficiency of each plant. The first place in each group will be granted an incentive to encourage their energy saving performance.



Uni-President Energy Conservation and Carbon Reduction Incentive System

At Uni-President, we have established an incentive system for improvement of energy conservation proposals. If an energy conservation proposal submitted by an employee meets the review criteria of the Review Committee, a grant will be given according to the improvement contents and energy conservation benefits. If carbon reduction benefits are recognized, NT\$1,738 will be granted for every ton of CO₂ emissions reduced. By taking this approach, we encourage all employees to work together towards energy conservation and carbon reduction. In 2022, incentives granted amounted to NT\$0.36 million.



Energy consumption status

In 2022, Uni-President consumed 1,601,648 gigajoules (GJ) of energy, of which 44.35% came from purchased electricity, and 0.02% from renewable energy. Moreover, natural gas takes up the majority of the direct energy consumption, making up 54.01% of the total energy consumption, indicating that electricity and natural gas are the principal sources of energy for Uni-President. For detailed energy consumption for the past years, please refer to energy consumption, non-renewable energy consumption and renewable energy generation in Appendix I – ESG Information.

Enterprises aiming to cut down on carbon are primarily tasked with reducing energy usage. Uni-President controls energy usage by establishing the power-saving rate for each plant. The average power-saving rate of the general plants in 2022 was 2.00%. In the future, Uni-President will intensify the management of each general plant's power-saving rates, hoping to reduce scope 1 and scope 2 emissions by 2030 by 38% from the 2005 level.

Meanwhile, to comply with renewable energy regulations, e.g., "Regulations for the Management of Setting up Renewable Energy Power Generation Equipment of Power Users above a Certain Contract Capacity" and the self-government ordinances for low-carbon cities promulgated by Tainan City, Taichung City, and Taoyuan City, Uni-President is also gradually improving the group's renewable energy transformation plan. In 2022, Uni-President generated 96,383 kWh of electricity through biogas-powered, wind-driven, and photovoltaic power generation facilities.

Going forward, Uni-President will dedicate resources to expanding renewable energy generation. The photovoltaic facility in Taichung General Plant was installed in February 2023 and a 2.05MW photovoltaic facility is planned to be installed in Xinshih Logistics Park in 2024.

GHG emissions

In the past, Uni-President performed GHG inventory management according to the government's policies. To be on par with the progress of GHG inventory standard conversion and global carbon management trends, inventories are made according to ISO 14064-1:2018 GHG inventory criteria in all plants and passed the external verification since 2021.

In 2022, we determined key indirect emission sources by following six significant principles for indirect emission source identification, namely: regulations and stakeholder expectations, ease of data acquisition, peer disclosure status, availability of emission coefficients, quantification of materiality and the possibility of reduction plans. In 2022, the total GHG emissions was 1,596,404 metric tons of CO₂e, and among this, the GHG emissions for Scope 1 and Scope 2 (self-operations) were 165,792 metric tons of CO₂e (account for 10% of the total emissions), while the GHG emissions for Scope 3 (value chain) were 1,430,612 metric tons of CO₂e (accounting for 90% of total emissions).

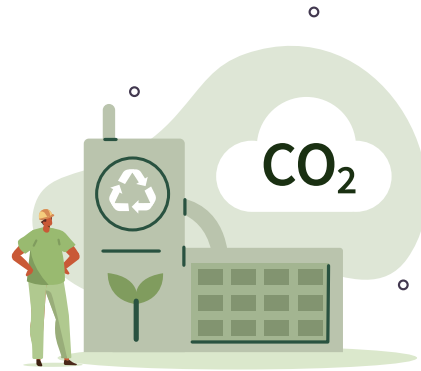
Of all the GHG emissions from self-operations (Scope 1 and Scope 2), 97,639 metric tons of CO₂e were the main emission source generated by purchased electricity, accounting for 59% of the GHG emissions from self-operations; followed by fixed emissions, including emissions generated from the use of fuel for power generation engines, boilers, and heaters, with emissions of 49,665 metric tons of CO₂e, accounting for 30% of the GHG emissions from self-operations.

The GHG emissions in the value chain this year covered upstream and downstream transportation and distribution, employee commuting, business travel, purchased goods, disposal of solid and liquid waste, downstream leasing assets and investments. Among these items, purchased goods were the main source of emissions with 1,013,657 metric tons of CO₂e, accounting for 71% of GHG emissions in the value chain; followed by emissions generated due to investments, with a total of emissions of 302,138 metric tons of CO₂e, accounting for 21% of GHG emissions in the value chain.

In 2022, the self-operating (Scope 1 and Scope 2) GHG emission intensity was 35.52 metric tons of CO₂e/per NT\$10 million of sales revenue. The greenhouse gas emission intensity of the value chain (scope 3) for this year is 306.47 metric tons of CO₂e per NT\$10 million of sales revenue. Going forward, we will keep an eye on and control the emission intensity, aspiring to eventually accomplish the aim of decoupling business growth from carbon emissions. For GHG emission data for the past 3 years, please refer to GHG Emission Data for the Past 3 Years in Appendix I – ESG Information.



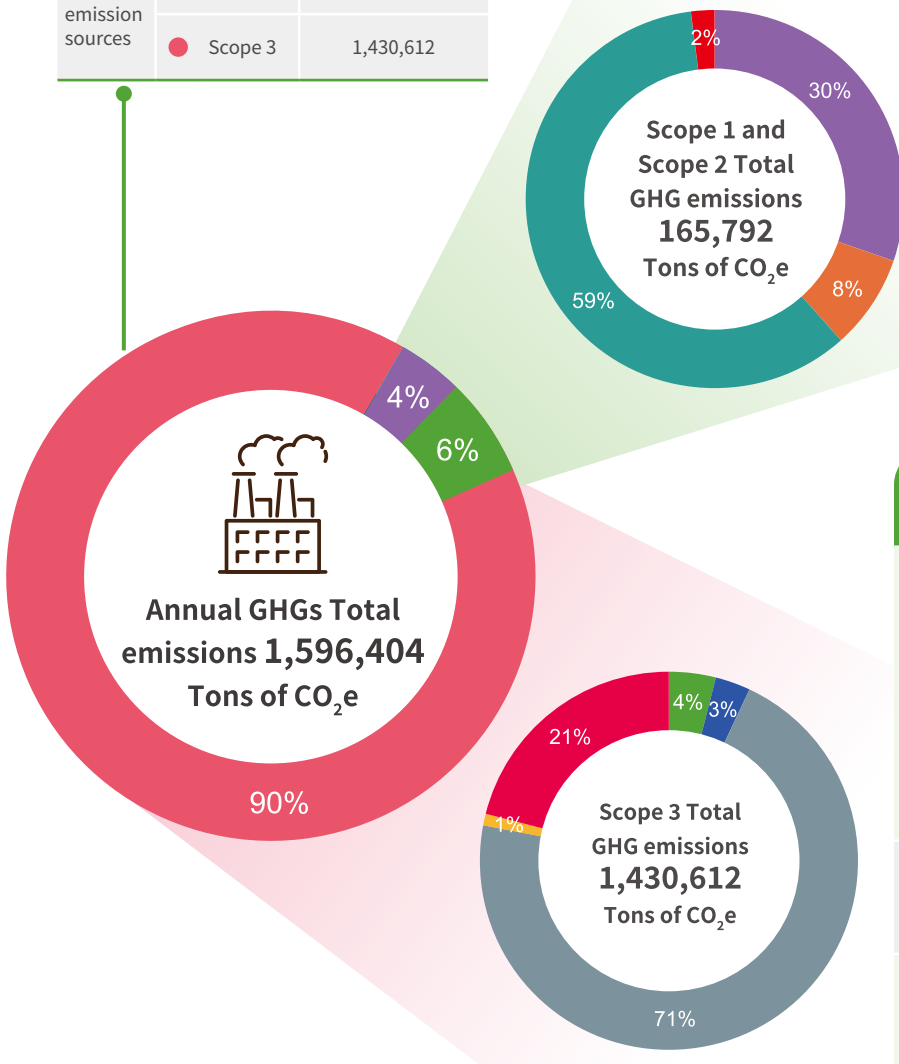
2022 GHG emissions of Uni-President



Emission sources		Emissions (metric tons of CO ₂ e)
Direct emission sources	Scope 1	64,793
	Scope 2	100,999
Indirect emission sources	Scope 3	1,430,612

Emission sources		Emissions (metric tons of CO ₂ e)
Scope 1 (Category 1)	Fixed emissions	49,665
	Mobile emissions	659
	Process emissions	257
	Fugitive emissions	14,212
Scope 2 (Category 2)	Purchased electricity	97,639
	Purchased energy	3,360

Emission sources		Emissions (metric tons of CO ₂ e)
Scope 3 (Category 3)	Upstream transportation and distribution	52,434
	Downstream transportation and distribution	42,735
	Employee commuting	3,086
	Business trips	830
Scope 3 (Category 4)	Purchased goods	1,013,657
	Disposal of solid and liquid waste	3,651
Scope 3 (Category 5)	Downstream leasing assets	12,081
	Investments	302,138



Note:

- The scope of inventory in 2022 included Yungkang General Plant, Xinshih General Plant (including ice general plant and cold food plant), Taichung General Plant, Yangmei General Plant (including Rueifang Mineral Water Plant) and Chungli General Plant (including Madou Bread Plant), TMR, logistics warehouses, Taipei branch, Kaohsiung Office, Neihu Office, Wugu Office, and Hukou Park (including the ice cube plant). Moreover, we also completed inventories using the operational control approach, as required by ISO 14064-1:2018, with the data verified by SGS.
- Types of GHG covered: CO₂, CH₄, N₂O, HFCs, SF₆
- In response to the ISO 14064-1: 2018 criteria, we conducted identification and inventory for Scope 3 (category 3-6) emission sources for the first time in 2021. Given this, we have set 2021 as the base year.
- At present, the electricity emission factor announced by the Bureau of Energy of the Ministry of Economic Affairs is applied to purchased electricity. The electricity emission factor in 2022, which was 0.495 kg CO₂e/kWh, was used as the calculation parameter. Other emission parameters are mostly adopted from the "Greenhouse Gas Emission Factor Management Table 6.0.4" announced by the Environmental Protection Administration in June 2019, and the applicable factors announced by the IPCC. Since the global warming potential (GWP) of various greenhouse gases have different impacts on the climate, the calculated emissions of various greenhouse gases from all emission sources are multiplied by the GWP value to convert into carbon dioxide equivalent (CO₂e). The GWP value is currently based on the 2021 IPCC Sixth Assessment Report, and might be changed in accordance with the regulations of government agencies in the future.
- We began to make inventories on Scope 3 GHG emissions since 2021 and the emission coefficients took reference from EPA's Product Carbon Footprint Information website, business database coefficients, academic papers, and similar goods or services of the public carbon footprint data. At present, our inventory items cover items that generate GHG emissions upstream and downstream transportation and distribution, employee commuting, business trips, purchased goods, disposal of solid and liquid waste, downstream leasing assets and investments.

3.2.4 Reduction Plans

(GRI 305-5)

To achieve the medium- and long-term reduction targets, we have replaced fuel oil with natural gas that causes low pollution. Each year, we implement energy-saving projects covering equipment replacement and modification, equipment parameter optimization, and production process control. In 2022 the energy savings projects of the plants were focused on replacing the water chiller and improving the operation of the system. Thanks to the energy-saving projects, 1,620 metric tons of CO₂e was diminished this year, saving NT\$8.42 million. Furthermore, to control the carbon footprint of products, we are persisting with carbon footprint label certification for 8 products. Tung-I Noodles - Minced Pork Flavor (85g) has been awarded the carbon reduction label.



2022 Product Carbon Footprint Label





Carbon footprint :
190.00g CO₂e / pack

Carbon Reduction Label

Carbon footprint :
380.00g CO₂e / pack




Carbon footprint for 300mL packages :
160.00g CO₂e / box

Carbon footprint for 375mL packages :
200.00g CO₂e / box




Carbon footprint for 300mL packages :
130.00g CO₂e / box

Carbon footprint for 375mL packages :
160.00g CO₂e / box




Carbon footprint for 300mL packages :
120.00g CO₂e / box

Carbon footprint for 375mL packages :
140.00g CO₂e / box

2022 Representative Energy Saving and Carbon Reduction Projects

Yangmei Dairy Product Plant No. 1 and Xinshih Beverage Plant No. 2 - Introduction of a new maglev water chiller



1,865.55 thousand kWh of electricity a year was saved, reducing 941.47 tons of CO₂e emissions, saving expenses by NT\$4.66 million.



- The old air-conditioned chillers were replaced with the latest energy-efficient magnetic levitation centrifugal chillers with system redundancy mechanism added. The power-saving of products per unit increased by more than 50%.



Xinshih Meat Plant - Improvement in the energy efficiency of the water chiller



703.60 thousand kWh of electricity a year was saved, reducing 353.00 tons of CO₂e emissions, saving expenses by NT\$2.12 million.



- The old air-conditioned chillers were replaced with the latest energy-efficient magnetic levitation centrifugal chillers with system redundancy mechanism added. The power-saving of products per unit increased by more than 50%.
- We optimized the settings of the water chiller system and the load correlated control system; we used the high-efficiency maglev water chiller as the central air conditioning unit, whose frequency conversion function can be utilized to adjust the load demand on the part of water chiller, thereby meeting the energy-efficiency requirements.



3.3 Water Resources Management

(GRI 303-1、GRI 303-2、GRI 303-3、GRI 303-4、GRI 303-5)

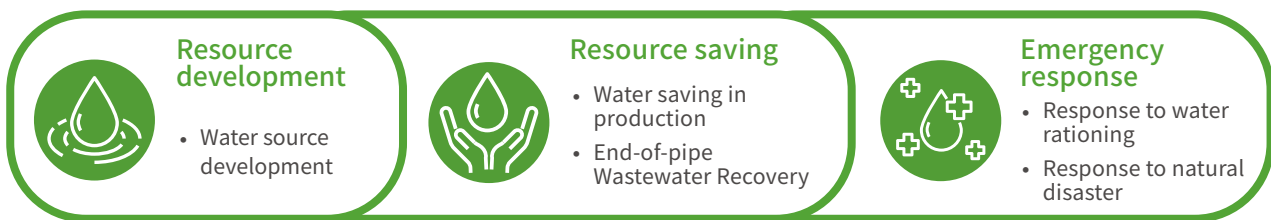
At Uni-President, we regard water resources as an important environmental and operational issue. Among our diversified products, beverage products such as juice, tea and dairy products are highly dependent on water in the manufacturing process. Although rainfall is abundant in Taiwan, with uneven distribution of water resources, coupled with frequent rainstorms and water shortages caused by climate change in recent years, the complexity of water resource management has further increased.

3.3.1 Water resource management strategies

(GRI 303-1)

To avoid the numerous risks to water resources, Uni-President has three standpoints, including resource development, resource saving and emergency response, which manage water resources based on the energy management team's hierarchical management system. We also hold regular meetings to discuss issues related to water resources, set up policies, and review the performance of water conservation, as well as integrate water conservation concepts into detailed planning, design, production and working environments via various means such as posters, slogans and training courses.

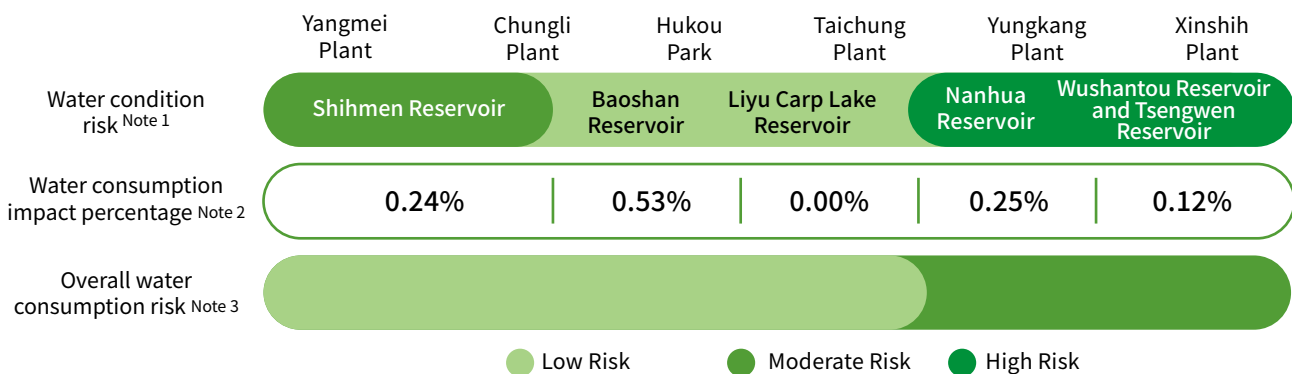
Water resource management strategies



Water resource risk identification and response

In the overall value chain, the "raw materials" and "manufacturing stage" of our products are highly related to water resources. Among them, raw materials come from crops, and as water, as an integral part of our products, is crucial for their production. To understand more about water withdrawal risk and its impact on the environment, we refer to the research data released by the National Science and Technology Center for Disaster Reduction to get an understanding of the probability of drought risk with each source of water withdrawal. Moreover, we also identify the overall water consumption risk of each plant with reference to the 2022 water consumption data. The results indicate the control of water conditions and production scheduling are management priorities.

Water consumption risk analysis of each plant



Note 1: Water condition risk data: With reference to the Disaster Risk Adaptation Platform.

<https://dra.ncdr.nat.gov.tw/Frontend/Disaster/RiskDetail/BAL0000022>

Note 2: Water consumption impact percentage: Water used by each plant in 2022/water supply data released by each reservoir in 2022

Note 3: Overall water consumption risk: The risk level identified after the combining of information on water condition risk data, water consumption impact percentage, and historical plant operation experience.

3.3.2 Risk Management for Water Resources





(GRI 303-2、GRI303-3、GRI303-4、GRI303-5)



Extreme weather makes it more difficult to manage water resource risks. Moreover, typhoons and rainstorms that hit Taiwan each year often lead to an increase in raw water turbidity or water risks such as water shortages caused by climate anomalies. These are risks that affect productivity. We have set up a water resources response team to prevent production losses caused by unstable water conditions. The supervisor of the Technical Group is appointed as the convener, and is responsible for cooperating with all relevant units and assigning work duties in order for different units to jointly develop response plans while strengthening the coordination among the emergency response team. We have also entered into a sales and purchase agreement with the water suppliers, agreed on reasonable transportation costs with water transportation operators, while effectively controlling the transportation schedule, ensuring that water is supplied during water shortages. In the event of a water shortage, we initiate related countermeasures according to the levels of water restrictions announced by the government. In doing so, we minimize operational losses caused by water shortages.

Water Resources Risk and Adaptation



Risk Source	Risk Issue	Adaptation Action
Regulations	<ul style="list-style-type: none"> Response to laws and regulations Water consumption fee collection method Water Pollution Control Act 	<ul style="list-style-type: none"> Establishment of the Water Response Team. Closely monitor the water consumption of each plant and water conditions in each area Acquire green building certification for new plant buildings Establish and monitor targets for discharged water quality
Disasters	<ul style="list-style-type: none"> Insufficient water resources Increased chance of heavy rainfall and floods 	<ul style="list-style-type: none"> Establish natural disaster response standards and conduct regular emergency response drills Promote water conservation projects to enhance water use efficiency Rainwater recovery equipment installed in the new plant Establish water restriction and response plans

Management mechanism and division of labor of the Water Resources Response Team

 Coordination and management	<ul style="list-style-type: none"> Decide on, announce, and implement countermeasures Coordinate the work and capture status 	Technical Group
 Monitoring water consumption	<ul style="list-style-type: none"> Understand water demands and cultivate water sources Monitor water conditions in production areas and announce related information Establish the water shortage response plan of the general plant and coordinate production based on water consumption sequences 	Engineering Division Production Plant
 Water scheduling	<ul style="list-style-type: none"> Dispatch water trucks Conclude transportation service agreement 	Logistics Division
 Water price management	<ul style="list-style-type: none"> Conclude agreements on the unit price with water suppliers 	Purchasing Division

 <p>Monitoring water quality</p>	<ul style="list-style-type: none"> Control water quality and water truck safety 	<p>Food Safety Center</p>
 <p>Water conservation measures</p>	<ul style="list-style-type: none"> Publicize and implement drinking water conservation measures in office buildings and dormitories. Promote and implement technologies for water conservation and recycling in the process. Implement technologies relating to water recycling 	<p>Engineering Division Administrative Service Division Production Plant</p>

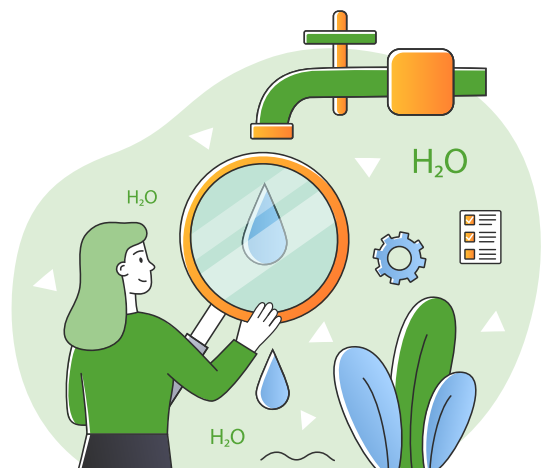
Water shortage countermeasures of Uni-President

 <p>Water rationing measures</p>	 <p>Emergency response of Uni-President</p>
<p>Phase I</p> <ul style="list-style-type: none"> Reduce water supply pressure Stop water supply to non-urgent or unnecessary facilities 	<ul style="list-style-type: none"> Increase the frequency of Water Supply Information Reports and online reporting of water consumption and storage to facilitate situation control
<p>Phase II</p> <ul style="list-style-type: none"> Stop high consumption water supply users Reduce water supply 	<ul style="list-style-type: none"> Check the quality of well water and purchased water after phase II water rationing is announced Verify the status of other water sources, including capacity, water quality, and water rights
<p>Phase III</p> <ul style="list-style-type: none"> Stop water in turns by area or in all areas 	<ul style="list-style-type: none"> Initiate the "Water Supply Emergency Response Mechanism." Manage purchased water, water transportation, and dedicated intakes, and test water quality and treat incoming water
<p>Phase IV</p> <ul style="list-style-type: none"> Fixed time and fixed quantity supply 	<ul style="list-style-type: none"> Activate water storage equipment and increase storage Perform inter-plant dispatch, with the Hukou park in northern Taiwan and the Xinshi General plant in southern Taiwan as the dispatch centers to supply water to other complexes in a timely manner Adjust production processes and product prioritization, and increase normal temperature inventory

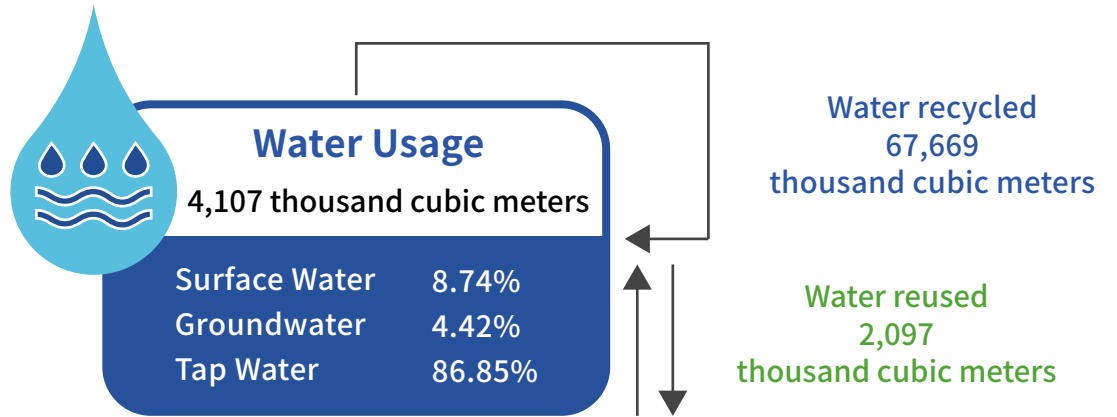
Water Consumption Status in Production Sites

In 2022, Uni-President's total water withdrawal amounted to 4,198 thousand cubic meters ^{Note}, and the total water consumption 1,084 thousand cubic meters ^{Note}. Water was withdrawn from various sources, with 87.57% from tap water, 8.69% from surface water, and 3.74% from groundwater. The total water discharge amounted to 3,114 thousand cubic meters, and the water withdrawal intensity for this year was 9.09% lower than that of 2021. For relevant data, see Appendix I Use of Water Resources for the Past Three Years.

Note: 1 thousand cubic meters of water = 1 million liters of water



Types of water used at production plants



Note:





1. Water for manufacturing includes water for soft water systems, boilers, and products
2. Water for public utilities includes water for cooling towers, washing towers, cleaning and pouring, and fire fighting
3. Water for household use includes water for drinking, washing and flushing toilets.
4. The water consumption here refers to the water withdrawal of the production plants.
5. 1 thousand cubic meters of water = 1 million liters of water.



3.3.3 Water Conservation Action

Apart from water that is required in production processes, we make an effort to promote efficient water usage in the plant through four water conservation strategies and introduction of water saving projects. These include water source development, process water source improvement, process water recycling, and end-of-pipe wastewater recycling.

Water Saving Strategy

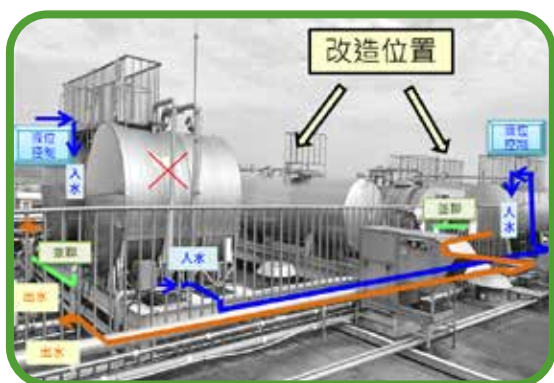
 <p>Water source development</p>	<p>Rainwater: Rainwater recovery equipment installed in the new plant for cooling towers and flushing toilets Air-conditioning condensate: Recovered into the clean water system or used as refill water for cooling water towers</p>
 <p>Process Water Source Improvement</p>	<p>Select low-water-consumption machines and establish "Water Balance Management" to control the reasonable consumption of machines in each plant used as the reference of calculating the plant's water recovery rate and water saving rate</p>
 <p>Process Water Recycling</p>	<p>Extend the scope of water recovery and reuse, while reducing wastewater generation For instance: steam condensate recovery, RO wastewater, discharge water recovery, and finished barrel jacketed ice water recovery</p>
 <p>End-of-pipe Wastewater Recovery</p>	<p>According to the classification of the machine's wastewater nature, discharged water quality is checked from time to time, and is effectively treated and recovered by the wastewater treatment plant. For instance, acid and alkaline discharge from the manufacturing process is recovered into the clean water system or into the cooling water tower as secondary water after being treated and monitored.</p>

2022 Water Saving Projects

Xinshih Dairy Plant No. 2 - Reuse of recycled process water

▶ A total of NT\$0.12 million was invested, saving 8.63 thousand cubic meters of water per year

- We remodeled two sets of 10-ton barrel tanks into recycled water storage tanks, increasing the recycled water volume by 719 tons per month while reducing the cost of soft water use and wastewater discharge.



3.3.4 Wastewater Management

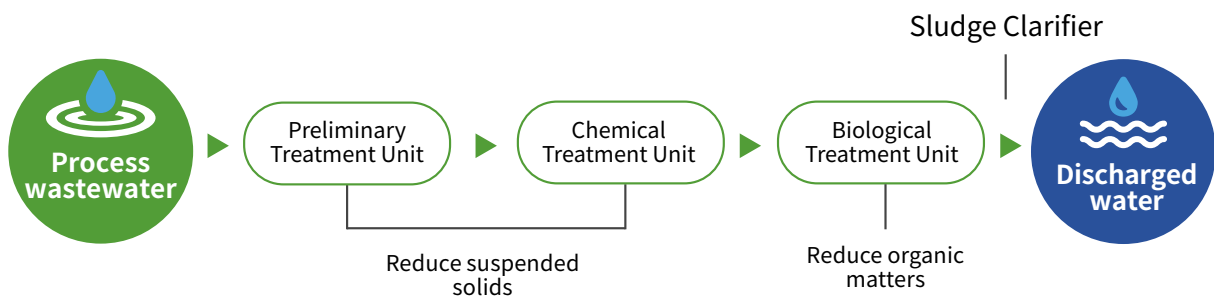
(GRI 303-2, GRI 303-4)

As Uni-President's wastewater is mainly organic, oil and grease, and suspended solids, we have set up wastewater treatment equipment for each plant. Wastewater is discharged after front-end pretreatment and biological treatment, or discharged to a legal outlet or into exclusive wastewater treatment plants in the industrial park. In order to comply with effluent standards, we have established strict standards in accordance with the government's laws and regulations. By doing this, we inspect the functions of wastewater treatment plants and the concentration of effluent in each plant. We have also set up targets for management on annual wastewater quality as the basis for assessing effectiveness.

In 2022, the total wastewater volume of all plants combined amounted to 3,114 thousand cubic meters. We are continuing to raise the bar on wastewater quality standards for each plant. The Chemical Oxygen Demand (COD) concentration targets for this year was set at an average of 48 mg/L. The average COD concentration in 2022 was 31.46 mg/L. TSS and BOD testing results this year were similar to those of past years, suggesting that the wastewater treatment performance of the plants has been stable.

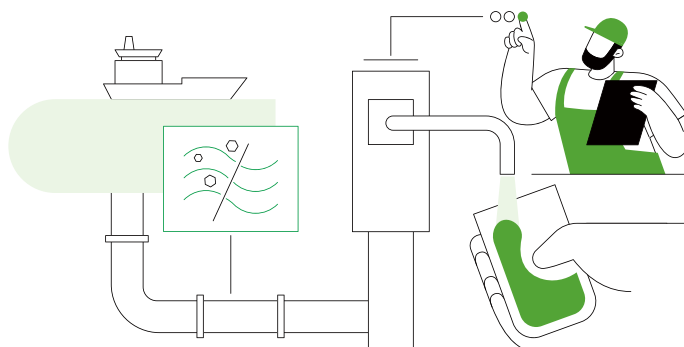
For this year, a project to enhance the waste water treatment system has been launched, with NT\$190,000 spent. Liuying TMR Center installed facilities which can reclaim water from scrubbers and dehydrators, capable of reducing 0.38 thousand tons of wastewater discharge.

Wastewater Treatment Process Schematic Diagram



Uni-President Wastewater Discharge Control Standards

Uni-President Wastewater Discharge Control Standards	Effluent Quality Standard	Standards of Setting Uni-President Effluent Quality Target
<ul style="list-style-type: none"> • BOD \leq 22.5 mg/L • COD \leq 48 mg/L • SS \leq 22.5 mg/L 	<ul style="list-style-type: none"> • BOD \leq 30 mg/L • COD \leq 100 mg/L • SS \leq 30 mg/L 	<ul style="list-style-type: none"> • Our self-imposed strict regulations (75% of the regulatory limits)





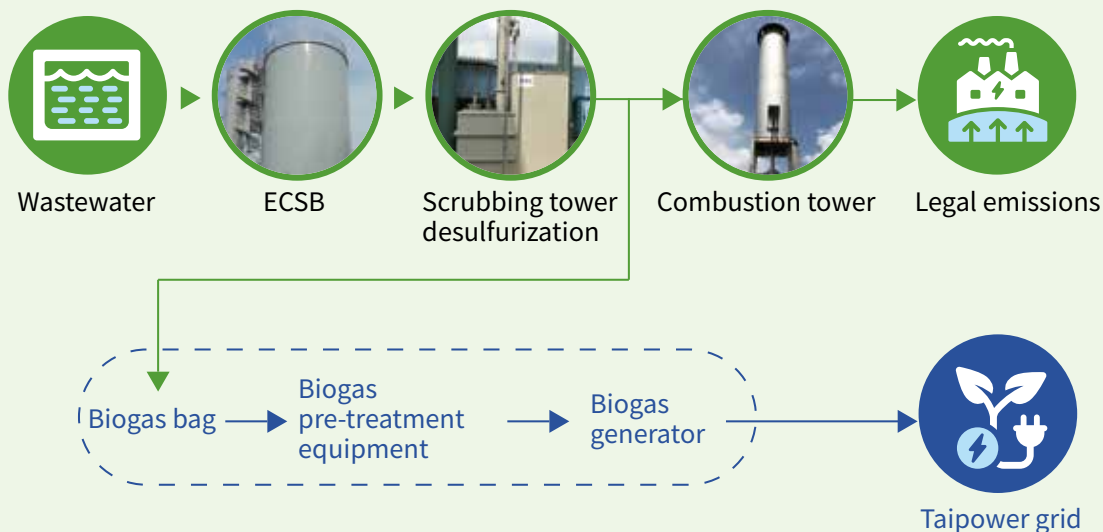
Xinshih Plant – Project of wastewater and biogas power generation

▶ Carbon emission reduced by 368 tons of CO₂e per year, increasing revenue by NT\$1.65 million

With circular economy and carbon reduction issues being the most pressing issues in the world at the moment, as a responsible company, we are dedicated to pollution reduction at source and waste recycling. We are aware that the high concentration of organic sugar-containing wastewater in the food manufacturing industry produces a large amount of biogas after treatment. Our old approach was to send biogas directly to the combustion tower for burning; however, according to domestic and international research, biogas collected for power generation can maximize the benefits of biogas and reduce methane emissions, posing a beneficial effect to GHG emission reduction.

In light of the environmental benefits of biogas power generation, the first biogas power generation system was installed in Xinshih Plant and completed in September 2022. The system collects methane from the wastewater treatment system for power generation. In 2022, the energy generated had attained 88,280 kWh, and it is forecast to reach 648,000 kWh in 2023. We anticipate to sell electricity back to TPC in February 2023.

Biogas power generation schematic diagram



3.4 Pollution Prevention and Management

(GRI 305-7、GRI 306)

3.4.1 Air Pollution Management

(GRI 305-7)

In the production processes of our products, air pollutant emissions are mainly PM, SO_x, NO_x and volatile organic compounds (VOCs). The pollutants may come from material processing, boiler combustion and wastewater treatment. To effectively collect air pollutants, we have installed cyclone dust collectors in the plants while strengthening equipment maintenance to improve equipment availability rate. At the same time, we plan to replace oil-fired boilers with natural gas boilers in all plants every year in an effort to largely reduce the generation of NO_x and SO_x.

The volume of volatile organic compounds (VOCs), sulfur oxides (SO_x), and nitrogen oxides (NO_x) in this year have all dropped significantly from 2021, mainly due to the boilers of Yung Kang General Plant being remodeled from fuel oil-driven to natural gas-driven, which decreased SO_x and NO_x significantly. On the other hand, VOCs decreased because the emission figure calculated by Hukou Park was converted from actual measurements. Emission of PM increased from 2021 mainly because of that the Hukou Park had adopted natural gas and that PM had been included in calculation. Going forward, we will keep tabs on the concentration of PM.

3.4.2 Waste Management and Circular Economy

(GRI 306)

At Uni-President, we manage waste from the perspective of the value chain as a whole. In terms of upstream value chain, we ensure proper treatment of waste by upstream suppliers through a supplier management system, while monitoring the waste flow of our OEMs. For our operating activities, we have established the "Waste Management Measures" to ensure that not only is all waste properly classified and managed, but waste must also be removed and treated in accordance with procedures and regulations. All waste generated in the process of our operation is disposed of by an outsourced vendor. Waste includes: general waste, food material waste, sludge, recycled packaging materials, and hazardous waste. The amount of waste produced in 2022 amounted to 36,406 metric tons, a 1.82% increase on the 2021 figure of 35,754 metric tons. To effectively reduce the amount of waste produced, we have incorporated circular economy thinking and established management KPIs for waste reuse. Since 2016, we achieved waste management objectives for six consecutive years. This year reached 95.48%. Specific examples of circular economy are as follows:

Soybean residue reuse

Uni-President is the first company in Taiwan to have obtained the certification of soybean as a byproduct in the manufacturing process by the Council of Agriculture. Not only this, but we were the first company in Taiwan to use soybean residue as a resource. Soybean residue generated in Xinshih General Plant is converted into feed for dairy cattle, saving waste removal costs while also bringing us new economic benefits. In 2022, we reused as many as 1,370 metric tons of bean dregs.

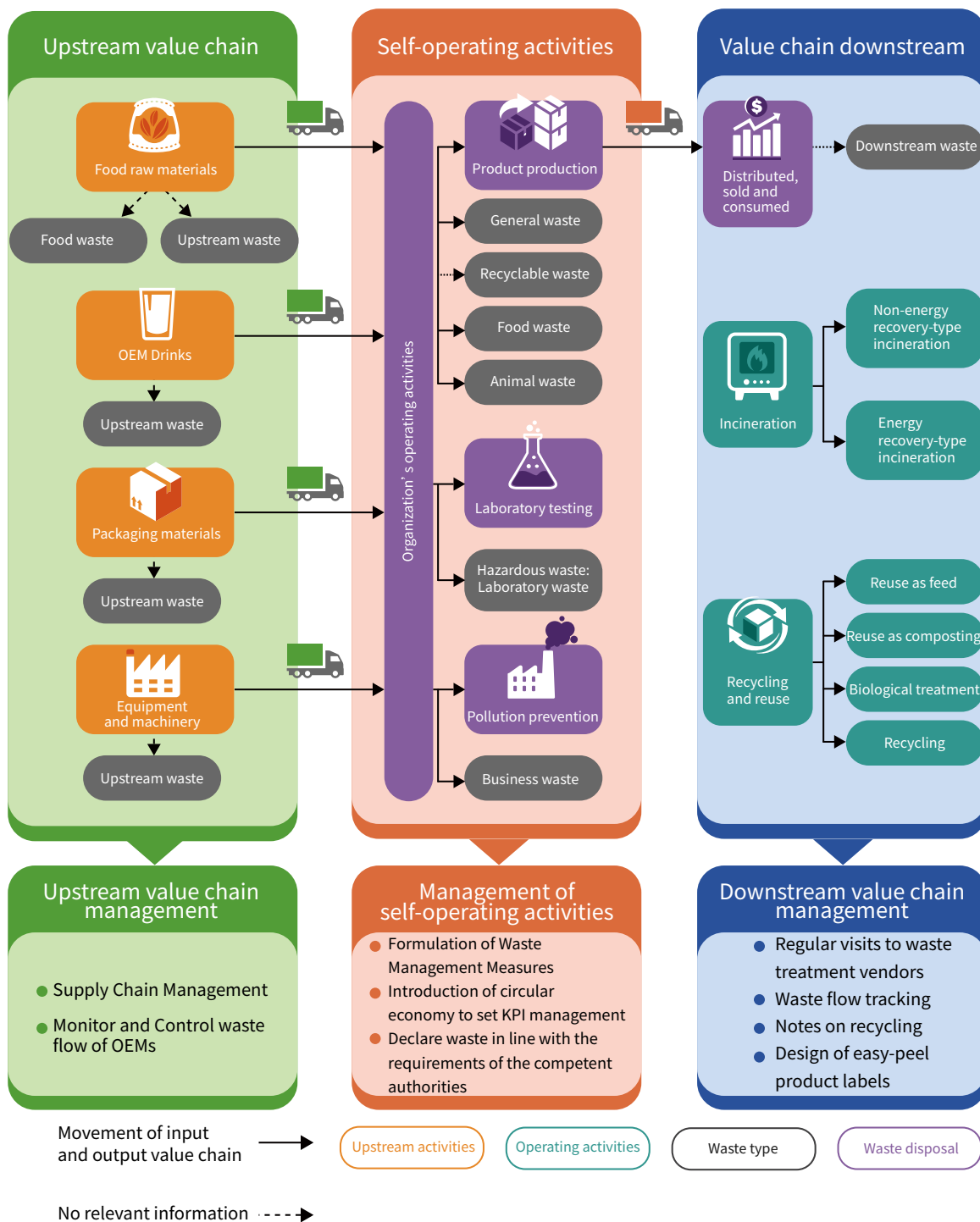
Decrease in moisture content of sludge and recycling of sludge

The sludge at the Yangmei General Plant had been composted before being transported to Yong Feng Yu for biomass energy treatment in 2022. The amount of sludge that can be reused is estimated to be 1,373 metric tons. Meanwhile, we also installed a sludge dryer in Yangmei General Plant, reducing the sludge's moisture content from 80% to 40%, thereby reducing the weight of sludge to be treated by 859 metric tons.

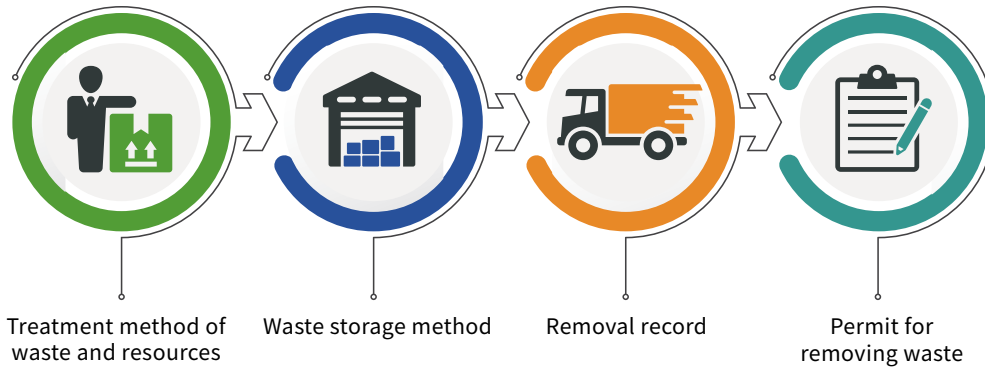


Finally, in terms of the downstream value chain, as we emphasize the proper waste removal by the vendor, waste generated by Uni-President is removed and recycled by a legal vendor. For waste that may be reused for food, we have clear regulations in place that prohibits its use in food reprocessing or to be used as food to ensure food safety. In addition, in order to strengthen the flow tracking of waste, we use a GPS system to clearly track and inspect the flow of waste, resources, and hazardous waste generated by each plant. The inspection includes treatment of waste and resources, waste storage approaches, disposal records, flow, and transportation licenses. In 2022, a total of 17 waste, resources, and hazardous waste treatment companies were inspected, with a total of 86 tracked. There were no violations discovered in the inspection and tracking results. In addition, we also clearly mark the waste sorting category on the products. Cha Li Won tea drink series, for instance, bear a easy peel removable label, thus minimizing the complexity of the recycling process.

Uni-President Value Chain Waste Flow Chart



Key Items for Waste Treatment Plant Inspection

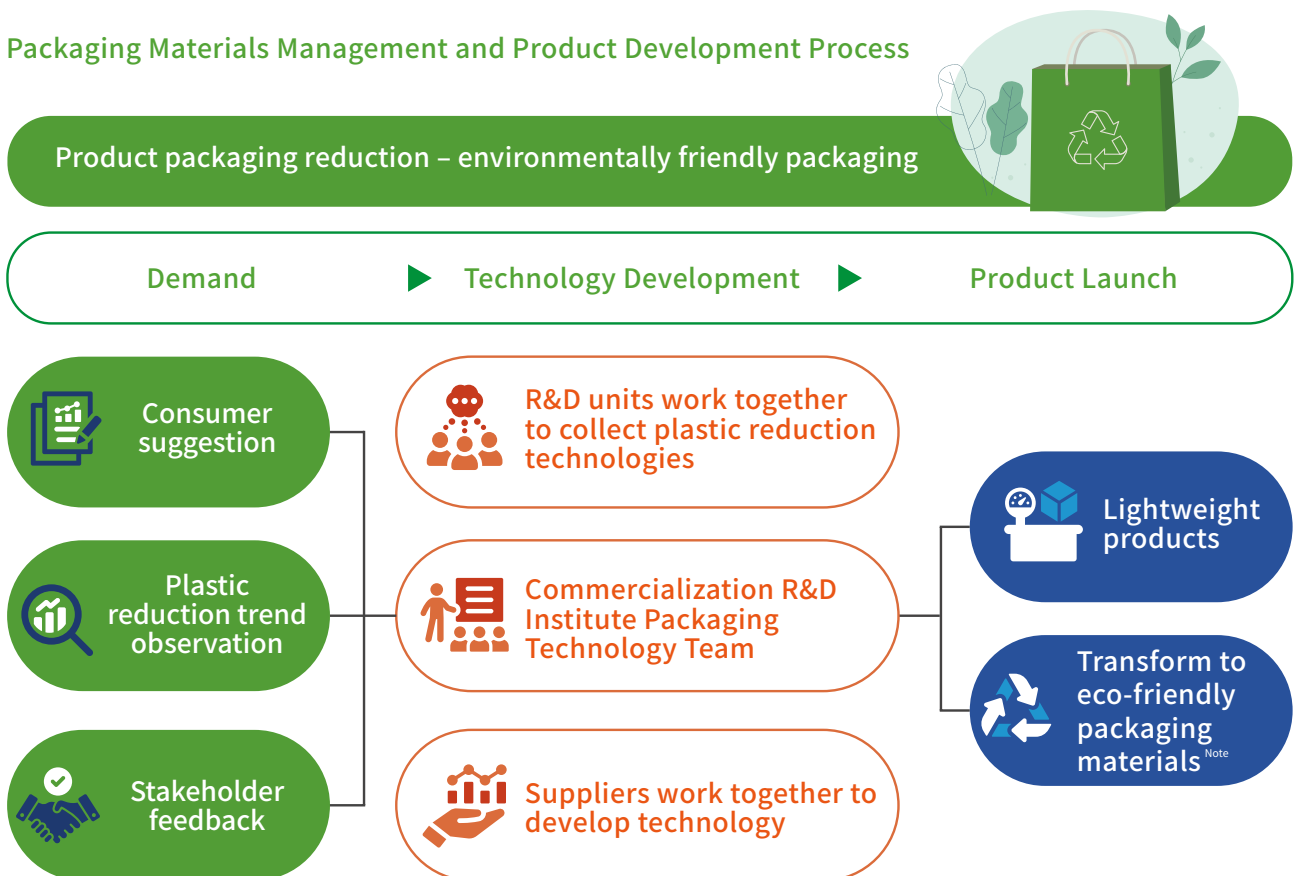


3.5 Packaging Materials Management

(GRI 301-1)

For many years, we have been making every effort to improve the sustainability of our product packaging materials. In response to the global trend of plastic reduction, waste reduction and recycling in recent years, the Packaging Technology Team takes a proactive approach to increase the use of environmentally friendly packaging materials and reduce packaging materials. Not only do we purchase internationally recognized sustainable and environmentally friendly packaging materials, we also regularly review the feasibility of optimizing existing product packaging materials. We proactively seek any possible plastic reduction methods to gradually reduce the use of plastic under the basis of ensuring food hygiene and safety.

Packaging Materials Management and Product Development Process



Note: The change to environmentally friendly packaging materials includes the use of reduced plastic products and environmentally friendly packaging materials. For example, polystyrene bowls of Imperial Bowl Instant Noodles have been changed to paper bowls.

Uni-President used 19,557 metric tons of plastic in its products in 2022, of which PET accounted for 63.14% of sole plastic packaging materials. To reduce plastic usage in packaging materials, we are actively employing four strategies: developing and testing R-PET bottles, optimizing packaging size, making containers lighter, and altering sales models. As a result, the projects implemented yielded an outcome of a total reduction of 1.35 tons of plastic.

Moreover, Uni-President collaborated with the subsidiaries of the Group in order to advance the PET recycling project this year. Uni-President and its subsidiary, President Packaging, partnered with upstream and downstream producers. Recycling machines developed by President Packaging were set up in the shops of President Chain Store for the purpose of recycling used PET containers. Concurrently, we have completed pilot introduction of the R-PET plastics. In 2023, we will evaluate the practical application of R-PET bottled products, thereby forming a closed loop of circular economy.

Going forward, Uni-President will persist in its efforts to reduce the use of plastic in packaging materials. Our aim is to create product packaging that uses a single type of material and is easy to recycle. We also evaluate the feasibility of introducing plant-sourced plastic materials or packaging new products using paper instead, so as to reduce product carbon footprint while decreasing the use of plastics in packaging materials.

Aspects	2022 Achievements	Picture
 <p>R-PET bottle development and testing</p>	<ul style="list-style-type: none"> This year, we have completed testing R-PET-bottled tea beverages and water for safety, suitability to be used in production line, product flavor, and color impact. There's no significant influence found on 25% R-PET content in the testing. 	
 <p>Optimize product packaging size</p>	<ul style="list-style-type: none"> Mai Dian Workshop substituted the prong inner bag with the flat bag used to hold its exclusive flour. This way, the bag length can be lessened from 270mm to 230mm, which can reduce plastic by about 1g (14.8%), or 0.5 tons per year. 	
 <p>Lightweight container</p>	<ul style="list-style-type: none"> Starbucks packed its Croissant Burger in PET inner liners, a container with an upper and a lower lid. By engaging a new supplier to optimize the mold of the containers, the weight of each unit can be reduced by 1g, leading to a savings of 0.4 tons of plastic per annum. The thickness of the bottom case of Jih Di Handmade Dumplings with Corn and Pork Fillings was reduced from 0.55mm to 0.5mm, reducing the weight by 1.0g per case, or 0.35 tons of plastic consumption per year. 	
 <p>Change in sales pattern</p>	<ul style="list-style-type: none"> We ceased to use the shrink film that had been used to wrap POWERMATE products into 6-can packs, reducing the weight of each carton by 2.08g, or 0.08 tons of plastic per year. We offered mineral water in cartons without labeling, reducing the use of plastic label by 0.43 tons in 2022 compared with ordinary carton-held bottled water. 	