Fortum Oyj - Climate Change 2018

C0. Introduction

C0.1

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

Fortum’s business activities cover the production and sales of electricity and heat, waste-to-energy and circular economy solutions as well as energy-sector expert services and various consumer solutions. Fortum is the third largest power generator and the largest electricity retailer in the Nordic countries. Globally, the company is one of the leading heat producers. As two thirds of Fortum’s power production is hydro and nuclear, it is also among the lowest-emitting generators in Europe.

Fortum’s ambition is to increase its CO2-free power generation. The company also has generation capacity based on fossil fuels, located mainly in Russia, and it has worked to increase its efficiency and reduce its specific emissions. Fortum is focusing on increasing its solar and wind power capacity heavily over the coming years. With core operations in 10 countries, Fortum employs a diverse team of close to 9,000 energy-sector professionals. Fortum’s key markets are the Nordic and Baltic countries, Russia, Poland and India.

Global megatrends as well as low energy prices and the low overall economic development have created a need for energy sector transformation. Fortum aims to meet these global challenges with its strategy that targets growth and continued profitability with strong focus on clean energy, customers and shareholder value creation.

Fortum's vision “For a cleaner world” reflects our ambition to drive the transformation towards a low-emissions energy system and optimal resource efficiency. Fortum's mission is to engage customers and society to drive the change towards a cleaner world. Fortum's role is to accelerate this change by reshaping the energy system, improving resource efficiency and providing smart solutions. This way we deliver excellent shareholder value. Fortum's strategy towards its vision has four cornerstones: (1) drive productivity and industry transformation, (2) create solutions for sustainable cities, (3) grow in solar and wind, and (4) build new energy ventures.

Sustainability is an integral part of Fortum's strategy. The tight link between business operations and corporate responsibility underscores the importance of sustainability as a competitive advantage. In its operations, Fortum gives balanced consideration to economic, social and environmental responsibility. Fortum emphasises a circular economy, resource and energy efficiency, the use of waste and biomass, and climate change mitigation in environmental responsibility. Fortum's know-how in CO2-free hydro and nuclear power production and in energy-efficient combined heat and power (CHP) production, investments in solar and wind power, as well as solutions for sustainable cities play a key role in environmental responsibility.

In 2017, Fortum's activities covered the generation and sales of electricity and heat as well as related expert services and energy solutions that improve present and future life. In the EU area, 96% of Fortum's power generation and close to 100% of the ongoing investment programme was CO2-free. 61% of Fortum's total electricity generation is CO2 free and Fortum's aim is to increase renewable energy generation in future.

In 2017, Fortum's sales were EUR 4.5 billion and the comparable operating profit totalled EUR 811 million. Fortum paid EUR 977 million in dividends to its shareholders and Fortum's total taxes borne amounted to EUR 445 million last year. Fortum’s share is listed on NASDAQ OMX Helsinki and our market cap was around 15 billion on the last trading day of 2017. Fortum believes that the future energy system will be based on carbon emissions-free and inexhaustible energy sources and on overall efficiency of the energy system. Climate change mitigation has for years been a fundamental business driver for Fortum.

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	January 1 2017	December 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.

Denmark
Estonia
Finland
Latvia
Lithuania
Norway
Poland
Russian Federation
Sweden

C0.4

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

EUR

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.

Operational 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

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
Board/Executive board	Sustainability is an integral part of Fortum's strategy, so the highest decision-making authority in these issues is with the Board of Directors, which has joint responsibility in matters related to sustainability. For this reason, Fortum has not designated a Sustainability Committee for decision-making on economic, environmental and social issues. The Audit and Risk Committee, members of the Fortum Executive Management (FEM), and other senior executives support the Board of Directors in the decision making in these matters, when necessary. Corporate Affairs and Communications segment, led by Senior Vise President (SVP), Corporate Affairs and Communications, is responsible of the lead in managing sustainability, including climate change issues. The Senior Vise President (SVP), Corporate Affairs and Communications, is a member of Fortum Executive Management. Fortum has not nominated any individual Board member as responsible for climate affairs.

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 – all meetings	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 Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	The Fortum Executive Management decides on the sustainability approach and Group-level sustainability targets that guide annual planning. The targets are ultimately approved by Fortum's Board of Directors. The Fortum Executive Management monitors the achievement of the targets in its monthly meetings and in Quarterly Performance Reviews. The achievement of the targets is regularly reported also to Fortum's Board of Directors.

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
Other C-Suite Officer, please specify (SVP Corporate Affairs and Communications) *By the CEO's designation, the Senior Vice President, Corporate Affairs and Communications segment, Mr Arto Räty, was responsible of the lead in managing sustainability, including climate change issues.*	Both assessing and managing climate-related risks and opportunities	Quarterly

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.

Fortum's Board of Directors has joint responsibility in matters related to sustainability. The Board of Directors appoints members of the Audit and Risk Committee from amongst its members. The Chairman of the committee reports on the committee's work to the Board of Directors regularly after each meeting, and the committee meeting materials and minutes are available to all members of the Board of Directors. The committee monitors Fortum Group's reporting process of, among others, the efficiency of the internal controls, internal audit and risk management systems. The committee also reviews annually the Group Risk Policy and risk exposures.

Fortum's President and CEO holds the position of Managing Director under the Companies Act and is the Chairman of the Fortum Executive Management (FEM). The President and CEO is in charge of the day-to-day management of the Group, in accordance with the Companies Act and the instructions and orders issued by the Board of Directors.

Fortum's President and CEO is supported by the Fortum Executive Management (FEM). The FEM assists the President and CEO in implementing the strategic and sustainability targets within the framework approved by the Board of Directors, preparing the Group's business plans, and deciding on investments, mergers, acquisitions and divestments within its authorisation.

The FEM decides on the sustainability approach and Group-level sustainability targets, including climate-related targets, that guide annual planning. The targets are ultimately approved by Fortum's Board of Directors. The FEM meets on a monthly basis. Sustainability results against set targets are reviewed in the monthly and quarterly reporting by the FEM. The achievement of the targets are regularly reported also to Fortum's Board of Directors. Quarterly Performance Review meetings with the management are embedded in the Fortum Performance Management process.

Corporate Affairs and Communications Function, led by Senior Vice President (SVP), is responsible for sustainability management, including climate-related issues.The SVP, Corporate Affairs and Communications, is a member of Fortum Executive Management. The SVP, Corporate Affairs and Communications, is responsible for the day-to-day operations and the implementation of operational decisions in his respective organisation. Risk assessment of major investments in terms of sustainability falls under responsibilities of the SVP, Corporate Affairs and Communications. The same applies to oversight of operational sustainability risks. The risk assessments include also assessments of climate-related risks.

Fortum's Corporate Sustainability unit is part of Corporate Affairs and Communications Function. The Corporate Sustainability unit is responsible for coordination and development of sustainability at the Group-level and for maintaining an adequate situation awareness and oversight regarding sustainability. The Corporate Sustainability unit works in close collaboration with the business functions as well as with functions responsible for risk management and for internal audit and controls. Collaboration with the units responsible for Legal, Mergers and Acquisitions, Strategy, Purchasing, Corporate Relations and Public Affairs is an ongoing activity. The Corporate Sustainability unit gives sustainability approval for all significant investments, acquisitions and divestments as part of Fortum's investment evaluation and approval procedure. In addition, the unit participates in the Group's market outlook and public affairs processes and supports the Investor Relations function with its expertise.

Fortum's line management is responsible for the implementation of the Group's policies and instructions and for day-to-day sustainability management. Realisation of the safety and other sustainability targets is a part of Fortum's short-term incentive system.

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?
Chief Executive Officer (CEO)

Types of incentives
Monetary reward

Activity incentivized
Emissions reduction target

Comment
Emissions reduction target and Efficiency target; Behaviour change related indicator; Incentive schemes applicable to Fortum's Executive management team (FEM) include long-term incentive scheme (LTI) and short-term incentive scheme (STI). The Board of Directors decides, based on the proposals made by the Nomination and Remuneration Committee, on performance criteria and award levels for senior management (President and CEO and the other members of Fortum Executive Management). Similarly, the Board of Directors approves all company-wide incentive arrangements for senior management and other key personnel. The criteria for annual incentives which were paid in 2017, were achievement of divisional targets and the Group's financial performance as well as success in reaching individual strategic targets. The performance criteria also included indicators related to sustainability targets. In 2017, the incentive scheme included an index measuring injury frequency for Fortum employees and for contractors, the number of serious injuries, the number of major environmental and health and safety incidents (EHS incidents). The criteria for annual incentives which were paid in 2018 based on 2017 results were the Group's profitability and cash flow, achievement of individual targets as well as targets based on injury frequency for Fortum employees and for contractors and the number of serious injuries. The LTI targets as of the plan 2015-2017 are based on Earning per share (EPS) and Total shareholder value.

Who is entitled to benefit from these incentives?
Corporate executive team

Types of incentives
Monetary reward

Activity incentivized
Emissions reduction target

Comment
Emissions reduction target and Efficiency target; Incentive schemes applicable to Fortum's Executive management team (FEM) include long-term incentive scheme (LTI) and short-term incentive scheme (STI). The Board of Directors decides, based on the proposals made by the Nomination and Remuneration Committee, on remuneration principles and remuneration for senior management (President and CEO and the other members of Fortum Executive Management). Similarly, the Board of Directors approves all company-wide incentive arrangements for senior management and other key personnel. The criteria for annual incentives which were paid in 2017, wereachievement of divisional targets and the Group's financial performance as well as success in reaching individual strategic targets. The performance criteria also included indicators related to sustainability targets. In 2017, the incentive scheme included an index measuring injury frequency for Fortum employees and for contractors, the number of serious injuries, the number of major environmental and health and safety incidents (EHS incidents). The criteria for annual incentives which were paid in 2018 based on 2017 results were the Group's profitability and cash flow, achievement of individual targets as well as targets based on injury frequency for Fortum employees and for contractors and the number of serious injuries. The LTI targets as of the plan 2015-2017 are based on Earning per share (EPS) and Total shareholder value.

Who is entitled to benefit from these incentives?
Business unit manager

Types of incentives
Monetary reward

Activity incentivized
Emissions reduction target

Comment
Emissions reduction target and Efficiency target; Sustainability targets affect every Fortum employee and are part of Fortum's

short-term incentive (STI) scheme. In addition, depending on the business division, the incentivised performance indicators include e.g. energy efficiency that indirectly reduces CO2 emissions. These type of incentive targets are set either as unit or individual level target depending on role. Weight of unit level targets is typically 30-40% and weight of all individual targets in the incentive scheme is 30%.

Who is entitled to benefit from these incentives?
Environment/Sustainability manager

Types of incentives
Monetary reward

Activity incentivized
Emissions reduction target

Comment
Emissions reduction target and Efficiency target; Fortum's Annual Bonus system (STI) is based on company's financial result and sustainability performance and on the individual/team performance result. The individual/team bonus targets for each individual are agreed upon with each employee. For environment/ sustainability managers bonus targets include climate change issues, when appropriate, depending on the responsibilities and tasks of the manager.

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	Fortum's short-term time horizon for risk assessments is one year.
Medium-term	1	6	Fortum's medium-term time horizon for risk assessments is one to six years.
Long-term	6	50	Fortum's longer-term time horizon for risk assessments is 10 to 50 years. The risks are assessed also the time-frame of over than 50 years, if feasible.

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	>6 years	The main features of Fortum's risk management process consist of event identification, risk assessment, risk response and risk control. Identification is carried out according to a structured process and risks are assessed in terms of impact and likelihood according to a Group-common methodology. Impact is assessed not only in monetary terms, but also in terms of health and safety, the environment and reputation. Risk owners, responsible for implementing actions to respond to the risk, are defined by the business and operational management. Risk responses can be to avoid, mitigate, transfer or absorb the risk. Risk control processes, which include monitoring and reporting of risks, are designed to support compliance with approved instructions, manuals and guidelines and to ensure that risk exposures remain within approved limits and mandates.

C2.2b

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

The main features of Fortum's risk management process consist of event identification, risk assessment, risk response and risk control. Identification is carried out according to a structured process and risks are assessed in terms of impact and likelihood according to a Group-common methodology. Impact is assessed not only in monetary terms, but also in terms of health and safety, environment and reputation.

Fortum's risk management process covers strategic risks, financial risks, operational risks and sustainability risks. Climate change risks may exist in several risk categories. For example, operational climate risks are the negative effects of extreme temperatures and floods whereas changes in average temperatures are part of financial risks as it affects the future market prices of power prices.

At company level: The Audit and Risk Committee (ARC) is responsible for monitoring the efficiency of risk management systems within the Group including reviewing risk exposures annually. Corporate Risk Management (CRM), a function headed by the Chief Risk Officer (CRO) reporting to the Chief Financial Officer (CFO), is responsible for assessing and reporting the Group's consolidated risk exposure to Fortum's Board of Directors, ARC and Group Management. Risks are identified and assessed by Divisions, Development Units and Functions according to models approved by the CRO, and are responsible for reporting risks to CRM.

At asset level: Depending on the business, the risk and opportunity identification process is done on power plant or asset level, business area or Division level. For example, risks/opportunities for hydropower production can be assessed at asset level if the production plants are located in the same region whereas for large combined heat and power (CHP) plants in a single location, the assessment is on power plant level. The risks are consolidated on both business area level and at division level and reported to CRM.

Prioritizing and classifying risks and opportunities into relevant categories is part of the risk assessment process. Priorities are defined by impact-likelihood analysis. Likelihood is a measure of how often we expect an event to occur in a specified period of time, and is measured in percentage terms (e.g. 1- 10% = Once in 10 years). Impact is a measure of the effect if the risk event realizes. The impact is assessed on the following scales: monetary, health and safety, environment and reputation. Each scale has a specifically defined level for what is considered to be low, medium or high impact. Fortum have defined the scale levels 1 to 4. For example, the substantive financial impact on the scale level 4 is tens of million euros. The combination of likelihood and impact determines the prioritization of the risk.

For monetary effects, the impact is the financial impact compared to agreed targets (e.g. EBIT) given that the event occurs. For example, climate policy, regulation and fluctuations in temperature and precipitation can have a direct effect on market variables and produced and consumed energy which can result in both positive and negative monetary impacts. In the same way, the risks in other dimension, such as health and safety and environmental impact is assessed, e.g. flooding or extreme temperatures may lead to hazardous workplaces or increase likelihood of leakage of oil or chemicals to the environment. The impact scale for health and safety and environmental impact is designed to ensure that these risk are given high priority.

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	Climate policy and regulation both at global, EU and national level in Fortum's operating countries is under continuous development. Forum follows closely policy developments that attempt to constrain actions that contribute to the adverse effects of climate change and policy developments that seek to promote adaptation to climate change. For example, national CO2 legislation in Fortum's operating countries has a significant economic impact. Overlapping national carbon policies dilute the EU ETS and carbon price despite the ETS reform. Both current and emerging regulation risks are assessed as a part of Fortum 's company-wide risk assessment process.
Emerging regulation	Relevant, always included	Climate policy and regulation both at global, EU and national level in Fortum's operating countries is under continuous development. The goals of the Paris Agreement require regular revision and tightening of the commitments by countries (nationally determined contributions). Anticipation of emerging regulation and related risks and opportunities is vital for the business development. For example currently the EU Commission is preparing the 2050 strategy that will have an impact on all sectors of the society. Potential strategic risks related to regulation and to the future energy and climate policy impact on Fortum's decision making concerning, for example, the technology used at production plants and the fuel selections, such as the use of biomass fuels. Both current and emerging regulation risks are assessed as a part of Fortum 's company-wide risk assessment process.
Technology	Relevant, always included	Technology development and the cost of technologies are important for the competitiveness of Fortum, likewise for other energy utilities. For example, the cost of wind and solar power production technologies has reduced remarkably in the past few years. Fortum has made several investments and investment decisions that will significantly grow its wind and solar power production in the years ahead. Fortum has also taken an active role in this climate-related development work. For example, Fortum promotes the adoption of electric vehicles by developing technology solutions that enable charging of electric vehicles. New technologies also expose Fortum to risks related to intellectual property rights, data privacy and viability of technologies. Technology risks are managed primarily through developing a diversified portfolio of projects consisting of different technologies. Technology risks are assessed as a part of Fortum 's company-wide risk assessment process.
Legal	Relevant, always included	Fortum's potential risks related to the future energy and climate policy framework include, for example, increasing cost burden for hydropower in Finland, driven by fish obligations, grid costs and real estate taxation and unbalanced implementation of the EU Water Framework directive in Sweden, potentially leading to lower hydropower production volumes. Legal risks are assessed as a part of Fortum 's company-wide risk assessment process.
Market	Relevant, always included	In competitive markets, such as in the Nordic region, the wholesale price of electricity is determined as the balance between supply and demand. The short-term factors affecting electricity prices and volumes on the Nordic market include hydrological conditions, temperature, CO2 allowance prices, fuel prices, economic development and the import/export situation. These defines also Fortum's potential risks related to the market. Market risks are assessed as a part of Fortum 's company-wide risk assessment process.
Reputation	Relevant, always included	Fortum expects customers' concern about climate change to increase the demand for low-carbon and energy-efficient energy products and solutions. Fortum is committed to working for cleaner, low-carbon energy production. Fortum's developing of circular economy services also meet the customers' demands, as the use of non-recyclable and non-recoverable waste in energy production replaces fossil fuels and reduces the formation of greenhouse gases generated from biodegradable waste at landfills. Fortum's customers require also a reliable supply of economically priced energy, during the transition towards a low-carbon energy system. Thus, Fortum emphasises the secure energy supply for customers. Fortum uses the extensive One Fortum survey annually to measure customer satisfaction and reputation and the factors that impact them. The survey covers customers, decision makers, capital markets, non-governmental organisations and opinion influencers, as well as Fortum’s personnel. Furthermore, reputation risks are assessed as a part of Fortum 's company-wide risk assessment process.
Acute physical	Relevant, always included	Fortum’s operations are exposed to physical risks caused by climate change, including changes in weather patterns that could alter energy demand and, for instance, hydropower production volumes. Higher precipitation and temperatures may also affect dam safety. Fortum aims to adapt its operations to the changing climate and to take climate change into consideration in, among other things, production and maintenance planning and the assessment of investment projects. Both acute and chronic physical risks are assessed as a part of Fortum 's company-wide risk assessment process.
Chronic physical	Relevant, always included	Fortum's operations are exposed to physical risks caused by climate change, including changes in weather patterns that could alter energy demand and energy production volumes. Higher precipitation, flooding and extreme temperatures may affect, for instance, hydropower production, dam safety, and also availability and supply of biofuels. Fortum adapts its operations to the changing climate and takes it into consideration in, for example, production and maintenance planning and in evaluating growth and investment projects. Both acute and chronic physical risks are assessed as a part of Fortum 's company-wide risk assessment process.
Upstream	Relevant, sometimes included	Fortum's power and heat generation requires use of fuels that are purchased on global or local markets. For fuels traded on local markets, such as biofuels, the volume risk in terms of availability of the raw material of appropriate quality is more significant as there may be a limited number of suppliers. Sustainability and climate-related requirements for forest biomass may also lead to reduced availability and increasing costs of biomass fuels. Uppstream risks are assessed as a part of Fortum 's company-wide risk assessment process.
Downstream	Not relevant, explanation provided	Fortum's risk management process is concentrating on the most substantive strategic, financial, operational and sustainability risks. Fortum is the energy utility company, so downstream risks are not considered as material as e.g. upstream risks.

C2.2d

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

Fortum’s risk management process is designed to support the achievement of agreed targets by ensuring that risk management activities are consistent with the general principles of risk management and that risks are monitored and followed-up in a prudent manner. Fortum's risks are primarily identified and assessed by divisions and corporate units in all existing operating countries and geographical areas under consideration as growth areas.

There are defined risk owners, who are responsible for implementing actions to respond to the risk, by the business and operational management. Risk responses can be one of, or a combination of, avoiding, mitigating, transferring or absorbing the risk. Risk control processes, which include monitoring and reporting of risks, are designed to support compliance with approved instructions, manuals and guidelines and to ensure that risk exposures remain within approved limits and mandates.

Fortum’s Board of Directors annually approves the Group Risk Policy and the CEO annually approves Group Risk Instruction covering commodity market risks, counterparty credit risks, and operational risks. Fortum also has other Group policies and instructions covering e.g. compliance and sustainability, which are aligned with the Group Risk Policy. Results of risk management process are reported to the Board of Directors or the Committee appointed by the Board.

Fortum’s operations are exposed to physical risks caused by climate change, including changes in weather patterns that could alter energy demand and, for instance, hydropower production volumes. Higher precipitation and temperatures may affect hydropower production, dam safety, and also bioenergy supply and availability. Fortum manage climate-related pysical risks by adapting its operations to the changing climate and takes it into consideration, for example, in evaluating growth and investment projects, and maintenance and production planning. For example, increasing temperature may result in increasing cooling water temperature for Fortum’s condensing power plants in Finland, such as the Loviisa nuclear power plant. There are continuously ongoing new investments at Loviisa nuclear power plant to enhance safety in the improbable extreme situation.

Fortum’s strategy in the power sector is based on a market-driven development. Potential risks related to the future energy and climate policy framework include, among others, overlapping national carbon policies diluting the EU's Emissions trading scheme (ETS) and carbon price despite the ETS reform, and implementation of national waste incineration taxes or other measures due to opposition to incineration, which may hamper the competitiveness of waste use as fuel. Additionally, Russian operations are exposed to risks resulting from changes in regulation, legislation, economic and social upheaval factors. Fortum maintains an active dialogue with the bodies involved in the development of laws and regulations in order to manage these transition risks and proactively contribute to the development of the energy policy and regulatory framework.

Climate change and the need for decarbonisation, energy and resource efficiency is changing energy industry in a profound way, and these changes create new business opportunities for Fortum. Fortum's Divisions and business units are responsible to assess opportunities and to make new profitable investment proposals and business decisions. Major investments are approved by Fortum Executive Management.

In addition to CO2-free hydropower and nuclear power production, Fortum believes that solar and wind power will play an essential role in the future. Solar power is becoming one of the most competitive forms of new power generation in many parts of the world, and thus Fortum is investing in solar power, especially in India. The market conditions in the Nord Pool area and in Russia are more suitable for wind power, and Fortum is increasing its wind investments heavily there.

Fortum expects the concern about climate change accelerate transition towards a low-carbon energy system, as well as the demand for low-carbon products and solutions. For example, Fortum promotes the adoption of electric vehicles by developing solutions that enable quick and safe charging of electric vehicles. Fortum also strives to realise a carbon capture and storage (CCS) project in Oslo in co-operation with the City of Oslo. If the project is realised, waste incineration in Oslo will become CO2-free. In 2018, Norwegian government decided to support on preparing the detailed engineering design of a CO2 capture project at the waste incineration plant at Klemetsrud in Oslo, Norway.

Early adaptation to climate change also creates competitive advantage to Fortum. Fortum adapts its operations for climate change, among others, by the methods for regulation and production planning in hydropower in Sweden and Finland.

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) 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
Transition risk

Primary climate-related risk driver
Policy and legal: Other

Type of financial impact driver
Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description
Despite the international Paris climate agreement made in 2015, the international climate policy framework including future greenhouse gas (GHG) emission reduction obligations and economic value of GHG emissions remain still uncertain, because the Paris Rulebook has not yet been finalised. This poses a risk to especially in 8 out of 10 countries where Fortum is operating in the European Union area. According to the Paris Agreement, all countries are obligated to prepare national contributions (INDC, NDC), including mitigation, adaptation and financing, to be reviewed every five years. The Paris Agreement is expected to increase long-term stability and predictability regarding climate policy for investors and companies, encourage market-driven actions and reduce the risk of carbon leakage. Potentially, it can result in an accelerated low-carbon energy transition and new business opportunities. However, there will be no direct impact on the EU carbon price unless the EU decides to increase its future GHG reduction targets. This process is currently being started as the EU Commission is expected to publish the 2050 strategy late 2018 and the future target setting will be discussed following the strategy. In Fortum's opinion, the EU's climate ambition has to be increased and market-driven policies and measures must be trusted. This risk is related to Fortum's direct GHG (Scope 1) that represent about 80% of Fortum's total emissions. Fortum prefers emissions trading as the key climate instrument. During the past few years, the EU's emissions trading scheme (ETS) has been faced with oversupply of allowances and consequently low allowance prices. In addition, renewable energy support is an overlapping steering instrument with the EU ETS leading to significant inefficiencies and sub-optimisation of production. This kind of uncertainty has entailed a risk for investments. In 2017, close to 100% of Fortum's new investments in EU area were CO2-free. 96% of Fortum's current European electricity production was CO2-free, and Fortum does not need to buy allowances for that production.

Time horizon
Medium-term

Likelihood
About as likely as not

Magnitude of impact
Medium-high

Potential financial impact
30000000

Explanation of financial impact
CO2 allowance price is among the most decisive factors affecting the electricity price in the Nordic power market and hence a financial risk for Fortum. In the short-term it affects the electricity prices in Europe where most of Fortum's CO2-emissions are subject to the EU ETS. In 2013–2020, most of the allowances will be auctioned. The value of Fortum's free CO2 allowances in 2017 (1.0 Mt) was about EUR 6 million using a price of EUR 6/t. With low CO2 emissions, Fortum is a relative winner, if the Paris Agreement tightens emission requirements and increases carbon and energy prices. Without it Fortum can't take full advantage of its low-carbon production portfolio. If CO2 price would increase e.g. EUR 1, the electricity price increases approx. EUR 0.5-0.6/MWh in the Nordic power market in 2017. This will result in an increase of Fortum's EBITDA by EUR 25-33 million. On the other hand, if this forecast is not realised, the profitability of Fortum's CO2-free investments may be reduced.

Management method
During 2017, Fortum was involved in the climate policy discussion and development and in promoting market driven energy and climate policy both at the EU level and in countries where it is operating. For example, Fortum was actively supporting the revision of the EU ETS, and we are satisfied with the final legislation adopted in 2017. In 2017, Fortum co-operated with two other Nordic utilities and also with a few other European utilities in order to lobby for a strong revision of the EU ETS and for mitigating the impact of other policies on the EU ETS. This coalition developed a joint position and a number of amendments to the EU Parliament

for the ETS Directive and for the Governance Regulation. The key asks by the coalition have been included in the adopted legislation. Fortum participated in several initiatives promoting the role of carbon pricing and market as part of the global climate agreement. Fortum is a member of the World Bank's Carbon Pricing Leadership Coalition and the UN Caring for Climate Initiative. Risks are also managed by using CO2 forwards and taking the costs of allowances into account in production planning in Fortum. Uncertainty of the regulatory regime and CO2 allowance pricing are taken into account in the investment calculations. In the EU area, most of the allowance cost is passed through to the electricity price and in heat market to the heat price to a large extent.

Cost of management
700000

Comment
In 2017, Fortum's EU area-specific lobbying costs were about EUR 730,000. Climate policy related issues were one of the major areas of lobbying, and these are directly climate-related costs. In addition, Fortum invests into renewable and CO2-free energy production capacity annually. In 2017, Fortum acquired Nygårdsfjellet's 32-MW wind power park and the licensed Ånstadblåheia (about 50 MW) and Sørfjord (about 90 MW) wind power projects in Norway. There were also under construction in Sweden the Solberg 75-MW wind power park, of which Fortum's share of ownership is 50%. In 2017, Fortum invested into wind power EUR 24 million in Norway and EUR 22 million in Sweden. Fortum also finalised refurbishments of hydropower plants in Sweden and Finland, resulting in additional hydropower capacity increase of 8 MW. In 2017, Fortum invested EUR 88 million into hydropower production in Sweden and Finland, mainly maintenance, legislation and productivity investments.

Identifier
Risk 2

Where in the value chain does the risk driver occur?
Direct operations

Risk type
Transition risk

Primary climate-related risk driver
Policy and legal: Increased pricing of GHG emissions

Type of financial impact driver
Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description
Russia's legislative and political operating environment related to climate change and policy differs significantly from that of Europe. In general, the regulatory framework is uncertain, and regulatory risks can evolve in the future in Fortum's Russian business. It is difficult to foresee how the regulation concerning e.g. timelines, emission reduction goals, form of regulation and other variables will develop in the future. At the moment there are no carbon constraints or price for carbon dioxide in Russia. Uncertainty of regulation can be seen as a risk also in 8 European countries, where Fortum has energy production. If future regulation can be anticipated only in a short term or legislation is limited to individual countries, it is difficult to do the right decisions concerning e.g. location of plants, fuel choices or technologies used. Inability to take long-term regulatory prospects into consideration when planning investments can lead to wrong investment decisions. Fortum has finalised its 2,300 MW investments in producing electricity and 660 MW investments in producing heat in Russia. This capacity increase is mainly based on natural gas. By the finalisation of the Russian investment programme in the end of 2016, Fortum almost doubled its power production capacity in Russia. Fortum's CO2 emissions will increase by several million tonnes at the same time. However, the specific emissions per produced energy unit will not significantly change because the new units are the most modern based on most recent technology and more energy efficient than the old plants. Fortum is now operating a fleet of power and heat plants with efficiency and emissions ranking among the best of peers in Russia. In 2017, Fortum and RUSNANO established a 50/50-owned wind investment fund that was awarded the right to build 1,000 MW of wind power in Russia in 2018–2022 in the RES capacity selection auction. Fortum also continued the construction of the 35-MW Ulyanovsk wind farm. The Ulyanovsk wind farm started production in 2018. Taking into account that 1 MW of wind power offsets about 2,600 tons of carbon dioxide emissions each year in Russia, this represents a substantial gain in the fight against climate change.

Time horizon
Medium-term

Likelihood
More likely than not

Magnitude of impact
Medium-high

Potential financial impact
75000000

Explanation of financial impact
Fortum's energy production in Russia is based on fossil fuels, mainly natural gas. Any cost of CO2 would increase Fortum's production costs. If this couldn't be passed to energy price, profitability of Fortum's operations would decrease. Fortum's CO2 emissions in Russia totalled 15.4 Mt in 2017, and we estimate them to be 15-20 Mt per year in the future. For example, with emissions of 15 Mt and CO2 price of EUR 5 the financial value of emissions would correspond EUR 75 million. Uncertainty of legislation can lead to losses in other countries, too.

Management method
Fortum's power production is CO2-free to a large extent. In 2017, 61% of Fortum's total power production was CO2-free. Of the direct CO2 emissions, 84% originated from the Russian operations in 2017. Fortum's investments in the new production capacity has increased annual direct CO2 emissions in Russia. In 2017, Fortum completed the third new Chelyabinsk GRES power plant unit, with power capacity is 248 MW and heat capacity 174 MW. However, by investing in the new energy-efficient CHP plants, Fortum has increased energy output and decreased specific CO2 emissions at the same time. Specific CO2 emissions from Russian power production has decreased by 23% from 2010 until 2017. Fortum is a member of the following organizations in Russia: Market Council for organizing efficient system of trading at wholesale and retail electricity and capacity market, Council of Power Producers, The Russian Union of Industrialists and Entrepreneurs, Association of the European Businesses in the Russian Federation. Fortum also aims at managing the risk by investing in renewable and CO2-free wind and solar power production capacity in Russia. At the end of 2017, Fortum acquired 35 MW of solar power capacity and won the right to build 110 MW of solar capacity in a Russian Capacity Supply Agreement (CSA) auction.

Cost of management
50000000

Comment
In 2017, Fortum's total capital expenditure in Russia was EUR 152 million including mainly productivity investments, modernisations and energy efficiency improvements. This includes in the EUR 53 million investment into new wind power in Russia. The total investment of wind power in 2016-2017 was EUR 68 million in Russia.

Identifier
Risk 3

Where in the value chain does the risk driver occur?
Direct operations

Risk type
Physical risk

Primary climate-related risk driver
Chronic: Rising mean temperatures

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
Increasing temperature may result in increasing cooling water temperature for Fortum's condensing power plants in Finland: the Loviisa nuclear power plant and the Meri-Pori power plant, and this could require additional pumping capacity of cooling water and construction of longer pipelines in order to take the water from further away in the sea. Increase in the back-flow condensation water temperature on the other hand, affects the availability of the plants. Based on environmental restrictions, increased water temperature may result in production breakdowns during the times of highest water temperatures. Increase in water temperature also affects the cleanliness of the systems, such as algae and mussels, and hence the system's reliability. For smaller energy production plants, algae doesn't pose a risk but for bigger production plants, such as Fortum's Loviisa nuclear power plant in Finland, masses of algae could be a problem, if they drifted close to the cooling water intake place due to e.g. storms or sea level rise. In such situations algae could cause business interruptions.

Time horizon
Long-term

Likelihood
Very unlikely

Magnitude of impact
Medium-low

Potential financial impact
5000000

Explanation of financial impact
Water temperature rise can affect nuclear power plants since back-flow condensation water isn't allowed to exceed the permit limit,

which is 34 degrees at Fortum's Loviisa nuclear power plant in Finland. Seawater temperature rise could also affect the water intake in case of excessive algae growth. Thus algae cleaning can cause business interruptions. At the Loviisa nuclear power plant, energy loss of total production breakdown is about 1,000 MW/hour. In 2017, the average area price in Finland was EUR 33.2 /MWh. The financial impacts depend the length of the production breakdown and power price. The production breakdown would result in financial loss about EUR 5 million per week.

Management method
Right now there's no need to take colder cooling water far from the sea at Fortum's condensing power plants in Finland. If the amount of measurable constrains on the availability of nuclear power production became common due to water temperature, investments in a new water intake place could be considered. There are continuously ongoing new investments at Fortum's Loviisa nuclear power plant to enhance safety in the improbable extreme situation, e.g. when seawater wouldn't be available to cool the plant's reactors. A reason for that could be among others an accident of oil tanker ship or a similar incident. The Loviisa nuclear power plant's new cooling system was commissioned in 2015, including, among others, the new cooling towers, which are independent of seawater cooling. The system improves the plant's preparedness for extreme conditions when seawater for some reason becomes unavailable for its normal cooling function. There is also the algae cleaning process at the Loviisa nuclear power plant. In 2017, the renewal project of the emergency diesel engines' coolant pipes was started.

Cost of management
0

Comment
The temperature of condensation water is monitored and controlled by authorities. This is a part of normal operations: in practice no additional costs (0 euros). However, Fortum invested EUR 84 million into the Loviisa nuclear power plant in Finland in 2017. During years 2015-2017, Fortum has invested in total approximately EUR 250 million into the Loviisa nuclear power plant in Finland.

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
Resource efficiency

Primary climate-related opportunity driver
Use of more efficient production and distribution processes

Type of financial impact driver
Increased production capacity, resulting in increased revenues

Company- specific description
Improving energy efficiency at power plants refers to measures, which increase the efficiency of production processes or reduce the energy consumption of plants or equipment. Implementing of these measures enable Fortum to produce more electricity or heat for its customers without increasing fuel consumption. Fortum has been actively involved in the development of market based climate instruments. All Fortum's power plants in Finland are within the scope of the Energy Efficiency Agreement period 2017-2025 between the Confederation of Finnish Industries and the Ministry of Employment and the Economy based on the Energy Efficiency Directive (EED) (Directive 2012/27/EU of the European Parliament and of the Council). The agreement covers e.g. the annual action plans for the energy efficiency programme, follow-up and monitoring, and annual reporting to Motiva (an expert company promoting sustainable and efficient use of energy and materials in Finland, operates as an affiliated Government agency), and

training of the plant personnel. Participating in this programme helps Fortum in focusing in energy efficiency and strengthens its position as an energy efficiency expert. Fortum's Group-level target is to achieve over 1,400 GWh of annual energy savings by 2020 compared to 2012. By the end of 2017, the annual cumulative energy savings achieved was 1,502 GWh, which exceeded the set target by about 100 GWh. In 2017, Fortum's energy efficiency improvement projects are calculated to yield total annual energy savings of about 131 GWh. In 2018, Fortum has set the new Group-level target for energy efficiency improvement, which is 1,900 GWh/a by 2020 compared to 2012.

Time horizon
Short-term

Likelihood
Very likely

Magnitude of impact
Medium-high

Potential financial impact
30000000

Explanation of financial impact
In 2017, City Solutions' sales made over 20% of Fortum’s total sales. If the energy demand increased e.g by 1%, this would mean approximately EUR 10 million increase in sales annually (City Solutions' sales in 2017 was EUR 1,015 million.). In 2017, Generations division's sales made almost 40% of Fortum’s total sales. If the energy demand increased e.g by 1%, this would mean approximately EUR 17 million increase in sales annually (Generations' sales in 2017 was EUR 1,677 million.). Additionally, energy efficiency savings in Fortum's operations results in cost savings of raw material and CO2 allowances. For example, improving fuel efficiency by 0.5 percentage increases savings up to 0.5 million euros in a 150-megawatt power plant annually.

Strategy to realize opportunity
Fortum Power Division’s energy-efficiency programme in 2017-2025 covers the power plants subject to the Finnish energy-efficiency agreement and Swedish hydropower plants. Other divisions have own energy efficiency projects. In Finland and Sweden, Fortum's target is 496,000 MWh/a energy efficiency improvements (regarded as primary energy) during 2017-2025. In the framework of the agreement in 2017, for example, the heat recovery project from a data centre to Fortum's district heating network was implemented in Finland, resulting in 17 gigawatt-hours (GWh) annually. In 2017, Fortum also replaced the high-pressure turbine at the Loviisa nuclear power plant's unit 1. The investment increases plant’s electricity production by about 40 GWh annually. In 2017, Fortum also accomplished refurbishments of hydropower plants in Sweden and Finland resulting in the new, renewable electricity capacity of 8 MW and the hydropower production of 27 GWh annually.

Cost to realize opportunity
40000000

Comment
In 2017, Fortum invested EUR 88 million into hydropower production in Finland and Sweden, mainly maintenance, legislation and productivity investments, and energy efficiency related investments were about EUR 39 million. In addition, Fortum invested also EUR 84 million into the Loviisa nuclear power plant in Finland.

Identifier
Opp2

Where in the value chain does the opportunity occur?
Customer

Opportunity type
Products and services

Primary climate-related opportunity driver
Shift in consumer preferences

Type of financial impact driver
Increased revenue through demand for lower emissions products and services

Company- specific description
According to the EU Directive on Renewable Energy Finland has a target to increase the share of RES in final consumption to 38% by 2020 and to 47% by 2030. The Swedish RES target is set at 49% by 2020 and at 59% by 2030, and Sweden has committed to 100% renewable energy by 2040. As the climate change mitigation requires reduction of fossil fuels, for example, in transportation there is a possibility to increase electricity consumption through electrification of transportation. Fortum has already taken an active role in this climate-related development work. Fortum actively promotes the adoption of electric vehicles by developing solutions that enable quick and safe charging of electric vehicles. Fortum Charge and Drive is the Nordic countries’ largest electric vehicle charging network, which operates in Norway, Sweden and Finland. The network consists of about 1,400 affiliated smart chargers

in the Nordic countries, and Fortum's international presence is growing rapidly. The Charge and Drive cloud-based business system is already used by about 50,000 end customers. Increased use of electric vehicles reduces emissions regardless of the source of electricity, because all electricity production is in the framework of the EU's emissions trading scheme (ETS), unlike petrol and diesel fuels.

Time horizon
Medium-term

Likelihood
Likely

Magnitude of impact
Medium

Potential financial impact
22000000

Explanation of financial impact
Developing infrastructure for electric cars in a large-scale offers Fortum new business opportunities. At the same time we create circumstances in which electricity can replace other energy forms. Therefore the demand for the electricity produced by us can increase. For example, 1% increase in Fortum's electricity sales would mean approximately EUR 22 million annually. (In 2017, Fortum's electricity sales in the EU area was EUR 2,244 million and about 60.5 TWh).

Strategy to realize opportunity
Fortum investigates and creates infrastructure for the large-scale introduction of electric cars. This includes, for example, the planning and development of recharging systems and recharging points. In 2017, Fortum started the development of charging systems for electric vehicles in India and Great Britain, and expanded our charging network in the Nordic countries. Fortum Charge and Drive has opened an innovative electric car charging facility in Oslo. It has over 100 charging stations available for customers. The charging facility was built in co-operation with the property owner and the city of Oslo. The facility is helping Oslo to reach its ambitious climate goals, which include cutting greenhouse gas (GHG) emissions by 50% by 2020 and 95% by 2030, compared to 1990 levels. Fortum's Charge and Drive is a leading charging network in Norway, the country with the most electric vehicles per capita. There are currently over 1,200 chargers and over 500 of these are quick chargers in Norway. In addition to that, Fortum is shifting to electric vehicles and chargeable hybrids with company cars in Finland.

Cost to realize opportunity
13000000

Comment
In 2017, Fortum invested in Charge and Drive EUR 13 million, mainly charging poles in Norway. In 2016, Fortum invested in Charge and Drive EUR 12 million.

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

Type of financial impact driver
Increased capital availability (e.g., as more investors favor lower-emissions producers)

Company- specific description
Hydropower, which has 28% stake of Fortum's power production portfolio, is a very competitive production technology, because it is CO2-free and variable costs are low. In 2017, about 44% of Fortum's European power generation was hydropower. Changing temperature and rainfall change the prerequisites for power production. Changes in temperature would affect snow amount, seasonal river flow patterns, and thus Fortum's hydropower production (20.7 TWh in 2017). Early adaptation to climate change creates competitive advantage to Fortum. Fortum has studied the impact of climate change on hydrology in rivers with hydropower in Sweden and Finland. Changes in timing of river flow affect water regulation patterns and production planning. Sometimes temperature increase may shift inflows to high demand season. Temperature changes also affect power demand, production and electricity prices. In hydropower production planning, Fortum is preparing for climate change by taking into consideration changes in precipitation and temperature and extreme weather phenomena. With hydropower Fortum can react quickly to changing markets and operate competitively in the electricity markets. Nordic power price typically depends on factors such as hedge ratios, hedge prices, spot prices, powerplants' availability and utilisation of Fortum's flexible production portfolio, i.e. hydropower plants, and

currency fluctuations. Excluding the potential effects from changes in the power generation mix, a 1 EUR/MWh change in the Generation segment's Nordic power sales achieved price will result in an approximately EUR 45 million change in Fortum's annual comparable operating profit.

Time horizon
Long-term

Likelihood
More likely than not

Magnitude of impact
Medium

Potential financial impact
6000000

Explanation of financial impact
With hydropower assets, Fortum can react quickly to changing electricity markets. Fortum has estimated the potential impacts of possible increase in precipitation and temperature on Fortum's hydropower production volumes and water regulation of rivers. The financial impact of potential change in hydropower production depends on the change in Fortum's hydropower production (20.7 TWh in 2017) and market price of electricity. The average system spot price in Nord Pool for the year 2017 was EUR 29.4 /MWh. The direct impact as an increase on the value of sold electricity would be EUR 6 million per 1% increase in Fortum's hydropower production annually. The climate change may affect power demand, production and electricity prices.

Strategy to realize opportunity
Especially the methods for regulation and production planning need to be altered due to climate change. Inflow forecast are adjusted with climate change corrections for more accurate production planning. Fortum is also monitoring the need for adjustments to regulation permits with changes in seasonal variation. One Fortum's permit change is currently under way in preparation for autumn flooding. Climate change impact can also be taken into account in hydropower refurbishment projects. Fortum's investment programme will increase hydropower capacity by about 100 MW by 2020. The goal of Fortum's investment programme is to increase CO2-free hydropower capacity and to improve hydropower plant safety and availability. Fortum's hydropower production capacity totals about 4,650 MW at present. In 2017, Fortum invested into hydropower production, mainly refurbishments and productivity investments. The refurbishments completed in 2017 resulted in an annual hydropower production increase of 27 GWh with a capacity increase of 8 MW. In Sweden and Finland, Fortum has also voluntarily worked with authorities and local interest groups to agree on and implement additional restrictions and other projects. Fortum finances projects that reduce the adverse environmental impacts of hydropower production and support biodiversity in built-up water systems. Funds come from the sales of "Ekoenergia" eco-labelled electricity in Finland and "Bra Miljöval"-labelled electricity in Sweden.

Cost to realize opportunity
10000

Comment
Related costs regarding the development of production planning in hydropower are some EUR 10,000 annually. In 2017, Fortum invested EUR 88 million into hydropower production, mainly maintenance, legislation and productivity investments. The biggest of these were Långströmmen dam safety EUR 9 million in Sweden and Imatra dam safety EUR 9 million in Finland.

C2.5

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

	Impact	Description
Products and services	Impacted	Fortum offers its customers a range of energy products and energy services to help them improve their energy efficiency and reduce their carbon footprint, for example: - Electric vehicle charging systems; Ref. Opp2; - Solar panel solutions - Carbon dioxide-free electricity products and carbon-neutral heat products - Real-time monitoring and optimisation of energy consumption.
Supply chain and/or value chain	Impacted for some suppliers, facilities, or product lines	Fortum's most significant climate-related risks in the supply chain are related mainly to fuel procurement, particularly coal and biomasses. Fortum's key tools in supply chain management are country and counterparty risk assessments, supplier qualification and supplier audits, including climate-related issues. About 57% of the wood-based biofuel used by Fortum in 2017 originated from certified sources. The share was over 70% in Finland. Fortum made also preparations for the Chain of Custody certification of wood-based biomass purchases that Fortum aims to acquire in 2018. Fortum uses the Bettercoal Code and tools in assessing the sustainability of coal supply chain. Bettercoal audits are conducted by a third party.
Adaptation and mitigation activities	Impacted	In line with the strategy, Fortum is driving the change towards a cleaner world. In addition to climate change mitigation, Fortum also aims to adapt its operations to the changing climate and takes climate change into consideration in, among other things, production planning and the assessment of growth projects.; Ref. Risk3 and Opp3 Improving energy efficiency at power plants refers to measures, which Fortum implements to increase the efficiency of production processes or reduce the energy consumption of plants or equipment. Fortum has also introduced energy-efficiency services for private and business customers in Finland and Sweden.; Ref. Opp1
Investment in R&D	Impacted	Fortum's Research and Development and innovation activities focus on the development of the energy system towards a future solar economy. Fortum's Research and Development expenditure was EUR 53 million, or 1.2% of sales, in 2017. Each new research and development project is assessed against the criteria of carbon dioxide emissions reduction and resource efficiency.; Ref. Opp2
Operations	Impacted	Fortum aims to adapt its operations to the changing climate and takes climate change into consideration in, among other things, production planning and the assessment of growth projects..; Ref. Risk3 and Opp3 The energy efficiency of Fortum's power plants are increased through investments and technical improvements, preventive maintenance, and by training personnel in the optimal operation of the plant and in monitoring the plant's operating economy. Improving power plant availability also increases energy efficiency, as unplanned plant start-ups are reduced.; Ref. Opp1
Other, please specify	Not impacted	

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	Fortum's circular economy business has grown in the Nordic countries in 2016-2017. For the time being, waste as a fuel has not included in the CO2 quota system in all European countries. Authorities may introduce, for example, a fiscal fee on CO2 generated in waste incineration in all European countries in the near future.; Ref. Risk1 Fortum's wind and solar investments in Russia and India have fixed priced PPAs (Purchase Price Agreement) based on auctions, which guarantees a stable, i.e. less risk, and higher revenues for 15–25 years (depending on country and asset) compared to selling power on the market at current price levels. In the Nordic countries, there are the elcerts which give additional revenue to Fortum. For customer/consumer products, Fortum is receiving fees, for example, Operation and Maintenance for solar and wind, and new revenue streams from Charge and Drive business.; Ref. Opp2
Operating costs	Impacted	Fortum's business is exposed to fluctuations in prices and availability of commodities used in the production and sales of energy products. The main exposure is toward electricity prices and volumes, prices of emissions and prices and availability of fuels. Fortum hedges its exposure to commodity market and fuel risks. The main factor influencing the prices of CO2 allowances and other environmental values is the supply and demand balance. Fortum hedges its exposure to these prices and volumes through the use of CO2 futures and environmental certificates.; Ref. Risk1 and Risk2, and Opp3
Capital expenditures / capital allocation	Impacted	Fortum invests into renewable and CO2-free energy production capacity annually. For example, Fortum is targeting investments totalling EUR 200-400 million in solar power in India. In 2017, Fortum investments totalled EUR 375 million in CO2-free energy production.; Ref. Risk1, Risk2, Risk3 and Opp1, Opp2, Opp3 Fortum invested in hydropower, wind and solar power in the Nordic countries, Russia and India in 2017. For example, Fortum commissioned two new solar power plants, Bhadla and Pavagada (total 170 MW), in India. Additionally, there were under construction in Sweden the Solberg 75-MW wind power park, of which Fortum's share of ownership is 50%, and the 35-MW Ulyanovsk wind power park in Russia. In 2017, Fortum and RUSNANO established a 50/50-owned wind investment fund that was awarded the right to build 1,000 MW of wind power in Russia in 2018-2022. Fortum's investments in the new power and heat plant units in Russia are based on gas turbine technology, which represents the best available technology in natural gas combustion. Construction of the new CHP plant (the capacity of 75 MW electricity and 145 MW heat) in Zabrze, Poland, continued in 2017. The plant is primarily fuelled by refuse-derived fuel (RDF) and coal.
Acquisitions and divestments	Impacted	Fortum has acquired renewable and CO2-free energy production capacity. In 2017, Fortum acquired Nygårdsfjellet's 32-MW wind power park and the Ånstadblåheia (about 50 MW) and Sørfjord (about 90 MW) wind power projects in Norway. Fortum also acquired three solar power plants (total 35 MW) in Russia. In addition, Fortum started the permanent demolition of coal-fired Inkoo condensing power plant during spring 2017. In 2017, 96% of Fortum's electricity production was CO2-free in the EU area, and 61% of total electricity production was CO2-free.; Ref. Risk1, Risk2
Access to capital	Not impacted	Long-term financing is primarily raised by issuing bonds under Fortum's Euro Medium Term Note programme as well as through bilateral and syndicated loan facilities from a variety of different financial institutions. Climate-related risks have not affected the access to these financing sources. Investments in renewable energy might benefit from a wider source of funding.
Assets	Impacted	Fortum's energy production is based primarily on carbon dioxide-free hydropower and nuclear power and on energy-efficient combined heat and power (CHP) production. In line with the strategy, Fortum is targeting a gigawatt-scale solar and wind portfolio. Although the solar and wind capacity is still small compared to Fortum's current total power generation capacity of close to 14,000 MW, the growth in 2017 was substantial and the capacity increased from 58 MW to 295 MW.; Ref. Risk1, Risk. 2 and Opp1, Opp3
Liabilities	Not impacted	Long-term financing is primarily raised by issuing bonds under Fortum's Euro Medium Term Note programme as well as through bilateral and syndicated loan facilities from a variety of different financial institutions. Climate-related risks have not impacted on the liabilities. Investments in renewable energy might benefit from a wider source of funding.
Other	Not impacted	

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?

Yes, qualitative

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)

(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) Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.

Yes

C3.1c

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

i. Driving the change for a cleaner world is the core of Fortum’s strategy. Fortum's role is to accelerate this change by reshaping the energy system, improving resource efficiency, and providing smart solutions. Fortum's focus is on decarbonised electricity and heat generation and sustainable solutions for growing cities and urban areas.

Fortum's strategy is based on four cornerstones with a clear priority order. The first priority is to drive productivity and industry transformation. The need to significantly decrease greenhouse gas emissions, pricing of CO2 and adaptation to climate change are key drivers of Fortum's strategy. The second priority is to offer solutions for sustainable cities. Fortum aims to support cities solve sustainability challenges and to build a circular economy. The third and fourth priorities –growing in solar and wind and building new energy ventures– target to secure Fortum's long-term competitiveness in the future energy system. In line with the strategy, Fortum is targeting a gigawatt-scale solar and wind portfolio.

ii. Sustainability targets including climate targets guide Fortum's business operations towards the vision - For a cleaner world. Fortum's specific carbon dioxide emissions have continued to be at a low level compared to other European major electricity utilities. Fortum's specific CO2 emissions (Scope 1) from total energy production in 2017 were 184 g/kWh. The five-year average, including 2017, was 188 g/kWh, which is below the target of 200 g/kWh. In 2017, Fortum's total CO2 emissions decreased from the previous year over 200,000 tonnes primarily because of the decreased condensing power production.

Fortum's annual cumulative energy savings achieved 1,502 GWh, which exceeded the set target (>1,400 GWh/a) by about 100 GWh. These energy efficiency improvements and other investments save fuel and reduce emissions about 162,000 tonnes CO2 annually.

Fortum has applied the Scenario analysis framework including also 2° C scenario. Fortum considers setting Science-based climate targets during the next two years. Fortum's production portfolio is already low-carbon and over the past decades Fortum has significantly increased its annual CO2-free power generation: from around 15 TWh in 1990 to 46 TWh in 2017.

iii. Fortum is among the best companies in Europe regarding the carbon exposure. In 2017, 96% of Fortum electricity production in the EU area was CO2-free. Including the Russian power generation, which is mainly fuelled by natural gas, and Indian solar power, Fortum was still in the category of the low-carbon energy utilities with 61% CO2-free.

In 2017, Fortum acquired Hafslund, a Norwegian circular economy company. Fortum acquired also three wind farm projects in Norway. Additionally, Fortum invested actively in wind power in Sweden and Russia.

In Russia, Fortum uses mainly natural gas as an energy source. Since a significant reduction in CO2 emissions is not possible with Fortum's current Russian production portfolio, Fortum aims to reduce emissions by improving energy efficiency. Fortum's EUR 2.5 billion investment programme in Russia was finalised in 2016. Fortum's new plants in Russia are mainly based on combined-cycle gas turbine (CCGT) technology, which represents the best available technology in natural gas combustion (efficiency in CHP production 80-85%). Fortum's production fleet is ranking among the best in Russia regarding energy efficiency and emissions. The specific CO2 emissions from Fortum's Russian energy production has decreased from 378 g/kWh in 2010 to 332 g/kWh in 2017.

In 2017, total value of Fortum's RES investments was EUR 396 million, of which CO2-free investment were EUR 291 million. Fortum’s Research and Development expenditure was EUR 53 million, or 1.2% of sales, in 2017.

iv. The entire energy sector is undergoing a transformation. Four megatrends are shaping this change: climate change and resource efficiency, urbanisation, digitalisation and new technologies, and active customers. Fortum's strategy is based on a comprehensive operating environment analysis. The need to significantly decrease greenhouse gas emissions, pricing of CO2 and adaptation to climate change are key drivers of Fortum's strategy. Fortum believes that the future energy system will be based on CO2-free and inexhaustible energy sources and on high-efficiency of the energy system.

v. Majority of Fortum's greenfield investments in Europe and solar power investments in India are CO2-free. In 2017, Fortum invested, for example, the Bhadla and Pavagada solar power plants in India, district heating and district cooling construction project

in Estonia, sizable refurbishments at hydropower plants in Sweden and Finland, and heat recovery from data centres to district heating network in Finland.

vi. A functional society requires an uninterrupted and reliable supply of energy. Fortum is committed to working for cleaner energy production. Implementing the vision –For a cleaner world- requires a reliable supply of economically priced energy delivered to customers as we transition towards a low-carbon energy system. Hydropower balances the growing, but weather-dependent, fluctuating production of other renewable energy forms like solar and wind. The flexibility of hydropower is needed to secure the functionality of the energy system and the power grid and to balance fluctuations in the price of electricity. Fortum will continue its investments in CO2-free, market-driven energy production, in line with its strategy. Fortum's Research and Development activities which aim at building a platform for future growth include e.g. solar energy, wave power, smart grids, pyrolysis oil, and horsepower fuel.

vii. The flexible and versatile production portfolio is a competitive advantage for Fortum. As Fortum's CO2 emissions are low in the EU area (96% of Fortum's power generation in the EU is CO2-free), the cost of acquiring emissions allowances remains lower over Fortum's competitors. At the same time, Fortum however can benefit from increased electricity price as most of the carbon cost is passed through into the power price.

viii. The Paris Agreement (PA) has further strengthened the role of climate action in Fortum's business strategy: Fortum believes that ratcheting of the national contributions (INDCs) of PA will accelerate low-carbon transition and create new business opportunities. Fortum believes that the PA creates a stable and long-term political framework for the energy sector steering investments to low-carbon production technologies. Fortum expects the PA to accelerate low-carbon transition and to create new business opportunities. The global commitment to climate change mitigation has strengthened Fortum's core belief in decarbonisation of the energy sector and given our strategy a more solid basis. The agreement has given evidence that Fortum's strategic choices have been right ones.

C3.1d

(C3.1d) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenarios	Details
2DS	Future energy market and regulation scenarios, including the impact of these to Fortum’s business, are continuously assessed and analysed. It is part of Fortum’s strategy to, in the long-term, broaden the base of revenues and diversify into new businesses, technologies and markets. Sustainability is at the core of Fortum’s strategy and, alongside Fortum’s current businesses, the company is carefully exploring and developing new sources of growth within CO2-free and renewable energy production. Fortum has included the general climate-related scenarios in the company-wide strategy process. The environmental ambition and climate change is one of the key uncertainty drivers within Fortum's five future scenarios. In two of Fortum's scenarios, the Paris agreement ambition level of 2° C is reached. In line with Fortum's strategy, we are targeting a gigawatt-scale solar and wind portfolio. In 2017, Fortum commissioned the 70-MW Bhadla solar power plant and the 100-MW Pavagada solar power plant in India, in addition to the previous 15-MW solar power capacity. Fortum also acquired 35 MW solar power in Russia. In 2017, Fortum's solar and wind power capacity grew from 58 MW to 295 MW. In 2018, Fortum will start the construction of a new 250-MW solar power plant in the Pavagada solar park in India.

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.

Fortum has been and will continue to be committed to a cleaner Europe and a controlled transition to a low-carbon energy system. Fortum's CO2-free production capacity has grown substantially over the last few decades and Fortum will continue to focus on increasing it.

Fortum concluded Hafslund restructuring in the fourth quarter of 2017 and the new business structure is now in place. Together with new colleagues from Hafslund, Fortum has updated the strategies for its divisions. Fortum has now set the path forward and will be working together on implementing the strategy. Fortum targets annual synergies of EUR 15–20 million by the end of 2020.

Following the earlier successful Ekokem and Hafslund transactions, Fortum announced the bid for Uniper towards the end of 2017. By investing in Uniper, Fortum continues the strategy implementation and capital redeployment to enable a more efficient use of our balance sheet. Together Fortum and Uniper have a good strategic mix of assets – both clean and secure – as well as the expertise required to successfully and affordably drive Europe's transition towards a low-carbon energy system. The investment in Uniper is a large investment for Fortum and is in line with our strategic goal to drive productivity and industry transformation in Europe. Fortum is also convinced that the investment will accelerate Europe's energy transition in line with our vision - For a cleaner world. At the end of the acceptance period in February 2018, 47.12% of Uniper's shares had been tendered to Forutm's offer, including Uniper's largest shareholder E.ON's 46.65% shareholding.

In line with its strategy, Fortum is also investing in new renewable generation and targeting a gigawatt-scale portfolio of wind and solar power. During 2017, Fortum started the implementation of other wind power plants in the Nordic countries and in Russia, invested in solar power in Russia, and commissioned its largest solar power plants, Bhadla and Pavagada, in India. In 2017, Fortum and RUSNANO established a 50/50-owned wind investment fund that was awarded the right to build 1,000 MW of wind power in Russia in 2018–2022 in the RES capacity selection auction. The wind investment fund made a decision on construction of the first 50-MW wind farm in Russia. The wind farm is expected to start production in 2019. In January 2018, Fortum also commissioned Russia's first industrial wind power site, Ulyanovsk, with a capacity of 35 MW.

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
7

Metric
Metric tons CO2e per megawatt hour (MWh)*

The five-year average, including 2017, was 188 g/kWh, which is below the set Group-level target of 200 gCO2/kWh.

Base year
2010

Start year
2011

Normalized baseline year emissions covered by target (metric tons CO2e)
19040000

Target year
2020

Is this a science-based target?
No, but we anticipate setting one in the next 2 years

% achieved (emissions)
14

Target status
Underway

Please explain
Fortum has the Group-level target for the specific CO2 emissions from total energy production in five-year average: 200 g/kWh. In 2017, Fortum achieved the target in specific carbon dioxide emissions. The specific CO2 emissions from total energy production were 184 gCO2/kWh in 2017. In 2017, direct CO2 emissions of Fortum's electricity production (target ID Int1) in the EU have decreased mainly because of reduced volume of coal condensing power production in Finland. Scope 3 emissions have remained approximately at the same level. Scope 3 emissions are about 20% of Fortum's total GHG emissions. The amount of Scope 3 emissions is less than 40%, which is considered to be the level of materiality.

% change anticipated in absolute Scope 1+2 emissions
4

% change anticipated in absolute Scope 3 emissions
0

C4.2

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

Target
Energy usage

KPI – Metric numerator
Fortum's target has been to achieve an annual energy savings of more than 1,400 GWh by 2020 compared to 2012.

KPI – Metric denominator (intensity targets only)
Energy efficiency target is the absolute target.

Base year
2012

Start year
2013

Target year
2020

KPI in baseline year
0

KPI in target year
1400

% achieved in reporting year
100

Target Status
Replaced

Please explain
In 2017, the energy efficiency improvement projects calculated to yield an annual energy savings of about 131 GWh. By the end of 2017, Fortum achieved annual cumulative energy savings 1,502 GWh, which exceeded the set target by about 100 GWh. Thus the target was increased by 500 GWh/a, and the new target is to achieve annual energy savings of 1,900 GWh by 2020 compared to 2012.

Part of emissions target
Fortum has been actively involved in the development of market based climate instruments. All Fortum's power plants in Finland are within the scope of the energy efficiency agreement between the Confederation of Finnish Industries and the Ministry of Employment and the Economy based on the Energy Efficiency Directive (EED) (Directive 2012/27/EU of the European Parliament and of the Council). The achieved energy efficiency improvements are annually reported to Motiva (an expert company promoting sustainable and efficient use of energy and materials in Finland, operates as an affiliated Government agency),

Is this target part of an overarching initiative?
Other, please specify (Energy Efficiency Agreement)

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	
To be implemented*	3	411000
Implementation commenced*	6	250000
Implemented*	5	160600
Not to be implemented	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
Solar PV

Estimated annual CO2e savings (metric tonnes CO2e)
144300

Scope
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)
20000000

Investment required (unit currency – as specified in CC0.4)
170000000

Payback period
4 - 10 years

Estimated lifetime of the initiative
21-30 years

Comment
Fortum commissioned two new solar power plants in India in 2017, in addition to the previous 15-MW solar power capacity. The new solar power plants are the 70-MW Bhadla solar power plant and the 100-MW Pavagada solar power plant. Fortum's solar investments in India totalled EUR 99 million in 2017, and EUR 43 million in 2016.

Activity type
Energy efficiency: Processes

Description of activity
Machine replacement

Estimated annual CO2e savings (metric tonnes CO2e)
4300

Scope
Scope 1

Voluntary/Mandatory
Voluntary

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

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

Payback period
4 - 10 years

Estimated lifetime of the initiative
11-15 years

Comment
A high-pressure turbine was replaced at the Loviisa nuclear power plant's unit 1 in 2017. The replacement increased electricity production about 40 GWh in an average year. The Loviisa plant's unit 2 will undergo the same replacement during the 2018 annual outage. In 2017, Fortum invested in total EUR 84 million into the Loviisa nuclear power plant.

Activity type
Energy efficiency: Processes

Description of activity
Machine replacement

Estimated annual CO2e savings (metric tonnes CO2e)
1000

Scope
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)
6000000

Investment required (unit currency – as specified in CC0.4)
39000000

Payback period
4 - 10 years

Estimated lifetime of the initiative
>30 years

Comment
In 2017, refurbishments of hydropower plants in Sweden and Finland increased electricity production of 27 GWh. In 2017, Fortum invested into EUR 62 million in hydropower production in Sweden and EUR 24 million in Finland, mainly maintenance and productivity investments. The payback period is mainly 2-10 years, which is osuus tulee koneistovaurion riskin pienentämisestä

Activity type
Energy efficiency: Processes

Description of activity
Heat recovery

Estimated annual CO2e savings (metric tonnes CO2e)
4900

Scope
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)
200000

Investment required (unit currency – as specified in CC0.4)
600000

Payback period
1-3 years

Estimated lifetime of the initiative
16-20 years

Comment
In 2017, Fortum invested heat recovery from a data centre to Espoo's district heating network in Finland. In 2017, Fortum invested in total EUR 11 million district heating network.

Activity type
Low-carbon energy installation

Description of activity
Other, please specify (District cooling)

Estimated annual CO2e savings (metric tonnes CO2e)
6100

Scope
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)
1000000

Investment required (unit currency – as specified in CC0.4)
10000000

Payback period
4 - 10 years

Estimated lifetime of the initiative
16-20 years

Comment
In 2017, Fortum invested in the construction of a district cooling plant in Tartu, Estonia. In 2017, Fortum invested EUR 11 million in the district heat and cooling in Estonia.

C4.3c

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

Method	Comment
Dedicated budget for energy efficiency	Fortum's target has been to achieve an annual energy savings of more than 1,400 GWh by 2020 compared to 2012. The power plant modernisation programmes and the investments in new technology and capacity have improved energy efficiency in Russia. In addition, the construction of new CHP plant in Zabrze in Poland will improve energy efficiency and reduce carbon dioxide into the environment in relation to produced energy, when replacing the two existing old power plant units. The plant is scheduled for completion in 2018.
Internal price on carbon	Since 2005 Fortum has had a compliance obligation in the EU's emissions trading scheme (EU ETS) setting a price for carbon emissions. Almost all of company's emissions in the EU region are in the scope of the EU ETS. Price of carbon is among the key factors impacting the Nordic electricity price and fully integrated into company's investment decisions.
Dedicated budget for low-carbon product R&D	Research and Development activities help Fortum to develop a sustainable, carbon dioxide-free future. Its focus areas are continuous improvement of current operations, enabling of growth opportunities and development of an emissions-free energy system in the long-term. Each new development activity is assessed against the criteria of emission reduction and resource- and energy-efficiency. Sustainability is at the core of Fortum's strategy and, alongside Fortum's current businesses, the company is carefully exploring and developing new sources of growth within renewable energy production. Fortum is particularly interested in developing environmentally-benign energy solutions (CO2-free) and new CHP concepts, such as pyrolysis fuel and the Fortum HorsePower concept. The company is also researching and developing its solar energy competences and is involved in wave power pilot projects. In addition, Fortum is developing new customer solutions in electricity and heat to improve user experiences and demand-response services. In 2017, Fortum's Research and Development costs totalled EUR 53 million, which corresponds to 1.2% of sales.
Internal incentives/recognition programs	Fortum's Technology and New Ventures team has organised the internal Accelerator (innovation activator) programme to inspire all employees to find new innovations. New ventures, such as Fortum HorsePower, have been created during this programme. The Fortum HorsePower is a service concept in which Fortum delivers bedding to horse stables and picks up the bedding-manure mixture for combustion. In 2017, bedding-manure mixture was collected from more than 200 horse stables in Finland. The service was rolled out also in Sweden in 2017. In 2017, Fortum continued Must-Win-Battle (MWB) development programmes to increase customer-centricity, speed and agility. One of Fortum's five MWB evelopment programmes is "Put the customer in the centre".
Dedicated budget for low-carbon product R&D	In 2017, Fortum continued the development of a virtual power plant for balancing electricity demand in a power grid. The growth of renewable energy increases the need for regulating power to balance the energy system and the need for new storage solutions in the energy system. In a service based on demand flexibility, customers participate with Fortum to maintain the power balance. Household water heaters or house batteries can be used to reduce the need to start up fossil-fuel-based reserve power plants and support the use of renewable energy by balancing peak consumption in the electricity network. The virtual power plant solutions include in the excess energy storage capacity in data center UPS-systems and telco base stations to get significant revenue stream from them, connecting customers' water heaters, home batteries or other assets through smart meters or directly, and building the next generation of grid aware charging for electric vehicles. In 2017, Fortum's Research and Development costs totalled EUR 53 million, which corresponds to 1.2% of sales.
Employee engagement	Along with emissions reduction measures implemented at production facilities, Fortum has taken various actions to reduce the carbon dioxide emissions, e.g. the carbon footprint, generated by the company's personnel and facilities. Actions include reduction of travelling, CO2 limits for company cars and education on climate issues. These measures are important in increasing the environmental awareness and motivation of employees.
Other	Fortum's sustainability targets include targets for company's specific CO2 emissions (g CO2/kWh produced energy). Progress in performance is followed-up quarterly and reported to the Fortum Executive Management and Fortum Board of Directors.

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?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation
Group of products

Description of product/Group of products
Fortum's energy products - electricity and heat - replace in certain cases the customer's alternative and more carbon intensive energy production and consequently reduce GHG emissions. Especially this concerns our environmentally labelled products that are CO2-free.

Are these low-carbon product(s) or do they enable avoided emissions?
Low-carbon product

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions
Other, please specify (European guarantees of origin)

% revenue from low carbon product(s) in the reporting year

Comment
European guarantees of origin of eco-labels on national nature conservation associations. Also nuclear power classified as low-carbon. In 2017, Fortum's electricity sales to private and commercial customers was 10.9 TWh in Nordic countries and also in Poland. 84% of this was from renewable energy sources, mainly hydropower. The share of nuclear power was 5%. The extent of impact mitigation can be assessed by assuming that carbon-free electricity sold by Fortum in Finland and Sweden would have had the specific CO2 emission of the Nordic residual electricity mix (351 g/kWh in 2016). The avoided CO2 emissions would have been about 3 million tonnes in 2017. These avoided emissions represent our customers' (third party) Scope 2 emissions. Fortum's sales of CO2-free electricity resulted in zero (0) greenhouse gas (GHG) emissions.

Level of aggregation
Product

Description of product/Group of products
As part of waste treatment services Fortum incinireates customers' ODS (ozone depleting substances) and F-gases at its waste-to-energy plants.

Are these low-carbon product(s) or do they enable avoided emissions?
Avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions
Addressing the Avoided Emissions Challenge- Chemicals sector

% revenue from low carbon product(s) in the reporting year

Comment
GWPs from IPCC Assessment reports used to calculate avoided emissions of ODS and F-gases.Fortum destroyed 120.9 tonnes of customers' ODS and F-gases at the Kumla waste-to-energy plant in Sweden in 2017. The avoided GHG emissions were about 807,761 tonne (GWP100). The avoided GHG emissions can be compared to the total amount of CO2 emissions generated at the Kumla waste-to-energy plant in 2017, which was 157,393 tonnes.

C-EU4.6

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

Natural gas is a naturally occurring hydrocarbon gas mixture consisting primarily of methane. Even if the share of natural gas use is 62% of Fortum's fuel consumption in energy production, only a very small amount of Fortum's greenhouse gas (GHG) emissions is generated from leaks related to the natural gas distribution.

In 2017, the share of methane emissions were about 0.04% from Fortum's Scope 1 GHG emissions and 0.11% from Fortum's total GHG emissions. Fortum's Scope 1 methane emissions have been calculated on the basis of plant-specific fuel data.

C5. Emissions methodology

C5.1

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

Scope 1

Base year start
January 1 2010

Base year end
December 31 2010

Base year emissions (metric tons CO2e)
19040000

Comment

Scope 2 (location-based)

Base year start
January 1 2013

Base year end
December 31 2013

Base year emissions (metric tons CO2e)
127700

Comment

Scope 2 (market-based)

Base year start
January 1 2016

Base year end
December 31 2016

Base year emissions (metric tons CO2e)
94700

Comment

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.
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

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)
18489300

End-year of reporting period
<Not Applicable>

Comment
The share of carbon dioxide (CO2) from Fortums's direct greenhouse gas (GHG) emissions was 99% in 2017. The share of Scope 1 emissions from Fortum's total GHG emissions was 79%.

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
69% of Fortum's Scope 2 emissions have been estimated on the basis of information received from electricity suppliers. The rest, including Fortum's Scope 2 emissions in Russia, has been estimated on the basis of country-specific breakdown of electricity production.

C6.3

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

Row 1

Scope 2, location-based
112600

Scope 2, market-based (if applicable)
102700

End-year of reporting period
<Not Applicable>

Comment
Fortum's Scope 2 emissions are related to purhased electricity. In 2017, Fortum was able to provide market-based data for 69% of our electricity procurement. The rest, including Fortum's Scope 2 emissions in Russia, has been estimated on the basis of country-specific breakdown of electricity production.

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

Relevant, calculated

Metric tonnes CO2e

371700

Emissions calculation methodology

(i) The volumes and categories of purchased goods and services are based on Fortum's purchasing databases. Forum has assessed our Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Emission data from DEFRA has been used in the calculation of emissions. The GWP values (100 years) are from updated UNFCCC reporting guidelines on annual inventories. (ii) We have assessed data quality based on criteria in Scope 3 standard on page 77 taking into account representativeness to the activity in terms of technology, time, geography, completeness and reliability. Based on this we have scored the quality of primary and secondary data as very good/good/fair/poor. The biggest source of uncertainty in the reported emissions is the emission factors (score: fair) for spending on different groups of goods and services. The data on spending of purchases is relatively accurate (score: good). (iii) As a part of our assessment, we have estimated our GHG emissions from purchased goods and services based on spend data from internal purchasing data management systems. We applied a financial spend analysis to prioritise our goods and services purchases in the reporting year before collecting data for this category. Our purchased goods and services (other than capital goods and energy and fuel related activities) consist mostly of maintenance and construction and other business activities. Supply chain emissions factors for kgCO2e per £ spend for purchasing categories provided by DEFRA (2013 guidance) were used and currencies were converted to EUR.

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

100

Explanation

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

229400

Emissions calculation methodology

(i) The volumes and categories of capital goods are based on Fortum's purchasing databases. We have assessed our Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Emission data from DEFRA has been used in the calculation of emissions. The GWP values (100 years) are from updated UNFCCC reporting guidelines on annual inventories. (ii) We have assessed data quality based on criteria in Scope 3 standard on page 77 taking into account representativeness to the activity in terms of technology, time, geography, completeness and reliability. Based on this we have scored the quality of primary and secondary data as very good/good/fair/poor. The biggest source of uncertainty in the reported emissions is the emission factors (score: fair) for spending on different groups of goods and services. The data on spending of purchases is relatively accurate (score: good). (iii) As a part of our assessment, we have estimated our GHG emissions from capital goods based on spend data from internal purchasing data management systems. We applied a financial spend analysis to prioritise our capital goods investments in the reporting year before collecting data for this category. Our capital goods consist mostly of heavy components in energy production process, like boilers, turbines, generators. Supply chain emissions factors for kgCO2e per £ spend for purchasing categories provided by DEFRA (2013 guidance) were used and currencies were converted to EUR.

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

4225800

Emissions calculation methodology

(i) Fuel data (primary data) is from Fortum's database. Emissions factors (secondary data) are based on literature and publicly available information (IPCC, UNFCCC, VTT Finland). The GWP values (100 years) are from updated UNFCCC reporting guidelines on annual inventories. (ii) We have assessed data quality based on criteria in Scope 3 standard on page 77 taking into account representativeness to the activity in terms of technology, time, geography, completeness and reliability. Based on this we have scored the quality of primary and secondary data as very good/good/fair/poor. The biggest uncertainty is related to emission factors (score: fair) applied. They are general estimates from different sources and not specifically estimated for the fuel lots for Fortum. Fuel data (score: very good) from our own statistics is reliable and accurate. (iii) Emissions from fuel value chains include emissions from fuel production (e.g. mining, refining and processing), fuel transportation and storaging. Emission factors from international and national sources have been applied for each part of the value chain.

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

50

Explanation

Upstream transportation and distribution

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

300

Emissions calculation methodology

(i) Primary data for upstream transportation is from Fortum's database. Emissions factors (secondary data) are based on publicly available information (VTT Finland). (ii) We have assessed data quality based on criteria in Scope 3 standard on page 77 taking into account representativeness to the activity in terms of technology, time, geography, completeness and reliability. Based on this we have scored the quality of primary and secondary data as very good/good/fair/poor. The biggest uncertainty is related to emission factors (score: fair) applied. Horsepower data (score: very good) from our own statistics is reliable and accurate. (iii) Emissions from upstream transportation and distribution includes only Fortum's horsepower. Upstream transportation of fuels is included in category 3 (Fuel and energy related activities). Upstream emissions of purchased electricity are already accounted for in scope 2 emissions.

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

100

Explanation

Upstream transportation of fuels is included in category 3 (Fuel and energy related activities). Upstream emissions of purchased electricity are already accounted for in scope 2 emissions.

Waste generated in operations

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

3900

Emissions calculation methodology

(i) Waste data has been collected from Fortum's own environmental data management systems and covers all operations of the company. Emission coefficient for waste from a Finnish "Ilmastolaskuri" (Climate Calculator) has been used. The GWP values (100 years) are from updated UNFCCC reporting guidelines on annual inventories. (ii) We have assessed data quality based on criteria in Scope 3 standard on page 77 taking into account representativeness to the activity in terms of technology, time, geography, completeness and reliability. Based on this we have scored the quality of primary and secondary data as very good/good/fair/poor. Waste data (score: very good) is from our own company sources. The quality of data is passable, as there are uncertainties in the emission factors (score: fair). The calculation of greenhouse gases for all waste fractions is based on current information from the municipal waste management of Helsinki and therefore not specifically developed for the waste fractions from Fortum's operations. (iii) The Climate Calculator estimates the direct greenhouse gas emissions from the waste processing and transport related to the site's biowaste, paper, cardboard, carton, energy fraction and unsorted waste. The Calculator was developed by HSY Helsinki Region Environmental Services Authority, Finland and the greenhouse gas emission coefficients for each type of waste were provided by the Finnish Environment Institute.

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

100

Explanation

Business travel

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

5500

Emissions calculation methodology

(i) The data consists of air travel, which is the most important source of business travel emissions for Fortum as it operates in 10 countries. Train and ship travelling is used only to minor extent. The data does not include use of car as a mean of transportation. The GWP values (100 years) are from updated UNFCCC reporting guidelines on annual inventories. (ii) We have assessed data quality based on criteria in Scope 3 standard on page 77 taking into account representativeness to the activity in terms of technology, time, geography, completeness and reliability. Based on this we have scored the quality of primary and secondary data as very good/good/fair/poor. Travel volume data (score: good) is based on the statistics from Fortum's Travel Agency and is reliable, but not fully representative as it does not cover all our operating countries. Emission factors from a Finnish LIPASTO database and IPCC are reliable (score: good). (iii) Air travel reports were provided by the travel agency. CO2 emission factors from calculation system for traffic exhaust emissions and energy consumption in Finland (LIPASTO). CH4 and N2O emissions calculated using IPCC 2006 emission factors, tie 1 default values.

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

100

Explanation

Employee commuting

Evaluation status
Not relevant, calculated

Metric tonnes CO2e
7100

Emissions calculation methodology
(i) The emissions have been estimated based on publicly available data and in-house calculations (assuming 50% of staff using own car and distance from home to work in average 20 km). Company benefit cars are included in scope 1 emissions and reported separately. The GWP values (100 years) are from updated UNFCCC reporting guidelines on annual inventories. (ii) We have assessed data quality based on criteria in Scope 3 standard on page 77 taking into account representativeness to the activity in terms of technology, time, geography, completeness and reliability. Based on this we have scored the quality of primary and secondary data as very good/good/fair/poor. Primary data (score: poor) for employee commuting is not available. The employee commuting distance is an average estimate and not based on any statistical data regarding Fortum's personnel. The means of transport/vehicles has been assumed, not based on any statistics. Employee specific data is not available. Emission data for vehicles is reliable (score: good). (iii) The emissions have been estimated based on publicly available data and in-house calculations (assuming 50% of staff using own car and distance from home to work in average 20 km). Company benefit cars are included in scope 1 emissions and reported separately.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Explanation

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
Fortum has assessed Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on our Scope 3 assessment Fortum does not have relevant upstream leased assets that would be reported on Group level. When applicable, emissions from the operation are accounted for in Scope 2 emissions (Purchased electricity).

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
Fortum has assessed Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on a rough calculation the emissions from downstrem transportation are, classified as not relevant.

Processing of sold products

Evaluation status
Not relevant, calculated

Metric tonnes CO2e
1000

Emissions calculation methodology
(i) The volume data of sold products (gypsum) has been collected from Fortum’s own environmental data management systems. The GWP values (100 years) are from updated UNFCCC reporting guidelines on annual inventories. (ii) We have assessed data quality based on criteria in Scope 3 standard on page 77 taking into account representativeness to the activity in terms of technology, time, geography, completeness and reliability. Based on this we have scored the quality of primary and secondary data as very good/good/fair/poor. The emission factor (score: good) is an average of 10 data sources. The amount of sold products (gypsum) is relatively accurate (score: very good). (iii) Average emissions for producing a gypsum plate have been estimated based on the average of 10 literature sources. The utilized gypsum totalled approx. 4,117 tonnes in 2017.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Explanation

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
Fortum has assessed Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on our Scope 3 assessment, Fortum’s does not manufacture products that would emit greenhouse gases during the use phase. Therefore, the category does not apply to Fortum’s operations.

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
Fortum has assessed Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on our Scope 3 assessment, Fortum’s does not manufacture products that would require end-of-life treatment. Therefore, the category does not apply to Fortum’s operations.

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
Fortum has assessed Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on our Scope 3 materiality assessment, Fortum does not have have relevant downstream leased assets that would be reported on Group level.

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
Fortum has assessed Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on our Scope 3 materiality assessment, Fortum has no franchising business and therefore the category does not apply to Fortum's operations.

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
Fortum is a shareholder in a Finnish hydropower company Kemijoki Oy and in a Finnish nuclear power company TVO. Production of hydro power (Kemijoki) and nuclear power (TVO) is CO2-free (Scope 1 emissions), and companies do not disclose their Scope 2+3 CO2 emissions.

Other (upstream)

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
Fortum has assessed Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on our Scope 3 materiality assessment, Fortum has no other Scope 3 emissions.

Other (downstream)

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
Fortum has assessed Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on our Scope 3 materiality assessment, Fortum has no other Scope 3 emissions.

C6.7

(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?
Yes

C6.7a

(C6.7a) Provide the emissions from biologically sequestered carbon relevant to your organization in metric tons CO2.

1400000

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

0.004

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

18592000

Metric denominator

unit total revenue

Metric denominator: Unit total

4520000000

Scope 2 figure used

Market-based

% change from previous year

21

Direction of change

Decreased

Reason for change

Emissions decreased by about 1% due to decreased condensing power production and in some extent emissions reduction activities. At the same time, revenue increased by 24%, resulting in clear decrease in emissions per revenue.

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	18388800	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	92700	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	7800	IPCC Fifth Assessment Report (AR5 – 100 year)
HFCs	0	IPCC Fifth Assessment Report (AR5 – 100 year)
SF6	0	IPCC Fifth Assessment Report (AR5 – 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	0	0	
Combustion (Electric utilities)	18386000	374	0	92700	Fortum's Scope 1 emissions include in direct greenhouse gas (GHG) emissions generated in combustion: CO2 emissions, methane - CH4 emissions and N20 emissions.
Combustion (Gas utilities)	0	0	0	0	
Combustion (Other)	0	0	0	0	
Emissions not elsewhere classified	2800	0	0	0	Fortum's Scope 1 emissions include in also greenhouse gas (GHG) emissions generated in use of company-owned vehicles.

C7.2

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

Country/Region	Scope 1 emissions (metric tons CO2e)
Russian Federation	15437000
Finland	1721700
Poland	711800
Denmark	159300
Lithuania	140100
Sweden	135100
Norway	86400
Estonia	76800
Latvia	21100

C7.3

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

By business division

By facility

C7.3a

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

Business division	Scope 1 emissions (metric ton CO2e)
Russia	15437000
City Solutions	2539200
Generation	513100

C7.3b

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

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
Nyagan GRES	3143100	62.1365	65.403
Tyumen CHP2	2404200	57.0876	65.6298
Tyumen CHP1	2050900	57.1471	65.6048
Chelyabinsk CHP3	1977000	55.23	61.4906
Chelyabinsk CHP2	1741500	55.1541	61.497
Chelyabinsk GRES	1721800	55.2014	61.4053
Argayash CHP	1251600	55.6385	60.7762
Suomenoja	832800	60.1499	24.7179
Chelyabinsk CHP1	594600	55.1338	61.4768
Meri-Pori	512500	61.6319	21.4056
Other sites	2259300		

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	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	18486500	<Not Applicable>	The majority of Fortum's Scope 1 greenhouse gas (GHG) emissions are generated from the use of fossil fuels in electricity and heat production. Only a small amount of Scope 1 emissions is generated from the use of company vehicles and leaks related to the natural gas distribution. In 2017, the share of carbon dioxide from Fortum's Scope 1 GHG emissions was 99%. The share of Scope 1 GHG emissions from our total GHG emissions was 79%.
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)
Russian Federation	63600	61800	157700	0
Denmark	13700	15700	33000	0
Poland	13600	11650	14100	0
Finland	19300	11300	213700	173400
Sweden	500	1100	48900	45900
Estonia	700	500	600	0
Lithuania	400	500	1200	0
Latvia	300	150	2400	0
Norway	500	0	51600	51600

C7.6

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

By business division

By facility

C7.6a

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

Business division	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Russia	63600	61800
City Solutions	42500	30400
Generation	6500	10500

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)
Chelyabinsk heat only boilers	20400	20400
Chelyabinsk heat network	19100	19100
Nyborg	13200	15100
Tyumen CHP1	13800	13800
Meri-Pori	2500	8070
Tymen heat network	8000	8000
Czestochowa heat network	3100	2680
Bytom heat only boilers	2700	2300
Zabrze heat only boilers	2600	2250
Inkoo	700	2100
Other sites	26500	8900

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	60400	Decreased	0.3	Changes to renewable fuel consumption in energy production identified at three heat and power plants in Estonia and Finland. These decreased Fortum's emissions about 60,400 t CO2e. Emission value calculated as = (actual emission (2017) - production (2017) * specific emission (2016)) / total emissions (2016). Emission value: (-32,800-25,300-2,300)/18,855,300=-60,400/18,855,300=-0.3%.
Other emissions reduction activities	192800	Decreased	1	Improved energy efficiency identified at two power plants in Russia. These decreased Fortum's emissions about 192,800 t CO2e. Emission value calculated as = (actual emission (2017) - production (2017) * specific emission (2016)) / total emissions (2016). Emission value: (-139,500-53,300)/18,855,300=-192,800/18,555,300=-1.0%.
Divestment	233000	Decreased	1.2	Divestments of Tobolsk power plant in Russia and DUON Praszka heat plant in Poland reduced Fortum's emissions about 233,000 t CO2e. Emission value: (-230,700-1,900-400)/18,855,300=-233,000/18,555,300=-1.2%.
Acquisitions	363400	Increased	1.9	Acquisitions of new circular economy businesses (Ekokem and Hafslund) increased Fortum's emissions about 363,400 t CO2e. Emission value: (277,000+86,400)/18,555,300=363,400/18,555,300 = 1.9%
Mergers	0	No change		
Change in output	128300	Decreased	0.7	Fortum's emissions change caused by changes in energy production (ouput). Emission value calculated as = (production (2017) * specific emission (2016) - actual emission (2016)) / total emissions (2016). Emission value: -128,300/18,555,300 = -0.7%.
Change in methodology	0	No change		
Change in boundary	0	No change		
Change in physical operating conditions	0	No change		
Unidentified	0	No change		
Other	71800	Increased	0.4	Other causes for changes in Fortum's emissions are caused by changes in fuel mix and changes in the electricity and heat production ratio at CHP plants. Emission value calculated as = (actual emission (2017) - production (2017) * specific emission (2016)) / total emissions (2016). Emission value: 71,800/18,555,300=0.4%.

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 30% but less than or equal to 35%

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	Yes
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 MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	4344000	81939000	86283000
Consumption of purchased or acquired electricity	<Not Applicable>	270900	252300	523200
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>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	4614900	82191300	86806200

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	Yes
Consumption of fuel for the generation of cooling	Yes
Consumption of fuel for co-generation or tri-generation	Yes

C8.2c

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

Fuels (excluding feedstocks)
Natural Gas

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
68348000

MWh fuel consumed for the self-generation of electricity

0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
0

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Fuels (excluding feedstocks)
Coal

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
10833000

MWh fuel consumed for the self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
0

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Fuels (excluding feedstocks)
Wood

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
2902000

MWh fuel consumed for the self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
0

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Fuels (excluding feedstocks)
General Municipal Waste

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization

2486000

MWh fuel consumed for the self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
0

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Fuels (excluding feedstocks)
Other, please specify (Hazardous waste)

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
855000

MWh fuel consumed for the self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
0

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Fuels (excluding feedstocks)
Peat

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
533000

MWh fuel consumed for the self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
0

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Fuels (excluding feedstocks)
Agricultural Waste

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization
204000

MWh fuel consumed for the self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
0

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Fuels (excluding feedstocks)
Biogas

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
13000

MWh fuel consumed for the self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
0

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Fuels (excluding feedstocks)
Fuel Oil Number 1

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
109000

MWh fuel consumed for the self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

MWh fuel consumed for self-generation of cooling
0

MWh fuel consumed for self- cogeneration or self-trigeneration
0

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

Agricultural Waste

Emission factor
360

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2017: Bio-based fuel

Comment
Fortum's Scope 1 greenhouse gas emissions (GHG) have been calculated and analysed on the basis of plant-specific data. The CO2 emissions of plants within the sphere of the EU's emissions trading scheme (ETS) are audited annually on a per plant basis by an external verifier accredited by the emissions trading authority. The verification addresses the reliability, credibility and accuracy of the monitoring system and the reported data and information relating to emissions. The plants must annually submit to the authorities a verified emissions report of the previous calendar year's CO2 emissions. The CO2 emissions, which are subject to the EU ETS, have an uncertainty 0-2%.

Biogas

Emission factor
202

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2017: Bio-based fuel

Comment
Fortum's Scope 1 greenhouse gas emissions (GHG) have been calculated and analysed on the basis of plant-specific data. The CO2 emissions of plants within the sphere of the EU's emissions trading scheme (ETS) are audited annually on a per plant basis by an external verifier accredited by the emissions trading authority. The verification addresses the reliability, credibility and accuracy of the monitoring system and the reported data and information relating to emissions. The plants must annually submit to the authorities a verified emissions report of the previous calendar year's CO2 emissions. The CO2 emissions, which are subject to the EU ETS, have an uncertainty 0-2%.

Coal

Emission factor
336

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2017: Coal

Comment
Fortum's Scope 1 greenhouse gas emissions (GHG) have been calculated and analysed on the basis of plant-specific data. The CO2 emissions of plants within the sphere of the EU's emissions trading scheme (ETS) are audited annually on a per plant basis by an external verifier accredited by the emissions trading authority. The verification addresses the reliability, credibility and accuracy of the monitoring system and the reported data and information relating to emissions. The plants must annually submit to the authorities a verified emissions report of the previous calendar year's CO2 emissions. About 13% of our total Scope 1 emissions are subject to the EU ETS, and these emissions have an uncertainty 0-2%. Major part of the remaining of Scope 1 emissions, which are generated in Russian operations, are calculated with appropriate international emission factors and local volume measurements for coal having an uncertainty 2-5%. Thus the estimated accredited uncertainty is in total less than 5%.

Fuel Oil Number 1

Emission factor
265

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2017: Fuel oil (light)

Comment
Fortum's Scope 1 greenhouse gas emissions (GHG) have been calculated and analysed on the basis of plant-specific data. The CO2 emissions of plants within the sphere of the EU's emissions trading scheme (ETS) are audited annually on a per plant basis by an external verifier accredited by the emissions trading authority. The verification addresses the reliability, credibility and accuracy of the monitoring system and the reported data and information relating to emissions. The plants must annually submit to the authorities a verified emissions report of the previous calendar year's CO2 emissions. About 13% of our total Scope 1 emissions are subject to the EU ETS, and these emissions have an uncertainty 0-2%. Major part of the remaining of Scope 1 emissions, which are generated in Russian operations, are calculated with appropriate international emission factors and local volume measurements for fuel oil having an uncertainty 2-5%. Thus the estimated accredited uncertainty is in total less than 5%.

General Municipal Waste

Emission factor
144

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2017: Municipal waste (50% share of bio-based fuel)

Comment
Fortum's Scope 1 greenhouse gas emissions (GHG) have been calculated and analysed on the basis of plant-specific data. CO2 emissions generated at Fortum's waste-to-energy plants are based on continous monitoring system , not emission factors. The CO2 emissions of plants within the sphere of the EU's emissions trading scheme (ETS) are audited annually on a per plant basis by an external verifier accredited by the emissions trading authority. The verification addresses the reliability, credibility and accuracy of the monitoring system and the reported data and information relating to emissions. The plants must annually submit to the authorities a verified emissions report of the previous calendar year's CO2 emissions. The CO2 emissions, which are subject to the EU ETS, have an uncertainty 0-2%.

Natural Gas

Emission factor
199

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2017: Natural gas

Comment
Fortum's Scope 1 greenhouse gas emissions (GHG) have been calculated and analysed on the basis of plant-specific data. The CO2 emissions of plants within the sphere of the EU's emissions trading scheme (ETS) are audited annually on a per plant basis by an external verifier accredited by the emissions trading authority. The verification addresses the reliability, credibility and accuracy of the monitoring system and the reported data and information relating to emissions. The plants must annually submit to the authorities a verified emissions report of the previous calendar year's CO2 emissions. About 13% of our total Scope 1 emissions are subject to the EU ETS, and these emissions have an uncertainty 0-2%. Major part of the remaining of Scope 1 emissions, which are generated in Russian operations, are calculated with appropriate international emission factors and local volume measurements for natural gas having an uncertainty 2-5%. Thus the estimated accredited uncertainty is in total less than 5%.

Peat

Emission factor
385

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2017: Peat

Comment
Fortum's Scope 1 greenhouse gas emissions (GHG) have been calculated and analysed on the basis of plant-specific data. The CO2 emissions of plants within the sphere of the EU's emissions trading scheme (ETS) are audited annually on a per plant basis by an external verifier accredited by the emissions trading authority. The verification addresses the reliability, credibility and accuracy of the monitoring system and the reported data and information relating to emissions. The plants must annually submit to the authorities a verified emissions report of the previous calendar year's CO2 emissions. The CO2 emissions, which are subject to the EU ETS, have an uncertainty 0-2%.

Wood

Emission factor
395

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2017: Bio-based fuel

Comment
Fortum's Scope 1 greenhouse gas emissions (GHG) have been calculated and analysed on the basis of plant-specific data. The CO2 emissions of plants within the sphere of the EU's emissions trading scheme (ETS) are audited annually on a per plant basis by an external verifier accredited by the emissions trading authority. The verification addresses the reliability, credibility and accuracy of the monitoring system and the reported data and information relating to emissions. The plants must annually submit to the authorities a verified emissions report of the previous calendar year's CO2 emissions. The CO2 emissions, which are subject to the EU ETS, have an uncertainty 0-2%.

Other

Emission factor
421

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2017: Hazardous waste

Comment
Fortum's Scope 1 greenhouse gas emissions (GHG) have been calculated and analysed on the basis of plant-specific data. CO2 emissions generated at Fortum's waste-to-energy plants are based on continous monitoring system , not emission factors. The CO2 emissions of plants within the sphere of the EU's emissions trading scheme (ETS) are audited annually on a per plant basis by an external verifier accredited by the emissions trading authority. The verification addresses the reliability, credibility and accuracy of the monitoring system and the reported data and information relating to emissions. The plants must annually submit to the authorities a verified emissions report of the previous calendar year's CO2 emissions. The CO2 emissions, which are subject to the EU ETS, have an uncertainty 0-2%.

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	73748600	2372200	22051900	196000
Heat	27890500	0	4460500	0
Steam	0	0	0	0
Cooling	29800	0	29800	0

C-EU8.2e

(C-EU8.2e) 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)
980

Gross electricity generation (GWh)
2050

Net electricity generation (GWh)
2050

Absolute scope 1 emissions (metric tons CO2e)
1491000

Scope 1 emissions intensity (metric tons CO2e per GWh)
728

Comment
Fortum dislosures the breakdown of total power plant capacity, generation, and related emissions in Russia and Finland. Fortum's electricity production in Russia is based on fossil fuels, mainly on natural gas. In 2017, Russia accounted for 51% of Fortum's use of coal and Finland accounted for 31% of Fortum's use of coal. The rest of coal consumption was in Poland.

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)
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
Fortum dislosures the breakdown of total power plant capacity, generation, and related emissions in Russia and Finland. Fortum uses fuel oil, for example, heat only boilers and waste-to-energy plants as subsidiary fuel, if required.

Gas

Nameplate capacity (MW)
4530

Gross electricity generation (GWh)
25300

Net electricity generation (GWh)
25300

Absolute scope 1 emissions (metric tons CO2e)
10262800

Scope 1 emissions intensity (metric tons CO2e per GWh)
405

Comment
Fortum dislosures the breakdown of total power plant capacity, generation, and related emissions in Russia and Finland. Fortum's electricity production in Russia is based on fossil fuels, mainly on natural gas. Fortum's new plant units in Russia are based on gas turbine technology, which represents the best available technology in natural gas combustion. In 2017, Russia accounted for 99% of Fortum's use of natural gas.

Biomass

Nameplate capacity (MW)
70

Gross electricity generation (GWh)
280

Net electricity generation (GWh)
280

Absolute scope 1 emissions (metric tons CO2e)
59800

Scope 1 emissions intensity (metric tons CO2e per GWh)
214

Comment
Fortum dislosures the breakdown of total power plant capacity, generation, and related emissions in Russia and Finland. In 2017, biomass was mainly used in Finland, Baltic countries and Poland.

Waste (non-biomass)

Nameplate capacity (MW)
20

Gross electricity generation (GWh)
50

Net electricity generation (GWh)
50

Absolute scope 1 emissions (metric tons CO2e)
33500

Scope 1 emissions intensity (metric tons CO2e per GWh)
710

Comment
Fortum dislosures the breakdown of total power plant capacity, generation, and related emissions in Russia and Finland. In 2017, waste was used in Finland, other Nordic countries, and also in Lithuania.

Nuclear

Nameplate capacity (MW)
1480

Gross electricity generation (GWh)
11720

Net electricity generation (GWh)
11700

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Fortum dislosures the breakdown of total power plant capacity, generation, and related emissions in Russia and Finland. Nuclear power is generated in Finland and in Sweden. In 2017, Fortum's nuclear capacity was 1,480 MW in Finland, 1,334 MW in Sweden, and in total 2,814 MW.

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

Hydroelectric

Nameplate capacity (MW)
1547

Gross electricity generation (GWh)
7350

Net electricity generation (GWh)
7350

Absolute scope 1 emissions (metric tons CO2e)
0

Scope 1 emissions intensity (metric tons CO2e per GWh)
0

Comment
Fortum dislosures the breakdown of total power plant capacity, generation, and related emissions in Russia and Finland. Hydropower is generated in Finland and Sweden. In 2017, Fortum's hydropower capacity was 1,547 MW in Finland, 3,125 MW in Sweden, and in total 4,672 MW.

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
Fortum dislosures the breakdown of total power plant capacity, generation, and related emissions in Russia and Finland.

Solar

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
Fortum dislosures the breakdown of total power plant capacity, generation, and related emissions in Russia and Finland.

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)
8600

Gross electricity generation (GWh)
46800

Net electricity generation (GWh)
46750

Absolute scope 1 emissions (metric tons CO2e)
11847000

Scope 1 emissions intensity (metric tons CO2e per GWh)
250

Comment
Fortum dislosures the breakdown of total power plant capacity, generation, and related emissions in Russia and Finland. Russia’s share of the total fuel consumption in 2017 was about 67%. In 2017, of Fortum's direct carbon dioxide emissions, 84% originated from the Russian operations and 9% from Finland.

C8.2f

(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.

Basis for applying a low-carbon emission factor
Energy attribute certificates, Guarantees of Origin

Low-carbon technology type
Solar PV
Wind
Hydropower
Biomass (including biogas)

MWh consumed associated with low-carbon electricity, heat, steam or cooling
270900

Emission factor (in units of metric tons CO2e per MWh)
0

Comment
This volume of purchased energy is carbon-free electricity certified with Guarantees of Origin (GoO). Additionally, Fortum sells only electricity produced without CO2 emissions to its customers in the Nordic countries. In 2017, Fortum continued to give Guarantee of Origin (GoO) to its electricity, meaning that a given share of quantity of energy is produced from renewable energy sources. Fortum also sells electricity under Green lables, which have stricter environment criterias i.e. not just renewable.

C-EU8.4

(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
Waste

Metric value
45

Metric numerator
The material recovery rate of own waste, %

Metric denominator (intensity metric only)
The material recovery rate of own waste, %

% change from previous year
24

Direction of change
Increased

Please explain
Fortum's aim is to promote the transition towards a more extensive circular economy. Fortum's new circular economy services recover by-products and wastes generated in energy production whenever possible. Materials are utilised as efficiently as possible and hazardous materials are removed from circulation. Fortum's circular economy business has grown especially in the Nordic countries in 2016-2017. Fortum's circular economy business operates waste treatment and incineration facilities in Finland, Sweden, Denmark, Norway and Lithuania. In 2017, Fortum concluded the restructuring of its ownership in Hafslund together with the City of Oslo. The City of Oslo's waste-to-energy plant Klemetsrud, which is the largest energy recovery plant in Norway, was transferred to Fortum's ownership through the transaction. Waste treatment reduces the formation of greenhouse gases (GHG) generated from biodegradable waste at landfills. Waste incineration also decreases the use of virgin fossil fuels in electricity and heat production. The total volume of by-products and waste generated at Fortum's own power and heat plants in 2017 was about 850,000 tonnes. Of this volume, 45% was recycled or reused. In 2016, the material recovery rate was 37%. In 2017, Fortum received also a total of approximately 1.2 million tonnes of non-hazardous waste from its customers and about 640,000 tonnes of hazardous waste from its customers. During year 2017, Fortum recovered as materials about 650,000 tonnes; environmental construction materials accounted for about 362,000 tonnes of that amount, recoverable ash accounted for about 159,000 tonnes, and processed raw materials and products about 80,000 tonnes. The material recovery rate of the waste received from customers was 57% in 2017. In addition, Fortum incinerated waste, which was unsuitable for recycling or reuse as a material, at the waste-to-energy plants about 1.2 million tonnes in 2017.

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
Solar	120000000	10	2019	In June 2018, Fortum won the right to build a 250 megawatt (MW) solar power plant in Pavagada solar park in India. Commissioning of the plant is expected in the third quarter of 2019. The capital expenditure is estimated to be approximately EUR 120 million and the solar park will be entitled to a fixed tariff of 2.85 INR/kWh for 25 years. In 2017, Fortum invested EUR 375 million in CO2 free energy production and Fortum's total Capital expenditure was EUR 690 million. Thus the share of investments in CO2 free production was 54%. Fortum disclosures Capital expenditure of previous year by country and by production type in the Financial Statements, Note 17.2 Capital Expenditure.

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
Please select				

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
January 1 2017

Investment end date
December 31 2017

Investment area
R&D

Technology area
Renewable energy

Investment maturity
Full/commercial-scale demonstration

Investment figure
53000000

Low-carbon investment percentage
80

Please explain
Sustainability is at the core of Fortum's strategy and, alongside Fortum's current businesses, the company is carefully exploring and developing new sources of growth within renewable energy production. Fortum's goal is to be at the forefront of energy technology and application development. The company is continuously looking for emerging clean energy solutions and for solutions that increase resource and energy efficiency. In 2017, Fortum's Research and Development expenditure was EUR 53 million, or 1.2% of sales. Each new Research and Development project is assessed against the criteria of carbon dioxide emissions reduction and resource efficiency.

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 and/or Scope 2 emissions and attach the relevant statements.

Scope
Scope 1

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
High assurance

Attach the statement
Suomenojan voimalaitos_VerificationStatement_28-03-18-12-36.pdf

Page/ section reference
Pages 1-5

Relevant standard
European Union Emissions Trading System (EU ETS)

Proportion of reported emissions verified (%)
13

Scope
Scope 1

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
CDP-verification_Fortum.pdf

Page/ section reference
Pages 1-4

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
100

Scope
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
CDP-verification_Fortum.pdf

Page/ section reference
Pages 1-4

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
100

Scope
Scope 2 location-based

Verification or assurance cycle in place
Please select

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
CDP-verification_Fortum.pdf

Page/ section reference
Pages 1-4

Relevant standard
ASAE3000

Proportion of reported emissions verified (%)
100

C10.1b

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

Scope
Scope 3- all relevant categories

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Attach the statement
CDP-verification_Fortum.pdf

Page/section reference
Pages 1-4

Relevant standard
ISAE3000

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?
Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C7. Emissions breakdown	Year on year change in emissions (Scope 1 and 2)	International Standard on Assurance Engagements ISAE3410, limited assurance	The verification referred to in C7 includes a comparison of annual emissions of 2017 and the previous year 2016.
C7. Emissions breakdown	Year on year change in emissions (Scope 3)	International Standard on Assurance Engagements ISAE3410, limited assurance	The verification referred to in C7 includes a comparison of annual emissions of 2017 and the previous year 2016.

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.

EU ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading systems in which you participate.

EU ETS

% of Scope 1 emissions covered by the ETS

13

Period start date

January 1 2017

Period end date

December 31 2017

Allowances allocated

1028300

Allowances purchased

1344600

Verified emissions in metric tons CO2e

2372900

Details of ownership

Facilities we own and operate

Comment

Fortum had a total of 50 plants in six member countries within the EU's emissions trading scheme (ETS) in 2017. Over 79% of carbon dioxide emissions from Fortum's energy production in the Nordic countries, the Baltic countries and Poland are within the scope of the EU ETS. In total, 13% of Fortum's scope 1 emissions are covered by the EU ETS.

C11.1d

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

Fortum's strategy complying with the EU ETS comprises of three main elements: emission reduction measures including efficiency upgrades in our own installations (in-house abatement) and investment in low-carbon production, operation in the emissions trading scheme (purchase and selling of allowances) and the use of project based emission reduction credits (Kyoto mechanisms). The individual compliance and trading strategies are defined by the relevant business divisions. In 2017, Fortum commissioned for example two new solar power plants in India: 70-MW Bhadla solar power plant and the 100-MW Pavagada solar power plant. In 2017, Fortum also implemented refurbishments of hydropower plants in Sweden and Finland increased electricity production of 27 GWh. The estimated annual CO2 savings from solar and hydro projects were 145,300 metric tonnes CO2.

C11.2

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

Yes

C11.2a

(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.

Credit origination or credit purchase

Credit origination

Project type

Landfill gas

Project identification

Fortum is a participant in the World Bank's Prototype Carbon Fund (PCF). Credits received in 2017 originate from the Durban landfill gas-to-electricity project in Mariannhill and La Mercy Landfills in South Africa (project number ZA545).

Verified to which standard

CDM (Clean Development Mechanism)

Number of credits (metric tonnes CO2e)

12362

Number of credits (metric tonnes CO2e): Risk adjusted volume

12362

Credits cancelled

Yes

Purpose, e.g. compliance

Voluntary Offsetting

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
Stress test investments

GHG Scope
Scope 1

Application
Internal price on carbon pertains to Scope 1 emissions in the EU countries and it is used in assessing the sensitivity of investments in Fortum's capital expenditure decisions. All investment proposals are subject to internal investment evaluation and approval process where use of the internal price is checked. In addition to other commodity prices, the price of carbon is among the factors affecting the profitability of the investments. Fortum does not disclose the actual internal price of carbon.

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

Variance of price(s) used
The allowance price in the EU emissions trading scheme has varied significantly (from almost zero up to 30 euros) during the years 2005-2017. At the end of 2017, price was around EUR 8, but since then has increased to the level of EUR 15. Consequently, the internal price on carbon based on the EU carbon price has also varied.

Type of internal carbon price
Shadow price

Impact & implication
Carbon pricing is one of the parameters used for the analysis of potential investments, with multiple price scenarios used to evaluate the impact on investment profitability. The inclusion of price scenarios with carbon prices above the current market prices allows better analysis of the benefits of low-carbon investments and also illustrates the potential risks of high-carbon alternatives.

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
Compliance & onboarding

Details of engagement
Included climate change in supplier selection / management mechanism

% of suppliers by number
7

% total procurement spend (direct and indirect)
76

% Scope 3 emissions as reported in C6.5
78

Rationale for the coverage of your engagement
Fortum assesses its business partners' sustainability performance through supplier qualification and supplier audits. The supplier qualification is made when the purchase volume is EUR 50,000 or more. In the qualification process, suppliers respond to a survey that Fortum uses to help determine, among other things, the supplier's environmental management systems and the occupational safety level of the contractors. Fortum's Russia Division uses its own supplier qualification process that is based on Russian procurement law. In 2017, the majority of Fortum's Scope 3 GHG emissions were caused by the fuel and energy related activities, such as the transportation of fuels and waste, 87%. Additionally, Fortum's Scope 3 emissions were caused by the purchases of goods and services, 8% and the investments, 5%, which are related to Fortum's suppliers. Other activities (e.g. employee business travel and waste management) accounted for less than 1% of Scope 3 GHG emissions.

Impact of engagement, including measures of success
In 2017, 76% of Fortum's spend came from qualified suppliers. If potential risks in the supplier's operations are identified through the questionnaire, the more extensive self-assessment questionnaire is sent or a supplier audit is conducted. During 2016 and 2017, more than 300 suppliers have been qualified based on the more extensive self-assessment questionnaire and 25 suppliers based on a supplier audit.

Comment

C12.1c

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

According to Fortum's Policy for Sponsoring and Donations, Fortum's sponsoring focuses on the wellbeing of children and youth, renewable energy projects, Research and Development and innovations supporting Fortum's strategy, recycling, recovery and reutilisation.

For example, Fortum launched in Russia the "Culture of the new generation: energy saving and efficiency" project in 2015. In 2017, more than 1,500 school kids in Tyumen, Chelyabinsk, and other cities in the Chelyabinsk region completed the "AboutEnergy" educational programme sponsored by Fortum. The goal of this Energy educational programme is to teach children to use resources efficiently and to foster an ecological mindset. During the school year, 67 classes in 20 schools in the participating cities and the districts took the total of more than 2,000 lessons under this programme.

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?
Direct engagement with policy makers
Trade associations
Funding research organizations

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Cap and trade	Support with minor exceptions	In 2017, Fortum actively promoted a market-based energy and climate policy regarding the future EU target setting, the emissions trading scheme and the functioning of the internal energy market. Fortum strongly advocated for the reform of the EU ETS . This reform was finalised in the end of 2017. Fortum highlighted the need to strengthen the ETS by increasing the linear reduction factor (LRF), improving the coherence between the EU ETS and parallel policies, and minimizing market distortions from the Innovation Fund and the New Entrants' Reserve (NER). During the EU legislative process Fortum had extensive dialogue with several governmental organisations and politicians in the EU, the European Commission and the Parliament in particular, and member states. Fortum was actively involved in the preparations of the Bonn COP23 and participated in the conference as part of the International Chamber of Commerce(ICC) delegation. During the year Fortum participated in several international business initiatives promoting the role of business in climate change mitigation: Caring For Climate Initiative under the UN Global Compact and Carbon Pricing Leadership Coalition by the World Bank. Fortum has also been active in the Union of the Electricity Industry – eurelectric, which represents the common interests of the whole European electricity industry, and has participated in discussions with national authorities and other stakeholders.	Fortum is strongly committed to climate change mitigation and supports cap and trade-based emissions trading as the main climate policy instrument in Europe. The European emissions trading system (EU ETS) should not be seen in isolation, but in a context of other climate and energy policy targets and measures set and implemented both on the EU and national levels. In that background, Fortum considers the following measures necessary to strengthen the incentives generated by the EU ETS: - Short-term (2013-2020): starting the Market Stability Reserve in 2019 and transfer of backloaded and unallocated allowances into the reserve. - Long-term (after 2020): Emissions reduction target as a headline target and the EU ETS as the key instrument to steer the EU climate policy. Other targets that have overlapping effects on the EU ETS – targets like those on renewable energy sources, energy efficiency and taxation – must be supportive of the EU ETS, if needed at all. This applies to the targets themselves as well as to the measures by which they are implemented in order to avoid a situation in which they water down the incentives of each other. CO2 reduction targets based on the EU Climate Roadmap should be set for 2040 and 2050. The cap of the ETS should be adjusted in accordance with these targets by increasing the linear emissions reduction factor latest from 2020 onwards. In addition, extension of the ETS to new sectors should be carefully analysed.
Carbon tax	Oppose	Fortum has opposed carbon taxes in general and so called windfall tax in particular. Fortum has engaged in close collaboration with the European Commission in particular. Fortum has also been active in the Union of the Electricity Industry – eurelectric, which represents the common interests of the whole European electricity industry, and has participated in discussions with national authorities and other stakeholders.	When designing energy and climate policy targets and measures to reach them, the EU must rely on the core source of its competitiveness i.e. well-functioning internal energy markets. EU cannot afford policy measures that do not exploit the internal market or which are non-market based and/or predominantly national. If the functioning of the emission trading is not addressed, the risk for national measures like CO2-taxes increases. This development must be reversed. Fortum supported an ambitious revision of the EU ETS. For the energy sector, where investments are capital intensive and with long lead times, it is crucial that the future energy and climate policy framework is predictable. In Fortum's view: - Well-functioning and efficient internal energy market is essential for reaching the de-carbonisation target in the most cost-efficient way, lowering the overall social costs of de-carbonisation. - The focus should be placed on carbon emission reduction. The 2030 framework should be based on a single binding headline target for CO2. - The level of target should be in line with the 2050 decarbonisation aspiration (80-95% CO2 reduction from 1990 level) which in our view would be in the range of at least 40% for 2030. The present trajectory will lead only to about 60% CO2 reduction by 2050.
Energy efficiency	Support with minor exceptions	In November 2016, the EU Commission made proposals for a revised energy efficiency Directive and for a revised energy performance of buildings Directive. Fortum has engaged in close collaboration with the European Commission, Parliament and Council. Fortum has also been active in the Union of the Electricity Industry – eurelectric, which represents the common interests of the whole European electricity industry, and has participated in discussions with national authorities and other stakeholders.	Fortum supports energy efficiency and believes that more efficient use of energy sources is of great importance. However, in a modern and low-emitting energy system where an increasing share of power production is characterised by intermittency, it is more important when energy is consumed than how much energy is consumed. Energy efficiency policies and legislation should be designed to reflect this paradigm and focus more on measures to accommodate the ever more flexible power markets rather than imposing static savings obligations like the Commission is proposing in the Energy Efficiency Directive. Fortum has asked for a common heating and cooling strategy for the EU, but sees the Energy Efficiency Directive as an important step forward within the heating and cooling plans drafted by the Member States. Fortum welcomed the Directive, as district heating and cooling (DHC) is acknowledged as an important technology in achieving a more energy-efficient society. Fortum is, however, against an EU obligation to introduce mandatory savings targets allocated to distributors or electricity retailers through energy-savings obligation schemes. It is the energy users who must be directly motivated to create their own energy savings. The energy provider, of course, must be involved in offering tools and information to get consumers to make conscious decisions regarding their energy consumption. Furthermore, whenever considering such targets, early actions in each Member State must be taken into account.

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Clean energy generation	Support with major exceptions	Fortum has engaged in close collaboration with the European Commission in particular. Fortum has also been active in the Union of the Electricity Industry – eurelectric, which represents the common interests of the whole European electricity industry, and has participated in discussions with national authorities and other stakeholders.	In Fortum's view: - Well-functioning and efficient internal energy market is essential for reaching the de-carbonisation target in the most cost-efficient way, lowering the overall social costs of de-carbonisation. - The focus should be placed on carbon emission reduction. We welcome that the EU 2030 framework sets the emissions reduction target as the headline target. - The EU ETS is the most efficient tool to be used to meet this target. Additional targets for renewable energy or energy efficiency should focus on non-ETS sectors. Measures promoting these targets should not water down the CO2-price incentive or undermine the functioning of the internal energy market, and they should be harmonized to the extent possible. - European policy needs European implementation measures. Complementary national policies (CO2 taxes etc.) must be avoided in order to secure a level playing field in the common market as these would lead to unnecessarily high costs.

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

Eurelectric

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Eurelectric is strongly committed to reducing carbon emissions and meeting the EU's climate targets for 2020-2030 and its 2050 climate vision. Delivering these targets and vision depends on an appropriate policy framework that enables cost-effective investments in low-carbon technologies. Eurelectric has consistently adopted a proactive approach in developing market-oriented policies and measures that will help to mitigate climate change. In 2017, eurelectric published its new vision on achieving a carbon-neutral electricity mix in Europe well before mid-century. In eurelectric's view, a meaningful carbon price is important to ensure decarbonisation - also beyond the power sector.

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

Fortum is through the national associations represented in the Working Group Climate Change and several other groups at eurelectric and has been actively contributing to the development of positions at eurelectric. Fortum has a continuous dialogue with the association almost on a daily basis.

Trade association

IETA (International Emissions Trading Association)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The International Emissions Trading Association (IETA) is a non-profit business organisation founded in June 1999 to establish a functional international framework for trading in greenhouse gas emission reductions. IETA members seek to develop an emissions trading regime that results in real and verifiable greenhouse gas emission reductions, while balancing economic efficiency with environmental integrity and social equity. IETA supports the ETS as the cornerstone of the EU's climate policy. According to IETA, ETS has achieved emissions reductions at a low cost, given its flexibility and links to the Kyoto mechanisms. IETA believes that structural reforms to the EU ETS thus need to be discussed as part of the wider future policy framework post-2020. The EU ETS cap - and its annual linear reduction factor - should be the main tool to reach the EU 2030 target.

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

Fortum is represented in several climate related working groups at IETA and has been actively contributing to the development of positions at IETA. Fortum has a continuous dialogue with the association.

Trade association
Finnish Energy

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
Finnish Energy (FE) is the voice of over 260 member companies that produce, acquire, transmit and sell electricity, district heat and district cooling and offer related services. FE is committed to a vision of carbon neutral electricity and district heat in Finland in 2050, supporting the EU-wide 80-95% emission reduction goal. FE sees a market-based EU ETS as the key instrument to a low carbon future in the covered sectors. FE welcomes the effort of strengthening the ETS, because alternative development would likely result in a fragmented climate policy, disintegrated internal energy market and high cost of transformation towards a low-carbon society. The changes to the ETS should be coordinated with regard to a broader energy and climate policy framework post-2020.

How have you, or are you attempting to, influence the position?
Fortum is represented in the Climate Change Committee, in the Board (Fortum CEO as chairman) and Energy Production Committee at FE and has been actively contributing to the development of positions at FE. Fortum has a continuous dialogue with the association almost on a daily basis.

Trade association
Swedenergy

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
Swedenergy is the united voice of Swedish energy industry. Swedenergy is representing companies involved in the production, distribution and trading of electricity and heating & cooling in Sweden – with a total of 400 member companies. Swedenergy believes that the EU ETS should become the main driver for cutting GHG emissions in line with the EU´s commonly agreed long-term climate objectives. EU ETS assures that emissions are reduced in a cost-efficient manner within the sectors covered by the system in the EU. The 2030 target for emission reduction together with a revised annual reduction factor in EU ETS, would help to increase the credibility of the EU Climate Change Policy and to provide the business society with visibility on the ambition levels aimed for beyond 2020 and thereby create incentives for long term investments in low carbon technology. Short term measures may however also be necessary to increase the credibility of EU ETS and to avoid introduction other, less cost-efficient measures, to rule out the role of EU ETS.

How have you, or are you attempting to, influence the position?
Fortum is represented in the Working Group Climate (with focus on EU ETS and other climate issues) at Swedenergy and has been actively contributing to the development of positions at Swedenergy. Fortum has a continuous dialogue with the association almost on a daily basis. Fortum is also engaged in different committees such as energy efficiency, production and infrastructure for EVs.

Trade association
Euroheat and Power

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
Euroheat and Power (EHP) is a European district heating and cooling association, representing members from over 30 countries. EHP membership includes national district heating and cooling associations, district heating and cooling utilities, equipment manufacturers, academic institutions, research bodies and consultancies active in the sector. EHP strongly supports the EU long term climate ambitions. In particular, EHP advocates for more action and investments to decarbonize the heating sector in Europe, promoting district heating and cooling as one of the vehicles to integrate more renewable and low carbon heat to the energy mix. With regards to the EU Emission Trading System, EHP called for boosting its effectiveness as a critical tool to reduce CO2 emissions in Europe. EHP sought that the EU ETS would not undermine the competitiveness of district heating as compared to other heating solutions, such as natural gas boilers, falling outside of the scope of the EU ETS. EHP long advocated that non-EU ETS heating solutions should be subject to different forms of carbon pricing e.g. carbon taxation. In addition, EHP called EU policy makers to ensure that EU ETS revenues are spent to modernize EU energy systems, including district heating networks, as well as to promote innovation. Currently, EHP is working with the EU policy makers to provide technical input and comments on a number of implementing legislation measures e.g. setting out the new benchmarks for free allowances, rules on the functioning of the Modernization Fund and others.

How have you, or are you attempting to, influence the position?
Fortum is represented in the Energy Policy Committee and in the Board of Directors and has been actively contributing to the development of association's positions. Fortum has a continuous dialogue with the association almost on a daily basis.

Trade association
COGEN Europe

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
COGEN Europe aligns with the importance of mitigating climate change. COGEN Europe's primary focus is on promoting the further utilization of high-efficiency co-generation for both industrial heat and district heating production. Key justification is the energy efficiency benefit of co-generation compared to separate production of required heat with heat-only boilers and separate production of electricity in a condensing power plant.

How have you, or are you attempting to, influence the position?
Fortum has delivered related own views and positions to COGEN Europe.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?
Yes

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?

This process is mainly governed and coordinated by Public Affairs function in the company. The main task of Fortum's Public Affairs is to be aware of current and upcoming energy-related policy and legislation in the EU and in all countries where Fortum operates. This information is brought into the company's strategic and business decisions. Fortum's positions are prepared in close collaboration with business divisions, corporate relations, communication and sustainability experts. Positions to influence policy are approved by relevant business divisions and/or corporate functions. The positions take into consideration our company strategy, our approach to climate change and our preferences in climate policy and policy instruments. The activities influencing policy are based on the established positions. The activities and key messages are coordinated and aligned throughout our operating countries. Fortum offers expert advice to decision makers and non-governmental organisations in energy-related issues. Fortum also takes part in consultations and provides authorities with constructive suggestions forming the basis of legislative proposals. Fortum engages in an active dialogue with authorities and decision-makers about key climate issues in the energy sector.

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 other regulatory filings

Fortum Sustainability Report 2017

Status
Complete

Attach the document
Fortum_Sustainability_2017.pdf

Content elements
Governance

Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Publication
In voluntary communications

Presentation: Sustainability at Fortum 2017

Status
Complete

Attach the document
Sustainability at Fortum.pdf

Content elements
Strategy
Emissions figures
Emission targets
Other metrics

Publication
In mainstream reports in accordance with the CDSB Framework

Fortum Financial Statements 2017 Other parts of Fortum's reporting entity include Fortum Online Annual Review, CEO Letter, Corporate Governance Statement, Remuneration Statement, Tax Footprint as well as the Sustainability Report. Fortum Online Annual Review 2017: http://annualreport2017.fortum.com/en/ CEO Letter, Environmental efficiency, Regulatory environment, Value-creating strategy, Fortum transformation.

Status
Complete

Attach the document
Fortum_Financials_2017.pdf

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Publication
In voluntary communications

Fortum Energy Review: Let's not waste our waste, published in November 2017, focuses on essential roles of hazardous waste treatment and energy recovery as vital elements of a circular economy.

Status
Complete

Attach the document
2017_11_Energy_review_Circular_economy.pdf

Content elements
Strategy
Risks & opportunities
Emission targets
Other metrics

Publication
In voluntary communications

Fortum Energy Review: Driving to a cleaner future, published in October 2017, focuses on challenges and opportunities in developing electromobility in Europe. Improving the availability of charging infrastructure encourages consumers to uptake electric vehicles.

Status
Complete

Attach the document
ER_Electromobility_Oct_2017.pdf

Content elements
Strategy
Risks & opportunities
Other metrics

Publication
In voluntary communications

Fortum Energy Review: Electricity Retail Market, published in May 2017, focuses on the new energy system and active energy consumers.

Status
Complete

Attach the document
Energy-Review_Electricity-retail-market-06_2017.pdf

Content elements
Strategy
Risks & opportunities
Other metrics

Publication
In voluntary communications

Our environment 2017 - Loviisa power plant: When combating climate change nuclear is part of the solution. As a producer of clean energy, the Loviisa power plant and carbon-free nuclear power play a significant role in mitigating climate change. The greenhouse gas emissions during nuclear power's lifecycle are as low as those for wind, hydro and solar power.

Status
Complete

Attach the document
meidan_ymparistomme_2017_eng_net.pdf

Content elements
Strategy
Risks & opportunities
Emission targets
Other metrics

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 and CEO	Chief Executive Officer (CEO)

Submit your response

In which language are you submitting your response?

English

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