3 Commitment to Environmental Sustainability

3.1 Environmental Management Responsibility

GRI 103-2, GRI 103-3, GRI 301-1

Material Topic	Operational environment management
Policy	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.
Goal	Develop annual Management Targets based on the management projects concerning energy conservation, carbon reduction, waste reduction, and wastewater discharge reduction to minimize their impact on the operating environment. In 2021, established targets were all achieved, with the performance provided below: • The annual average power saving rate of each general plant is greater than 1% • The steam source of each general plant is 95.85% natural gas • Annual COD intensity is 29.62 mg/L • Annual waste recycling rate is 95.65% • Proactively introduced water-saving programs, with cumulative annual water savings of 10.25 million liters • The GHG emission intensity between the two years could not be compared as ISO 14064-1:2018 GHG emission inventory was introduced in 2021 and the basis for inventory changed
Responsibility and Resource	• An Environmental Management and Review Promotional Team has been formed in each general plant, responsible for correct implementation of the plant's internal environmental management system • A cross-departmental management team is set up by each production plant to tackle energy and water resources on a project-by-project basis. • In 2021, NT$430.27 million was invested in environmental protection matters.
Action Plan	• 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 in accordance with the ISO 14064-1 inventory process • The Environmental Management and Review Promotional Team of each general plant regularly tracks and updates changes in environmental regulatory requirements of the Government and proposes 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 • Establish a Group Green Energy Management Center to collectively plan the promotion of green energy related projects within Uni-President and its respective affiliates. • Establish an Energy Management Team and Water Resource Management Team to regularly conduct risk evaluation and plan the promotion of relevant issues. • Each plant to take the initiative to introduce energy conservation, carbon reduction, water saving, waste recycling programs to reduce the environmental impact arisen from the production process
Evaluation Mechanism	• 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.
Grievance Mechanism	• Establish environmental communication and management processes, and make the Administrative Service Department 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.

Material Topic	Packaging Material Management
Policy	Introduce and develop optimal environmentally friendly and functional packaging materials; proactively promote lightweight packaging materials and reducing plastic packing using in our products.
Goal	Use eco-friendly materials and implement plastic packaging reduction. In 2021, established targets were all achieved, with the performance provided below: • Continue to introduce optimized, environmentally friendly and functional packaging materials. This year, a total of six projects were implemented
Responsibility and Resource	• The Central Research Institute Packaging Technology Team, packaging material suppliers and external academic institutions team up and continue to promote the research and development of product packaging material optimization
Action Plan	• Introduce FSC paper packaging material to carton products, while continuing to assess the feasibility of expanding the production lines. • Continue to work with external parties in the research and development of plastic decomposition-related technologies; communicate with consumers to get an understanding of their needs, while working closely with suppliers to introduce the most sustainable, environmentally friendly and functional packaging materials.
Evaluation Mechanism	• Project for plastic reduction in product packaging materials • Decrease in product waste disposal fees
Grievance Mechanism	• The Consumer Service Center receives comments from our consumers via multiple channels (0800 hotline, official website, service mailbox, retail feedback). We provide consumers with product consulting and services, while collecting the views and opinions of customers regarding the use of products and submitting the feedback to the Packaging Technology Team. Constructive suggestions will be transformed into practical actions on reducing packaging materials and plastic through systematic management.

Environmental Management Performance for the Past 3 Years

Environmental Management Performance	Unit	2019	2020	2021
Water Consumption (Water Withdrawal) Intensity	Million liters/ $10 million	1.02	1.00	0.99
Waste intensity	Metric tons/ $10 million	9.38	9.05	8.39
Air pollution emission intensity	Metric tons/ $10 million	0.012	0.017	0.014
Self-Operating GHG emission intensity[Note 2]	Metric tons of CO_2/ $10 million	39.28	37.72	36.25
Power intensity	GJ/$10,000	0.36	0.35	0.35

Note
1. The denominator of each type of environmental management is the operating income 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 climate change and GHG emissions, power 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

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).

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.

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.

Performance Management

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

Green Procurement:

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

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.

Main targets, subjects and introduction programs for ISO 14001 in 2021

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	1 environmental violation improved
	To convert heavy oil boilers to natural gas boilers	**Yongkang General Plant** SOx emissions reduced by 7.332 tons/year NOx emissions reduced by 4.069 tons/year
	To establish odor control equipment	**Yongkang General Plant** Completed the installation of odor control equipment
 To improve the operating environment	Improved the storage environment for trash in the plant	**Zhongli General Plant** Completed the rain-proofing facility of the storage area
	To install dust collection bucket to reduce dust in the sieving area	**Zhongli General Plant** Reduced the weight of dust in the sieving area in the plant to less than 1 kg/day
 Reduction of wastewater/waste	Sludge dryer installation project	**Yangmei General Plant** The construction period has been extended due to COVID-19. After completion, the water content of food processing sludge is expected to reduce from 85% to less than 50% in an effort to reduce waste processing weight.
	Waste plastic packaging bags for food recycled and reused	**Hukou plant** Garbage removal volume reduced by 1%
 Reduction of energy consumption	To improve steam proportional valve leakage	A total of 390 tons/year of steam at all general plants was saved
	To optimize CIP cleaning system and shorten cleaning time	
	Project of the optimization of the labeling machine operational efficiency in the plant	A total of 418,000 kWh/year electricity of all general plants was saved
	Project of energy efficiency improvement for air compressor systems and chilled water mainframes in the plants	
	Project of the installation of inverts to the refrigeration units and air compressors in the plants	
	Project of energy efficiency for wastewater treatment system flowback motors	

2021 Uni-President Environmental Footprint

Ingredients/materials investment (tons)

Milk, powdered milk	140,493
Soybeans (non-genetically modified beans + for feed)	9,694
Tea leaves	1,954
Coffee beans	7,533
Sugar	27,394
Flour	40,511
Beef	1,007
Palm oil	5,084
Pork	3,261
Wheat	117,648
Corn	58,657

Increased utilization of raw materials

- Fresh milk production rate reached 96.8%
- Soybean production rate increased to 97.5%
- Tea production rate increased to 92.6%

Waste generation (tons)

General waste	1,554
Recyclable waste (sludge)	5,887
Recyclable waste (tea residue)	6,698
Recyclable waste (wastepaper)	1,927
Recyclable waste (waste plastic)	182
Recyclable waste (soybean residue)	9,881
Recyclable waste (other)	9,622
Organic experimental waste liquid	3.00

Resource recovery rate

- 95.65%

Energy consumption (GJ)

Purchased electricity Fuel oil Diesel Biodiesel Petroleum Natural gas (NG) Liquefied petroleum gas (LPG)	1,487,226
Self-generated green electricity	26

Energy saving

- Reduced electricity by 6,778 thousand kWh
- Reduced fuel oil and diesel by 1.67 kiloliter
- Reduced 966 natural gas by thousand cubic meters

GHG emission (ton of CO_2e)

Direct emissions (Scope 1)	58,384
Indirect emissions (Scope 2+Scope 3)	1,487,395

Air pollution (metric tons)

VOCs	4.48
Nitrogen oxides (NO_X)	36.86
Sulfur oxide (SO_X)	5.67
Particulate matters (PM)	12.40

Carbon intensity

GHG emission intensity:

- Self-operations (Scope 1 and Scope 2) 36.25 metric tons CO_2e/10 million
- Value chain (Scope 3): 326.37 metric tons CO_2e/10 million

Water resources consumption (million liters)

Total water withdrawal	4,233
Surface water	510
Municipal water	3,661
Underground water	62

Water saving

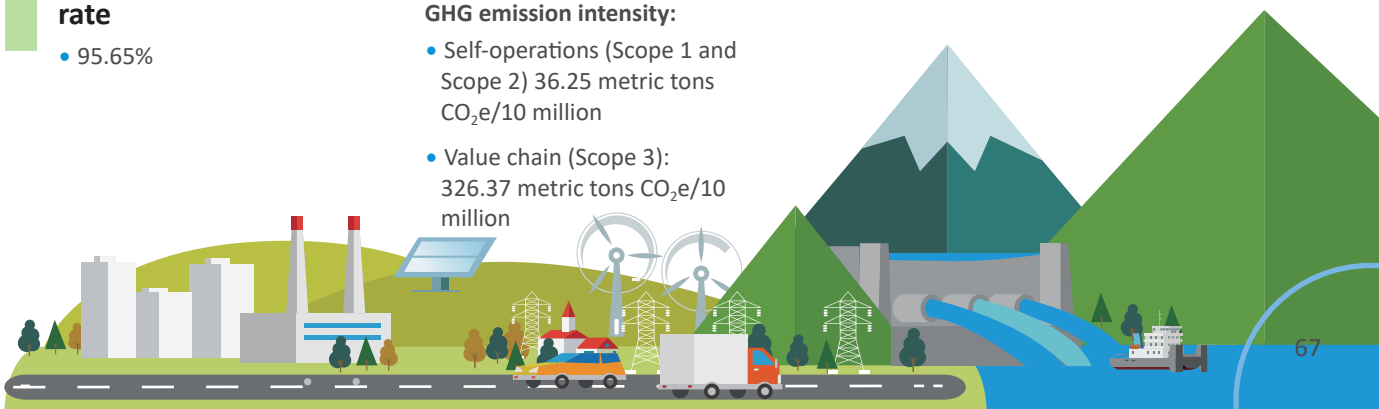
- Reduced by 10.25 million liters

Wastewater discharge (million liters)

Wastewater	3,228

Average COD equivalent

- reduction of 98.42%



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$1.187 billion in 2021, an increase of 2.3% compared to the previous year. In addition, we continue FSC™-certified[(Note)] procurement. The ratio of FSC™ procurement amount accounted for 40.28% of the total procurement amount of paper packaging materials in 2021

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

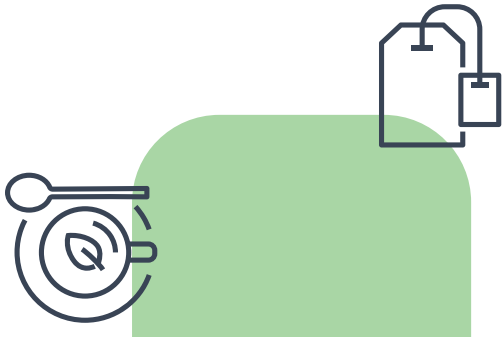
With respect to raw materials, we continue to keep a close eye on domestic and international material trends, while gradually introducing the procurement of relevant certified raw materials for our key ingredients.

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 we purchased in the past 3 years accounted for more than 30% of all soybeans purchased. In 2021, the procurement amount totaled NT$68.33 million, an increase of 4.23% from 2020.

Sustainable palm oil procurement

With characteristics such as low price, high yield and stable supply, palm oil has become a mainstream vegetable oil around the world. However, its huge demand has at the same time brought about greater environmental damage, with the most serious damage being the large-scale destruction of primary forests, seriously affecting the ecosystem and increasing GHG emissions. In a bid to foster the sustainability of palm oil production, the Roundtable on Sustainable Palm Oil (RSPO) was established in 2004. The RSPO brought together seven stakeholders involved in the palm oil industry, including oil palm tree plantation operators, processing plants or traders, consumer product manufacturers, retailers, banks/investors, and environmental and social NGOs to formulate global standards for sustainable palm oil. 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 will continue to focus on this issue and evaluate the possibility of a gradual purchase of RSPO certified palm oil.



Sustainable tea management and local procurement

Uni-President's tea products are very popular among consumers. Based on our commitment to food safety and sustainability, we have formulated the tea management principle. In terms of tea management – our top priority is safety, quality and stable supply; in terms of safe management – in addition to meeting 380 pesticide regulations, we also monitor herbicide content, to help enhance the rational management of tea raw materials. We have a full tea history system so that all raw materials for tea are traceable. In 2021, our local procurement of tea (Note) reached 1,902 tons, accounting for 97% of our total annual tea procurement volume.

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

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$415.691 million. In 2021, 45% of investment expenses for environmental equipment were mainly used on boiler replacement to improve plant GHG and pollutant emissions; 20% on upgrading wastewater treatment systems; 20% on waste reduction measures; with the remaining 15% on other environmental equipment. Other environmental expenditures were for operational maintenance, removal and treatment and air pollution fees as well as container recovery and removal fees. In general, there was no significant increase in fees and were more or less the same as the previous year. 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 and improve raw material utilization rates, we introduced a number of technologies in the product process in 2021. 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 year, to further reduce resource consumption.

Fresh Milk

In 2021, the production rate of fresh milk raw materials underwent improvement and optimization through conductivity meter installation to monitor the conductivity value. At the same time, the pressure stabilization system of the finished barrel was modified to improve the front discharge and reduce the loss of waste at the bottom and rear of the barrel, reducing the fixed loss to a minimum. Finally reaching an output rate of 96.8%.

Soy Milk

This year, by continuing to improve soybean extraction technology, we achieved an optimal production efficiency of 97.53%, an increase of more than 5% compared to the extraction rate target originally set, after adjusting the parameters of the bean grinder and the ratio between water and beans. Our target for soybean extraction rate by 2025 is 98.4%.

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. In 2021, overall tea output increased from 86.29% to 92.57%, up 6.28%, saving 3,845.6kg of tea leaves used. We hope to increase tea output rate to 93.2% by 2025.

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.

Uni-President smart production lines

3.2 Climate change and energy management

GRI 302-1, GRI 305-1, GRI 305-2, GRI 305-4, GRI 305-5

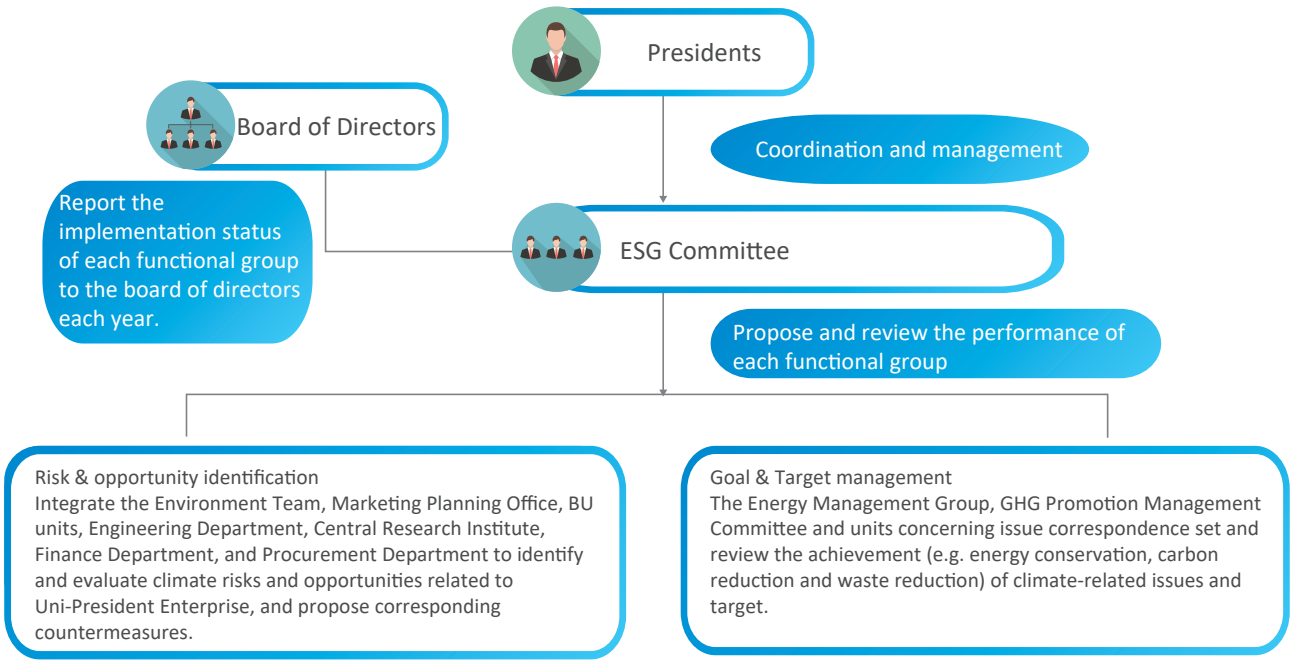
Many climate-related natural disasters have occurred in recent years, including forest fires in Western U.S., heavy rainfall and severe flooding in Western Europe, heat waves in North America, and floods in Henan Province, China. Not only have these natural disasters caused operational losses for many 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

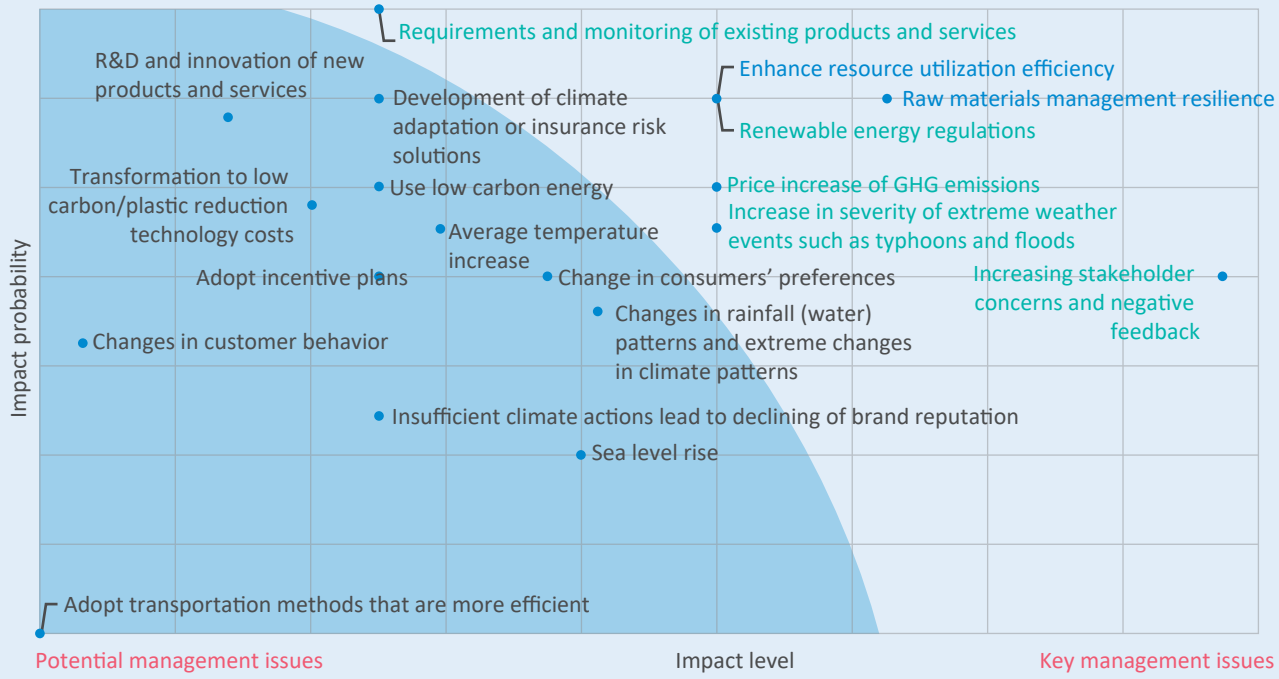
3.2.2 Evaluation and Management Strategies for Climate Risks and Opportunities

In an attempt to understand the impact of climate change on company business, strategies and financial planning, we identified six key management issues through three stages. The results are shown in the matrix of climate risks and opportunities. For a detailed methodology of the assessment, please refer to our 2020 CSR report. In 2021, we re-examined the development status of the industry and issues in order to adjust the current state of issue response and management for key climate risks and opportunities.

Response and Management of Climate Risk and Opportunity Issues (1)

Climate risks and opportunities		Potential impact to Uni-President	Time interval
Physical risks	Increase of severity of extreme weather events such as typhoons, floods and droughts	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.	Short-term (less than three years)

Uni-President Climate Risks and Opportunities



Financial impact	Adaptive management strategy	Management Target
• Increasing the number of days for storage of ingredients/materials 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	• 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	• 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

Response and Management of Climate Risk and Opportunity Issues (2)

Climate risks and opportunities		Potential impact to Uni-President	Time interval
Transformation risk	Requirements and monitoring of existing products and services	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.	Mid-term (three to five years)
Transformation risk	Climate-related policy	In response to the global GHG management requirements, the government has prescribed renewable energy regulations. These regulations require large energy users to set up a certain percentage of renewable energy through means including purchasing of renewable energy power or certificates, energy storage equipment, or by paying an allowance. Moreover, in a bid to increase the use of renewable energy in the plant, it is possible that carbon fees will be imposed in the future in Taiwan. Meanwhile, many countries around the world have begun to establish carbon taxes, which may increase our energy costs, affecting product competitiveness.	Mid-term (three to five years)
Transformation risk	Stakeholder concerns	• 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.	Mid-term (three to five years)
Transformation risk	Raw materials management resilience	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.	Mid-term (three to five years)
Opportunity	Improve resource utilization efficiency	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.	Short-term (less than three years)

Financial impact	Adaptive management strategy	Management Target
• 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	• The Central Research 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 group, the Central Research Institutive, the Marketing Planning Office, 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	• Product labelling is in compliance with regulatory standards • Introduction of most suitable, environmental and functional packaging materials
• Payment of carbon fees results in an increase in operating expenses • 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)	• Inventory and performance evaluation of annual energy consumption and greenhouse gas emission of the organization • Product footprint introduction • Energy conversation and carbon reduction project introduction • Establish a Green Energy Management Center to coordinate and manage green energy projects of Uni-President and each affiliated company • Installation of solar photovoltaic (PV) system	• The annual average power saving rate of each general plant is >1% for 2020–2024. • Current annual target for carbon intensity for each production plant ▲ For units that reached the target in the previous year, the performance for the year will be reduced by 1% ▲ For units that did not reach the target in the previous year, the performance for the year will be reduced by 2%
• 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	• 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	• Continue to refine quality products • Introduce optimized, environmentally friendly and functional packaging materials
• Unstable raw material supply prices of raw materials result in an increase in operating costs • Alternative material selection and development results in an increase in operating costs	• Stable management of raw material sources • R&D of flavored raw material replacement • Supply chain stability (e.g. alternative material response and development, get hold of supply source situation from suppliers on a periodic basis)	• 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
• 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	• Installing sludge dryers, soybean residue dryers and expanding the possibility of resource utilization of tea residue in the future • Evaluate commercialization of soybean residue and biogas power generation • Resale of anaerobic sludge • Carry out product process improvement through the Technology Group to reduce raw material consumption	• Waste recovery rate over 95.0%

3.2.3 Energy Consumption and GHG Emissions Management Performance

GRI 302-1, GRI 305-1, GRI 305-2, 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. Aside from the emission management of the self-operating end, we have also extended GHG management to the value chain, enabling the carbon management of Uni-President to move towards a new milestone. We will re-plan and re-evaluate the short-, medium- and long-term carbon reduction targets depending on the 2021 inventory results as well as current key carbon reduction trends, such as standards including the science-based target (SBT) setting and Net Zero Emissions by 2050.

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$850 will be granted for every ton of CO_2 emissions reduced. By taking this approach, we encourage all employees to work together towards energy conservation and carbon reduction. In 2021, incentives granted amounted to NT$0.23 million.

Energy consumption status

In 2021, the main energy used by Uni-President was natural gas of 750,644 GJ (50.47%) and electricity of 689,747 GJ (46.38%), both accounting for 96.85% of non-renewable energy use. Due to environmental considerations, we reduce the use of fuel oil year by year and the ratio of fuel oil used in 2021 only accounted for 1.46% of energy used.

Non-renewable energy of Uni-President used in 2021 was 1,487,226 GJ, an increase of 3,955 GJ compared to 2020. This was due to the increase in production value this year as well as the expansion of the inventory scopes. Despite this, the energy intensity (0.35 GJ/million) this year did not increase significantly compared to 2020 (0.35 GJ/million).

In the face of the current energy conservation and carbon reduction trends, relevant laws and regulations require large electricity users to install a certain percentage of renewable energy. In 2021, a total of 7,135 kWh of renewable energy was generated, including 7,064 kWh of solar power and 71 kWh of wind power.

In the future, Uni-President expects to invest NT$98 million to install 1.87MW of solar power in Xinshi Logistics Park in 2024, while 0.09MW of solar power will be installed in Taichung General Plant by January 2023.

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.

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.

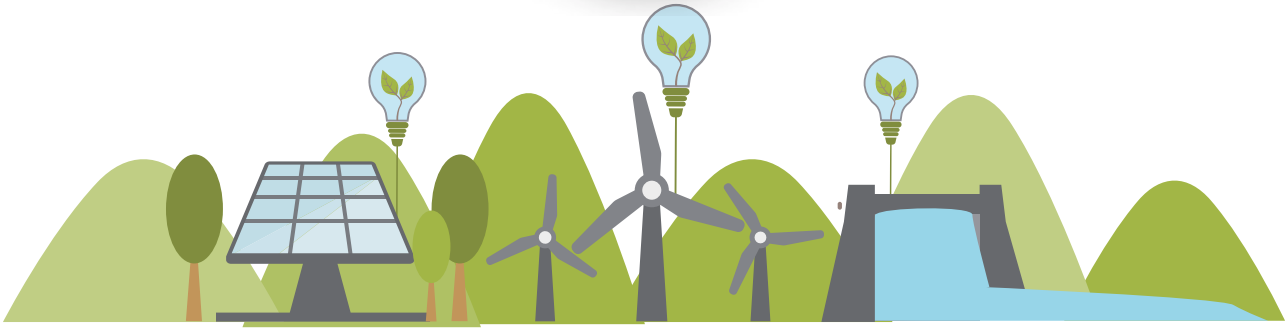
In 2021, we determined key indirect emission sources by following six significant principles for indirect emission source identification, namely: regulations and stakeholder expectations, ease of data acquisition peer disclosure status, availability of emission coefficients, quantification of materiality and the possibility of reduction plans. In 2021, the total GHG emissions was 1,545,779 metric tons of CO_2e, and among this, the GHG emissions for Scope 1 and Scope 2 (self-operations) were 154,543 metric tons of CO_2e (account for 10% of the total emissions), while the GHG emissions for Scope 3 (value chain) were 1,391,235 metric tons of CO_2e (accounting for 90% of total emissions).

Of all the GHG emissions from self-operations (Scope 1 and Scope 2), 96,160 metric tons of CO_2e were the main emission source generated by purchased electricity, accounting for 62% 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 44,939 metric tons of CO_2e, accounting for 29% of GHG emissions from self-operations. From the inventory results, it was found that the GHG emissions from our operations came from the use of natural gas and electricity in our 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 984,106 metric tons of CO_2e, accounting for 71% of GHG emissions in the value chain; followed by emissions generated due to investments, with a total of emissions of 290,901 metric tons of CO_2e, accounting for 21% of GHG emissions in the value chain

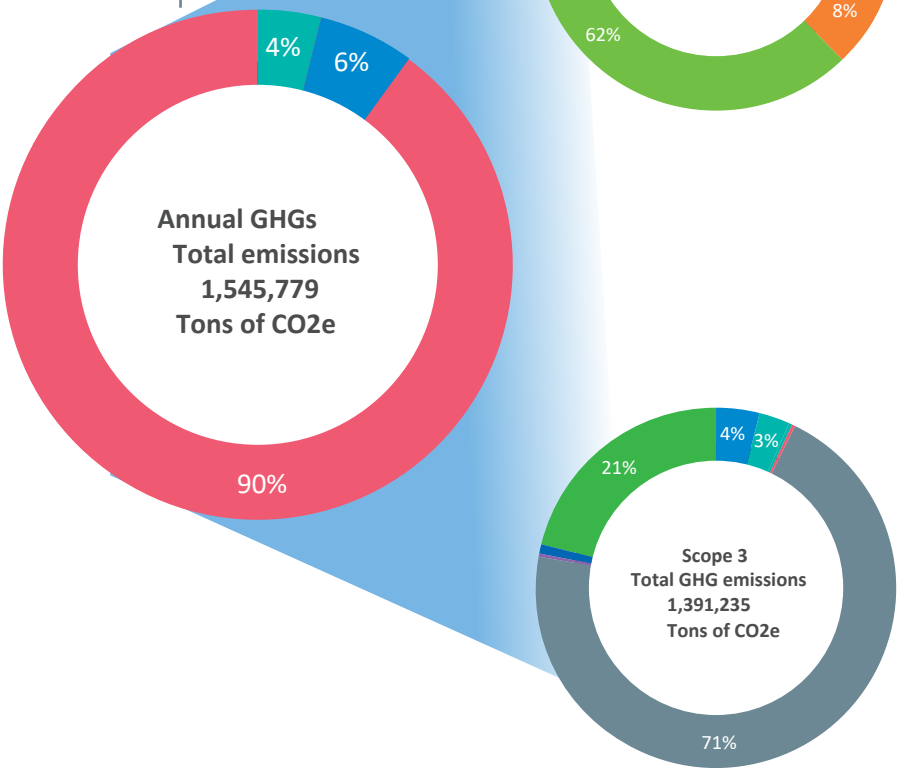
In 2021, the self-operating (Scope 1 and Scope 2) GHG emission intensity was 36.25 metric tons of CO_2e/operating income (tens of millions of dollars). The value of the value chain (Scope 3) GHG emission intensity calculated for the first time this year was 326.37 metric tons of CO_2e/operating income (tens of millions of dollars). In the future, we will take into account absolute emissions and intensity and establish targets for energy conservation and carbon reduction. 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.

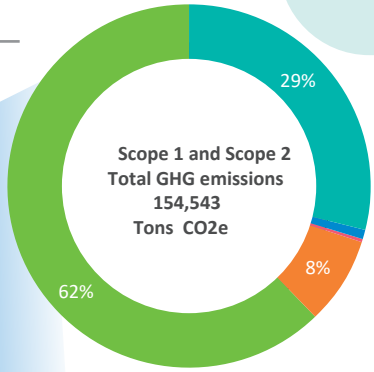
Uni-President Principle of Identification of Significant Indirect Emission Sources



2021 GHG emissions of Uni-President

Emission sources		Emissions (metric tons of CO_2e)
Direct emission sources	Scope 1	58,384
Indirect emission sources	Scope 2	96,160
	Scope 3	1,391,235





Emission sources		Emissions (metric tons of CO_2e)
Scope 1 (Category 1)	Fixed emissions	44,939
	Mobile emissions	690
	Process emissions	243
	Fugitive emissions	12,512
Scope 2 (Category 2)	Purchased electricity	96,160

Emission sources		Emissions (metric tons of CO_2e)
Scope 3 (Category 3)	Upstream transportation and distribution	54,168
	Downstream transportation and distribution	42,258
	Employee commuting	3,561
	Business trips	561
Scope 3 (Category 4)	Purchased goods	984,106
	Disposal of solid and liquid waste	4,270
Scope 3 (Category 5)	Downstream leasing assets	11,409
	Investments	290,901

Note

1. The scope of inventory in 2021 included Yongkang General Plant, Xinshi General Plant (including the ice product plant and cold food plant), Taichung General Plant, Yangmei General Plant (including Ruifang Mineral Water Plant) and Zhongli General Plant (including Madou Bread Plant), TMR, logistics warehouses, Taipei branch, Kaohsiung Office, Neihu Office, Wugu Office, and Hukou Plant (including the ice cube factory). Moreover, we also completed inventories using the operational control approach. as required by ISO 14064-1:2018, with the data verified by SGS.
2. Types of GHG covered: CO_2, CH_4, N_2O, HFCs, SF_6
3. 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.
4. At present, our electricity purchased externally is handled in accordance with the electricity emission coefficients announced by Bureau of Energy, Ministry of Economic Affairs. As the 2021 electricity emission coefficients have not yet been announced, we used the figure of 0.502kg of CO_2e announced in 2020 as the calculation parameter. Other emission parameters mostly adopted the "GHG Emission Coefficient Management Table Version 6.0.4" announced by the Ministry of Economic Affairs in June 2019 and applicable coefficients announced by the IPCC. As the warming potential of various types of GHGs has different degrees of climate impact, after calculating emissions of various types of GHG sources, they are then multiplied by the GWP value to convert to carbon dioxide equivalent (CO_2e). The GWP value at the current stage is based on the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) 2013. The selection of GWP will be adjusted in the future in accordance with the regulations of government agencies.
5. 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 transformation, equipment parameter optimization, and production process adjustment and control. In 2021, energy-saving projects of all plants totaled 5,269 metric tons of CO_2e, saving NT$31.65 million. As well as this, to manage carbon footprint of our products, the carbon footprint of eight products are in the process of being certified.

Carbon footprint:

190.00g CO_2e/pack

Carbon footprint:

380.00g CO_2e/box

Carbon footprint for 300mL packages: **160.00g** CO_2e/box

Carbon footprint for 375mL packages: **200.00g** CO_2e/box

Carbon footprint for 300mL packages: **130.00g** CO_2e/box

Carbon footprint for 375mL packages: **160.00g** CO_2e/box

Carbon footprint for 300mL packages: **120.00g** CO_2e/box

Carbon footprint for 375mL packages: **140.00g** CO_2e/box

2021 Representative Energy Saving and Carbon Reduction Projects

Madou bread factory – Energy-efficient motor installed in chiller mainframe

▶999,095 kWh of electricity a year was saved, reducing 506.88 tons of CO_2e emissions, saving expenses by NT$3.41 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%.

Xinshi General Plant – Improve the energy efficiency of ice water building

▶539,168 kWh of electricity per year was saved, reducing 274.44 tons of CO_2e emissions, saving expenses by NT$1.41 million.

- The efficiency of the heat exchanger is improved after upgrading the cooling pipes of the chiller, further reducing electricity used for running the chiller.

Yangmei General Plant – Frequent boiler starts and stops reduced

▶394,136 kWh of electricity per year was saved, reducing 200.62 tons of CO_2e emissions, saving expenses by NT$1.04 million.

- With less use of steam on holidays, frequent unloading affected the combustion efficiency. By setting up a fuel ratio sensor linked with an inverter control system, the fan speed adjusted improves the frequent start/stop condition, with energy efficiency also enhanced.

3.3 Water Resources Management

GRI 303-1, GRI 303-3, GRI 303-2, GRI 303-4

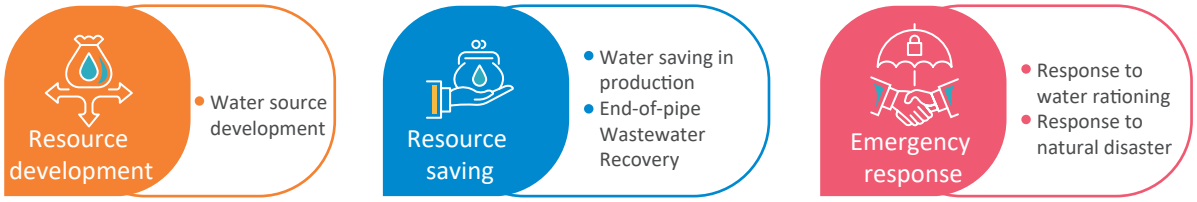
At Uni-President, we regard water resources as an important environmental and operational issue. Among our diversified products, beverage products such as juice, tea and dairy products are highly dependent on water in the manufacturing process. Although rainfall is abundant in Taiwan, with uneven distribution 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, GRI 303-3

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 2021 water consumption data. The results indicate the control of water conditions and production scheduling are management priorities.

Water consumption analysis of each plant

	Yangmei Plant	Zhongli Plant	Hukou plant	Taichung Factory	Yongkang Plant	Xinshi Plant
Water condition risk Note 1	Shihmen Reservoir		Baoshan Reservoir	Liyu Carp Lake Reservoir	Nanhua Reservoir	Wushantou Reservoir and Tsengwen Reservoir
Water consumption percentage Note 2	0.25%		0.92%	0.00%	0.15%	0.07%
Overall water consumption risk Note 3						

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 2021/water supply data released by each reservoir in 2020
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

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.

The production in our plants was affected by a drought that hit Taiwan in the first half of 2021. In response to the risk of water shortages, we re-examined the legal underground resources of each plant and obtained verification documents for water quality and volume to ensure the safety of our products. Meanwhile, we also reviewed the production scheduling during the period where water was scarce and determined production scheduling based on the importance of factors including the product, the water required for pipeline cleaning, the amount of water used for the product, and other factors. At the same time, we stopped the production for some water-consuming products such as soybean milk. Through implementing relevant measures, the drought event in 2021 did not have a significant financial impact on the operations of Uni-President.

Water Resources Risk and Adaptation

Risk Source	Risk Issue	Adaptation Action
Regulations	• Response to laws and regulations • Water consumption fee collection method • Water Pollution Control Act	• Closely monitor the water consumption of each plant and water conditions in each area • Acquire green building certification for all new plant buildings • Establish and monitor targets for discharged water quality
Disasters	• Insufficient water resources • Increased chance of heavy rainfall and floods	• 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	• Decide on, announce, and implement countermeasures • Coordinate the work and capture status	Technical Group
Monitoring water consumption	• 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 factory and coordinate production based on water consumption sequences.	Engineering Department
Water scheduling	• Dispatch water trucks • Conclude transportation service agreement	Transportation Service Department
Water price management	• Conclude agreements on the unit price with water suppliers	Procurement Department
Monitoring water quality	• Control water quality and water truck safety	Food Safety Center
Water conservation measures	• 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	Engineering Department Administration Department Production Plant

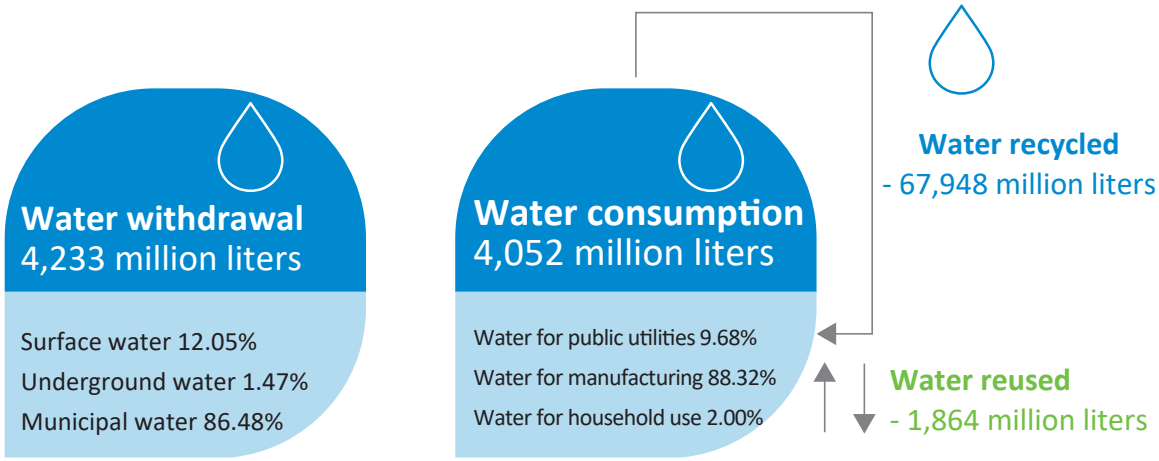
Water shortage countermeasures of Uni-President

Water rationing measures		Emergency response of Uni-President
Phase I	• Reduce water supply pressure • Stop water supply to non-urgent or unnecessary facilities	• Increase the frequency of Water Supply Information Reports and online reporting of water consumption and storage to facilitate situation control • 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
Phase II	• Stop high consumption water supply users • Reduce water supply	
Phase III	• Stop water in turns by area or in all areas.	• Initiate the “Water Supply Emergency Response Mechanism.” Manage purchased water, water transportation, and dedicated intakes, and test water quality and treat incoming water • Activate water storage equipment and increase storage • Perform inter-plant dispatch, with the Hukou Plant 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
Phase IV	• Fixed time and fixed quantity supply	

Water Consumption Status in Production Sites

In 2021, the total water consumed by our plants was 4,233 million liters (3,661 million liters of municipal water supply, 510 million liters of surface water, and 62 million liters of groundwater). As our production increased in 2021, total water consumption also increased by 0.8% from 2020. Furthermore, we will continue to promote water-saving projects to improve the efficiency of water use so as to mitigate the impact of water resources driven by production. For water use from 2019 to 2021, please refer to Appendix I – ESG Information

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.

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

Water source development	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
Process Water Source Improvement	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
Process Water Recycling	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
End-of-pipe Wastewater Recovery	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.

2021 water saving projects

Xinshi Plant – Optimized the use of water resources in the soymilk line

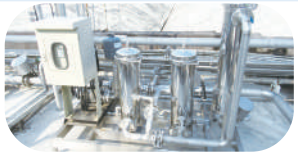
▶A total of NT$0.27 million was invested, saving 0.46 million liters of water per year

- In the past, to avoid interruptions in production, water was constantly being injected into equipment in order to keep them running after soybean residue was cleaned. With the implementation of this project, additional soybean residue storage tanks were purchased to keep the production running while reducing water discharge.

Xinshi Plant – Project of water flavor optimization

▶A total of NT$2.63 million was invested, saving 1.82 million liters of water per year

- In response to the dry season, we activate the acid-washed carbon filter system to filter soft water for production during March to July every year. By doing so, we are able to reduce soft water wastage of RO water production.



Yangmei Plant – Optimization of cleaning conditions for dairy production line

▶Annual water consumption reaching 3.93million liters

- The frequency of pickling and alkaline washing has been adjusted in the cleaning of production tanks and filling machines in order to reduce steam and soft water used.

3.3.4 Wastewater Management

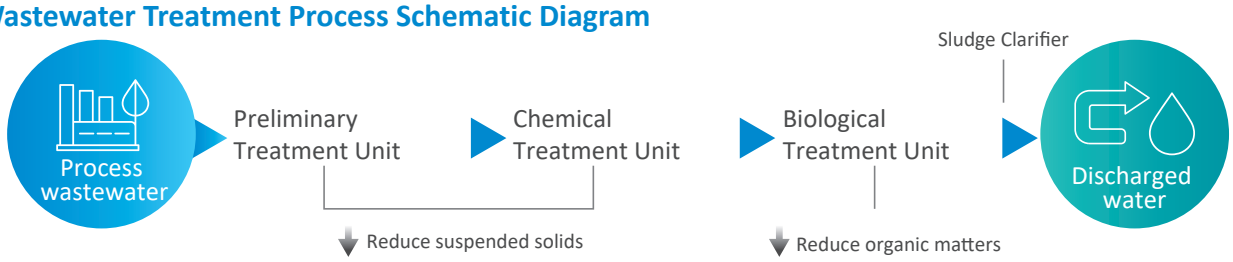
GRI 303-2, GRI 303-4

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 2021, the total volume of wastewater from each plant was 3,228 million liters. The average COD concentration 29.62 mg/L, a year-on-year decrease and lower than our target of 75 mg/L. This year's BOD decreased by approximately 39% from the previous year, showing that the wastewater treatment performance of plants is stable. For water discharge volume and quality data of water discharged for the past 3 years, please refer to Appendix I – ESG Information.

This year, three improvement projects were carried out for the wastewater treatment systems, totaling NT$6.18 million. These projects were: improving sludge treatment efficiency at Yangmei General Plant; adding dissolved air flotation equipment to improve wastewater treatment amount and suspended solid volume at Yongkang General Plant; while also introducing a wastewater treatment monitoring system at Zhongli General Plant to reduce monthly sewage treatment costs through real time monitoring.

Wastewater Treatment Process Schematic Diagram



Uni-President Wastewater Discharge Control Standards

Plant Discharge Water Quality

- BOD ≤ 22.5 mg/L
- COD ≤ 75mg/L
- SS ≤ 22.5 mg/L

National Effluent Quality Standard

- BOD ≤ 30mg/L
- COD ≤ 100mg/L
- SS ≤ 30 mg/L

Standards of Setting Uni-President Effluent Quality Target

- Our self-imposed strict regulations (75% of the regulatory limits)

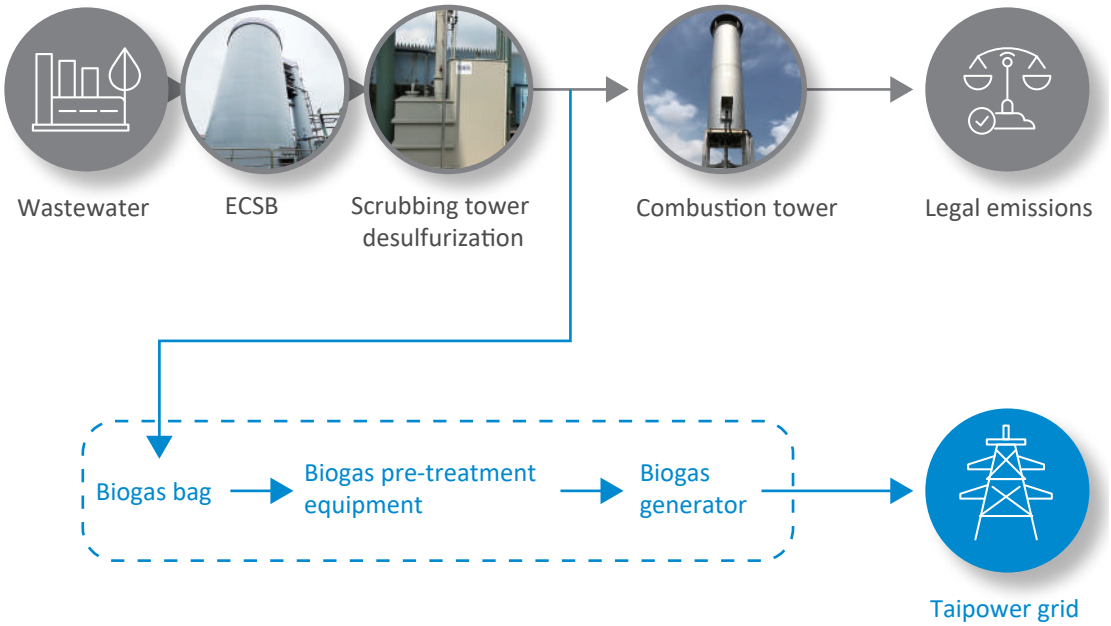
Xinshi Plant – Project of food plant wastewater and biogas power generation

▶ Carbon emission reduced by 368 tons of CO_2e 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 will be installed in Xinshi Plant, which is expected to be completed in September 2022. The system collects methane from the wastewater treatment system for power generation. The preliminary test showed that the methane generated from the wastewater treatment had a purity of 90%, which can produce 722,621 kWh of power per year. The current plan is to sell the power generated back to Taipower, creating NT$3.69 million of power sales a year. If amortized at 20 years, revenue can increase by NT$1.65 million per year.

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, SOx, NOx 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 NOx and SOx. In 2021, a total of NT$12.41 million was spent to renew boilers at Yongkang Factory to reduce So_x emissions by 7.33 tons and NOx emissions by 4.07 tons.

Compared to the previous year, emissions of volatile organic compounds (VOCs) and particulate matters (PM) increased. The increase in PM was due to the production capability of feed and instant noodles that were higher than in the 2020 by 13% and 10%, respectively. Nevertheless, we have also set up a new water washing tower equipment in order to reduce the emissions of PM, expecting to reduce 0.85 tons of PM emissions per year. The increase in VOCs was due to the calculation method revised by the competent authority, resulting in an increase of emissions by 1.10 metric tons. The use of raw materials did not significantly increase. For air pollution emission data from 2019 to 2021, please refer to Appendix I – ESG Information.

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. In 2021, a total of 35,754 metric tons of waste was generated, representing a decrease of 2,152 metric tons from 2020 (for detailed data, please refer to Waste Generated and Disposed of for the Past 3 Years in Appendix I – ESG Information). The decrease was attributed to the fact that we implemented the concept of “circular economy” in waste management. Since 2016, we achieved waste management objectives and waste recovery rate this year reached 95.65% (for this year’s waste recovery percentage, please refer to Appendix I – ESG Information). Specific examples of circular economy are as follows:

Soybean residue reuse

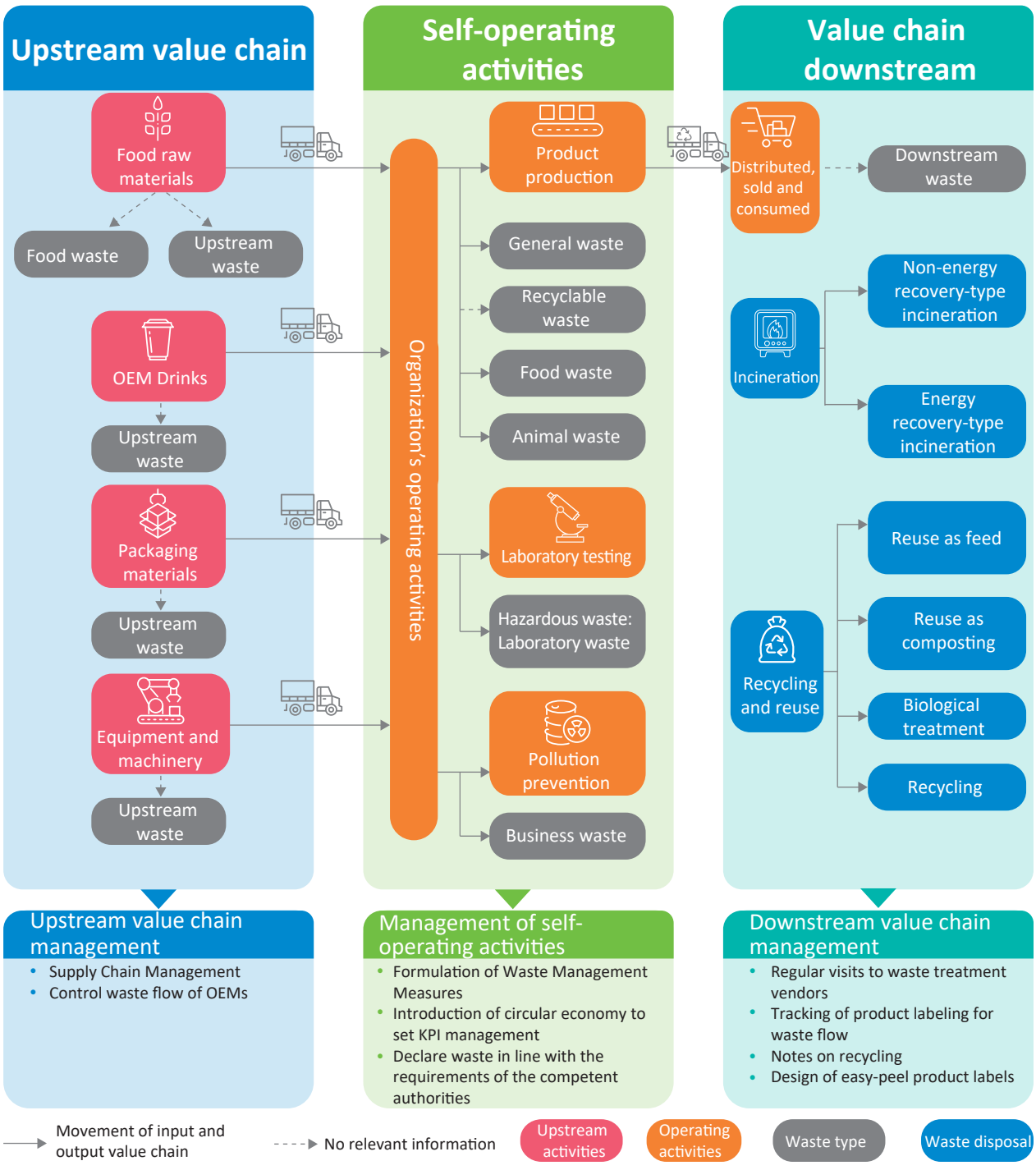
Uni-President is the first company in Taiwan to have obtained the certification of soybean as a by-product in the manufacturing process by the Council of Agriculture. Not only this, but we were the first company in Taiwan to use soybean residue as a resource. Soybean residue generated in Xinshi General Plant is converted into feed for dairy cattle, saving waste removal costs while also bringing us new economic benefits.

Water content of soybean residue, tea residue and sludge improved

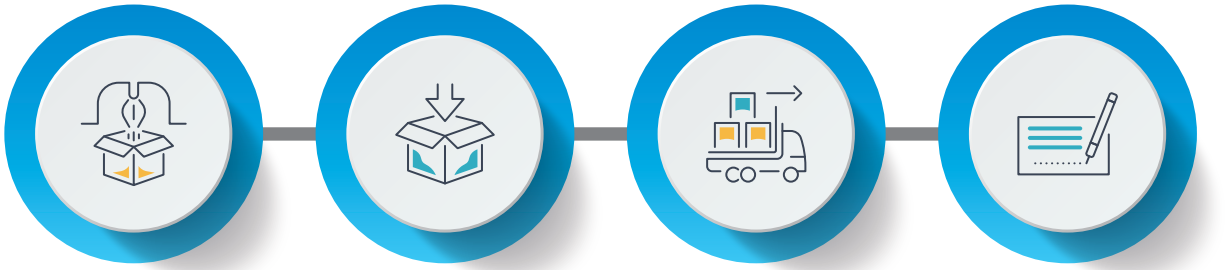
The extraction efficiency for tea and soymilk products at Yangmei General Plant and Xinshi General Plant have been improved. At the same time, we also managed to successfully reduce the water content in the residue, effectively increasing waste residue value and reducing transportation costs. In 2021, we reduced 982 tons of soybean residue and 250 tons of tea residue. As well as this, we completed the installation of a sludge dryer in Xinshi General Plant which reduces the water content of sludge by more than 50%. In 2021, we successfully reduced 1,376 tons of sludge and our sludge can be used as organic fertilizer after composting.

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 2021, a total of 17 waste, resources, and hazardous waste treatment companies were inspected, with a total of 91 tracked. There were no violations discovered in the inspection and tracking results. In addition, we have marked waste classification on products and have also established easy-to-tear labels for specific products such as Chai Li Won tea range. For the tracking records of waste and resource flows for the past 3 years, please refer to Appendix I – ESG Information.

Uni-President Value Chain Waste Flow Chart



Key Items for Waste Treatment Plant Inspection



Treatment method of waste and resources

Waste storage method

Removal record

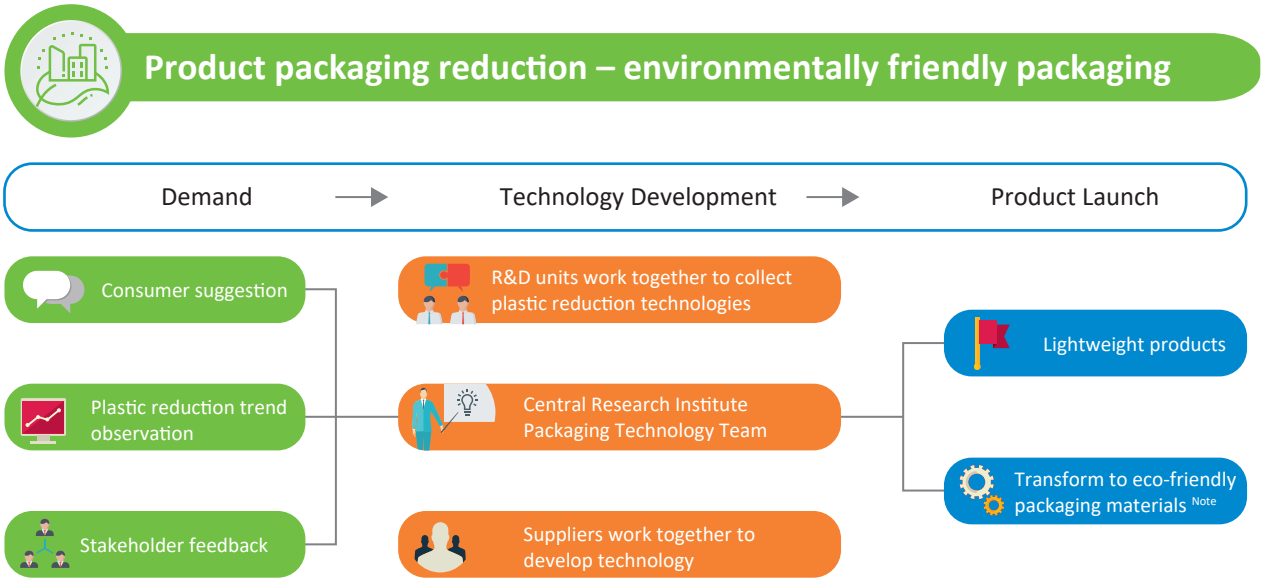
Permit for removing waste

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. Although Taiwan's recycled plastic food packaging regulations have not yet been adjusted to follow the global plastic reduction trend, we still 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.

In 2021, 18,488 tons of plastic was used, with PET, PP, and PE accounting for more than 97.42% of the total amount. This year, the use of plastic showed a slight increase, mainly due to the fact that PET bottles for oil were included for inventory. (for plastic usage in the past 3 years, please refer to Appendix I – ESG Information)

Three major projects were divided for this year's plastic reduction programs: The first – replacement of packaging materials and lightweight products. We will change heat and pressure resistant bottles to carbonated soft drink bottles for Apple Soda. Based on the estimated annual sales of 6.48 million bottles for 2022, a total PET usage of 47.3 tons/year is reduced. We also plan to reduce the thickness of the PE laminate layer of containers for instant noodles (Ah-Q, Wakuwaku, Uni-President Minced Pork Flavor Instant Noodles), successfully reducing 9.5 tons of plastic usage. The second – an attempt to adjust the sales model. This year, we introduced full-case mineral water products with any labels. We reduce the use of PP and facilitate product recovery to increase the value of recycled materials by removing single-bottle labels and adopting to full labeling on the outer box. The third parts are the research and development of technology. We completed the feasibility of the application for PET bottle cap to stay on after opening, while at the same time keeping a close eye on the trend of international regulations as a reference for future product development. Meanwhile, we have introduced biodegradable plastics and applied related materials to ice product packaging materials. Finally, r-PET was tested in PET bottle labels this year, and 30% replacement was completed during our testing phase. If r-PET is introduced into products, the use of 120 tons of new PET materials are expected to be reduced per year. In the future, we will continue to promote plastic packaging material reduction by planning to design product packaging in the direction of single-materials and easy recycling. As well as this, we will also evaluate the possibility to introduce vegetable-sourced plastics to reduce the product's carbon footprint.

2021 Uni-President Packaging Management Achievements

Development of eco-friendly packaging technology

- Stay-on-cap technology for PET bottles
- Biodegradable PLA material technology
- r-PET labeling technology

Lightweight alternative packaging materials and products

- PE lamination thinning for Instant noodle paper containers
- Change in Apple Soda bottles to carbonated soft drink bottles

Change in sales pattern

- Pure water bottles sold in boxes without labels

Packaging change for Apple Soda

Classification	Heat and pressure resistant (HPR) bottle	Carbonated soft drink (CSD) bottle
Bore-type