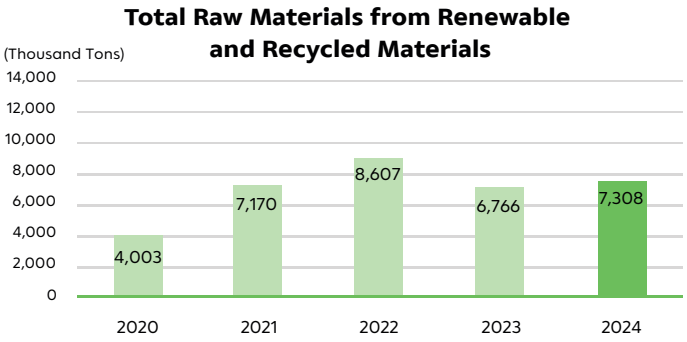
Environmental Performance

Production and Raw Materials

Performance	2020	2021	2022	2023	2024	GRI Standard	SASB
Production (Thousand Tons) *	3,359	5,700	5,548	5,526	6,061		RT-CP-000.A
Total Raw Materials (Thousand Tons) ENO.1	6,405	7,219	8,649	6,828	7,443	GRI 301-1	
Recycled Materials (Thousand Tons) ENO.1	4,003	4,420	3,916	3,649	5,723	GRI 301-2	RT-CP-410a.1
Percentage of Raw Materials from Recycled Materials ENO.1	N/A	N/A	N/A	N/A	76.9	GRI 301-2	RT-CP-410a.1
Renewable Materials (Thousand Tons) ENO.1	N/A	2,750	4,691	3,117	7,304	GRI 301-1	RT-CP-410a.1
Percentage of Raw Materials from Renewable Materials ENO.1	N/A	N/A	N/A	N/A	98.1		RT-CP-410a.1
Percentage of Raw Materials from Renewable and Recycled Materials ENO.1	N/A	N/A	N/A	N/A	98.1		



Greenhouse Gas Emissions and Sequestration

Performance	2020	2021	2022	2023	2024	GRI Standard	SASB
Scope 1 and 2 GHG emissions (Tons CO_2 equivalent) EN1,*	4,990,348	4,872,474	4,357,603	4,015,834	4,117,063		
Scope 1 GHG emissions (Tons CO_2 equivalent) EN1,*	4,486,157	4,365,669	3,778,126	3,447,684	3,478,086	GRI 305-1	RT-CP-110a.1.
Biogenic CO_2 emissions / CO_2 emissions from biomass (Tons CO_2 equivalent) EN1	N/A	1,399,131	1,540,860	1,786,776	2,054,168	GRI 305-1	
Scope 2 GHG emissions (Tons CO_2 equivalent) EN1,*	504,191	506,806	579,477	568,150	638,997	GRI 305-2	
- Market Based (Tons CO_2 equivalent)	504,191	506,806	579,477	568,150	638,997		
- Location Based (Tons CO_2 equivalent)	520,732	508,118	631,788	586,057	673,520		
Scope 3 GHG emissions (Tons CO_2 equivalent) EN1,*	N/A	N/A	1,459,010	2,096,246	2,800,423	GRI 305-3	
Category 1: Purchased goods and services (Tons CO_2 equivalent) EN1,*	N/A	N/A	556,430	859,465	1,419,020		
Category 2: Capital goods (Tons CO_2 equivalent) EN1,*	N/A	N/A	0	36,550	53,830		
Category 3: Fuel and energy related activites (Tons CO_2 equivalent) EN1,*	N/A	N/A	427,544	441,172	407,527		
Category 4: Upstream transportation & distribution (Tons CO_2 equivalent) EN1,*	N/A	N/A	354,632	384,560	344,322		
Category 5: Waste generated in operations (Tons CO_2 equivalent) EN1,*	N/A	N/A	0	17,883	26,502		
Category 6: Business travel (Tons CO_2 equivalent) EN1,*	N/A	N/A	653	831	996		
Category 7: Employee commuting (Tons CO_2 equivalent) EN1,*	N/A	N/A	533	247	26,824		

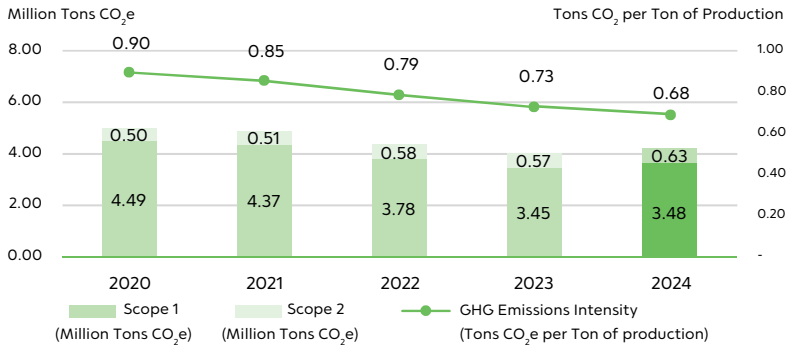
* Within SGS (Thailand) limited assurance scope (page 105-107)
GHG emissions and removals monitoring and reporting cover companies and subsidiaries within the boundary of sustainability reporting (page 101-103)

Greenhouse Gas Emissions and Sequestration

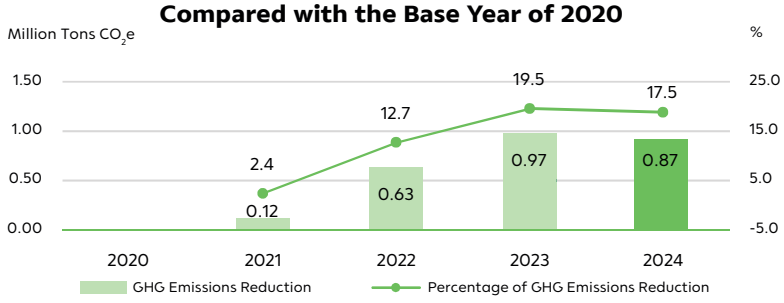
Performance	2020	2021	2022	2023	2024	GRI Standard	SASB
Category 8: Upstream leased assets (Tons CO_2 equivalent) EN1,*	N/A	N/A	0	0	0		
Category 9: Downstream transportation & distribution (Tons CO_2 equivalent) EN1,*	N/A	N/A	83,180	66,206	67,851		
Category 10: Processing of sold products (Tons CO_2 equivalent) EN1,*	N/A	N/A	0	219,533	405,334		
Category 11: Use of sold products (Tons CO_2 equivalent) EN1,*	N/A	N/A	0	0	0		
Category 12: End-of-life treatment of sold products (Tons CO_2 equivalent) EN1,*	N/A	N/A	17,035	37,463	28,941		
Categrory 13: Downstream leased assets (Ton CO_2 equivalent) EN1,*	N/A	N/A	0	0	107		
Category 14: Franchises (Tons CO_2 equivalent) EN1,*	N/A	N/A	0	0	0		
Category 15: Investments (Tons CO_2 equivalent) EN1,*	N/A	N/A	19,002	32,336	19,169		
Scope 1 and 2 GHG Intensity (Tons CO_2 equivalent per Ton of Production)	0.90	0.85	0.81	0.73	0.68	GRI 305-4	
Scope 1 GHG Intensity (Tons CO_2 equivalent per Ton of Production)	0.80	0.77	0.68	0.62	0.57	GRI 305-4	
Scope 2 GHG Intensity (Tons CO_2 equivalent per Ton of Production)	0.09	0.09	0.10	0.10	0.11	GRI 305-4	
Scope 1 and Scope 2 GHG emissions reduction compared with the base year of 2020 (Tons CO_2 equivalent) EN1	428,281	117,874	632,745	994,515	873,285	GRI 305-5	
Scope 1 and Scope 2 GHG emissions reduction compared with the base year of 2020 (%)	0	2.36	12.7	19.5	17.5	GRI 305-5	
- GHG Emissions Reduction from activities within organization (Tons CO_2 equivalent)	N/A	N/A	632,745	994,515	873,285		
- GHG Emissions Reduction from carbon offset activities (Tons CO_2 equivalent)	N/A	N/A	0	0	0		
Carbon Sequestration in Economic forest (Tons CO_2 equivalent) EN1,*	N/A	N/A	N/A	152,181	270,228	GRI 305-5	

* Within SGS (Thailand) limited assurance scope (page 105-107)
GHG emissions and removals monitoring and reporting cover companies and subsidiaries within the boundary of sustainability reporting (page 101-103)

Greenhouse Gas Emissions



GHG Emissions Reduction Compared with the Base Year of 2020

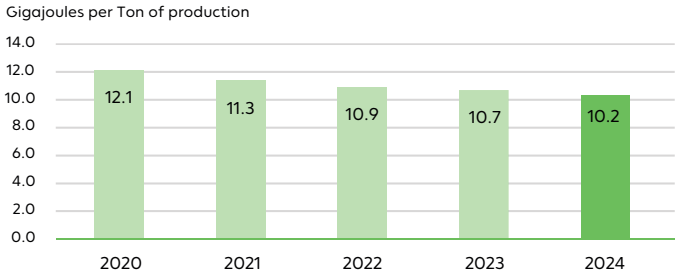


Energy Consumption

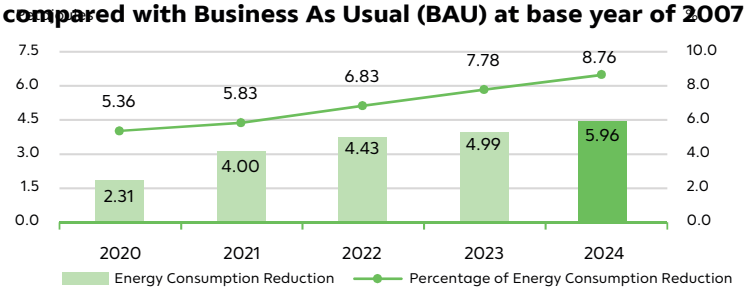
Performance	2020	2021	2022	2023	2024	GRI Standard	SASB
Fuel Consumption from Non-Renewable Sources (Petajoules) EN2,*	36.2	47.5	41.5	38.1	38.3	GRI 302-1	
Fuel Consumption from Renewable Sources (Petajoules) EN2,*	28.5	13.4	14.6	16.8	19.3	GRI 302-1	RT-CP-130a.1.
Heating and Steam Consumption (Petajoules) EN2,*	1.70	1.47	1.43	1.47	1.20	GRI 302-1	RT-CP-130a.1.
Electricity Consumption (Petajoules)	1.37	2.66	3.48	3.31	3.52	GRI 302-1	RT-CP-130a.1.
Electricity Sold to grid (Petajoules)	0.45	0.35	0.26	0.25	0.25	GRI 302-1	
Energy Consumption outside of the organization (Petajoules)	0.00	0.00	0.40	0.34	0.00	GRI 302-2	
Total Energy Consumption within the organization (Petajoules) EN2,*	67.3	64.7	60.4	59.1	62.1	GRI 302-1	RT-CP-130a.1.
Total Energy Consumption Intensity (Gigajoules per Ton of Production)	12.1	11.3	10.9	10.7	10.2	GRI 302-3	
Energy Consumption Reduction compared with business as usual (BAU) at base year of 2007 (Petajoules)	2.31	4.00	4.43	4.99	5.96	GRI 302-4	
Energy Consumption Reduction compared with business as usual (BAU) at base year of 2007 (%)	5.36	5.83	6.83	7.78	8.76	GRI 302-4	
Reduce Energy Consumption Intensity compared with the base year of 2020 (%)	0	6.42	9.73	11.4	15.2	GRI 302-4	
Proportion of electricity purchased directly through the grid electricity (%)	1.47	3.12	4.12	4.15	4.64	GRI 302-1	RT-CP-130a.1.

* Within SGS (Thailand) limited assurance scope (page 105-107)

Total Energy Consumption Intensity



Energy Consumption Reduction compared with Business As Usual (BAU) at base year of 2007



Air Emissions

Performance	2020	2021	2022	2023	2024	GRI Standard	SASB
Oxides of Nitrogen (Thousand Tons) EN5,*	2.99	3.83	3.81	4.09	4.00	GRI 305-7	RT-CP-120a.1.
Oxides of Sulfur (Thousand Tons) EN5,*	2.57	3.80	3.67	4.30	3.00	GRI 305-7	RT-CP-120a.1.
Particulate Matter (Thousand Tons) EN5,*	0.31	0.95	0.90	0.75	0.90	GRI 305-7	RT-CP-120a.1.

* Within SGS (Thailand) limited assurance scope (page 105-107)

Water Withdrawal and Effluent Quality

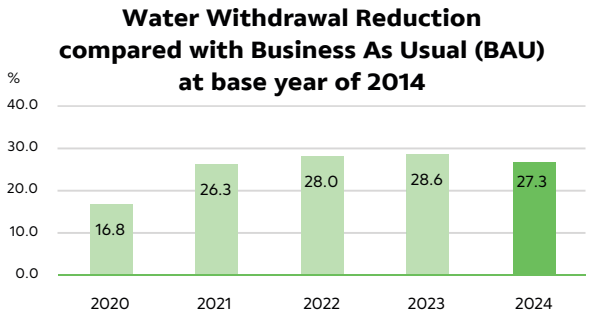
Performance	2020	2021	2022	2023	2024	GRI Standard	SASB
Total water withdrawal (Million Cubic Meter) EN3,*	54.8	78.8	72.8	71.6	76.9	GRI 303-3	RT-CP-140a.1.
Water withdrawal from freshwater (TDS ⩽ 1,000 mg/L) (Million Cubic Meter) EN3,*							
- Surface Water	17.1	34.2	32.0	34.0	35.9	GRI 303-3	RT-CP-140a.1.
- Groundwater	30.6	39.8	36.5	33.4	36.0	GRI 303-3	RT-CP-140a.1.
- Seawater	0.00	0.00	0.00	0.00	0.00	GRI 303-3	RT-CP-140a.1.
- Tap water or Third-party	0.42	4.80	4.30	4.11	4.98	GRI 303-3	RT-CP-140a.1.
Water withdrawal from freshwater (TDS > 1,000 mg/L) (Million Cubic Meter) EN3,*							
- Surface Water	0.00	0.00	0.00	0.00	0.00	GRI 303-3	RT-CP-140a.1.
- Groundwater	0.00	0.00	0.00	0.00	0.00	GRI 303-3	RT-CP-140a.1.
- Seawater	0.00	0.00	0.00	0.00	0.00	GRI 303-3	RT-CP-140a.1.
- Tap water or Third-party	0.00	0.00	0.00	0.00	0.00	GRI 303-3	RT-CP-140a.1.
Water withdrawal from freshwater (TDS ⩽ 1,000 mg/L) in water stress area(Million Cubic Meter) EN3,*							
- Surface Water	0.00	0.00	0.00	0.00	17.80	GRI 303-3	RT-CP-140a.1.
- Groundwater	0.00	0.00	0.00	0.00	31.00	GRI 303-3	RT-CP-140a.1.
- Seawater	0.00	0.00	0.00	0.00	0.00	GRI 303-3	RT-CP-140a.1.
- Tap water or Third-party	0.00	0.00	0.00	0.00	1.00	GRI 303-3	RT-CP-140a.1.
Water withdrawal from freshwater (TDS > 1,000 mg/L) in water stress area (Million Cubic Meter) EN3,*							
- Surface Water	0.00	0.00	0.00	0.00	0.00	GRI 303-3	RT-CP-140a.1.
- Groundwater	0.00	0.00	0.00	0.00	0.00	GRI 303-3	RT-CP-140a.1.
- Seawater	0.00	0.00	0.00	0.00	0.00	GRI 303-3	RT-CP-140a.1.
- Tap water or Third-party	0.00	0.00	0.00	0.00	0.00	GRI 303-3	RT-CP-140a.1.
Water Withdrawal Reduction compared with business as usual (BAU) at base year of 2014 (Million Cubic Meter)	11.1	28.1	28.4	29.8	28.9	GRI 303-3	RT-CP-140a.1.
Water Withdrawal Percentage Reduction compared with business as usual (BAU) at base year of 2014 (%)	16.8	26.3	28.0	28.6	27.3	GRI 303-3	RT-CP-140a.1.
Recycled Water (Million Cubic Meter) *	9.0	15.9	14.2	14.6	14.4		RT-CP-140a.2.
Portion of Recycled Water (%)	14.1	14.2	16.3	17.0	15.7		RT-CP-140a.2.

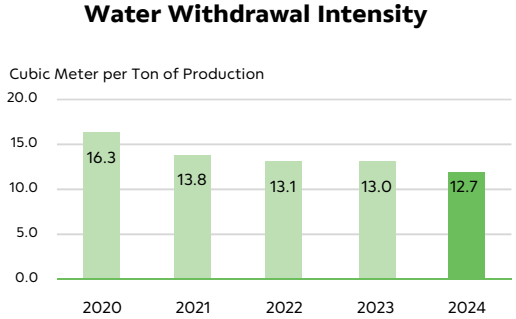
* Within SGS (Thailand) limited assurance scope (page 105-107)

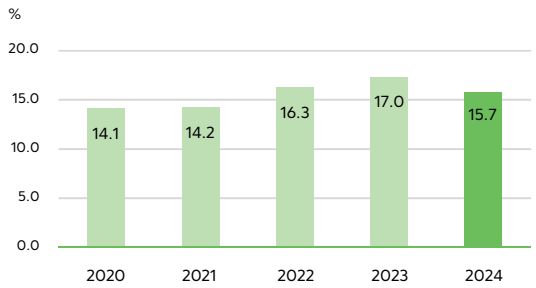
Water Withdrawal and Effluent Quality

Performance	2020	2021	2022	2023	2024	GRI Standard	SASB
Water Withdrawal Intensity (Cubic Meter per Ton of Production)	16.3	13.8	13.1	13.0	12.7		RT-CP-140a.2.
Water Withdrawal Intensity percentage reduction compared with the base year of 2022	N/A	N/A	N/A	N/A	3.1		RT-CP-140a.2.
Water Withdrawal Target compared with business as usual (BAU) at base year of 2014 (Million Cubic Meter)	65.8	106.9	101.1	99.3	126.3		RT-CP-140a.2.
Water Withdrawal Intensity Target (Million Cubic Meter per Ton of Production)	19.6	18.8	18.2	18.0	19.0		RT-CP-140a.2.
Water discharged to any sources (Million Cubic Meter) EN3,*							
- Surface Water	30.8	58.1	58.3	58.6	60.0	GRI 303-4	
- Groundwater	1.16	0.00	0.00	0.00	0.03	GRI 303-4	
- Seawater	0.00	0.00	0.00	0.00	0.00	GRI 303-4	
- Third-party water (total)	4.69	3.94	3.06	1.81	0.70	GRI 303-4	
- Third-party water sent for use to other organizations	4.62	3.81	2.91	1.67	0.49	GRI 303-4	
Total Water Discharge (Million Cubic Meter) EN3,*	36.7	62.1	61.4	60.4	60.7	GRI 303-4	
Water discharge by freshwater (TDS ⩽ 1,000 mg/L) (Million Cubic Meter) EN3,*	4.3	19.1	14.6	21.7	19.1	GRI 303-4	
Water discharge by other water (TDS > 1,000 mg/L) (Million Cubic Meter) EN3,*	32.4	42.9	46.8	38.8	41.6	GRI 303-4	
Water discharge by freshwater (TDS ⩽ 1,000 mg/L) in Water Stress Area (Million Cubic Meter) EN3,*	0.00	0.00	0.00	0.00	0.00	GRI 303-4	
Water discharge by other water (TDS > 1,000 mg/L) in Water Stress Area (Million Cubic Meter) EN3,*	0.00	0.00	0.00	0.00	0.00	GRI 303-4	
BOD loading (Tons) EN3,*	153	1,460	666	531	425		
COD loading (Tons) EN3,*	3,623	8,093	6,020	5,768	5,698		
TSS loading (Tons) EN3,*	505	1,155	999	777	688		

* Within SGS (Thailand) limited assurance scope (page 105-107)





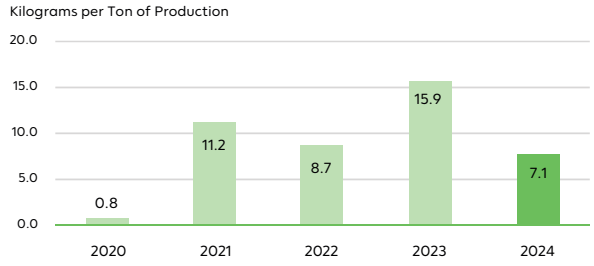


Industrial Waste Management

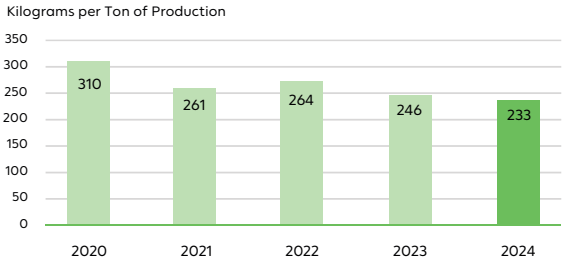
Performance	2020	2021	2022	2023	2024	GRI Standard	SASB
Hazardous Waste							
Hazardous Waste Generation during reporting year (Thousand Tons) EN4,*	2.66	64.0	48.4	87.7	43.1	GRI 306-3	RT-CP-150a.1.
Percentage of Recycled Hazardous waste (%) EN4	N/A	N/A	N/A	N/A	36.7		RT-CP-150a.1.
Hazardous Waste Generation Intensity (Kilograms per Ton of Production)	0.8	11.2	8.7	15.9	7.1		
Hazardous Waste Diverted from Disposal by Recovery Operations (Thousand Tons) EN4							
- Reuse / Recycling/ Other Recovery Operations / Treatment	N/A	N/A	N/A	N/A	33.9	GRI 306-4	RT-CP-150a.1.
Hazardous Waste Directed to Disposal by Disposal Operations (Thousand Tons) EN4	N/A	N/A	N/A	N/A	10.0	GRI 306-5	RT-CP-150a.1.
- Incinerated with energy recovery (Thousand Tons)	N/A	N/A	N/A	N/A	1.9	GRI 306-5	RT-CP-150a.1.
- Incinerated without Energy Recovery (Thousand Tons)	0.02	0.06	0.21	0.03	0.72	GRI 306-5	RT-CP-150a.1.
- Landfilled (Thousand Tons)	0.0	14.8	8.7	7.2	7.0	GRI 306-5	RT-CP-150a.1.
- Other disposal operations (Thousand Tons)	N/A	N/A	N/A	N/A	0.5	GRI 306-5	RT-CP-150a.1.
Hazardous Waste in the Storage at the end of reporting year (Thousand Tons) EN4	0.11	0.18	1.18	0.95	0.13		RT-CP-150a.1.
Non Hazardous Waste							
Non Hazardous Waste Generation (Thousand Tons) EN4,*	1,043	1,489	1,467	1,359	1,415	GRI 306-3	
Non Hazardous Waste Generation Intensity (Kilograms per Ton of Production)	310	261	264	246	233		
Non Hazardous Waste Diverted from Disposal by Recovery Operations (Thousand Tons) EN4							
- Reuse / Recycling / Other Recovery Operations / Treatment	N/A	N/A	N/A	N/A	993	GRI 306-4	
Non Hazardous Waste Directed to Disposal by Disposal Operations (Thousand Tons) EN4	N/A	N/A	N/A	N/A	321	GRI 306-5	
- Incinerated with energy recovery (Thousand Tons)	N/A	N/A	N/A	N/A	286	GRI 306-5	
- Incinerated without Energy Recovery (Thousand Tons)	0.0	36.1	36.0	32.4	33.2	GRI 306-5	
- Landfilled (Thousand Tons)	0.0	2.9	3.5	0.3	2.1	GRI 306-5	
- Other disposal operations (Thousand Tons)	N/A	N/A	N/A	N/A	0.4	GRI 306-5	
Non Hazardous Waste in the Storage at the end of reporting year (Thousand Tons) EN4	124	103	105	152	252		

* Within SGS (Thailand) limited assurance scope (page 105-107)

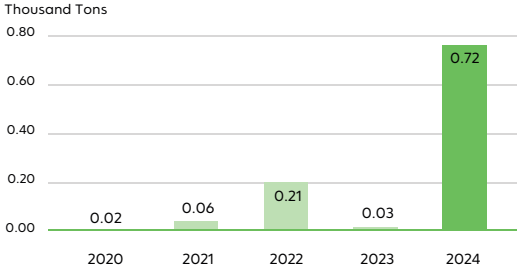
Hazardous Waste Generation Intensity



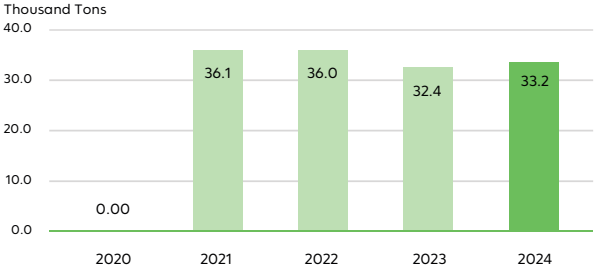
Non Hazardous Waste Generation Intensity



Hazardouse waste management by Incinerated without Energy Recovery



Non Hazardouse waste management by Incinerated without Energy Recovery



Waste diverted from disposal - Thailand and abroad, GRI 306-4*

Waste	2024 (Tons)				
	Inside SCGP		Outside SCGP		Total
	Within Factory	Inside SCGP	Inside SCG	Outside SCG	
Hazardous Waste					
Preparation for reuse	686.47	-	-	20,442.72	21,129.19
Recycling	-	-	953.48	11,480.58	12,434.06
Other recovery operations	-	-	-	336.21	336.21
Treatment	-	-	-	11.93	11.93
Total	686.47	-	953.48	32,271.44	33,911.39
Non Hazardous Waste					
Preparation for reuse	493.67	8,112.81	4,331.70	37,615.50	50,553.69
Recycling	75,127.81	454,186.52	27,860.45	385,631.05	942,805.82
Other recovery operations	-	-	-	28.06	28.06
Treatment	-	-	-	-	-
Total	75,621.48	462,299.34	32,192.15	423,274.61	993,387.57

Waste directed to disposal - Thailand and abroad, GRI 306-5*

Waste	2024 (Tons)				
	Inside SCGP		Outside SCGP		Total
	Within Factory	Inside SCGP	Inside SCG	Outside SCG	
Hazardous Waste					
Incineration (with energy recovery)	-	-	2.55	1,881.53	1,882.08
Incineration (without energy recovery)	-	-	-	721.07	721.07
Landfilling	-	-	-	6,964.94	6,964.94
Other disposal operations	-	-	-	475.24	475.24
Total	-	-	2.55	10,040.78	10,043.33
Non Hazardous Waste					
Incineration (with energy recovery)	185,388.47	4,559.81	276.41	95,399.52	285,624.18
Incineration (without energy recovery)	2,842.98	-	-	30,395.35	33,238.33
Landfilling	-	-	-	2,054.38	2,054.38
Other disposal operations	-	-	-	378.53	378.53
Total	188,231.45	4,559.81	276.41	128,227.78	321,295.42

* Within SGS (Thailand) limited assurance scope (page 105-107)

Environmental Expenditures and Benefits/Violations of Legal Obligations and Regulations

Performance	2020	2021	2022	2023	2024	GRI Standard	SASB
Environmental Operating Expenses (Million Baht)	742	739	1,005	871	843		
Environmental Capital Expenditures/Investment (Million Baht)	330	512	310	345	678		
Tax Incentives linked to Environmental Investment (Million Baht) EN6	8	70	56	10	10		
Number of violations of legal obligations/regulations (Number of Cases) EN7	0	0	0	0	0	GRI 2-27	RT-CP-140a.3
Amount of fines/penalties related to the above (Baht) EN7	0	0	0	0	0	GRI 2-27	
Environmental liability accrued at year end (Baht) EN7	0	0	0	0	0	GRI 2-27	

EN0.1 Production and Raw Materials

1. In 2020, the reporting covered the total raw material volume and the volume of raw materials from recycled materials across all plants in Thailand and abroad.
2. In 2021, the reporting included the total production volume of all plants in Thailand and abroad.
3. In 2024, the reporting covered the total volume of all key raw materials, the volume of raw materials from recycled materials, and the volume of raw materials from renewable sources, such as wood chips, recycled paper scraps, virgin pulp, starch, and plastic pellets, across all factories in Thailand and abroad.
4. Reporting of the percentage of raw materials from recycled content, renewable resources, renewable and recycled content has been included since 2024.

EN1 Greenhouse Gases

Greenhouse Gases (GHG) mean the volume of greenhouse gas emissions from operations, calculated in accordance with the "Greenhouse Gas Reporting and Calculation Guidelines" by the WRI/WBCSD GHG Emissions Protocol and the calculation tools of the International Council of Forest and Paper Associations (ICFPA). The principles are as follows:

1. Reporting scopes

1.1 Direct Greenhouse Gas emissions (Scope 1)

These GHG emissions are generated from the production processes or activities that are under the company or factory's control and management. Examples of Scope1 GHG emissions include from stationary combustion, mobile combustion, fugitive emissions, chemical reactions. However, Carbon dioxide emissions from biomass combustion, biogas, and lime mud combustion at lime kilns shall be reported separately from Scope 1, as the carbon contained in these materials originates from natural sources.

1.2 Indirect Greenhouse Gas Emissions (Scope 2)

These emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling. These emissions are indirect because they happen at the facility that generates the energy, not at the company's own facilities. Market-based and location-based are two methods for calculating a company's Scope 2 emissions. SCGP reports both methods, which are in line with the GHG protocol, as follows:

- Location-based method reflects the average emissions intensity of grids on which energy consumption occurs (using mostly grid average emission factor data).
- Market-based method reflects emissions from electricity that companies have purposefully chosen (or their lack of choice). It derives emission factors from contractual instruments, which include any type of contract between two parties for the sale and purchase of energy bundled with attributes about the energy generation, or for unbundled attribute claims.

1.3 Indirect Greenhouse Gas Emissions (Scope 3)

These emissions are generated indirectly from other sources, including those arising from activities not specified in Scope 1 and Scope 2. The Scope 3 GHG emissions consist of 15 categories as follows:

- Category 1: Purchased Goods and Services
- Category 2: Capital Goods
- Category 3: Fuel- and Energy-Related Activities
- Category 4: Upstream Transportation and Distribution
- Category 5: Waste Generated in Operations (reporting to commence in 2023)
- Category 6: Business Travel
- Category 7: Employee Commuting
- Category 8: Upstream Leased Assets (Not significant or related to SCGP businesses)
- Category 9: Downstream Transportation and Distribution
- Category 10: Processing of Sold Products
- Category 11: Use of Sold Products (Not significant or related to SCGP businesses)
- Category 12: End-of-Life Treatment of Sold Products
- Category 13: Downstream Leased Assets (reporting commence in 2024)
- Category 14: Franchises (Not significant or related to SCGP businesses)
- Category 15: Investments

Note: In 2024, Scope 3 GHG emissions increased by 704,177 tCO_2e compared to 2023. This was primarily due to the inclusion of additional companies within the scope of the sustainability report, contributing 554,894 tCO_2e (see page 101-103 for details). Additionally, emissions rose by approximately 245,000 tCO_2e following the expanded reporting scope for chemicals under Category 1: Purchased Goods and Services.

1.4 Carbon Dioxide Emissions from Lime Mud Combustion at Lime Kilns and Biomass combustion are defined as Biogenic CO_2.These emissions are generated from the release of carbon dioxide during the combustion of biomass/biogenic fuels, such as biomass fuel, sludge from wastewater treatment systems, biogas, black liquor from pulp production, and lime mud combustion at lime kilns.

1.5 Carbon sequestration refers to the process of capturing carbon dioxide gas from the atmosphere and storing it in the form of biomass. For example, eucalyptus forest serve as a source of carbon sequestration, helping to absorb carbon dioxide from the atmosphere.

2. Reporting of Greenhouse Gas Volumes

2.1 Calculation of Scope1 Greenhouse Gas Emissions will be reported from summation of GHG emissions from all combustion sources. The calculation for each type of fuel = volume of fuel consumed x fuel heating value x fuel emission factoreferenced from the Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) Other than TGO refer to “Intergovernmental Panel on Climate Change 2006”, (IPCC).

2.2 Calculation of Indirect (Scope 2) Greenhouse Gas Emissions will be reported from the volume of purchased electricity, steam × greenhouse gas emission factor referenced from TGO, energy producer or supplier.

2.3 In 2023, SCGP has set a new target to reduce Scope1 and Scope2 greenhouse gas emissions by 25% by year 2030 compared to the base year of 2020 (4.99 million tons CO_2e), covering both Thailand and abroad businesses, and aims to achieve net-zero greenhouse gas emissions by 2050.

2.4 Greenhouse gas data from abroad companies has been included since 2020.

2.5 The margin of error in calculating greenhouse gas emissions shall not exceed 0.05% of the reported data.

3. Greenhouse Gas Types

This report will cover all 7 types of Greenhouse gases: CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3 and calculated and presented in terms of carbon dioxide equivalents using the Global Warming Potential (GWP) values set by the IPCC.

EN2 Energy

The total energy consumption includes thermal energy, steam, all the electricity used in the company or factory areas, and the volume of electricity sold externally and to associated companies. For thermal energy, the report shows the fuel consumption from both renewable and non-renewable sources.

1. Thermal Energy Consumption is the volume of fuel or steam (estimated based on the purchased amount or the change in stock) × Low Heating Value (obtained from laboratory testing or from the supplier).
2. Electrical Energy Consumption is the volume of electricity purchased from external sources. This does not include electricity generated internally through fuel combustion, as this would be double-counting energy.
3. Renewable Fuel includes biomass fuels, sludge from wastewater treatment systems, black liquor from the pulp production process and biogas.
4. Non-Renewable Fuel includes fossil fuels and fuels from waste materials or by-products from production processes produced from fossil fuels, including waste reject and used oil.
5. Renewable Energy is clean energy derived from natural sources, including biomass energy (Biomass, Biogas, Sludge and Black Liquor), solar energy, wind energy, hydro energy, geothermal energy, used to replace dependency of fossil fuels.
6. Non-Renewable Energy is thermal energy derived from fossil fuels or purchased steam produced from fossil fuels.
7. Data from abroad companies has been included since 2020.

EN3 Water

1. Water Management (comprising the volume of water withdrawal, water treated before discharge into external water bodies, and recycled water) is a consideration for assessing the efficiency of water usage from various sources.
2. Water Withdrawal refers to the volume of water withdrawn from various raw water sources used in production processes, offices, maintenance, and utilities. The sources of raw water are divided into five categories: surface water, groundwater, sea water, tap water, and water produced alongside the production process. This information is obtained from accounting records or meter readings.
3. Water Source Quality refers to the quality of water from various sources, measured by Total Dissolved Solids (TDS) using standard methods. This is used to categorize the water source quality into two types:
   - Freshwater: TDS less than or equal to 1,000 milligrams per liter.
   - Other Water: TDS greater than 1,000 milligrams per liter.
4. Recycled Water refers to the volume of water reused in all factory activities after undergoing quality treatment processes, excluding water that has not been through quality improvement.
5. Effluent Quality refers to the quality of water discharged externally, such as BOD, COD, and total suspended solids, which are measured for concentration using standard methods along with the volume of effluent discharged into external water bodies.
6. Receiving Water Body Quality refers to the quality of various receiving water bodies, measured by Total Dissolved Solids (TDS) using standard methods. This is used to categorize the water body quality into two types:
   - Freshwater: TDS less than or equal to 1,000 milligrams per liter.
   - Other Water: TDS greater than 1,000 milligrams per liter.
7. Water Data from overseas companies has been included since 2021.
8. The latest version of the Aqueduct 4.0 tool is used for assessing water-related risks.

EN4 Industrial Waste

Waste management is a consideration for assessing the efficiency of production processes, improving product quality, and reducing the costs of manufacturing processes. SCGP has established guidelines for the collection and reporting of environmental data since 2013, to serve as a standard for data collection and reporting for companies within SCGP.

The volume of industrial waste refers to the amount of waste generated from production processes, excluding waste in the production process that can be recycled (Work in Process, WIP). Industrial Waste is categorized into two types: hazardous waste and non-hazardous waste, as defined by the Ministry of Industry's 2023 Decree on the Disposal of Industrial Wastes.

Quantification Report

1. Waste Generated refers to the volume of industrial waste at the point of origin, or before entering the waste storage building. The volume is obtained by weighing scale or estimation.
2. Waste Stock refers to the volume of industrial waste accumulated and not yet managed or stored in designated areas as of the end of the year. The volume is obtained by weighing scale or estimation.
3. Waste Managed refers to the volume of industrial waste handled both internally and externally (outside SCG). The volume is obtained from weighing scale only.
4. Onsite Waste Management (within SCGP) refers to waste management carried out by companies within the scope of SCGP's management (or SCGP subsidiaries).
5. Offsite Waste Management (outside SCGP) refers to waste management carried out by companies outside the scope of SCGP's management.
6. Reporting of waste management volumes from 2017-2020 was in accordance with GRI 306-2, 2016.
7. Reporting of waste management volumes from 2021 onwards was in accordance with GRI 306-4 and GRI 306-5, 2020.
8. Data from overseas companies has been included since 2021.
9. The amount and Percentage of hazardous waste generated to be recycled both in Thailand and abroad has been reported since 2024 in accordance with SASB (RT-CP-150a.1).
10. Reporting of hazardous and non-hazardous waste diverted from disposal by other recovery operations in Thailand and abroad (thousand tons) has been included since 2024 in accordance with GRI 306-4.
11. Reporting of hazardous and non-hazardous waste directed to disposal by other disposal operations in Thailand and abroad (thousand tons) has been included since 2024 in accordance with GRI 306-5.

Remark: Gigajoules per Ton of production the amount of hazardous waste directed to disposal by incineration without energy recovery in 2024 increased to 0.72 thousand tons due to the increased coverage of companies according to the sustainability report 2024 page 101-103.

EN5 Air Emissions

Air emissions refer to the volume of air pollutants, such as nitrogen oxides, sulfur oxides, and particulate matter deriving from combustions and present in production processes. The type of pollutant depends on the specific production processes of each operational unit. The results and methods of measurement are based on legal requirements, such as those set by the US EPA or equivalent standards.

1. Reporting Air Pollutant Volumes is done by calculating the concentration obtained from random emission testing (Spot Check) at the time of measurement under actual conditions. This is conducted by laboratories certified and registered with the Department of Industrial Works, Thailand. This includes the flow rate of the released flue gas and the operating hours of steam boilers. Additionally, the measurement of pollutant discharge from the stacks is carried out using Continuous Emission Monitoring Systems (CEMS).
    - Fiber-Based Packaging Business and Consumer and Performance Packaging Business conducts random emission testing of air pollutants discharged from stacks (Spot Check) under actual conditions at the time of measurement by laboratories certified and registered with the Department of Industrial Works, Thailand.
    - Packaging Paper Business, Food Packaging Paper and Pulp & Paper Packaging Business conducts continuous automatic measurement of air pollutant discharge from stacks using Continuous Emission Monitoring Systems (CEMS).
2. Data from overseas companies has been included since 2021.

EN6 Tax Incentives and Privileges from the Board of Investment (BOI) for Environmental Projects

EN7 Number / Amount of Fines or Settlements in case of Violations of Legal Binding Regulatory Obligations Exceeding 10,000 US Dollars