Climate Change 2017 Information Request
KAO Corporation

Module: Introduction

Page: Introduction

CC0.1
Introduction
Please give a general description and introduction to your organization.

Kao. The Company is a Japan-based company that operates through two business segments: Comsumer Product and Chemical. The Consumer Product segment has three divisions. The Beauty Care division offers prestige cosmetics; premium skincare products such as face washes, as well as premium hair care products including shampoos, hair styling products and hair colouring products, among others. The Human Health Care division provides food and beverage products such as drinks ; sanitary products including hygiene products and paper diapers, as well as personal health products such as bath additives. The Fablic and Home Care division offers fabric care products including detergents for apparel use, and home care products including detergents for kitchen use. The Chemical segment provides oil and fat products such as fatty acids; functional materials products such as surface acting agents and additives for plastic use, as well as specialty chemical products such as essences, among others.
The beauty care business accounted for 41.3% of total turnover in fiscal 2016; human health care business,18.7%; fablic and home care business, 23.7%; and chemical business,16.3%. The Company reported JPY 1,457.6b in revenues and 33,195 permanent employees at December 31,2016.

CC0.2
Reporting Year
Please state the start and end date of the year for which you are reporting data.
The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.
We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.
Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

Enter Periods that will be disclosed
Fri 01 Jan 2016 - Sat 31 Dec 2016

CC0.3
Country list configuration

Please select the countries for which you will be supplying data. If you are responding to the Electric Utilities module, this selection will be carried forward to assist you in completing your response.

Select country
Japan
China

Select country
Taiwan
Philippines
Thailand
Vietnam
Malaysia
Indonesia
United States of America
Mexico
Germany
Spain
United Kingdom
South Korea
Hong Kong
Singapore
Australia
New Zealand
Canada
Finland
Norway
Sweden
Denmark
Russia
Netherlands
Belgium
Czech Republic
France
Austria
Switzerland
Italy
South Africa

CC0.4
Currency selection

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.

JPY(¥)

CC0.6
Modules
As part of the request for information on behalf of investors, companies in the electric utility sector, companies in the automobile and auto component manufacturing sector, companies in the oil and gas sector, companies in the information and communications technology sector (ICT) and companies in the food, beverage and tobacco sector

(FBT) should complete supplementary questions in addition to the core questionnaire.
If you are in these sector groupings, the corresponding sector modules will not appear among the options of question CC0.6 but will automatically appear in the ORS navigation bar when you save this page. If you want to query your classification, please email respond@cdp.net.
If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below in CC0.6.

Further Information

Module: Management

Page: CC1. Governance

CC1.1
Where is the highest level of direct responsibility for climate change within your organization?

Board or individual/sub-set of the Board or other committee appointed by the Board

CC1.1a
Please identify the position of the individual or name of the committee with this responsibility

The internal organizations responsible for Kao's response to climate change are the Responsible Care Promotion Committee, a subordinate committee of the Internal Control Committees, chairman is CEO and this committee is approved by the Board, under the Kao corporate governance system, and the Sustainability Committee, chairman is CEO, is approved by the Management Committee. The Responsible Care Promotion Committee manages progress in risk-management activities, while the Sustainability Committee manages progress in activities related to locating new opportunities. The Responsible Care Promotion Committee is convened annually and reported of the Internal Control Committee.

CC1.2
Do you provide incentives for the management of climate change issues, including the attainment of targets?

Yes

CC1.2a
Please provide further details on the incentives provided for the management of climate change issues

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Board/Executive board	Monetary reward	Emissions reduction target Energy reduction target Efficiency target Other: sales of low-carbon products	Evaluate by EVA which is related to all environmental matter such as level of achievement of GHG emission reduction objectives related to variable cost reduction by energy reduction projects and efficiency projects, responses to climate change problems related to variable cost reduction and sales increase, and expansion of sales of low-carbon products related to sales increase itself.

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Executive officer	Monetary reward	Emissions reduction target Energy reduction target Efficiency target Other: sales of low-carbon products	Evaluate all matters such as level of achievement of GHG emission reduction target and energy reduction target (basic unit and absolute quantity) by emission reduction projects, energy reduction projects and efficiency projects, responses to climate change problems, and expansion of sales of low-carbon products.
Chief Purchasing Officer (CPO)	Monetary reward	Environmental criteria included in purchases Supply chain engagement Other: sales of low-carbon products	Evaluate all matters of supply chain engagement such as GHG emission reduction activities and water risk management of each supplyer.
Management group	Monetary reward	Emissions reduction target Energy reduction target Efficiency target Other: sales of low-carbon products	Evaluate all matters such as level of achievement of GHG emission reduction target and energy reduction target (basic unit and absolute quantity) by emission reduction projects, energy reduction projects and efficiency projects, responses to climate change problems, and expansion of sales of low-carbon products.
Business unit managers	Monetary reward	Other: sales of low-carbon products	Evaluate all matters such as level of achievement of GHG emission reduction target and energy reduction target (basic unit and absolute quantity) by emission reduction projects, energy reduction projects and efficiency projects, responses to climate change problems, and expansion of sales of low-carbon products.
Buyers/purchasers	Monetary reward	Environmental criteria included in purchases Supply chain engagement	Evaluate all matters of supply chain engagement such aslevel of GHG emission reduction activities and water risk management of related supplyer.
Energy managers	Monetary reward	Emissions reduction project Emissions reduction target Energy reduction project Energy reduction target Efficiency project Efficiency target	Evaluate applicable matters such as level of achievement of emission reduction target and energy reduction target (basic unit and absolute quantity)

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Environment/Sustainability managers	Monetary reward	Emissions reduction target Energy reduction target Efficiency target Behavior change related indicator Supply chain engagement Other: sales of low-carbon products	Evaluate all matters such as level of achievement of GHG emission reduction target and energy reduction target (basic unit and absolute quantity) by emission reduction projects, energy reduction projects and efficiency projects, responses to climate change problems, and expansion of sales of low-carbon products.
Facility managers	Monetary reward	Emissions reduction project Emissions reduction target Energy reduction project Energy reduction target Efficiency project Efficiency target	Evaluate applicable matters such as level of achievement of GHG emission reduction target and energy reduction target (basic unit and absolute quantity) and responses to climate change problems.
Process operation managers	Monetary reward	Emissions reduction project Emissions reduction target Energy reduction project Energy reduction target Efficiency project Efficiency target	Evaluate applicable matters such as level of achievement of GHG emission reduction target and energy reduction target (basic unit and absolute quantity) and responses to climate change problems.
Procurement manager	Monetary reward	Environmental criteria included in purchases Supply chain engagement	Evaluate all matters of supply chain engagement such aslevel of GHG emission reduction activities and water risk management of related supplyer.
Public affairs managers	Monetary reward	Other: evaluate responses to climate change problems	Evaluate responses to climate change problems.

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Risk managers	Monetary reward	Other: locate climate change risk and determine response measures	Locate climate change risks and determine response measures.
All employees	Monetary reward	Emissions reduction project Energy reduction project Efficiency project	Depending on each employee achievement of some project related to emission reduction, energy reduction and efficiency, responses to climate change problems, and expansion of sales of low-carbon products.

Further Information

Page: CC2. Strategy

CC2.1
Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities

Integrated into multi-disciplinary company wide risk management processes

CC2.1a
Please provide further details on your risk management procedures with regard to climate change risks and opportunities

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Six-monthly or more frequently	Board or individual/sub-set of the Board or committee appointed by the Board	Area where our manufacturing site, offices, supplier manufacturing sites are located and our product are sold.	> 6 years	

CC2.1b
Please describe how your risk and opportunity identification processes are applied at both company and asset level

i) At company level, the Responsible Care Promotion Committee and the Sustainability Committee are reported by departments about risks and opportunities of climate change, and then identify the risk and opportunity. Both committees discuss measures and actions for those and provide feedback to management in a timely manner.

ii)At asset level, risks and opportunities are screened by the committee mainly composed of members who are representative of facilities and are responsible for environment and/or energy assigned to each facilities in order to identify them which should be managed by themselves.

CC2.1c
How do you prioritize the risks and opportunities identified?

i) We prioritize the risks as follows:
1) We make the matrix chart consisting of financial impact of risk and likelihood of risk in order to assess the level of importance.
2) We estimate the impact and likelihood of each risk item and identify important risk items from the chart.
3) The extracted important risk items are checked by Risk Management Committee and some of them are check and managed by management council or board of directors as needed.
4) The rest of the risk items are handled by relevant departments.
ii) We prioritize the opportunities as follows:
1) We estimate the impact of each opportunity and feasibility of actions to get it making information exchanges among many relevant departments including business units and R&D, and then identify important opportunity items.
2) The extracted important opportunity items are discussed by the Sustainability Committee and reported to management council or board of directors and approved by them.
3) The rest of the opportunity items are handled by relevant departments.

CC2.2
Is climate change integrated into your business strategy?

Yes

CC2.2a
Please describe the process of how climate change is integrated into your business strategy and any outcomes of this process

i) The process of how the business strategy has been influenced
Kao has established the Kao Group Mid-term Plan 2020 (K20).
The major goal of our business activities has been to enrich the lives of people globally. K20 goes further, laying a corporate framework to contribute to the sustainability of the world and to the resolution of social issues.
The Paris Agreement and the Sustainable Development Goals(SDGs) present targets for the world to achieve by working together to realize sustainability.
The four social issues that the Kao addresses are the Environment, Health, Aging and Hygiene.
For the Environment, we are reducing environmental impact including GHG emission and Water impacts throughout our product lifecycles based on the Kao Environmental Statement.

ii) At least one example given of how the business strategy has been influenced;
Kao promotes sustainable procurement of raw materials such as paper and pulp to promote zero deforestation which prevents CO2 emission.
Because we understand the impact of deforestation for climate change is so high.
In March 2016, we began introducing FSC-certified cardboard, a first in Japan. In 2016, we achieved our initial annual target of switching to FSC-certified cardboard for 50% of our cardboard consumption globally. This activity is based on great support of our suppliers.

iii) What aspects of climate change have influenced the strategy
To reduce the total emissions applicable to Scope 1 and 2, we are actively and systematically transitioning to cleaner energy, and introducing leading-edge technologies such as high-efficiency turbo chillers and heat pumps at production sites. We are also actively promoting the implementation of modal shift. And we are also promoting zero deforestation in the procurement of palm and timber.
These activities are not only respond to the risks associated with regulations, but also reduce the carbon footprint of products, which is a type of opportunity. Therefore, we understand that these are also beneficial activities for our customer companies.
In terms of creating opportunities, we are expanding sales areas for products responding to climate change, such as liquid laundry detergent that enables consumers to conserve water and energy at the time of use of the product in households, as well as expanding B-to-B products responding to climate change(scope 3).We took actions listed in shorter period than usual in case that there emerge more significant impact by climate change than expected.

iv) How the short term strategy has been influenced by climate change
To reduce the total emissions applicable to Scope 1 and 2, we are actively and systematically transitioning to cleaner energy, and introducing leading-edge technologies such as high-efficiency turbo chillers and heat pumps at production sites. We are also actively promoting the implementation of modal shift.
These activities are not only respond to the risks associated with regulations, but also reduce the carbon footprint of products, which is a type of opportunity. Therefore, we understand that these are also beneficial activities for our customer companies.

In terms of creating opportunities, we are expanding sales areas for products responding to climate change, such as liquid laundry detergent that enables consumers to conserve water and energy at the time of use of the product in households, as well as expanding B-to-B products responding to climate change(scope 3).We took actions listed in shorter period than usual in case that there emerge more significant impact by climate change than expected.

v) How the long term strategy has been influenced by climate change
Kao's corporate missions are: to conduct yoki-monozukuri or product development with excellent value, achieve wholehearted satisfaction and the enrichment of the lives of people globally, and to contribute to social sustainability. In terms of opportunity creation, we believe that responding to major changes in consumer needs such as changes in regulations and preferences is the highest priority for both risks and opportunities. To accelerate technological development in response to climate change, we build our Eco-Technology Research Center to accelerate the development of next-generation environmental technologies, including the advanced use of renewable raw materials such as plant-derived resins, the development of non-edible oil plants, and fundamental technology aimed at the development of water-saving products.
For risks associated with regulations related to business activities, we have introduced solar panels, heat pumps that hold high potential for energy-use reduction. Needless to say, we have continuously implemented the development of energy-conserving processes.We review risks and opportunities as needed when we recognize that there emerge more significant impact than expected.

vi)How the Paris Agreement has influenced the business strategy
The CO2 emission reduction target (scope 1, 2, 3) which is set at present is confirming whether or not the Paris agreement meets the reduction target to specify. If necessary, it is operating the process to readjust the target.

vii)How this is gaining a strategic advantage over your competitors
Kao states the following in its Business Conduct Guidelines:

- We support and implement the ten principles of the Global Compact advocated by the United Nations;
- We thoroughly consider the environment and safety

We released the Kao Environmental Statement, in which we made a broad declaration to society of our intention to position ecology at the core of management. We also positioned the reduction of GHG emission by 35 percent across the product life-cycle as one of the medium-term objectives that accompany the Kao Environmental Statement. To achieve this objective, we must not only reduce scope1 and 2 emissions but also reduce scope3 emissions. The former is directly linked to our responses to risks associated with regulations, and also to the development of new production processes. The latter is directly linked to the creation of opportunities such as expanding the viewpoint of yoki-monozukuri or product development for high environmental value-added products. Therefore, by establishing these medium-term objectives, we already have an advantage over our competitors.

viii) Do you use forward-looking scenario analyses, including a 2 degree scenario, to inform your organization's businesses, strategy, and/or financial planning?
Yes. We are developing tool to make clear risks and opportunities under 2 degree senario and transition period. It will include the impact to finance.

CC2.2c
Does your company use an internal price on carbon?

Yes

CC2.2d
Please provide details and examples of how your company uses an internal price on carbon

Case1: Kao consider the advantages which are estimated supposed that carbon dioxide emissions trading scheme was introduced, when it makes decision of investment of energy saving facilities. That means that Kao uses an internal price of carbon by embedding the carbon values of absolute scope 1 and 2 emissions, which is the carbon price on a market, into its investments for energy saving facilities.
Case2 Kao makes investment decision for the building of relatively large scale plants or factories considering carbon price as well as actual price. It decide which kind of fossil fuel a plant or a factory use after estimating the carbon price to offset carbon dioxide emissions.

CC2.3
Do you engage in activities that could either directly or indirectly influence public policy on climate change through any of the following? (tick all that apply)

Direct engagement with policy makers
Trade associations

CC2.3a
On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
Other: Scope3 reporting	Neutral	Kao in Japan provided examples and information on effective use of Scope 3 accounting and had a face-to-face discussion with policymakers relating to reporting of Scope 3. The results are open to the public on the web site operated by the Japanese Government.	Kao supprts to measure Scope3 on every companies on our supply chain under "eco together" which is the policy of Kao environmenta activity.

CC2.3b
Are you on the Board of any trade associations or provide funding beyond membership?

Yes

CC2.3c
Please enter the details of those trade associations that are likely to take a position on climate change legislation

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
Japan Chemical Industry Association	Consistent	Chemical industry provides highly-functional materials with society contributing to the reduction of the risks in society from climate change. ICCA, International Council of Chemical Associations, quantified the contributions and has addressed actions leading to cotributions to society. As a part of that ICCA and WBCSD, World Business Council for Sustainable Development, dreaw up the guidelines for the contributions calculations. Kao in a member of Japan Chemical Industry Association, which is a board member of ICCA.	Kao supports activities for measures pursuing total optimization based on "c-LCA (carbon-Life Cycle Analysis)" that the Japan Chemical Industry Association has developed and proposes both at home and abroad. In addition, Kao joined an LCA working group of The Japan Science Society to participate in developing c-LCA analysis, providing examples of possible contributions to emission reduction based on the methodology.

CC2.3f
What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

Some members of secretariat on Kao Responsible Care promotion Committee and Sustaninability Committee attend several kinds of committees of Japan Chemical Industry Association as their members and update information on domestic and global strategies trend of government and industries. The secretariats check the consistency between Kao's strategies for climate change and JCIA's ones depending on its relevance.

Further Information

Page: CC3. Targets and Initiatives

CC3.1
Did you have an emissions reduction or renewable energy consumption or production target that was active (ongoing or reached completion) in the reporting year?

Intensity target

CC3.1b
Please provide details of your intensity target

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment
Int1	Scope 1+2 (location-based)+3 (downstream)	69%	35%	Metric tonnes CO2e per unit revenue	2005	0.000921	2020	No, but we anticipate setting one in the next 2 years	
Int2	Scope 1+2 (market-based)	100%	35%	Metric tonnes CO2e per unit revenue	2005	0.001060	2020	No, but we anticipate setting one in the next 2 years	

CC3.1c
Please also indicate what change in absolute emissions this intensity target reflects

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
Int1	Increase	13.78	Increase	13.78	We re-estimate the change of each scope emissions because we publish roughly target revenue on 2020 in 2016.
Int2	Increase	13.78			We re-estimate the change of each scope emissions because we publish roughly target revenue on 2020 in 2016.

CC3.1e
For all of your targets, please provide details on the progress made in the reporting year

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
Int1	73.33%	40.00%	
Int2	73.33%	86.00%	

CC3.2
Do you classify any of your existing goods and/or services as low carbon products or do they enable a third party to avoid GHG emissions?

Yes

CC3.2a

Please provide details of your products and/or services that you classify as low carbon products or that enable a third party to avoid GHG emissions

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
Group of products	Water saving laundry detergent	Avoided emissions	Addressing the Avoided Emissions Challenge-Chemicals sector			
Group of products	Water saving shampoo	Avoided emissions	Addressing the Avoided Emissions Challenge-Chemicals sector			
Group of products	Water saving dishwashing detergent	Avoided emissions	Addressing the Avoided Emissions Challenge-Chemicals sector			
Group of products	Water saving bathroom detergent	Avoided emissions	Addressing the Avoided Emissions Challenge-Chemicals sector			
Group of products	Detergent and rinsing agent for steel sheet	Avoided emissions	Addressing the Avoided Emissions Challenge-Chemicals sector			
Group of products	Toner for copier for lower temperature fixing	Avoided emissions	Addressing the Avoided Emissions Challenge-Chemicals sector			
Group of products	Plasticizer for lighter wire harness	Avoided emissions	Addressing the Avoided Emissions Challenge-Chemicals sector			
Group of products	Dispersing agent for fuel-efficient tires	Avoided emissions	Addressing the Avoided Emissions Challenge-Chemicals sector			
Group of products	Runner pipe made of pulp	Avoided emissions				

CC3.3

Did you have emissions reduction initiatives that were active within the reporting year (this can include those in the planning and/or implementation phases)

Yes

CC3.3a

Please identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	4	
To be implemented*	27	974.00
Implementation commenced*	5	868.00
Implemented*	266	27743.00

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Not to be implemented	5	

CC3.3b
For those initiatives implemented in the reporting year, please provide details in the table below

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Building services	We have done some activities, for example changing from fluorescent to LED, changing to new high efficiency type air conditioner and reducing number of light.	1148.00	Scope 1 Scope 2 (market-based)	Voluntary	38700000	231200000	4-10 years	3-5 years	
Energy efficiency: Processes	We have done some activities, for example recovering steam, changing to new high efficinecy type equipment and install heat pump.	9796.00	Scope 1 Scope 2 (market-based)	Voluntary	187120000	447830000	1-3 years	1-2 years	
Low carbon energy purchase	Three of our factories in EU, Kao Manufacturing Germany and so on purchase renewable electricity. Further some factries in Japan changed electric supplyer to lower emission electric supplyer.	16799.00	Scope 2 (market-based)	Voluntary	0	0	>25 years	Ongoing	

CC3.3c
What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	We promote the introduction of methods with a lower CO2 reduction cost to achieve the reduction amounts required by law. We have reviewed the effectiveness of methods with a high-reduction potential by introducing them on a trial basis.
Dedicated budget for energy efficiency	We promote the introduction of methods with a lower CO2 reduction cost to achieve the reduction amounts required by law. We have reviewed the effectiveness of methods with a high-reduction potential by introducing them on a trial basis.
Dedicated budget for low carbon product R&D	At the time an opportunity is located, we estimate the potential reduction amount with regard to customers in the product development stage, confirm with customers whether the reduction amount is attractive to them, and start development.
Dedicated budget for other emissions reduction activities	We promote the introduction of methods with a lower CO2 reduction cost. We have reviewed the effectiveness of methods with a high-reduction potential by introducing them on a trial basis.
Partnering with governments on technology development	When we estimate CO2 reduction costs in preparing budgets such as the energy-conserving investment and the low-carbon investment, we also include public assistance such as available subsidies.
Other	The methodologies mentioned above are all applicable to either Scope 1, 2, or 3, targeting the medium-term objective to reduce LC-CO2 by 35 percent by 2020, and their degree of effectiveness has been clarified.

Further Information

Page: CC4. Communication

CC4.1
Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s)

Publication	Status	Page/Section reference	Attach the document	Comment
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	P13-24	https://www.cdp.net/sites/2017/56/9956/Climate Change 2017/Shared Documents/Attachments/CC4.1/securities_fy2016_all_01.pdf	Kao Securities Report 2016
In voluntary communications	Complete	P3,18,23-32,61-66,196-197	https://www.cdp.net/sites/2017/56/9956/Climate Change 2017/Shared Documents/Attachments/CC4.1/sustainability2017_e_all.pdf	Kao Sustainability Data Book 2017
In voluntary communications	Complete	P9,26-27,80	https://www.cdp.net/sites/2017/56/9956/Climate Change 2017/Shared Documents/Attachments/CC4.1/Kao Integrated reports_fy2017e_all.pdf	Kao Integrated Report 2017

Further Information

Module: Risks and Opportunities

Page: CC5. Climate Change Risks

CC5.1
Have you identified any inherent climate change risks that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Risks driven by changes in regulation
Risks driven by changes in physical climate parameters
Risks driven by changes in other climate-related developments

CC5.1a
Please describe your inherent risks that are driven by changes in regulation

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
International agreements	We will need to pay the more emissions fee in case the CO2 emission reduction target would set severer in every country which Kao operating business activity based on the Paris agreement.	Increased operational cost	3 to 6 years	Direct	Likely	Medium	Kao reduced 27,743 tons of GHG in 2016. We would have to pay 27.7 million yen additionally to purchase credit if we had no reduction activities, which is estimated using the rate 1000 yen per ton.	GHG reduction activities and quantities are managed by the Responsible Care Promotion Committee. In 2016, Kao reduced 27,743 tons of GHG emissions through 266 projects including purchasing renewable electricity in our factories in EU.	In 2016, the investment in energy reduction reached about 679 million yen.
Air pollution limits	If controls on CO2 emissions (absolute quantity and basic unit) are imposed at the national level or provincial/prefectural/city levels, it is possible that our business activities will be restricted. Emission concentration controls and absolute quantity controls on pollutants other than CO2, such as SOx and NOx, have already been imposed in many countries—including Japan—targeting stationary emission sources such as plants, and mobile emission sources such as automobiles. We have responded to these controls by establishing emission-removal facilities and changing the fuels we consume.	Increased capital cost	3 to 6 years	Direct	Likely	Low	These items relate to compliance. Failure to comply with the requirements for product labels will result in zero sales for these products. Nonconformance to air pollution control or voluntary agreements will mean locations such as the plants cannot be operated and there will be no sales of their products. We emitted 544 tons-NOx which reduced 83 tons to previous year, and 72tons-SOx which increased 9tons to previous year.	Regulations applied to individual plants have been confirmed by each plant and/or the secretariat of the Responsible Care Promotion Committee depending on the details.	In 2016, the investment in factries reached about 664 million yen.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Emission reporting obligations	A number of countries, including Japan, Spain, and Mexico, impose reporting obligations for CO2 emissions from plants. Management of data is becoming a major concern, especially the preparation of multiple templates— even though we try to use unified template for calculation— because calculation rules, such as reporting boundaries and emission factors, differ depending on the parties to receive the report. Furthermore, we anticipate that if reported data are publicized, some stakeholders may require us to reduce emissions.	Increased operational cost	1 to 3 years	Direct	Likely	Low	These items relate to compliance. Failure to comply with the requirements for product labels will result in zero sales for these products. Nonconformance to air pollution control or voluntary agreements will mean locations such as the factries cannot be operated and there will be no sales of their products.	Regulations applied to individual factry have been confirmed by each factry and/or the secretariat of the Responsible Care Promotion Committee depending on the details. Kao pays close attention to the "Recommendations of the Task Force on Climate-related Financial Disclosure" which developed by the Task Force on Climate Disclosure.	In 2016 , the cost to manage environmental regulations, ISO 14001 and so on was 1,385million yen.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Product efficiency regulations and standards	Kao anticipate the following standards as examples: standards for the amount of water used with laundry detergent; standards for the space rate of container/packaging against products; standards for the amount of resins used in containers; and standards for the amount of detergents used by dishwashers, etc. These standards may be not only imposed by governmental administrations, but also implemented as a voluntary action by industry associations or in response to a request from customers. If these standards are introduced, we will have to engage in technology and product development in order to comply with them, and if we cannot meet the standards, we will have to withdraw from the market.	Inability to do business	>6 years	Direct	Likely	Medium-high	If regulatory energy efficiency requirements to be introduced (such as prohibition of over packaging) exceed the current levels that Kao's products can achieve, the sales of these products will become zero. For instance, 345.2 billion yen of sales will become zero in case that the regulations are introduced in the markets which our fablic & home care business.	Information on trends in regulations of the countries in which Kao is operating has been obtained through administrative bodies and industrial associations for each country, and global trends in regulations via such persons as consultants by the secretariat of the Responsible Care Promotion Committee. In addition, the Design for Environment Guidelines have been established to perform multifaceted environment assessments of our products as required.	In 2016 , the cost to manage environmental regulations, ISO 14001 and so on was 1,385 million yen.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Product labeling regulations and standards	The carbon footprint labeling system that a number of countries, including Japan, Taiwan, and EU, are considering introducing, is anticipated to generate a risk that may reduce product demands if there is no carbon footprint labeling on products, or if the numerical value is higher than that of competitor's products. Furthermore, if each product or country and region uses different calculation rules or conversion factors, it will affect us by increasing the management burden, even if we use a unified template for the calculation of carbon footprint.	Reduced demand for goods/services	3 to 6 years	Direct	Likely	Medium-high	These items relate to compliance. Failure to comply with the requirements for product labels will result in zero sales for these products. Nonconformance to air pollution control or voluntary agreements will mean locations such as the plants cannot be operated and there will be no sales of their products. For instance, more than 345.2 billion yen of sales in Attack bland will become zero in case that the regulations are introduced in the markets which our laundry detergent business.	Information on trends in regulations of the countries in which Kao is operating has been obtained through administrative bodies and industrial associations for each country, and global trends in regulations via such persons as consultants by the secretariat of the Responsible Care Promotion Committee. In addition, the Design for Environment Guidelines have been established to perform multifaceted environment assessments of our products as required. Because landry detergent category is operated as pilot program in Environmental footprint Scheme in EU, Kao pays attention to the trend of it.	In 2016, the cost to manage environmental regulations, ISO 14001 and so on was 1,385million yen.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Renewable energy regulation	It is known that the price of renewable energy is higher than that of fossil energy generally. Therefore, as an example of regulations associated with renewable energy, the introduction of a regulation mandating the consumption of renewable energy to some extent would increase the energy cost for the Kao Group.	Increased operational cost	3 to 6 years	Direct	Likely	Low-medium	Increasing costs of energy procurement involves a risk of a reduced profit. For example, in tha case that the regulations are introduced in Japan where Kao group Scope 2 emissions account for 45% of our global ones, the additional cost for purchasing electricity will be about 1 billion yen.	Regulations applied to individual plants have been confirmed by each plant or the Cooperate Environment and Safety Management Department depending on the details.	In 2016 , the cost to manage environmental data and regulation, ISO 14001 and so on was 1,385 million yen.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Cap and trade schemes	We will need to pay the aditional cost in case that ETSs are newly introduced into many coutries prpbably. Japan where Kao's main business area may introduce ETS. China where Kao operates six factories will introduce nation wide ETS.	Increased operational cost	Unknown	Direct	More likely than not	Medium	If EST would introduce in Japan and we would have to buy emission credit as 1000yen/ton which is equivalent to 3 % of the GHG emission of Kao in Japan, we would have to pay about 15million yen extra costs. In China GHG emissions from Kao sites will be less than the regulation.	The SCM Division, which oversees plants with large Scope 1 and 2 emissions, holds energy-efficiency working group meetings twice a year comprising staff in charge of energy efficiency at all plants. The working group considers topics such as progress management for energy-efficiency activities at plants as well as reviews and in-house development of new technologies and introduced technologies. Aiming to improve the efficiency of our steam use, we are continuing to strengthen our steam trap maintenance and increase the amount of steam we recover. We had 199 cases of energy-saving activities in 2016, resulting in approximately 2,900 tons of CO2 reductions.	In 2016, the investment in energy reduction reached about 679 million yen.

CC5.1b

Please describe your inherent risks that are driven by changes in physical climate parameters

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in mean (average) precipitation	Among the risks of changes in average precipitation, there is a risk in particular that a decreased amount of precipitation may create restrictions on water usage. Restriction on household water usage can lead to a situation where demand for consumer products of the Kao Group declines. In addition, restriction on water usage at a customer's plant using our industrial use products will reduce demand for the products.	Reduced demand for goods/services	Up to 1 year	Direct	More likely than not	Medium	Decreasing precipitation, for example, in an area where enough water is not always available may reduce the quantity of water available for consumers. In such cases, the sales of products of the Fabric and Home Care Business including laundry detergents with high water consumption will drop by around 345.2 billion yen.	In preparation for consumers being allowed to consume less water, the Kao Group's R&D division manages to promote development of technologies applicable to various products including technologies that allow products to be washed and rinsed with less water. The technology which rinsed with less water for 'Attack Neo' one time rinse off was developed under this management method. And this technology towarded other products like as dish wash detergent.	In 2016 the investment in research and development of environmentally friendly products was 579 million yen and the operating costs were 2,680 million yen.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in mean (average) temperature	On rising average temperature, there are risks that the declining productivity of the workers who work outdoors, and the increasing power consumption for air-conditioners.	Increased operational cost	Up to 1 year	Direct	Virtually certain	Low-medium	If we would not manage these risks, the conditions of work become inferior and it is predicted that an employee leaves a company. If it becomes so, sales 1457.6 billion yen of whole Kao will be influenced directly.	To keep the health of the labors who works outdoors, it is doing the following. -shorten continuous working time on high-temperature day. -prepar drinking water , and so on. Since the power consumption for air-conditioners influences electric cost directly, our budget added its additional cost.	The cost to apply these risks is additional cost. It occurs continuously.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation pattern	Among the risks of changes in the pattern of precipitation, there is a risk that a drought caused by no rainfall over a prolonged period of time may lead to a restriction being placed on water usage. A restriction on household water usage can lead to a situation where demand for consumer products of the Kao Group declines. In addition, a restriction on water usage at a customer's plant using our industrial use products will reduce demand for the products.	Reduction/disruption in production capacity	Up to 1 year	Indirect (Supply chain)	Very likely	Medium	Changes of the pattern of precipitation, for example, in an area where enough water is not always available may reduce the quantity of water available for consumers. In such cases, the sales of products of the Fabric and Home Care Business including laundry detergents with high water consumption will drop by around 345.2 billion yen.	In preparation for consumers being allowed to consume less water, the Kao Group's R&D division manages to promote development of technologies applicable to various products including technologies that allow products to be washed and rinsed with less water. The technology which rinsed with less water for 'Attack Neo' one time rinse off was developed under this management method. And this technology toward other products like as dish wash detergent.	In 2016 the investment in research and development of environmentally friendly products was 579 million yen and the operating costs were 2,680 million yen.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation extremes and droughts	Among the risks of changes in the pattern of precipitation, there is a risk that a drought caused by no rainfall over a prolonged period of time may lead to a restriction being placed on water usage. A restriction on household water usage can lead to a situation where demand for consumer products of the Kao Group declines. In addition, a restriction on water usage at a customer's plant using our industrial use products will reduce demand for the products.	Reduction/disruption in production capacity	Up to 1 year	Indirect (Supply chain)	Very likely	Medium	Decreasing precipitation or changes of the pattern of precipitation, for example, in an area where enough water is not always available may reduce the quantity of water available for consumers. In such cases, the sales of products of the Fabric and Home Care Business including laundry detergents with high water consumption will drop by around 345.2 billion yen.	In preparation for consumers being allowed to consume less water, the Kao Group's R&D division continues to promote development of technologies applicable to various products including technologies that allow products to be washed and rinsed with less water. The technology which rinsed with less water for 'Attack Neo' one time rinse off was developed under this management method. And this technology toward other products like as dish wash detergent.	In 2016 the investment in research and development of environmentally friendly products was 579 million yen and the operating costs were 2,680 million yen.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Tropical cyclones (hurricanes and typhoons)	Stronger tropical cyclones with heavier rainstorms increase the probability of risks including floods. Passage of a tropical cyclone in an area close to the Kao Group's plant causing a flood would not only affect the production facilities directly, but also could damage the houses of the plant employees who would be unable to work accordingly, adversely affecting the operational status of the production facilities.Factories which has high possibility influence of the flood and strong wind by Tropical cyclon are Philippinas Kao in Philippin , Toyohashi and Wakayama factories in Kao Japan.	Reduction/disruption in production capacity	Up to 1 year	Direct	Likely	Medium	At the Kao Group's site, unanticipated torrential rain may occur. For example, if Philipinas Kao, producing 100,000 tons of higher alcohol products in the Philippines, suffers flood damage, it would slow the operation of the production facilities with a decline in sales of 273.8 billion yen in the Chemical Business.	For our manufacturing sites all over the world, the Production & Engineering Division has started assessing and managing the risks of floods, typhoons, tsunamis, and such like. To decrease flood damage, Philipinas Kao in Philippines made stronger bank and is planting mangrove coastline.	Philippinas Kao in the Philippines, for example, has spent about 50 million yen on measures to prevent turbid waters from flowing into the plant when a creek passing by the plant overflows.

CC5.1c
Please describe your inherent risks that are driven by changes in other climate-related developments

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Reputation	Kao manufacture and sell mainly products for general consumers, and our businesses are held in high regard by many general consumers. We assume that if we were to lose their support due a fall in reputation, sales would drop sharply, and take a considerable time to recover. Therefore, we recognize reputational risks are enormous risks.	Inability to do business	Up to 1 year	Direct	Likely	High	Slow responses to carbon footprint and Scope 3 left to voluntary activities can incur the risk of negative publicity for Kao with regards to its limited capacity of carbon management, for example, among institutional investors. This presumably would affect the stock price and the company's rating.	To calculate the life cycle CO2 for all products accurately in a short time, specialists in LCA are assigned to the Cooperate Environment and Safety Division and they work to maintain a LCA system.	To calculate the life cycle CO2, the operating cost of the LCA system was 20 million yen.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Changing consumer behavior	As mentioned in the sections of regulation risks and physical risks, consumer preferences have changed along with the impact of climate change. Unless we promptly respond to such changes, we will lose our market share, and it will cost us a lot to recover it. For Kao Corp. which is providing the consuming public the Consumer Product, it is a very important thing to understand consumers. Therefore, we recognize this risk also as being extremely significant.	Reduced demand for goods/services	Up to 1 year	Direct	Likely	High	Kao has launched new laundry detergents with life cycle CO2 emissions reduced by 21% in Japan and revenue from them is growing. A failure to maintain the sales for such products corresponding to a change in consumer preferences would result in, for example, a decline of 345.2 billion yen in sales of the Fabric and Home Care Business including laundry detergents.	Changes in consumer preferences are kept track of by the Divisions, through inquiries directed at our customer service representatives in countries around the world and surveys on changes in people's lifestyles by the Consumer Communication Center.	Activities such as the administration of service representatives and operation of the Consumer Communication Center required an expenditure of about 500 million yen.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Induced changes in human and cultural environment	Kao recognize that consumers' environmental awareness has been enhanced through increased awareness of energy and water conservation, and that CO2 footprint labeling on products is becoming widespread, which are risks but—at the same time—potential opportunities to create new markets. Furthermore, considering that refill products have come into general use in Japan, we anticipate that consumer awareness of the environmental responses of products will be heightened; for example, they will choose a product based on the point that a refill for it is marketed.	Reduced demand for goods/services	3 to 6 years	Direct	Likely	High	A lower valuation on Kao's humanitarian efforts may curtail ESG investment in Kao, resulting in a lower stock price. This also affects the sales with a decrease in EVA (244 to 266 in 2016).	Changes in consumer preferences are kept track of by the Divisions, through inquiries directed at our customer service representatives in countries around the world and surveys on changes in people's lifestyles by the Consumer Communication Center. There was a request of the consumers in the refill pack. By having consumers refill product contents and continuously use the same plastic containers for shampoo and liquid detergent, Kao helps reduce the use of natural resources as well as the amount of waste. Kao has continued releasing more refill products. As of December 2016, Kao offers 266 refill products, that is 23 items more than last year. To use refill products is commonn in Japan and refill products expand to world wide gradually.	Environmental humanitarian efforts cost about 80 million yen.

Further Information

Page: CC6. Climate Change Opportunities

CC6.1
Have you identified any inherent climate change opportunities that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Opportunities driven by changes in regulation
Opportunities driven by changes in physical climate parameters
Opportunities driven by changes in other climate-related developments

CC6.1a
Please describe your inherent opportunities that are driven by changes in regulation

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
International agreements	Paris agreement developments indicate that it is possible for all countries to become subject to emission control obligations. Therefore, we anticipate that it is possible that reduction obligations may be directly and indirectly imposed on companies that operate business in these countries. Therefore, these exists obvious and potential needs to improve energy consumption efficiency both in corporations and households. We expect that demand for product lines that contribute to energy conservation will increase across all our business areas. The ratio of revenue from chemical business is about 30% in 2016.	Increased demand for existing products/services	1 to 3 years	Direct	Virtually certain	High	To reduce the procurement of energy for the company, Kao implements many energy conservation activities. The amount of cost reduction resulting from effective activities including energy conservation activities (TCR) are estimated 5 billion yen. In addition, Kao's Chemical Business supplies companies, as our customers, with numerous environmentally friendly products. The	Kao's TCR activities including cost-cutting by reducing energy procurement are controlled by the TCR office under the officer in charge, and it holds meetings every month to track the progress. The Chemical Business develops environmentally friendly products, exchanging information closely primarily with other divisions and the R&D Division,	Among the TCR activities, energy conservation activities cost was 677 million yen. Research and development expenditures of the Chemical Business were 9.1 billion yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							Chemical Business expects in 2016 sales of 273.8 billion yen including sales of environmentally friendly products.	explores new projects, and promotes technical development. In 2016, Kao advanced to the commercial print business by using aqueous pigmented ink jet which emit no VOC. We bought two aqueous pigmented ink jet company s .	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Carbon taxes	Carbon taxes are imposed on fossil fuels consumed, and their range can apply from the direct consumption of fossil fuels, to the use of fossil fuels at the time of power generation if electricity is purchased. Therefore, if a carbon tax is introduced, energy costs will increase, leading users to commence activities to reduce the amount of energy usage. If this is the case, we expect that demand for product lines that contribute to reduced energy usage will increase across all our business areas (consumer products business and chemical business).	Increased demand for existing products/services	Up to 1 year	Direct	Very likely	Medium-high	To reduce the procurement of energy for the company, Kao implements many energy conservation activities. The amount of cost reduction resulting from effective activities including energy conservation activities (TCR) are estimated 5 billion yen. In addition, Kao's Chemical Business supplies companies, as our customers, with numerous environmentally friendly products. The Chemical Business expects in 2016 sales of 273.8 billion yen including sales of environmentally friendly products.	Kao's TCR activities including cost-cutting by reducing energy procurement are controlled by the TCR office under the officer in charge, and it holds meetings every month to track the progress. The Chemical Business develops environmentally friendly products, exchanging information closely primarily with other divisions and the R&D Division, explores new projects, and promotes technical development.	Among the TCR activities, energy conservation activities cost was 677 million yen. Research and development expenditures of the Chemical Business were 9.1 billion yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Cap and trade schemes	Emission trading is normally undertaken by corporations. Therefore, we expect that the introduction of emission trading will have an impact on our chemical business that deals in Bto-B products. For example, in cap-and-trade type emission trading, a cap—the upper limit of allowable CO2 emissions— will be established for a company, and if the company exceeds that upper limit, an additional cost will be required for the purchase of emission credits. If the company falls below the upper limit, an emission credit will be generated, meaning an opportunity to gain profit will be created. Therefore, companies subject to emissions caps will commence activities to reduce CO2 emissions, or in other words, to reduce their energy usage amount. As a result, the demand for products that can contribute to reduced energy usage will increase.	Increased demand for existing products/services	Up to 1 year	Direct	Very likely	Medium-high	To reduce the procurement of energy for the company, Kao implements many energy conservation activities. The amount of cost reduction resulting from effective activities including energy conservation activities (TCR) are estimated 5 billion yen. In addition, Kao's Chemical Business supplies companies, as our customers, with numerous environmentally friendly products. The Chemical Business expects in 2016 sales of 273.8 including sales of environmentally friendly products.	Kao's TCR activities including cost-cutting by reducing energy procurement are controlled by the TCR office under the officer in charge, and it holds meetings every month to track the progress. The Chemical Business develops environmentally friendly products, exchanging information closely primarily with other divisions and the R&D Division, explores new projects, and promotes technical development.	Among the TCR activities, energy conservation activities cost was 677 million yen. Research and development expenditures of the Chemical Business were 9.1 billion yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Fuel/energy taxes and regulations	Kao recognize that fuel and energy taxes have a similar effect as environment taxes. Therefore, if fuel and energy taxes are introduced, energy costs will increase, leading users to commence activities to reduce the amount of energy usage. If this is the case, we expect that demand for product lines that contribute to reduced energy usage will increase across all our business areas (consumer products business and chemical business).	Increased demand for existing products/services	3 to 6 years	Direct	Likely	Medium-high	To reduce the procurement of energy for the company, Kao implements many energy conservation activities. The amount of cost reduction resulting from effective activities including energy conservation activities (TCR) are estimated 5 billion yen. In addition, Kao's Chemical Business supplies companies, as our customers, with numerous environmentally friendly products. The Chemical Business expects in 2016 sales of 273.8 billion yen including sales of environmentally friendly products.	Kao's TCR activities including cost-cutting by reducing energy procurement are controlled by the TCR office under the officer in charge, and it holds meetings every month to track the progress. The Chemical Business develops environmentally friendly products, exchanging information closely primarily with other divisions and the R&D Division, explores new projects, and promotes technical development.	Among the TCR activities, energy conservation activities cost was 677 million yen. Research and development expenditures of the Chemical Business were 9.1 billion yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Product efficiency regulations and standards	With regard to product efficiency regulations and standards, and standards for containers and packaging in particular, under the Law for the Promotion of Sorted Collection and Recycling Containers and Packaging in Japan, recycling fees based on utilization volume have already been charged. Accordingly, Kao has already been working on the development of containers and packaging reduction technology. For this reason, establishment of new standards for use of containers and packaging in other countries would help Kao maintain its advantage over other companies with relatively lower sales in Japan.	Increased demand for existing products/services	3 to 6 years	Direct	Likely	Medium	Kao has been a leading company aboutproduct efficiency regulations andproduct labels. To reduce the volume of containers and packaging for consumer products, Kao launched refills and replacement products ahead of others in the Japanese market. The average conversion rate is currently at least 80%. The financial impact of regulations relating these technologies is unclear; it is realistic for Kao to achieve the current level of sales because of its technological advantages over its competitors.	Kao not only prohibits excessive packaging but also has been continuously promoting activities to reduce the weight of the containers and packages themselves (reduce and reuse). For example, the rates of conversion to refills and replacement products from 1995 in Japan are shown on our website. With regard to product labels, labeling in general is confirmed and managed by the Cooperate Product Quality Management Department. The information required for Carbon Foot Print in future is managed by the Cooperate Environment and Safety Management Department.	The investment in research and development of environmentally friendly products including the technical development of containers and packaging was 1,335 million yen and the operating costs were 3,994 million yen. In addition, operating the LCA system to obtain data including for Carbon Foot Print cost 20 million yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Product labeling regulations and standards	Requirements for labeling of a carbon footprint, which is one of the product labels, will force products with no labeling out of the market. As Kao has already introduced and is operating a LCA system to calculate carbon footprint, the position is considered to be advantageous to Kao compared with other companies.	Increased demand for existing products/services	3 to 6 years	Direct	Likely	Medium	Kao has been a leading company aboutproduct efficiency regulations andproduct labels. To reduce the volume of containers and packaging for consumer products, Kao launched refills and replacement products ahead of others in the Japanese market. The average conversion rate is currently at least 80%. The financial impact of regulations relating these technologies is unclear; it is realistic for Kao to achieve the current level of sales because of its technological advantages over its competitors.	Kao not only prohibits excessive packaging but also has been continuously promoting activities to reduce the weight of the containers and packages themselves (reduce and reuse). For example, the rates of conversion to refills and replacement products from 1995 in Japan are shown on our website. With regard to product labels, labeling in general is confirmed and managed by the Cooperate Product Quality Management Department. The information required for Carbon Foot Print in future is managed by the Cooperate Environment and Safety Management Department.	The investment in research and development of environmentally friendly products including the technical development of containers and packaging was 1,335 million yen and the operating costs were 3,994 million yen. In addition, operating the LCA system to obtain data including for Carbon Foot Print cost 20 million yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Voluntary agreements	Voluntary agreements are treated as having the same force as legal regulations. Therefore, we recognize that if a voluntary agreement is concluded, the same opportunities will be generated as if a legal regulation was implemented. For example, if an industrial association establishes voluntary objectives for CO2 emissions, member companies will be required to comply with the applicable voluntary objectives. Therefore, energy-reduction activities will be initiated to reduce CO2 emissions. As a result, we expect that demand for product lines in our B-to-B chemical business will increase.	Increased demand for existing products/services	3 to 6 years	Direct	Very likely	Medium	To reduce the procurement of energy for the company, Kao implements many energy conservation activities. The amount of cost reduction resulting from effective activities including energy conservation activities (TCR) are estimated 5 billion yen. In addition, Kao's Chemical Business supplies companies, as our customers, with numerous environmentally friendly products. The Chemical Business expects in 2016 sales of 273.8 billion yen including sales of environmentally friendly products.	Kao's TCR activities including cost-cutting by reducing energy procurement are controlled by the TCR office under the officer in charge, and it holds meetings every month to track the progress. The Chemical Business develops environmentally friendly products, exchanging information closely primarily with other divisions and the R&D Division, explores new projects, and promotes technical development.	Among the TCR activities, energy conservation activities cost was 677 million yen. Research and development expenditures of the Chemical Business were 9.1 billion yen.

CC6.1b
Please describe your inherent opportunities that are driven by changes in physical climate parameters

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in mean (average) temperature	The rise in the average temperature causes longer light-sweating periods. This would increase the sales of the Kao Group's products such as antiperspirants and antiperspirant sprays.	Increased demand for existing products/services	Up to 1 year	Direct	Virtually certain	Medium-high	Changes in average temperature and increases in ultraviolet radiation would increase the sales of products such as antiperspirants and antiperspirant sheets, and UV care products, resulting in higher sales for the Beauty Care Business, which has current sales of 601.6 billion yen.	All items listed here are related to our product development. Kao employs a matrix system that combines business units and functional units. Matrix management is also pursued within the Kao R&D Division between the product development and fundamental research sections. Close ties are maintained with Corporate Production and Quality Assurance Depaatment and Customer Communication Sections within the company. In 2016, Kao decided to launch new Deodrant product ,Biore Deodrant Z in Japan.（Launch February, 2017)	Research and development expenditures of the Beauty Care Business were 24.2 billion yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in mean (average) precipitation	A decrease in average precipitation reduces the volume of water available. This change drives up demand for Kao's water-saving products such as laundry detergents requiring less water, which are already on the markets in China and Australia as well as in Japan to contribute to the growth of the Kao Group's sales.	Increased demand for existing products/services	Up to 1 year	Direct	Very likely	Medium-high	Decreasing precipitation or changes in the pattern of precipitation, for example, in areas where enough water is not always available, may reduce the quantity of water available for consumers. Acceptance of water-saving products by the consumers in these regions would improve the sales of the Kao Group. On the other hand, when the rainy day becomes long, the opportunity to dry the clothing which was washed in the room increases. When drying washed clothing in the room, the offensive smell occurs to the clothing. The demand of the detergent for the clothing which added the function to prevent from an unpleasant smell increases. The sales of the Fabric and Home Care Business including laundry detergents with high water consumption can especially increase by 345.2 billion yen.	All items listed here are related to our product development. Kao employs a matrix system that combines business units and functional units. Matrix management is also pursued within the Kao R&D Division between the product development and fundamental research sections. Close ties are maintained with Corporate Production and Quality Assurance Department and Customer Communication Sections within the company. In 2016, Kao decided to launch new Detergent product which added the function to prevent from the clothing an unpleasant smell, new type of "ATTACK NEO EX POWER".	Research and development expenditures of the Fabric and Home Care Business were 8.1 billion yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation pattern	It is assumed that changes in the pattern of precipitation would extend the periods when less water is available. This change drives up demand for Kao's water-saving products such as laundry detergents requiring less water, which are already on the markets in China and Australia as well as in Japan to contribute to the growth of the Kao Group's sales.	Increased demand for existing products/services	Up to 1 year	Direct	Very likely	Medium-high	Decreasing precipitation or changes in the pattern of precipitation, for example, in areas where enough water is not always available, may reduce the quantity of water available for consumers. Acceptance of water-saving products by the consumers in these regions would improve the sales of the Kao Group. On the other hand, when the rainy day becomes long, the opportunity to dry the clothing which was washed in the room increases. When drying washed clothing in the room, the offensive smell occurs to the clothing. The demand of the detergent for the clothing which added the function to prevent from an unpleasant smell increases. The sales of the Fabric and Home Care Business including laundry detergents with high water consumption can especially increase by 345.2 billion yen.	.All items listed here are related to our product development. Kao employs a matrix system that combines business units and functional units. Matrix management is also pursued within the Kao R&D Division between the product development and fundamental research sections. Close ties are maintained with Corporate Production and Quality Assurance Depaatment and Customer Communication Sections within the company. In 2016, Kao decided to launch new Detergent product which added the function to prevent from the clothing an unpleasant smell, new type of "ATTACK NEO EX POWER".	Research and development expenditures of the Fabric and Home Care Business were 8.1 billion yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation extremes and droughts	The spread of drought-stricken areas means there are greater areas with less volume of water available. In such regions, Kao's watersaving products such as laundry detergents requiring less water, which are already on the markets in China and Australia as well as in Japan to contribute to the growth of the Kao Group's sales.	Increased demand for existing products/services	3 to 6 years	Direct	Very likely	Medium-high	To install levee is one method of reducing risk level for flood. In generally, cement is used for a levee. Therefore, we think that there is big opportunity in the chemical business(273.8billion yen revenue in 2016) which is selling an additive for the cement.	The Chemical Business develops environmentally friendly products, exchanging information closely primarily with other divisions and the R&D Division, explores new projects, and promotes technical development. It is doing the research which increases a product series to expand the use of the additive for the cement at present.	Research and development expenditures of the Fabric and Home Care Business were 8.1 billion yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other physical climate opportunities	For example, the amount of ultraviolet radiation reaching the earth is anticipated to increase. This situation could increase the demand for the Kao Group's UV care products that are sold globally.	Increased demand for existing products/services	Up to 1 year	Direct	Virtually certain	Medium	Changes in average temperature and increases in ultraviolet radiation would increase the sales of products such as antiperspirants and antiperspirant sheets, and UV care products, resulting in higher sales for the Beauty Care Business, which has current sales of 601.6 billion yen.	All items listed here are related to our product development. Kao employs a matrix system that combines business units and functional units. Matrix management is also pursued within the Kao R&D Division between the product development and fundamental research sections. Close ties are maintained with Corporate Production and Quality Assurance Department and Customer Communication Sections within the company. At present, Kao is doing the development which aimed to improve the high UV product function and the customer use convenience .	Research and development expenditures of the Beauty Care Business were 24.2 billion yen.

CC6.1c
Please describe your inherent opportunities that are driven by changes in other climate-related developments

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Reputation	We manufacture and sell mainly products for general consumers, and our business are held in high regard by many general consumers. Social reputation, such as word of mouth, has an influence on the consumption behavior of general consumers, who have a great impact on our sales. At Kao, we have promoted environmental activities under the theme “eco together.”	Increased demand for existing products/services	Up to 1 year	Direct	Very likely	Medium-high	Kao's adequate responses to them can enhance Kao's reputation and raise the stock price and sales. A high opinion of Kao's brand value from financial institutions and such like would affect fund procurement such as the rate of corporate bonds.	Kao's the Sustainability Committee manages progress in including major SRI indices recognized around the world. This is the external evaluated an activity about a wide range of ESG such as the efforts to the climate change of Kao. In 2016, Kao got evaluation as follows: - CDP’s Water A List (2016) - The World’s Most Ethical Companies (11th consecutive year)	The Sustainability Committee were held 4 times in 2016. Operation Cost of secretariat of this committee was about 100 million yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Changing consumer behavior	Consumer preferences change daily. In particular, as more information has become available in various areas, preferences have also changed in various ways. By promptly addressing the signs of these changes and offering products that respond to the resulting needs, we believe that demand for our products will increase.	Increased demand for existing products/services	Up to 1 year	Direct	Very likely	Medium-high	A liquid laundry detergent with reduced rinsing cycles, which Kao was first in Japan to launch on the market, and other companies' conceptually similar products have already garnered a certain level of market share. This factor has an impact on the Fabric and Home Care Business with the sales of 345.2 billion yen for products including this item. Such a change may occur among our other businesses according to our understanding of the situation.	Kao is doing lifestyle activities leading the Prevention of Global Warming to become popular. For example, it is doing an environment program using detergent " attack Neo " for the clothing which can be washed with water-saving. Besides, it is doing a factory tour and an environment event and so on. It is managing these activity conditions in the the Sustainability Committee. The number of total persons who participated in the environment program became 650000 persons from 2014 to 2016. This result is managed by the Sustainability Committee.	The Sustainability Committe were held 4 times in 2016. Operation Cost of secretariat of this committee was about 100 million yen.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Induced changes in human and cultural environments	Increasing awareness of energy and water conservation, and the fact that CO2 footprint labeling on products is becoming widespread, have the effect of enhancing people’s environmental awareness generally. Therefore, we recognize that if we take the lead in guiding this growing awareness, we may see pioneering advantages. With the introduction of concentrated laundry detergents and the launch of refill products, Kao has led the way in popularizing the concentrated/compact products and refill products in the Japanese market.	Increased demand for existing products/services	Up to 1 year	Direct	Very likely	Medium-high	A liquid laundry detergent with reduced rinsing cycles, which Kao was first in Japan to launch on the market, and other companies' conceptually similar products have already garnered a certain level of market share. This factor has an impact on the Fabric and Home Care Business with the sales of 334.4 billion yen for products including this item. Such a change may occur among our other businesses according to our understanding of the situation.	Matrix management is also pursued within the Kao R&D Division between the product development and fundamental research sections. Close ties are maintained with Corporate Production and Quality Assurance Department and Customer Communication Sections within the company. Kao also engage in joint research projects with various outside reserch institutes, universities, and companies. As one of the results of such an activity, it decided that Kao Corp. sold a new Deodrant product ,Biore Deodrant Z, in 2016.	The investment in research and development of environmentally friendly products was 1,335million yen and the operating costs were 3,994 million yen.

Further Information

Attachments

https://www.cdp.net/sites/2017/56/9956/Climate Change 2017/Shared Documents/Attachments/ClimateChange2017/CC6.ClimateChangeOpportunities/sustainability data book2017_e_all.pdf

Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading

Page: CC7. Emissions Methodology

CC7.1
Please provide your base year and base year emissions (Scopes 1 and 2)

Scope	Base year	Base year emissions (metric tonnes CO2e)
Scope 1	Fri 01 Apr 2005 - Fri 31 Mar 2006	698448.00
Scope 2 (location-based)		
Scope 2 (market-based)	Fri 01 Apr 2005 - Fri 31 Mar 2006	299020.00

CC7.2
Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

Please select the published methodologies that you use
Japan Ministry of the Environment, Law Concerning the Promotion of the Measures to Cope with Global Warming, Superceded by Revision of the Act on Promotion of Global Warming Countermeasures (2005 Amendment)

CC7.2a
If you have selected "Other" in CC7.2 please provide details of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

CC7.3
Please give the source for the global warming potentials you have used

Gas	Reference
CO2	IPCC Second Assessment Report (SAR - 100 year)
CH4	IPCC Second Assessment Report (SAR - 100 year)
N2O	IPCC Second Assessment Report (SAR - 100 year)
HFCs	IPCC Second Assessment Report (SAR - 100 year)
PFCs	IPCC Second Assessment Report (SAR - 100 year)
SF6	IPCC Second Assessment Report (SAR - 100 year)
NF3	IPCC Fourth Assessment Report (AR4 - 100 year)

CC7.4
Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data at the bottom of this page

Fuel/Material/Energy	Emission Factor	Unit	Reference

Fuel/Material/Energy	Emission Factor	Unit	Reference
Natural gas	2.23400	metric tonnes CO2e per m3	GHG reporting protcol in Japan (in Japan case)
Other: heavy oil	2.99600	kg CO2 per liter	GHG reporting protcol in Japan (in Japan case)
Kerosene	2.48900	kg CO2 per liter	GHG reporting protcol in Japan (in Japan case)
Wood or wood waste	0	metric tonnes CO2 per metric tonne	GHG reporting protcol in Japan (in Japan case)

Further Information

Page: CC8. Emissions Data - (1 Jan 2016 - 31 Dec 2016)

CC8.1
Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory

Operational control

CC8.2
Please provide your gross global Scope 1 emissions figures in metric tonnes CO2e

648800.00

CC8.3
Please describe your approach to reporting Scope 2 emissions

Scope 2, location-based	Scope 2, market-based	Comment
	We are reporting a Scope 2, market-based figure	

CC8.3a
Please provide your gross global Scope 2 emissions figures in metric tonnes CO2e

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
	391900.00	

CC8.4
Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

CC8.4a
Please provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure

Source	Relevance of Scope 1 emissions from this source	Relevance of location-based Scope 2 emissions from this source	Relevance of market-based Scope 2 emissions from this source (if applicable)	Explain why the source is excluded
Factories,Offices,Warehouses,sales car outside Japan	Emissions are not relevant			Data for Factories,Offices,Warehouses and sales car outside Japan had been collected only CO2 . Based on the collected data in Japan, the total emissions of except CO2 from these sources is estimated to be less than 0.5% of all the emissions.

CC8.5

Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	Less than or equal to 2%	Metering/ Measurement Constraints	The amounts of fuel usage by type are measured with meters regularly maintained. However, as some meters are read by a measurer, it is impossible to take a reading from all meters at the same time on the same day every year. In addition, the values indicated on the meters primarily contain errors to some extent.
Scope 2 (location-based)			
Scope 2 (market-based)	Less than or equal to 2%	Metering/ Measurement Constraints	The uncertainty of Scope 2 emissions are considered to be extremely low and there is a reason for that as follows: - The amount of purchased electricity is measured using the power meter provided by a electriical supplier and the power meter is periodically checked by each country's law.

CC8.6

Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

Third party verification or assurance process in place

CC8.6a

Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/56/9956/Climate Change 2017/Shared Documents/Attachments/CC8.6a/KAO2017 CDP.pdf	all	ISAE3000	100
Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/56/9956/Climate Change 2017/Shared Documents/Attachments/CC8.6a/sustainability2017_e_all.pdf	Kao Sustainability Data Book 2017, 191page	ISAE3000	100

CC8.7

Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

Third party verification or assurance process in place

CC8.7a
Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Market-based	Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/56/9956/Climate Change 2017/Shared Documents/Attachments/CC8.7a/KAO2017 CDP.pdf	all	ISAE3000	100
Market-based	Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/56/9956/Climate Change 2017/Shared Documents/Attachments/CC8.7a/sustainability2017_e_all.pdf	Kao Sustainability Data Book 2017, 191page	ISAE3000	100

CC8.8
Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment
Other: energy consumption	energy consumption

CC8.9
Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

Yes

CC8.9a
Please provide the emissions from biologically sequestered carbon relevant to your organization in metric tonnes CO2

73977.55

Further Information

Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC9.1
Do you have Scope 1 emissions sources in more than one country?

Yes

CC9.1a
Please break down your total gross global Scope 1 emissions by country/region

Country/Region	Scope 1 metric tonnes CO2e
Japan	272400.00
Asia Pacific (or JAPA)	290600.00
US, Latin America and Caribbean (USLAC)	38800.00
EU12	47000.00

CC9.2
Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)

Further Information

Page: CC10. Scope 2 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC10.1
Do you have Scope 2 emissions sources in more than one country?

Yes

CC10.1a
Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Japan		169400.00	328135.00	459.00
Asia Pacific (or JAPA)		200300.00	324721.00	0.00
US, Latin America and Caribbean (USLAC)		13900.00	50200.00	0.00
EU12		8300.00	60373.00	29921.00

CC10.2
Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

Further Information

Page: CC11. Energy

CC11.1
What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

CC11.2
Please state how much heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year

Energy type	MWh
Heat	0.00
Steam	36500.00
Cooling	0.00

CC11.3
Please state how much fuel in MWh your organization has consumed (for energy purposes) during the reporting year

2917000.00

CC11.3a
Please complete the table by breaking down the total "Fuel" figure entered above by fuel type

Fuels	MWh
Motor gasoline	44900.00
Kerosene	7700.00
Other: A-heavy oil	14000.00
Other: C-heavy oil	6700.00
Liquefied petroleum gas (LPG)	2400.00
Liquefied Natural Gas (LNG)	2477600.00
	363800.00

CC11.4
Please provide details of the electricity, heat, steam or cooling amounts that were accounted at a low carbon emission factor in the market-based Scope 2 figure reported in CC8.3a

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Emissions factor (in units of metric tonnes CO2e per MWh)	Comment

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Emissions factor (in units of metric tonnes CO2e per MWh)	Comment
Off-grid energy consumption from an on-site installation or through a direct line to an off-site generator owned by another company	459.00	0.000000	We generated electricity by solar panels on sites and consumed for use in the sites.
Direct procurement contract with a grid-connected generator or Power Purchase Agreement (PPA), supported by energy attribute certificates	29921.00	0.000000	Three of our factories in EU, Kao Manufacturing Germany and so on purchase renewable electricity. The purchased electricity fully covered the whole electricity the factories' consume.

CC11.5
Please report how much electricity you produce in MWh, and how much electricity you consume in MWh

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
2325752.00	2023237.00	302515.00	459.00	459.00	

Further Information

Page: CC12. Emissions Performance

CC12.1
How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to the previous year?

Decreased

CC12.1a
Please identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Emissions reduction activities	2.59	Decrease	We reduced 27,743 tons of GHG emissions by 266 emissions reduction activities in 2016. -2.59%= (-27,743/1,071,000)*100
Divestment	0.00	No change	There was no divestment in 2016.
Acquisitions	0.00	No change	There was no acquisition in 2016.
Mergers	0.04	Increase	Kao merged new company, Kao Collins in 2016. 0.04%=(399/1,071,000)*100
Change in output	3.65	Increase	Because of increasing our revenue, our production output increase also. 3.65%=(39,109/1,071,000)*100
Change in methodology	1.21	Decrease	The whole GHG emissions decreased by 12,939 tons due to the changes of emissions intensity of purchased electricity. -1.21%=(-12,939/1,071,000)*100
Change in boundary	0.18	Increase	We started to gather GHG emissions from offices, Warehouses outside Japan from 2016. 0.18%= (1,980/1,071,000)*100

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Change in physical operating conditions	0.00	No change	There was no Change in physical operating conditions in 2016.
Unidentified	0.06	Decrease	There was 671 tons of emission reduction that we can not identify. -0.06%=(-671/1,071,000)*100
Other	2.81	Decrease	We reduced 30,136 tons of GHG emissions because of the product mix changed due to the market demand, and so on. -2.81%=(-30,136/1,071,000)*100

CC12.1b
Is your emissions performance calculations in CC12.1 and CC12.1a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

CC12.2
Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.000714	metric tonnes CO2e	1457610000000	Market-based	1.86	Decrease	The emissions intensity decreased 1.86% thanks to controlling GHG emissions decrease by 2.80% in spite of the production output decrease by 0.96%. The emissions intensity would have decreased by 0.76% to 0.000733 compared to 2015 without emissions reduction activities equivalent to 27,743 tons.

CC12.3
Please provide any additional intensity (normalized) metrics that are appropriate to your business operations

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.3000	metric tonnes CO2e	metric tonne of product	3470000	Market-based	4.94	Decrease	This emissions intensity decreased 4.94% due to GHG emissions decrease by 2.80% in spite of the production output increase by 2.25%. The emissions intensity would have decreased by 2.41% to 0.3080 compared to 2015 without emissions reduction activities equivalent to 27,743 tons.

Further Information

Page: CC13. Emissions Trading

CC13.1
Do you participate in any emissions trading schemes?

Yes

CC13.1a
Please complete the following table for each of the emission trading schemes in which you participate

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO2e	Details of ownership
European Union ETS	Fri 01 Jan 2016 - Sat 31 Dec 2016	9505	15782	25287.00	Facilities we own and operate
Tokyo Cap-and-Trade	Fri 01 Apr 2016 - Fri 31 Mar 2017	11927	0	10139.00	Facilities we own and operate

CC13.1b
What is your strategy for complying with the schemes in which you participate or anticipate participating?

Placing top foremost priority on our own activities to reduce the emissions, our goal is to carry out many activities to keep the emissions below the assigned amount. In so doing, we will compare the cost for the emission reduction activities with cost of the purchasing emission quotas on the market, determine whether or not we need to purchase from the market from a medium- to long-term perspective, and purchase quotas as required. The Kao Group has not made any actual purchase of emission quotas from the market.

CC13.2
Has your organization originated any project-based carbon credits or purchased any within the reporting period?

No

Further Information

Page: CC14. Scope 3 Emissions

CC14.1
Please account for your organization's Scope 3 emissions, disclosing and explaining any exclusions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Relevant, calculated	4134003.96	Activity volume is input by type of raw material used for sold products. The emissions intensity used is the emissions intensity by type of raw material which set by Kao from the emissions intensity database (ver.2.0) prepared by the Ministry of the Environment and the Ministry of Economy, Trade and Industry in Japan and so on. .	24.12%	
Capital goods	Relevant, calculated	261752.46	Activity volume is the investment amount. The emissions intensity used is the emissions intensity database (ver.2.0) prepared by the Ministry of the Environment and the Ministry of Economy, Trade and Industry in Japan. As for the activities in countries outside Japan, the emissions intensity in Japan is used also.	0.00%	
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Relevant, calculated	22309.93	Activity volume is the consumption of energy by type.The emissions intensity used is the emissions intensity database (ver.2.0) prepared by the Ministry of the Environment and the Ministry of Economy, Trade and Industry in Japan. As for the activities in countries outside Japan, the emissions intensity in Japan is used also.	0.00%	
Upstream transportation and distribution	Relevant, calculated	242490.72	Activity volume is the case where the Kao Group is a cargo owner. Raw materials and such like having a cargo owner as the supplier are included in Category 1. Calculatiion methodology and the emission intensities Kao used obey under Law Concerning the promotion of the measures to cope with Global Warming in Japan .	0.00%	
Waste generated in operations	Relevant, calculated	47440.00	Activity volume is classified by type of waste and processing . The emissionsintensity used is the emissions intensity database (ver.2.0) prepared by the Ministry of the Environment and the Ministry of Economy, Trade and Industry in Japan. As for the activities in countries outside Japan, the emissions intensity in Japan is used also.	0.00%	
Business travel	Relevant, calculated	3618.26	Activity volume is the number of employees. The emissions intensity used is the emissions intensity database (ver.2.0) prepared by the Ministry of the Environment and the Ministry of Economy, Trade and Industry in Japan.	0.00%	
Employee commuting	Relevant, calculated	18083.56	Activity volume is the numbers of employees and work days.The emissions intensity used is the emissions intensity database (ver.2.0) prepared by the Ministry of the Environment and the Ministry of Economy, Trade and Industry in Japan.	0.00%	
Upstream leased assets	Not relevant, explanation provided	0.00	Kao rents some equipments like as sales car. Emission from these equipments have included in category "Scope1 and Scope2". Even until last year we calculaterd this cateory and selected "Not relevant, calculated" , we change to this category is "Not relevant, explanation provided" from this year.	0.00%	Emission from upstream leased assets has included in "Scope1 and Scope2".
Downstream transportation and distribution	Relevant, calculated	93705.88	Activity volume is the weight of sold products which excluded Kao deliveried to store directory. The emissions intensity used is the emissions intensity database (ver.2.0) prepared by the Ministry of the Environment and the Ministry of Economy, Trade and Industry in Japan.	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Processing of sold products	Relevant, calculated	113197.95	Activity volume is the number of sold of fatty alcohols, tertiary amine and many kinds of surfactants. The emissions intensity used is model number which decided by result of the emission intensity on Kao factory. Kao processes these material same as our customers.	0.00%	
Use of sold products	Relevant, calculated	4965099.83	Calculated according to the scenario established by Kao. Activity volume is the amount of usage of electricity, gas, and such like in house from slod products. The emissions intensity used is set by Kao from the emissions intensity database (ver.2.0) prepared by the Ministry of the Environment and the Ministry of Economy, Trade and Industry in Japan and so on.	0.00%	
End of life treatment of sold products	Relevant, calculated	1317000.00	Calculated according to the scenario established by Kao. Activity volume is the type and volume of ingredients, containers and packaging and used water in house for each sold product. The emissions intensity used is set by Kao from the emissions intensity database (ver.2.0) prepared by the Ministry of the Environment and the Ministry of Economy, Trade and Industry in Japan and so on.	0.00%	
Downstream leased assets	Not relevant, explanation provided	0.00	Kao has no downstream leased assets.	0.00%	Kao has no downstream leased assets.
Franchises	Not relevant, explanation provided	0.00	Kao has no Franchises.	0.00%	Kao has no Franchises.
Investments	Relevant, calculated	7187.14	Activity volume is the number of shares of stock holding on the securities report by type of issue. The emissions intensity used is the latest figure for GHG emissions for each company according to the holding ratio of stocks. Please note that companies with no published data available are excluded from the calculation. Kao's share is calculated by multiplying the activity volume by emissions intensity and then dividing the number proportionally at the ratio of the number of shares owned by Kao to the amount of outstanding shares.	0.00%	
Other (upstream)					
Other (downstream)					

CC14.2
Please indicate the verification/assurance status that applies to your reported Scope 3 emissions

Third party verification or assurance process in place

CC14.2a
Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/56/9956/Climate Change 2017/Shared Documents/Attachments/CC14.2a/KAO2017 CDP.pdf	all	ASAE3000	95
Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/56/9956/Climate Change 2017/Shared Documents/Attachments/CC14.2a/sustainability2017_e_all.pdf	Kao Sustainability Data Book 2017, 191page	ASAE3000	95

CC14.3
Are you able to compare your Scope 3 emissions for the reporting year with those for the previous year for any sources?

Yes

CC14.3a
Please identify the reasons for any change in your Scope 3 emissions and for each of them specify how your emissions compare to the previous year

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Purchased goods & services	Change in boundary	102.95	Increase	From 2016, the boundary was extended from Kao Group in Japan to Kao Group.
Capital goods	Change in output	3.87	Increase	We added some manufacturing facilities in 2016.
Fuel- and energy-related activities (not included in Scopes 1 or 2)	Emissions reduction activities	17.37	Decrease	The volume of fossel fuel consumption and purchased electricity decreased because of our many emission reduction activity (see CC12.1a)
Upstream transportation & distribution	Change in boundary	155.25	Increase	From 2016, the boundary was extended from Kao Group in Japan to Kao Group.
Waste generated in operations	Change in boundary	97.67	Increase	From 2016, the boundary was extended from Kao Group in Japan to Kao Group.
Business travel	Change in output	0.51	Increase	The employee increased in 2016.
Employee commuting	Change in boundary	41.28	Increase	From 2016, the boundary was extended from Kao Group in Japan to Kao Group.
Upstream leased assets	Change in boundary	100.00	Decrease	Kao rents some equipments like as sales car. Emission from these equipments have included in category "Scope1 and Scope2". Even until last year we calculaterd this cateory and selected "Not relevant, calculated" , we change to this category is "Not relevant, explanation provided" from this year.
Investments	Change in output	10.16	Decrease	The number of holding stocks decreased.

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Downstream transportation and distribution	Change in boundary	58.82	Increase	From 2016, the boundary was extended from Kao Group in Japan to Kao Group.
Processing of sold products	Change in output	13.20	Increase	The sales volume of product processed with sold products increased.
Use of sold products	Change in boundary	33.65	Increase	From 2016, the boundary was extended from Kao Group in Japan to Kao Group.
End-of-life treatment of sold products	Change in boundary	19.04	Increase	From 2016, the boundary was extended from Kao Group in Japan to Kao Group.

CC14.4

Do you engage with any of the elements of your value chain on GHG emissions and climate change strategies? (Tick all that apply)

Yes, our suppliers
Yes, our customers
Yes, other partners in the value chain

CC14.4a

Please give details of methods of engagement, your strategy for prioritizing engagements and measures of success

The Kao Group is promoting the following collaboration throughout the value chain.
- Working with the suppliers of raw materials, we are implementing various activities such as surveys according to Kao's Guidelines for CSR Procurement, surveys in the CDP Supply Chain Program, collection of a wide range of technical information from suppliers, joint development of technologies to be applied to Kao's products, and reduction of transportation load by revising the number of times raw materials are accepted.
- With respect to waste generated in plants, we promote activities to continuously reduce the emissions. In order to keep the volume of final landfill disposal at 0.1% or less, we also ensure waste materials are separated and train waste service companies to complete recycling resources.
- As for the transportation of products, increased use of transportation by railway and ship with less burden on the environment than trucking, and improvements in load efficiency for better transport efficiency have been implemented in collaboration with carriers.
- Working with retailers, for example, through joint development of ordering management for reducing the number of deliveries from Kao, we have worked to reduce transportation load, and also low carbon products have been introduced at events by retailers.
- Activities for raising consumers' environmental awareness and environmental classes for elementary and middle schools conducted at the Eco-Lab Museum founded in the Wakayama Plant of Kao Co., Ltd. in Japan.

The environmental burdens categorized by life cycle stage for each Kao's products are: procurement of raw materials: 35%, manufacturing: 9%, transport: 2%, use: 43%, disposal: 11%. This means that the possible reduction by Kao's own activities is approximately 10% of the whole environmental load. Given these circumstances, Kao made the Environmental Declaration in 2009 to espouse three "eco together" activities, namely Eco with Consumers, Eco with Business Partners and Eco with Society as collaborative strategies. One of the fruits of these activities is the annual evaluation and publication of targets for a reduction of life cycle CO2 for all of Kao's products.

CC14.4b

To give a sense of scale of this engagement, please give the number of suppliers with whom you are engaging and the proportion of your total spend that they represent

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
Collaboration/innovation	143	42.00%	Kao manages the suppliers based on CDP SC program. This program scores climate change actions on each our supplyer. We award suppliers for excellence in the areas of Quality, Cost, Delivery, Information Sharing, and Company Management and Sustainability including contents of CDP SC program reply.

Further Information

Module: Sign Off

Page: CC15. Sign Off

CC15.1
Please provide the following information for the person that has signed off (approved) your CDP climate change response

Name	Job title	Corresponding job category
Michitaka Sawada	President and Chief Executive Officer	Chief Executive Officer (CEO)

Further Information