

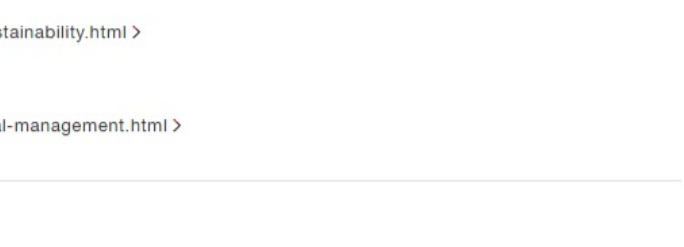
Carbon neutrality

Disclosure based on TCFD Recommendations > Reducing carbon emissions and climate change > Third-party verification of GHG emissions based on ISO 14064-3 >

Hamamatsu Photonics will contribute to the realization of a carbon neutral society in FY2050 through optical technology. The Hamamatsu Photonics Group has positioned "responding to climate change" as one of its key issues, and will enhance its efforts based on the TCFD recommendations in order to achieve its "long-term vision for global warming countermeasures" and SBT targets. We will reduce greenhouse gas emissions throughout the value chain, actively introduce renewable energy, promote energy savings, and develop and provide low-carbon products. Through collaborative efforts in the value chain, we will contribute to the achievement of a carbon-neutral society.

Disclosure based on TCFD Recommendations

In August 2020, we announced our support for the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and promoted an analysis of the risks, opportunities, and financial impacts of climate change on our business. We are pleased to disclose some of the results of this study based on the TCFD recommendations.



Governance

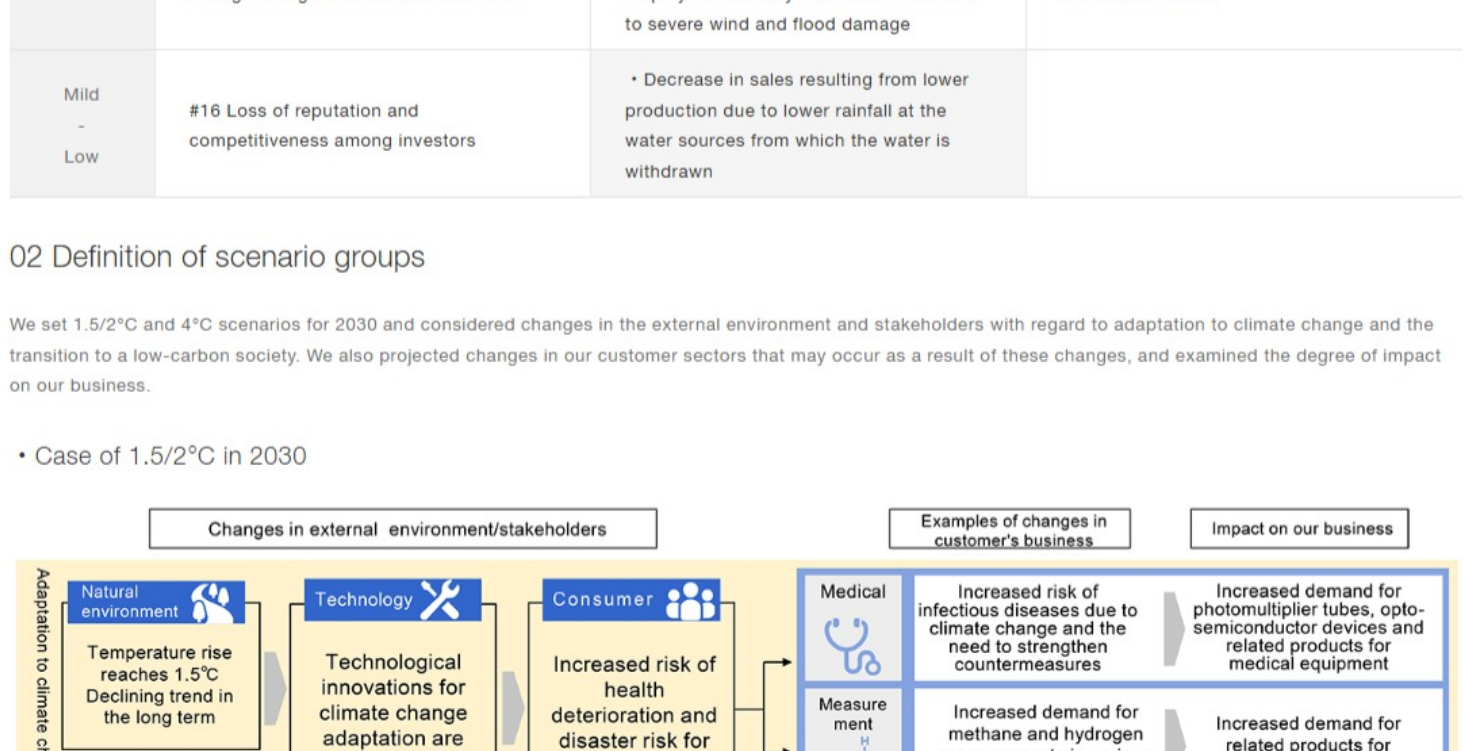
Based on "Hamamatsu Photonics Group Basic Policy of Sustainability" and "Hamamatsu Photonics Group Environmental Policy," we recognize that initiatives for climate change is one of the most important issues. The contents of the studies conducted by the Environmental Committee, which are chaired by executive officers, as well as by its subcommittees and working groups under their supervision, are scrutinized by the Sustainability Management Committee, which is chaired by the officer in charge. The Sustainability Management Committee notifies Board of directors of the key issues. The PDCA cycle has implemented to ensure matters pointed out by Board of directors throughout the company.

Hamamatsu Photonics Group Basic Policy of Sustainability:
<https://www.hamamatsu.com/jp/en/our-company/sustainability/hamamatsu-photonics-sustainability.html>

Hamamatsu Photonics Group Environmental Policy:
<https://www.hamamatsu.com/jp/en/our-company/sustainability/environment/environmental-management.html>

Strategy

We recognize that various changes due to climate change will affect our business. In order to identify the most important risks and opportunities, we conducted a scenario analysis at 1.5/2°C and 4°C for our entire business in the following steps.



01 Identification of key risks and opportunities

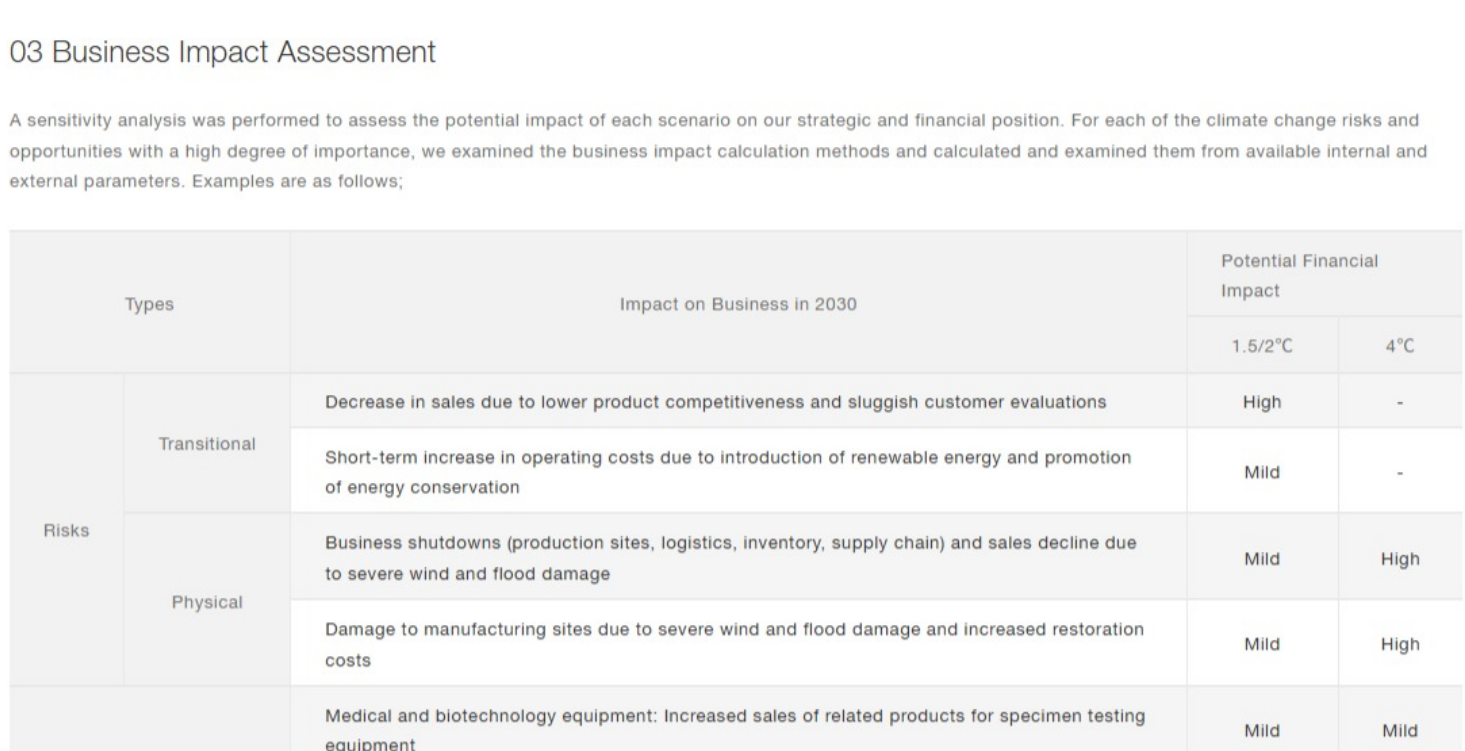
We identified the climate change risks and opportunities facing the company now and in the foreseeable future. We scrutinized the interests of our stakeholders and their future significance. As a result, we identified 16 transition and physical risks and opportunities.

Degree of Impact	Risks		Opportunities
	Transition	Physical	
High	<ul style="list-style-type: none"> #1 Increase in operational costs due to introduction of carbon tax/emissions trading scheme #2 Increased burden and risk of fines due to stricter disclosure requirements and regulations #3 Loss of reputation among customers, decrease in sales, and loss of competitiveness #4 Short-term increase in operating costs due to introduction of renewable energy and promotion of energy conservation #5 Tighter regulations on raw materials 	<ul style="list-style-type: none"> #6 Increased risk of business shutdown and decreased sales due to severe wind and flood damage #7 Increased damage due to severe wind and flood damage #8 Increased air conditioning and cooling costs due to higher average temperatures #9 Increased risk of business shutdowns and decreased sales due to employees' inability to come to work due to higher average temperatures #10 Increased risk of business shutdown and decreased sales due to employees' inability to come to work due to severe wind and flood damage 	<ul style="list-style-type: none"> #11 Increase in sales through the provision of products and services that contribute to addressing climate change #12 Increase revenues by entering new markets #13 Decrease in expenses due to gains in client and investor reputation #14 Increase in revenues through introduction of renewable energy and promotion of energy conservation #15 Long-term increase in sales and decrease in expenses due to enhanced disaster resilience
Mild - Low	<ul style="list-style-type: none"> #16 Loss of reputation and competitiveness among investors 	<ul style="list-style-type: none"> - Decrease in sales resulting from lower production due to lower rainfall at the water sources from which the water is withdrawn 	

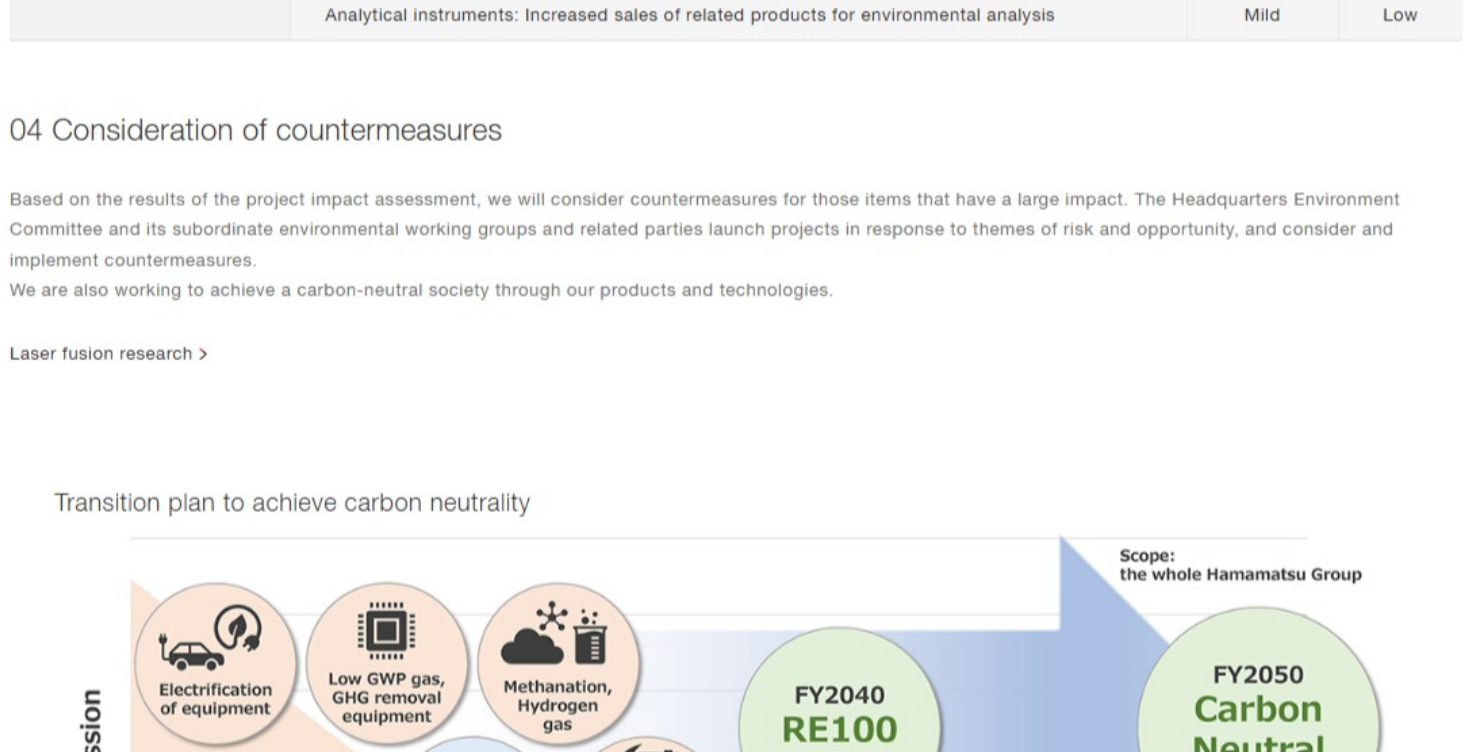
02 Definition of scenario groups

We set 1.5/2°C and 4°C scenarios for 2030 and considered changes in the external environment and stakeholders with regard to adaptation to climate change and the transition to a low-carbon society. We also projected changes in our customer sectors that may occur as a result of these changes, and examined the degree of impact on our business.

Case of 1.5/2°C in 2030



Case of 4°C in 2030



03 Business Impact Assessment

A sensitivity analysis was performed to assess the potential impact of each scenario on our strategic and financial position. For each of the climate change risks and opportunities with a high degree of importance, we examined the business impact calculation methods and calculated and examined them from available internal and external parameters. Examples are as follows:

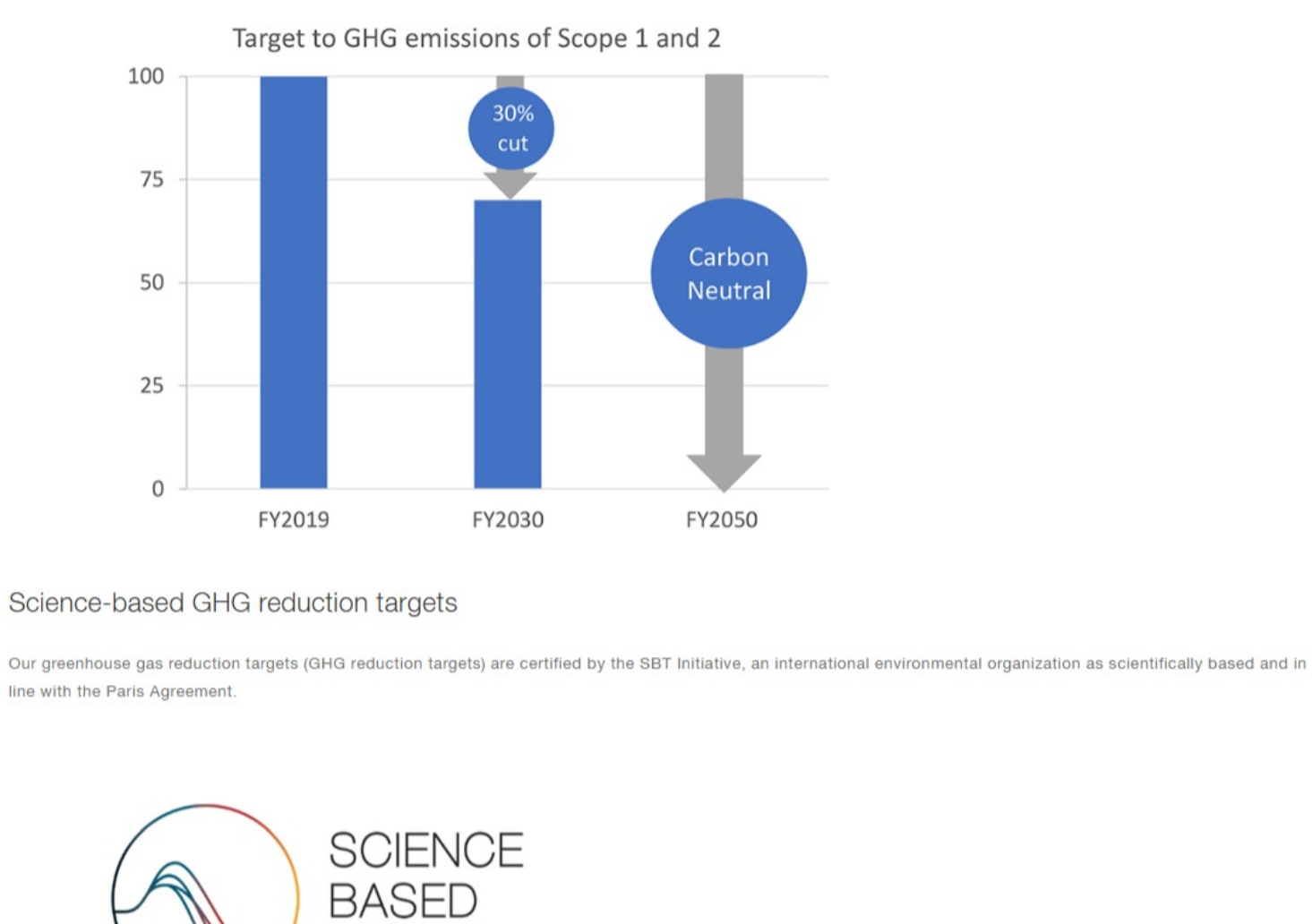
Types	Impact on Business in 2030	Potential Financial Impact	
		1.5/2°C	4°C
Risks	Transitional	Decrease in sales due to lower product competitiveness and sluggish customer evaluations	High
	Physical	Short-term increase in operating costs due to introduction of renewable energy and promotion of energy conservation	Mild
Opportunities	Medical and biotechnology equipment: Increased sales of related products for specimen testing equipment	Mid	Mid
	Industrial Equipment: Increased sales of related products for EV battery inspection systems	Mid	Mid
	Analytical instruments: Increased sales of related products for environmental analysis	Mid	Low

04 Consideration of countermeasures

Based on the results of the project impact assessment, we will consider countermeasures for those items that have a large impact. The Headquarters Environment Committee and its subordinate environmental working groups and related parties launch projects in response to themes of risk and opportunity, and consider and implement countermeasures.

Laser fusion research >

Transition plan to achieve carbon neutrality



Target	Outline	Approach
Scope 1'	Renewal of fuel-using equipment	<ul style="list-style-type: none"> Replacing company cars with EV Electrifying equipment Introducing new green technology into existing equipment
Scope 2'	Carbon offset	<ul style="list-style-type: none"> Purchasing reliable credit
	Saving energy usage	<ul style="list-style-type: none"> Introducing energy-efficient equipment
Scope 3'	Introducing renewable energy	<ul style="list-style-type: none"> Introducing on- and off-site PPA Introducing RE100-compliant electricity with new technical criteria
	Carbon offset	<ul style="list-style-type: none"> Purchasing reliable credit
Scope 3''	Reducing Category 1	<ul style="list-style-type: none"> Collecting more accurate data from value chain Promoting SBT1 supplier engagement
	Reducing Category 11	<ul style="list-style-type: none"> Designing low greenhouse gas (GHG) emission products

* Scope 1: Direct emission from use of fuels, city gas, GHGs from non-energy sources, etc.
 * Scope 2: Indirect emissions from the use of purchased electric power, etc.
 * Scope 3: Indirect emissions from the value chain (purchase of goods and services, logistics, sales, disposals etc.)

Risk management

We have established environmental management rules and operated a company-wide environmental management system. Environmental risks and opportunities related to climate change are evaluated, and environmental objectives and targets are set for each fiscal year. The management reviews our progress and challenges, and we strive to improve our environmental performance through continuous improvement.

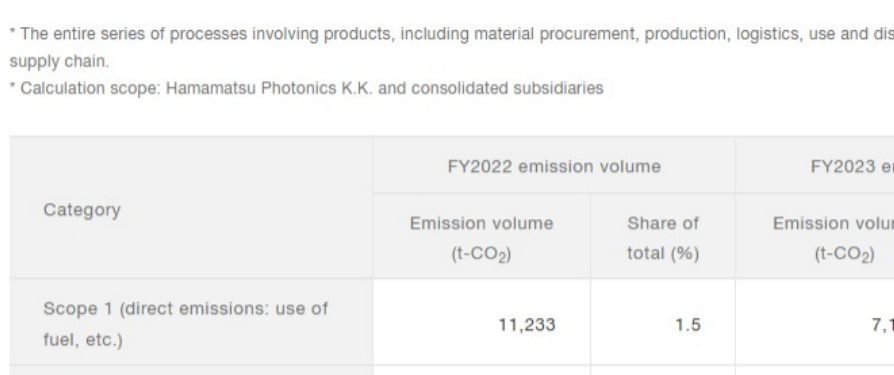
Risk management for our group, including consolidated subsidiaries, is conducted at the Group ESG Meeting held once a year. The progress of risk management activities at those subsidiaries is reported to the Environmental Committee Secretariat every three months to promote group-wide risk management.

Metrics and Targets

Long-Term Vision of Global Warming Countermeasures

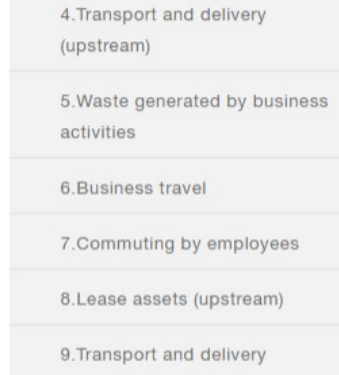
In March 2020, we formulated our Long-term Vision of Global Warming Countermeasures, and are working to cut GHG emissions (scope 1 and 2) from our business activities.

In August 2024, the Long-term Vision has been revised to "Achieving carbon neutral FY2050," reflecting our new SBT certified target and the applied boundary. Hamamatsu Photonics Group keeps working all together to cut our GHG emissions.



Science-based GHG reduction targets

Our greenhouse gas reduction targets (GHG reduction targets) are certified by the SBT Initiative, an international environmental organization as certified and in line with the Paris Agreement.



Scope	Target
Scope 1+2	30% reduction by FY2031 (Compared to FY2019)
Scope 3	<ul style="list-style-type: none"> Category 11 (Emissions from use of sold products): 15% reduction by FY2031 (Compared to FY2019) Category 1 (Emissions from purchased goods and services): 76% of suppliers by spending covered purchased goods and service will have science-based targets by FY2026.

SBT: <https://sciencebasedtargets.org/>

Joining RE100

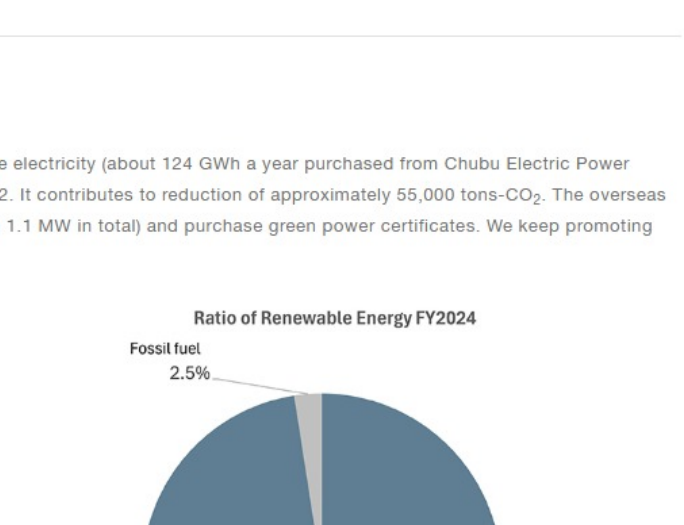
We have joined RE100 (100% Renewable Electricity), an international corporate initiative with the goal of ensuring that 100% of the electricity used in business operations comes from renewable energy sources, on 3rd October 2022. We are committed to sourcing 100% renewable electricity across its entire global operations by FY2040.



Reducing carbon emissions and climate change

GHG emissions of Scope 1 and 2

In the FY2024, we have reduced CO₂ emissions drastically by 86.2% comparison with the FY2019 level due to introducing renewable energy etc. We keep working to reduce GHG emissions in accordance with our countermeasures.



* Calculation scope: Hamamatsu Photonics K.K., domestic consolidated subsidiaries, and overseas consolidated subsidiaries (Up to FY2023, only manufacturing sites were included. From FY2024, non-manufacturing sites were also included.)

Value chain carbon emissions (including Scope 3)

To grasp the environmental impact of the value chain*, HPK is working on the calculation of Scope 1, 2 and 3 based on the "GHG Protocol."

* The entire series of processes involving products, including material procurement, production, logistics, use and disposal. Includes both upstream and downstream parts of the Company's supply chain.
 * Calculation scope: Hamamatsu Photonics K.K. and consolidated subsidiaries

Category	FY2022 emission volume		FY2023 emission volume		FY2024 emission volume	
	Emission volume (t-CO ₂ e)	Share of total (%)	Emission volume (t-CO ₂ e)	Share of total (%)	Emission volume (t-CO ₂ e)	Share of total (%)
Scope 1 (direct emissions: use of fuel, etc.)	11,233	1.5	7,130	1.0	5,765	1.1
Scope 2 (indirect emissions: use of purchased electricity)	46,271	6.2	1,840	0.3	1,814	0.3
Scope 3 (other indirect emissions)	685,923	92.3	707,115	98.7	531,521	98.6
1. Purchased goods and services	408,044	(59.5)	404,124	(57.2)	283,264	(53.3)
2. Capital goods	96,641	(14.4)	145,335	(20.6)	108,256	(20.4)
3. Fuel and energy use not included in Scopes 1 and 2	10,811	(1.6)	1,484	(0.2)	1,109	(0.2)
4. Transport and delivery (upstream)	17,747	(2.6)	15,892	(2.2)	9,094	(1.7)
5. Waste generated by business activities	486	(0.1)	417	(0.1)	442	(0.1)
6. Business travel	754	(0.1)	2,659	(0.4)	2,908	(0.5)
7. Commuting by employees	5,995	(0.9)	6,091	(0.90)	6,572	(1.2)
8. Lease assets (upstream)	—	—	—	—	—	—
9. Transport and delivery (downstream)	—	—	—	—	—	—
10. Processing of sold products	7,176	(1.1)	6,709	(0.9)	5,438	(1)
11. Use of sold products	135,912	(19.8)	124,392	(17.6)	114,429	(21.5)
12. Disposal of sold products	358	(0.1)	12	(0.0)	8	0
13. Lease assets (downstream)	—	—	—	—	—	—
14. Franchises	—	—	—	—	—	—
15. Investments	—	—	—	—	—	—

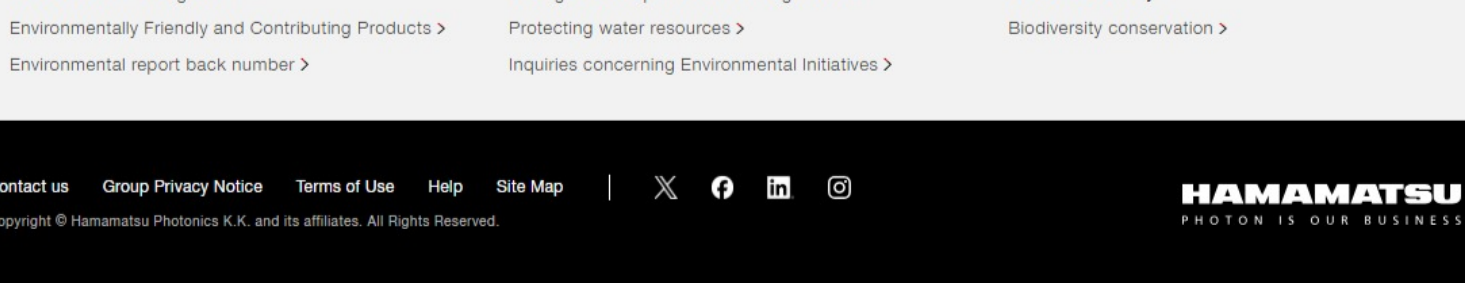
* Values in parentheses indicate percentages in Scope 3

Method of calculation of Scope 3

Category	Activity volume	Unit
1. Purchased goods and services	Amount of purchases of raw materials and parts	Emissions per unit amount of purchase
2. Capital goods	Monetary amount of capital goods purchased	Emissions per unit amount of purchase
3. Fuel and energy use not included in scopes 1 and 2	Fuel, electricity, and heat energy use	Emissions per unit of electricity and fuel used
4. Transport and delivery (upstream)	<ul style="list-style-type: none"> Shipping volume related to purchased products and services Cost of shipping of sold products 	<ul style="list-style-type: none"> Emission rate (corrected 1/kg method) Emission rate by shipping method
5. Waste generated by business activities	Output volume by type of waste	Output rate by type of waste
6. Business travel	<ul style="list-style-type: none"> Distance traveled Traveling expenses paid 	Emission rate by transportation mode
7. Commuting by employees	<ul style="list-style-type: none"> Distance traveled Traveling expenses paid 	Emission rate by commuting mode
8. Lease assets (upstream)	N/A	—
9. Transport and delivery (downstream)	N/A	—
10. Processing of sold products	Sales of products	Manufacturing emissions intensity by sector
11. Use of sold products	Final products: Number of units shipped, power consumption and service life	Proxy value for CO ₂ emission coefficient by electricity provider (the Ministry of the Environment)
12. Disposal of sold products	Final products: Number of units shipped and product weight	Emission rate by product type
13. Lease assets (downstream)	N/A	—
14. Franchises	N/A	—
15. Investments	N/A	—

Reducing Scope 2 - Utilization of renewable energy -

As one of the concrete actions to achieve our carbon neutral, we have introduced CO₂-free electricity (about 124 GWh/year) purchased from Onbu Electric Power Mitsui Company Inc. into manufacturing plants and an office in Japan since October 2022. It contributes to reduction of approximately 55,000 tons-CO₂. The overseas plants and offices also are planning to introduce solar-power generating equipment (about 1.1 MW in total) and purchase green power certificates. We keep promoting those actions over the group.



* Main Factory, Mitsui Factory, Shingai Factory, Toyooka Factory, Tenno Glass Works, Joko Factory, Miyakoda Factory, Central Research Laboratory, Industries Development Center, Tokyo Sales Office, and our group companies (Koto Corporation, Takaka Electronics Co., Ltd., Hamamatsu Electronic Press Co., Ltd., KOHDEN CO., Ltd.)
 * Calculation scope: Hamamatsu Photonics K.K. and consolidated subsidiaries
 * Renewable energy: Based on RE100 March 2022 technical requirements

Reducing Scope 1 - Utilization of GHG removal equipment -

GHG used in semiconductor manufacturing such as HFC, PFC, SF₆ and NF₃ have large global warming potential (GWP). We are working to reduce its emissions by installing removal equipment and optimizing processes.

Third-party verification of GHG emissions based on ISO 14064-3

To disclose transparent and reliable information on our GHG emissions data (Scope 1, 2, and 3), we obtained third-party verification and their written opinion. We will continue to work to improve the reliability of its data and reduce GHG emissions.

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