

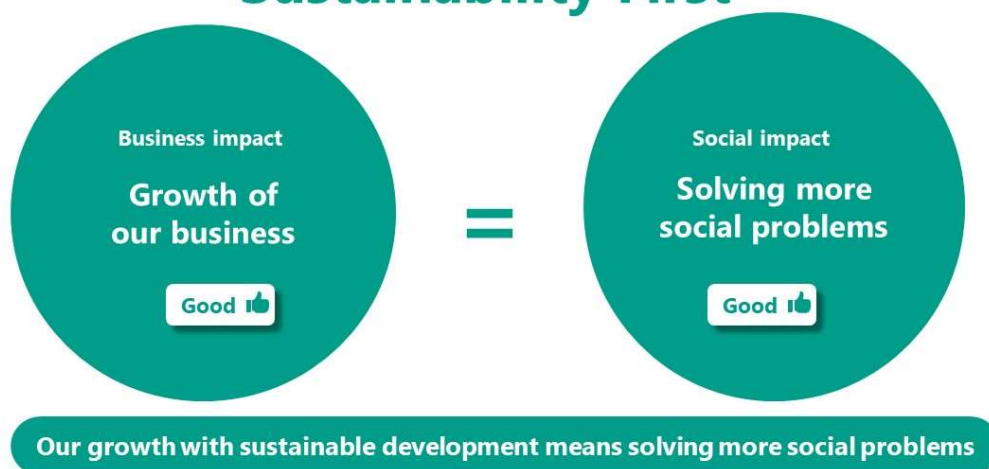
FY2023 TCFD Report

Towards a world of net zero greenhouse gas emissions by 2050

With the Euglena Philosophy of "Sustainability First," we believe that we have a responsibility to leave the earth rich in nature to the next generation through our business activities to reduce environmental impact. Since our founding in 2005, we have continued to work on the creation of innovative technologies and businesses that provide solutions to various social issues such as global environmental problems, and have contributed to the development of a sustainable society. Toward achieving a world of net zero greenhouse gas emissions by 2050, we will further promote the reduction of environmental impact through the Euglena Group's business, and contribute to the reduction of CO2 emissions in society as a whole through the spread of biofuels.

All members of the Euglena Group are constantly considering and acting on the following:
"How can our happiness continuously coexist with someone else's happiness?"

Sustainability First



● Development and production of biofuels

As a concrete measure against climate change, Euglena manufactures and sells "SUSTEO", a biofuel made from cooking oil and the microalgae *Euglena*. When "SUSTEO" is used, it is expected to contribute to the realization of carbon neutrality, in which the amount of carbon dioxide emissions is lower comparing to fuels derived from fossil fuels. Next-generation biodiesel fuel was completed in March 2020, and biojet fuel was completed in March 2021, and the introduction of biofuel has been gradually expanded in all areas of "land, sea, and air." In December 2022, Euglena, Petrolia Nasional Berhad (PETRONAS) and Eni S.p.A (Eni) announced their joint study on the possibility of developing and

operating a biorefinery in the Pengerang Integrated Complex (PIC) in Malaysia and the plant to be completed in near future.



Related links

- Energy / environment business introduction
[Euglena Co., Ltd.](#) | [Euglena 's business introduction \(euglena.jp\)](#)
- Euglena culture demonstration for biofuels
[vol.14 Cultivate Euglena with Japanese original technology.](#) | [Sustainable Times by euglena](#) | [Sustainable Times by euglena](#)

● Supporting Climate Initiatives

We have endorsed domestic and international industry initiatives that will lead efforts towards a world with net zero greenhouse gas emissions by 2050. As a participating company, we will strengthen our efforts to achieve carbon neutrality, while regularly confirming the consistency of each initiative's climate change policy and our climate policy and make policy recommendations as necessary.

Example

Support to TCFD

In May 2019, Euglena agreed with the proposal by the Task Force on Climate-related Financial Disclosures (TCFD ^{* 1}: Task Force on Climate-related Financial Disclosures) for the disclosure of climate-related financial information, and aims to promote the proposal. I joined the TCFD Consortium ^{*} ² established in Japan. Based on the recommendations of TCFD, we are strengthening information disclosure regarding climate-related risks, business opportunities, and governance systems.

^{* 1} TCFD: A task force established by the Financial Stability Board, an international organization that aims to stabilize the financial system. The purpose is to stabilize financial markets by supporting companies that disclose information on climate change and by smoothly transitioning to a low-carbon society.

^{* 2} TCFD Consortium: Established in Japan in May 2019 to discuss effective information disclosure by companies and

efforts to connect the disclosed information to appropriate investment decisions by financial institutions. Any company or institution that supports TCFD can join.

Example

Supporting Japan's "GX League (GX: Green Transformation)*3" established by the Ministry of Economy, Trade and Industry

We have expressed our support for the "GX League Basic Concept" launched by the Ministry of Economy, Trade and Industry in February 2022 to promote social change toward carbon neutrality and the creation of new markets. We are participating in discussions toward the operation of the GX League as a supporting company.

*3 A forum for cooperation between a group of companies and the government, universities, and academic institutions in order to meet greenhouse gas reduction targets and increase industrial competitiveness by using Japan's goal of carbon neutrality by 2050 as an opportunity for economic growth. Supporting companies from various industries that endorse the GX League are working together to develop a vision of the future society, make rules for market creation, and prepare a carbon credit exchange scheme.

Initiatives and Disclosure based on TCFD Recommendations

Governance on climate change issues

In February 2023, the Group established a Sustainability Committee directly that the company's Board of Directors decided and established a Sustainability Committee to discuss various sustainability policies, goals, strategies and countermeasures for promoting company-wide sustainability activities and ESG management in order to further realize our corporate philosophy of "Sustainability First."

Sustainability Committee functions as an advisory body to the Board of Directors, placed directly under the Board of Directors, and promotes sustainability initiatives throughout the Group. In addition, in order to promote overall sustainability activities throughout the entire Group including climate risks and opportunities, as well as our response to climate change. We have also established theme-specific working groups consisting of persons in charge from our company and Group companies' business divisions. These working groups identify issues, discuss countermeasures and propose actions to the Committee.

With the establishment of the Sustainability Committee, we will further accelerate the sustainable management of the entire group, actively promote the disclosure of information on sustainability to all stakeholders, including shareholders, investors and customers, and continuously grow in a sustainable society.

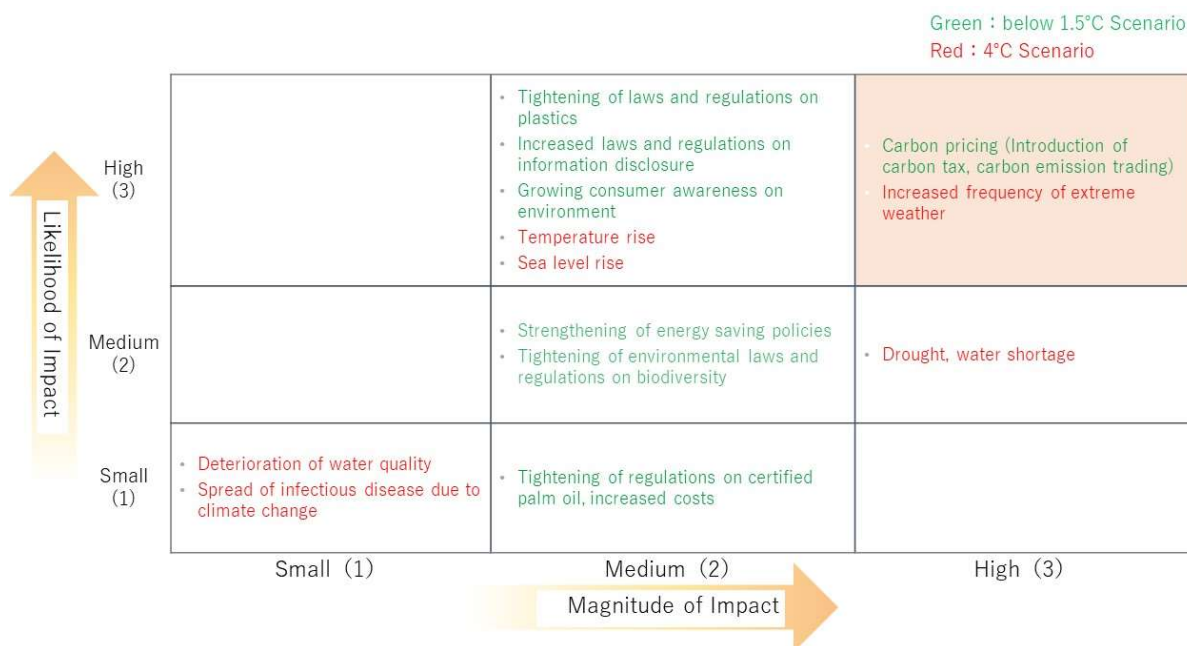
Scenario analysis of climate change impact

In this scenario analysis, we have looked at the scenario to achieve the Paris Agreement goal of "keeping the world average temperature rise well below 2°C compared to before the Industrial Revolution and pursuing efforts to keep it at 1.5°C" and realizing a carbon-free society. In addition to the 1.5°C scenario, we considered the 4°C scenario, assuming that climate change countermeasures will not progress sufficiently worldwide. In addition, we targeted 2030 in the analysis as a timeframe where the probability of our business can be foreseen. We have set the healthcare business, as well as, biofuel business of Euglena Co., Ltd. as the target businesses of the analysis, and identified the impact of climate change on the Group. In the scenario analysis, we referred to IEA SDS, IPCC RCP2.6 / SR1.5, WRI Aqueduct Optimistic, etc. in the 1.5°C scenario analysis, and IEA STEPS, IPCC RCP8.5, WRI Aqueduct BaU, etc. in the 4°C scenario analysis.

Analysis of key opportunities and risks related to climate change

Based on the world assumed in each scenario, as the first step, we have comprehensively listed possible risks and opportunities for the target projects selected during the preparatory stage. As the second step, we qualitatively evaluated the importance of risks based on the magnitude of the possibility that risks and/or opportunities could occur, as well as, the magnitude of the business impact if the risks and/or opportunities become reality (Figure 1). At the final stage, based on discussions with Executive Officers and persons in charge from relevant departments, the degree of impact and occurrence of risks and opportunities on the business were evaluated qualitatively and quantitatively, and classified into three stages: small, medium, and high. did.

Assessment results on importance of risks and opportunities (healthcare business)



As a result, we organized potential climate risks and opportunities expected for each business as shown in the chart below, and identified important risks and opportunities.

Key climate risks and opportunities in the Healthcare business

● Risks

Climate events and its likelihood			Expected risks and magnitude of impact	
Below 1.5°C Scenario	Introduction of carbon pricing	High	<ul style="list-style-type: none"> • Increased capital investment related to CO2 emissions reduction efforts • Increased raw materials cost on heavy oil, gas, and electricity 	High
	Tightening of laws on plastics	High	<ul style="list-style-type: none"> • Increased cost on logistics and shipping 	High
	Tightening of laws on plastics	High	<ul style="list-style-type: none"> • Increased cost on bioplastics use and container recycling etc. 	High
	Increased laws on information disclosure	High	<ul style="list-style-type: none"> • Increased burdens due to disclosure and regulatory requirements 	Medium
	Strengthening of energy saving policies	Medium	<ul style="list-style-type: none"> • Increase in capital investment cost for improving energy efficiency 	High
	Tightening of laws and regulations on biodiversity	Medium	<ul style="list-style-type: none"> • Increase in capital investment cost due to stricter regulations on water emissions and wastewater 	Medium

Climate events and its likelihood			Expected risks and magnitude of impact	
4 °C Scenario	Increased frequency of extreme weather events	High	• Sales decrease due to capital damages and disruption to production and manufacturing factories, and supplier factories, and increased cost to respond to such damages	High
			• Sales decrease due to disruption of logistics and shipping routes	
	Sea level rise	High	• Increased cost due to damages to equipment in production and manufacturing factories	Medium
	Temperature rise	High	• Reduced or delayed productivity of field workers	Medium
			• Increased temperature control cost for Euglena culture facilities	Low
			• Increased cost of required investments in production equipment and consumables	
			• Increased risk of mutation in cultured organisms and emergence of hostile viruses	
			• Decrease in yield and quality of ingredients other than Euglena (green barley leaves, kale etc.) resulting in lower product quality and higher procurement cost	High
	Drought, Water shortage	Medium	• Suspension of Euglena culture due to lack of water supply	
			• Increased culture cost due to changes in water properties	
			• Increase in water bills and raw material cost due to lack of water supply	Medium
			• Decrease in Euglena culture volume due to heat waves and drought	Low

Key climate risks identified:

- Damage to production bases and distribution functions due to the increased frequency of extreme weather events under the 4°C scenario.
- Increasing cost associated with capital investment and raw material procurement due to the introduction of carbon pricing under the 1.5°C scenario.

We identified the above as a risk factor that should be considered in particular and conducted a quantitative evaluation on their impact on our business. We will carry out more detailed risk analysis and strive for more comprehensive risk management.

Risk case	Suspension of production and distribution bases due to floods and storm surges
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We assessed the impact of extreme weather such as floods and storm surges on the Group's production and distribution bases by using hazard maps and inundation forecast maps issued by local governments. For each distribution base, we calculated the loss of sales due to the suspension of business based on the expected number of days of business suspension and business stagnation, referring to the "Manual for Economic Evaluation of Flood Control Investment (draft)" by the Ministry of Land, Infrastructure, Transport and Tourism, Japan. As a result, as of 2030, the decrease in sales due to the inability to supply products due to the inundation of distribution bases was limited, and it was evaluated as a manageable risk. We will further take measures such as formulating a BCP in the event of a flood and predicting inundation and strive to mitigate and eliminate such risks identified. For each production base,

we confirmed by the hazard map issued by the local governments that the risk of flooding is low and that the possibility of significant delays in production due to flooding is also low.

Risk case	Impact of temperature rise and water shortage on Ishigaki Island Euglena production
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Since the culture of Ishigakijima Euglena and Yaeyama Chlorella must be carried out within the proper temperature range, the temperature control cost of the culture may increase if the temperature rise expected in the 4°C scenario occurs. In addition, although the degree of occurrence is relatively small, the impact on Euglena / Chlorella production is expected to some extent if there is a risk of water shortage due to drought, etc. and it becomes difficult to secure the water required for cultivation. We will take measures to avoid or reduce risks, such as capital investment for temperature control.

● Opportunities

Climate events and its likelihood			Expected opportunities and magnitude of impact	
Below 1.5°C Scenario	Increased consumer awareness on environment	High	<ul style="list-style-type: none"> Increased sales due to market expansion of environmentally friendly products 	High
	Decreased renewable energy prices	High	<ul style="list-style-type: none"> Cost reduction by using renewable energy 	Low
4 °C Scenario	Increased frequency of extreme weather events	High	<ul style="list-style-type: none"> Growing demand for supplements for emergency stocks 	Low
	Temperature rise	High	<ul style="list-style-type: none"> Expansion of areas where Euglena can be produced due to temperature rise 	Low
		High	<ul style="list-style-type: none"> Decreased crop and procurement cost due to rising average temperature 	Low
		High	<ul style="list-style-type: none"> Generation of Euglena strains with excellent production efficiency due to temperature rise 	Low
	Degradation of marine ecosystems, rise in seawater temperature	Medium	<ul style="list-style-type: none"> Occurrence of alternative demand for fishery resources due to reduced fish catches 	Medium

Under the 1.5°C scenario, where climate change is being dealt with, we assumed the world where consumers are becoming more environmentally conscious, and that our health care products with low environmental impact will be accepted more in the future. We will continue to seize such opportunities for business development along with other opportunities.

Key climate risks and opportunities in the Biofuel business

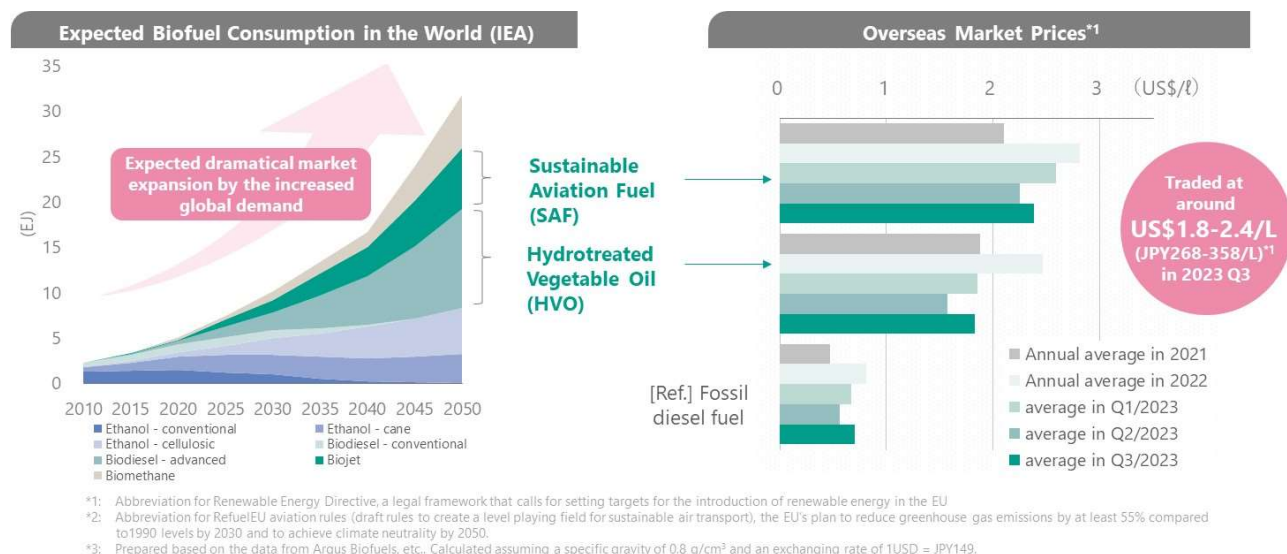
Similarly, in the biofuel business, we qualitatively and quantitatively evaluated the degree of impact and occurrence of risks and opportunities on the business. On the other hand, since this business is in the pre-commercial phase and it was difficult to make an appropriate evaluation, we disclosed the results of qualitative analysis of risks and opportunities in FY2021. We will disclose the corresponding action areas. We are proceeding with the analysis of risks and opportunities, including the following.

Climate risks and opportunities

Below 1.5°C Scenario	Risk	• Increased manufacturing cost due to the introduction of carbon pricing
		• Increased prices of biofuel raw materials
	Opportunities	• Increase in product added value (sales price) due to the introduction of carbon pricing
		• Tightening of laws and regulations to promote the use of biofuels
4 °C Scenario	Risk	• Damage to manufacturing and distribution functions due to extreme weather
		• Increased biomass raw material cost due to changing climate patterns

Opportunity case	Increased sales due to tightening of laws and regulations to promote the use of biofuels
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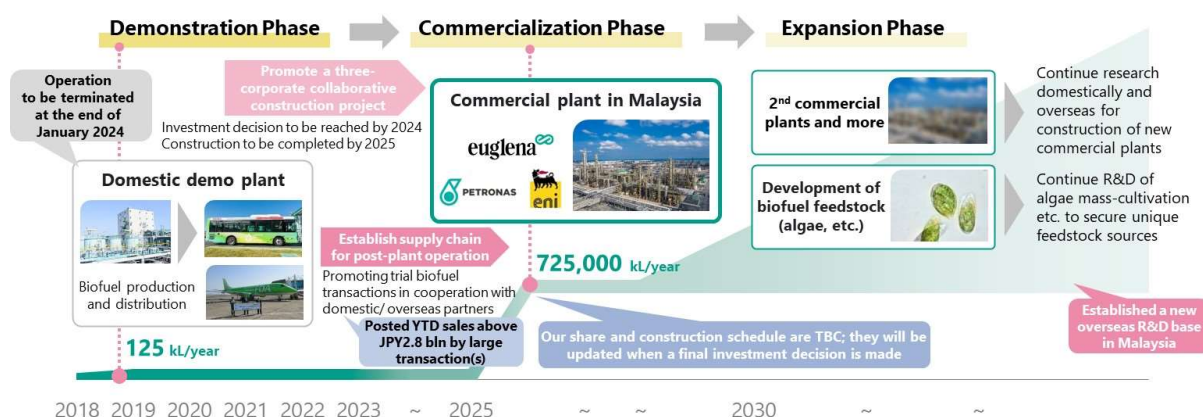
Demand for biofuels is expected to expand globally toward the realization of carbon neutrality, and it is predicted that further tightening of laws and regulations such as the quota system and carbon tax will improve price competitiveness for petroleum fuels and dramatically expand the market. Demand is expected to grow in all "land, sea, and air" industries, with biofuels expected to be introduced in 41% of road transport, 45% of aircraft, and 21% of ships by 2050. Due to the expected shortage, we expect sales to increase as production increases. Regarding biojet fuel (SAF), the Ministry of Land, Infrastructure, Transport and Tourism, Japan, has set a goal of replacing 10% of the fuel used by Japanese airlines with SAF by 2030, and thus it is expected that the introduction and spread of SAF will be promoted. In February 2023, the Japanese government decided on a "basic policy for the realization of GX" at a cabinet meeting, and has set out to expand GX investment in carbon-recycled fuels including SAF. Private sector investment in large-scale demonstrations and capital investment is also expected to increase.



Group strategy and initiatives on climate change issues

● Biofuel business that contributes to mitigation of climate change

The biofuel "SUSTEO" manufactured and sold by our company has gained the support of many companies and organizations, and the total number of biofuel supply destinations is more than 93 (as of the end of fiscal 2023). We will continue our research, manufacturing, and sales efforts related to biofuels in order to further expand the circle of support. Currently, in the assumption of business opportunities under the 1.5°C scenario, we are in collaboration with domestic and overseas partners. In December 2022, Euglena, Petroliaam Nasional Berhad (PETRONAS) and Eni S.p.A (Eni) announced their joint study on the possibility of developing and operating a biorefinery in the Pengerang Integrated Complex (PIC) in Malaysia. For post-commercialization, we continue engaging in biofuel trial transactions to build a supply chain and R&D activities at our laboratory in Malaysia. By starting full-scale supply of next-generation biodiesel fuel and bio-jet fuel and introducing them widely to automobiles, ships, airplanes, and other mobile vehicles, we will contribute to the realization of the 1.5°C scenario and carbon neutrality in 2050.



*1: We obtained ISCC EU certification (International Sustainability & Carbon Certification), one of the international certification systems for sustainable products such as biofuel, in September 2021.

*2: The figures are based on the estimated PL contribution equivalent to our ownership, assuming biofuel price of JPY 250/L, EBITDA margin of 20%, and our ownership share of 30%. Actual sales and EBITDA size will change depending on future trends of biofuel feedstock and product prices, our final ownership share, commercial plant utilization rates, etc.

● Initiatives through the healthcare business

The Group regards sustainable reduction of environmental impact in its business activities as one of the important management issues, and is particularly focusing on "control of climate change." Established by the first CFO (Chief Future Officer) and summit members, "We aim to build a system that allows customers to take environmentally conscious actions regardless of their height or low awareness of the environment." Based on this policy, we have been striving to reduce greenhouse gas emissions in the healthcare business by significantly reducing the number of petroleum-derived plastics used in products and packaging and using renewable energy, and will strengthen further efforts in the future.



Euglena for Healthcare: Green Smoothie Lactobacillus

Example of initiatives Switching to tube skin care product containers

Since September 2021, the 6 all-in-one cream containers of the skin care brand "one" have been gradually switched from the conventional jar type container to the tube type container containing sugar cane-derived resin in the main body, and the official EC site. It is sold at "Euglena Online shop". By changing the container, we have achieved a reduction of up to 90% in petroleum-derived plastic compared to conventional products. In addition, when delivered by mail, the transportation volume is small and redelivery is not required, so we have realized a sustainable product design from the viewpoint of reducing CO2 emissions associated with delivery.



Example of initiatives Use of sustainable packaging

In the bio-natural skin care brand "NEcCO" launched in January 2023, the weight of the packaging bottle was reduced by up to 50% by compressing the effect by making each drop of the prescription in the contents highly concentrated. *4 (compared to our conventional products), reducing the environmental impact during delivery. In addition, the package container contains up to 30% of plant-derived biomass plastic*5, which considers CO2 emissions, the material of the cosmetic box is 100% used paper pulp, and the printing uses vegetable oil ink. We use materials that contribute to reducing environmental impact.

※4 Compared to our conventional products

※5 Excluding the inner stopper and cap of the container



Example of initiatives Initiatives by the group company Q'SAI

Q'SAI's Fukuoka Konominato Factory introduced a solar power generation system in 2014 as part of its environmental conservation activities. 868 power generation panels were installed on the roof of the factory, and the annual power generation will be 181,467kwh kWh (January to December 2023). In addition, Q'sai's healthcare products use plant-derived materials in part of the product packaging to reduce plastic waste. In addition, they are promoting efforts to reduce environmental impact, such as implementing environment-friendly agriculture and recycling resource waste.



Risk management

Euglena Group has established a company-wide risk management system that identifies important risks company-wide and manages risks through the PDCA cycle. Regarding risk information within the group, we report to the Board of Directors through the department in charge and receive feedback. Climate change risk is also regarded as one of the important risks for the entire company, and it is managed by the company-wide risk management system, and the details of examinations and responses are also discussed in the Sustainability Committee, which are reported to the Board of Directors at least once a year.

Indicators and goals

Based on the results of scenario analysis of climate risks and opportunities, we have calculated our Scope 1 and 2, as well as key categories of Scope 3 CO₂ emissions since fiscal 2022 and disclosed its emissions data. We will continue to formulate our CO₂ emissions reduction goals in our own operations and improving accuracy of Scope 3 emissions data.

CO₂ emissions data (FY2023: January – December 2023)*¹ :

Unit: tons

Scope	Items		Fiscal 2022	Fiscal 2023
Scope 1 * ²	Gas		1,674	1,572
Scope 2 * ²	Electricity	Market-based* ³	3,750	3,318
		Location-based* ⁴	3,248	2,975
Total (Scope 1 and Scope 2 Market-based)			5,424	4,890
Scope 3 * ⁵	Category 1 (Purchased goods and services)		66,056	TBD
	Category 4 (Upstream transportation and distribution)		5,458	TBD
	Category 6 (Business travel)		663	TBD
	Category 7 (Employee commuting)		233	TBD

*¹ Boundary : Euglena headquarters, Q'sai Group, Yaeyama Shokusan, LIGUNA, Epauler, Tsurumi Demonstration Plant, R&D Research Institute, and Daikyo Fertilizer

*² Since the fiscal year ending December 31, 2022, we acquire a third-party verification for Scope 1 and 2 emissions data by SGS Japan.

*³ Market-based (A method of calculation using the GHG emission coefficient for each electric company)

*⁴ Location-based (A method of calculation using the average GHG emission coefficient of the region's electricity grid)

*⁵ Scope 3 calculations are based on the value-based emissions intensity (purchaser price-based) of the Ministry of the Environment's "Emissions Intensity Database ver. 3.2 for Calculating Greenhouse Gas Emissions of Organizations through Supply Chains."

Moreover, we will formulate countermeasures in collaboration with the business and promote their incorporation into management and business plans. We will set various indicators for mitigating physical risks due to climate change and utilizing opportunities in the future, and aim to carry out regular monitoring.

Related links
<ul style="list-style-type: none"> ● Responding to climate change