Fortum Oyj - Climate Change 2019

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 CO2 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 countries, 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 energy and 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 Fortum delivers excellent shareholder value. Fortum presented its updated strategy in November 2018. Fortum's strategy has four priorities: (1) Pursue operational excellence and increased flexibility, (2) Ensure value creation from investments and portfolio optimisation, (3) Drive focused growth in the power value chain, and (4) Build options for significant new businesses.

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 takes into consideration climate and resource issues as well as impacts on personnel and society, and Fortum emphasises a circular economy, better resource and energy efficiency, and climate change mitigation. Fortum’s aim is to provide its customers environmentally benign and reliable products and services. Fortum's know-how in carbon dioxide-free hydro and nuclear power production and in energy-efficient combined heat and power production, investments in renewable energy, such as wind and solar power, as well as circular economy and resource efficiency, play a key role in environmental responsibility.

In 2018, 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 2018, 96% of Fortum's electricity production was CO2-free in Europe, and 57% of Fortum's total electricity production was CO2-free. Fortum's aim is to increase renewable energy generation in future. Fortum's strategy is targeting to a multi-gigawatt wind and solar portfolio.

In 2018, Fortum's sales were EUR 5.2 billion and the comparable operating profit totalled EUR 987 million. In 2018, Fortum paid EUR 977 million in dividends to its shareholders, and Fortum's total taxes borne amounted to EUR 299 million. Fortum’s share is listed on NASDAQ OMX Helsinki and our market capitalisation was around 17 million on the last trading day of 2018. 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 2018	December 31 2018	No	<Not Applicable>

C0.3

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

Denmark
Estonia
Finland
India
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) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Director on board	Sustainability including climate-related issues is an integral part of Fortum's strategy, so the highest decision-making authority is with the Board of Directors, which has joint responsibility (all directors) in matters related to sustainability. Fortum has not nominated any individual Board member as responsible for climate affairs. The Audit and Risk Committee (ARC), members of the Fortum Executive Management (FEM), and other senior executives support the BoD in the decision making in these matters, when necessary. Fortum will implement TCFD reporting and, once implemented, the ARC will have a responsibility to annually review climate-related risks. By the CEO's designation the Senior Vice President (SVP), Corporate Affairs and Communications, has the overall responsibility for sustainability, including also climate-related issues. The SVP is a member of FEM. As a C-suite officer he has the executive level responsibility for Fortum's TCFD reporting to be implemented in early 2020.

C1.1b

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

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding business plans 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 (FEM) 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 (FEM) 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. In its Annual Clock the Board has specific meetings dedicated for strategy, review of the Group's consolidated Risk Report and risk management policies. Performance objectives are set as part of the business planning process and reviewed in Quarterly Performance Reviews. This also includes review of actions. Major capital expenditures, acquisitions and divestments are handled at the Board according to the requirements and timetables defined in the Fortum investment manual.

C1.2

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

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Other C-Suite Officer, please specify (SVP Corporate Affairs and Communications)	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 (do not include the names of individuals).

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 (ARC) 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. As part of Fortum's TCFD reporting to be published in early 2020, the ARC is also responsible for annual review of the Group's climate-related risks.

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.

The Fortum Executive Management (FEM) consists of ten members, including the President and CEO. Fortum's President and CEO is supported by the 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 (FEM) and has the executive level responsibility for Fortum's TCFD reporting to be implemented in early 2020. 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 sustainability (safety) targets is a part of Fortum's short-term incentive (STI) scheme.

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 (do not include the names of individuals).

Who is entitled to benefit from these incentives?

Chief Executive Officer (CEO)

Types of incentives
Monetary reward

Activity incentivized
Emissions reduction target

Comment
Incentive schemes applicable to Fortum's Executive management team include long-term incentive (LTI) scheme and short-term incentive (STI) scheme. The Board of Directors decides, based on the proposals made by the Nomination and Remuneration Committee, on performance criteria and award levels for the 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. Under the 2017-2019 and the 2018–2020 LTI plan, the Board-approved earnings criteria are based on earnings per share (50%) and relative total shareholder return (50%) measured against the European utilities peer group. The criteria for annual incentives (STI) which were paid in 2019 based on 2018 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. The Board of Directors can, at its discretion, take into consideration in the result also other sustainability performance, i.e., including the number of severe occupational accidents. In 2018, four severe occupational accidents took place in our operations. Therefore, the Board decided to reduce the Group safety STI result by 20%. The reduction directly addressed Fortum Executive Management members and all members of Divisional and Functional management teams. Furthermore, it was decided that Division heads cascaded the adjustment down to their respective organisations in a way they see appropriate to execute the principle of line responsibility. As part of the TCFD reporting implementation the incentive structure for senior management is currently being evaluated. The revised structure is proposed to have climate-related incentive (emission reduction target, gCO2/kWh) for i) addressing Fortum Executive Management or ii) as part of LTI addressing some 100 senior managers. The Board of Directors will decide the structure by year-end 2019.

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

Types of incentives
Monetary reward

Activity incentivized
Emissions reduction target

Comment
Incentive schemes applicable to Fortum's Executive management team include long-term incentive (LTI) scheme and short-term incentive (STI) scheme. The Board of Directors decides, based on the proposals made by the Nomination and Remuneration Committee, on performance criteria and award levels for the 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. Under the 2017-2019 and the 2018–2020 LTI plan, the Board-approved earnings criteria are based on earnings per share (50%) and relative total shareholder return (50%) measured against the European utilities peer group. The criteria for annual incentives (STI) which were paid in 2019 based on 2018 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. The Board of Directors can, at its discretion, take into consideration in the result also other sustainability performance, i.e., including the number of severe occupational accidents. In 2018, four severe occupational accidents took place in our operations. Therefore, the Board decided to reduce the Group safety STI result by 20%. The reduction directly addressed Fortum Executive Management members and all members of Divisional and Functional management teams. Furthermore, it was decided that Division heads cascaded the adjustment down to their respective organisations in a way they see appropriate to execute the principle of line responsibility. As part of the TCFD reporting implementation the incentive structure for senior management is currently being evaluated. The revised structure is proposed to have climate-related incentive (emission reduction target, gCO2/kWh) for i) addressing Fortum Executive Management or ii) as part of LTI addressing some 100 senior managers. The Board of Directors will decide the structure by year-end 2019.

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

Types of incentives
Monetary reward

Activity incentivized
Emissions reduction target

Comment
As part of the TCFD reporting implementation the incentive structure for senior management is currently being evaluated. The revised structure is proposed to have climate-related incentive (emission reduction target, gCO2/kWh) for i) addressing Fortum

Executive Management or ii) as part of LTI addressing some 100 senior managers. The Board of Directors will decide the structure by year-end 2019. If the option ii) is selected, then this 100 senior managers will also include key business managers.

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 period for quantified risks assessments is up to 2030. Long-term risks may be assessed also after 2030, when 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	Six-monthly or more frequently	>6 years	Fortum has an annual process to identify and assess all risks, including climate-related risks. The process supports both identification of new risks and updating existing risks. The timeframe focus on the medium-term risks, i.e. up to 6 years, but also include the long-term risks. These risk assessments are reviewed at least bi-annually and updated in case of any significant change. As part of annual strategy reviews, the long-term risks, including climate-related risks, are identified and assessed in relation to Fortum’s strategic targets and used as inputs in updating long-term scenarios. Fortum monitors and discloses relevant risks in its quarterly reporting including climate-related regulatory changes, CO2 pricing, changes in energy commodity prices and weather induced changes in water reservoir levels.

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 likelihood and impact according to a Group-common methodology. The timeframe for considered risks is >6 years. 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. An example of operational climate-related risks are the negative effects of extreme temperatures and floods whereas changes in average temperatures are also part of financial risks as it affects the future market prices of power prices.

Fortum's risk identification and assessment process is run at least annually through both a bottom-up and top-down approach. Each year, business areas and functions identify and assess their risks through self-assessment workshops, some of which are facilitated by Corporate Risk Management. The focus of the bottom-up process is operational risks, but risks from all categories are considered. Climate-related risks are included as a specific area to be addressed in this process during 2019.

All risks are documented in a Group-common risk register which includes a description of the risk, it's root causes and consequences, the impact and likelihood of each risk (including a description of how the assessment has been done), owner of the risk, mitigation actions and action owners. The risks are then consolidated on Division and Group-level and relevant management teams, Corporate Functions and experts give their top-down view on the risks exposures. The aim is that the top-down review process will include a review of the key climate-related risks of the Group by a "climate risk committee" by the end of 2019.

The Group's key risks and uncertainties, including climate-related risks, are reviewed by Fortum's Executive Management in conjunction with the annual update of the long-term forecast. The key risks are also reviewed by Fortum's Audit and Risk Committee (ARC). In conjunction with strategy updates, key risks which can impact Fortum's ability to implement or reach strategic targets are identified and assessed. This assessment includes analysing different scenarios of possible future developments of key parameters such as business environment, technology, energy policy and regulation and also climate-change.

Prioritizing and classifying risks 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 expects an event to occur in a specified period of time, and it is measured in percentage terms (i.e. 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 can be hundreds of million euros, whereas the scale level 3 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, i.e. 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 appropriate priority in relation to monetary impacts .

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's emissions trading scheme (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. Each business division has established a system to follow current regulation as part of their environmental and quality management system. Public Affairs produces a quarterly internal report reviewing the key legislative developments in the EU and in Fortum's operating countries. Fortum uses several external policy information sources i.e. Politico and ENDS in collecting information on regulation.

	Relevance & inclusion	Please explain
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, the EU Commission is currently 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 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. Public Affairs produces a quarterly internal report reviewing the key legislative developments in the EU and in Fortum's operating countries. Fortum uses several external policy information sources i.e. Politico and ENDS in collecting information on regulation.
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. Especially viability of new technologies is relevant within the context of climate-related risks. The investments into and the pace of development of new technologies related to, for example, renewable energy production, fuels, storage (i.e. batteries), recycling and carbon capture and storage is constantly increasing. Technology risks are managed primarily through developing a diversified portfolio of projects consisting of different technologies as well as investing into start-up funds in order to monitor key developments in the area of clean energy. 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. Public Affairs produces a quarterly internal report reviewing the key legislative developments in the EU and in Fortum's operating countries. Fortum uses several external policy information sources e.g. Politico and ENDS in collecting information on regulation.
Market	Relevant, always included	Changes in prices and volumes of electricity pose the single largest risk and also opportunity for Fortum in monetary terms. 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	For Fortum, customer satisfaction and reputation are a top priority in implementing the company’s strategy and in growing the business. Fortum has set Group-wide targets for its customer satisfaction and reputation. Fortum uses the extensive One Fortum Survey annually to measure reputation and customer satisfaction and the factors that impact them. The survey covers customers and general public, decision makers, capital markets, non-governmental organisations (NGOs) and opinion influencers, and personnel. Furthermore, the impact of all risks on Fortum’s reputation is assessed as part of Fortum’s company-wide risk assessment process. A broad-based dialogue is held on the means by which Europe can transition towards low-carbon energy production in the upcoming decades. For example, concerns have been raised by environmental NGOs about the use of coal in energy production. Fortum is committed to working for low-carbon energy production. Fortum strongly supports the goal of a carbon-neutral Europe by 2050. Fortum expects customers' concern about climate change to increase the demand for low-carbon and energy-efficient energy products and solutions. Additionally, Fortum emphasises the secure energy supply for customers. Fortum's customers require a reliable supply of economically priced energy, during the transition towards a low-carbon energy system.
Acute physical	Relevant, always included	Fortum’s operations are exposed to acute 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 flooding may also affect dam safety. Fortum adapts its operations to the changing climate by the methods for regulation and production planning, i.e., in hydropower in Sweden and Finland. Fortum also takes climate change into consideration in 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 chronic physical risks caused by climate change, including changes in weather patterns that could alter power and heat demand and energy production volumes. Fluctuating 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 new 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. Furthermore, availability of forest biomass and other wood-derived biofuels can be affected by weather conditions, especially wetter than normal weather, which can cause difficulties in procurement of biofuels. Sustainability and climate-related requirements for forest biomass may also lead to reduced availability and increasing costs of biomass fuels. Upstream 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 electric utility, and based on the materiality analysis of the company, there are not identified any downstream risks, which had been considered as material.

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. The timeframe for considered risks is >6 years.

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. Results of risk management process are reported to the Board of Directors or the Committee appointed by the Board.

There are 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.

The energy business is influenced by national and EU-level energy and climate policies and regulations. Fortum’s strategy in the power sector is based on a market-driven development. Fortum takes into consideration the climate-related transition risks of potential new businesses, investments and technologies. Potential transition 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. 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.

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. Fluctuating precipitation, flooding and extreme temperatures may affect hydropower production, dam safety, and the price and availability of biofuels. Hydrological conditions, precipitation, temperatures and wind conditions also affect the short-term electricity price in the Nordic power market.

In addition, climate-related opportunities are included in Fortum's company-wide approach in relation to its business strategy. Fortum takes climate change into consideration, i.e. in evaluating growth projects and investments, and in operation and maintenance planning. Early adaptation to climate change creates competitive advantage to Fortum. Fortum adapts its operations for climate change by the methods for regulation and production planning, i.e., in hydropower in Sweden and Finland.

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 and divestments 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 has also decommissioned coal-fired Inkoo power plant in Finland in 2017, and demolition of the plant is on-going. A circular economy principle is being applied at the demolition site.

Additionally, Fortum 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.

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.

C2.3

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

Yes

C2.3a

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

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Other

Type of financial impact

<Not Applicable>

Company- specific description

Despite the international Paris climate agreement made in 2015 and the Paris Rulebook adopted in 2018, the international climate policy framework including future greenhouse gas (GHG) emission reduction obligations and economic value of GHG emissions still remains uncertain. 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 started in 2018 when the EU Commission published the 2050 strategy proposal in November 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 a complementary 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. 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. In 2018, 96% of Fortum’s current European electricity production was CO2-free, and Fortum does not need to buy emission allowances for that production.

Time horizon

Medium-term

Likelihood

About as likely as not

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

34000000

Potential financial impact figure – maximum (currency)

40000000

Explanation of financial impact figure

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 free emission allowances are auctioned. The value of Fortum's free CO2 allowances in 2018 (0.8 Mt) was about EUR 20 million using a price of EUR 25/t. If CO2 price would decrease i.e. EUR 1, the electricity price decreases approx. EUR 0.5-0.6/MWh in the Nordic power market. In 2018, Fortum's electricity sales in EU and Norway was EUR 2,922 million and about 68.1 TWh. This will result in a decrease of Fortum's EBITDA by appr. EUR 34-40 million in an unhedged situation. On the other hand, if this forecast is not realised, the profitability of Fortum's CO2-free investments may be improved.

Management method

In 2018, Fortum co-operated with two other Nordic utilities and also with a few other European utilities in order to lobby for an ambitious EU long-term climate policy 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 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. In 2018, Fortum was also actively supporting the development of the EU 2050 climate strategy and satisfied with the proposal by the EU Commission. Fortum is a member of the World Bank's Carbon Pricing Leadership Coalition and the UN Caring for Climate Initiative. In 2018, Fortum's EU area-specific lobbying costs were about EUR 640,000. 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 2018, Fortum invested into wind power production EUR 62 million in the Nordic countries. Fortum also finalised refurbishments of hydropower plants in Sweden and Finland, resulting in additional hydropower capacity increase of 5 MW. In 2018, Fortum invested EUR 79 million into hydropower production in Sweden and Finland, mainly maintenance, legislation and productivity investments.

Cost of management

640000

Comment

Fortum is 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. 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.

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

<Not Applicable>

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. In 2018, the Ministry for Economic Development in Russia introduced a bill on “State regulation of Greenhouse Gases and on Amendments to Certain Legislative Acts of the Russian Federation” that could lay foundation for a national Emissions Trading System (ETS). Currently it is unclear how and when this proposal will proceed. 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 by 2016. This capacity increase is mainly based on natural gas, and Fortum's CO2 emissions will increase 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 2018, Fortum and Rusnano investment fund with 50/50 ownership gained the right to build and commission 1,823 MW of new CSA-supported wind power in Russia in 2019–2023. In 2019, the 50-MW Ulyanovsk wind farm was commissioned, and the investment fund has 350 MW of new wind power capacity

under construction. 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

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
15000000

Potential financial impact figure – maximum (currency)
20000000

Explanation of financial impact figure
Fortum's energy production in Russia is based on mainly natural gas and other fossil fuels. Even if several investment decisions and investments in new CO2-free wind and solar power production have been made in Russia, any cost of CO2 would increase also Fortum's power 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 16.9 Mt in 2018, and we estimate them to be 15-20 Mt per year in the future. For example, with emissions of 15-20 Mt and CO2 price of EUR 1 the financial value of emissions would correspond EUR 15-20 million. On the other hand, if such a emission trading scheme was in place in Russia, there could be positive impact on i.e. electricity and heat prices, which has not been estimated. Furthermore, the profitability of Fortum's CO2-free investments may also be improved in Russia.

Management method
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's investments in the new production capacity has increased annual direct CO2 emissions in Russia. 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 about 24% from 2010 until 2018. Fortum also aims at managing the risk by investing in renewable and CO2-free wind and solar power production capacity in Russia. In 2018, Fortum's total capital expenditure in Russia was EUR 54 (2017: 152) million including maintenance, productivity investments, modernisations and energy-efficiency improvements. Investments into new CO2-free wind power were EUR 5 (2017: 53) million. In Russia, the investments of wind power in 2017 and 2018 totalled EUR 58 million, which is on average EUR 29 million annually. In 2018, Fortum also won the right to build 110 MW of solar capacity in a Russian Capacity Supply Agreement (CSA) auction. Solar power will be commissioned during 2021–2022.

Cost of management
29000000

Comment
Of the direct CO2 emissions, 84% originated from the Russian operations in 2018. Fortum’s power production is CO2-free to a large extent. In 2018, 57% of Fortum's total power production was CO2-free.

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: Changes in precipitation patterns and extreme variability in weather patterns

Type of financial impact
Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description
Fortum's operations are exposed to the physical risks caused by climate change, including changes in weather patterns. Fluctuating precipitation, flooding and extreme temperatures may affect, for instance, hydropower production and dam safety. As any other dam owner, Fortum is exposed to a risk for a hydropower dam failure caused by extreme weather conditions and flooding, or other reasons. Method for identifying the impact: Fortum's dams have been allocated to dam safety classes defined by Swedish regulations. Dam failures of class A dams would have the most severe strain on the society and society's functions and include strong flooding along the river and loss of lives. Fortum has three dams in safety class A. Impacts on Fortum's operations; For Fortum a major dam break would lead to physical damages causing large capital costs, business interruptions leading to loss of production, and third-party liabilities. Major dam failures are extremely unlikely to occur.

Time horizon
Long-term

Likelihood
Exceptionally unlikely

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
1000000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The financial impact depends totally on the severity of the dam failure. A long-term program is in place for improving the surveillance of the condition of dams and for securing the discharge capacity in extreme flood situations. In Sweden, third-party liabilities from dam failures are strictly the plant owner’s responsibility. Together with other hydropower producers, Fortum has a shared dam liability insurance program in place that covers Swedish dam failure liabilities appr. EUR 1,000 million (SEK 10,000 million). The figure represents the value of this insurance. Possible costs may include evacuation, repair, replacement and outage costs of power plants, dams, public and private property, culture and nature environment and infrastructure.

Management method
The condition control program, investment program and maintenance program for Fortum's hydropower dams are totalled appr. EUR 25 million annually. For example in 2018, Fortum invested in total EUR 79 million into hydropower production, mainly maintenance, legislation and productivity investments in Sweden and Finland. The dam safety investment program is continuous with yearly investment costs. Fortum has a long-term program in place for improving the surveillance of the condition of dams and for securing the discharge capacity in extreme flood situations. In 2018, Fortum's biggest dam safety investment was the Imatra dam safety investment EUR 10 million in Finland.

Cost of management
25000000

Comment
In Sweden, dams of dam safety classes A, B and C are subject to specific regulations regarding monitoring, maintenance and hydrological conditions to endure. Fortum has a well-developed Risk Management Process for Dam Safety to ensure an efficient and safe management our Dam Portfolio, with special emphasis on high consequence dams. This process, in its content and core is formed based on the frame-works of ISO 31000 (Risk Management) and ICOLDs (International Commission of Large Dams) Bulletin 154 - Dam Safety Management: Operational phase of the dam life cycle. Fortum's dams have each a Risk Control Program that consists of programs for: Investment; Maintenance; Condition Control and Monitoring; Operation and Emergency; Preparedness; Experience Feed-back.

Identifier
Risk 4

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
Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description
Increasing temperature may result in increasing cooling water temperature for Fortum’s condensing power plants in Finland: Fortum's Loviisa nuclear power plant and 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, for example, storms or sea level rise. In such situations algae could cause business interruptions.

Time horizon
Long-term

Likelihood
Very likely

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
8000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
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 2018, the average area price in Finland was EUR 46.8 /MWh. The financial impacts depend the length of the production breakdown and power price. The production breakdown would result in financial loss about EUR 8 million per week at maximum.

Management method
At present, there is 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. 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). The Loviisa nuclear power plant has the cooling system, 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 2018, the automation modernisation, implemented over several years, was completed at the Loviisa nuclear power plant. In the project’s final phase, the old part of the plant’s scram system was replaced with new digital systems. Changes and improvements were also made to ensure the safety functions of the secondary circuit. Fortum invested EUR 99 million into the Loviisa nuclear power plant in Finland in 2018, and EUR 84 million in 2017.

Cost of management
0

Comment
There are continuously ongoing new investments at Fortum's Loviisa nuclear power plant to enhance safety in the improbable extreme situation, i.e. when seawater would not be available to cool the plant’s reactors. A reason for that could be also an accident of oil tanker ship or a similar incident.

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

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 2018, Fortum has set the new Group-level target for energy efficiency improvement, which is 1,900 GWh/a by 2020 compared to 2012. By the end of 2018, the annual cumulative energy-efficiency improvement achieved was 1,637 GWh. The Fortum's energy-efficiency improvement projects in 2018 are calculated to yield total annual energy-efficiency improvements about 135 GWh.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

10000000

Potential financial impact figure – maximum (currency)

30000000

Explanation of financial impact figure
In 2018, City Solutions division' sales made about 20% of Fortum’s total sales, EUR 5,242 million. City Solutions' sales in 2018 was EUR 1,094 million. If the energy demand increased i.e. by 1%, this would mean appr. EUR 10 million minimum increase in sales annually. In addition to this, Generations division's sales made about 35% of Fortum’s total sales, EUR 5,242 million. Generations' sales in 2018 was EUR 1,837 million. If the energy demand increased i.e. by 1%, this would mean approximately EUR 18 million increase in sales annually. Thus potential financial impact is totalled about EUR 30 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 at a 150-megawatt power plant annually.

Strategy to realize opportunity
In 2018, Fortum invested EUR 79 million into hydropower production in Finland and Sweden, mainly maintenance, legislation and productivity investments. One of the investments was Åsen refurbishment EUR 10 million in Sweden, which among others improved energy efficiency at the plant. Fortum's energy-efficiency programme in 2017-2025 covers the power plants subject to the Finnish energy-efficiency agreement and also Swedish hydropower plants. Other business units have their 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, 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 2018, Fortum also accomplished refurbishments of hydropower plants in Sweden, resulting in the new, renewable electricity production of 15 GWh annually. Additionally, Fortum replaced the high-pressure turbine at the Loviisa nuclear power plant's unit 2. The investment increases plant’s CO2-free electricity production by about 40 GWh annually.

Cost to realize opportunity
10000000

Comment
Additionally, Fortum’s operation and maintenance services have been improving the energy efficiency of customers’ power plants already for decades. Fortum has also introduced energy-efficiency services for private customers in Finland and Sweden. Fortum’s customers can, for instance, monitor their electricity consumption with an in-home display or control and optimise the heating of their homes based on electricity price and use.

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
Increased revenue through demand for lower emissions products and services

Company-specific description
Fortum develops solutions to promote clean transportation in Finland and internationally. As the climate change mitigation requires reduction of fossil fuels, i.e. in transportation, there is a need to increase electricity consumption through electrification of transportation. 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 4,000 affiliated smart chargers, of which about 3,000 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 125,000 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

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
15000000

Potential financial impact figure – maximum (currency)
29000000

Explanation of financial impact figure
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. In 2018, Fortum's electricity sales in EU and Norway was EUR 2,922 million and about 68.1 TWh. For example, 0.5-1% increase in Fortum's electricity sales would mean appr. EUR 15 million to EUR 29 million annually.

Strategy to realize opportunity
In 2018, Fortum invested in Charge and Drive EUR 9 million, mainly charging poles in Norway. In 2017, Fortum invested in Charge and Drive EUR 13 million. Fortum investigates and creates infrastructure for the large-scale introduction of electric vehicles. This includes, i.e., the planning and development of recharging systems and recharging points. Fortum Charge and Drive has an innovative electric vehicle 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 climate goals, which include cutting greenhouse gas (GHG) emissions by 50% by 2020 and 95% by 2030, compared to 1990 levels. Fortum Charge and Drive is a leading charging network in Norway, the country with the most electric vehicles per capita. There are currently over 2,200 chargers and about 700 of these are quick chargers in Norway. Fortum Charge and Drive has built the first high-power charging corridor for electric vehicles between Helsinki and Oslo to facilitate EV mobility in the Nordics. There are currently 16 high power charging locations in Fortum's Charge and Drive network. The network enables the EV models, which have a range of over 300 kilometres, to drive from Helsinki to Oslo in the same amount of time as combustion engine cars.

Cost to realize opportunity
9000000

Comment
In addition to external activities, Fortum is electrifying its employees' transportation. In Finland, the company's employee car policy has allowed for only new electric vehicles or plug-in hybrids as company cars. The same policy was adopted in 2018 for employees in Sweden.

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
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 2018, about 43% 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 (in total 19.1 TWh in 2018). 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

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
8000000

Potential financial impact figure – maximum (currency)
9000000

Explanation of financial impact figure
With its 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 (19.1 TWh in 2018 and 20.7 TWh in 2017) and market price of electricity. The average system spot price in Nord Pool for the year 2018 was EUR 44.0 per MWh. Thus, the direct impact as an increase on the value of sold electricity would be appr. EUR 8 million to EUR 9 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. Related costs regarding the development of production planning in hydropower are some EUR 10,000 annually. Climate change impact can also be taken into account in hydropower refurbishment projects. 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, including shares of ownership, totals about 4,672 MW at present. In 2018, Fortum invested into hydropower production, mainly refurbishments and productivity investments. The refurbishments completed in 2018 resulted in an annual hydropower production increase of 15 GWh with a capacity increase of about 5 MW. In 2018, Fortum invested EUR 79 million into hydropower production in Finland and Sweden, mainly maintenance, legislation and productivity investments. The biggest of these were Åsen refurbishment EUR 10 million in Sweden and Imatra dam safety EUR 10 million in Finland.

Cost to realize opportunity
10000

Comment
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.

C2.5

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

	Impact	Description
Products and services	Impacted	Fortum has identified climate-related opportunities from products and services due to shifts in consumer preferences that investigate demands for energy-efficiency improvements and low-carbon solutions. Fortum provides its customers a range of various low-carbon energy products and services to help them improve their energy efficiency and reduce their carbon footprint, for example: - Carbon dioxide-free electricity products and carbon-neutral heat products - Electric vehicle (EV) charging systems - Solar panel solutions - Real-time monitoring and optimisation of energy consumption. These products and services will continue to be important source of current and future revenues. The magnitude of impact of the identified opportunities to products and services is high.
Supply chain and/or value chain	Impacted for some suppliers, facilities, or product lines	Fortum's most significant climate-related risks in the company's supply chain are related to fuel procurement, particularly coal and biomass. Fortum's key tools in supply chain management are country and counterparty risk assessments, supplier qualification and supplier audits, including climate-related issues. In 2018, more than 60% of the wood-based biofuel used by Fortum originated from certified sources. The share was nearly 80% in Finland. Fortum's goal is that 80% of the wood-based biomass fuel in use should be verified by a third party by the end of 2020. In 2018, Fortum built elements of a Chain of Custody management system for wood-based fuel. Fortum uses the Bettercoal Code and tools in assessing the sustainability of coal supply chain. Bettercoal audits are conducted by a third party. The magnitude of impact of identified risks to the supply chain is relatively low.
Adaptation and mitigation activities	Impacted	In line with its 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 others, the assessment of growth projects and production planning. Especially in hydropower production, the methods for regulation and production planning need to be altered due to climate change. Fortum adjusts inflow forecast with climate change corrections for more accurate production planning. Fortum also monitors the need for adjustments to regulation permits of its hydropower plants with changes in seasonal variation. Improving energy efficiency at power plants refers to measures, which Fortum continuously develops processes to increase the efficiency of production 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. The magnitude of impact of identified risks as well as opportunities to adaptation and mitigation activities is medium.
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. In 2018, Fortum's Research and Development (R&D) expenditure was EUR 56 million, or 1.1% of sales. Fortum has also committed to invest into external (i.e. Valo Ventures) and internal (i.e. Growth Board) start-ups who are developing technologies, digital solutions or business models in the scope of clean energy and resource efficiency. Each new research and development project is assessed against the criteria of carbon dioxide emissions reduction and resource efficiency. The magnitude of impact of identified opportunities to investment in R&D is high.
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 scheduled maintenance activities. 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. The magnitude of impact of identified risks to operations is from low to medium.
Other, please specify	Not impacted	Fortum's risk management process is concentrating on the most substantive strategic, financial, operational and sustainability risks. Based on the materiality analysis, no other issues are identified, which could significantly impact Fortum's businesses.

C2.6

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

	Relevance	Description
Revenues	Impacted	CO2 allowance price is among the most decisive factors affecting the electricity price in the Nordic power market, which is described more detailed in Fortum's Risk 1. Fortum's circular economy business has grown in the Nordic countries in 2016-2018. For the time being, waste as a fuel has not been 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. 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 environmental values such as electricity certificates and Guarantees of Origin, 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. Fortum's international presence in Charge and Drive business is growing rapidly, as described more detailed in Fortum's Opportunity 2. The magnitude of impact of identified opportunities to revenues is from medium to high.
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, as described also in Fortum's Risk 1 and Opportunity 3. Fortum hedges its exposure to the prices and volumes through the use of CO2 futures and environmental certificates. Fortum's operations are also exposed to the physical risks caused by climate change, including changes in weather patterns and rising mean temperatures, which may increase operating costs. These are described more detailed in Fortum's Risk 3 and 4. The magnitude of impact of identified risks to operating costs is medium.
Capital expenditures / capital allocation	Impacted	Fortum invests into renewable and CO2-free energy production capacity annually. Fortum's Risks 1-4 and Opportunities 1-3 are related to capital expenditures and capital allocation. In 2018, Fortum's investments were a total of EUR 180 million in hydro, wind and solar power and bioenergy. Fortum's investments totalled EUR 278 million in CO2-free energy production, mainly hydro, nuclear and wind power. Fortum also invested in Charge and Drive EUR 9 million, mainly charging poles in Norway. Fortum disclosures Capital expenditure of previous year by country and by production type in the Financials 2018 report, Note 18.2 Capital Expenditure. In 2018, Fortum invested in hydropower, wind and solar power in the Nordic countries, Russia and also India. For example, Fortum commissioned the 50-MW Ånstadblåheia wind farm in Norway, and the construction of the 97-MW Sørfjord wind farm continued. In Sweden, Fortum commissioned the 76-MW Solberg wind farm in which Fortum has a 50% stake. In 2018, Fortum and Rusnano investment fund with 50/50 ownership gained the right to build and commission 1,823 MW of new CSA-supported wind power in Russia in 2019–2023. Fortum is targeting investments totalling EUR 200-400 million in solar power in India. In 2018, Fortum's investments included solar investments in India EUR 19 million. In 2018, Fortum started the trial run of the new Zabrze CHP production plant in Poland. The plant combusts also refuse-derived fuel (RDF) and the share of RDF is about 40-50%. The plant has a maximum capacity of 75 MW electricity and 145 MW heat. Additionally, Fortum will replace some of the coal use in heat production in Finland by building a bioheat plant in Espoo, Finland. Its maximum heat output will be 58 MW, and the construction started in late 2018. The magnitude of impact of identified risks and opportunities to capital expenditures and capital allocation is from medium to high.
Acquisitions and divestments	Impacted	Fortum has acquired renewable and CO2-free energy production capacity. Fortum's Risk 1 and Risk 2 are related to acquisitions and divestments. For example, Fortum has acquired Nygårdsfjellet's 32-MW wind power park and the Ånstadblåheia (50 MW) and Sørfjord (97 MW) wind power projects in Norway. Fortum also acquired three solar power plants (total 35 MW) in Russia at the end of 2017. In 2018, Fortum divested the 54% share of its 185-MW solar power portfolio in India to free up capital for additional solar power investments. This capital recycling business model enables Fortum to efficiently utilise its key competences to develop, construct, and operate power plants while utilising partnerships and other forms of cooperation to create a more asset-light structure and thereby enable more investments into building new renewable and CO2-free capacity. Additionally, Fortum has continued the permanent demolition of coal-fired Inkoo condensing power plant in 2018. In 2018, 96% of Fortum's electricity production was CO2-free in Europe and specific CO2 emissions were 26 gCO2/kWh. 57% of total electricity production was CO2-free. The magnitude of impact of identified risks and opportunities to acquisitions and divestments is from medium to high.
Access to capital	Not yet 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 yet affected the access to these financing sources, but there is a risk that this could change in the future as investors and financial institutions implement stricter requirements on their investment portfolios, i.e. related to the amount of fossil-fuel based energy production. Possible timeframe for impact on access to capital is 0-10 years. Investments in renewable energy might also benefit from a wider source of funding. In 2018, for example, Fortum divested the 54% share of its 185-MW solar power plants in India to free up capital for further investments. The magnitude of impact of identified risks to access to capital is relatively low.
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. Fortum's Risks 1-3 and Opportunities 1 and 3 are related to assets. In line with its strategy, Fortum is targeting to a multi-gigawatt 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 Fortum's total wind and solar portfolio has grown substantially in 2018. Together with its associated companies, Fortum have a portfolio of close to 3 GW (Fortum's share of 1,686 MW) of wind and solar power projects in the Nordic countries, Russia and India. The magnitude of impact of identified risks and opportunities to assets is from low to medium.
Liabilities	Not yet impacted	Fortum follows actively climate change trends and evaluate, if it had an impact on its plans. Any changes have impact on investments and/or operation procedures. Ongoing regulatory changes in sustainability financing may have an increased impact also on liabilities in the future. Possible timeframe for impact on liabilities is 0-10 years. The magnitude of impact of identified risks to liabilities is low.
Other	Not impacted	Fortum's risk management process is concentrating on the most substantive strategic, financial, operational and sustainability risks. Based on the materiality analysis, no other issues are identified, which could significantly impact Fortum's businesses.

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 and quantitative

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 in 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. Climate change is one of the main drivers behind Fortum’s strategy, and the strategy has been designed so that Fortum would be successful in a decarbonised world. Fortum's strategy is based on four strategic priorities: 1) Pursue operational excellence and increased flexibility; 2) Ensure value creation from investments and own portfolio optimisation; 3) Drive focused growth in the power value chain; and 4) Build options for significant new businesses. In line with its strategy, Fortum is targeting a multi-gigawatt solar and wind portfolio. Operational excellence and increased flexibility are key pre-requisites for a cost efficient decarbonised energy system dominated by intermittent wind and solar. Driving focused growth in the power value chain is focusing on growth in CO2-free hydro, solar and wind, as well as solutions for B2C and B2B customers. In building options for significant new businesses, Fortum is focusing on circular economy and resource efficiency through recycling, waste management and bio-based materials.

ii. Sustainability targets including climate-related targets guide Fortum's business operations towards the vision -For a cleaner world. Fortum’s Group-level specific emission target is 200 gCO2/kWh (five-year average). Fortum Executive Management has approved a new target to achieve 180 gCO2/kWh by 2022. As per Fortum’s governance model this new target is subject to BoD's approval in December 2019. Fortum's specific CO2 emissions have continued to be at a low level compared to other European major electricity utilities. In 2018, Fortum's specific CO2 emissions (Scope 1) from total energy production were 192 g/kWh. The carbon exposure of Fortum's electricity production in Europe is among the lowest at 26 g/kWh.

Fortum has a Group-level target to achieve energy-efficiency improvements >1,900 GWh/a by 2020 compared to 2012, and it was achieved 1,637 GWh/a in 2018. The energy-efficiency improvements were about 135 GWh/a in 2018, and the projects save fossil fuels and reduce CO2 emissions almost 40,000 tonnes annually.

Fortum has applied the scenario analysis framework including also 2° C scenario. 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 43 TWh in 2018.

iii. Fortum is among the best companies in Europe regarding the carbon exposure. In 2018, 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 57% CO2-free. In 2018, Fortum invested actively in wind power in the Nordic countries and Russia. In order to enable more investments into renewable production, Fortum co-operates with other financial investors.

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 new plants in Russia are mainly based on CCGT technology, which represents the best available technology in natural gas combustion (efficiency 80-85%). The specific CO2 emissions from Fortum's Russian energy production has decreased from 378 g/kWh in 2010 to 337 g/kWh in 2018.

In 2018, investments in CO2-free production were EUR 278 million. Investments were a total of EUR 180 million in hydro, wind and solar power and bioenergy. In 2018, Fortum’s R&D expenditure was EUR 56 million, or 1.1% of sales.

To improve resource efficiency, Fortum is also focusing on material recycling, i.e. Fortum expanded high-value recycling to metals by acquiring the Finnish Fincumet in 2018.

iv. The entire energy sector is undergoing a transformation. The main drivers behind the change are climate and environment, politics and regulation, technology development, and consumer trends. 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 and resource efficiency 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 energy system.

v. Majority of Fortum's greenfield investments in Europe and solar power investments in India are CO2-free. In 2018, Fortum invested, i.e., new wind farms in Norway, Sweden and Russia, district heating and cooling construction projects in Estonia, and refurbishments at hydropower plants in Sweden.

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 energy system 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 R&D activities which aim at building a platform for future growth include, i.e. wind and solar power, batteries, demand response, and bio-fractionation.

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 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	Fortum believes that future global energy development paths have become irrevocably driven by climate change mitigation efforts. While demography, politics and economics, as well as technological development, will continue to influence the future, the single most important uncertainty is now the pace of decarbonisation, dependent on climate policy ambition. Fortum built its scenarios in an company-wide exercise in 2018 subject to critical review and recurring adjustments, with all business units and corporate functions participating. The outcome was Fortum's current five scenarios, each representing progressively more ambitious climate change mitigation and ambition levels. Considered as aspirational targets, “Well under 2 degrees”, as well as 1.5 degrees (Paris 2050) are roughly in line with Fortum’s most optimistic scenario. 2DS corresponds with Fortum’s current main scenario. Fortum strongly supports the goal of a carbon-neutral Europe by 2050. All Fortum’s scenarios assume some degree of sector integration, where electrification drives integration of mobility, heating and industrial energy consumption. Fortum’s main scenario (2DS compatible) analysis with its several sensitivity cases implies electricity sector decarbonisation level of 95-100% by 2050. High degree sector integration is likely to hinge on the creation of hydrogen on energy sector that supports renewable-based electricity sector. Climate ambition drives also hydrogen growth. Robust carbon pricing is a central element in Fortum’s scenarios, with EU ETS assumed to remain its integrity as the main carbon pricing method in Europe. All these supply side drivers are complemented by demand side drivers such as energy-efficiency improvements and dynamics of the circular economy, and ambition levels depend on the scenarios. Participations in the process are delegated widely in Fortum and all divisions and business units are involved, but Corporate Industrial Intelligence (long-term analysis) and Corporate Strategy are the main process drivers. The results of Fortum's scenario analysis has a direct and strong influence on Fortum’s business objectives. Fortum’s strategy needs to be aligned with the scenario analysis, and the strategy shapes business objectives and targets. In line with its strategy, Fortum is targeting a multi-gigawatt solar and wind portfolio. Together with its associated companies, Fortum has a portfolio of close to 3 GW (Fortum’s share 1,686 MW in 2018) of CO2-free solar and wind parks and development projects in the Nordic countries, Russia, and India. Solar power is becoming one of the most competitive forms of new power generation in many parts of the world, and Fortum is targeting investments totalling EUR 200–400 million in solar power 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 there. For example, Fortum and Rusnano investment fund with 50/50 ownership has the right to build and commission almost 2 GW of new wind power in Russia in 2019–2023. Fortum Executive Management has approved a new specific emission target (180 gCO2/kWh) for total energy production by 2022; The baseline year is 2018. The new target is subject to Board of Director’s approval to be valid as of 1 January 2020.

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's role is to accelerate decarbonisation drive by reshaping the energy system, and improving resource efficiency. Fortum operated European power generation fleet is currently nearly 100% carbon-free. Harder to decarbonize, Fortum's heat generation is still in the process of decarbonizing as fossil fuels are being replaced by heat pumps, waste heat, sustainable biomass and other decarbonized sources.

Fortum's aim is to promote the transition towards a more comprehensive circular economy. By circular economy Fortum means that materials are utilised as efficiently as possible and hazardous materials are removed from circulation. In 2018, Fortum opened a new processing line at the Riihimäki plastic refinery in Finland. The investment triples the refinery's processing capacity to about 30,000 tonnes a year. Fortum also expanded high-value recycling to metals by acquiring the recycling business of the Fincumet in late 2018.

Fortum has recently expanded to waste-to-energy business, thereby implementing its circular economy strategy. Fortum completed the restructuring of the Hafslund business ownership in 2017, and the waste-to-energy plant Klemetsrud, which is the largest energy recovery plant in Norway, was transferred to Fortum's ownership through the transaction. In 2019, Fortum also commissioned the new Zabrze CHP production plant in Poland. The plant combusts among others refuse-derived fuel (RDF), and the share of RDF is about 40–50% of fuel use.

In line with its strategy, Fortum is also investing in new renewable generation and targeting a multi-gigawatt wind and solar power portfolio. During 2017 and 2018, Fortum has started the implementation of other wind power plants in the Nordic countries and in Russia, and also invested in solar power in Russia and India.

In January 2018, Fortum commissioned Russia's first industrial wind power site, Ulyanovsk, with a capacity of 35 MW. In autumn 2018, Fortum commissioned the 50-MW Ånstadblåheia wind farm in Norway, and construction of the 97-MW Sørfjord wind farm continues. In Sweden, Fortum commissioned the 76-MW Solberg wind farm in which Fortum has a 50% stake.

In June 2018, Fortum won the right to build 110 MW of solar capacity in a Russian Capacity Supply Agreement (CSA) auction. Solar power will be commissioned during 2021–2022.

Additionally, Fortum and Rusnano investment fund with 50/50 ownership has the right to build and commission 1,823 MW of new CSA-supported wind power in Russia in 2019–2023. A separate investment decision will be made for each project. At the beginning of 2019, the investment fund commissioned the 50-MW Ulyanovsk wind farm.

In 2018, Fortum divested the 54% share of its 185-MW solar power plants in India to free up capital for further solar power investments. In June 2018, Fortum won the new 250-MW Pavagada solar power project in Karnataka, India.

Fortum has decommissioned the coal-fired Inkoo power plant in Finland in 2017, and demolition of the plant is on-going. The coal-fired Meri-Pori power plant is still a part of Finnish power reserve agreement by 2020.

Fortum is also planning construction of a new 20-MW heat pump unit at the Suomenoja power plant in Espoo, Finland to replace fossil fuel-based heat production. The unit will increase the share of Fortum's carbon-neutral district heating production in Espoo by 2022 to over 50%.

Fortum offers customers a range of energy services and energy products to help them improve their energy efficiency and reduce their carbon footprint, such as CO2-free electricity products and carbon-neutral heat products, real-time monitoring and optimisation of energy consumption, electric vehicle charging systems and solar panel solutions.

Fortum is expanding its offering also by investing in startups that are developing new technologies. At the end of 2018, Fortum announced the new Valo Ventures growth fund, which invests in early- and growthstage technology companies. Valo Ventures is aligned with Fortum's vision -For a cleaner world- and business strategy.

Fortum's CEO was recently nominated as chair of the Confederation of Finnish Industries. He has been instrumental in the association joining Climate Leadership Coalition in 2018 initiative to limit temperature increase to 1.5 degrees. This role allows Fortum to disseminate Paris 2050, IEA SD and other progressive climate scenarios and promote related decarbonisation effort outside energy industries, too. The Association includes energy-intensive industries such as metallurgy, very typical of the Finnish economy. Fortum is therefore both lobbying for decarbonisation and at the same time providing carbon-free energy solutions to industries, taking thus an additional role as an enabler for energy users in their decarbonisation efforts.

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

Targeted % reduction from base year
12

Metric
Metric tons CO2e per megawatt hour (MWh)*

The five-year average, including 2018, was 186 g/kWh, which is below the set Group-level target of 200 gCO2/kWh.

Base year
2010

Start year
2011

Normalized base 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

% of target achieved
100

Target status
Achieved

Please explain
Fortum has the Group-level target 200 gCO2/kWh for the specific CO2 emissions from total energy production, as five-year average. In 2018, Fortum achieved the target in specific carbon dioxide emissions. In 2018, the specific CO2 emissions of total energy production were 192 gCO2/kWh, and as five-year average, 186 gCO2/kWh, which is 7% lower than the set target of 200 gCO2/kWh. Fortum considers to lower the Group-level target to achieve 180 gCO2/kWh by 2022; The baseline year is 2018. Fortum Executive Management (FEM) has approved a new specific emission target (180 gCO2/kWh for total energy production by 2022). As per Fortum's governance model this new target is subject to Board of Director's approval in December 2019 and valid as of 1 January 2020. 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 for science-based target initiatives or other climate-related target setting.

% change anticipated in absolute Scope 1+2 emissions
4.5

% 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 the cumulative energy-efficiency improvement of more than 1,900 GWh/a 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
1900

% achieved in reporting year
86

Target Status
Revised

Please explain
By the end of 2017, Fortum achieved the cumulative energy-efficiency improvement 1,502 GWh/a, which exceeded the set target of 1,400 GWh/a by about 100 GWh/a. Therefore, the target was revised and increased by 500 GWh/a, and the new set target is to achieve the cumulative energy-efficiency improvement of more than 1,900 GWh/a by 2020 compared to 2012. By the end of 2018, the annual cumulative energy-efficiency improvement achieved was 1,637 GWh, which is 86% of the set target (1,900 GWh/a).

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

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	2	350000
Implementation commenced*	5	500000
Implemented*	5	32500
Not to be implemented	0	0

C4.3b

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

Initiative type
Energy efficiency: Processes

Description of initiative
Machine replacement

Estimated annual CO2e savings (metric tonnes CO2e)
4000

Scope
Scope 1

Voluntary/Mandatory
Voluntary

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

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

Payback period
4 - 10 years

Estimated lifetime of the initiative
11-15 years

Comment
In 2018, the high-pressure turbine was replaced at the Loviisa plant’s unit 2 during the annual outage. The machine replacement increased annual CO2-free electricity production about 40 GWh . In 2017, the similar high-pressure turbine replacement was executed at the Loviisa nuclear power plant’s unit 1. The power upgrades at the Loviisa nuclear power plant in 2016-2017 enable to produce about an additional 180 GWh of CO2-free electricity annually. In 2018, Fortum invested in total EUR 99 million into the Loviisa nuclear power plant, and in 2017, Fortum invested total EUR 84 million.

Initiative type
Energy efficiency: Processes

Description of initiative
Machine replacement

Estimated annual CO2e savings (metric tonnes CO2e)
500

Scope
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
2000000

Investment required (unit currency – as specified in C0.4)
15000000

Payback period
4 - 10 years

Estimated lifetime of the initiative
>30 years

Comment
In 2018, Fortum completed hydropower plant refurbishments in Sweden, which enables to produce an additional 15 GWh of CO2-free electricity annually. In 2018, Fortum invested in total EUR 79 million into hydropower production in Sweden and Finland, mainly maintenance, productivity and legislation investments. In 2018, hydropower investments were EUR 59 million in Sweden, and the biggest of these was the Åsen refurbishment EUR 10 million. The investment in the Åsen refurbishment is about EUR 15 million.

Initiative type
Low-carbon energy installation

Description of initiative
Wind

Estimated annual CO2e savings (metric tonnes CO2e)
1000

Scope
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
4000000

Investment required (unit currency – as specified in C0.4)
75000000

Payback period
11-15 years

Estimated lifetime of the initiative
21-30 years

Comment
In 2018, Fortum invested in EUR 51 million in the new Ånstadblåheia and Sørfjord wind parks in Norway, and in 2017, EUR 24 million. These investments were in total EUR 75 million.

Initiative type
Low-carbon energy installation

Description of initiative
Wind

Estimated annual CO2e savings (metric tonnes CO2e)
1000

Scope
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
1000000

Investment required (unit currency – as specified in C0.4)
31000000

Payback period

11-15 years

Estimated lifetime of the initiative
21-30 years

Comment
In 2018, Fortum invested EUR 9 million in the new Solberg wind park in Sweden, and in 2017, EUR 22 million. The investments were in total EUR 31 million.

Initiative type
Low-carbon energy installation

Description of initiative
Wind

Estimated annual CO2e savings (metric tonnes CO2e)
28500

Scope
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
3000000

Investment required (unit currency – as specified in C0.4)
50000000

Payback period
11-15 years

Estimated lifetime of the initiative
16-20 years

Comment
In 2018, Fortum invested EUR 5 million in the wind power in Russia, and in 2017, EUR 53 million. The investment in the Ulyanovsk wind park was about EUR 50 million.

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 1,900 GWh by 2020 compared to 2012. For example, the power upgrades at the Loviisa nuclear power plant in 2016-2018 enable to produce about an additional 180 GWh of CO2-free electricity annually. Power plant modernisation programmes and the investments in new technology and capacity have also improved energy efficiency in Russia. In 2018, Fortum also started the trial run of the new Zabrze CHP production plant in Poland. The plant has a maximum capacity of 75 MW electricity and 145 MW heat. The new Zabrze CHP plant represents the best available technology (BAT) and will eventually replace the old Zabrze and Bytom coal-fired power plants. It improves the energy efficiency and reduces carbon dioxide emissions into the environment in relation to the produced energy.
Internal price on carbon	Since 2005 Fortum has had a compliance obligation in the EU's emissions trading scheme (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. In 2018, Fortum's Research and Development costs totalled EUR 56 million, or 1.1% of sales. 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 Fortum HorsePower service and Fortum Otso bio-oil. The company is also researching and developing its solar energy competences and solutions for customers. In addition, Fortum is developing new customer solutions in electricity and heat to improve user experiences and demand-response services. In 2018, Fortum provided the virtual power plant service 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 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.
Internal incentives/recognition programs	Fortum's Business Technology, Innovation and Venturing 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 2018, bedding-manure mixture was collected about 300 horse stables in Finland and about 75 in Sweden. In 2018, Fortum continued Must Win Battle (MWB) development programmes to increase customer-centricity, speed and agility. One of Fortum's five MWB development programmes is "Put the customer in the centre".
Employee engagement	Along with emissions reduction measures implemented at production facilities, Fortum has taken various actions to reduce the carbon dioxide emissions, for example, the carbon footprint, generated by the company's personnel and facilities. Actions include CO2 reductions in travelling and education on climate issues. In Finland, the company's employee car policy has allowed for only new electric vehicles or plug-in hybrids as company cars. The same policy was adopted in 2018 for employees in Sweden. 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 (gCO2/kWh). 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
60

Comment
European guarantees of origin (GoO) of eco-labels on national nature conservation associations. Nuclear power is also classified as CO2-free electricity production. In 2018, Fortum's electricity sales to private and commercial customers was about 11 TWh in the Nordic countries and also in Poland. About 80% of this was from renewable energy sources, mainly hydropower. The share of CO2-free nuclear power was about 7%. In 2018, Fortum's electricity sales was EUR 4,331 million (incl. eliminations and netting of Nord Pool transactions). Fortum's total external sales was EUR 5,242 million. 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 (329 g/kWh in 2017). In 2018, the avoided CO2 emissions were about 2.7 million tonnes. The avoided emissions represent Fortum's 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 incinerates customers' ODS (ozone depleting substances) and F-gases at its waste-to-energy (WtE) 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 is used to calculate avoided emissions of ODS and F-gases. Fortum destroyed 92.8 tonnes of customers' ODS and F-gases at the Kumla waste-to-energy plant in Sweden in 2018. The avoided CO2eq. emissions were about 553,230 tonnes (GWP100). The avoided CO2eq. emissions can be compared to the total amount of direct CO2 emissions generated at the Kumla waste-to-energy plant in 2018: 127,850 tonnes, which is only 20% of avoided CO2eq. emissions.

C-EU4.6

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

In 2018, the share of methane emissions were only 0.06% of Fortum's Scope 1 GHG emissions, and about 14% of Fortum's total GHG emissions. Therefore, the volume of methane emissions are not relevant especially in Fortum's Scope 1 GHG emissions.

Natural gas is a naturally occurring hydrocarbon gas mixture consisting primarily of methane. Even if the share of natural gas use is 63% of Fortum's fuel consumption in energy production, only a small amount of Fortum's greenhouse gas (GHG) emissions is generated from leaks related to the natural gas distribution.

Proactive maintenance management reduce leaks of methane and other greenhouse gas emissions into air. Fortum carry out planned refurbishment and preventive maintenance activities regularly at all sites under its operational control.

Fortum's Scope 1 methane emissions have been calculated on the basis of plant-specific fuel data. Fortum's Scope 3 emissions from fuel value chains include emissions from fuel production (e.g. mining, refining and processing), fuel transportation and storing. Emission factors from international and national sources have been applied for each part of the value chain.

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?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

20209810

Start date

January 1 2018

End date

December 31 2018

Comment

In 2018, the share of carbon dioxide (CO2) emissions from Fortum's direct greenhouse gas (GHG) emissions was 99.5%. The share of Scope 1 GHG emissions from Fortum's total GHG emissions was 77%.

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

About 80% 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 greenhouse gas 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?

Reporting year

Scope 2, location-based
94000

Scope 2, market-based (if applicable)
92200

Start date
January 1 2018

End date
December 31 2018

Comment
In 2018, carbon dioxide (CO2) emissions accounted for 99.6% of Fortum's Scope 2 greenhouse gas (GHG) emissions. The share of Scope 2 GHG emissions of Fortum's total GHG emissions was 0.4%.

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
260870

Emissions calculation methodology
(i) The volumes and categories of purchased goods and services are based on Fortum's purchasing databases. Fortum has assessed its Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Emission data from EXIOBASE2 has been used in the calculation of emissions. The GWP values are from IPCC Fifth Assessment Report, 2014 (AR5), 100-year time horizon. (ii) Fortum has 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, Fortum has 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 its assessment, Fortum has estimated its GHG emissions from purchased goods and services based on spend data from internal purchasing data management systems. Fortum's purchased goods and services (other than capital goods and energy and fuel related activities) consist mostly of maintenance and construction and other business activities.

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

Explanation

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

310700

Emissions calculation methodology

(i) The volumes and categories of capital goods are based on Fortum's purchasing databases. Fortum has assessed its Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Emission data from EXIOBASE2 has been used in the calculation of emissions. The GWP values are from IPCC Fifth Assessment Report, 2014 (AR5), 100-year time horizon. (ii) Fortum has 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, Fortum has 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 its assessment, Fortum has estimated its GHG emissions from capital goods based on spend data from internal purchasing data management systems. Fortum's capital goods consist mostly of heavy components in energy production process, like boilers, turbines, generators.

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

5489580

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 IPCC Fifth Assessment Report, 2014 (AR5), 100-year time horizon. (ii) Fortum has 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, Fortum has 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 storing. 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

320

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) Fortum has 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, Fortum has 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

6170

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 are from IPCC Fifth Assessment Report, 2014 (AR5), 100-year time horizon. (ii) Fortum has 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, Fortum has 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
5750

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 are from IPCC Fifth Assessment Report, 2014 (AR5), 100-year time horizon. (ii) Fortum has 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, Fortum has 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
6690

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 are from IPCC Fifth Assessment Report, 2014 (AR5), 100-year time horizon. (ii) Fortum has 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, Fortum has 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
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Fortum has assessed its Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on the Scope 3 assessment, Fortum does not have any relevant upstream leased assets that would be reported on Group-level. When applicable, GHG 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
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Fortum has assessed its 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
780

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 are from IPCC Fifth Assessment Report, 2014 (AR5), 100-year time horizon. (ii) Fortum has 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, Fortum has 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. 3260 tons in 2018.

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
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Fortum has assessed its Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on the 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
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Fortum has assessed its Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on the Scope 3 assessment, Fortum 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
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

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

Franchises

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Fortum has assessed its Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on the 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
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Fortum has assessed its Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Fortum is a shareholder in a Finnish hydropower company Kemijoki Oy and in a Finnish nuclear power company TVO. Production of hydropower (Kemijoki) and nuclear power (TVO) is CO2-free (Scope 1 emissions), and companies do not disclose their Scope 2+3 CO2 emission.

Other (upstream)

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Fortum has assessed its Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on the Scope 3 materiality assessment, Fortum does not have other upstream emissions that would be reported on Group-level.

Other (downstream)

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Fortum has assessed its Scope 3 emissions based on GHG Protocol's Corporate Value Chain Accounting and Reporting Standard. Based on the Scope 3 materiality assessment, Fortum does not have other downstream emissions that would be reported on Group-level.

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.

Row 1

Emissions from biologically sequestered carbon (metric tons CO2)
1468400

Comment
In 2018, Fortum’s direct biogenic carbon dioxide emissions were about 1.5 million tonnes. The biogenic carbon dioxide emissions are generated in bio-fuelled energy production.

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
0.0039

Metric numerator (Gross global combined Scope 1 and 2 emissions)
20302010

Metric denominator
unit total revenue

Metric denominator: Unit total
5242000000

Scope 2 figure used
Market-based

% change from previous year
6

Direction of change
Decreased

Reason for change
The revenue increased by 16%, resulting in decrease in the emissions per revenue.

C7. Emissions breakdowns

C7.1

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

C7.1a

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

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	20111560	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	87060	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	11190	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)	20109520	11190	0	87050	Fortum's Scope 1 emissions include direct greenhouse gas (GHG) emissions generated in combustion: CO2 emissions, methane - CH4 emissions and N2O emissions.
Combustion (Gas utilities)	0	0	0	0	
Combustion (Other)	0	0	0	0	
Emissions not elsewhere classified	2040	0	0	10	Fortum's Scope 1 emissions include also greenhouse gas (GHG) emissions generated in use of company-owned vehicles, according to the Greenhouse gas (GHG) protocol.

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	16901740
Finland	1715600
Poland	786940
Norway	219400
Denmark	162960
Lithuania	150810
Sweden	129800
Estonia	99230
Latvia	43330
India	0

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	16901740
City Solutions	2779300
Generation	528770

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	3571510	62.1365	65.403
Tyumen CHP2	2587420	57.0876	65.6298
Tyumen CHP1	2287980	57.1471	65.6048
Chelyabinsk CHP4 (GRES)	2189990	55.2014	61.4053
Chelyabinsk CHP3	2088170	55.23	61.4906
Chelyabinsk CHP2	1764060	55.1541	61.497
Argayash CHP	1396420	55.6385	60.7762
Suomenoja power plant	794570	60.1499	24.7179
Chelyabinsk CHP1	586300	55.1338	61.4768
Meri-Pori power plant	527460	61.6319	21.4056
Other sites	2415930		

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	20209810	<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 2018, the share of carbon dioxide from Fortum's Scope 1 GHG emissions was 99.5%. The share of Scope 1 GHG emissions from our total GHG emissions was 77%.
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	43600	43600	106900	0
Denmark	6400	14700	34000	0
Poland	14500	17000	19400	0
Finland	21500	8300	215400	184000
Sweden	700	2600	75900	68500
Estonia	5800	4800	5300	0
Lithuania	100	900	1300	0
Latvia	600	300	4300	0
Norway	800	0	542500	542500

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	43600	43600
City Solutions	43400	40800
Generation	7000	7800

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	15400	15400
Chelyabinsk heat network	15000	15000
Nyborg WtE plant	6200	14200
Tyumen CHP1	9200	9200
Meri-Pori power plant	2700	7200
Old Zabrze CHP	5100	6000
New Zabrze CHP	2700	3100
Czestochowa heat network	830	2800
Tartu heat only boilers	3200	2700
Kumla WtE plant	70	2500
Suomenoja power plant	11000	0
Loviisa nuclear power plant	3200	0
Other sites	19400	14100

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?

Increased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	
Other emissions reduction activities	165440	Decreased	0.9	Improved energy efficiency and better quality fuel use identified at three Fortum's CHP plants in Russia and two plants in Finland. These decreased Fortum's emissions about 165,440 t CO2e. Emission value calculated as = (actual emission (2018) - production (2018) * specific emission (2017)) / total emissions (2017). Emission value: (-91,000-18,400-11,880-34,090-10,070)/18,589,200=(-165,440)/ 18,5890,200=-0.9%
Divestment	1800	Decreased	0.01	Divestments of DUON Praszka heat plant in Poland reduced Fortum's emissions about 1,800 t CO2e. Emission value: (-1,800)/18,589,200=-0.01%
Acquisitions	282400	Increased	1.5	Acquisitions and investments of Fortum's WtE plant and heat plants in Norway, the CHP plant in Latvia and also the new CHP plant in Poland increased Fortum's emissions about 282,400 t CO2e. Emission value: (189,00+30,400+11,100+51,900)/18,589,200=(282,400)/18,589,200=1.5%
Mergers	0	No change	0	
Change in output	1349300	Increased	7.3	Fortum's emissions increased by increased power production (output), mainly in Russia. Emission value calculated as = (production (2018) * specific emission (2017) - actual emissions (2017)) / total emissions (2017). Emission value: 1,349,300/18,589,200= 7.3%.
Change in methodology	0	No change	0	
Change in boundary	0	No change	0	
Change in physical operating conditions	0	No change	0	
Unidentified	0	No change	0	
Other	480500	Increased	2.6	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 the power plants. Emission value calculated as = (actual emission (2018) - production (2018) * specific emission (2017)) / total emissions (2017). Emission value: 480,500/18,589,200=2.6%

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)	5050000	114390000	119440000
Consumption of purchased or acquired electricity	<Not Applicable>	795000	210000	1005000
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>	21610000	<Not Applicable>	21610000
Total energy consumption	<Not Applicable>	27455000	114600000	142055000

C8.2b

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

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	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
75740000

MWh fuel consumed for self-generation of electricity
2000000

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

Comment
In 2018, natural gas was used in Fortum's power and heat production mainly in Russia, and also in Finland and the Baltic countries.

Fuels (excluding feedstocks)
Other, please specify (Uranium)

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
25390000

MWh fuel consumed for self-generation of electricity
1000000

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

Comment
In 2018, uranium was used in Fortum's power production. Nuclear power is CO2-free electricity production.

Fuels (excluding feedstocks)
Coal

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
10110000

MWh fuel consumed for self-generation of electricity
250000

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

Comment
In 2018, coal was used in Fortum's power and heat production.

Fuels (excluding feedstocks)
General Municipal Waste

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
3370000

MWh fuel consumed for self-generation of electricity
220000

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

Comment
In 2018, bio-derived and fossil municipal waste was used as waste-derived fuels in Fortum's power and heat production. The bio-waste is, in average, 50% of the total amount of muncipal waste.

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

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
810000

MWh fuel consumed for self-generation of electricity
40000

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

Comment
In 2018, hazardous waste, including i.e. waste oils and waste fertilizers and other chemicals, was used in Fortum's power and heat production.

Fuels (excluding feedstocks)
Wood

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
2890000

MWh fuel consumed for self-generation of electricity

190000

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

Comment
In 2018, wood chips and other forest biomass were used in Fortum's power and heat production.

Fuels (excluding feedstocks)
Peat

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
600000

MWh fuel consumed for 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

Comment
In 2018, peat was used in Fortum's power and heat production.

Fuels (excluding feedstocks)
Agricultural Waste

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
420000

MWh fuel consumed for 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

Comment
In 2018, agrobiomass and bio-liquids were used in Fortum's power and heat production.

Fuels (excluding feedstocks)
Fuel Oil Number 1

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
110000

MWh fuel consumed for 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

Comment
In 2018, fuel oil was used in, among others, in start-ups at Fortum's power plants, for heat production in heat only boilers, and also in Waste to Energy plants as subsidiary fuel, when needed.

C8.2d

(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
CO2 emissions from bio-derived fuels; Statistics Finland, Fuel classification 2018: Vegetable-based fuel (agrobiomass)

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 2018: 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 12% 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
262

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2018: 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 12% 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%.

General Municipal Waste

Emission factor
144

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2017: General 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 continuous 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 2018: 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 12% 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
387

Unit
kg CO2 per MWh

Emission factor source
Statistics Finland, Fuel classification 2018: 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
CO2 emissions from bio-derived fuels; Statistics Finland, Fuel classification 2018: Forest fuel, wood

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 2018: 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 continuous 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	75636000	3567000	20536000	1010000
Heat	29270000	0	2810000	0
Steam	0	0	0	0
Cooling	41000	0	41000	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)
1201

Gross electricity generation (GWh)
2010

Net electricity generation (GWh)
2010

Absolute scope 1 emissions (metric tons CO2e)
1563350

Scope 1 emissions intensity (metric tons CO2e per GWh)
778

Comment
In 2018, Fortum used coal in Russia, Finland and Poland. Russia accounted for 56% of Fortum's total use of coal. Poland and Finland accounted both for 22% of Fortum's total use of coal.

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

Gas

Nameplate capacity (MW)
4564

Gross electricity generation (GWh)
28700

Net electricity generation (GWh)
28700

Absolute scope 1 emissions (metric tons CO2e)
11728450

Scope 1 emissions intensity (metric tons CO2e per GWh)
409

Comment
In 2018, Russia accounted for 98% of Fortum's total use of natural gas. Fortum's power plant units in Russia are based on gas turbine technology, which represents the best available technology in natural gas combustion. In addition, Fortum used natural gas in Finland and Latvia.

Biomass

Nameplate capacity (MW)
139

Gross electricity generation (GWh)
750

Net electricity generation (GWh)
750

Absolute scope 1 emissions (metric tons CO2e)
0

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

Comment
In 2018, Fortum used biofuels in power production in Finland, the Baltic countries and Poland.

Waste (non-biomass)

Nameplate capacity (MW)
81

Gross electricity generation (GWh)
320

Net electricity generation (GWh)
320

Absolute scope 1 emissions (metric tons CO2e)
235080

Scope 1 emissions intensity (metric tons CO2e per GWh)
737

Comment
In 2018, Fortum used waste-derived fuels at Waste to Energy plants in Finland, other Nordic countries, and Lithuania.

Nuclear

Nameplate capacity (MW)
2819

Gross electricity generation (GWh)
21730

Net electricity generation (GWh)
21730

Absolute scope 1 emissions (metric tons CO2e)
0

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

Comment
Fortum has nuclear power production in Finland and Sweden. In 2018, Fortum's nuclear capacity was 1,485 MW in Finland and 1,334 MW in Sweden, and in total 2,819 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)
4672

Gross electricity generation (GWh)
18740

Net electricity generation (GWh)
18740

Absolute scope 1 emissions (metric tons CO2e)
0

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

Comment
Fortum has hydropower production in Finland and Sweden. In 2018, Fortum's hydropower capacity was 1,548 MW in Finland and 3,124 MW in Sweden, and in total 4,672 MW.

Wind

Nameplate capacity (MW)
194

Gross electricity generation (GWh)
410

Net electricity generation (GWh)
410

Absolute scope 1 emissions (metric tons CO2e)
0

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

Comment
Fortum has wind power production in Norway, Sweden and Russia. In 2018, Fortum's wind power capacity was in total 194 MW.

Solar

Nameplate capacity (MW)
35

Gross electricity generation (GWh)
300

Net electricity generation (GWh)
300

Absolute scope 1 emissions (metric tons CO2e)
0

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

Comment
Fortum has solar power production in Russia. In 2018, Fortum's solar power capacity was 35 MW in Russia. Additionally, Fortum’s share of the solar power plants in India is 85 MW at the present.

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)
19

Gross electricity generation (GWh)
110

Net electricity generation (GWh)
110

Absolute scope 1 emissions (metric tons CO2e)
83360

Scope 1 emissions intensity (metric tons CO2e per GWh)
800

Comment
In 2018, Fortum used peat in power production in Finland and the Baltic countries.

Total

Nameplate capacity (MW)
13724

Gross electricity generation (GWh)
73070

Net electricity generation (GWh)
73070

Absolute scope 1 emissions (metric tons CO2e)
13610240

Scope 1 emissions intensity (metric tons CO2e per GWh)
186

Comment
In 2018, Russia's share of the total fuel consumption was about 67%. Of the direct carbon dioxide emissions, 84% originated from the Russian operations and 8% 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

Region of consumption of low-carbon electricity, heat, steam or cooling
Europe

MWh consumed associated with low-carbon electricity, heat, steam or cooling
795000

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

Comment
This volume of Fortum's purchased energy is carbon-free electricity certified with the Guarantees of origin (GoO). Additionally, Fortum sells only electricity produced without CO2 emissions to its customers in the Nordic countries. In 2018, Fortum continued to give the Guarantees 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 labels, which have stricter environment criteria, i.e. not just renewable.

C-EU8.4

(C-EU8.4) Does your electric utility organization have a 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
50

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
11

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. In 2018, the total volume of by-products and waste generated at Fortum's own power and heat plants was about 770,000 tonnes. Of this volume, 50% was recycled or reused. In 2017, the material recovery rate was 45%, so the material recovery rate increased 11%. Fortum's circular economy business has grown especially in the Nordic countries in 2016-2018. Fortum's circular economy business operates waste treatment and incineration facilities in Finland, Sweden, Denmark, Norway and Lithuania. 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. In 2018, Fortum received also a total of approximately 1.6 million tonnes of non-hazardous waste from its customers and about 600,000 tonnes of hazardous waste from its customers. In 2018, the material recovery rate of the waste received from customers was 59%. In addition, Fortum incinerated waste, which was unsuitable for recycling or reuse as a material, at the Waste-to-energy plants about 1.5 million tonnes.

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-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. Additionally in 2019, Fortum has announced that it has won the right from Solar Energy Corporation of India to build a new 250-MW solar power plant in Rajasthan in India. Commissioning of the plant is expected in the fourth quarter of 2020. The solar park will be entitled to a fixed tariff of 2.48 INR/kWh for 25 years. In 2018, Fortum invested EUR 278 million in CO2 -free energy production and Fortum's total Capital expenditure was EUR 584 million. Thus, the share of investments in CO2-free energy production was about 50%. Fortum disclosures Capital expenditure of previous year by country and by production type in the Financials 2018 report, Note 18.2 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
Charging networks	Recharging systems and points for electric vehicles			

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 2018

Investment end date
December 31 2018

Investment area
R&D

Technology area
Renewable energy

Investment maturity
Full/commercial-scale demonstration

Investment figure
56000000

Low-carbon investment percentage
81-100%

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 2018, Fortum's Research and Development expenditure was EUR 56 million, or 1.1% 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_28-03-19-03-31.pdf

Page/ section reference
Verification Statement in 2018 (Suomenoja power plant); Pages: 1-4

Relevant standard
European Union Emissions Trading System (EU ETS)

Proportion of reported emissions verified (%)
12

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
Deloitte for Fortum - Addendum to the Independent limited assurance report.pdf

Page/ section reference
CDP Verification in 2018; Addendum to the Independent limited assurance report, pages: 1-2

Relevant standard
ISAE 3410

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
Deloitte for Fortum - Addendum to the Independent limited assurance report.pdf

Page/ section reference
CDP Verification in 2018; Addendum to the Independent limited assurance report, pages: 1-2

Relevant standard
ISAE 3410

Proportion of reported emissions verified (%)
100

Scope
Scope 2 location-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
Deloitte for Fortum - Addendum to the Independent limited assurance report.pdf

Page/ section reference
CDP Verification in 2018; Addendum to the Independent limited assurance report, pages: 1-2

Relevant standard
ISAE 3410

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
Deloitte for Fortum - Addendum to the Independent limited assurance report.pdf

Page/section reference
CDP Verification in 2018; Addendum to the Independent limited assurance report, pages: 1-2

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)	International Standard on Assurance Engagements ISAE3410, limited assurance	The verification referred to in C7. includes a comparison of annual emissions of 2018 and the previous year 2017.
C7. Emissions breakdown	Year on year change in emissions (Scope 2)	International Standard on Assurance Engagements ISAE3410, limited assurance	The verification referred to in C7. includes a comparison of annual emissions of 2018 and the previous year 2017.
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 2018 and the previous year 2017.
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 2018 and the previous year 2017.

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
12

Period start date
January 1 2018

Period end date
December 31 2018

Allowances allocated
1653950

Allowances purchased
8941200

Verified emissions in metric tons CO2e
2495150

Details of ownership
Facilities we own and operate

Comment
In 2018, Fortum had a total of 53 plants in six member countries within the EU's emissions trading scheme (ETS). About 77% 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, 12% 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 2018, Fortum commissioned the 35-MW Ulyanovsk wind farm in Russia, and the 50-MW Ånstadblåheia wind farm in Norway. In Sweden, Fortum commissioned the 76-MW Solberg wind farm in which Fortum has a 50% stake. In 2018, Fortum also implemented refurbishments of hydropower plants in Sweden increased annual electricity production of 15 GWh. The estimated annual CO2 savings from wind and hydropower projects were about 30,300 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 purchase

Project type
Hydro

Project identification
Project number GT606, El Canadá Hydroelectric Project, that has been implemented in the framework of the Prototype Carbon Fund of the World Bank.

Verified to which standard
CDM (Clean Development Mechanism)

Number of credits (metric tonnes CO2e)
66605

Number of credits (metric tonnes CO2e): Risk adjusted volume
66605

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
Carbon pricing is one of the parameters used in Fortum. 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 2018, price was around EUR 25 and this was 3.5 times higher than in the beginning of 2018. Consequently, the internal price on carbon based on the EU allowance 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
Climate change is integrated into supplier evaluation processes

% of suppliers by number
8

% total procurement spend (direct and indirect)
66

% Scope 3 emissions as reported in C6.5
87

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 2018, 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, about 90%. Additionally, Fortum's Scope 3 emissions were caused by the purchases of goods and services, 4%, 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. In 2018, 66% of Fortum's total spend came from qualified suppliers. In addition to that, 90% of Fortum's fuel spend came from qualified suppliers.

Impact of engagement, including measures of success
If potential risks in the supplier's operations are identified through the supplier questionnaire, the more extensive self-assessment questionnaire is sent or a supplier audit is conducted. During 2017 and 2018, 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.

Fortum has launched the marketplace to kick-start CO2 removal from the atmosphere called Puro. Puro is an internal startup at Fortum. This shared experiment pilot joined by a group of 23 pioneering companies aims to find a way to verify, compare and trade CO2 removals. The companies joining the experiment across industry boundaries are Fortum, Tieto, Valio, St1, ÅF Pöyry, Compensate Foundation, Carbofex, Yara Suomi Oy, Lassila and Tikanoja, SOK, Orbix, Nordic Offset, Hedman Partners, South Pole, and SEB.

Puro is developing new verification methodologies for CO2 removal. Science-based quantification of different CO2 removal methods is the foundation for credible CO2 removal certificates. Initially, Puro will offer certificates from three long-term CO2 removal methods at an industrial scale: CO2 fixated in carbonated building elements, wooden building elements and in biochar. As quantification and verification methodologies are developed further, new removal methods may be added to the marketplace. Puro hold the first auctions where CO2 Removal Certificates (CORC) are traded in May and June 2019. Puro auctions are open to all companies wanting to provide CO2 removal or to explore CORC as a solution to meet their voluntary climate objectives.

Fortum's thermal performance services include management consulting and training, planning, productivity and performance development services with remote monitoring for bio, waste to energy (WtE) and CHP (combined heat and power) plants managing especially availability, energy efficiency and life cycle condition monitoring. Fortum’s operation and maintenance services have been improving the energy efficiency of customers’ power plants already for decades.

Fortum has also world-class know-how in combustion and low-NOx technology. Fortum has delivered combustion technology solutions to reduce nitrogen oxide (NOx) emissions to many customers' power plants. In 2018, Fortum implemented projects to reduce the nitrogen oxide emissions of customers' coal-fired boilers in Poland, Finland and India, and a peat-fired boiler in Ireland.

Fortum provides resource-efficient recycling and waste solutions for customers regarding, i.e., plastics, oils, metals, and lithium-ion batteries. Fortum offers sustainable solutions of the highest quality to treat hazardous waste and ensure a safe final disposal. Fortum also process slag, sludge, and other masses for reuse in environmental construction and earthwork. In 2018, Fortum received a total of approximately 1.6 million tonnes of non-hazardous, conventional waste from its customers, and about 600,000 tonnes of hazardous waste from its customers.

Additionally, Fortum’s survey-based plan can improve the whole waste management chain of a customer for a cleaner, more sustainable world. Based on a waste survey, Fortum is able to design the entire waste management system for company's needs, including also training, advising and reporting after implementation.

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

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Cap and trade	Support with minor exceptions	In 2018, Fortum actively promoted a market-based energy and climate policy regarding the future EU long-term target setting, the emissions trading scheme and the functioning of the internal energy market. Fortum strongly advocated for the adoption of the EU 2050 strategy and increasing the climate targets 2030-2050. Fortum highlighted the need to strengthen the ETS by modifying the MSR, increasing the linear reduction factor (LRF) and improving the coherence between the EU ETS and complementary policies. 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 Katowice COP24 and participated in the conference as part of the International Emissions Trading Association(IETA) 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 (2019-2030): revision of the Market Stability Reserve in 2021. - Revision of the linear reduction factor (LRF) in 2024 - Long-term (after 2030): 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 2050 Strategy should be set for 2030-2050. 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 EU long-term climate strategy. 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 future climate policy framework should be based on a single binding headline target for CO2. - The EU should target at carbon neutrality by 2050.
Energy efficiency	Support with minor exceptions	In December 2018, the revised energy efficiency Directive entered into force. Earlier in July 2018 the revised energy performance of buildings Directive entered into force. In the revision process, 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. '. 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 2018, eurelectric published the Decarbonisation Pathways Study. According to the study, at least 60% of the EU's economy should be electrified by 2050 to achieve 95% GHG emission reduction versus 1990 levels. The study also concludes that the European power sector can be fully decarbonised by 2045. In eurelectric's view, a meaningful carbon price is important to ensure decarbonisation - also beyond the power sector.

How have you influenced, or are you attempting to influence their 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 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 influenced, or are you attempting to influence their 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 influenced, or are you attempting to influence their position?
Fortum is represented in the Climate Change Committee, in the Board 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 influenced, or are you attempting to influence their 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 influenced, or are you attempting to influence their 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 influenced, or are you attempting to influence their 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 and the Public Affairs Steering Group 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 mainstream reports, in line with the CDSB framework (as amended to incorporate the TCFD recommendations)

Status
Complete

Attach the document
fortum_financials2018.pdf

Page/Section reference
Fortum Financials 2018 report, the link on Fortum's website: https://www.fortum.com/Financials2018 Risk management, pages: 25-30; Sustainability, pages: 20-24; Capital expenditure, pages: 87-88

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

Comment

Publication
In other regulatory filings

Status
Complete

Attach the document
Fortum_Sustainability_2018.pdf

Page/Section reference
Fortum Sustainability 2018 report, the link on Fortum's website: https://www.fortum.com/Sustainability2018 Contribution to the Sustainable Development Goals, including updated strategy, pages: 4-6; Key sustainability topics, pages: 7-9; Governance and management, page: 10; Climate change mitigation, including climate-related risks and opportunities, pages: 24-28; Improving energy efficiency, pages: 29-30; Circular economy, pages: 31-34

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

Comment

Publication
In other regulatory filings

Status
Complete

Attach the document
fortum_ceos_business_review_2018_1.pdf

Page/Section reference
Fortum CEO's Business Review 2018, the link on Fortum's website: https://www.fortum.com/CEO-Business-Review2018 Fortum's strategy, page: 6-8; Sustainability at Fortum, page: 9; Risks and opportunities, page: 11

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

Comment

Publication
In voluntary sustainability report

Status
Complete

Attach the document
Sustainability at Fortum_2018.pdf

Page/Section reference
Presentation: Sustainability at Fortum 2018; Fortum's vision and strategy, page: 2; Sustainability targets and performance, pages: 10-11; Fortums' power and heat production by source, page: 16; Fortum's carbon exposure, page: 18; Energy efficiency, page: 19; Circular economy, page: 20

Content elements
Strategy
Emissions figures
Emission targets
Other metrics

Comment

Publication
In voluntary communications

Status
Complete

Attach the document
ER_Electromobility_Oct_2017.pdf

Page/Section reference
Fortum Energy Review, the net link on Fortum's website: https://www.fortum.com/about-us/media/media-room/energy-review Fortum Energy Review: Driving to a cleaner future. Challenges and opportunities in developing electromobility in Europe. Improving the availability of charging infrastructure encourages consumers to uptake electric vehicles. Published at the end of 2017; Pages: 1-20; Fortum's key messages on page 20.

Content elements
Strategy
Risks & opportunities
Other metrics

Comment
Fortum publishes position papers and views on energy sector and policy development, and actively communicates them in multiple media.

Publication
In voluntary communications

Status
Complete

Attach the document
2018_04_fortum_energiakatsaus_vesivoima.pdf

Page/Section reference
Fortum Energy Review, the net link on Fortum's Finnish website: https://www.fortum.fi/tietoa-meista/medialle/uutishuone/energiakatsaus Fortum Energy Review: Hydropower - for a cleaner future. An energy system needs flexible hydopower (Only in Finnish). Published in 2018; Pages: 1-16; Fortum's key messages of hydropower on page 16.

Content elements
Strategy
Risks & opportunities
Other metrics

Comment
Fortum publishes position papers and views on energy sector and policy development, and actively communicates them in multiple media.

Publication
In voluntary sustainability report

Status

Complete

Attach the document
meidänympäristömme_2018_eng_WEB.pdf

Page/Section reference
Fortum's nuclear related publications, the net link on Fortum's website: the https://www.fortum.com/publications Our environment 2018, Loviisa power plant. The Loviisa nuclear power plant produces carbon-free electricity, which play a significant role in mitigating climate change. The most important task of Fortum's nuclear power operations is to produce electricity safely, reliably and competitively.; Pages: 1-7

Content elements
Strategy
Risks & opportunities
Emissions figures
Other metrics

Comment
In 2018, Loviisa nuclear power plant generated about 8 TWh electricity without carbon dioxide emissions.

Publication
In voluntary communications

Status
Complete

Attach the document
loviisa_40_eng_web.pdf

Page/Section reference
Fortum's nuclear related publications, the net link on Fortum's website: the https://www.fortum.com/publications Four decades of clean power. Loviisa Nuclear power plant 40 years. Nuclear power as part of Finland’s electricity system. Mitigating climate change: The role that carbon dioxide-free nuclear power plays as a producer of clean energy is significant in mitigating climate change.; Pages: 1-5 (8)

Content elements
Strategy
Risks & opportunities
Emissions figures

Comment
Transitioning to a low-carbon energy system will advance the efficient use of all carbon dioxide-free energy sources. In line with Fortum’s strategic policies, nuclear power is an important step on the path towards a solar economy that is based on the efficient use of renewable energy sources. For example, if the electricity produced over the entire operating life of the Loviisa power plant were produced by coal condensing power plants, about 230 million tonnes of carbon dioxide would have been released into the atmosphere.

Publication
In voluntary communications

Status
Complete

Attach the document
2017_11_Energy_review_Circular_economy.pdf

Page/Section reference
Fortum Energy Review, the net link on Fortum's website: https://www.fortum.com/about-us/media/media-room/energy-review Fortum Energy Review: Let's not waste our waste. Essential roles of hazardous waste treatment and energy recovery as vital elements of a circular economy. Published at the end of 2017; Pages: 1-20; Fortum's key messages on pages 13-17 and 20.

Content elements
Strategy
Risks & opportunities
Other metrics

Comment
Fortum publishes position papers and views on energy sector and policy development, and actively communicates them in multiple

media.

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

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I have read and accept the applicable Terms