

C0. Introduction

C0.1

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

Based on our basic philosophy that "Our company will not grow without the prosperity of the Tohoku region", we have delivered electricity which is essential for a prosperous living to our customers and have prospered with the region.

As the environment surrounding the energy business evolves quickly, as seen with the progress of the electric power system reform, the Tohoku Electric Power Group has set the "Tohoku Electric Power Group Medium-term Management Policy (FY 2017 - FY 2020)" as a guide for sustainable growth with a region still in the midst of reconstruction.

In the future, based on this policy, we will respond to the expectations of our customers and local communities by actively evaluating together the new business opportunities and challenging further growth.

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
Row 1	April 1 2016	March 31 2017	No	<Not Applicable>
Row 2	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Row 3	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Row 4	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>

C0.3

(C0.3) Select the countries/regions 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 consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

Financial control

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

Please select

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) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
President	The President is the chairman of the Board of Directors. At the Board of Directors, important matters of business execution related to climate change are determined, and reports on the status of business execution from Directors and execution of duties by Directors are supervised.

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
Sporadic - as important matters arise	Reviewing and guiding business plans	At the Board of Directors, important matters of business execution related to climate change are determined, and reports on the status of business execution from Directors and execution of duties by Directors are supervised. Climate change issues are handled by the Board of Directors as they arise.

C1.2

(C1.2) Below board-level, provide the highest-level management 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
President	Both assessing and managing climate-related risks and opportunities	Less frequently than annually

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.

At the Global Environment Issue Countermeasure Council I chaired by the President, we deliberate on companywide environmental management, including climate change issues, from a comprehensive perspective and promote environmental management which aims for sustainable development with the local community.

In addition, we have established, under the Global Environment Issue Countermeasure Council, the Environmental Management Committee which is chaired by the Managing Executive Officer and deliberates on company-wide environmental management policies and plans, individual measures, performance evaluation across the divisions, and provides proposals and reports to the Global Environment Issue Countermeasure Council. A PDCA cycle is implemented to evaluate the company-wide environmental management policies and plans, individual measures, and performance evaluations to reduce greenhouse gases to realize a low-carbon society (replacement of the Shin-Sendai Thermal Power Station that achieved the world's highest thermal efficiency) and actively use renewable energy by making use of the abundant nature of Tohoku and Niigata (including the construction of Tsugaru Power Station and the Dai-ni Yabukami Power Station), both of which are measures for the Mid-term Environmental Action Plan that sets "promotion of multifaceted global warming countermeasures based on S+3E (Safety, Energy Security, Economy and Environmental Conservation)" as one of the important issues.

C1.3

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

Yes

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues.

Who is entitled to benefit from these incentives?

All employees

Types of incentives

Monetary reward

Activity incentivized

Other, please specify (Environmental activities, emissions reduction, energy reduction and technological development for efficiency improvement)

Comment

We have a system to honor those who have contributed significantly to initiatives such as environmental activities, emissions reduction, energy reduction and technological development for efficiency improvement.

C2. Risks and opportunities

C2.1

(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.

	From (years)	To (years)	Comment
Short-term	0	1	Fiscal year 2016 - 2017
Medium-term	1	4	Fiscal year 2017 - 2020
Long-term	4	14	Fiscal year 2020 - 2030

C2.2

(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

C2.2a

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Annually	Up to 1 year	

C2.2b

(C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.

[How are climate-related risks identified and assessed at a company level?]

Every year, each division regularly conducts a business and financial risk analysis, which includes the long-term risks of climate change as determined by the Company. Among the business risks for the Company, for example, are the transition risk to performance and financial conditions as a result of a rise in fuel prices and transportation costs due to a significant increase in taxes for global warming countermeasures, and the particularly large physical risk to our 209 hydropower stations (the most ownership in the country) due to abnormal changes in precipitation. Regarding these important risks, we regularly identify and evaluate risks according to their contents, and for risks that may have a serious effect on our management, each division formulates actions such as countermeasures for each fiscal year, which are incorporated into the management plan and managed as risks in the management cycle.

[How are climate-related risks identified and assessed at an asset level?]

Every year, when conducting the periodic business and financial risks analysis for each division, which includes climate change risks, we also identify, analyze and evaluate risks for each business establishment including plants. Regarding important risks including physical factors such as natural disasters, in addition to establishing in-house regulations, we prepare for emergency risks through trainings for typhoons and floods and other disasters, as well as set up an internal committee to improve the safety of the nuclear power stations by regularly evaluating and analyzing safeness, considering countermeasures to reduce risks and respond in an appropriate manner.

[How does your organization define substantive financial or strategic impact on your business?]

Regarding the risks periodically reported from each business establishment, the risks are managed by classifying them according to their respective categories, occurrence frequency and assumed damages. For climate change risks which have financial impact above a certain level, internal committees will consider countermeasures.

C2.2c

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	In the event that the suspension of nuclear power stations will be prolonged and impact stable operation due to changes in future policy and regulations, the business performance and financial condition may be affected. We regularly conduct business and financial risk analysis, including current regulatory risks, to identify, analyze and evaluate the risks. Important risks are taken into consideration at internal committees according to their content and incorporated into the PDCA cycle appropriately at the company level, including incorporating it into the annual Mid-term Plan and Business Implementation Plan of each division.
Emerging regulation	Relevant, always included	Business performance and financial condition may be affected by policy changes based on the Electricity System Reform or the Strategic Energy Plan, including the establishment of the Organization for Cross-regional Coordination of Transmission Operators, electric power system reform consisting of full deregulation in the retail field and legal unbundling of the transmission/distribution sectors. The Company periodically conducts business and financial risk analysis including emerging regulatory risks, and identifies, analyzes and evaluates the risks. Important risks are taken into consideration at internal committees according to their content and incorporated into the PDCA cycle appropriately at the company level, including incorporating it into the annual Mid-term Plan and Business Implementation Plan of each division.
Technology	Relevant, always included	Nuclear power back-end projects are ultra-long-term projects and imply future uncertainty, but the risks of operators are mitigated by factors such as institutional measures by the government. However, the business performance and financial condition may be affected due to changes in government policies and reviews of related institutional measures, changes in the estimate of future expenses, and cost burden increases due to changes in the operating situation of the reprocessing facility. The Company periodically conducts business and financial risk analysis including technology risks, and identifies, analyzes and evaluates the risks. Important risks are taken into consideration at internal committees according to their content and incorporated into the PDCA cycle appropriately at the company level, including incorporating it into the annual Mid-term Plan and Business Implementation Plan of each division.
Legal	Relevant, always included	The business performance and financial condition may be affected by increased competition with electric utilities and other energy companies due to the Electricity System Reform which includes a full deregulation in the retail field. The Company periodically conducts business and financial risk analysis including legal risks, and identifies, analyzes and evaluates the risks. Important risks are taken into consideration at internal committees according to their content and incorporated into the PDCA cycle appropriately at the company level, including incorporating it into the annual Mid-term Plan and Business Implementation Plan of each division.
Market	Relevant, always included	Trends in market interest rates and changes in ratings may affect the results of business performance and financial condition. The Company periodically conducts business and financial risk analysis including market risks, and identifies, analyzes and evaluates the risks. Important risks are taken into consideration at internal committees according to their content and incorporated into the PDCA cycle appropriately at the company level, including incorporating it into the annual Mid-term Plan and Business Implementation Plan of each division.
Reputation	Relevant, always included	If an act contrary to corporate ethics such as a violation of laws or regulations happens, social credibility will decline and the business performance and financial condition may be affected. The Company periodically conducts business and financial risk analysis including reputational risks, and identifies, analyzes and evaluates the risks. Important risks are taken into consideration at internal committees according to their content and incorporated into the PDCA cycle appropriately at the company level, including incorporating it into the annual Mid-term Plan and Business Implementation Plan of each division.
Acute physical	Relevant, always included	A major power outage due to a natural disaster such as a typhoon, resulting in damages to the facilities or a long-term suspension of the power supply, may result in an adverse effect on business performance and financial condition. The Company periodically conducts business and financial risk analysis including acute physical risks, and identifies, analyzes and evaluates the risks. Important risks are taken into consideration at internal committees according to their content and incorporated into the PDCA cycle appropriately at the company level, including incorporating it into the annual Mid-term Plan and Business Implementation Plan of each division.
Chronic physical	Relevant, always included	As the amount of electricity sold in the electricity business fluctuates due to changes in factors such as the temperature, the business performance and financial condition may be affected. The Company periodically conducts business and financial risk analysis including chronic physical risks, and identifies, analyzes and evaluates the risks. Important risks are taken into consideration at internal committees according to their content and incorporated into the PDCA cycle appropriately at the company level, including incorporating it into the annual Mid-term Plan and Business Implementation Plan of each division.
Upstream	Relevant, always included	If the CIF costs and exchange rates of materials such as coal, LNG and heavy crude oil fluctuate significantly, the business performance and financial condition may be affected. The Company periodically conducts business and financial risk analysis including upstream risks, and identifies, analyzes and evaluates the risks. Important risks are taken into consideration at internal committees according to their content and incorporated into the PDCA cycle appropriately at the company level, including incorporating it into the annual Mid-term Plan and Business Implementation Plan of each division.
Downstream	Relevant, always included	Increasing competition with electric utilities and other energy companies may affect the business performance and financial condition. The Company periodically conducts business and financial risk analysis including downstream risks, and identifies, analyzes and evaluates the risks. Important risks are taken into consideration at internal committees according to their content and incorporated into the PDCA cycle appropriately at the company level, including incorporating it into the annual Mid-term Plan and Business Implementation Plan of each division.

C2.2d

(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

[Risk]

Transition risks include in particular the financial impact due to the expansion of introduction of global warming prevention taxes on fossil fuels and physical risks due to the rapid change in precipitation and its impact on our 209 hydropower stations (the most ownership in Japan). For the medium- to long-term risks including our climate change risks, which may have a serious impact on our business, we incorporate measures into the annual Business Plan formulated by each division and manage the risks within the management cycle.

In addition to preventing unforeseen circumstances in advance, we have established the Committee of Crisis Management aimed at minimizing the damage in the event of occurrence. Also, the Large-scale Disasters Countermeasure Meeting aims to prepare for large scale supply interruption accidents and severe accidents at nuclear power stations. The Committee of Market Risk Management manages market risks caused by factors such as wholesale electricity. Each committee reports on the status of risk management to the Management Committee as necessary.

[Opportunity]

For the medium- and long-term opportunities for the Company regarding climate change, if regulations on emissions reduction strengthen, we will incorporate measures, such as opportunities for reduction of CO2 emissions by increasing the operation of our 209 hydroelectric power stations (the most ownership in Japan), into the Mid-term Environmental Action Plan formulated every year and implement action policies through the PDCA cycle. We have established the Environmental Management Committee to formulate policies and plans related to the Mid-term Environmental Action Plan, and deliberate individual measures and performance evaluations across departments, which will be proposed and reported to the Global Environment Issue Countermeasure Council.

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

Physical risk

Primary climate-related risk driver

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

Type of financial impact driver

Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants)

Company- specific description

The company owns the largest number of hydropower stations in the Tohoku region and Niigata prefecture in Japan, which are affected by annual rainfall/snowfall. In the case of abundant water, fuel costs decline and in the case of drought, fuel costs increase.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

High

Potential financial impact

8640000000

Explanation of financial impact

Financial impact in the case of drought is estimated from the water output rate of 85.6% in FY 2016 (-14.4% compared to the average year). The effect per 1% of the water output rate in FY 2016 was 600 million JPY.

Management method

Abundant water lowers fuel costs, while droughts increase fuel costs. However certain adjustments are made based on the provision of reserve for fluctuation in water level.

Cost of management

1100000000

Comment

The management expenses of 1.1 billion JPY describes the provision of reserve for fluctuation in water level for FY 2017.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Acute: Increased severity of extreme weather events such as cyclones and floods

Type of financial impact driver

Increased capital costs (e.g., damage to facilities)

Company- specific description

Business performance and financial conditions may be affected due to natural disasters such as typhoons causing suspension of power supply or large-scale blackout and damaging hydropower stations at sites such as the Tsugaru Power Station and the Dai-ni Yabukami Power Station, steam power generation facilities at sites such as the Shin-Sendai Thermal Power Station, and power transmission facilities and substation equipment.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

High

Potential financial impact

18500000000

Explanation of financial impact

The financial impact describes the amount recorded as an extraordinary loss during the Niigata - Fukushima heavy rainfall in FY 2011. In the event of damage to facilities or long-term suspension of power supply, the business performance and financial condition may be affected.

Management method

Regarding risks related to natural disasters, we have established internal regulations and prepare for emergency risks through actions such as training for disasters and effective use of damage insurance.

Cost of management

900000000

Comment

The administrative cost of 900 million JPY describes the damage insurance cost for FY 2016.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Supply chain

Risk type

Transition risk

Primary climate-related risk driver

Market: Increased cost of raw materials

Type of financial impact driver

Market: Abrupt and unexpected shifts in energy costs

Company- specific description

We strive to diversify the risk of fuel cost fluctuation by aiming for a balanced power portfolio. However, business performance and financial condition may be affected by thermal power generation fuel costs at sites such as Haramachi Thermal Power Station (coal) and Shin-Sendai Thermal Power Station (LNG) due to fluctuations of CIF costs for coal, LNG, heavy and crude oils and exchange rates as well as soaring fuel costs and transportation costs in the event that tax for global warming countermeasures against fossil fuels rises above expectations.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

High

Potential financial impact

1000000000

Explanation of financial impact

The effect of the time lag of fuel cost adjustment system for FY 2016 is as follows: The fuel cost adjustment system calculates the fuel cost adjustment unit price two months later, based on the 3 month average fuel price and reflects it to the monthly electricity charge. Due to fluctuations in fuel prices, there is a time lag in the reflection of fuel costs (expenses) and fuel cost adjustment (electricity charge income), which causes a temporary profit increase / decrease.

Management method

With regard to fluctuations in thermal power generation fuel costs in sites such as Haramachi Thermal Power Station (coal) and Shin-Sendai Thermal Power Station (LNG), the CIF price of fuels such as coal, LNG, and heavy crude oil and exchange rate are reflected to the electricity charge. We are also working to reduce negative financial impact risk by effectively utilizing financial transactions such as fuel price swaps to reduce the risk of fuel price fluctuations.

Cost of management

3822000000

Comment

The management cost describes the net receivables and liabilities arising from derivative transactions in net value.

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

Type of financial impact driver

Reputational benefits resulting in increased demand for goods/services

Company- specific description

The Company owns 209 hydropower stations (the largest ownership in Japan) and the entire group owns geothermal power generation facilities which account for about half of Japan's geothermal power output. Our corporate reputation may improve due to the growing demand for low carbon energy.

Time horizon

Current

Likelihood

About as likely as not

Magnitude of impact

High

Potential financial impact

13880000000

Explanation of financial impact

Our corporate reputation may improve and our operating revenues may increase due to the growing demand for low carbon energy. The amount of 13.88 billion JPY is the estimated value (on the basis of FY 2016) when the operating revenue (lighting (residential) charge and power charge) increases by 1%.

Strategy to realize opportunity

The Company owns 209 hydropower stations (the largest ownership in Japan) and the entire group owns geothermal power generation facilities which account for about half of Japan's geothermal power output. In the Tohoku Electric Power Group Medium-Term Management Policy (FY 2017- FY 2020), we indicate that we "promote the development of hydropower, geothermal power and wind power generation together with the group companies to further promote the spread of renewable energy in the well-suited lands of the Tohoku region" and implement a PDCA cycle to incorporate the Mid-term Plan and Business Implementation Plan of each division.

Cost to realize opportunity

16853000000

Comment

16.853 billion JPY describes the increase in the recorded cost of hydroelectric power generation facilities and new energy generation facilities in FY 2016.

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of new technologies

Type of financial impact driver

Reduced operational costs (e.g., through use of lowest cost abatement)

Company- specific description

Concerning the Shin-Sendai Thermal Power Station No 3 series, the existing Shin-Sendai Power Station Units 1 and 2 were terminated and replaced with existing high-efficiency combined cycle power generation facilities. Commercial operation commenced at half of capacity in December 2015, and at full output in July 2016, achieving the world's highest thermal efficiency of 60% or more. Introduction of high-efficiency thermal power may contribute to reducing CO2 emissions and power generation costs.

Time horizon

Current

Likelihood

About as likely as not

Magnitude of impact

High

Potential financial impact

10000000000

Explanation of financial impact

The financial impact describes the increase factor in FY 2016 due to the operation of the Shin-Sendai Thermal Power Station No. 3 series which can reduce fuel consumption by about 30% compared to conventional gas fired power stations.

Strategy to realize opportunity

In the "Tohoku Electric Power Group Medium-Term Management Policy" (FY 2017 - FY 2020) we indicate that "with regard to thermal power generation, we strive to strengthen our cost-competitive power from optimal power supply configuration, by developing economically superior coal fired power stations and high efficiency gas thermal power stations." We are implementing a PDCA cycle to incorporate the mid-term plan and business implementation plan of each division. In order to realize a reduction of CO2 emission and power generation cost, the existing Shin-Sendai Power Station Units 1 and 2 were terminated and replaced with existing high-efficiency combined cycle power generation facilities. Commercial operation commenced at half of capacity in December 2015, and at full output in July 2016, achieving the world's highest thermal efficiency of 60% or more.

Cost to realize opportunity

62471000000

Comment

62.471 billion JPY describes the increase in the recorded cost of steam power generation facilities in FY 2016 which includes the increase in recorded cost of high-efficiency thermal power stations.

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Development of new products or services through R&D and innovation

Type of financial impact driver

Increased revenue through demand for lower emissions products and services

Company- specific description

Hydrogen energy is expected to be an important source of energy for Japan from many viewpoints including energy saving, improvement of energy security and reduction of environmental burden. In the country, efforts to realize a hydrogen society are proceeding. To further expand the introduction of renewable energy, we started the operation of the "hydrogen production system" to conduct research on hydrogen production in March 2017, and carried out research using this system until March 2019. In the research, we investigate the possibility that electricity with large output fluctuation can be used and absorbed for hydrogen production, and the possibility that hydrogen production technology, similar to storage battery, can be applied as countermeasure for the expanding introduction of renewable energy. Promotion and spread of renewable energy by utilizing hydrogen may lead to expansion of our business opportunities.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

High

Potential financial impact

13880000000

Explanation of financial impact

Promotion and spread of renewable energy by utilizing hydrogen may lead to expansion of our business opportunities, including an increase in operating revenue. The amount of 13.88 billion JPY describes the estimated value (on the basis of FY 2016) when the operating revenue (lighting charge and power charge) increases by 1%.

Strategy to realize opportunity

Our aim to be selected by customers and grow with the region while contributing to regional reconstruction and development through stable supply of electric power is outlined in our policies such as the Tohoku Electric Power Group Medium-Term Management Policy (FY 2017- FY 2020). Based on such policies we conduct research and development on high priority areas to contribute to system stabilization related to large-scale renewable energy linkage, as well as advanced technologies such as hydrogen production / utilization technology for renewable energy to strengthen competitiveness.

Cost to realize opportunity

6488000000

Comment

6.488 billion JPY describes the research expenses for FY 2016, including research expenses related to hydrogen production.

C2.5

(C2.5) Describe where and how the identified risks and opportunities have impacted your business.

	Impact	Description
Products and services	Impacted	In the Tohoku Electric Power Group Medium-Term Management Policy (FY 2017- FY 2020), we indicate that we "promote the development of hydropower, geothermal power and wind power generation together with the group companies to further promote the spread of renewable energy in the well-suited lands of the Tohoku region". We commenced commercial operation of the Tsugaru Power Station in May 2016 and the Dai-ni Yabukami Power Station in June 2016 which actively utilize renewable energy by taking advantage of the abundant nature of the Tohoku and Niigata region. Commencement of these two plants helped us achieve approximately 16,500 tons of annual CO2 emission control in FY 2016.
Supply chain and/or value chain	Impacted	In order to reduce the environmental burden such as reduction of CO2 emissions, we developed with our transformer supplier, Kitashiba Electric Co., Ltd., an environmentally friendly transformers that use rapeseed oil instead of the conventional mineral oil for insulating which is the first ever in Japan. Both companies cooperated in order to solve problems such as cost reduction, measures against aging years and environmental load reduction to newly develop a practically usable environmentally friendly transformer. This transformer has an extended life expectancy of 60 years, twice as long as the conventional product, and has reduced power loss by about 15%. Also, when discarding the transformer, the insulating oil is extracted and incinerated, but as rapeseed oil absorbs CO2 during growth the CO2 emitted during incineration is offset to become carbon neutral. As of the end of FY 2016 we introduced 20 units, and we anticipate an annual reduction of 372 tons of CO2 emissions.
Adaptation and mitigation activities	Impacted	At the Shin-Sendai Thermal Power Station No 3 series, in order to control CO2 emission and to reduce generation cost, the existing Shin-Sendai Power Station Units 1 and 2 were terminated and replaced with existing high-efficiency combined cycle power generation facilities. Commercial operation commenced at half of capacity in December 2015, and at full output in July 2016, achieving the world's highest thermal efficiency of 60% or more.
Investment in R&D	Impacted	Our Research & Development Center started operation of the "hydrogen production system" to conduct research on hydrogen production in March 2017, and carried out research using this system until March 2019. In order to expand the introduction of renewable energy, adjustment of output fluctuation due to weather conditions is an issue. In the research, we investigate the possibility that electricity with large output fluctuation can be used and absorbed for hydrogen production, and the possibility that hydrogen production technology, similar to storage battery, can be applied as countermeasure for the expanding introduction of renewable energy. We installed new equipment such as solar power generation equipment and hydrogen production equipment in the building of the Research & Development Center where we manufactured and stored hydrogen using electricity generated by photovoltaic power generation. Electricity for the center was generated from the hydrogen developed in this research.
Operations	Impacted	Shin-Sendai Thermal Power Station No 3 series which achieved the world's highest thermal efficiency of 60% or more commenced full operations from July 2016. We strove for awareness of plant performance management through visualization of thermal efficiency of each thermal power stations and to maintain and improve thermal efficiency by daily management and performance tests after periodic inspection to improve thermal efficiency. This resulted in an improvement of 46.3% in thermal efficiency at the power generation end for all thermal power stations in FY 2016, compared to 45.6% in FY 2015.
Other, please specify	Please select	

C2.6

(C2.6) Describe where and how the identified risks and opportunities have factored into your financial planning process.

	Relevance	Description
Revenues	Not yet impacted	The Company owns 209 hydroelectric power stations (the largest ownership in Japan) and owns geothermal power generation facilities that accounts for about half of those in Japan. Based on the Paris Agreement, as Japan's response to achieve emission reduction targets in FY 2030 progresses, the demand for low-carbon energy will grow and may increase our business opportunities and improve reputation as well as increase revenue.
Operating costs	Impacted	In preparation for natural disasters such as typhoons, in a planned manner we have included inspection and repair of hydroelectric power generation facilities including the Tsugaru Power Station and the Dai-ni Yabukami Power Station, steam power generation facilities such as the Shin-Sendai Thermal Power Station, and facilities for power transmission and at substations in the financial plan for improving the reliability of the facilities. Repair expenses for FY 2016 were 192.22 billion JPY.
Capital expenditures / capital allocation	Impacted	In July 2015, we merged Tosei Kougyo Co., Inc., which is responsible for hydropower projects, Tohoku Hydropower & Geothermal Energy Co., Inc., which is responsible for hydroelectric power generation and geothermal power generation, TOHOKU NATURAL ENERGY DEVELOPMENT Co., Ltd., which is responsible for wind power projects, and Tohoku Solar Power Company, Ltd., which is responsible solar power projects. We established the Tohoku Sustainable & Renewable Energy Co., Inc. as the core renewable energy power generation company within the group, and have a 100% stake in Tohoku Sustainable & Renewable Energy Co., Inc. with a capital stock of 5.27 billion JPY.
Acquisitions and divestments	Impacted	In March 2017, in order to further strengthen our total energy solution service, the Company announced that it will acquire all shares of TOHOKU ENERGY SERVICE Co., Ltd. ("Tohoku ESCO"), a group company of the Company. (Making the Company a wholly owned subsidiary on April 3, 2017.) Tohoku ESCO is mainly engaged in solution services such as corporate customers' energy conservation consulting and installation / operation of energy facilities. So far, we have been working towards improving energy usage efficiency based on customers' energy usage situation to provide one-stop proposals for operation improvement and equipment introduction, as well as design, procurement and operation of air conditioning and electricity reception / transformation equipment. Meanwhile, in order to respond to customers' energy needs for reduction of energy costs and environmental awareness, to realize further energy and cost savings, we have developed an energy management system (EMS) "EXEMS" which utilizes IoT and AI. By making this wholly owned subsidiary, we will strengthen the total energy solution that combines energy provided by our company (electricity and gas) with services such as EMS and facility consignment services by Tohoku ESCO, so that we can make more prompt and accurate proposals for various forms of energy usage by customers.
Access to capital	Not impacted	We are procuring capital from the perspective of overall optimization while promoting efforts to realize the Action Plan for the Electricity Business for Achieving a Low-Carbon Society, which aims for the electric power business as a whole in FY 2030 to reduce CO2 emissions intensity to 0.37 kg-CO2/kWh, although we do not procure capital for the purpose of dealing with specific risks and opportunities and have no plans at the moment.
Assets	Impacted	The Shin-Sendai Thermal Power Station No. 3 series, which is part of mitigation activities through high efficiency, terminated the existing Shin-Sendai Power Station Units 1 and 2 and replaced them with existing high-efficiency combined cycle power generation facilities. Commercial operation commenced at half of capacity in December 2015, and at full output in July 2016, achieving the world's highest thermal efficiency of 60% or more.
Liabilities	Impacted	In FY 2016, we issued corporate bonds of 140 billion JPY which includes corporate bond with the objective of allocating investments to facility funds for activities such as responding to natural disasters (physical risks) and reducing CO2 emissions (transition risks).
Other	Please select	

C3. Business Strategy

C3.1

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

C3.1a

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

No, and we do not anticipate doing so in the next two years

C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b)

Yes

C3.1c

(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

[A company-specific explanation of how business objectives and strategy have been influenced by climate-related issues]

Based on the adoption of the Paris Agreement at COP 21, the Global Warming Countermeasure Plan adopted by the Japanese government will reduce greenhouse gas emissions by 26% by 2030 and by 80% by 2050, compared with 2013 levels.

Based on this, the Electricity Business Council for a Low-Carbon Society, which was established as an initiative of the utilities' voluntary global warming countermeasures, aims to promote initiatives aimed at realizing the "Action Plan for the Electricity Business for Achieving a Low-Carbon Society as a whole by reducing CO2 emissions per unit to around 0.37kg-CO2/kWh by FY 2030.

As a member of the Electricity Business Council for a Low-Carbon Society, we also aim to achieve optimum energy mix and countermeasures against global warming from the viewpoint of "S+3E" (Safety, Energy Security, Economy and Environmental Conservation). We are steadily proceeding with various measures based on the "Action Plan for the Electricity Business for Achieving a Low-Carbon Society", and the current Medium-term Management Policy that includes measures taking climate change into account. For example, one of the main points of the policy is the "promotion of the renewable energy business" and concrete efforts that include "development of hydroelectric power generation, geothermal power generation, large wind power generation" as well as "utilization of hydrogen to promote the expansion and diffusion of renewable energy".

[Explanation of whether your business strategy is linked to an emissions reductions target or energy reduction target]

We will work on restarting the Onagawa Nuclear Power Station and others, with the premise of ensuring safety, so that we can contribute to achieving the CO2 emission intensity of 0.37kg-CO2/kWh by FY 2030 with the rest of the electric power business. We will also work towards reducing CO2 emissions by improvement of efficiency of thermal power generation, including the Shin-Sendai Thermal Power Station No. 3 series which boasts the world's highest thermal efficiency, introduction of renewable energy utilizing the characteristics of the area, and reduction of power loss in transmission and distribution.

[What have been the most substantial business decisions made during the reporting year that have been influenced by the climate change driven aspects of the strategy]

In order to reduce CO2 emissions and reduce power generation costs, the Shin-Sendai Thermal Power Station No. 3 series terminated the existing Shin-Sendai Power Station Units 1 and 2 and replaced them with existing high-efficiency combined cycle power generation facilities. Commercial operation commenced at full output in July 2016.

C-AC3.1e/C-CE3.1e/C-CH3.1e/C-CO3.1e/C-EU3.1e/C-FB3.1e/C-MM3.1e/C-OG3.1e/C-PF3.1e/C-ST3.1e/C-TO3.1e/C-TS3.1e

(C-AC3.1e/C-CE3.1e/C-CH3.1e/C-CO3.1e/C-EU3.1e/C-FB3.1e/C-MM3.1e/C-OG3.1e/C-PF3.1e/C-ST3.1e/C-TO3.1e/C-TS3.1e)
Disclose details of your organization's low-carbon transition plan.

The Electricity Business Council for a Low-Carbon Society aims to achieve an emission factor of about 0.37kg-CO₂/kWh by FY 2030 based on the long-term energy supply and demand forecast of 2030 shown by the government.

The Council formulated an Action Plan for the Electricity Business for Achieving a Low-Carbon Society, and as part of "the target of domestic corporate activities for 2030" will utilize nuclear power generation with the premise of ensuring safety, utilizing renewable energy, and achieving high efficiency of thermal power generation as well as delivering services such as energy conservation and CO₂ reduction to customers in the electricity retail field. The businesses will also introduce technologies such as smart meters as part of efforts to "enhance alliances between entities". As part of efforts to "promote international contribution" the businesses will work on overseas expansion of business technologies and insight. And to deal with the "development of innovative technologies" the businesses will introduce large amounts of renewable energy.

As a member of the council, we have formulated an individual company action plan in line with the Action Plan for the Electricity Business for Achieving a Low-Carbon Society (aiming for an emission factor of about 0.37kg-CO₂/kWh by FY 2030 for the entire electric power business) and have set Initiatives for restarting the Onagawa Nuclear Power Station Unit 2, replacing the Shin Sendai Thermal Power Station No. 3 series with high efficiency thermal power generation equipment and construction of new hydropower stations such as the Tsugaru Power Station and the Dai-ni Yabukami Power Station.

C3.1g

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

There is no standardized method for creating a scenario at the present time, and there are institutional investors suggesting that TCFD has the role of generating such benchmarks. We believe it is appropriate to consider scenarios for the business environment such as regulation introduction and to analyze business prospects. We plan to analyze the degree of influence on our company that identified risks and opportunities and their countermeasures, based on multiple scenarios with both favorable and unfavorable consequences for the Company, and use it as a tool for future business strategy development.

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

Scope

Scope 1

% emissions in Scope

100

% reduction from baseline year

37

Metric

Metric tons CO₂e per megawatt hour (MWh)

Base year

2013

Start year

2015

Normalized baseline year emissions covered by target (metric tons CO₂e)

0.589

Target year

2030

Is this a science-based target?

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

% achieved (emissions)

19

Target status

Underway

Please explain

The Electricity Business Council for a Low-Carbon Society aims to achieve about 0.37kg-CO₂/kWh, and by implementing the PDCA cycle based on the individual company action plan, we will actively execute actions towards achieving the goals. Around 0.37kg-CO₂/kWh is consistent with the national emission factor calculated from the energy mix indicated by the government's Long-Term Energy Supply and Demand Outlook.

The scope of this target includes CO₂ emissions from electricity purchased from other companies for the purpose of selling to our customers, but as most of it is CO₂ emissions from our own power generation, Scope 1 is selected as the target scope.

% change anticipated in absolute Scope 1+2 emissions

-37

% change anticipated in absolute Scope 3 emissions

C4.2

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

Target

Other, please specify (Non-fossil power supply ratio)

KPI – Metric numerator

Non-fossil power supply ratio in the Act on Sophisticated Methods of Energy Supply Structures 44%

KPI – Metric denominator (intensity targets only)

Base year

Start year

Target year

2030

KPI in baseline year

KPI in target year

% achieved in reporting year

Target Status

Please select

Please explain

Part of emissions target

Is this target part of an overarching initiative?

Please select

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 projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	3	0
Implementation commenced*	1	0
Implemented*	3	257000
Not to be implemented	0	0

C4.3b

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

Activity type

Low-carbon energy installation

Description of activity

Natural Gas

Estimated annual CO2e savings (metric tonnes CO2e)

240500

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

10000000000

Investment required (unit currency – as specified in CC0.4)

62470000000

Payback period

11-15 years

Estimated lifetime of the initiative

>30 years

Comment

At the Shin-Sendai Thermal Power Station No 3 series, the existing Shin-Sendai Power Station Units 1 (heavy oil) and 2 (LNG, heavy oil and crude oil) were terminated and replaced with existing high-efficiency combined cycle power generation facilities. Commercial operation commenced at half of capacity in December 2015, and at full output in July 2016, achieving the world's highest thermal efficiency of 60% or more. As the investment amount includes sensitive information on management, we responded 62.47 billion JPY increase in the recorded cost of steam power generation equipment in FY 2016 (which includes the investment in Shin-Sendai Thermal Power Station No.3-2 series) as well as the repayment period which is the service life of the depreciable asset under the tax law (15 years for steam power generation facilities).

Activity type

Low-carbon energy installation

Description of activity

Hydro

Estimated annual CO2e savings (metric tonnes CO2e)

16500

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)

156000000

Investment required (unit currency – as specified in CC0.4)

16480000000

Payback period

21-25 years

Estimated lifetime of the initiative

>30 years

Comment

We are actively working on the establishment of hydroelectric power stations. In May 2016 the Tsugaru Power Station and in June 2016 the Dai-ni Yabukami Power Station commenced commercial operation. The annual emission reduction amount for the two stations in FY 2016 was calculated based on the company's factor of FY 2015. The annual expense reduction was calculated using the reduced fuel cost when substituting thermal power generation using the steam power generation fuel cost for FY 2016, the internal combustion power generation fuel cost, and the amount of thermal power generation in FY 2016. As the investment amount contains sensitive information on management, we provide the increase in recorded cost of 16.48 billion JPY of Hydroelectric power generation equipment in FY 2016 (including investments for Tsugaru Power Station and Dai-ni Yabukami Power Station) as well as the repayment period which is the service life of the depreciable assets under the tax law (22 years for hydroelectric power generation facilities in the electric power business).

C4.3c

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

Method	Comment
Compliance with regulatory requirements/standards	

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 electricity generation activities.

Our activities may contribute to reduction of methane emission at the coal mining stage and oil / gas production stage by promoting reduction of fuel consumption through high efficiency of thermal power generation including at the Shin-Sendai Thermal Power Station No. 3 series which boasts the world's highest thermal efficiency (with a thermal efficiency of 60% or more).

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)

36777400

Comment

Scope 2 (location-based)

Base year start

April 1 2013

Base year end

March 31 2014

Base year emissions (metric tons CO2e)

0

Comment

Scope 2 (market-based)

Base year start

April 1 2013

Base year end

March 31 2014

Base year emissions (metric tons CO2e)

0

Comment

As the company (including headquarters) uses electricity generated by the company itself, Scope 2 emissions are 0t.

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.

Act on the Rational Use of Energy

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

C6. Emissions data

C6.1

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

Row 1

Gross global Scope 1 emissions (metric tons CO2e)

31861100

End-year of reporting period

<Not Applicable>

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?

Row 1

Scope 2, location-based

0

Scope 2, market-based (if applicable)

0

End-year of reporting period

<Not Applicable>

Comment

As the company (including headquarters) uses electricity generated by the company, Scope 2 emissions are 0t.

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?

No

C6.5

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

Purchased goods and services

Evaluation status

Not relevant, explanation provided

Metric tonnes CO₂e

Emissions calculation methodology

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

Explanation

It is extremely small compared with the total amount of Scope 3 emission.

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

749671

Emissions calculation methodology

The electricity business' fixed asset recorded cost increase (227,173 million JPY) x capital goods emission factor (3.30t /million JPY)

* Source of emission factor: "Emission intensity per unit of capital goods" in "Emission intensity unit database for calculating an organization's greenhouse gas emissions etc. through supply chain" published by Ministry of the Environment

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

100

Explanation

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

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

13468715

Emissions calculation methodology

Electricity received from other companies (22,945GWh) x substitute value (0.587 kg-CO₂/kWh) = 13,468,715t

* Source of substitute value: Electricity companies' emission factor (for calculation of greenhouse gas emissions of specific establishment emitters) - FY2005 results

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

100

Explanation

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

20636

Emissions calculation methodology

CO₂ emissions from domestic cargo transports submitted to the government every year under the Act on the Rational Use of Energy.

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

100

Explanation

Waste generated in operations

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

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

Explanation

It is extremely small compared with the total amount of Scope 3 emissions.

Business travel

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

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

Explanation

It is extremely small compared with the total amount of Scope 3 emissions.

Employee commuting

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

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

Explanation

It is extremely small compared with the total amount of Scope 3 emissions.

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

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

Explanation

Because the relationship with the main business (the electric power business) is insignificant.

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

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

Explanation

It is extremely small compared with the total amount of Scope 3 emission.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO₂e

Emissions calculation methodology

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

Explanation

Because the relationship with the main business (the electric power business) is insignificant.

Use of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO₂e

Emissions calculation methodology

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

Explanation

Because it is included in Scope 1, and not calculated separately.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO₂e

Emissions calculation methodology

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

Explanation

Because the relationship with the main business (the electric power business) is insignificant.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Metric tonnes CO₂e

Emissions calculation methodology

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

Explanation

Because the relationship with the main business (the electric power business) is insignificant.

Franchises

Evaluation status

Not relevant, explanation provided

Metric tonnes CO₂e

Emissions calculation methodology

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

Explanation

Because there is no franchise.

Investments

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

Emissions calculation methodology

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

Explanation

It is extremely small compared with the total amount of Scope 3 emission.

Other (upstream)

Evaluation status

Metric tonnes CO2e

Emissions calculation methodology

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

Explanation

Other (downstream)

Evaluation status

Metric tonnes CO2e

Emissions calculation methodology

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

Explanation

C6.7

(C6.7) Are carbon dioxide emissions from biologically sequestered 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

0.0000183257

Metric numerator (Gross global combined Scope 1 and 2 emissions)

31861100

Metric denominator

unit total revenue

Metric denominator: Unit total

173860000000

Scope 2 figure used

Market-based

% change from previous year

2.96

Direction of change

Increased

Reason for change

Sales declined compared with the previous fiscal year due to a decrease in lighting (residential) and power charges due to a decrease in electricity sales volume and fuel cost adjustment.

Intensity figure

0.0004965805

Metric numerator (Gross global combined Scope 1 and 2 emissions)

31861100

Metric denominator

megawatt hour generated (MWh)

Metric denominator: Unit total

64161000

Scope 2 figure used

Market-based

% change from previous year

1.37

Direction of change

Decreased

Reason for change

The intensity figure has declined as CO2 emissions from thermal power generation have decreased due to the full commencement of commercial operation at the New Sendai Thermal Power Station No.3 series and the expansion in introduction of renewable energy.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization have greenhouse gas emissions other than carbon dioxide?

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 CO2e)	GWP Reference
CO2	31800000	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	39200	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	21900	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)	Gross Scope 1 emissions (metric tons CO2e)	Comment
Fugitives	0	0	21900	21900	
Combustion (Electric utilities)	31800000	0	0	31800000	
Combustion (Gas utilities)	0	0	0	0	
Combustion (Other)	0	0	0	0	
Emissions not elsewhere classified	0	0	39200	39200	

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	31861100

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)
Electricity generation	31861100

(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	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility generation activities	31861100	<Not Applicable>	
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons 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	0	0	0	0

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By facility

C7.6b

(C7.6b) Break down your total gross global Scope 2 emissions by business facility.

Facility	Scope 2 location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Headquarters mainly engaged in administration work	0	0
Others	0	0

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	
Other emissions reduction activities	14019000	Decreased	4.2	{market based Scope 1+2 emissions in the current fiscal year - market based Scope 1+2 emissions in the previous fiscal year } ÷ (market based Scope 1+2 emissions in the previous fiscal year) × 100 = (31,861,100t - 33,263,000t) ÷ 33,263,000t × 100 ≈ - 4.2% CO2 emissions associated with thermal power generation declined due to the full commencement of commercial operation at the Shin-Sendai Thermal Power Station No.3 series and the expansion in introduction of renewable energy.
Divestment		<Not Applicable>		
Acquisitions		<Not Applicable>		
Mergers		<Not Applicable>		
Change in output		<Not Applicable>		
Change in methodology		<Not Applicable>		
Change in boundary		<Not Applicable>		
Change in physical operating conditions		<Not Applicable>		
Unidentified		<Not Applicable>		
Other		<Not Applicable>		

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 undertakes this energy-related activity
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	No

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 MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	132218639	132218639
Consumption of purchased or acquired electricity	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total energy consumption	<Not Applicable>	0	132218639	132218639

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 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)

Coal

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

52185278

MWh fuel consumed for the self-generation of electricity

52185278

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Fuels (excluding feedstocks)

Other, please specify (Crude Oil Heavy)

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

6285000

MWh fuel consumed for the self-generation of electricity

6285000

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Fuels (excluding feedstocks)

Crude Oil

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

3183333

MWh fuel consumed for the self-generation of electricity

31833333

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Fuels (excluding feedstocks)

Natural Gas

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

2900000

MWh fuel consumed for the self-generation of electricity

2900000

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Fuels (excluding feedstocks)

Liquefied Natural Gas (LNG)

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

66430000

MWh fuel consumed for the self-generation of electricity

66430000

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

C8.2d

(C8.2d) List the average emission factors of the fuels reported in C8.2c.

Coal

Emission factor

0.0247

Unit

metric tons CO2 per GJ

Emission factor source

Greenhouse gas calculation and reporting manual on calculation, reporting and publication of greenhouse gas emissions based on the Act on Promotion of Global Warming Countermeasures

Comment

Crude Oil

Emission factor

0.0187

Unit

metric tons CO2 per GJ

Emission factor source

Greenhouse gas calculation and reporting manual on calculation, reporting and publication of greenhouse gas emissions based on the Act on Promotion of Global Warming Countermeasures

Comment

Liquefied Natural Gas (LNG)

Emission factor

0.0135

Unit

metric tons CO2 per GJ

Emission factor source

Greenhouse gas calculation and reporting manual on calculation, reporting and publication of greenhouse gas emissions based on the Act on Promotion of Global Warming Countermeasures

Comment

Natural Gas

Emission factor

0.0139

Unit

metric tons CO2 per GJ

Emission factor source

Greenhouse gas calculation and reporting manual on calculation, reporting and publication of greenhouse gas emissions based on the Act on Promotion of Global Warming Countermeasures

Comment

Other

Emission factor

0.0195

Unit

metric tons CO2 per GJ

Emission factor source

Greenhouse gas calculation and reporting manual on calculation, reporting and publication of greenhouse gas emissions based on the Act on Promotion of Global Warming Countermeasures

Comment

Crude Oil Heavy

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

No

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 plant)

Metric value

46.3

Metric numerator

Gross thermal efficiency (Lower Heating Value (LHV) standard)

Metric denominator (intensity metric only)

% change from previous year

1.5

Direction of change

Increased

Please explain

Shin-Sendai Thermal Power Station No 3 series (LNG / output: 980,000 kW) which achieved the world's highest thermal efficiency of 60% or more (low heating value standard) commenced full operations from July 2016. We strove for awareness of plant performance management through visualization of thermal efficiency of each thermal power station and to maintain and improve thermal efficiency by daily management and performance tests after periodic inspection to improve thermal efficiency. This resulted in an improvement of 46.3% (low heating value standard) in gross thermal efficiency for all thermal power stations in FY 2016, compared to 45.6% in FY 2015.

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
Gas			2023	LNG: Joetsu Thermal Power Station Unit 1 (Output: 572,000 kW, planned commencement of operation: June 2023)
Lignite			2020	Coal: Noshiro Thermal Power Station Unit 3 (Output: 600,000 kW, planned commencement of operation: June 2020)

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 (introduction of a new distribution transformer)	We plan to introduce a new distribution transformer. In order to reduce the environmental burden such as reduction of CO2 emissions, we developed with our transformer supplier, Kitashiba Electric Co., Ltd., an environmentally friendly transformer that uses rapeseed oil instead of the conventional mineral oil for insulating which is the first ever in Japan. Both companies cooperated in order to solve problems such as cost reduction, measures against aging years and environmental load reduction to newly develop a practically usable environmentally friendly transformer. This transformer has an extended life expectancy of 60 years, twice as long as the conventional product, and has reduced power loss by about 15%. Also, when discarding the transformer, the insulating oil is extracted and incinerated, but as rapeseed oil absorbs CO2 during growth the CO2 emitted during incineration is offset to become carbon neutral. As of the end of FY 2016 we introduced 20 units, and we anticipate an annual reduction of 372 tons of CO2 emissions.			2020

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

(C-CO9.6/C-EU9.6/C-OG9.6) Disclose your investments in low-carbon research and development (R&D), equipment, products, and services.

Investment start date

April 1 2016

Investment end date

March 31 2017

Investment area

R&D

Technology area

Renewable energy

Investment maturity

Pilot demonstration

Investment figure

6488000000

Low-carbon investment percentage

Please explain

To further expand the introduction of renewable energy, we started operation of the "hydrogen production system" to conduct research on hydrogen production in March 2017, and carried out research using this system until March 2019. We installed new equipment such as solar power generation equipment and hydrogen production equipment in the building of the Research & Development Center where we manufactured and stored hydrogen using electricity generated by photovoltaic power generation. Electricity for the Center was generated from the hydrogen developed in this research. Since the investment amount includes sensitive management information, we have stated the research expense (6.488 billion JPY) of the whole Company in FY 2016.

C10. Verification

C10.1

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

	Verification/assurance status
Scope 1	No third-party verification or assurance
Scope 2 (location-based or market-based)	No third-party verification or assurance
Scope 3	No third-party verification or assurance

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 in which you participate.

Japan carbon tax

Period start date

April 1 2016

Period end date

March 31 2017

% of emissions covered by tax

100

Total cost of tax paid

9000000000

Comment

9 billion JPY of total tax paid is calculated by multiplying the fuel consumption for FY 2016 by the tax rate of "tax for measures against global warming".

C11.1d

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?

Because it is a tax corresponding to the amount of fossil fuel procured, we are working on restarting nuclear power stations on the premise of ensuring safety, and at the same time to further improve the efficiency of thermal power generation as well as expand the introduction of renewable energy, and aim for reduction and further improvement in efficiency.

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 low-carbon investment

GHG Scope

Scope 1

Application

Thermal power station. It is applied when we conduct electric wholesale supply bidding.

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

890

Variance of price(s) used

Based on the "Guidelines for operation of new thermal power supply bidding" the price evaluation was carried out taking CO2 countermeasure costs into account for the electric wholesale supply bidding tender. During the tender for FY 2014 the invitation guideline set 890yen/t-CO2 derived from the cost of near term goods of CER futures trading.

Type of internal carbon price

Internal fee

Impact & implication

If the CO2 emission coefficient of the bidding power supply exceeds the reference emission factor (alternative value based on the Act on Promotion of Global Warming Countermeasures), we multiply by a CO2 countermeasure cost unit price of 890 yen/t-CO2 and add the multiplied amount to the bidding price. If the bidding power supply is lower than the reference emission factor, we subtract from the bid price when conducting price evaluation.

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

% Scope 3 emissions as reported in C6.5

0

Rationale for the coverage of your engagement

In order to reduce the environmental burden such as reduction of CO2 emissions, we developed with our transformer supplier, Kitashiba Electric Co., Ltd., an environmentally friendly transformer that uses rapeseed oil instead of the conventional mineral oil for insulating which is the first ever in Japan. Both companies cooperated in order to solve problems such as cost reduction, measures against aging years and environmental load reduction to newly develop a practically usable environmentally friendly transformer. This transformer has an extended life expectancy of 60 years, twice as long as the conventional product, and has reduced power loss by about 15%. Also, when discarding the transformer, the insulating oil is extracted and incinerated, but as rapeseed oil absorbs CO2 during growth the CO2 emitted during incineration is offset to become carbon neutral.

Impact of engagement, including measures of success

As of the end of fiscal 2016 we introduced 20 units, and we anticipate an annual reduction of 372 tons of CO2 emissions.

Comment

C12.1c

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

We regard environmental conservation as one of the important management issues and formulate the Mid-term Environmental Action Plan to promote initiatives such as reducing CO2 emissions. As part of such efforts, we partnered with Toyota Motor Corporation and launched a new service for customers who purchase plug-in hybrid vehicles (PHV) that are excellent in environmental performance. From March 2017, we started the "PHV Yorisou e-Drive Project" where we will provide PHV customers with "Yorisou e-Points", an electronic money / common points, from our Company according to metrics such as the EV mode mileage, contributing to the improvement of the customer's energy use efficiency. The Project offers a variety of services through our membership-based web service "Yorisou e-Net" which is scheduled to operate for 3 years from March 2017.

PHV is a hybrid car that can be charged from an external power source and has excellent environmental performance that combines the merit of an electric vehicle that does not emit CO2 or exhaust gas at the time of driving and the merit of a hybrid car with high fuel efficiency performance. In the Act on Promotion of Global Warming Countermeasures formulated by the government, the spread of next-generation vehicles such as PHV is mentioned as a measure to reduce the emissions from the transportation sector, which accounts for approximately 17% of the total CO2 emissions in Japan. We plan to introduce a total of around 100 PHVs as commercial vehicles over the next 10 years.

The Project is a new initiative to protect the rich nature of the region and pass on the global environment in a more desirable form to future generations. We will continue to develop initiatives according to customer's needs while reducing environmental impact.

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 Electricity Business Council for a Low-Carbon Society

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

In order to steadily promote initiatives aimed at attaining the goals set out in the Action Plan for the Electricity Business for Achieving a Low-Carbon Society, we promote and support efforts of member companies and promote the PDCA cycle.

How have you, or are you attempting to, influence the position?

The General Manager of the Environment Division participates in the Board of Directors of the Council as a Director and strives to reflect opinions on the operation of the council for achieving the goals. In addition, when reporting to the Council our Company implements a PDCA cycle for our individual company action plan concerning the Action Plan for the Electricity Business for Achieving a Low-Carbon Society and report examples that can be shared by other member companies.

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?

Regarding the details of the initiatives listed in the Action Plan for the Electricity Business for Achieving a Low-Carbon Society of the Electricity Business Council for a Low-Carbon Society, an industry organization, we implement a PDCA cycle of our Mid-term Environmental Action Plan. The Environmental Management Committee deliberates on policies, plans, individual measures, and performance evaluations related to the Mid-Term Environmental Action Plan across sectors and proposes and reports it to the Global Environment Issue Countermeasure Council chaired by the president.

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 voluntary communications

Status

Complete

Attach the document

EnvironmentalActionReport.pdf

Content elements

- Governance
- Emissions figures
- Emission targets
- Other metrics

Publication

In mainstream reports

Status

Complete

Attach the document

AnnualReport.pdf

Content elements

- Governance
- Strategy
- Risks & opportunities

C14. 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.

C14.1

(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	President	President

Submit your response

In which language are you submitting your response?

Japanese

Please confirm how your response should be handled by CDP

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

Please confirm below

I have read and accept the applicable Terms