

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

- Company name: The Chugoku Electric Power Co., Inc.
- Address (Head Office): 4-33 Komachi, Naka-ku, Hiroshima 730-8701 Tel: +81-82-241-0211
- Representative directors: Tomohide Karita, Chairman; Mareshige Shimizu, President & CEO
- Established: May 1, 1951
- Paid-in capital: 197,024 million yen
- Number of shares issued: 387,154,692
- Number of shareholders: 86,551
- Number of employees: 8,256
- Electricity sales
Residential (lighting): 16,813 million kWh
Commercial, industrial & other: 33,395 million kWh
Total: 50,208 million kWh
- Net sales (operating revenue) 1,243,742 million yen

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Reporting year	April 1, 2019	March 31, 2020	Yes	1 year

C0.3

(C0.3) Select the countries/areas for which you will be supplying data.

Japan

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

JPY

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Other, please specify

The scope of the report is The Chugoku Electric Power Co., Inc. on a disaggregated basis.

C-EU0.7

(C-EU0.7) Which part of the electric utilities value chain does your organization operate in? Select all that apply.

Row 1

Electric utilities value chain

Electricity generation

Transmission

Distribution

Other divisions

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
President	<p>As the chief executive responsible for environmental management throughout the Company, the President oversees environmental management on climate-related issues.</p> <p>Specifically, in order to promote efforts to address climate-related issues, the President regularly confirms the status and results of implementation during the fiscal year and provides instructions.</p> <p>In January 2020, the President formulated a new management vision for the Chugoku Electric Power Group. This plan adopted the goal of introducing renewable energy generation facilities by FY2030 that would be capable of generating between 300,000 kW and 700,000 kW of electricity.</p>

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	<ul style="list-style-type: none"> Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Setting performance objectives Monitoring implementation and performance of objectives Monitoring and overseeing progress against goals and targets for addressing climate-related issues 	<p>The Board of Directors determines basic policies, action plans, and environmental goals to promote efforts to address climate-related issues. In addition, the Board of Directors makes important changes to basic policies, action plans, and environmental targets as necessary.</p> <p>The directors in charge of environmental management for the entire Company provide an annual report of the status of implementation of their tasks to the Board of Directors.</p> <p>The Board of Directors oversees the Directors' implementation of tasks.</p> <p>Similarly, the Board of Directors monitors risks, including climate-related issues.</p>

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Chief Operating Officer (COO)	Both assessing and managing climate-related risks and opportunities	Quarterly
Sustainability committee	Assessing climate-related risks and opportunities	Half-yearly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

The Chief Operating Officer (COO), who is also the main promoter of environmental management, including climate-related issues, throughout the Company, assists the President in summarizing the entire Company's environmental management. The COO provides the necessary guidance to the entire Company upon implementation of the Environmental Action Plan.

Following due analysis, the Chief Operating Officer regularly reports to the Board of Directors on the enforcement status of environmental management, including climate-related issues, on a quarterly basis. The Board of Directors oversees the execution of the tasks of the Chief Operating Officer.

In order to promote climate-related issues and other environmental issues, the Company has established a Sustainability Committee chaired by the Chief Operating Officer which, on a semiannual basis, deliberates on and evaluates the status of implementation of important matters regarding the Environmental Action Plan decided by the Board of Directors.

With regard to the Environmental Action Plan, the Company has identified the promotion of global warming countermeasures as an important issue and has formulated an action plan to expand the use of fossil-free energy.

The Environmental Action Plan stipulates the use of the PDCA cycle to address various issues through environmental target-setting, performance evaluation, and plan review.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive	Type of incentive	Activity incentivized	Comment
All employees	Monetary reward	Emissions reduction project Energy reduction project Efficiency project Behavior change related indicator Supply chain engagement Company performance against a climate-related sustainability index	In fiscal 2005, the Company introduced the Environmental Recognition System to recognize those offices, employees, and others who have achieved outstanding results in responding to climate-related issues and other environmental issues. Two types of commendations were created. These are awarded as Certificates of Commendation and a monetary reward was provided as a supplementary prize. • President’s Commendation • Chief Operating Officer’s Commendation Under this system, the Sustainability Committee deliberates on the project submissions and, from the results, the President or Chief Operating Officer determines whether to award a commendation.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	1	April 2019 to March 2020
Medium-term	1	3	April 2020 to March 2022
Long-term	3	11	April 2022 to March 2031

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

In our process for identifying and assessing business risks, we define significant financial and strategic impacts on the business by classifying them according to level from the perspective of risk impact and frequency of occurrence.

Specifically, we create a risk map, with risks with the potential for significant impact on the Company's business assigned a level of 1 to 5 (Level 1 representing potential costs of less than 3 billion yen and Level 5 representing potential costs of 100 billion yen or more) depending on the risk impact (monetary and social impacts); as for frequency of risk occurrence, risks are assigned a level of 1 to 5 (Level 1 representing once every 1,000 years and Level 5 representing once every 3 years).

The higher the overall risk (calculated as risk impact level × risk occurrence level), the more significant a risk is defined for our business.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

Annually

Time horizon(s) covered

Short-term

Medium-term

Long-term

Description of process

Description of Process;

The Company has established a Risk Management Basic Policy outlining our basic approach to risk management as well as Risk Management Regulations outlining the stipulations for specific risk-management initiatives. These constitute our Company-wide risk management system.

The Company periodically identifies and evaluates risks and continuously implements risk management by implementing its management plan, including its countermeasures for significant business risks that have the potential to affect the Company's business operations.

Every year the Strategic Risk Council under the chairmanship of the President conducts a comprehensive review of its policy on significant business risks, including climate-related risks that should be prioritized for investment of management resources. It then reports to the Board of Directors, determines a policy response, and evaluates the results and effectiveness of the implementation of risk countermeasures.

The Company has established a dedicated organization to oversee Company-wide risk management and provides the guidance and coordination necessary for appropriate risk management.

The Company's individual departments and business divisions annually implement the risk management set forth in the management plan by reviewing their identification of risk, conducting risk assessments, and implementing preventive measures and recovery operations related to the main business, including climate-related risks.

In our process of risk identification and risk assessment, we classify risks according to level from the perspective of risk impact and frequency of occurrence.

Case studies on the process of identifying, assessing, and responding to physical risks and opportunities;

In our company, hydroelectric power generation accounts for about 25% of the total capacity of our own power generation facilities.

Should drought reduce the annual rainfall and snowfall, the output of our hydroelectric power generation facilities would be reduced, making it necessary to compensate by increasing the output of our thermal power generation facilities.

As a result, the increase in fuel costs for thermal power generation would likely have an impact on our business performance and financial situation.

Accordingly, in terms of risk assessment, drought is identified as a serious physical risk to our business.

To cope with this risk, the Company prepares for drought with financial provisions and equipment updates for more effective use of water resources in terms of equipment according to the medium-term management plan.

Case studies on transition risks and opportunities through identification, evaluation, and response processes;

In fiscal 2019, the electricity generated by our own thermal power generation facilities accounted for about 70% of the total amount of electricity sold.

The Company's business is subject to increases in the amount of tax on CO2 emissions in response to environmental issues such as climate change that may affect the Company's business.

Consequently, in terms of risk assessments, changes in the system related to taxation of CO2 is identified as a serious transition risk to the Company's business.

In order to address this risk, we have undertaken improvements to our facilities to ensure efficient use of fossil energy while expanding the introduction of non-fossil energy according to our medium-term management plan.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	<p>The Company's business is subject to the effects of policy changes related to nuclear power and stricter regulations that may lead to prolonged shutdown of nuclear power stations. The impact on operations may be accompanied by increased fuel costs for thermal power generation and increased CO2 emissions due to the increase in the ratio of thermal power generation to the total amount of power generated.</p> <p>The Company periodically conducts risk identification and risk assessment and formulates countermeasures for business risks, including current regulatory risks.</p> <p>The Company's Strategic Risk Council reviews important risks according to their specific nature.</p> <p>The Company also practices ongoing risk management by accommodating the business operation policies formulated annually by each department and business division.</p>
Emerging regulation	Relevant, always included	<p>The Company's business is subject to the effects of institutional reforms and tax reforms targeting the electric power industry; responses to climate change and other environmental issues; shifts in policy trends under the Basic Energy Plan; and increased taxation and higher costs arising from reviews of long-term power supply configuration strategies.</p> <p>The Company periodically conducts risk identification and risk assessment and formulates countermeasures for business risks, including current emerging regulatory risks.</p> <p>The Company's Strategic Risk Council reviews important risks according to their specific nature.</p> <p>The Company also practices ongoing risk management by</p>

		accommodating the business operation policies formulated annually by each department and business division.
Technology	Relevant, always included	<p>If technological innovations contribute to a significant decrease in the cost of generating renewable energy, thereby leading to a rapid increase in the introduction of renewable energy sources, it may be difficult to adjust for the resulting frequency variations, which would interfere with the stability of the electricity supply.</p> <p>The Company periodically conducts business and financial risk assessments that encompass technical risks in order to identify, assess, and evaluate risks.</p> <p>The Company's Strategic Risk Council reviews important risks according to their specific nature.</p> <p>The Company also practices ongoing risk management by accommodating the business operation policies formulated annually by each department and business division.</p>
Legal	Relevant, always included	<p>The Company's business is subject to the effects of power system reforms, such as the liberalization of retail sales and separation of electrical power production from power distribution and transmission, which would result in increased competition between existing general electricity providers and new electric power companies.</p> <p>The Company periodically conducts risk identification and risk assessment and formulates countermeasures for business risks, including current legal risks.</p> <p>The Company's Strategic Risk Council reviews important risks according to their specific nature.</p> <p>The Company also practices ongoing risk management by accommodating the business operation policies formulated annually by each department and business division.</p>
Market	Relevant, always included	<p>The Company's business is subject to the effects of future changes in the Company's credit rating and market interest rates.</p> <p>The Company periodically conducts risk identification and risk assessment and formulates countermeasures regarding current market risks.</p> <p>The Company's Strategic Risk Council reviews important risks according to their specific nature.</p> <p>The Company also practices ongoing risk management by accommodating the business operation policies formulated annually by each department and business division.</p>
Reputation	Relevant, always included	<p>The Company's business is subject to the effects of any action that violates laws and regulations or contravenes social norms, including ethics and morals, resulting in a decrease in public trust of the Company, a reduction in the amount of electricity sold, and difficulty in attracting new personnel.</p> <p>The Company periodically conducts risk identification and risk assessment and formulates countermeasures for current reputational</p>

		<p>risks.</p> <p>The Company's Strategic Risk Council reviews important risks according to their specific nature.</p> <p>The Company also practices ongoing risk management by accommodating the business operation policies formulated annually by each department and business division.</p>
Acute physical	Relevant, always included	<p>The Company's business is subject to the effects of a typhoon, storm surge, or other natural disaster that damages equipment or causes a long-term shutdown of the power supply, specifically through increased repair costs and the higher cost of procuring electricity on the market.</p> <p>The Company periodically conducts risk identification and risk assessment and formulates countermeasures for current acute physical risks.</p> <p>The Company's Strategic Risk Council reviews important risks according to their specific nature.</p> <p>The Company also practices ongoing risk management by accommodating the business operation policies formulated annually by each department and business division.</p>
Chronic physical	Relevant, always included	<p>The Company's business is subject to the effects of sluggish growth in electricity demand due to population decline and economic recession that would result in decreased electricity sales.</p> <p>The Company periodically conducts risk identification and risk assessment and formulates countermeasures for chronic physical risks.</p> <p>The Company's Strategic Risk Council reviews important risks according to their specific nature.</p> <p>The Company also practices ongoing risk management by accommodating the business operation policies formulated annually by each department and business division.</p>

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Market

Increased cost of raw materials

Primary potential financial impact

Increased direct costs

Company-specific description

Fuel prices may rise due to the potential for increased fuel taxes and production cutbacks in oil-producing countries implemented as global warming countermeasures. Since the amount of power generated by our own thermal power generation facilities represents as much as about 70% of the total amount of power sold in FY2019, any increase in the cost of fuel used for thermal power generation would likely have a significant impact on our business performance and financial situation.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

8,400,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

With regard to the financial impact of changes in raw material costs, the Company estimates that a \$1 per barrel fluctuation in crude CIF prices in fiscal 2019 has an impact of about 1.9 billion yen.

Accordingly, the impact of the crude oil CIF price fluctuation in 2019 on the cost of raw materials is estimated at 8.4 billion yen.

(1.9 billion yen × 4.4 [=72.2\$/b in FY2018 – 67.8\$/b in FY2019] = about 8.4 billion yen)

Cost of response to risk

550,000,000,000

Description of response and explanation of cost calculation

Although we remain focused on minimizing the risk of fuel price fluctuations by committing to a balanced configuration of power sources, we are proceeding with safety measures under the new regulatory standards adopted for the restart of Unit 2 of the Shimane Nuclear Power Plant and the start of operation of Unit 3 in order to reduce our consumption of fossil fuels.

The estimated total cost of safety measures for the Shimane Nuclear Power Station is entered as a risk response cost of 550 billion yen.

Comment

The reduction in fuel costs accruing from the operation of Units 2 and 3 of the Shimane Nuclear Power Station is estimated to be at least 100 billion yen annually.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Acute physical

Increased severity and frequency of extreme weather events such as cyclones and floods

Primary potential financial impact

Increased capital expenditures

Company-specific description

Unlike other businesses, many of the facilities of our businesses are located in mountainous areas with steep slopes and unstable geology. Therefore, typhoons and heavy rainfalls present a risk of severe impacts from landslides and other natural disasters.

Consequently, the potential exists for damage to our hydroelectric power generation facilities, thermal power plants, power transmission facilities, substations, and other power generation infrastructure that may result in long-term or large-scale power outages.

Such an eventuality could significantly impact our business performance and financial situation.

Time horizon

Short-term

Likelihood

Unlikely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

3,600,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

As the financial impact of typhoons, torrential rains, and other natural disasters, the Company posted an extraordinary loss of 3.6 billion yen due to the torrential rains that occurred in July 2018.

Cost of response to risk

2,600,000,000

Description of response and explanation of cost calculation

To protect our equipment from heavy rainfall and other natural disasters, we are implementing countermeasures through various projects.
The actual cost of restoration and construction work in FY2018 was 2.6 billion yen entered as a risk response cost.

Comment

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Chronic physical
Changes in precipitation patterns and extreme variability in weather patterns

Primary potential financial impact

Increased direct costs

Company-specific description

In our Company, hydroelectric power generation accounts for about 25% of the total capacity of our power generation facilities.
Should drought reduce our annual rainfall and snowfall, the output of our hydroelectric power generation facilities would be reduced, making it necessary to compensate by increasing the output of our thermal power generation facilities.
As a result, the increase in fuel costs for thermal power generation would likely have a significant impact on our business performance and financial situation.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

4,400,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

In calculating the financial impact of a drought, we estimate that each 1% fluctuation in the water discharge rate represented 400 million yen in terms of the impact on raw material costs in FY2019.

Accordingly, we estimate that the fluctuation in the water discharge rate in FY2019 had an impact on raw material costs of about 4.4 billion yen.

(400 million yen × 11.1 [92.4% in FY2018 - 81.3% in FY2019] = about 4.4 billion yen)

Cost of response to risk

300,000,000

Description of response and explanation of cost calculation

While the effects of drought do increase fuel costs, certain adjustments can be made through our Water Reserve System, which accumulates profits during floods to compensate for losses during times of drought.

The amount of compensation provided by the Drought Reserve Allowance in FY2019 in response to the cost of risk response was 300 million yen.

Comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of lower-emission sources of energy

Primary potential financial impact

Reduced direct costs

Company-specific description

Given the growing demand for low-emission energy, we are proceeding with the development of new nuclear power generation capacity at our Shimane and Kaminoseki sites.

The operation of the Shimane Nuclear Power Station and Kaminoseki Nuclear Power Station is expected to reduce CO2 emissions attributable to our power supply operations by about 20% and 60%, respectively.

At the same time, this will result in reduced fuel costs for our backup thermal power plants.

Time horizon

Long-term

Likelihood

Likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

100,000,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

The impact on raw materials cost per 1% utilization rate of Unit 2 of the Shimane Nuclear Power Station in FY 2019 is estimated at 600 million yen.

Accordingly, assuming Unit 2 of the Shimane Nuclear Power Station had operated at an average facility utilization rate of 79% during the past 10 years, the reduction in raw material costs would have been about 45 billion yen.

(Average facility utilization rate of 79% during past 10 years × 600 million yen per 1% fluctuation in utilization rate = about 45 billion yen)

As a result, the reduction in raw material costs accruing from the operation of Units 2 and 3 of the Shimane Nuclear Power Station is estimated to be at least 100 billion yen annually.

Cost to realize opportunity

550,000,000,000

Strategy to realize opportunity and explanation of cost calculation

In order to develop new nuclear power facilities, we are accommodating new regulatory standards and are working diligently to implement safety measures at the Shimane facility.

The estimated total cost of safety measures adopted for the Shimane Nuclear Power Station is entered as 550 billion yen as the cost of realizing an opportunity.

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of lower-emission sources of energy

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

Amid growing demand for lower-emission energy, the Company is implementing the Osaki CoolGen Project to develop a coal-fired thermal power in the future benefitting from excellent supply stability and economic operation.

This project aims to implement innovative low-carbon coal-fired power generation featuring Integrated Coal Gasification Fuel Cell Combined Cycle (IGFC) power

generation offering CO₂ separation and recovery.

This project has the potential to reduce CO₂ emissions significantly and benefit our public reputation.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

12,400,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

In light of the rising demand for lower-emission energy, this project may benefit our reputation and increase our operating revenue. Each 1% increase in our operating revenues (electric lighting and electricity charges) is estimated to accrue 12.4 billion yen (according to actual results for FY 2019).

Cost to realize opportunity

120,000,000,000

Strategy to realize opportunity and explanation of cost calculation

The Osaki CoolGen Project is operated by Osaki CoolGen Corporation, a joint venture of Electric Power Development Co., Ltd. and Chukogu Electric Power Co., Inc., with the assistance of the Ministry of Economy, Trade and Industry (FY 2012–15) and subsidized (since FY 2016) by the grant program of the New Energy and Industrial Technology Development Organization (NEDO), National Research and Development Agency. The total project cost of the oxygen-blown integrated coal gasification combined cycle (oxygen-blown IGCC) power generation demonstration plant (phase I) and the CO₂ separation/recovery IGCC demonstration plant (phase II) is entered as 120 billion yen as the cost of realizing an opportunity. About 50 billion yen is covered by the NEDO subsidy, with the balance shared between our Company and Electric Power Development Co., Ltd.

Comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of lower-emission sources of energy

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

The Company operates 92 hydroelectric power stations in the Chugoku region (representing about 25% of our power generation capacity) in a stable and efficient manner.

Consequently, our public reputation may improve as demand for lower-emission energy increases.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

12,400,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

In light of the rising demand for lower-emission energy, this project may benefit our reputation and increase our operating revenue. Each 1% increase in our operating revenues (electric lighting and electricity charges) is estimated to accrue 12.4 billion yen (according to actual results for FY 2019).

Cost to realize opportunity

17,800,000,000

Strategy to realize opportunity and explanation of cost calculation

We own 92 hydroelectric power stations (representing about 25% of our own power generation capacity) in the Chugoku region. We operate them in a stable and efficient manner while ensuring appropriate maintenance is carried out.

The hydropower operation and maintenance costs as well as various expenses in FY2019 are entered as 17.8 billion yen as the cost of realizing an opportunity.

Comment

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization’s strategy and/or financial planning?

Yes

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform its strategy?

No, but we anticipate using qualitative and/or quantitative analysis in the next two years

C3.1c

(C3.1c) Why does your organization not use climate-related scenario analysis to inform its strategy?

As for formulating an energy mix for our power supply and setting quantitative targets for CO2 emissions and emissions intensity, we believe that doing so is difficult because of the present uncertainty regarding the future operation and initial volume of nuclear power and renewable energy in 2050, and the accuracy of the low-carbon technologies that can be implemented.

The government will review the national Basic Energy Plan and energy mix within two years; we intend to analyze them based on their formulas.

C3.1d

(C3.1d) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	FA concrete replaces some components of cement, the precursor to concrete, with coal ash. The use of coal ash reduces CO2 generation.

		Using 13,000 metric tons of coal ash would supplant about 20% of the cement required for construction of Unit 2 of the Misumi Power Plant (scheduled for FY2018 to FY2022). Compared with the use of conventional concrete, this would eliminate 9,000 t-CO ₂ equivalent, or about 20% of anticipated CO ₂ emissions.
Supply chain and/or value chain	Yes	<p>The Company is working to increase the use of coal from short-haul coal-producing areas such as Indonesia and Russia. Australian coal can be shipped in about two weeks, Indonesian coal in about one week, and Russian coal in two or three days.</p> <p>Expanding the introduction of coal from short-haul production areas with short transportation times contributes to a reduction in fuel consumption by ships as well as reduced CO₂ emissions.</p> <p>We are also working to further reduce CO₂ emissions by increasing the size of our coal carriers and implementing joint transportation methods. Since 2001, we have used three large 100,000-tonne-class ocean-going vessels to transport coal to Japan.</p> <p>As a result, we have been able to save about 4,000 tonnes of ship fuel annually, or 8% compared to conventional shipping on 70,000- to 80,000-tonne-class vessels, while also reducing CO₂ emissions.</p>
Investment in R&D	Yes	<p>The Company is implementing the Osaki CoolGen Project (scheduled for FY2012 to FY2022) to develop a coal-fired thermal power plant benefitting from excellent supply stability and economic operation.</p> <p>This project aims to implement innovative low-carbon coal-fired power generation featuring integrated coal gasification fuel cell combined cycle (IGFC) technology offering CO₂ separation and recovery as a clean and highly efficient technology.</p> <p>This project is expected to reduce CO₂ emissions by about 30% compared to pulverized coal-fired power generation at ultra-supercritical (USC) pressure by improving the efficiency of the power generation system. Moreover, CO₂ emissions can be reduced by 90% by installing CO₂ separation and recovery equipment in each system and treating all gas.</p>
Operations	Yes	The Company has improved the thermal efficiency of its thermal power plants by introducing an LNG combined-cycle power generation system and adopting an ultra-supercritical pressure power generation system. The thermal efficiency in fiscal 2019 was 41.2% (43.5% when

		<p>converted on a lower calorific value basis). Improving the thermal efficiency of each thermal power plant by 1% accrues a CO2 emissions reduction effect of 500,000 t-CO2 annually; this also results in a reduction in fuel costs of approximately 200,000 kl (heavy oil equivalent). Accordingly, as outlined in our annual medium-term management plan, we are further improving thermal efficiency by implementing maintenance plans and introducing high-efficiency power generation facilities.</p>
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C3.1e

(C3.1e) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Direct costs Capital expenditures Assets Liabilities	<p>Direct costs; In preparation for typhoons and other natural disasters, the Company has included expenses in its medium-term financial plan to fund an initiative to improve the reliability of its facilities through inspections and repair of hydroelectric power generation facilities, steam power generation facilities, power transmission facilities, and substation facilities. Repair costs for FY 2019 totaled 92.4 billion yen.</p> <p>Capital expenditures; In cooperation with Hiroshima Prefecture, Energia Solution & Service (ESS), a Group company, the Company established the Hiroshima Renewable Energy Promotion Limited Liability Partnership and entered into a community-benefitting mega solar business. This project is the first mega solar business in the country to be jointly operated by a local government and power company. This project contributes to the region and promotes renewable energy at the same time by utilizing the profits earned from the power generation business for community-benefitting business. The Company launched the business in 2013 and introduced six locations generating 10,400 kW as of the end of fiscal 2019.</p> <p>Assets; In 1990, the Company started operating the Series 1 Yanai Power Station (125,000 kW × 6 units) as our first LNG combined-cycle power generation plant. This unit has been in operation for more than 20 years; therefore, between December 2010 and March 2015, all gas turbines and air compressors were replaced with updated equipment. As a result, the unit's power generation efficiency is expected to</p>

		<p>increase by 0.41%, and CO2 emissions are expected to decline by about 200,000 t-CO2 per year.</p> <p>Liabilities; The Company issued 130 billion yen in bonds in fiscal 2019. This includes corporate bonds to fund equipment and respond to short- and long-term natural disasters and CO2 emissions-reduction efforts.</p>
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C3.1f

(C3.1f) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

Nothing

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Intensity target

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1

Year target was set

2015

Target coverage

Other, please specify

Member Companies of the Electric Power Council for a Low Carbon Society

Scope(s) (or Scope 3 category)

Scope 1

Intensity metric

Metric tons CO2e per megawatt hour (MWh)

Base year

2013

Intensity figure in base year (metric tons CO2e per unit of activity)

0.57

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure

100

Target year

2030

Targeted reduction from base year (%)

35.08

Intensity figure in target year (metric tons CO₂e per unit of activity) [auto-calculated]

0.370044

% change anticipated in absolute Scope 1+2 emissions

35.08

% change anticipated in absolute Scope 3 emissions

Intensity figure in reporting year (metric tons CO₂e per unit of activity)

0.463

% of target achieved [auto-calculated]

53.51177259

Target status in reporting year

Underway

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

Please explain (including target coverage)

This is the overall target of the Electric Power Council for a Low Carbon Society and is based on the government's long-term energy supply and demand forecast for FY 2030. A total of 62 companies, including our own, participate as members of the Electric Power Council for a Low Carbon Society. Our Company and the other member companies promote their own responsible PDCA cycles compatible with their respective business types and will promote initiatives aimed at achieving this goal across the council.

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

Target(s) to increase low-carbon energy consumption or production

C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.

Target reference number

Low 1

Year target was set

2020

Target coverage

Company-wide

Target type: absolute or intensity

Absolute

Target type: energy carrier

Electricity

Target type: activity

Production

Target type: energy source

Renewable energy source(s) only

Metric (target numerator if reporting an intensity target)

Percentage

Target denominator (intensity targets only)

Base year

2020

Figure or percentage in base year

100

Target year

2030

Figure or percentage in target year

130

Figure or percentage in reporting year

100

% of target achieved [auto-calculated]

0

Target status in reporting year

New

Is this target part of an emissions target?

This target is part of our plan to achieve the emissions intensity target (int1) of the Electric Power Council for a Low Carbon Society.

Is this target part of an overarching initiative?

No, it's not part of an overarching initiative

Please explain (including target coverage)

This target is the target for our entire Group.
 Our Group aims to introduce between 300,000 kW and 700,000 kW of new renewable energy power generation facilities by fiscal 2030.
 Our Group operates about 1 million kW of renewable energy generation facilities as of the benchmark year.

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	2	7,000,000
Implementation commenced*	1	
Implemented*	1	150,000
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Energy efficiency in production processes

Machine/equipment replacement

Estimated annual CO2e savings (metric tonnes CO2e)

150,000

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

1,300,000,000

Investment required (unit currency – as specified in C0.4)

23,300,000,000

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

The Company is focused on maintaining or improving the thermal efficiency of the equipment in our thermal power plants by steadily undertaking routine maintenance and regular repairs.

Improving the thermal efficiency of each thermal power plant by 1% accrues a CO2 emissions reduction effect of about 500,000 t-CO2 annually; this also results in a reduction in fuel costs of approximately 200,000 kl (heavy oil equivalent).

Our actual repair expenses for FY2019 are entered as an investment amount of 23.3 billion yen.

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	At the Shimane Nuclear Power Station, we are responding to new regulatory standards and steadily implementing safety measures. In order to achieve the benchmark indicators based on the Act on the Rational Use of Energy, we have adopted ultra supercritical pressure generation, a state-of-the-art power generation system equivalent to the best available technology, for Unit 2 of Misumi Power Station.

C4.5

(C4.5) 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?

No

C-EU4.6

(C-EU4.6) Describe your organization's efforts to reduce methane emissions from your activities.

Methane is generated through incomplete combustion of fuel, but our thermal power stations do not emit methane because they are designed to operate for complete fuel combustion.

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

April 1, 2013

Base year end

March 31, 2014

Base year emissions (metric tons CO₂e)

25,093,558

Comment

Scope 2 (location-based)

Base year start

April 1, 2013

Base year end

March 31, 2014

Base year emissions (metric tons CO₂e)

34

Comment

Scope 2 (market-based)

Base year start

April 1, 2013

Base year end

March 31, 2014

Base year emissions (metric tons CO2e)

28

Comment

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

Japan Ministry of the Environment, Law Concerning the Promotion of the Measures to Cope with Global Warming, Superseded by Revision of the Act on Promotion of Global Warming Countermeasures (2005 Amendment)

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

19,106,197

Start date

April 1, 2019

End date

March 31, 2020

Comment

Past year 1

Gross global Scope 1 emissions (metric tons CO2e)

20,343,309

Start date

April 1, 2018

End date

March 31, 2019

Comment

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO₂e?

Reporting year

Scope 2, location-based

55

Scope 2, market-based (if applicable)

46

Start date

April 1, 2019

End date

March 31, 2020

Comment

Past year 1

Scope 2, location-based

49

Scope 2, market-based (if applicable)

36

Start date

April 1, 2018

End date

March 31, 2019

Comment

C6.4

(C6.4) 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

C6.4a

(C6.4a) 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

Emissions associated with the handling of HFCs contained in commercial air conditioning and refrigeration equipment

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)

Emissions are not relevant

Explain why this source is excluded

Because it is an extremely small amount compared with our Scope 1,2 emissions.

C6.5

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Not relevant, explanation provided

Please explain

Because GHG emissions from this source are small compared to the total Scope 3 emissions of the Company, we believe the impact on overall supply chain emissions will be small.

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

555,693

Emissions calculation methodology

Calculated by multiplying the total capital investment by the emissions intensity per capital goods of electricity.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Please explain

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Metric tonnes CO2e

11,534,246

Emissions calculation methodology

- The GHG emissions from this emissions source are calculated by multiplying the amount of power generated (power transmission end) by the power generation emissions intensity as stipulated in the report of the Central Research Institute of Electric Power Industry titled "Life Cycle CO2 Emissions Evaluation of Japanese Power Generation Technology (July 2010)."
- GHG emissions from this source are calculated based on fuel consumption and the emissions coefficient for CO2 emissions associated with other companies receiving electricity.
- GHG emissions from this source are calculated by multiplying the amount of electricity received by other companies by the emissions intensity in effect at the time of fuel procurement.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Please explain

Upstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Please explain

Because GHG emissions from this source are small compared to the total Scope 3 emissions of the Company, we believe the impact on overall supply chain emissions will be small.

Waste generated in operations

Evaluation status

Relevant, calculated

Metric tonnes CO2e

68,044

Emissions calculation methodology

GHG emissions from this source are calculated by multiplying the amount of waste generated by the emissions intensity classified by category.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Please explain

Business travel

Evaluation status

Relevant, calculated

Metric tonnes CO2e

1,046

Emissions calculation methodology

GHG emissions from this source are calculated by multiplying the number of workers by the emissions intensity per worker.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Please explain

Employee commuting

Evaluation status

Relevant, calculated

Metric tonnes CO2e

2,709

Emissions calculation methodology

For each office, the number of employees and number of working days by city segment and work type multiplied by the emissions intensity per working day

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Please explain

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Please explain

Because GHG emissions from this source are small compared to the total Scope 3 emissions of the Company, we believe the impact on overall supply chain emissions will be small.

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Please explain

Because GHG emissions from this source are small compared to the total Scope 3 emissions of the Company, we believe the impact on overall supply chain emissions will be small.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Please explain

Due to the electricity utility industry

Use of sold products

Evaluation status

Not relevant, explanation provided

Please explain

Due to the electricity utility industry

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Please explain

Due to the electricity utility industry

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Please explain

Due to the electricity utility industry

Franchises

Evaluation status

Not relevant, explanation provided

Please explain

Due to the electricity utility industry

Investments

Evaluation status

Not relevant, explanation provided

Please explain

Due to the electricity utility industry

Other (upstream)

Evaluation status

Please explain

Other (downstream)

Evaluation status

Please explain

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO₂e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.61

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO₂e)

19,106,243

Metric denominator

megawatt hour generated (MWh)

Metric denominator: Unit total

31,160,625

Scope 2 figure used

Market-based

% change from previous year

0.76

Direction of change

Increased

Reason for change

The emissions intensity increases as the amount of hydroelectric power generated decreases.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO ₂ e)	GWP Reference
----------------	--	---------------

CO2	19,064,466	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	27,339	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	14,392	IPCC Fourth Assessment Report (AR4 - 100 year)

C-EU7.1b

(C-EU7.1b) Break down your total gross global Scope 1 emissions from electric utilities value chain activities by greenhouse gas type.

	Gross Scope 1 CO2 emissions (metric tons CO2)	Gross Scope 1 methane emissions (metric tons CH4)	Gross Scope 1 SF6 emissions (metric tons SF6)	Total gross Scope 1 emissions (metric tons CO2e)	Comment
Fugitives	0	0	14,392	14,392	
Combustion (Electric utilities)	19,064,466	0	0	19,091,805	The total value of emissions does not equal the total Scope 1 emissions because 27,339 t-CO2 of N2O were emitted.
Combustion (Gas utilities)	0	0	0	0	
Combustion (Other)	0	0	0	0	
Emissions not elsewhere classified	0	0	0	0	

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
Japan	19,106,197

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By activity

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
The electricity industry	19,106,197

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Comment
Electric utility activities	19,106,197	

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) 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.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	Not applicable
Other emissions reduction activities	1,237,102	Decreased	6.1	{Scope 1+2 (market basis) for current year – Scope 1+2 (market basis) for previous year} ÷ Scope 1+2 (market basis) for previous year × 100 = (19,106,243 t - 20,343,345 t) ÷ 20,343,345 t × 100 = -6.1%
Divestment				
Acquisitions				

Mergers				
Change in output				
Change in methodology				
Change in boundary				
Change in physical operating conditions				
Unidentified				
Other				

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 15% but less than or equal to 20%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	No
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No

Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	71,675,400	71,675,400
Consumption of self-generated non-fuel renewable energy				
Total energy consumption		0	71,675,400	71,675,400

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	No
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Crude Oil

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

1,051

MWh fuel consumed for self-generation of electricity

1,051

MWh fuel consumed for self-generation of heat

0

Emission factor

0.00262

Unit

metric tons CO2 per liter

Emissions factor source

Act on Promotion of Global Warming Countermeasures

Comment

Fuels (excluding feedstocks)

Petrol

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

10,692

MWh fuel consumed for self-generation of electricity

10,692

MWh fuel consumed for self-generation of heat

0

Emission factor

0.00232

Unit

metric tons CO2 per liter

Emissions factor source

Act on Promotion of Global Warming Countermeasures

Comment

Fuels (excluding feedstocks)

Diesel

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

165,137

MWh fuel consumed for self-generation of electricity

165,137

MWh fuel consumed for self-generation of heat

0

Emission factor

0.00258

Unit

metric tons CO2 per liter

Emissions factor source

Act on Promotion of Global Warming Countermeasures

Comment

Fuels (excluding feedstocks)

Other, please specify

Bunker A

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

383,191

MWh fuel consumed for self-generation of electricity

383,191

MWh fuel consumed for self-generation of heat

0

Emission factor

0.00271

Unit

metric tons CO2 per liter

Emissions factor source

Act on Promotion of Global Warming Countermeasures

Comment

Fuels (excluding feedstocks)

Other, please specify

Bunker B · C

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

2,954,869

MWh fuel consumed for self-generation of electricity

2,954,869

MWh fuel consumed for self-generation of heat

0

Emission factor

0.003

Unit

metric tons CO2 per liter

Emissions factor source

Act on Promotion of Global Warming Countermeasures

Comment

Fuels (excluding feedstocks)

Liquefied Petroleum Gas (LPG)

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

268

MWh fuel consumed for self-generation of electricity

268

MWh fuel consumed for self-generation of heat

0

Emission factor

3

Unit

metric tons CO2 per metric ton

Emissions factor source

Act on Promotion of Global Warming Countermeasures

Comment

Fuels (excluding feedstocks)

Liquefied Natural Gas (LNG)

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

27,450,787

MWh fuel consumed for self-generation of electricity

27,450,787

MWh fuel consumed for self-generation of heat

0

Emission factor

2.7

Unit

metric tons CO2 per metric ton

Emissions factor source

Act on Promotion of Global Warming Countermeasures

Comment

Fuels (excluding feedstocks)

Coal

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

40,709,393

MWh fuel consumed for self-generation of electricity

40,709,393

MWh fuel consumed for self-generation of heat

0

Emission factor

2.33

Unit

metric tons CO2 per metric ton

Emissions factor source

Act on Promotion of Global Warming Countermeasures

Comment

Fuels (excluding feedstocks)

Town Gas

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

13

MWh fuel consumed for self-generation of electricity

13

MWh fuel consumed for self-generation of heat

0

Emission factor

0.00223

Unit

metric tons CO2 per m3

Emissions factor source

Act on Promotion of Global Warming Countermeasures

Comment

C-EU8.2d

(C-EU8.2d) For your electric utility activities, provide a breakdown of your total power plant capacity, generation, and related emissions during the reporting year by source.

Coal – hard

Nameplate capacity (MW)

2,590

Gross electricity generation (GWh)

16,987

Net electricity generation (GWh)

16,987

Absolute scope 1 emissions (metric tons CO₂e)

Scope 1 emissions intensity (metric tons CO₂e per GWh)

Comment

Lignite

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO₂e)

0

Scope 1 emissions intensity (metric tons CO₂e per GWh)

0

Comment

Oil

Nameplate capacity (MW)

2,836

Gross electricity generation (GWh)

1,175

Net electricity generation (GWh)

1,175

Absolute scope 1 emissions (metric tons CO₂e)

Scope 1 emissions intensity (metric tons CO₂e per GWh)

Comment

Gas

Nameplate capacity (MW)

2,375

Gross electricity generation (GWh)

11,812

Net electricity generation (GWh)

11,812

Absolute scope 1 emissions (metric tons CO₂e)

Scope 1 emissions intensity (metric tons CO₂e per GWh)

Comment

Biomass

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO₂e)

0

Scope 1 emissions intensity (metric tons CO₂e per GWh)

0

Comment

Waste (non-biomass)

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO₂e)

0

Scope 1 emissions intensity (metric tons CO₂e per GWh)

0

Comment

Nuclear

Nameplate capacity (MW)

820

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO₂e)

0

Scope 1 emissions intensity (metric tons CO₂e per GWh)

0

Comment

Fossil-fuel plants fitted with CCS

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO₂e)

0

Scope 1 emissions intensity (metric tons CO₂e per GWh)

0

Comment

Geothermal

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO₂e)

0

Scope 1 emissions intensity (metric tons CO₂e per GWh)

0

Comment

Hydropower

Nameplate capacity (MW)

2,905

Gross electricity generation (GWh)

2,943

Net electricity generation (GWh)

2,943

Absolute scope 1 emissions (metric tons CO₂e)

0

Scope 1 emissions intensity (metric tons CO₂e per GWh)

0

Comment

Wind

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Solar

Nameplate capacity (MW)

6

Gross electricity generation (GWh)

7

Net electricity generation (GWh)

7

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Marine

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Other renewable

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO₂e)

0

Scope 1 emissions intensity (metric tons CO₂e per GWh)

0

Comment

Other non-renewable

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO₂e)

0

Scope 1 emissions intensity (metric tons CO₂e per GWh)

0

Comment

Total

Nameplate capacity (MW)

11,532

Gross electricity generation (GWh)

32,925

Net electricity generation (GWh)

32,925

Absolute scope 1 emissions (metric tons CO₂e)

19,106,197

Scope 1 emissions intensity (metric tons CO₂e per GWh)

580

Comment

C-EU8.4

(C-EU8.4) Does your electric utility organization have a transmission and distribution business?

Yes

C-EU8.4a

(C-EU8.4a) Disclose the following information about your transmission and distribution business.

Country/Region

Japan

Voltage level

Transmission (high voltage)

Annual load (GWh)

50,208

Annual energy losses (% of annual load)

4.9

Scope where emissions from energy losses are accounted for

Scope 1

Emissions from energy losses (metric tons CO₂e)

1,400,000

Length of network (km)

92,000

Number of connections

5,400,000

Area covered (km²)

32,000

Comment

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description

Other, please specify
Thermal efficiency of thermal power plants

Metric value

43.5

Metric numerator

Gross thermal efficiency (LHV standard)

Metric denominator (intensity metric only)

% change from previous year

0.7

Direction of change

Increased

Please explain

The Company has improved the thermal efficiency of its thermal power plants by introducing an LNG combined-cycle power generation system and adopting a ultra supercritical pressure power generation system. The thermal efficiency in fiscal 2019 was 41.2% (43.5% when converted on a lower calorific value basis).

Improving the thermal efficiency of each thermal power plant by 1% accrues a CO₂ emissions reduction effect of about 500,000 t-CO₂ annually; this also results in a reduction in fuel costs of approximately 200,000 kl (heavy oil equivalent).

We are further improving thermal efficiency by carrying out daily maintenance and regular repairs to facilities and by introducing high-efficiency power generation facilities.

C-EU9.5a

(C-EU9.5a) Break down, by source, your total planned CAPEX in your current CAPEX plan for power generation.

Primary power generation source	CAPEX planned for power generation from this source	Percentage of total CAPEX planned for power generation	End year of CAPEX plan	Comment
Fossil-fuel	120,000,000,000	100	2022	The Company is implementing the

plants fitted with CCS			<p>Osaki CoolGen Project to develop a coal-fired thermal power plant benefitting from excellent supply stability and economic operation. This project aims to implement innovative low-carbon coal-fired power generation featuring integrated coal gasification fuel cell combined cycle (IGFC) technology offering CO₂ separation and recovery as a clean and highly efficient technology.</p> <p>The electricity generated by the power generation facilities under this project is sold on the Japan Electric Power Exchange (JEPEX).</p> <p>The total project cost of the oxygen-blown integrated coal gasification combined cycle (oxygen-blown IGCC) power generation demonstration plant (phase I) and the CO₂ separation/recovery IGCC demonstration plant (phase II) is entered as a capital expenditure of 120 billion yen. About 50 billion yen is covered by the NEDO subsidy, with the balance shared between our Company and Electric Power Development Co., Ltd.</p>
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C-EU9.5b

(C-EU9.5b) Break down your total planned CAPEX in your current CAPEX plan for products and services (e.g. smart grids, digitalization, etc.).

Products and services	Description of product/service	CAPEX planned for product/service	Percentage of total CAPEX planned products and services	End of year CAPEX plan
Other, please specify CO ₂ separation and recovery technology	The Company is implementing the Osaki CoolGen Project to develop a coal-fired thermal power plant benefitting from excellent supply stability and economic operation. This project aims to implement innovative low-carbon coal-fired power generation featuring integrated coal	27,000,000,000	100	2020

	<p>gasification fuel cell combined cycle (IGFC) technology offering CO2 separation and recovery as a clean and highly efficient technology. In order to develop business using this technology in the future, this project aims to establish CO2 separation/recovery technology in phase II after demonstrating oxygen-blown integrated coal gasification combined cycle (oxygen-blown IGCC) in phase I.</p> <p>The total project cost of the CO2 separation/recovery IGCC demonstration plant (phase II) is entered as a capital expenditure of 27 billion yen. About 15 billion yen is covered by the NEDO subsidy, with the balance shared between our Company and Electric Power Development Co., Ltd.</p>			
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C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	

C-CO9.6a/C-EU9.6a/C-OG9.6a

(C-CO9.6a/C-EU9.6a/C-OG9.6a) Provide details of your organization's investments in low-carbon R&D for your sector activities over the last three years.

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Other, please specify Development of innovative low-carbon coal-fired power	Applied research and development	61-80%		The Company is implementing the Osaki CoolGen Project to develop a coal-fired

<p>generation through Integrated Coal Gasification Fuel Cell Combined Cycle (IGFC) and CO2 separation/recovery technology</p>				<p>thermal power plant benefitting from excellent supply stability and economic operation. This project aims to implement innovative low-carbon coal-fired power generation featuring integrated coal gasification fuel cell combined cycle (IGFC) technology offering CO2 separation and recovery as a clean and highly efficient technology. The Osaki CoolGen Project is operated by Osaki CoolGen Corporation, a joint venture of Chukogu Electric Power Co., Inc. and Electric Power Development Co., Ltd., with the assistance of the Ministry of Economy, Trade and Industry (FY 2012–15) and subsidized (since FY 2016) by the grant program of the New Energy and Industrial Technology Development Organization (NEDO), National Research and Development Agency.</p>
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C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

 C10-1_Third_party_assurance.pdf

Page/ section reference

Page1

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

 C10-1_Third_party_assurance.pdf

Page/ section reference

Page1

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

 C10-1_Third_party_assurance.pdf

Page/section reference

Page1

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

100

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

No, but we are actively considering verifying within the next two years

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.

Japan carbon tax

C11.1c

(C11.1c) Complete the following table for each of the tax systems you are regulated by.

Japan carbon tax

Period start date

April 1, 2019

Period end date

March 31, 2020

% of total Scope 1 emissions covered by tax

100

Total cost of tax paid

5,400,000,000

Comment

The total tax expense of 5.4 billion yen is the amount of fuel consumed in fiscal 2019 multiplied by the tax rate for Global Warming Prevention Measures.

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

We are working to increase our use of nuclear power, renewable energy, and other fossil-free energy sources. In addition, we are striving to reduce emissions from our new thermal power plants by focusing on the efficient use of fossil fuels and by adopting the best available technologies that can be used economically.

As a specific example of the above initiatives, our Group has set a goal of introducing a new renewable energy power generation facility providing between 300,000 kW and 700,000 kW of power by fiscal 2030.

In order to achieve our target, we are building biomass power plants in our Kaita and Onahama locations and we are participating in wind power generation projects.

The Company is implementing the Osaki CoolGen Project to develop a coal-fired thermal power plant benefitting from excellent supply stability and economic operation. This project aims to implement innovative low-carbon coal-fired power generation featuring integrated coal gasification fuel cell combined cycle (IGFC) technology offering CO₂ separation and recovery as a clean and highly efficient technology.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price

Drive energy efficiency

GHG Scope

Scope 1

Application

Applicable when we submit a bid for thermal power

Actual price(s) used (Currency /metric ton)

435

Variance of price(s) used

When submitting a thermal power supply bid, the Company conducts price evaluations that consider the cost of CO₂ countermeasures in accordance with the Guidelines Pertaining to the Submission of a New Thermal Power Supply Bid.

In a 2015 thermal power supply bid submission, the Company used the price of near-term commodity futures contracts for CER to determine the average of each day's closing price from January to December 2012 as 435 yen/t-CO₂.

Type of internal carbon price

Internal fee

Impact & implication

The Company evaluates the difference between the CO₂ emissions coefficient of the power supply tender and the standard emissions coefficient by adding the CO₂

countermeasure cost, calculated by multiplying the market price of carbon credits (435 yen/t-CO₂) to the bid price.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers

Yes, other partners in the value chain

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Innovation & collaboration (changing markets)

Details of engagement

Run a campaign to encourage innovation to reduce climate impacts on products and services

% of suppliers by number

1

% total procurement spend (direct and indirect)

1

% of supplier-related Scope 3 emissions as reported in C6.5

0

Rationale for the coverage of your engagement

The Company is working to increase the use of coal from short-haul coal-producing areas such as Indonesia and Russia. Australian coal can be shipped in about two weeks, Indonesian coal in about one week, and Russian coal in two or three days.

Expanding the introduction of coal from short-haul production areas with short transportation times contributes to a reduction in fuel consumption by ships as well as reduced CO₂ emissions.

We are also working to reduce CO₂ emissions by increasing the size of coal carriers and implementing joint transportation.

Impact of engagement, including measures of success

The Company introduced three large 100,000-tonne-class vessels in 2001 as outbound vessels to transport coal to Japan.

Compared to the conventional 70,000- to 80,000-tonne-class ships, this innovation reduces fuel consumption by about 8%, representing a savings of about 4,000 tonnes of fuel annually as well as reduced CO₂ emissions.

We are also working to increase joint transportation with other companies, and we are pursuing transportation efficiencies to further reduce fuel consumption from shipping as well as CO2 emissions.

Currently, the Ministry of Land, Infrastructure, Transport and Tourism is promoting port development in the Shimomatsu area through the International Bulk Strategic Port Development Project. This will lead to the increased use of larger-sized vessels and additional joint transportation of ships, to an extent not seen previously.

After completion of the port development project, the maximum size of ship that can be accommodated in the Shimomatsu area will increase from 100,000 to 200,000 tonnes. Moreover, further increases in transport efficiency and reduction of environmental impacts are expected. As well, joint transportation with other companies is also expected to increase.

Comment

C12.1d

(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.

As a global warming countermeasure, it is necessary to promote the adoption of renewable energy and expand the introduction of energy-efficient equipment at the earliest opportunity. However, because of budget constraints, implementing these measures in public facilities has proved difficult.

Consequently, in collaboration with Hiroshima Prefecture and Energia Solution & Service (ESS), a group company, we established the Hiroshima Renewable Energy Promotion Limited Liability Partnership to promote a mega solar business that returns profits to the community. Launched in 2013, this initiative generated 10,400 kW (at six locations) as of the end of FY2019.

The proceeds from the power generated under this project are used as a source of funding for the implementation of energy-efficiency initiatives in Hiroshima Prefecture and the introduction of facilities such as energy-efficient equipment and solar power generation systems.

Since the start of the project, financial assistance has been provided to about 120 projects. At the same time, we have achieved our regional contribution objective and have promoted the introduction of renewable energy.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

Trade associations

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

The Electric Power Council for a Low Carbon Society

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The council is steadily promoting efforts to achieve the goals set forth in the Action Plan for Achieving a Low-carbon Society in the electricity business. Therefore, the council promotes and supports the efforts of member companies and promotes the PDCA cycle. As a result, the members of this council are working together to make a low-carbon society a reality.

How have you influenced, or are you attempting to influence their position?

The Chief Operating Officer (Environment) participates as a managing director and confirms the status of initiatives undertaken under the Action Plan for Achieving a Low Carbon Society.

C12.3f

(C12.3f) 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?

The Company has formulated a Company-wide plan and has developed a PDCA cycle with regard to the approach stated in the Action Plan for the Electricity Business for Achieving a Low-carbon Society as formulated by the Electric Power Council for a Low Carbon Society. The Company shall review the plans, achievements, evaluations, and other aspects of these initiatives annually in the Sustainability Committee through reporting and deliberation and shall, if necessary, refer it to the Management Committee.

C12.4

(C12.4) 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

In mainstream reports

Status

Complete

Attach the document

 C12-4_Annual_Securities_Reports.pdf

Page/Section reference

From page 10 to page 14.

Content elements

Governance
Strategy
Risks & opportunities

Comment


Publication

In voluntary communications

Status

Underway – previous year attached

Attach the document

 C12-4_Environmental_Report.pdf

Page/Section reference

From page 3 to page 17.
Page 47,48,50.

Content elements

Governance
Strategy
Emissions figures
Emission targets
Other metrics

Comment

C15. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	President & CEO	President

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I am submitting to	Public or Non-Public Submission
I am submitting my response	Investors	Public

Please confirm below

I have read and accept the applicable Terms