



Part 4

Green Cheng Shin

Key Performance

◆ ISO50001

The mainland region has passed the external certification for the ISO50001 energy management system.

◆ Greenhouse Gas Reduction

Energy-saving programs have been promoted in Taiwan and mainland region in the past two years, and it is estimated that the greenhouse gas emissions - CO₂e can be reduced by 4,861.74 tons.

◆ Cleaner Production

Douliu Second Factory passed the cleaner production evaluation system certification of the Industrial Development Bureau, Ministry of Economic Affairs.

◆ Reduction in the Use of Water Resources

Water consumption has been reduced in Taiwan and mainland region by a total of 223,155 tons.

◆ Reduction of Wastewater Discharge

Wastewater discharge has been reduced in Taiwan and mainland region by 15.6% and 34.7%, respectively.

4.1 Risks and Challenges of Climate Change

In order to cope with the risk and impact of extreme weather, Cheng Shin convened relevant heads of all departments through the Corporate Social Responsibility Working Group to identify major climate risk topics related to climate change based on the materiality principle and the Task Force on Climate-Related Financial Disclosures (TCFD), analyze their impact and opportunity, draw a climate change risk and opportunity matrix by identifying physical and transformational risks. Cheng Shin has developed a core and strategy for implementing climate change actions to address major risks in order to implement risk response measures, enhance the resilience of Cheng Shin to extreme climate and reduce the risk. Through regular review of the effectiveness of mitigation measures, Cheng Shin aims to standardize procedures to reduce the response time for similar risk treatment in the future.

Key steps to identify climate change risks/opportunities and risk management processes.

◆ Key steps to identify climate change risks/opportunities and risk management processes



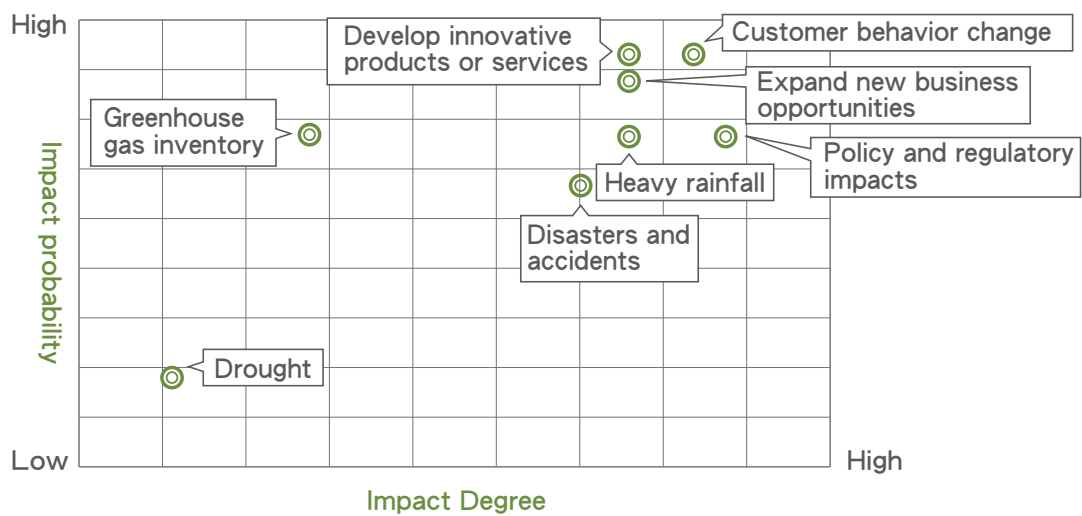
◆ Indicator Disclosure Framework for Cheng Shin TCFD

Level	Indicator	Corresponding CSR Section
Governance	A. Describe the board’s oversight of climate-related risks and opportunities.	Green CST P.48
	B. Describe the role of management in assessing and managing climate-related risks and opportunities.	
Strategy	A. Describe the short term, medium term and long term climate-related risks and opportunities that the organization has identified	Green CST P.50~52
	B. Describe climate-related risks and opportunities that would have a significant impact on the organization’s business, strategy, and financial planning.	
	C. Describe the organization’s strategic resilience, taking into account different climate change scenarios, including 2°C or lower.	
Risk Management	A. Describe the organization’s processes for identifying and assessing climate-related risks.	Green CST P.49~50
	B. Describe the organization’s processes for managing climate-related risks.	
	C. Describe the organization’s integration of processes for identifying, assessing, and managing climate-related risks into its overall risk management framework.	
Indicators and Objectives	A. Disclosure of the indicators the organization uses to assess climate-related risks and opportunities in accordance with its strategy and risk management processes.	Green CST P.52~53 4.3.4 Greenhouse Gas
	B. Disclose the emissions and related risks within the scope of steps 1, 2, and 3 (where applicable).	
	C. Describe the objectives and performance of the organization to manage climate-related risks and opportunities.	

◆ Identify Risks and Opportunities of Climate Change

In response to the climate change and energy use crisis, Cheng Shin's CSR working group, together with staff from each department, assessed the "impact probability" and "impact degree" of each risk according to the materiality principle, identified eight climate change risks and opportunities, integrated Cheng Shin's development with policies and solutions for economic development, environmental protection, and sustainable development, and set the long-term objectives to continuously strengthen climate resilience and build a culture of environmental sustainability.

◆ Climate Risk and Opportunity Matrix



◆ Risk and Opportunity Impact Analysis of Climate Change

Type	Potential Risks and Opportunities	Impact to Cheng Shin	Response Measures
Transformation Risks	Policy and regulatory impacts	For the environmental protection laws and regulations announced by the government, it is necessary to understand and judge the compliance degree in the factory in a timely manner to facilitate compliance with the government policies and regulations	<ul style="list-style-type: none"> Self-inspect the pollution prevention status and the pollution prevention equipment capability on a regular basis through the internal audit of the effective environmental management system. It has established regulations on the identification and management of environmental safety and health-related laws and regulations and collects regulations updated by relevant competent authorities every month to identify and implement them accordingly. Conduct compliance assessment once a year to comply with statutory provisions.

Type	Potential Risks and Opportunities	Impact to Cheng Shin	Response Measures
Transformation Risks	Customer behavior change	<ul style="list-style-type: none"> Environmental topics: In order to improve environmental protection and driving safety, with the expectation on the tire industry to provide consumers with better tire quality, stricter standards of the EU Labeling Law have been put forward to implement by stages (2017~2030). Buy all-seasons tires: Some countries in the European area have light snow weather all year round. Although the temperature is low, it won't have extremely cold weather. Therefore, for convenience, consumers began to buy all-season tires. 	<ul style="list-style-type: none"> Continue to carry out market and customer demand surveys so as to provide the new generation of all-season tire products in line with the market and customer demand.
	Cap-and-trade of greenhouse gases	At present, the national policy tends to be caps on greenhouse gas emissions, and some main plants in mainland are subject to the cap, which may result in cost increase.	<ul style="list-style-type: none"> Participate in industrial associations, negotiate with the government about greenhouse gas caps. Participate in voluntary greenhouse gas reduction and continue to enhance the efficiency of equipment. Conduct greenhouse gas inventory.
Entity Risks	Heavy rainfall	<ul style="list-style-type: none"> Affect the traffic in the plant as a result of the surface gathered water. Due to climate change, waterways in the plant have soared, resulting in water accumulation. 	<ul style="list-style-type: none"> Remove the silt in the waterway and increase the load of water. Add and purchase new equipment to increase the number of drainage motors in the plant to promote drainage efficiency.
	Drought	Water restrictions imposed by the government affect the water for business use.	Continuously monitor the government's water restriction policies to avoid any unexpected impacts on Cheng Shin's capacity.
	Disasters and accidents	Disasters and accidents cause disruption of operations and equipment damage.	<ul style="list-style-type: none"> Contingency shall be dealt with in accordance with the "Disaster and Accident Handling Management Methods". Such as: Emergency Response Plan Operation Process, Emergency Response Contact System, and Disaster Response Management, etc. Implement in accordance with the Technical Guidelines on Emergency Response Measures and follow the Taiwan Occupational Safety and Health Management Systems (TOSHMS) guidelines and the five related technical guidelines (risk assessment, procurement management, contracting management, change management, and emergency response measures) issued by the Ministry of Labor.

Type	Potential Risks and Opportunities	Impact to Cheng Shin	Response Measures
Opportunities	Expand new business opportunities	The abnormal weather caused a change in customer demand. If we can predict the market demand and develop new products, we are likely to enter new markets and increase our revenue.	<ul style="list-style-type: none"> Develop new product of all-season PCR and SUV according to customer performance requirements. Segment market and look for new niches.
	Develop innovative products or services	<ul style="list-style-type: none"> Anti-closure 3D Sipe technology. High wet grip 4S white smoke tread formula technology. 	Development of a new generation of all-season tire commercial products.

◆ Response Strategies and Objectives for Climate Change

Strategy	Sustainable Development Goals	Achievements in 2020
Internal audit and regulatory identification	Continuously ensure compliance through internal audits and regulatory identification, and advance regulatory deployment being superior to the laws and regulations.	In 2020, Xizhou Plant and Douliu First Plant in Taiwan were punished for violating the Waste Disposal Act. Cheng Shin made immediate improvements for the penalty items imposed by the Environmental Protection Administration and continued to follow up and even re-examined similar environmental issues in all plants.
Accurate Market Response	In response to the demand for all-season tires, we arrange regular market surveys every year to understand product-market feedback and consumer demand to analyze future trends.	Affected by the epidemic and the cargo transportation in short supply in 2020, the overall European car/commercial vehicle sales market declined by 10% approximately, while the demand of the all-season tire market only saw a slight decline, which is sufficient to show that the demand remains strong. In the future, we will continue to provide market feedback and continue to provide customers with satisfactory products.
Promote energy conservation and carbon reduction in manufacturing	<ul style="list-style-type: none"> Cooperate with the Bureau of Energy's electricity saving targets every year. Cheng Shin aims to reduce energy consumption by 2% by 2021. 	The energy-saving and carbon reduction performance of the central plant in 2020 is about 129,350 kWh, equivalent to 1703.74 tons of CO ₂ E, approximately
Water Resources Risk Management	<ul style="list-style-type: none"> Conduct management in accordance with the Measures for Flood Control Pumping, adjust motor-related equipment as necessary (e.g., water level of each area, setting of stopping pumping water level, maintenance cycle, regional maintenance management). Continue to monitor climate-related information for advance development of relevant countermeasures. 	<ul style="list-style-type: none"> Continuously monitor the government's water restriction policies to avoid any unexpected impacts on Cheng Shin's capacity. Established records of climate anomalies and relevant government policies.

Strategy	Sustainable Development Goals	Achievements in 2020
Enhance Climate Resilience	Conduct management according to the "Provisions for the Management of Disasters and Accidents" every year, and continuously review and revise to conform to the current situation.	Implemented plant accident management in accordance with technical guidelines for emergency response measures, implemented and avoided disaster events in accordance with management regulations, and constantly revised and reviewed the contents of management provisions.
R&D Innovation	From 2019 to 2020, the Group completed two development projects of PCR/LTR all-season tires and is expected to launch three new all-season product development projects in 2022.	<ul style="list-style-type: none"> ·AP3 SUV product development with the verification results show that the braking performance on wet ground and the control performance on dry ground are better than those of competitors. (235/60R18 Spec.) ·AP3 product development with the verification results show that operation safety on dry and wet ground is better than those of competitors. (205/55R16 Spec.)

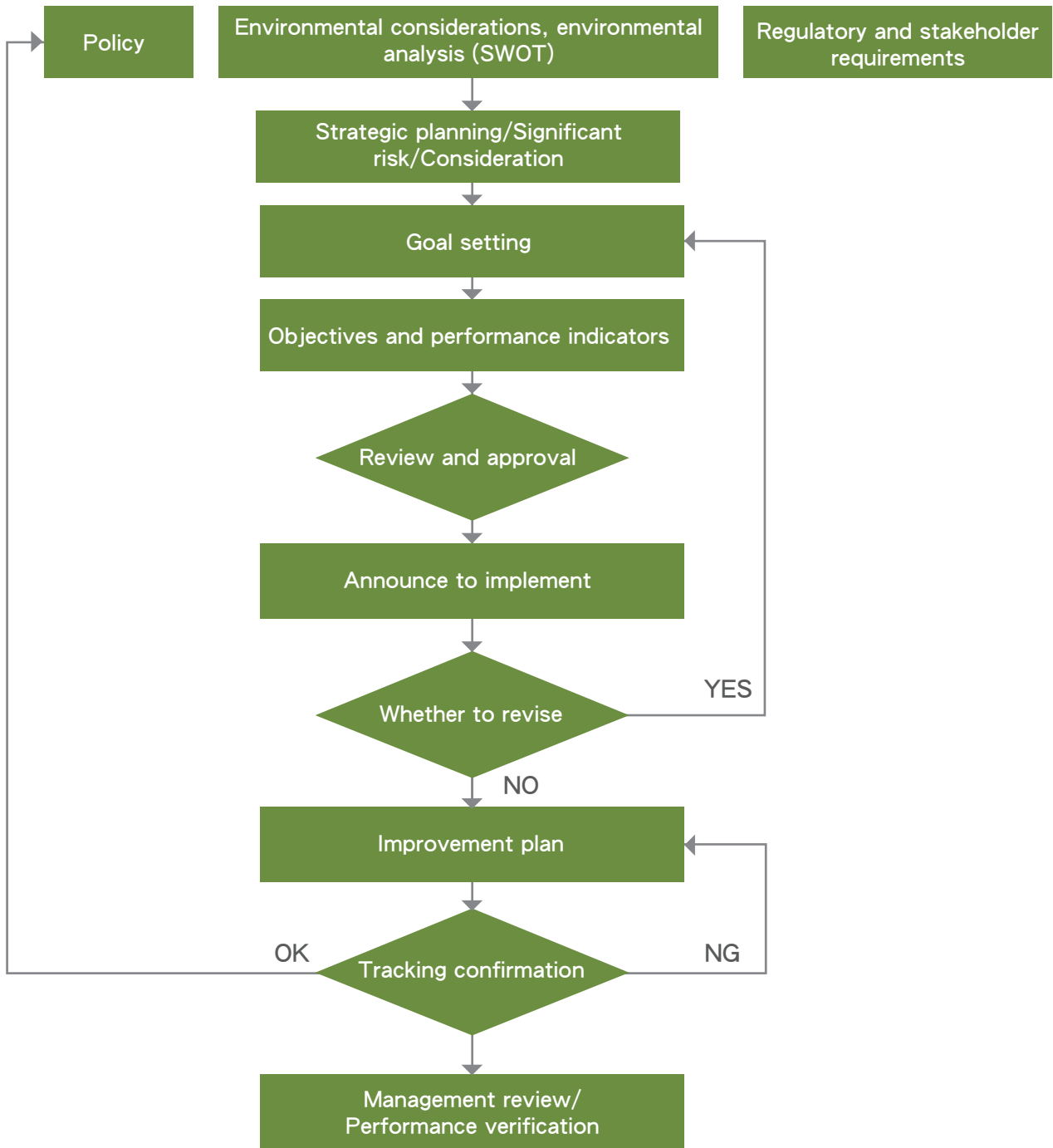
4.2 Environmental Management

The earth's climate and environment are deteriorating as a result of the effects of greenhouse gases, and Cheng Shin is fully aware of the fact that there is only one earth. As a global citizen, in order to comply with international norms such as the Paris Agreement and fulfill the corporate responsibility for environmental protection, Cheng Shin is committed to greenhouse gas inventory and has a good grasp of greenhouse gas emissions. Based on the inventory results, Cheng Shin further promotes the voluntary greenhouse gas reduction program and implements the environmental policy of "energy conservation, resource recovery, operation safety, and pollution prevention".

Cheng Shin has recognized that environmental protection is an indispensable factor in the sustainable operation of its business and has established a corporate environmental management system in line with the global environmental protection philosophy. Cheng Shin is committed to environmentally friendly product design and improving the equipment and operating environment, and has reduced the waste gas, wastewater, noise, and waste from the process and saved energy, achieving proper recycling of resources. Cheng Shin also strengthens the promotion of industrial safety, continues to carry out all kinds of pollution prevention and control to enhance its strength, enabling the harmonious coexistence and strong growing of enterprise and the environment. Cheng Shin's commitment to the environment is:

- ◆ Comply with all work safety and environmental laws and regulations and related requirements.
- ◆ Considering the product life cycle, Cheng Shin is committed to continuous improvement of technology and methods during the process of design, raw material, manufacturing, storage, transportation, usage, and waste disposal, so as to reduce the impact on the environment and enhance safety
- ◆ Set up a sound internal and external communication channel and promote the concept of environmental protection to contractors and partner factories.

- ◆ Continue to promote industrial waste reduction, resource recycling, and pollution prevention.
- ◆ Continue to promote environmental education and establish a complete and effective environmental management system.



Environmental Management System Flow Chart

In terms of environmental management policy, Taiwan region passed the ISO14001:2015 version change certification in 2017 and continued improvement through the "Plan-Do-Check-Act" model of the ISO14001 environmental management system. It has set annual targets for energy saving, water saving, waste reduction, and resource conservation and effectively improved the overall environmental performance through regular monitoring and tracking management by the EHS Committee. In addition, in line with the national promotion policy of energy conservation and carbon reduction and the international trend of environmental protection, to develop toward green industry and promote the sustainable development of the industry, Douliu Second Factory passed the "Cleaner Production System Assessment of Green Factory" certified by the Industrial Development Bureau, Ministry of Economic Affairs in 2017, being the 78th manufacturer in Taiwan to pass the evaluation. In July 2018, Douliu Second Factory was re-examined by the inspection team of the Industrial Development Bureau and passed the review without any objections.



Cleaner Production Certificate

Environmental Communication

Adequate environmental communication and dialogue with stakeholders can enable them to understand Cheng Shin's emphasis on and management of environmental protection. In accordance with the principles of "environmental communication procedures" in the ISO environmental management system, each plant will conduct community and neighborhood activities from time to time to establish smooth communication channels with the residents near the plant. In addition, Cheng Shin also provides channels for telephone complaints about local residents or external stakeholder groups who have concerns about the environmental impact on the local area of the production process. When each plant receives a telephone complaint, the handling process will be recorded in detail in the "External Communication Record Form". If there is any improvement, it will be made by the competent and responsible unit according to the complaint content and tracked by the environmental management department.

Important Communication Record of Taiwan and Mainland Plants in 2020

Plant	External Agency	Communication/ Abstract	Improvement Recommendation	Handling Situation
Taiwan Region	Nearby resident	People complained that foul smell was floating out from the chimney	Carry out regular inspection and maintenance to ensure the normal operation of air pollution control equipment system.	Went to the complaint office to confirm that the production equipment and control equipment were not in operation. But there was a suspected smell of pig excrement, and it was judged that the odor might have come from a nearby pig farm.

4.3 Energy Resources and Greenhouse Gas Management

4.3.1. Resource Management

The products produced by Cheng Shin are tire products, which are mainly made from raw materials such as raw rubber, artificial rubber, soot, steel wire, etc. In order to reduce the exploitation of earth resources and save procurement costs, Cheng Shin adopts the following methods to reduce raw material consumption as much as possible.

- ◆ Adjust process parameters to reduce raw material consumption.
- ◆ Seek auxiliary material alternatives, or reduce the usage to remove the auxiliary materials.
- ◆ Review the reasonableness of material usage regularly.
- ◆ Look for reinforcing auxiliary materials of high strength and lightweight to replace.

In 2020, the total raw materials used by Taiwan and mainland plants were 139,499 and 220,306 tons, respectively, the production capacity of tires (including inner tubes) is 122,790 and 215,330 tons, respectively, and the usage intensity of raw materials is 0.880 and 0.977, respectively. In Taiwan region, new raw materials are developed to gradually replace old materials and integrate them so as to reduce material loss. Therefore, the usage intensity of raw intensity has been improved compared with last year. In the future, Cheng Shin will continue to use raw materials efficiently and increase the usage intensity of raw materials year by year.

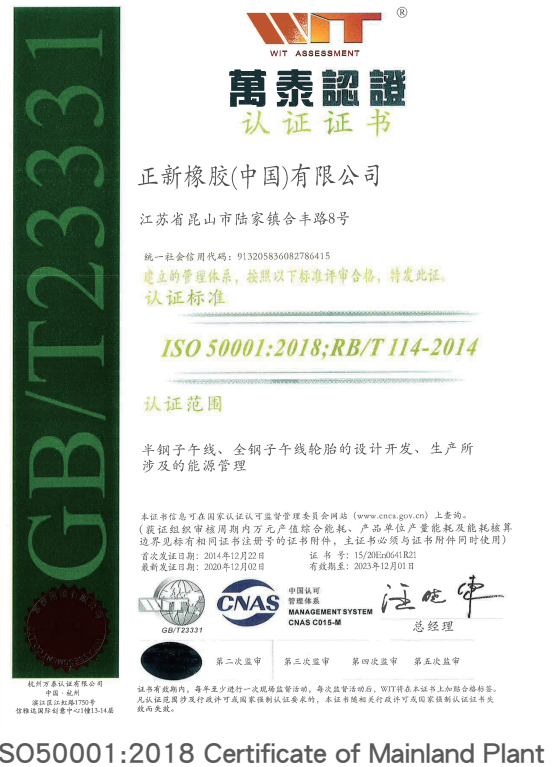
Use Strength of Raw Materials

Plant	2018年	2019年	2020年
Taiwan Region	0.911	0.856	0.880
Mainland Region	0.982	0.973	0.977

Note: Usage strength of raw materials = total weight of products (tons) / total materials consumed (tons)

4.3.2. Energy Management

Adhering to the energy policy of "energy saving, carbon reduction, and efficiency improvement", Cheng Shin has always attached great importance to the usage of energy, and energy management is our fundamental commitment to the environment. Energy management organizations have been established in both mainland and Taiwan plants to set energy saving targets and implementation plans every year. Implement an incentive system in which assessment is linked to remuneration, rewards, and punishments by decomposing the energy-saving targets and conduct related assessments with the quarterly and year-end performance appraisal forms. Encourage all departments to actively carry out technological renovation of energy conservation and gradually implement energy conservation and carbon reduction. All energy management personnel in the mainland plants have passed the ISO50001: 2018 energy management system requirements training, have obtained the qualification certificate of internal auditor, and have the management-related skill requirements. In addition, each plant has passed the third-party management system certification, and Kunshan Plant has been awarded the Energy Efficiency Star Level 3 Energy Award.



In terms of energy use, Cheng Shin uses electricity, gasoline, diesel, and natural gas most. In 2020, the energy consumption of Taiwan and mainland plants were 1,699,077GJ and 2,420,672GJ, respectively. The energy intensity of Taiwan plants was 13.84GJ/ ton, and that of mainland plants was 11.24GJ/ ton. The consumption of diesel fuel in Taiwan region in 2020 was slightly higher than that of last year. Diesel fuel was used for the power of the stacker and the emergency generator, in which most was used to supply the power of the stacker. After checking and comparing the data of diesel consumption in the previous three years, it was found that the diesel consumption increased slightly year by year, which should be caused by the frequent use of stackers as handling equipment in the plant. And all gasoline is used for official cars.

Taiwan Region

Energy Category	2018	2019	2020
Electricity (kWh)	230,922,520	232,442,420	230,555,369
Natural gas (KL)	29,383,119	26,922,209	25,839,965
Diesel (L)	88,530	103,070	106,620
Gasoline (L)	141,797	145,029	142,610
Total calorific value (GJ)	1,823,282	1,741,988	1,699,077

Note 1: The source of calorific value refers to the "Greenhouse Gas Emission Coefficient Management Table 6.0.4" published by Taiwan Environmental Protection Administration.

Note 2: The electricity emission coefficient is calculated by referring to the value announced by the Bureau of Energy and the electricity coefficient for 2019 provided in the announcement issued on June 30, 2020.

Mainland Region

Energy Category	2018	2019	2020
Electricity (kWh)	274,458,015	319,634,467	281,194,254
Diesel (KG)	409,485	349,145	291,377
Gasoline (KG)	137,940	123,905	90,265
Purchased steam (ton)	534,732	522,776	472,733
Nitrogen (ton)	10,505,910	10,469,403	9,184,133
Total calorific value (GJ)	2,811,985	2,714,061	2,420,672

Note: The energy category is counted according to the China energy regulatory projects and by adopting the Guidelines on Accounting Methods and Reporting of Greenhouse Gas Emission of Enterprises in Industrial and Other Industries.

Energy Usage Intensity

Plant	2018	2019	2020
Taiwan Region	13.75	14.01	13.84
Mainland Region	10.70	10.97	11.24

Note: Energy intensity = energy consumption (GJ) / gross product weight (tons)

4.3.3. Energy Conservation and Carbon Reduction Measures

Since 2009, each Cheng Shin plant has been launching a number of energy-saving programs. In the past two years, the main focus of energy-saving is on the optimization of process/plant equipment, replacement of old equipment, and energy-saving control management. It is estimated that greenhouse gas emissions in Taiwan region and mainland region will be reduced by 1,703.74 tons and 3,988 tons of CO_{2e}, respectively, with the energy conservation programs launched in the past two years.

In 2020, enumerate representative energy-saving plans for the past two years

Plant	Measures for Energy Conservation and Carbon Reduction in the Past Two Years	Calculation Instructions of Energy Saving	Annual Energy Saving Performance	Annual Carbon Reduction Performance (Unit: CO _{2e})
Taiwan Region Central plant	Improvement of voltage drop of control power supply of vulcanizer for the third manufacture department	Replaced the power supply of the man-machine monitoring system from AC 110V to DC 24V, which can effectively maintain the transient voltage and avoid the shutdown caused by the instantaneous voltage drop. It is estimated that the energy consumption can be saved by 20,416 kWh/set X 4 = 81,664 kWh/year	81,664kWh	41.6 tons

		Measures for Energy Conservation and Carbon Reduction in the Past Two Years	Calculation Instructions of Energy Saving	Annual Energy Saving Performance	Annual Carbon Reduction Performance (Unit: CO ₂ e)
Taiwan Region	Central plant	Power saving and improvement of air conditioning system in EBR workshop	Fixed the cooling pump for one-to-one cooling of the ice water machine to reduce the non-summer start-up frequency of one cooling pump (estimated at only half of a year), saving energy consumption by 20HP X 0.746 kW/HP X 300 days X 24 hours X 0.5 = 53,712 kWh	53,712kWh	27.3 tons
		Improvement of inlet water temperature of BO-026 boiler deaerator	Modified and recycled the steam decompression station of boiler No. 19 and the condensate water pipe of the distributor to the deaerator of boiler No. 26, realizing the annual recovery of condensate water of 295.2T/year, recovery of heat of (295.2T X 1,000 kg)/year X 460.4 kcal /kg = 135,910,080 kcal/year Annual saving of natural gas: 135,910,080 Kcal/year ÷ 8,885 Kcal / m ³ X boiler efficiency 95% = 14,531 m ³ Note: 8,885 kcal is the annual average low calorific of natural gas in the plant, and the low calorific value of 8,885 is put in the EPA coefficient table (version 6.0.4) to obtain the CO ₂ emission coefficient: 2.0869041798	14,531 m ³	30.5 tons
		Improvement of air source leakage in the central plant	Conducted field air pressure energy leakage control and maintenance. The air leakage measured before improvement was 1,099 kWh/ day, and after improvement was 960 kWh/ day, saving energy consumption (1,099-960) kWh/ day X 24 hours X 300 days = 1,000,800 kWh/ year	1,000,800kWh	509.4 tons
		Improvement of water usage in the chilling tank during the extrusion process	Water quality control in the control process: Extend the frequency of water changing from one week to once every two weeks. Based on the sewage discharge of 5,760T/ year last year, the water changing frequency is estimated to reduce after improvement, and the sewage volume will be reduced from 480T/ month to 240T/ month, saving energy consumption 240T/ month X 12 months X 1.64688 kWh /T= 4,743 kWh/ year	4,743 kWh	2.4 tons

Plant		Measures for Energy Conservation and Carbon Reduction in the Past Two Years	Calculation Instructions of Energy Saving	Annual Energy Saving Performance	Annual Carbon Reduction Performance (Unit: CO ₂ e)
Taiwan Region	Central plant	Improvement of the process water discharge of OO-004 warm water equipment	The warm-water equipment discharges water about 7 times a week for about 4 minutes at a time. The discharge volume is calculated as 4min X 0.15m ³ /min X 7 times X 52 weeks/year = 218.4 t/year, with the drainage pipe diameter of 40mm and water volume of 0.12~0.2m ³ /min Energy saving: 218.4t X 0.44 kWh /T =96 kWh/ year	96kWh	48.9 tons
		Improvement of lighting and electricity saving in the whole plant	Replaced the 129 old 100W power-saving bulbs with the 80 new 130W high-efficiency electrode-less lamps, saving energy (0.1KW X 129 - 0.13 KW X 80) X 26 days X 24 hours X 12 months/year =18,720 kWh	18,720 kWh	9.5 tons
	2nd and 3rd Plant	Energy-saving improvement of fluorescent lamps on the west side of the sulphurization project	Replaced the old 40W traditional lamps with the 100 new 32W electronic lamps, energy saving = (0.4 KW - 0.32 KW) X 100 X 24 hours X 24 days/month X 12 months/year = 55,296 kWh/year	55,296 kWh	28.14 tons
		Improvement of energy saving of vacuum pump for the extrusion shift	5 HP X 0.746 kW /HP X 24 hours X 24 days/month X 12 months/year X 0.9 (power saving rate) = 23,203 kWh/year	23,203 kWh	11.8 tons
	Zhongzhuang Plant	Improvement of constant pressure control of sulfurized BLD pumping vacuum	25 HP X 0.746 kW /HP X 24 hours X 50% (power saving rate) X 24 days/month X 12 months/year = 64,454 kWh	64,454 kWh	32.8 tons
		Improvement of lighting and electricity saving in the plant	Replaced the old 40W traditional lamps with the 100 new 32W electronic lamps, energy saving = (0.4 KW - 0.32 KW) X 200 X 24 hours X 24 days/month X 12 months/year = 110,592 kWh/year	110,592 kWh	56.3 tons
		Improvement of air source leakage	The average daily statistical of the air compressor meter is about 1,958 kWh, improving leakage about 2%, 1,958 kWh X 2% X 24 days/month X 12 months/year = 11,278 kWh/year	11,278 kWh	5.7 tons
		Improvement of constant pressure of water supply in temperature control system of extrusion area	Changed the frequency constant voltage motor, removed the two 5HP supercharged motors, 5 HP X 2 X 0.7 (running efficiency) X 0.746 kW/HP X 24 hours X 24 days/month X 12 months/year = 36,094 kWh/year	36,094 kWh	18.4 tons

Plant		Measures for Energy Conservation and Carbon Reduction in the Past Two Years	Calculation Instructions of Energy Saving	Annual Energy Saving Performance	Annual Carbon Reduction Performance (Unit: CO ₂ e)
Taiwan Region	Xizhou	Improvement of liquid nitrogen evaporator	The cooling water recovery pipeline was equipped with water-cooled evaporator, and the liquid nitrogen outlet was changed to water-cooled evaporator, and the ice water flows to the cooling pool by natural flow pipe, to effectively reduce the electricity of 3 cooling fans for the cooling pool, saving energy $16.875 \text{ kWh} \times 0.9 \times 24 \text{ hours} \times 25 \text{ days/month} \times 12 \text{ months/year} = 109,350 \text{ kWh}$	109,350 kWh	55.7 tons
		Power saving improvement of lighting equipment in plant	Replaced the old 80W traditional lamps with the 150 new 40W LED lamps, energy saving = $(0.8\text{kW} - 0.4\text{kW}) \times 150 \times 24 \text{ hours} \times 25 \text{ days/month} \times 12 \text{ months/year} = 432,000 \text{ kWh/year}$	432,000 kWh	219.9 tons
		Pressure improvement of the air pressure system	The head pressure of the high pressure air compressor was changed from 8.6 kg/cm^2 to 6.0 kg/cm^2 , energy saving = $225 \text{ kWh} \times 0.8 (8.6 \text{ kg/cm}^2 - 6.0 \text{ kg/cm}^2) \times 6\% \times 24 \text{ hours} \times 25 \text{ days/month} \times 12 \text{ months/year} = 202,176 \text{ kWh}$	202,176 kWh	102.9 tons
	Douliu Plant	Energy saving improvement of the water chiller for the air pressure system	AD-5 gas-consuming water purifier is used in 12 places of the air pressure system. To remove condensate water from compressed air, 0.4cmm cooling water is lost per minute. Replaced it with the gas-free ST-1500, energy-saving = $0.4\text{cmm} \times 12 \text{ places} / 42 \text{ CMM} \times 223.8 \text{ kW} \times 8,000 \text{ hours} = 204,800 \text{ kWh/year}$	204,800 kWh	104.2 tons
		Pressure reduction improvement of the air pressure system	The supply pressure of the air pressure systems was reduced from 6.8kg/cm^2 to 6.5kg/cm^2 , saving energy of about 2%, and saving power consumption of the air pressure in 2020 of $3,476,484 \text{ kWh} \times 2\% = 69,530 \text{ kWh}$	69,530 kWh	35.3 tons
		Rolling workshop lighting improvement	Replaced the old 250W metal halide lamps with the 132 new 150W LED lamps, energy saving = $(0.25\text{kW} - 0.15\text{kW}) \times 132 \times 24 \text{ hours} \times 26 \text{ days/month} \times 12 \text{ months/year} = 98,842 \text{ kWh/year}$	98,842 kWh	50.3 tons
		Energy saving improvement of air conditioning system in workshop	Adjusted the pump supply of the air conditioning system, saving energy $110 \text{ HP} \times 0.746 \text{ kW/HP} \times 24 \text{ hours} \times 26 \text{ days/month} \times 12 \text{ months/year} = 614,465 \text{ kWh/year}$	614,465 kWh	312.7 tons

Plant		Measures for Energy Conservation and Carbon Reduction in the Past Two Years	Calculation Instructions of Energy Saving	Annual Energy Saving Performance	Annual Carbon Reduction Performance (Unit: CO ₂ e)
Mainland Region	Kunshan Plant	Replace the ordinary fluorescent lamp to LED fluorescent lamp	Power saving (January - December): 588,571 kWh Saving electric charge: 588,571 X 0.6215 = NT\$365,796	588,571 kWh	433 tons
		Use high-efficient centrifugal air compressor	Eliminated and replaced the original air compressor that has been in use for nearly 20 years with 10,000V centrifugal air compressor. The electric ratio in 2019 is 0.132, and the electric ratio in 2020 is 0.120. Gas production from January to December in 2020: 337,258,025 m ³ Power saving: (0.1317 - 0.1189) X 337,258,025 = 4,316,902 kWh Saving electric charge: 4,316,902 kWh X 0.65 = NT\$2,805,986	4,316,902 kWh	3,176 tons
		Improvement of water supply mode of pool and management of energy saving	Power consumption of 123 pool in 2019: 5,139,422 kWh, output: 137,541.4 tons, unit consumption: 37.37 kWh/ton Power consumption from January to December in 2020 (excluding the impact of the epidemic in February and March): 3,811,307 kWh, output: 106,815.53 tons, unit consumption: 35.68 kWh/ ton Power saving: (37.37 - 35.68) X 106,815.53 = 180,518 kWh Saving electric charge: 180,518 kWh X 0.65 = NT\$117,336	180,518 kWh	133 tons
		Energy saving management of the vacuum pump	Power consumption of vacuum pump in 2019: 1,722,590 kWh, output (PCR+TBR): 195,948.436 tons, unit consumption: 8.791; Power consumption from January to December in 2020: 1,111,615.54 kWh, output (PCR+TBR): 164,495.407 tons, unit consumption: 6.758 Power saving: (8.791-6.758) X 164,495.407=334,469 kWh Saving electric charge: NT\$217,405	334,469 kWh	246 tons

Note 1: The amount of carbon dioxide at Taiwan plants refers to the electricity emission coefficient announced by the Bureau of Energy, citing the electricity coefficient for 2019 provided in the announcement issued on July 20, 2019.

Note 2: The amount of carbon dioxide in mainland plants refers to the "Guidelines on Accounting Methods and Reporting of Greenhouse Gas Emission" announced in 2014. Steam emission coefficient: 0.116 tCO₂e/GJ; Power emission coefficient: 7.356tCO₂e/10,000 kWh.

4.3.4. Greenhouse Gas Management

The Intergovernmental Panel on Climate Change (IPCC) has stressed that it is "very likely" that the increase in average global temperatures is caused by man-made greenhouse gases.

Cheng Shin is fully aware of the fact that there is only one earth. As a global citizen, in order to comply with international norms such as the Paris Agreement and fulfill the corporate responsibility for environmental protection, Cheng Shin is committed to greenhouse gas inventory and has a good grasp of greenhouse gas emissions. Based on the inventory results, Cheng Shin further promotes the voluntary greenhouse gas reduction program and implements energy-saving transformation to reduce energy consumption and greenhouse gas emissions. Referring to ISO14064-1:2006 Organizational Greenhouse Gas Inventory Procedures, Cheng Shin voluntarily discloses the greenhouse gas emissions on an annual basis. In 2020, the total greenhouse gas emissions from plants in Taiwan and the mainland were 171,532 and 356,975 tons of CO₂e, respectively. The direct emission in Taiwan region has a decreasing trend year by year, which is speculated to be due to the continuous energy saving and improvement of the operating machinery and equipment required by the process in each plant year by year. Therefore, the direct emission projects have achieved significant results. As a result of the COVID-19 epidemic, personnel did not return to work, and the production capacity in February and March was insufficient, and some energy-consuming equipment was turned on, the greenhouse gas emission intensity of plants in mainland region increased by 2.5%.

Greenhouse Gas Emission

Unit: ton CO₂e

Plant		2018年	2019年	2020年
Taiwan Region	Category I: Direct Emission	61,527	56,428	54,180
	Category II: Energy Indirect Emission	127,931	128,773	117,352
	Total	189,458	185,201	171,532
Mainland Region	Category I: Direct Emission	1,686	1,453	1,177
	Category II: Energy Indirect Emission	416,233	399,843	355,798
	Total	417,919	401,296	356,975

Note 1: The data for Taiwan region is calculated by referring to the "Greenhouse Gas Emission Coefficient Management Table 6.0.4" published by Taiwan Environmental Protection Administration.

Note 2: GWP values for greenhouse gas type are based on the IPCC Fourth Assessment Report (2007).

Note 3: The electricity emission coefficient refers to the value announced by the Bureau of Energy, citing the electricity coefficient for 2019 provided in the announcement issued on July 20, 2019.

Note 4: The data for the mainland region is calculated by referring to the "Guidelines on Accounting Methods and Reporting of Greenhouse Gas Emission" issued by the National Development and Reform Commission of China in 2014.

Greenhouse gas emission intensity

Unit: ton CO₂e

Plant	2018	2019	2020
Taiwan Region	1.43	1.49	1.40
Mainland Region	1.59	1.62	1.66

Note: Greenhouse gas emission (tons of CO₂e) / Gross product weight (tons)

4.4 Water Resources Management

4.4.1. Water Usage Management

Item	Water Management Strategy
Importance	Due to climate change, the growing water shortage has become one of the top five global risks.
Policy/Commitment	Environmental policy "energy conservation, resource recovery, operation safety, pollution prevention".
Goals and Targets	Reduce production water and wastewater discharge, comply with laws.
Responsibility	Environmental safety departments of the parent company and subsidiaries.
Communication Channels	Environmental communication procedures.
Action Plan	<ul style="list-style-type: none"> · ISO14001 environmental management system. · Taiwan region: RO pure water is used for boiler water, and residual water is recycled for process use, and process water is recycled. · Mainland region: reclaimed water system; Water saving valves are used in living areas. · Wastewater treatment method: The wastewater is pretreated at the in-plant treatment station and then discharged through pipes to municipal or industrial wastewater treatment plants. Some plants treat the wastewater by themselves and then discharge it into the natural water.
Effective Evaluability	Regularly review production water and wastewater discharge.

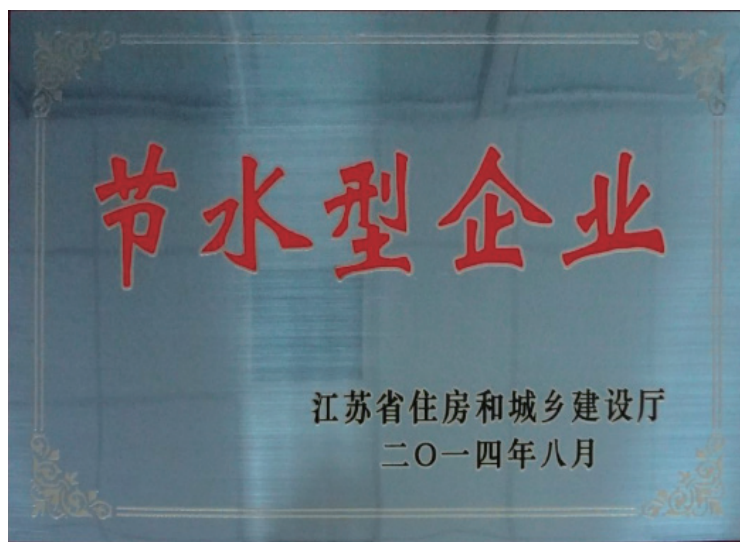
Due to climate change, water resources are increasingly scarce. Both developed and developing countries have been affected by dwindling water resources. Moreover, in the Global Risk Report of the World Economic Forum in the past three years, the "water crisis" has been listed as one of the five global risks. In the plight of poor water resources conditions, the stability of water supply becomes the concern for business operation. Based on the position of risk control and corporate sustainability, Cheng Shin has already promoted cooling water recycling through dedicated pipes, boiler steam recovery, etc., and advocated water saving, and installed faucets with water economizers. Cheng Shin's RO reverse osmosis is mainly used for boilers, and the wastewater after reverse osmosis is reintroduced with cooling water for recycling to avoid water waste. The water sources used by Cheng Shin include tap water and underground water. Cheng Shin holds the water rights certificate issued by the competent authority for all wells in which groundwater is extracted and uses water according to the authorized amount. In 2020, the total water consumption in Taiwan and the mainland region were 1,082,002 tons and 490,123 tons, respectively, which has been reduced by 11% and 15.4%, respectively, compared with the previous year due to the production adjustment and the promotion of water-saving awareness among employees.

Water Resources Usage

Unit: ton CO₂e

Plant	Item	2018	2019	2020
Taiwan Region	Running Water	319,273	322,310	455,954
	Ground Water	1,011,271	893,491	626,048
	Total	1,330,544	1,215,801	1,082,002
Mainland Region	Running Water	643,128	579,479	490,123
	Total	643,128	579,479	490,123

In addition, the mainland region has always attached great importance to the conservation of water resources, conducted water-saving education in employee activities, and posted water-saving signs in employee bathrooms, washrooms, and washbasins, encouraged multi-usage of water, prevented leakage and waste, improved the reuse of industrial water, reduced waste sewage discharge, and has been awarded as "Water-Saving Enterprise" in China.



Kunshan Plant in mainland region was awarded as "Water-Saving Enterprise"

4.4.2 Wastewater Management

For wastewater generated from daily operations, Cheng Shin conducts wastewater discharge operations in accordance with local laws and regulations and ensures that the quality of the discharge water is within the limits of the "Effluent Standards". In order to reduce the discharge of wastewater, the boiler water in Taiwan plants is replaced with RO pure water so that the residual water can be recycled for process use and the reverse washing water for process water can be recycled. In addition, a water recovery facility has been set up in the Xizhou Plant to recycle about 35% effluent of the waste (sewage) water for irrigation and toilet flushing to reduce the discharge of water. In addition, by integrating the production configuration of each plant, Cheng Shin effectively utilizes the space and water sources in the plant, fully check the discharge pipelines in the plant, diverges the flow direction of wastewater and rainwater, integrates the main pipelines, and eliminates those with water leakage, damage and low frequency of use. This improvement plan can effectively reduce the discharge of wastewater (sewage). With the increase of high-concentration and low-concentration wastewater treatment in the mainland plant, 100% wastewater reuse was achieved, and the wastewater discharge was reduced by 34.7%. In some parts of the wastewater discharge destination, the wastewater of some plants in Taiwan and mainland is pretreated at the in-plant treatment station and then discharged through pipes to municipal or industrial wastewater treatment plants. Some plants treat the wastewater by themselves and then discharge it into the natural water. In 2020, the amount of wastewater discharged in Taiwan and the mainland was 448,307 and 284,942 tons, respectively.

Wastewater discharge in the past three years

Unit: ton CO₂e

Plant	Characteristic of Wastewater	2018	2019	2020
Taiwan Region	Mainly Daily Life and Cooling Water	535,680	531,384	448,307
Mainland Region	Mainly domestic wastewater and steam condensate wastewater	404,308	436,632	284,942

Note 1: The wastewater volume of the plants in Taiwan is measured by the flowmeter on the facilities. The flowmeter is regulated by the environmental protection regulations in Taiwan and calibrated by the qualified verification third-party once a year.

Note 2: The wastewater volume of the mainland plants is counted by the flowmeter stipulated by the government and measured by the connection with the government immediately. The flowmeter is calibrated by the quality assurance department once a year.

Water quality standards for plants in Taiwan and mainland are different depending on the location of effluent. The standards for general areas and industrial areas in Taiwan are detailed in the following table. The wastewater in the general areas is treated by the wastewater facilities in the plant and can only be discharged after reaching the effluent standards. The effluent from industrial areas is discharged to industrial sewage treatment plants after being treated by in-plant facilities. Therefore, the water quality and quantity standards are different from those in other areas. For the water unsatisfied with the water discharge standard for the industrial areas shall be charged with an additional treatment fee and shall be spot-checked on a regular basis by the industrial area.

Cheng Shin follows the relevant local management norms of testing and declaration. The Taiwan plants conduct water quality testing every six months to facilitate the declaration, and the annual water quality testing result in 2020 met the effluent standards. In accordance with the control items required by the Phase 5-2 EIA, the mainland plants follow the water quality standards for sewage discharged into urban sewers, and the water quality testing result of the mainland plants in 2020 all met the implementation standards.

The following table lists the effluent standards and water quality data of the central plant and Douliu First Plant in Taiwan, as well as the water quality standards and data of the mainland region.

Taiwan Region

Water Quality Item	Taiwan Region Effluent Standards		Effluent Testing of Central Plant (apply general areas standards)	Effluent Testing of Douliu First Plant (apply industrial areas standards)
	General Areas	Industrial Areas	Effluent	Effluent
Water Temperature (°C)	38°C in May to September 35°C in October to April	45	31.7	31.5
Suspended Solids (mg/L)	30	320	3.9	6.1
Biochemical Oxygen Demand (mg/L)	30	320	5.9	8.1
Chemical Oxygen Demand (mg/L)	100	480	19.6	25.4
pH	6-9	5-9	7.6	7.8
Grease (mg/L)	10	10	2.1	<0.5

Mainland Region

Water Quality Item	Water Quality Standards of Mainland Region	Effluent Testing of Mainland Region
COD(mg/m ³)	70	46.25
SS(mg/m ³)	40	15.50
NH ₃ -N(mg/m ³)	10	6.15
TP(mg/m ³)	0.5	0.03
TN(mg/m ³)	10	5.2
Petroleum (mg/m ³)	1	0.11

4.5 Waste and recycling

At present, all the waste in the plant is handled according to the "Business Waste Cleaning Plan" approved by the local environmental protection authority and disposed of by an environmental protection cleaning and transportation company certified by the competent authority. Cheng Shin tracks the vehicle routes of the cleaning and transportation company on a regular basis to understand whether the final flow of the waste is legal. Recyclable waste (residual) includes waste rubber, waste metal, waste plastic, waste pallet, and waste paper/carton, etc., which are sorted and collected by qualified local recyclers for recycling to enhance the life cycle of recycling of waste resources. The waste goods and containers to be recovered and reused are also announced in the plant. A classification and recovery system has been properly established to strengthen the concept of resource recovery among employees. In addition to compliance with the regulations for waste disposal, Cheng Shin also adopts the following practices to minimize waste generation:

- ◆ Waste classification and recycling to reduce the type and quantity of cleaning and transportation.
- ◆ Cheng Shin has developed the level 1-3 independent maintenance plan to extend the service life of articles by regular maintenance and gradually introduce consumables and raw materials of environment-friendly materials.
- ◆ Entrust recycling institutions and disposal companies for related recyclable (residual) wastes according to the announced categories.
- ◆ Reduce the use of disposable tableware, provide staff with personal tableware and use stainless steel tableware in restaurants for reusing.
- ◆ In 2020, the waste categories in Taiwan and mainland plants included domestic waste, general waste, and hazardous waste, with a total output of 5,866.34 tons and 8,098 tons, respectively.

Waste Output and Disposal Statistics

Unit: ton CO₂e

Plant	Waste Type	Action Taken			Total
		Incineration	Bury	Recycling	
Taiwan Region	Daily Life Business Waste	552.50	0	0	552.50
	General Business Waste	27.61	0	5,245.63	5,273.24
	Toxic Business Waste	0.02	40.58	0	40.60
	Total				5,866.34
Mainland Region	Daily Life Business Waste	91	-	554	645
	General Business Waste	1,255	-	5,698	6,953
	Toxic Business Waste	102		398	500
	Total				8,098

Note: Since the data of hazardous wastes in Chongqing Plant cannot be distinguished by the disposal method of incineration and bury, the data is consolidated.

4.6 Air Pollution Control

The source of air pollutants in the tire industry is mainly the exhaust gas produced by the process escape and boiler combustion. The types of pollutants include dust, granules, nitrogen oxides, volatile organic compounds (VOCs) and odors, etc. For the prevention and control of various pollutants, Cheng Shin mainly focuses on improving the efficiency of pipe end treatment and carrying out strict monitoring and invests a large amount of funds in optimizing and upgrading the exhaust gas treatment equipment. For the treatment of VOCs and odors in Taiwan plants, we installed a washing tower and photocatalyst system at the back end of the mulling process to effectively reduce VOCs emissions and odor escape. All exhaust ports in the mulling workshop of Kunshan Plant are installed with compound exhaust gas treatment equipment. Air pollution emissions from Taiwan plants have been on a downward trend over the years, which is mainly due to the replacement of heavy oil boilers with more environmentally friendly natural gas boilers. However, the number of monitoring points for environmental air pollution sources in mainland plants is 56 according to the previous EIA and is 88 updated by the law and EIA in 2020. Therefore, as the number of monitoring points increases, air pollution emissions will also increase.

Air Pollution Emissions in the Recent Three Years

Units: ton

Plant	Pollutant Type	2018	2019	2020
Taiwan Region	Oxysulfide	-	-	0.02
	Nitrogen Oxides	41.53	46.97	46.66
	Volatile Organic Compounds	121.91	129.80	126.1
	Particulates	0.34	0.46	0.93
	Total	163.78	177.23	173.69
Mainland Region	Volatile Organic Compounds	5.74	6.77	6.88
	Particulate Matter	9.03	16.01	8.63
	Sulfide (H ₂ S)	0.05	0.03	0.04
	Total	14.82	22.81	15.55

Note: Statistics are made according to the main pollutants controlled by local laws and regulations.

4.7 Compliance with Environmental Regulations

Adhering to the principle of abiding by laws and regulations, improving environmental quality, and reducing environmental pollution, Cheng Shin self-inspects the pollution prevention status and the pollution prevention equipment capability on a regular basis through the internal audit of the effective environmental management system and rectifies immediately in case of any failure. Cheng Shin has also developed the environmental safety and health-related laws and regulations identification management provisions, which are implemented by the safety, health, and environmental protection management units by collecting and identifying the relevant competent authority's laws and regulations update one by one monthly and following accordingly. Cheng Shin conducts compliance assessments once a year to comply with statutory requirements. However, there were still two cases of violation of environmental protection laws and regulations in Taiwan region in 2020, including the abnormal amount declared by the Douliu First Plant and Xizhou Plant. Meanwhile, for the violation of environmental protection laws and regulations, the plant immediately corrected the declaration amount and formulated prevention and improvement measures so as to avoid the recurrence of the same case. There is no violation in the mainland region.

Violations of environmental protection laws and regulations by Taiwan and mainland plants in 2020:

Plant	Name of Law Violated	Causes/Circumstances of Violation	Penalty	Improvement Plan
Taiwan Region	Subparagraph 2, Paragraph 1, Article 31 of the Waste Disposal Act	Quantity of waste declared by Douliu No. 1 Plant is inconsistent with the site	NTD6,000	Modified the declaration quantity
	Subparagraph 1, Paragraph 1, Article 31 of the Waste Disposal Act	The quantity of waste declaration of Xizhou Plant was inconsistent with the waste cleaning plan.	NTD6,000	Modified the declaration quantity