The Report of Climate-related Financial Disclosure

24th June 2022

1. Background

Task Force on Climate-related Financial Disclosures (TCFD) was established by the Financial Stability Board at the request of G20 to examine how climate-related information should be disclosed, and how should financial institutions respond. TCFD published its final report[1)] in June 2017, and recommends companies to assess, manage, and disclose risks and opportunities related to climate change with corporate management perspective. In Japan, the revised Corporate Governance Code published in April 2021 emphasized the necessity of disclosure along with the TCFD flamework. Managing the climate-related risks/opportunities is becoming essential as ESG disclosure. The importance of forecasting uncertain mid- and long-term future risks by scenario analysis and taking countermeasures is recognized as common sense.

Table 1 TCFD Recommendations and supporting recommended disclosures[1)]

Governance: Disclose the organization's governance around climate-related risks and opportunities.
1. Describe the board's oversight of climate-related risks and opportunities. 2. Describe management's role in assessing and managing climate-related risks and opportunities.
Strategy: Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.
1. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term. 2. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning. 3. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.
Risk Management: Disclose how the organization identifies, assesses, and manages climate-related risks.
1. Describe the organization's processes for identifying and assessing climate-related risks. 2. Describe the organization's processes for managing climate-related risks. 3. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.
Metrics and Targets: Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.
1. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process. 2. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks. 3. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

The Global Risks Report[2] published by the World Economic Forum indicates climate-related factor as the most significant risk to the global market. It is important to accurately analyze climate-related risks and opportunities and respond to them in advance to ensure sustainable business growth considering the recent severe damage caused by disasters.

Table 2　Global risk landscape (Global Risks Report 2022)

	Risk		Risk
1	Extreme weather	6	Infectious diseases
2	Climate action failure	7	Climate action failure
3	Human environmental damage	8	Weapons of mass destruction
4	Infectious diseases	9	Biodiversity loss
5	Biodiversity loss	10	Nature resource crisis

In 2021, the Intergovernmental Panel on Climate Change (IPCC) published the Sixth Assessment Report, which summarizes the latest scientific findings on climate. In response to the findings, the Glasgow Climate Pact — which agrees to limit the global temperature increase to 1.5° C above pre-industrial levels — was adopted at the 2021 UN Climate Change Conference (COP26). We recognize that climate change is not only an environmental issue, but a real issue that will affect our business strategies and financial plans over the medium to long term. Various factors caused through climate change such as regulations, natural disasters, and change in consumers' perception should be considered. We need to mitigate the climate-related risks which influence both our business and the wider society, and turn them into opportunities. For example, many of cosmetic raw materials are made from agricultural products such as oil palm. Stable climate conditions, including rain and temperature, are essential for our continuous business growth. If the weather condition changes due to climate change, it will cause water shortages and serious disasters, which will have significant impacts on society as well as our value chain, including our procurement, production, logistics, and sales activities.

Therefore, in 2020, we disclosed the target of achieving carbon neutrality by 2026 through the reduction of CO_2* emissions of the Scope 1 and Scope 2. We also committed to accelerate to analyze climate-related risks and opportunities, and integrate them into our company-wide actions.

The methodology and results of the analysis disclosed in this report were developed and evaluated by the Sustainability Strategy Acceleration Department in Corporate Transformation Acceleration Division with advice from an external third party. The analysis assumes a much longer time scale than that of normal business planning and risk management, the results contain a great deal of uncertainty and indeterminacy, which is an issue that needs to be improved in the future.

*Greenhouse gases usually refer to CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, and NF_3, but in this report, these greenhouse gases are described as “CO_2” unless otherwise noted.

2. Governance

The Shiseido Sustainability Committee discusses management decisions concerning sustainability issues. The committee is chaired by a Representative Director President and CEO and consists of executive officers in charge of Corporate Strategy, Sustainability, R&D, Supply Network, Corporate Communications and Brands, as well as Corporate Auditors. The committee makes decisions on group-wide sustainability strategies and policies, manages the progress of medium- and long-term targets, and implements activities such as the Task Force on Climate-related Financial Disclosures (TCFD) and human rights actions.

For decisions regarding business execution, issues are also discussed at the Global Strategy Committee and the Board of Directors. In 2021, due to the significance of climate change-related issues, the Board of Directors stressed the importance of reflecting our stakeholders’ expectations (consumers, business partners, employees, shareholders, society and the Earth) into our sustainable initiatives.

3. Strategy - Scenario analysis, Countermeasure, and Transition plan

We conducted our scenario analysis for both the transitional and the physical risks/opportunities in terms of the 1.5/2° C and 4° C scenarios, respectively, based on the Representative Concentration Pathways (RCPs) and Shared Socioeconomic Pathways (SSPs) provided by the IPCC.

A variety of factors and relationships among them are assumed to contribute to climate-related risks and opportunities. Regarding transitional risk, the elements associated with the transition to a decarbonized society — such as policy, regulation, technology, market, and consumer perceptions — were considered. Physical risks related to the acute or chronic phenomena caused by the rise in temperature — such as, for example, floods and water shortages — were also considered. We selected carbon taxes, market and consumers’ perception changes, floods, water shortages, and instability of raw material production as the influential risk factors in the supply chain, and quantified their financial impacts in

2030 while taking into consideration the continuity, uncertainty, and lifetime of the business or asset. In the 1.5/2° C scenario, where a decarbonized society will be formed, the impact of transition risk will be more pronounced, and in the 4° C scenario, where temperature will rise significantly, the physical risk will be more obvious. So, the corresponding risks are described in the following scenario analysis.

In the 1.5/2° C scenario, we analyzed the transition risk based on the SSP-1 scenario, in which global coordination and sustainability are emphasized with the assumption that a society has successfully mitigated climate change. In such the society, awareness of consumer on environmental issues is so high, and a market has been established in which sustainability is as important as product's quality and price. In terms of regulations and policies, we assumed that public funds would be invested in decarbonization technologies such as Carbon Capture, Utilize and Storage (CCUS) and Direct Air Capture (DAC), and that a high-level carbon tax would be introduced worldwide to fund these investments. As a result, upstream in the value chain, the introduction of the carbon tax would increase energy and raw material procurement costs. In order to mitigate or avoid such additional costs caused by the carbon tax, the introduction of energy conservation and renewable energy through improved production efficiency is highly significant, and we are proactively working on it. And in the downstream, the loss of sales opportunities for some products was considered a risk. In the decarbonized society, it is also expected that products that do not take sustainability into consideration will not be accepted by consumers due to their high awareness on environment. We aim to mitigate risks and create new opportunities by providing sustainable products with new solutions through innovation.

Table 3 Climate-related risks and opportunities

	Category	Factor	Natural phenomena	Impact to society	Impact to Shiseido
1.5/2°C scenario (Transition risks/ Opportunities)	Policy, Regulation	Carbon tax		Energy cost rising	Procurement and operation cost rising
		Circular economy, Green deal		Implement circular economy	Prohibit the use of single-use plastic
	Technology	Decarbonated fuel (H_2, NH_3 etc.)		Switch fuel and boiler facility	Energy cost rising, Facility switching
		Renewable energy		Expand renewable energy	Energy cost rising
	Energy security	Instability in the energy supply-demand balance		Insufficient energy supply	
				National and interstate conflicts	Suspension of production and sales activities
	Market	Demand from investors		Enhance of disclosure	Fall/rise in stock price, Change in financial plan
		Empathy for sustainable brands		Increase demand for ethical and sustainable Products	Ethical and sustainable product design
	Reputation	Demand for solving Env. and social issues			
4°C scenario (Physical risks/ Opportunities)	Acute	Temperature rising	Extreme weather event, Floods	Increase flood damage, Insurance cost rising	Suspension of production, Disruption of logistics
	Chronic		Sea level rising	Submergence of coastal areas	Surge damage to sites in coastal areas
			Temperature rising	Spread of infectious diseases and heat stroke	Health hazards for employees
			Rainfall increase	Destabilization of agricultural production	Procurement cost rising
			Rainfall decrease	Fall in public safety	Suspension of production and sales activities
				Water shortage	
Factors other than climate change		Population increase			

We tried to organize the major risk factors in each continent caused by climate change based on the 5th Assessment Report[3] published by IPCC in order to specify the risks we should focus on for 4° C scenario. The following phenomena was identified as the factors to be considered:

(1) Floods caused by extreme weather event

(2) Water shortage due to changes in weather conditions

The Flood risk and water shortage due to changes in climatic conditions was analyzed based on the scientific evidence published in the IPCC report, and focused on the river basin where our factories are located. As an approximation of flood risk in 2030, we used the flood frequency in the RCP 2.6 in 2100. As for the impact of water shortage due to climate change on operations, the relative precipitation change rate from 2011 to 2040 in the RCP 8.5 was used to assess the impact in 2030. In addition, a comparative study based on the RCP 4.5 and 6.0 was conducted to confirm the severity of the physical risk in 4° C scenario and the effect of mitigation.

Table 4 Key risk factors reported by IPCC and Shiseido's activity area

Area	Key Risk Factor	Procurement	Manufacturing	Distribution
Asia	1. Flood 2. Heat-related mortality 3. Water shortage	✓	✓	✓
Europe	1. Flood 2. Water shortage 3. Extreme heat event	✓	✓	✓
North America	1. Wildfire 2. Heat-related mortality 3. Flood	✓	✓	✓
South America	1. Flood 2. Food production 3. Infections	✓		✓
Oceania	1. Coral leaf system 2. Flood 3. Sea-level-rise ranges	✓		✓
Africa	1. Water shortage 2. Food production 3. Infections	✓		

Changes in weather conditions are also expected to have a significant impact on our raw materials procurement. We created a logic tree starting from the natural conditions and demographic changes to the end points such as effect on plant operations and procurement in order to understand the relationship between each factor.

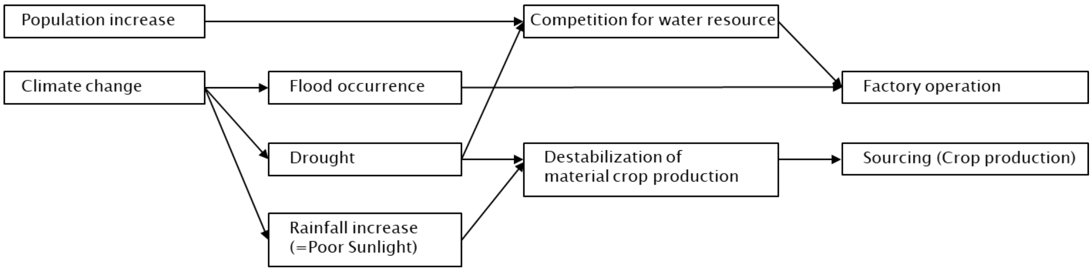

Fig. 2 Relationship between physical risks and impacts

Based on that, we evaluated the financial impact due to the flooding and drought on our plant operations. As for the impact on raw materials procurement because of changes in weather conditions, we tried to identify the crops and regions which tend to be affected.

3.1 1.5/2° C scenario

(1) Carbon tax

The financial impact of a carbon pricing scheme is a concern in the transition to a decarbonized society. Various carbon pricing schemes are being discussed, including a carbon tax, a border carbon tax on the movement of goods from countries with weak carbon regulations to those with strong carbon regulations, Cap & Trade, and an emissions trading system.

Currently, carbon tax prices are set at US$20-140 per ton of CO_2 emissions in European countries[4]. Since the carbon tax is used to secure the budget for implementing mitigation, adaptation measures, and compensation for climate disasters, the carbon tax price is expected to be determined based on the social cost of carbon in the near future. The International Energy Agency (IEA) has projected a carbon price of $120 (Announced Pledges Scenario) to $130 (Net Zero Emissions by 2050 Scenario) per ton of CO_2 emissions in 2030, which includes the cost of implementing climate-related policies. With France and Iceland announcing carbon taxes of €100 and Canada of $170 in 2030, the trend toward higher carbon tax prices is likely to continue.

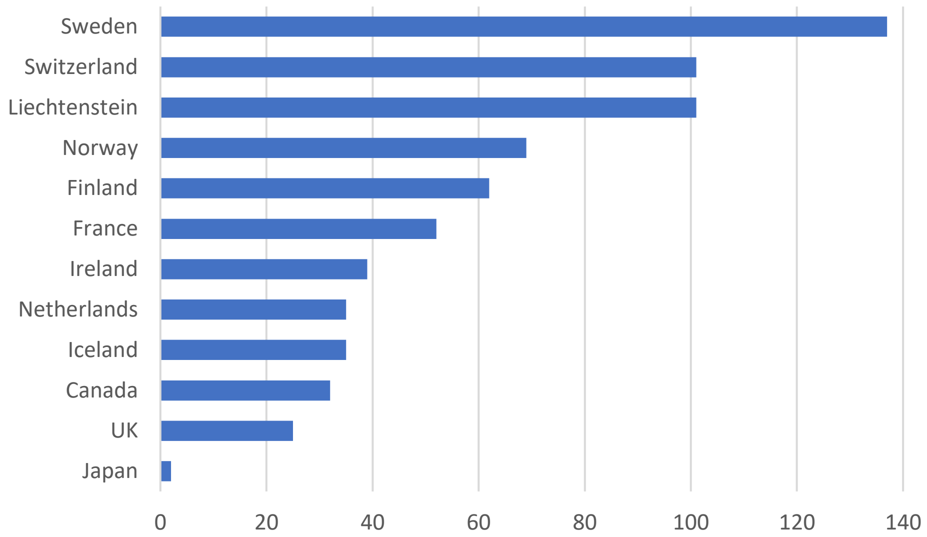

Fig. 2　Price of carbon taxes worldwide (as of April 2021, USD/t-CO2e)[4)]

In recent years, a series of studies on the social cost of carbon have been published, and some reports put the appropriate future carbon price at $500-1,500[5,6)]. As the carbon tax becomes more expensive, the transaction price in the ETS market is expected to follow the carbon tax price. Based on the current situation regarding carbon prices, we analyzed the financial burden of carbon taxes in 2025 as a short-term impact and in 2030 as a medium- to long-term impact based on IEA AP scenario and IEA NZE scenario. Based on the assumption that a border carbon tax with the same price will have been introduced in Europe or in many countries around the world as of 2030, we analyzed the financial impact based on our projected CO_2 emissions of Scope 1 and Scope 2.

Table 5　Projected financial impact due to carbon tax

	Period	Price of carbon tax	Region/ Country	Annual financial impact
Scenario 1	2025	$52	France	$ 70 k
Scenario 2	2030	$120	EU	$ 1.0 mil.
Scenario 3			Global	$ 7.2 mil.
Scenario 4				$ 18 mil.

As a result, it was estimated that the financial impact in the short term would be small (Scenario 1). However, in the medium to long term, if a carbon tax is introduced only within the EU, the annual impact would be approximately US$1.0 mil. in 2030 (Scenario 2), and if the same level was applied globally, the annual impact would be approximately US$7.2 mil. per year (Scenario 3). If the level of renewable energy deployment in 2030 were to remain at the same level as in 2020, the annual carbon tax burden would be approximately US$18 mil. (Scenario 4).

One means of reducing the financial impact due to the carbon tax is introducing Internal Carbon Pricing (ICP). For example, the CO_2 emission factor for TEPCO in 2020 was announced to be 0.441 kg-CO_2e/kWh. If the ICP price is set at €100/ton-CO_2e, which is the same as the planned tax price in France, a cost increase of up to 5.7 JPY/kWh of electricity would become motivation the switch to renewable energy. It is important to support efforts related to decarbonization by setting an appropriate ICP in line with external carbon prices through regulations and market transaction prices. In addition, the carbon tax would affect procurement costs. The next challenge is to predict and address the indirect impacts associated with Scope 3 emissions.

(2) Opportunities for sustainable products

Based on the SSP-1, in which a society is formed in which global cooperation and sustainability are emphasized in order to achieve the 1.5° C or 2° C target, we assumed a market where consumers have extremely high level knowledge and sensitivity to environmental issues. In such the society, the marine plastic problem will be solved from the viewpoint of environmental aspects such as sustainable resource consumption and climate change prevention, as well as social system design, mainly in developing countries. Sales opportunities for ethical or sustainable brands and products will expand. On the other hands, products with high CO_2 emissions and what are not in line with the circular economy concept will not only lose consumers’ support but will likely be excluded from the market by regulations.

Among the Shiseido Group's products developed by the Global Innovation Center, products that are difficult to switch to reusable or recyclable packaging because of technical issues will lose sales opportunities in regions where regulations are scheduled to be introduced. The negative impact was estimated small because we expect that most of our products will be able to switch to sustainable packaging which are meet with the circular economy. Also, the number of countries or regions where strict regulations are scheduled to be introduced is small.

In the meantime, with the introduction of the EU taxonomy in Europe, public and private funds are expected to be concentrated in the market of sustainability. It is expected that the implementation of circular economy policies in the European market will be a great opportunity for Shiseido, which has been providing refillable products for many years since the first launch of the refillable white powder in 1926.

3.2　4°　C scenario

(1) Operation stop with natural disaster

The impact of large-scale floods due to temperature increase was evaluated. For the flood frequency in future, we used the return period of large-scale flood in the RCP 8.5 scenario reported by Hirabayashi *et al.*[7] As for the current frequency, we adopted the average number of floods per unit area by country for the decade from 2000 to 2019 based on the Emergency Events Database of the Catholic University of Louvain[8]. The ratio of the reciprocal of return period in 2020 and 2100 was used for the increase rate of flood occurrence. The reported data are evaluated at a resolution of 0.25 degrees in latitude and longitude. Therefore, the results may differ significantly due to slight differences in location information. For this reason, we calculated the average score for each river basin and used them in this analysis. The amount of damage was calculated for all domestic and overseas factories based on the assumption that factory operations would be suspended for one month when a large-scale flood will hit the factory area. As a result, the increase in the flood frequency is limited as of 2030, and the risk is assessed to be small. However, the impact is expected to increase toward the end of this century, and the importance of taking measures such as developing a business continuity plan, and predicting flooding from a long-term perspective was pointed out.

Such the extreme weather events have a significant impact not only on shipping from out factories but also on logistics. Therefore, we started to investigate the flood risk of our important distribution centers. First, we have carried out the analysis based on the same methodology for our distribution centers in Japan, and confirmed that the flood risk is low according to the hazard maps published by the local governments. We plan to conduct a more reliable risk analysis on the facilities in our factories and the other distribution centers.

Fig. 3 Procedure for natural disaster risk assessment

(2) Operation stop due to water shortage

The impact on factory operation due to water shortage, which will be caused by climate change. Rainfall projections were based on the relative precipitation change from 2011 to 2040 under the RCP 8.5 scenario, reported by Hanasaki *et al.*[9] The reported data are evaluated at a resolution of 0.25 degrees in latitude and longitude. Therefore, the results may differ significantly due to slight differences in location information. For this reason, we calculated the average score for each river basin and used them in this analysis. The amount of damage was calculated based on the assumption that factory operations would be suspended depending on the severity of the water shortage. In addition, the demographic change of the country or region where the factory is located was adopted as one of the explanatory variables based on the medium scenario of the United Nations demographic projections[10] because access to water resources is also affected by the population. The effect of demographic change is weighted 1/9 compare to the effect of precipitation change.

The financial impact due to the suspended factory operation was calculated for all domestic and oversea factories by the risk function which can S-shaped curve in response to the risk factors such as rainfall reduction or population increase between the thresholds where the impact becomes apparent and where the impact is maximized because the effect of the fluctuation and the buffer effect of infrastructure should be taken into consideration.

As a result, the risk of water shortage in 2030 was assessed to be limited. However, the impact is expected to increase toward the end of this century, as is the flood risk. In order to manage water risk from a long-term perspective, we have selected water consumption at our business sites as a metrics and set a target of reducing by 40% by 2026. We will work to mitigate the risk and reduce the impact on the watershed environment by reducing water consumption through the introduction of water-saving and reclaimed water facilities, especially at factories that use a lot of water.

(3) Procurement cost increase for crops-derived materials due to rain condition change

Many of the cosmetic raw materials purchased by Shiseido are made from plants. The precipitation change due to the climate changes also affects the raw material production that derived from agricultural harvesting.

Based on our actual raw material procurement result in 2019, we have analyzed how much and in which regions water resources were used to grow raw material crops in the basis of water footprint methodology[11]. The sustainability of the water consumption was analyzed by the precipitation change until 2100 and the demographic projections for each country used in the previous chapter. As a result, we identified the material crops and location whose cultivation would be significantly affected by climate change. These crops may make procurement itself impossible as well as significant cost rising. We will take measures to avoid or mitigate the risk by changing the materials and diversifying the production areas for the material crops suggested to be severely affected.

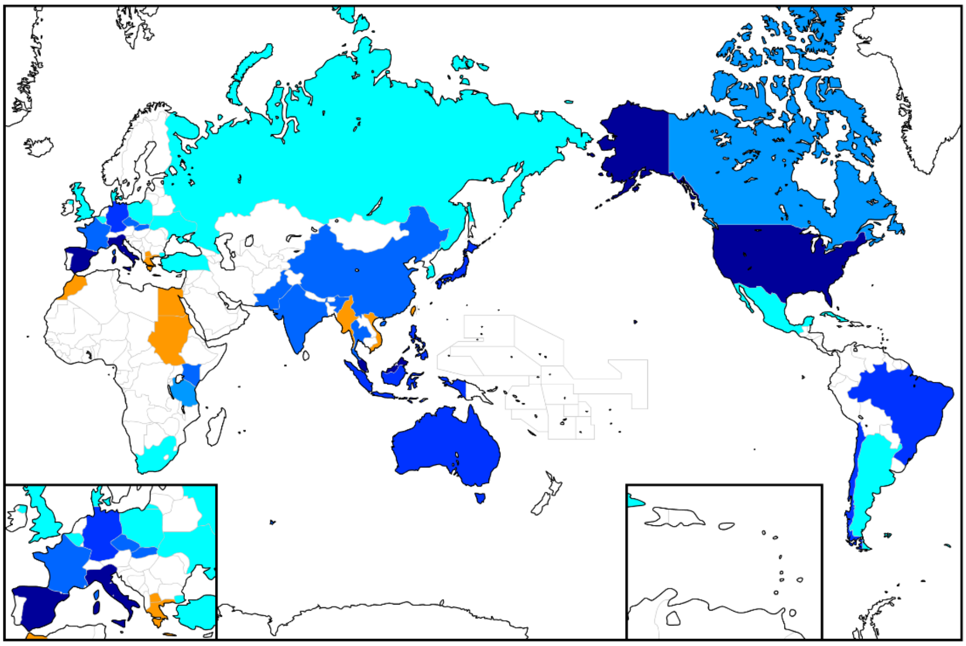

Fig. 4　Water consumption for raw material production

Secondly, we analyzed the increase in procurement costs for palm oil and palm kernel oil, which are the most commonly used oilseed crops for cosmetic raw materials, due to the instability of agricultural production. First, we identified raw materials containing ingredients derived from palm oil and palm kernel oil, such as glycerin and fatty acids, based on our actual procurement of raw materials in 2019, and calculated the total usage of palm oil and palm kernel oil. And then, we estimated the usage of palm oil and palm kernel oil for raw material production in 2030 based on our business growth scenario. Next, a regression analysis was conducted based on the monthly market transaction prices of palm oil and palm kernel oil over the past 25 years (1997-2021) to determine the average price increase, the standard deviation of the ratio of price fluctuations to the average price, and the frequency of prices exceeding the average. Based on the price trends, we forecasted the average price of palm oil and palm kernel oil in 2030 and calculated the potential price increase due to production instability caused by climate change. The rate of increase in the frequency of once-every-10-year droughts as reported in the IPCC 6th Assessment Report[12] was applied to project the increase in the frequency of production destabilization. The IPCC report shows the frequency of extreme weather events in 2100. Therefore, the frequency of extreme weather events in 2030 was set for the 1.5/2° C (RCP 1.9, RCP 2.6) and 4° C temperature increase cases (RCP 8.5) based on the assumption of a linear increase in frequency from 2020 to 2100. We calculated the potential price increase of palm oil and palm kernel oil due to climate change by multiplying the average price, estimated procurement volume in 2030, standard deviation of the price fluctuation rate, and the frequency of extreme weather events.

Potential price increase due to climate change
= (Estimated average price in 2030) x (Estimated procurement volume in 2030) x (Standard deviation of the ratio of price change from the average over the past 25 years) x (Frequency of occurring extreme weather event)

As a result, it was estimated that there is no significant difference between the 1.5/2° C and 4° C scenarios as of 2030, and that climate impacts are expected to increase costs by approximately US$140k per year. This is due to the projection that there is no significant difference in the range of temperature increase under either RCP scenarios until 2030.

In addition to promoting the procurement of sustainable palm oil, with regard to material crops other than oil palm, we should also be aware of the possibility that material demand may lead to higher procurement costs in the future, as well as the possibility that procurement itself may become impossible because of climate change. We will continue to analyze the financial impact and take measures to avoid or mitigate risks, such as changing materials and diversifying production areas.

(4) Opportunities due to climate change

In a 4° C scenario with a significant temperature rising, sales opportunities for products used in the summer will expand. Shiseido has elucidated the mechanism by which cool-touch ingredients such as menthol influence more effectively and continuously through researching the structure of the cell surface[13)]. Cool-touch products based on these findings and technologies are expected to expand the opportunities not only in Japan and Asia, but also in Europe, where heat waves have caused significant damage in recent years.

Furthermore, the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) has announced that the amount of UV radiation reaching the ground surface in the mid-latitudes of the Northern Hemisphere is expected to increase toward the end of this century due to various environmental factors including climate change[14)]. The Northern Hemisphere mid-latitudes have many large cities with concentrated populations such as Tokyo and Beijing. The increase in UV radiation is expected to lead to make opportunities for sunscreen products or skincare products that treat skin damaged by UV rays.

3.3 Complex scenarios

While the world is moving emphatically and aggressively to mitigate climate change, as seen in the Glasgow Climate Pact, and introducing various regulations, including a carbon tax, and developing technologies, scientific researchers are making pessimistic predictions about the future climate. According to the results of a survey conducted by the British scientific journal Nature among the authors of the IPCC 6th Assessment Report, about half of the authors answered that the average global temperature will increase by 3° C by 2100[15].

The risks and opportunities associated with the social transition envisioned in a decarbonized society that successfully suppresses climate change, and the risks and opportunities in a 4° C world in which climate change suppression fails and temperature rise becomes a reality, have been assumed in each scenario analysis, respectively. However, when considering longer-term risk projections and responses for the latter half in this century, the standard scenario could be a complex scenario that assumes both a transition risk at the 1.5/2° C level and a physical risk at the 3° C level (SSP2-4.5) as the most likely scenario in the future.

3.4 Climate-related geopolitical risks

In 2021, while Asian countries were accelerating their coal phase-out, coupled with the economic stagnation caused by the Covid-19 pandemic, fuel shortage became apparent in Europe. The global shortage of natural gas supply rapidly increased fuel dependence on some natural gas producing countries, and this became one of the factors that triggered the military invasion. At first glance, international military conflicts and decarbonization may seem unrelated, decarbonization is closely linked to countries' energy security. The global expansion of renewable energy will promote local energy production for local consumption and be able to stabilize energy supply in the long term. But in the short term, it may destabilize the balance between international energy supply and demand and cause serious financial impacts. In addition, the civil war that broke out in the Middle East region in 2011 made the acceptance of refugees a major social issue in Europe. A severe drought that lasted for several years devastated agricultural production in rural areas, and the influx of many people into urban areas is said to have been one of the causes of this civil war. A climate model analysis suggests that this drought was caused by climate change[16]. The breakdown of risks related to such conflicts and civil wars can include the following items:

(1) Opportunity losses resulting from the suspension of production and sales activities

in the countries involved in the conflict

(2) Increased procurement costs due to shortages in the supply of raw materials and energy produced in the countries involved in the conflict.

(3) Decrease in sales in other countries due to stagnation of the global economy

The potential financial impact of international conflict is expected to be very significant compared to other transition and physical risks. It is difficult to make a quantitative assessment at this stage, however, we consider geopolitical instability and the destabilization of the energy supply-demand balance as one of the new climate-related risks, and we recognize that analyzing the magnitude of the potential impact and developing countermeasures are also important issues to be addressed in the future.

3.5 Transition Plan toward Decarbonized Society

In 2021, the IPCC declared in its 6th Assessment Report that "It is unequivocal that human influence has warmed the atmosphere, ocean and land", and announced its prediction that the temperature increase will exceed 1.5° C around 2030. In response, the Glasgow Climate Pact, which agreed to limit the increase in global average temperature to 1.5° C or less compared to pre-industrial levels, was adopted at the COP 26. The Pact can be interpreted that countries all over the world recognize "the toward net-zero emissions" as the common goal. As society moves toward decarbonization, there is no doubt that our business environment will also be greatly affected. Shiseido has continuously promoted initiatives to reduce CO_2 emissions as a pillar of our environmental activities since the publication of our first Environmental Report '97 in 1998.

The purpose of this plan is to describe our activities toward decarbonization, and to secure transparent disclosure by adding or revising this plan as appropriate when longer-term or more specific activities are added.

3.5.1 Efforts for Transition

Climate change is a central issue in the environmental area. All economic activities, including food production, resource and energy consumption, and waste disposal, are emitting CO_2 and accelerating climate change. If weather condition changes due to climate change, many environmental issues will be affected, such as water shortages and heat waves that will adversely affect ecosystems as well as human society.

CO_2 reductions should be prioritized for emissions from fuels consumption (Scope 1) and emissions from the use of energy supplied by others, such as electricity (Scope 2). In addition, the value chain of our business, including procurement, transportation, use of sold products, and disposal of waste, must be taken into account. We must comprehensively reduce CO_2 emissions by selecting materials and processes that emit less emissions in collaboration with stakeholders.

For actual efforts for CO_2 reduction, the first priority is to reduce or eliminate emissions through energy saving, including the development of new technologies, and for energy and materials required for business activities. Also, we will utilize renewable energy and renewable materials. Regarding fuels, the utilization of carbon-free fuels such as hydrogen and ammonia requires the development of social infrastructure, which still needs long time. In the meantime, we will study the feasibility of options such as electrification, renewable energy, and Carbon dioxide Capture, Utilization and Storage (CCUS), as well as carbon-free fuels, from both technical and economic aspects.

(1) Energy used in our operation

About 60% of the energy-derived CO_2 emissions come from production at our factories. We use the latest IT technologies, such as energy management systems, to reduce unnecessary energy consumption and visualize CO_2 emissions from our production processes. This allow to educate and motivate our employees in energy-saving at our sites. At the same time, we aim to switch 100% of renewable energy-derived electricity by 2030.

(2) Procurement of raw materials

Procurement of raw materials is the largest contributor to our carbon footprint. We recognize the importance of reducing CO_2 emissions related to raw material procurement through collaboration with our suppliers

Some raw materials generate significant indirect emissions at the upstream of the supply chain. Palm oil and palm kernel oil, which are one of the most important oilseed crops for food and daily necessities as well as cosmetics, are derived from oil palm grown in Southeast Asia region. Oil palm plantations are often developed causing deforestation and significant loss of biodiversity. According to a report by Germer *et al.*[17)], when 1 hectare of tropical rainforest is developed to create a plantation, 777 to 1,443 tons of CO_2 will be released from the ground over the next 25 years. In order to prevent CO_2 emissions associated with such land use change and to conserve the precious rainforest ecosystem, Shiseido aims to switch all cosmetic ingredients directly purchased to RSPO-certified ingredients by 2026. This will reduce CO_2 emissions by approximately 600,000 tons per year.

In the future, as with oil palm, we will continue to investigate environmental impact of raw materials due to land use change. Also, we will make efforts to minimize our impact on the climate and ecosystems by switching to sustainable procurement.

(3) Saving water

Water is an essential resource in all aspects of cosmetics, including the cultivation of crops used as raw material ingredients, heat transfer medium during production, cleaning, and product use as well as important raw material for cosmetics. Climate change is expected to affect atmospheric circulation on a global scale, resulting in significant changes in rainfall conditions. In addition, glaciers in the Himalayas and the European Alps, which are water sources for Asia and European region, are expected to recede due to rising temperatures. Due to the effects of climate change, there are regions that are currently abundant in water resources, but will face the threat of drought in the future. Therefore, in order to make effective use of water resources and mitigate water risks caused by climate change, we are promoting water saving activities, especially at production plants with high water consumption, with the goal of reducing the amount of water consumption at our sites by 40% by 2026, compared to 2014 levels*. In addition to water saving by optimizing equipment cleaning and reviewing manufacturing processes, our factories in France, which are particularly interested in water issues, have set their own targets and are working on initiatives such as reusing water once used and switching from water to alcohol cleaning for fragrance product manufacturing equipment. As a result, the factories has achieved water savings of more than 60% per unit of bulk production compared to 2009.

* Water consumption volume to sales

(4) Product development

As the transition to a decarbonized society, consumers' awareness in climate and environmental issues is expected to increase more than ever. Responding flexibly to these changes in consumers' awareness is critical to the sustainability of our business. We aim to replace all plastic cosmetics packaging with reusable, recyclable, or biodegradable by 2025. Shiseido has developed and provided a variety of solutions for packaging since the launch of the first refillable face powder in 1926. We will be striving to save resources, promote recycling, and reduce CO_2 emissions by improving the recyclability and expanding the reuse of packaging through refills with consumers. These efforts can contribute not only to solve climate issues, but also to conserve marine ecosystem by reducing the amount of waste discharged into the ocean.

3.5.2 Disclosure

Shiseido has supported the Task Force on Climate-related Financial Disclosures, and has disclosed the result of climate related risk analysis based on TCFD flamework. In preparation for a decarbonized society, we have compiled our climate-related goals, scope and initiatives into a transition plan. We are disclosing climate-related information through our responses to the CDP, as well as our website, Integrated Report, and Sustainability Report. Our disclosure on CO_2 emissions (Scope 1, Scope 2, and Scope 3) are verified by an independent third party verification organization, SGS Japan, to ensure transparent disclosure. In addition, our target on mitigating climate change is certified by SBTi. Regarding renewable electricity, we have joined RE100.

4. Risk Management

We assessed and identified the impactful risks holistically from a mid-to-long-term perspective. "Environment and Climate Change" and "Natural and Human-made Disasters" are listed as the categories related to sustainability.

Climate-related risks are analyzed based on scientific and socio-economic evidence and integrated into the enterprise risk management system as one of the elements related to climate change or natural disasters. Based on the significance, the Shiseido Group's risks assessment and countermeasures are reviewed by the Global Risk Management & Compliance Committee, the Global Strategy Committee, and the Board of Directors.

5. Metrics and Targets

In order to mitigate the climate-related risks, we set the reduction of CO_2 emissions as our target, achieving carbon-neutral operations by 2026 for Scope 1 and Scope 2 emissions, and we monitor this every year.

In terms of mitigating market risks and creating opportunities in the 1.5/2° C scenario, we support the concept of a circular economy, and aim to reduce CO_2 emissions and eliminate single-use plastics with the target of switching to 100% sustainable packaging by 2025. To manage the risk of water shortage in the 4° C scenario, we selected water consumption at our sites as an indicator and set a target of reducing it by 40%* compared to 2014 result by 2026. As for other physical risks, we will examine appropriate metrics from the viewpoint of long-term risk management.

* Water consumption volume to sales

Table 6 CO_2 emissions of Shiseido

(t-CO2e)

			2019 (Base year)	2021
Scope 1			27,036	28,744
Scope 2	Market-based		51,714	36,737
Scope 3	1	Purchased goods & services	644,000	60,6000
		Indirect emissions due to LUC	* (543,000)	347,000
	2	Capital goods	231,000	225,000
	4	Upstream transportation & distribution	110,000	51,600
	5	Waste generated in operations	20,700	15,100
	11	Use of sold products	1,580,000	134,000
	12	End of life treatment of sold products	148,000	118,000
	The other categories		30,800	21,900

*Indirect emissions related to land use change for raw material procurement were added to the category 1 since 2021 assessment. For 2019, the result of retroactive calculations is shown in parentheses.

6. Reference

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