Welcome to your CDP Climate Change Questionnaire 2020

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 was the third largest power generator and the largest electricity retailer in the Nordic countries in 2019. As almost two thirds of Fortum’s power production is hydro and nuclear, it is among the lowest-emitting generators in Europe. Fortum’s key markets are the Nordic countries, the Baltic countries, Russia, Poland and India. With core operations in 10 countries, Fortum has employed a diverse team of over 8,000 energy-sector professionals in 2019.

Fortum’s ambition is to increase its CO2-free power generation. Fortum is one of the leading heat producers globally. Fortum has also generation capacity based on fossil fuels, located mainly in Russia, and it has worked to increase its energy efficiency and reduce its specific CO2 emissions. Fortum is focusing on increasing its solar and wind investments, which are subject to the capital recycling business model.

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 its ambition to drive the transformation towards a low-carbon 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 matters 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 with environmentally benign and reliable products and services. Fortum's know-how in CO2-free hydro and nuclear power production and in energy-efficient combined heat and power (CHP) 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 2019, 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 2019, 96% of Fortum's electricity production was CO2-free in Europe, and 59% of Fortum's total electricity production was CO2-free. Fortum's aim is to increase renewable energy generation in future. In line with the strategy, Fortum targets a multi-gigawatt wind and solar portfolio, which is subject to the capital recycling business model.
In 2019, Fortum's sales were EUR 5,447 million and the comparable operating profit totalled EUR 1,191 million. In 2019, Fortum paid EUR 977 million in dividends to its shareholders, and Fortum's total taxes borne amounted to EUR 397 million. Fortum's share is listed on Nasdaq Helsinki and its market capitalisation was EUR 19,542 million on the last trading day of 2019. Fortum believes that the future energy system will be based on CO2-free and inexhaustible energy sources and on overall efficiency of the energy system.
In March 2020, Fortum closed transaction to become majority owner in Uniper. As the majority owner with 75% of shares in Uniper, Fortum consolidates Uniper as a subsidiary as of 31 March 2020. As of the year 2020, Fortum's reportable segments and reporting order are the following: Generation, Russia, City Solutions, Consumer Solutions, and Uniper. The strategy alignment for Fortum and Uniper also includes aligning joint visions for carbon neutrality and other sustainability targets. The review of the objectives, policies, and reporting for sustainability will be initiated during 2020.

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
Reporting year	January 1, 2019	December 31, 2019	No

C0.3

(C0.3) Select the countries/areas 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 chosen approach for consolidating your GHG 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

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 matters, is an integral part of Fortum's strategy. The highest decision-making authority on sustainability and climate-related matters is with the members of the Board of Directors, who share joint responsibility (all directors) for these matters. Fortum's Board of Directors approves annually Fortum Group's performance targets, including sustainability and climate-related targets. Fortum has not nominated any individual Board member as responsible for climate affairs. In 2019, Fortum's Board of Directors decided to approve a new Group-level target for specific CO2 emissions from total energy production, applicable for 2020: ≤180 gCO2/kWh. Fortum's Audit and Risk Committee (ARC), members of the Fortum Executive

	Management (FEM), and other senior executives support the Board of Directors in the decision making in these matters, when necessary. Fortum has implemented TCFD (Task Force on Climate-related Financial Disclosures) reporting process, and the ARC reviews annually the Group Risk Policy, material risks, including climate-related risks, and uncertainties. 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, and as a C-suite officer he has, among others, the executive level responsibility for Fortum's TCFD reporting.

C1.1b

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

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – all meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies 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	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).

The highest decision-making authority on sustainability and climate-related matters is with the members of Board of Directors, who share joint responsibility for these matters in Fortum.
Fortum's Board of Directors approves annually Fortum Group's performance targets, including sustainability and climate-related targets. In 2019, Fortum's Board of Directors decided to approve a new Group-level target for specific CO2 emissions from total energy production, applicable for 2020: ≤180 gCO2/kWh.
Fortum's 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 ARC also reviews annually the Group Risk Policy, material risks, including climate-related risks, and uncertainties. Fortum published its first TCFD (Task force on Climate-related Financial Disclosures) report on March 2020.
Fortum's President and CEO holds the position of Managing Director under the Companies Act and is the Chairman of Fortum Executive Management (FEM). The President and CEO is in charge of the day-to-day management of Fortum Group, in accordance with the Companies Act and the instructions and orders issued by the Board of Directors.
The 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 annual Fortum Group-level 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.
Fortum's Corporate Affairs and Communications function, led by Senior Vice President (SVP), has the overall responsibility for sustainability, including also climate-related issues. The SVP, Corporate Affairs and Communications, is a member of Fortum Executive Management (FEM)

and as a C-suite officer he has, for example, the executive level responsibility for Fortum's TCFD reporting. Key climate-related risks are reported to FEM and the ARC as part of the annual review of material risks and uncertainties for Fortum Group.
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 Fortum Group-level and for maintaining an adequate situation awareness and oversight regarding sustainability. The Corporate Sustainability unit gives sustainability approval for all significant investments, acquisitions and divestments as part of Fortum's investment evaluation and approval procedure. The Corporate Sustainability unit works in close collaboration with the business functions as well as functions, such as Legal, Risk Management, Strategy, Investor Relations, Public Affairs and Procurement. The unit participates in Public Affairs processes and supports the Investor Relations function with its expertise. Responsibility for providing a consolidated view of Fortum's production portfolio, its long-term development and its alignment with Fortum Group's strategy and climate-related targets falls under Fortum's Strategy function.
Fortum's line management is responsible for the implementation of Fortum Group's policies and instructions and for day-to-day sustainability management. Concrete actions are executed by the line management according to the annual planning.

C1.3

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

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	In 2019, Fortum's Board of Directors approved inclusion of total CO2 emissions from energy production as part of the earnings criteria for the 2020–2022 long-term incentive (LTI) plan for key employees and executives. Sustainability targets affect every Fortum employee, and realisation of the safety targets is a part of Fortum's short-term incentive (STI) programme.

C1.3a

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

Entitled to incentive	Type of incentive	Activity inventivized	Comment

Chief Executive Officer (CEO)	Monetary reward	Emissions reduction target	Incentive schemes applicable to Fortum 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 long-term incentive (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. As part of the TCFD reporting implementation Fortum's incentive structure for senior management has been evaluated. In 2019, Fortum's Board of Directors approved inclusion of total CO2 emissions from energy production as part of the earnings criteria for the 2020–2022 long-term incentive (LTI) plan for key employees and executives. The criteria for annual incentives (STI) which were paid in 2020 based on 2019 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.
Corporate executive team	Monetary reward	Emissions reduction target	Incentive schemes applicable to Fortum 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 long-term incentive (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.

			As part of the TCFD reporting implementation Fortum's incentive structure for senior management has been evaluated. In 2019, Fortum's Board of Directors approved inclusion of total CO2 emissions from energy production as part of the earnings criteria for the 2020–2022 long-term incentive (LTI) plan for key employees and executives. The 2020-2022 LTI plan will comprise approximately 140 participants, including the members of Fortum Executive Management. The criteria for annual incentives (STI) which were paid in 2020 based on 2019 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.
Business unit manager	Monetary reward	Emissions reduction target	Subject to a decision by the Board of Directors the President and CEO is authorised to decide on individual participants and potential maximum awards for other participants than the Fortum Executive Management in accordance with the nomination guidelines approved by the Board of Directors. Incentive schemes applicable to Business unit managers include long-term incentive (LTI) scheme for those participating in the LTI programme and short-term incentive (STI) scheme for all. As part of the TCFD reporting implementation Fortum's incentive structure for senior management has been evaluated. In 2019, Fortum's Board of Directors approved inclusion of total CO2 emissions from energy production as part of the earnings criteria for the 2020–2022 long-term incentive (LTI) plan for key employees and executives. The 2020-2022 LTI plan will comprise approximately 140 participants, including the members of Fortum Executive Management.

C2. Risks and opportunities

C2.1

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

Yes

C2.1a

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

	From (years)	To (years)	Comment
Short-term	0	1	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	10	Fortum's period for quantified risks assessments is up to 2030. Long-term risks may be assessed also after 2030, when feasible.

C2.1b

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

Management of climate-related risks is integrated into Fortum’s risk management framework and follows the same governance and processes as Fortum’s other material risks and uncertainties. Fortum’s main features of risk management process consist of event identification, risk assessment, risk response and risk control.

Prioritizing and classifying risks into relevant categories is part of Fortum's risk assessment process. Priorities are defined by impact-likelihood analysis. Likelihood is a measure of how often an event is expected 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 levels from 1 to 4 for what is considered to be low, medium or high impact. For example, the substantive financial or strategic impact on the monetary scale level 4 is defined to be more than 50 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 risk is the annual financial EBITDA impact assessed against the latest forecast given that the event occurs. For example, energy and climate policy and regulation, as well as 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, are assessed, i.e. extreme temperatures or flooding may lead to hazardous workplaces or increase likelihood of leakage of oil or chemicals to the environment. The four level 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, meaning that substantive strategic impact can also be assessed on other scales than purely monetary scale. For example, substantive environmental impact is defined as very serious damage to the environment which is permanent or long-lasting (more than one year). Substantive reputation impact would be significant national or international media coverage causing long-term (more than one year) negative impact to Fortum’s brand.

Fortum has assessed substantive financial and strategic impacts regarding key climate-related transition risks and key climate-related physical risks. The identified physical risks are generally found in the operational risk category, whereas transition risks are generally longer-term and part of the strategic risk category.
Fortum's climate-related transition risks have been assessed to have financial impacts in hundreds of million euros, which are therefore considered substantive. Fortum’s strategy is to a large extent built on taking advantage of the opportunities associated with the transition to a low-carbon economy and successfully mitigating the risks. The transition to a low-carbon economy poses a number of strategic risks related to changes in energy and climate policy and regulation, technology development and the business environment in which Fortum operates. Additionally, Fortum’s reputation and brand can be negatively impacted by changes in stakeholder perception about Fortum’s ability to deliver on its strategy. There is a risk of increasing activity by non-governmental organisations (NGOs) which could affect key stakeholder perception. In order to mitigate the risks, Fortum focuses on the sustainability impacts of strategy and business decisions, communicating transparently about strategy implementation to key stakeholders, ensuring a broad base of investors and flexibility in financing including a diversified bond portfolio.
Fortum's climate-related acute and chronic physical risks have been assessed to have financial impacts in tens of million euros, which are therefore not considered to be substantive. Fortum’s operations and assets exposed to external events, the frequency and magnitude of which may increase as a result of climate change. Fortum adapts its operations to the changing climate and takes it into consideration in production and maintenance planning and in evaluating growth and investment projects.

C2.2

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

Value chain stage(s) covered

Direct operations
Upstream
Downstream

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

Annually

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

Management of climate-related risks is integrated into Fortum’s risk management framework and follows the same governance and processes as Fortum’s other material risk and uncertainties. Fortum has an annual process to identify and assess all risks, including climate-related risks in all Business divisions, Corporate Functions and legal entities within the operational control of the Fortum Group. The process supports both identification of new risks and updating existing 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. Impact is assessed in monetary terms as well as in terms of health and safety, environment and reputation. Fortum's main risk management process covers strategic risks, financial risks, operational risks, sustainability risks, and climate-related risks which can exist in relevant risk categories.
Business areas and functions identify and assess their risks annually through self-assessment workshops, some of which are facilitated by Corporate Risk Management. Fortum's climate-related risks are also identified and assessed annually through this bottom-up process. In 2019, Fortum emphasized climate-related risks as part of the process and introduced a specific top-down review of climate-related risks by Group experts.
The timeframe focus on Fortum's 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 long-term 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 material 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.
Fortum Group’s key risks and uncertainties, including key climate-related transition and physical risks, are reviewed by Fortum’s Executive Management (FEM) 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 energy policy and regulation, technology and business environment and market. For each climate-related risk, a risk owner is assigned who has the appropriate authority level and is responsible for implementing risk response actions. The risk definition, assessment and proposed actions to respond to the risk are proposed by the risk owner and approved by the relevant management team.
All material 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.

C2.2a

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Energy policy and current regulation risks are assessed as a part of Fortum's company-wide risk assessment process. Climate targets, policy and regulation both at global, EU and national level in Fortum's operating countries is under continuous development. Fortum 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 climate legislation in Fortum's operating countries can have a significant monetary impact. Fortum prefers the EU emissions trading system (ETS) as the leading climate instrument, but overlapping national carbon policies (e.g. national coal phase-out laws) tend to dilute the system and the carbon price despite the ETS reforms. For example, revision of targets for the EU clean energy package could lead to higher ambition levels, but could also introduce mechanisms such as non-market based capacity renumeration schemes which are not efficient or aligned. The impact is evaluated as lower income for Fortum’s current asset base. Any national decision to phase-out coal in the ETS sector should be accompanied by a decision to cancel the corresponding amount of emissions allowances. Germany is the first country committed to cancelling issued allowances while phasing out coal-fired power generation. Fortum thinks this is the right solution that will lead the way to other EU member states phasing out coal. CO2 emissions from coal in Germany amounted to 160 million tons in 2019, corresponding to about 20% of the total German emissions. The German share of the total emissions covered by the EU ETS was 20–25% during 2013–2019. If the emissions allowances are not removed from the market, this will shift the emissions to other operators in EU ETS member states, so Germany’s decision has significant implications in the EU. Each Fortum's Business division has established a system to follow current regulation as part of their environmental and quality management system. Fortum Public Affairs has a continuous dialogue with legislators and decision makers in order to have up-to-date information on policy developments. 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, Carbon Pulse and ENDS, in collecting information on regulation.

Emerging regulation	Relevant, always included	Energy policy and emerging regulation risks are assessed as a part of Fortum's company-wide risk assessment process. Climate targets, policy and regulation both at global, EU and national level in Fortum's operating countries is under continuous development. The Paris Agreement requires regular revision and tightening of the climate commitments by countries (nationally determined contributions). Anticipation of emerging regulation risks and opportunities is vital for the business development. For example, the EU Commission is currently preparing the revision of the 2030 climate target and a number of revisions of energy and climate-related legislation is expected in 2021 in the framework of the European Green Deal. These 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. Banning or tighter restrictions on incineration and burning of waste, biomass, or natural gas due to changed views on what is considered acceptable from a sustainability perspective (including also e.g. early shut-down of coal plants in Germany) is a potential emerging regulation risk. Fortum Public Affairs has a continuous dialogue with legislators and decision makers in order to have up-to-date information on policy developments. 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, Carbon Pulse and ENDS, in collecting information on regulation.
Technology	Relevant, always included	Technology risks are assessed as a part of Fortum's company-wide risk assessment process. 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 continuously updates estimates for the future cost of wind and solar power production with different scenarios which, in turn, impacts the estimates of the future energy mix and supports decision-making for investing in these assets. Fortum has made several investments and investment decisions that will significantly grow wind and solar power production in the years ahead. Fortum's investment decisions always include an assessment of different future scenarios for the cost development, which are used to evaluate the investment profitability. 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.
Legal	Relevant, always included	Legal risks are assessed as a part of Fortum's company-wide risk assessment process. Fortum's potential legal risks related to the present and future energy and climate policy framework include, for example, climate-related litigation claims. Although considered unlikely that any such climate-related litigation case would be successful, even having such a claim raised could negatively impact Fortum’s brand and reputation. Another example of legal risks could be inadequate compensation for forced closure of assets due to changes in legislation, for example, early coal phase-out laws or other changes in environmental laws and permits, which would make certain plants illegal to operate. Fortum's potential legal risks related to the energy and climate policy framework also 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. Each Fortum's Business division has established a system to comply current legal requirements as part of their environmental and quality management system. Fortum Public Affairs has a continuous dialogue with legislators and decision makers in order to have up-to-date information on policy developments. 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, Carbon Pulse and ENDS, in collecting information on regulation.
Market	Relevant, always included	Market risks are assessed as a part of Fortum's company-wide risk assessment process. 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 key physical climate-related risk factors affecting electricity prices and volumes on the Nordic market include hydrological and wind conditions and temperature. The key transition-related risk factors which affect the wholesale price of electricity on the

		Nordic market are the CO2 allowance prices, which is dependent on the share of renewable energy as well as future regulation. The physical climate-related risks are assessed through fundamental models, which vary the amount of precipitation, temperature and wind in Fortum's operating countries, and production areas in the Nordic system. This results in different scenarios for Fortum's power production as well as for the price of the wholesale price of electricity in the Nordic region. Similarly, the price of CO2 is modelled under different scenarios of climate ambition in the EU with different mixes of renewable energy and fossil-based generation. This, in turn, gives different scenarios for the wholesale price of electricity on the Nordic market.
Reputation	Relevant, always included	Reputation risks are assessed as part of Fortum's company-wide risk assessment process. 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. 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 supports constructive dialogue in which solutions are sought together rather than in confrontation. In case of substantial negative media, there could be still an impact Fortum's brand and reputation. Fortum is committed to working for low-carbon energy production. Fortum strongly supports the EU's climate neutrality objective 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 consumers and industry. Fortum's customers require a reliable energy supply at affordable price, during the transition towards a low-carbon energy system.
Acute physical	Relevant, always included	Acute physical risks are assessed as a part of Fortum's company-wide risk assessment process. 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 example, production volumes at hydropower plants. Higher precipitation and flooding may also affect dam safety at hydropower plants. An example of an acute risk is intense storms with heavy rains and flooding leading to local damages and lost production or flash floods increasing risk of dam breaches. Extreme heat and dry spells could

		also lead to forest fires causing local damages and supply constraints at Fortum's operational facilities. 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.
Chronic physical	Relevant, always included	Chronic physical risks are assessed as a part of Fortum's company-wide risk assessment process. 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 example, production and dam safety at hydropower plants, and also availability and supply of biomass fuels in Fortum's operating countries in the Nordic countries, the Baltic countries and Poland. 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.

C2.3

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

Yes

C2.3a

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

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Current regulation

Carbon pricing mechanisms

Primary potential financial impact

Other, please specify

Changes in carbon pricing, lower electricity price

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 of climate change, 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, when the EU Commission published the 2050 strategy proposal in November 2018. In 2019, the EU reached a political agreement on the 2050 climate neutrality objective. Currently the EU is in the process of revising the 2030 climate target and adopt the European Climate Law. 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 GHG emissions.
Fortum prefers emissions trading as the key climate instrument. Significant progress has been achieved in improving the design and functionality of the EU emissions trading system (ETS) over the past three years. However, the system has to be further revised in order to be able to deliver on the increased climate ambition and to ensure the long-term credibility of the ETS as the flagship climate policy instrument. Policy overlaps with ETS should be avoided, because they entail 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 2019, 96% of Fortum's current European electricity production was CO2-free, and Fortum does not need to buy emission allowances for that electricity 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)

Potential financial impact figure – minimum (currency)

35,000,000

Potential financial impact figure – maximum (currency)

42,000,000

Explanation of financial impact figure

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 2019, Fortum's electricity sales was EUR 3,063 million in EU and Norway and about 69.6 TWh in the Nordic countries. These will result in a decrease of Fortum's EBITDA due to the decrease in EU ETS allowance market price by appr. EUR 35-42 million in an unhedged situation corresponding to 2-2.5% of Fortum's total EBITDA in 2019 (1,685 million EUR). This potential financial impact is not economically significant. On the other hand, if this forecast is not realised, the profitability of Fortum's CO2-free investments may be improved.

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 emission allowances are auctioned. The value of Fortum's free CO2 allowances in 2019 (0.7 Mt) was about EUR 18 million using a price of EUR 25/t.

Uncertainty of the regulatory regime and CO2 allowance pricing are taken into account in the investment calculations. In the EU area, most of the allowance cost is passed through to the electricity price and in heat market to the heat price to a large extent.

Cost of response to risk

650,000

Description of response and explanation of cost calculation

In 2019, Fortum's EU area-specific lobbying costs were about EUR 650,000. Climate policy related issues were one of the major areas of lobbying, and these are directly climate-related costs. In 2019, 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 an ambitious European Green Deal. This coalition developed joint positions and a had a dialogue with the European institutions. Fortum participated in several initiatives promoting the role of carbon pricing and market as part of the global climate agreement. Fortum is a member of the World Bank's Carbon Pricing Leadership Coalition and the UN Caring for Climate Initiative.

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.

Fortum also invests into renewable and CO2-free energy production capacity annually. In 2019, Fortum's investments to wind power production totalled EUR 111 million in the Nordic countries. Fortum commissioned the first wind turbines of the total 97-MW Sørfjord wind power park in Norway, the investment of which was EUR 52 million. The wind investments also included the EUR 30 million Solberg fixed asset acquisition that is part of the Blaiken-Solberg wind park ownership swap. Additionally, Fortum invested EUR 68 million into hydropower production in Sweden and Finland, mainly maintenance, legislation and productivity investments. Fortum's refurbishments of

hydropower plants produced 13.5 MW of new renewable electricity production capacity in 2019.

Comment

Over the past decades, Fortum has significantly increased its annual CO2-free power production: from around 15 TWh in 1990 to 45 TWh in 2019.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation

Carbon pricing mechanisms

Primary potential financial impact

Other, please specify

Increase in carbon pricing

Company-specific description

Russia’s legislative and political operating environment on climate change and policy differs significantly from that of Europe. In general, 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.

However, in 2019-2020, the Russian Ministry of Economic Development published the first ever draft Low-Carbon Strategy including several scenarios for the emission development by 2050 from today. Measures to reach the targets include, e.g. a large-scale increase in energy efficiency, the introduction of carbon pricing, an increase of nuclear and renewable energy, electrification and digitalization of transport and industry, use of carbon capture and storage and utilisation technologies, and measures in the forestry sector. 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 may lead to wrong investment decisions.

Fortum has finalised its 2,300 MW investments in electricity production and 660 MW investments in heat production in Russia by 2016, mainly based on natural gas. However, specific CO2 emissions has decreased, because the new units are more energy efficient than the old plants. Fortum is operating a fleet of power and heat plants with efficiency and emissions ranking among the best of peers in Russia. The specific CO2 emissions from Russian power production has decreased by about 23% from 2010 until 2019.

Fortum has also invested in new wind and solar power. 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. A separate investment decision will be made for each project. Taking into account that 1 MW of wind power offsets about 2,600 tons of carbon dioxide emissions each year in Russia, these represent a substantial gain in the climate change mitigation.

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)

Potential financial impact figure – minimum (currency)

16,000,000

Potential financial impact figure – maximum (currency)

20,000,000

Explanation of financial impact figure

Fortum's CO2 emissions in Russia totalled 16.3 Mt in 2019, and Fortum estimates them to be 16-20 Mt per year in the future. For example, with emissions of 16-20 Mt and CO2 price of EUR 1 the financial value of emissions would correspond EUR 16-20 million. Fortum's energy production in Russia is mainly based on natural gas. 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. Of the direct CO2 emissions (Scope 1), about 85% originated from the Russian operations in 2019.

On the other hand, if such an emissions 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.

Cost of response to risk

5,000,000

Description of response and explanation of cost calculation

Fortum aims at managing the risk by investing in renewable and CO2-free wind and solar power production capacity in Russia. Investments in CO2-free production were EUR 5 million during 2018-2019. In 2019, Fortum's total capital expenditure in Russia

was EUR 67 million including maintenance, legislation, productivity projects, modernisations and energy-efficiency improvements.
In 2019, the Fortum and Rusnano investment fund with 50/50 ownership commissioned the 50-MW Ulyanovsk-2 wind farm. Fortum and Rusnano investment fund also decided to start a 200-MW wind power project in Kalmykia and a 50-MW wind power project in the Rostov region.
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.

Comment

In 2019, 96% of Fortum's electricity production in Europe was CO2-free. Of Fortum's total electricity production, including the Russian power generation, 59% was of CO2-free, i.e. Fortum was among the low-carbon energy utilities.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

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

Primary potential financial impact

Increased insurance claims liability

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)

1,000,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

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; this was approximately EUR 1,000 million (SEK 10,000 million) in 2019. 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.

The financial impact depends on the severity of the possible 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.

Cost of response to risk

25,000,000

Description of response and explanation of cost calculation

In 2019, Fortum invested in total EUR 68 million into hydropower production in Sweden and Finland, mainly maintenance, legislation and productivity investments. The dam safety investment and maintenance program is continuous with annual investment and maintenance costs. The condition control, investment and maintenance program for Fortum's hydropower dams are approximately EUR 25 million annually. 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.

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 & Primary climate-related risk driver

Chronic physical

Rising mean temperatures

Primary potential financial impact

Increased indirect (operating) costs

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.

Climate change and water temperature rise can also increase algae growth in water systems. Increase in water temperature 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

More likely than not

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)

7,400,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

At the Loviisa nuclear power plant, energy loss of total production breakdown is about 1,000 MW/hour. In 2019, the average area price in Finland was EUR 44.0 /MWh. The financial impacts depend the length of the production breakdown and power price. The production breakdown would result in financial loss about EUR 7.4 million per week (168 h) at maximum.

Water temperature rise can affect nuclear power plants since back-flow condensation water isn't allowed to exceed the permit limit, which is +34°C at Fortum's Loviisa nuclear power plant in Finland. Seawater temperature rise could also affect the cooling water intake in case of excessive algae growth, and thus algae cleaning can cause business interruptions.

Cost of response to risk

0

Description of response and explanation of cost calculation

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).

In Finland, the Loviisa nuclear power plant has the back-up systems for loss of seawater and the cooling system, including the safety-enhancing cooling towers, which are independent of seawater cooling. The cooling system consists of two air cooling towers per unit, one of which will be used for decay heat removal from the reactor, the other from the spent fuel pools as well as cooling-off other equipment critical from the nuclear safety point of view. The cooling system improves the plant's preparedness for extreme conditions, where seawater becomes unavailable for cooling, such as an oil catastrophe in the Gulf of Finland, or an exceptional natural phenomenon such as excessive algae growth. There is also the algae cleaning process at the Loviisa nuclear power plant.

In 2019, Loviisa power plant's flood control project was completed. The modifications reduced the flood risk caused by an estimated sea-level rise exceeding three meters. A modification of the primary water purification system's filtering was also implemented in both Loviisa power plant's units. Additionally, to ensure sufficient data transmission capacity and availability, a fibre optic connection was installed through the containment building.

The transmitters for the emergency make-up water tank surface level measurements in the Loviisa power plant's unit 1 were replaced with transmitters from two different suppliers. The change reduced the possibility of a combined failure in measuring, which in turn significantly reduced the risk of damage to the power plant's reactor core. In 2019, Fortum's investments into the Loviisa nuclear power plant totalled EUR 57 million.

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 an accident of oil tanker ship or a similar incident, or an exceptional natural phenomenon such as excessive algae growth.

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

Primary potential financial impact

Increased revenues resulting from increased production capacity

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's Group-level target is to achieve over 1,900 GWh of annual energy savings by 2020 compared to 2012. In 2019, the combined annual energy savings of the energy-efficiency improvement projects was about 70 GWh. By the end of 2019, the cumulative energy-efficiency improvement achieved was in total 1,707 GWh/a compared to 2012. Fortum's business units have their own country-specific energy-efficiency improvement projects in all Fortum's operating countries.
Fortum has also 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 energy-efficiency 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.
Additionally, Fortum's operation and maintenance services have been improving the energy efficiency of Fortum's customers' power plants already for decades. In 2019, a project was launched to improve energy-efficiency and plant capacity at the Riihimäki waste-to-energy plant in Finland; the results of the project will be ready in 2020.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

30,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

In 2019, City Solutions division' sales made about 22% of Fortum's total sales, EUR 5,447 million. City Solutions' sales in 2019 was EUR 1,200 million. If the energy demand increased i.e. by 1%, this would mean approximately EUR 10 million minimum increase in sales annually. In addition to this, Generations division's sales made about 39% of Fortum's total sales, EUR 5,447 million. Generations' sales in 2019 was EUR 2,141 million. If the energy demand increased i.e. by 1%, this would mean approximately EUR 20 million increase in minimum sales annually. Therefore, 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.

Cost to realize opportunity

10,000,000

Strategy to realize opportunity and explanation of cost calculation

In 2019, Fortum invested EUR 68 million into hydropower production in Finland and Sweden, mainly maintenance, legislation and productivity investments. Of this volume, the refurbishments of hydropower plants in relation to energy-efficiency improvements are totalled approximately EUR 10 million annually. In 2019, Fortum accomplished, among others, the refurbishments of hydropower plants in Sweden and Finland, resulting in annual energy-efficiency improvement of 30 GWh with the increased production capacity of 13.5 MW.

Fortum's energy-efficiency programme in 2017-2025 covers its hydropower, nuclear power and other power plants subject to the Finnish energy-efficiency agreement, and also its Swedish hydropower plants. 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 energy-efficiency agreement, for example, the heat recovery project from a data centre to Fortum's district heating network has been implemented in Finland in 2018, resulting in 17 GWh annually.

Fortum's other business units also have their own country-specific energy-efficiency improvement projects. In 2019, Tartu district heating and cooling construction projects in Estonia gained energy savings of 10 GWh annually.

Comment

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?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

Fortum develops solutions to promote clean transportation in the Nordic countries, and also in India. As the climate change mitigation requires reduction of fossil fuels in all sectors, i.e. also in transportation, there is a need to increase electricity consumption through electrification of transportation. In the Nordic countries, increased use of electric vehicles reduces emissions regardless of the source of electricity, because all electricity production is in the framework of the EU ETS, unlike transportation with fossil-fueled

vehicles, which use petrol or diesel. Fortum actively promotes the adoption of electric vehicles by developing solutions that enable quick and safe charging of electric vehicles. By 2040, electric vehicles are estimated to present more than half of all new vehicles sold globally.

Fortum's solutions offer customers e-mobility services for digital public charging, as well as home and destination charging services. The solutions are known in the market under the brands Plugsurfing and Fortum Charge and Drive. Together with these solutions, Fortum is able to offer the complete package for electric vehicle charging networks. In 2019, Plugsurfing's charging and payment application connected 60,000 electric vehicle (EV) drivers to more than 200 charging networks, thus offering access to over 100,000 charging points in 31 European countries.

Fortum Charge and Drive provides customers and operators the service for quick and convenient EV charging. Fortum Charge and Drive EV charging platform responds to the critical need to decarbonise cities' transport systems by providing smart solutions that support e-mobility.

Fortum Charge and Drive offers a cloud-based SaaS (Software as a Service) platform for operating EV charging infrastructure networks, and customer interfaces to public CPOs (Charging Point Operators). Fortum's offering cover, among others, the software, consumer apps, end-user account management, and real-time network communication. The Fortum Charge and Drive platform handles hundreds of thousands of charging sessions per month, from thousands of connected chargers. In 2019, it was connected to a network of over 1,400 affiliated smart chargers in Norway, Finland and Sweden, and its international presence is growing rapidly.

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)

Potential financial impact figure – minimum (currency)

15,000,000

Potential financial impact figure – maximum (currency)

30,000,000

Explanation of financial impact figure

Developing infrastructure and e-mobility services for electric vehicles in a large-scale offers Fortum new business opportunities. At the same time, Fortum creates circumstances in which electricity can replace other traditional fossil-based energy

forms. Therefore the demand for the low-carbon electricity produced by Fortum can be increased in the Nordic countries, such as in Finland, Sweden and Norway.
In 2019, Fortum's electricity sales in EU and Norway was EUR 3,063 million and about 69.6 TWh in the Nordic countries. For example, 0.5-1% increase in Fortum's electricity sales would mean approximately EUR 15 million to EUR 30 million in EU and Norway annually.

Cost to realize opportunity

5,000,000

Strategy to realize opportunity and explanation of cost calculation

Fortum investigates and creates solutions for the large-scale introduction of electric vehicles. This has included investments, for example, the planning and development of recharging systems and recharging points. In 2019, Fortum invested in Charge and Drive EUR 5 million, mainly charging stations in Norway. In 2018, Fortum invested in Charge and Drive EUR 9 million.
In 2019, Fortum completed the Nordic high-power charging corridor between Helsinki, Stockholm and Oslo for electric vehicles to facilitate EV mobility in the Nordic countries. The network enables the newest generation 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.
Additionally, Fortum is supporting the effort by developing an EV charging network in India for common electric vehicles and three-wheeled vehicles. Fortum’s collaboration with the Swedish Clean Motion company offers an innovative battery swap service for three-wheeled vehicles. The battery swap service for three-wheeled vehicles enables drivers to exchange a discharged battery quickly for a new, charged battery. The main target groups of the service are major taxi companies and other organisations operating large fleets of vehicles. Fortum also provides Indian electricity charging station operators an opportunity to manage their infrastructure with a cloud-based SaaS (Software as a Service) platform.

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 has also adopted 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

Primary potential financial impact

Returns on investment in low-emission technology

Company-specific description

Hydropower, which had 33% stake of Fortum's total power production portfolio in 2019, is a very competitive power production technology, because of small carbon footprint and low variable costs. Compared to other CO2-free power generation sources, like solar, wind and nuclear, the advantage of hydropower is that it can be adjusted based on the electricity demand. Especially hydropower that utilises reservoirs, in which water is stored behind a dam, ensures secure supply of electricity. The flexibility of hydropower production also makes it an important enabler for the growth of other renewable energy production, like wind power in the Nordic countries.
In 2019, about 43% of Fortum's European power generation was hydropower. Changing temperature and rainfall change the prerequisites for power production. Changes in temperature and rainfall would affect snow amount, seasonal river flow patterns, and thus Fortum's hydropower production, which was 20.3 TWh in 2019.
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. When timing of river flow is changing due to the climate change, regulation of water levels and discharges as well as production planning for hydropower production need to be changed for optimal power production. Sometimes temperature increase may shift inflows - which is water flowing into the river system - to winter, when electricity demand is high in the Nordic countries. Temperature changes due to climate change also affect electricity 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 flexible hydropower production, 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, power plants' availability and utilisation of Fortum's flexible power 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)

Potential financial impact figure – minimum (currency)

8,000,000

Potential financial impact figure – maximum (currency)

8,500,000

Explanation of financial impact figure

The financial impact of potential change in hydropower production depends on the change in Fortum's hydropower production (20.3 TWh in 2019 and 19.1 TWh in 2018) and market price of electricity. The average system spot price in Nord Pool was EUR 38.9 per MWh in 2019, and EUR 44 per MWh in 2018. Thus, the direct impact as an increase on the value of sold electricity would be approximately EUR 8 million up to EUR 8.5 million per 1% increase in Fortum's hydropower production annually.
The climate change may affect electricity demand, production and electricity prices. 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. On the other hand, hydrological changes may also create negative impacts on e.g. regulation possibilities.

Cost to realize opportunity

10,000

Strategy to realize opportunity and explanation of cost calculation

Related costs regarding the development of production planning in hydropower are approximately EUR 10,000 annually. Especially the methods for regulation and production planning need to be altered due to climate change. Fortum forecasts water flowing into all the river systems with Fortum's hydropower plants using inflow forecasts. Inflow forecasts are adjusted with climate change corrections to take into account changes in precipitation and temperature for more accurate production planning. Allowed water levels and discharges are given in regulation permits. Fortum is also monitoring the need apply for changes in these regulation permits when seasonal variation of temperature, precipitation and hydrology changes due to the climate change. Changes in regulation permits enable more effective power production fitted in the changing hydrological conditions.
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, in total 4,677 MW at present. In 2019, Fortum invested EUR 68 million into hydropower production in Finland and Sweden, mainly maintenance, legislation and productivity investments. The refurbishments completed in 2019 resulted in the capacity increase of 13.5 MW in Sweden and Finland, and furthermore, 30 GWh more renewable electricity production annually.

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.

C3. Business Strategy

C3.1

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

Yes

C3.1a

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

Yes, qualitative and quantitative

C3.1b

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

Climate-related scenarios and models applied	Details
2DS	Fortum has five climate-related scenarios that relate to varying degrees of ambition in climate change mitigation, technological development and evolution in the political landscape and regulation. The purpose of scenarios is to plan for alternative futures and enable quick change in plans in case the climate ambition changes. The scenarios relate to global warming temperatures of +1.5°C, +2°C, +3°C and +4°C in 2100. Based on external benchmarks, such as IEA, BloombergNEF and IHS Markit, together with internal industry expertise in the strategy development, the current ambition level represents the scenario with +3°C global warming. In this scenario, Europe's decarbonisation is close to -80% by 2050. These time-frames are commonly used by organizations such as IPCC. Their global warming degrees always refer to 2100. Fortum uses the same time-frames as them to avoid confusion and to make comparison between different data sources easier. In order to reach the Paris Agreement to limit global temperature rise to well below +2°C, changes are needed and expected in the climate ambition level, technological development and/or the political landscape and regulation. Europe has a strong exemplary role in the energy transition that will have an impact in actions in other continents. Fortum's long-term planning uses the scenario with +2°C global warming as a reference scenario. This scenario is 2DS compatible. The results of Fortum's scenario analysis has a direct and strong influence on

	Fortum's climate-related risks and opportunities, and business objectives. Fortum's strategy needs to be aligned with the scenario analysis, and the strategy shapes business targets. For example, the results of the scenario analysis have influenced Fortum's business objectives and strategy in defining the time-horizons and renumeration options not only of renewable energy but also infrastructure and security of electricity supply required for +2°C pathway. The scenario analysis has supported Fortum to accelerate the change towards a low-carbon energy system, improving energy and resource efficiency and providing smart solutions for customers. In the power production value chain, Fortum is focusing on growth in CO2-free hydro, wind and solar power, while efficiently operating the existing assets needed for security of supply during the energy transition as efficiently as possible. The focus areas were selected in such a way that they are compatible with the +1.5°C and 2°C scenarios, and CO2-free hydropower as well as nuclear power in security of electricity supply increases also through Fortum's Uniper acquisition. The scenario analysis has also supported in the planning of time-horizons of actions. For example, Fortum's Espoo Clean Heat is a project where Fortum discontinues the use of coal in the City of Espoo's district heating by 2025; five years before Fortum and the City of Espoo have together committed to achieve carbon-neutral heat to be delivered in Espoo's district heating network. This project is used to create competences in decarbonisation of district heating and these can be efficiently utilized in case cities introduce faster decarbonisation targets than today. Participation in Fortum's scenario analysis process are delegated company-widely in Fortum and all Business divisions and business units are involved, but Corporate Industrial Intelligence (long-term analysis) and Corporate Strategy have been the main process drivers. In 2019, the findings from the scenario analysis were also used as one of key inputs in supporting Fortum's Board of Directors' decision to tighten the Group-level climate target by 10%, and therefore the specific CO2 emissions from total energy production, applicable for 2020, was set ≤180 gCO2/kWh (one year performance). Group-level sustainability targets will be revised after consolidation of Uniper.

C3.1d

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

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	Climate-related risks and opportunities have been one of the most important influence on Fortum's long-term strategy and shaped Fortum's direction for the past decade. One of the

		most significant strategic decisions related to products and service portfolio for Fortum has been the agreement on majority share acquisition of Uniper in 2019. As the majority owner, Fortum will focus on co-operation and strategic alignment with Uniper. Fortum and Uniper are well-positioned to drive forward the European energy transition to enable a carbon-neutral Europe by 2050. To achieve this ambition, energy companies are expected to execute ambitious climate policies while continuing to secure electricity and heat supply at an affordable cost. Fortum stands for a strategy of decarbonisation, and supports Uniper's decision to close down the company's old coal-fired units in Germany, as the company's new coal-fired CHP plant Datteln 4 is taken into use. As long as coal has to be used to provide for security of supply in Germany, it makes sense to use it in the most efficient power plants. Electricity sales for consumers: Fortum provides its consumer 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 charging solutions, solar panel solutions, and real-time monitoring and optimisation of energy consumption. Circular economy and waste recovery: Fortum owns and operates plastic, metal and other waste recycling and recovery facilities. For example, Fortum's recycled plastic end-product, Fortum Circo, can completely or partially replace virgin materials in producing plastic for a wide variety of purposes. Fortum Circo fits from household appliances to industrial and commercial films and blow-molded articles, for example, a new hands-free handle, Vipu, for safe opening of doors was developed to fight the Covid-19 pandemic in 2020. Services to power plant operators: Fortum has extended the offering of services for power plant operators by applying its technical expertise and long experience to optimise performance and reduce emissions of energy producers on a global scale. The significance and magnitude of impact of identified opportunities in relation to products and services is high.
Supply chain and/or value chain	Yes	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 counter-party risk assessments, supplier qualification and supplier audits,

		including climate-related issues. To mitigate risks related to coal supply chain, Fortum is a member of the Bettercoal initiative, and Fortum uses the Bettercoal Code and tools in assessing the sustainability of the coal supply chain. Bettercoal assessments are conducted by a third party. By the end of 2020, Fortum has committed to purchasing 70% of coal from suppliers whose mines have undergone a Bettercoal assessment. To mitigate risks related to biomass supply chain, Fortum has improved the Chain of Custody management system for wood-based fuel by strengthening the systematic assessment of risks related to the biomass supply chain and procurement countries. Fortum annually collects data on the share of certified wood-based biomass fuel used in its power plants. In 2019, slightly over 50% of the wood-based biofuel used by Fortum originated from certified or controlled sources. The significance and magnitude of impact of identified risks in relation to the supply chain is relatively low.
Investment in R&D	Yes	Fortum's Research and Development (R&D) and Innovation activities focus on the development of the energy system towards a future low-carbon society and renewable-based economy. Climate-related risks and opportunities have substantially influenced Fortum's R&D investment strategy over the past years. The focus areas are selected with identified climate-related opportunities (e.g. low-carbon and renewable energy systems will replace fossil-based energy systems) and minimizing company-wide climate-related risks (e.g. varying renewable energy power generation will create more volatility in the electricity market). In 2019, Fortum spent EUR 67 million on research and development, or 1.2% of sales. Over 80% of this amount targeted R&D on mitigating climate change, and the majority of the R&D results expected to be in use within the next five years. Fortum has also committed to invest into external (e.g. Valo Ventures growth fund, which invests in early- and growth-stage technology companies) and internal e.g. 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 (R&D) project is assessed against the criteria of carbon dioxide emissions reduction and resource and energy efficiency. The significance and magnitude of impact of identified opportunities in relation to investments in R&D is high.

Operations	Yes	Fortum aims to adapt its operations to the changing climate and takes climate change into consideration in assessment of growth projects, production planning and scheduled maintenance activities. Fortum is investing in solar and wind power with the target to create a multi-gigawatt portfolio, which is subject to capital recycling business model. For example, Fortum has constructed new wind power plants in Finland and Norway in 2019, and new wind turbines are also estimated to start production in the Nordic countries and Russia in 2020. Climate-related risks and opportunities have also influenced Fortum's strategy related to its operations, among others, in hydropower production and energy-efficiency improvements. The flexibility of hydropower production enables that Fortum can operate competitively in the electricity market during energy consumption peaks, and fluctuating electricity prices. As described in C2.4a Opportunity 3, Fortum has the potential competitive advantage of its hydropower production related to adaptation to climate change. In hydropower production, the methods for regulation and production planning need to be altered due to climate change by taking into consideration changes in precipitation and inflow, including longer wet or dry periods, as well as extreme weather phenomena. 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. Additionally, as described in C2.4a Opportunity 1, energy-efficiency has been one of Fortum's strategic focus area in operations over past decades. Fortum's Group-level target is to achieve over 1,900 GWh of annual energy savings by 2020 compared to 2012. By the end of 2019, the cumulative energy-efficiency improvement achieved was in total 1,707 GWh/a compared to 2012. The energy efficiency of Fortum's power plants has been improved 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 significance and magnitude of impact of identified risks in relation to operations is from low to medium.

C3.1e

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

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Indirect costs Capital expenditures Capital allocation Acquisitions and divestments Assets	Revenues: CO2 allowance price is among the most decisive factors affecting the electricity price and hence Fortum's revenues. The main factor influencing the prices of CO2 allowances and other environmental values is the supply and demand balance, as described in C2.3a Risk 1. If CO2 price would change i.e. EUR 1, the electricity price changes approx. EUR 0.5-0.6/MWh in the Nordic power market. Furthermore, excluding the potential effects from changes in the power generation mix, a 1 EUR/MWh change in Fortum's Nordic power sales achieved price will result in an approx. EUR 45 million change in Fortum's annual comparable operating profit. Fortum's business is exposed to more volatile prices, availability of commodities used in energy production, and sales of power and heat products. The main exposure is toward electricity prices and volumes, prices of CO2 emissions and prices and availability of fuels. Fortum hedges its exposure to the prices and volumes through the use of CO2 futures and environmental certificates, as well as commodity market and fuel risks. In the Nordic countries, there are also environmental values such as Guarantees of Origin (GoO) and other electricity certificates, which give to Fortum additional revenue by electricity sales to customers. 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. For customer/consumer products, Fortum has received income, for example, revenue streams from Charge and Drive business. Fortum's international presence in Charge and Drive business is growing rapidly, as described in C2.4a Opportunity 2. In 2019, Fortum invested in Charge and Drive EUR 5 million, mainly charging stations in Norway. Direct and indirect costs: In addition to transition risks, Fortum's operations are exposed to the physical risks caused by climate change, including changes and extreme variability in weather patterns, which may increase operating cost, as described in C2.3a Risk 3 and 4. Fortum adapts its operations to the changing climate and takes it into consideration in production and maintenance planning and investment

		projects, e.g. in the long-term dam safety investment program, so that extreme flooding situations can be managed. Fortum's circular economy business has also grown in the Nordic countries in 2016-2019. For the time being, waste as a fuel has not been included in the CO2 quota system in all European countries. However, authorities may introduce, e.g., a fiscal fee on CO2 generated in waste incineration in all European countries in the future. Capital expenditures and allocation: Fortum's energy production is based primarily on CO2-free hydropower and nuclear power and on energy-efficient CHP production. Fortum invests into renewable and CO2-free energy production capacity annually. All Fortum's Risks described in C2.3a and Opportunities described in C2.4a are related to capital expenditures and allocation. In 2019, Fortum's investments were EUR 401 million (over 56% of Fortum's total capital expenditures) in CO2-free energy production, mainly hydro, nuclear and wind power. Fortum's investments in renewable energy totalled EUR 344 million. Fortum invested EUR 111 million into wind power production in the Nordic countries in 2019. The largest wind power investment was EUR 52 million to the 97-MW Sørfjord wind park in Norway. Fortum also invested EUR 68 million into hydropower production, mainly maintenance, legislation and productivity investments. In 2019, Fortum's investments included solar investments in India EUR 143 million. Fortum is targeting investments of EUR 200-400 million in solar power in India. Additionally, Fortum and Rusnano investment fund (50/50 joint venture) won the right to build 1,823 MW of wind capacity in a CSA (Capacity Supply Agreement) auction in 2018. The wind farms were to be commissioned during the years 2019–2023. In the first quarter in 2020, 250 MW of the capacity was operational, about 580 MW under construction, and about 1,000 MW under development. Acquisitions, divestments and assets: Fortum has acquired renewable and CO2-free energy production assets, as described in C2.3a Risk 1 and Risk 2. In line with its strategy, Fortum targets a multi-gigawatt wind and solar portfolio, which is subject to the capital recycling business model. For example, Fortum acquired Nygårdsfjellet's 32-MW wind power park and the Ånstadblåheia (50 MW) and Sørfjord (97 MW) wind power projects in Norway in 2018. In 2019, Fortum commissioned the first wind turbines of the 97-MW Sørfjord wind park in Norway. In addition to the previous over 80-MW minority share of solar ownership in India, Fortum commissioned the new 250-MW Pavagada 2 solar power plant in Karnataka in India. Fortum also has the new 90-MW Kalax wind farm under construction in Finland, and the new 250-MW Rajasthan solar power plant in India. Fortum has a business model of capital recycling in its wind and solar power portfolio. In line with the model, Fortum sells the majority share in

		its Nordic wind power and Indian solar power portfolio and releases capital for new wind and solar power investments. The 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 under development 116 MW of new solar power capacity in Russia. Fortum also dismantles coal-fueled power capacity. In Finland, Fortum's 1,000-MW Inkoo coal-fueled power plant was demolished in 2017-2020, and over 90% of all the demolition material was recycled. In 2019, Fortum has also decommissioned the old, coal-fueled Zabrze CHP and Bytom CHP plants in Poland. Fortum and the City of Espoo have together committed to make the district heating network in Espoo area, in Finland, carbon-neutral in the 2020s. Fortum has set an intermediate goal to discontinue the use of coal in Espoo in 2025. Fortum is replacing some of the coal use in heat production by commissioning the new 58-MW Kivenlahti biomass-fueled heat plant in Espoo, and the production will start in summer 2020. The new geothermal plant is expected to be commissioned in late 2020, and the new 20-MW heat pump unit utilising waste heat from wastewater is estimated to start its operations at the Suomenoja CHP plant in 2021. With these actions, Espoo’s district heating production is estimated to achieve 50% carbon neutrality in 2022.

C3.1f

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

Fortum believes that the transformation of the electricity sector is making good progress, and e.g. the EU emissions trading system will increasingly steer investments towards CO2-free production technologies. This will accelerate the low-carbon transition in society and create new business opportunities, but it alone will not be sufficient for the EU to meet the Paris Agreement targets. In December 2019, the European Council agreed on the goal to achieve climate neutrality by 2050 (although Poland didn’t commit to the timetable in question). This requires a reduction in carbon dioxide emissions by all sectors. In addition to the electricity sector, emissions must be reduced in, e.g., heating and cooling, transport and industry, and, at the same time, carbon capture and negative emissions must be increased.

Fortum is accelerating the change towards a low-carbon energy system, improving resource efficiency and providing smart solutions for customers. In the power production value chain, Fortum is focusing on growth in CO2-free hydro, wind and solar power, while efficiently operating the existing assets needed for security of supply during the energy transition as efficiently as possible.

Fortum is pursuing solutions to decrease the carbon footprint of its customers. Fortum develops and offers new solutions, such as e.g. batteries and demand response, which will be necessary in the future low-carbon energy system. Fortum is also focusing on the circular economy and

resource efficiency through waste recycling, material recovery as well as bio-originated materials, such as biotextiles.

C4. Targets and performance

C4.1

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

Intensity target

C4.1b

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

Target reference number

Int 1

Year target was set

2011

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1

Intensity metric

Metric tons CO2e per megawatt hour (MWh)

Base year

2010

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

215

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

100

Target year

2020

Targeted reduction from base year (%)

16.28

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

179.998

% change anticipated in absolute Scope 1+2 emissions

-5

% change anticipated in absolute Scope 3 emissions

0

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

189

% of target achieved [auto-calculated]

74.2814696303

Target status in reporting year

Revised

Is this a science-based target?

No, but we anticipate setting one in the next 2 years

Please explain (including target coverage)

In 2019, Fortum had the Group-level target of ≤200 gCO2/kWh for the specific CO2 emissions from total energy production, as five-year average. In 2019, the specific CO2 emissions of total energy production were 189 gCO2/kWh, and as five-year average, 186 gCO2/kWh, which is 7% lower than the set target of 200 gCO2/kWh.
In 2019, Fortum achieved the Group-level climate target. Fortum's Board of Directors decided to approve a new target for specific CO2 emissions from total energy production, applicable for 2020: ≤180 gCO2/kWh (one year performance). This Group-level target will be revised after consolidation of Uniper.
In 2019, Fortum's Scope 3 emissions have remained approximately at the same level as previous years. Scope 3 emissions were 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 (SBTis) or other climate-related target setting.

C4.2

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

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

C4.2a

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

Target reference number

Low 1

Year target was set
2012

Target coverage
Company-wide

Target type: absolute or intensity
Absolute

Target type: energy carrier
All energy carriers

Target type: activity
Consumption

Target type: energy source
Low-carbon energy source(s)

Metric (target numerator if reporting an intensity target)
MWh

Target denominator (intensity targets only)

Base year
2011

Figure or percentage in base year
0

Target year
2020

Figure or percentage in target year
1,900,000

Figure or percentage in reporting year
1,707,000

% of target achieved [auto-calculated]
89.8421052632

Target status in reporting year
Underway

Is this target part of an emissions target?
Fortum’s Group-level target is to achieve an annual energy-efficiency improvement of ≥1,900 GWh (1,900,000 MWh) by 2020 compared to 2012. By the end of 2019, the cumulative energy-efficiency improvement achieved was 1,707 GWh (1,707,000 MWh) annually. In 2019, the combined annual energy savings of the energy-efficiency improvement projects was about 70 GWh (70,000 MWh).
Improving energy efficiency at power plants refers to measures Fortum implements to

increase the efficiency of power and heat production processes or reduce the energy consumption of plants or equipment. This enables Fortum to produce more electricity or heat for its customers without increasing fuel consumption.

Is this target part of an overarching initiative?

Other, please specify

Energy-Efficiency Agreement

Please explain (including target coverage)

Fortum's Group-level target of annual energy-efficiency improvement (≥1,900 GWh/a by 2020 compared to 2012) is valid for Fortum's all operating countries (100%). Fortum's business units have their own country-specific energy-efficiency improvement projects in Fortum's operating countries (10 countries).

Fortum has also 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). Fortum's energy-efficiency programme in 2017-2025 covers its hydropower, nuclear power and other power plants subject to the Finnish energy-efficiency agreement, and also its Swedish hydropower plants. In Finland, 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).

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*	4	30,000
Implementation commenced*	5	750,000
Implemented*	4	220,000
Not to be implemented	0	0

C4.3b

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

Initiative category & Initiative type

Energy efficiency in production processes
Machine/equipment replacement

Estimated annual CO2e savings (metric tonnes CO2e)

2,000

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

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

2,000,000

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

15,000,000

Payback period

4-10 years

Estimated lifetime of the initiative

>30 years

Comment

In 2019, Fortum invested EUR 68 million into hydropower production in Sweden and Finland, mainly maintenance, legislation and productivity investments. The total investment in the Åsen refurbishment in Sweden was about EUR 15 million.
In 2019, Fortum completed the refurbishments of hydropower plants in Sweden and Finland, resulting in an annual electricity production increase of 30 GWh with the capacity increase of 13.5 MW.

Initiative category & Initiative type

Low-carbon energy generation
Wind

Estimated annual CO2e savings (metric tonnes CO2e)

8,000

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

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

4,000,000

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

52,000,000

Payback period

11-15 years

Estimated lifetime of the initiative

21-30 years

Comment

In 2019, Fortum invested EUR 111 million into wind power production in the Nordic countries. The wind investments also included the EUR 30 million Solberg fixed asset acquisition that is part of the Blaiken-Solberg wind park ownership swap. The largest wind power investment was EUR 52 million to the Sørfjord wind park in Norway. At the end of 2019, Fortum commissioned the first wind turbines of the total 97-MW Sørfjord wind park.

Initiative category & Initiative type

Low-carbon energy generation
Solar PV

Estimated annual CO2e savings (metric tonnes CO2e)

206,000

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

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

20,000,000

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

140,000,000

Payback period

4-10 years

Estimated lifetime of the initiative

16-20 years

Comment

In 2019, Fortum commissioned the new Pavagada 2 solar power plant in India, in addition to the previous over 80-MW minority share of solar ownership in India. Fortum's solar investments in India totalled EUR 143 million in 2019. The largest investment project was EUR 140 million to the Pavagada 2 solar plant.

Initiative category & Initiative type

Energy efficiency in production processes
Cooling technology

Estimated annual CO2e savings (metric tonnes CO2e)

4,000

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

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

1,000,000

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

7,000,000

Payback period

4-10 years

Estimated lifetime of the initiative

16-20 years

Comment

In 2019, Fortum invested in the construction of district heating and cooling construction project in Tartu, Estonia. The energy-efficiency savings of the project are approx. 10 GWh annually. In 2019, Fortum investments in the district heat and cooling in Estonia were EUR 3 million, and in 2018 EUR 11 million, which is, in average, EUR 7 million annually.

C4.3c

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

Method	Comment
Dedicated budget for energy efficiency	Fortum seeks economically profitable alternatives that provide the opportunity to increase capacity and improve energy efficiency, as well as reduce CO2 emissions. New investment proposals are assessed against sustainability criteria as part of Fortum’s investment assessment and approval process.

	Fortum’s sustainability targets include the Group-level target of ≥1,900 GWh/a for cumulative energy-efficiency improvement by 2020 compared to 2012. At the end of 2019, the cumulative energy-efficiency improvement achieved was 1,707 GWh annually. In 2019, the combined annual energy savings of the energy-efficiency improvement projects was about 70 GWh. Significant projects improving energy efficiency were completed in 2019, among others, hydropower plant refurbishments with the increased production capacity of 13.5 MW in Sweden and Finland, which enables to produce an additional 30 GWh electricity annually, and the district heating and cooling construction project in Tartu, Estonia, the energy-efficiency savings of which are approx. 10 GWh annually.
Internal price on carbon	Since 2005 Fortum has had a compliance obligation in the EU emissions trading system (ETS) setting a price for carbon emissions. About 75% of its CO2 emissions from the energy production in the Nordic countries, the Baltic countries and Poland are within the sphere of the EU ETS. Price of carbon is among the key factors impacting the Nordic electricity price and fully integrated into Fortum's investment decisions. In 2020, Fortum's sustainability targets include the Group-level target of ≥180 gCO2/kWh for the specific CO2 emissions from total energy production. Progress in performance is followed-up monthly and reported to the Fortum Executive Management and Fortum Board of Directors on regular basis.
Dedicated budget for low-carbon product R&D	Each new R&D project is assessed against the criteria of carbon dioxide emissions reduction and resource efficiency. In 2019, Fortum’s Research and Development costs totalled EUR 67 million, or 1.2% of sales. Over 80% of this amount targeted R&D on mitigating climate change, and the majority of the R&D results are expected to be in use within the next five years. 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 and low-carbon energy production, products and services. Fortum is 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. Fortum's development of smart solutions have included, among others, the excess energy storage capacity in data centers with their UPS-systems, connecting customers' water heaters, home batteries and other assets through smart meters or directly, and developing digital e-mobility solutions for operations of electric vehicle (EV) charging. Fortum provides 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.
Internal incentives/recognition programs	Fortum's Business Technology, Innovation and Venturing team organize the internal Accelerator (innovation activator) program annually to inspire all employees to find new innovations. New ventures, such as Fortum HorsePower, have been created during this program. The Fortum HorsePower is a service concept in which Fortum delivers bedding to horse stables and picks up the bedding-manure mixture for combustion as bio-originated fuel. In 2019, Fortum combusted bedding-manure mixture at the Järvenpää power plant in Finland. In 2019, Fortum also continued Must-Win Battle (MWB) development programs to increase customer orientation, speed and agility. By MWB development programs, Fortum prioritizes competences and topics that are needed for successful implementation of Fortum's strategy.
Employee engagement	Along with CO2 emission 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 has also been adopted for employees in Sweden since 2018. These measures are important in increasing the environmental awareness and motivation of employees.

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 electricity and heat products replace in certain cases the customer's alternative and more carbon intensive energy production and consequently reduce GHG emissions. Especially this concerns Fortum's eco-labelled products, which are CO2-free.

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

Low-carbon product and avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify

RES Directive (EU) 2018/2001 of the European Parliament and of the Council

% 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 categorized as CO2-free electricity production. In 2019, Fortum's electricity sales to private and commercial customers was about 29 TWh in the Nordic countries, and also in Poland. About 50% of the electricity sales was guaranteed by CO2-free energy sources, mainly hydropower. Of this volume, the share of CO2-free nuclear power was about 12%.

In 2019, Fortum's power sales was EUR 4,714 million (including netting of Nord Pool transactions), of which about 35% (EUR 1,630 million) was electricity sales to customers and about 65% was power sales of electricity production. In 2019, 96% of Fortum's electricity production was CO2-free in Europe, and majority of electricity production in Russia was fossil-fueled. This results approximately 60% revenue from CO2-free power products in 2019.

The extent of climate change mitigation can be assessed by assuming that CO2-free electricity sold by Fortum to private and commercial customers would have had the specific CO2 emission of the Nordic residual electricity mix (2018: 290 gCO2/kWh)

In 2019, the avoided CO2 emissions by Fortum's electricity sales were approx. 3.5 million metric 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.

C-EU4.6

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

In 2019, the share of methane (CH4) emissions were only 0.06% of Fortum's Scope 1 greenhouse gas (GHG) emissions, which are mainly generated in incineration of fossil fuels, and about 10% of Fortum's total Scope 1, 2, 3 GHG emissions. Therefore, the volume of methane emissions are assessed to be non-material, especially in Fortum's Scope 1 GHG emissions. In 2019, Russia accounted for 99% of Fortum's use of natural gas. Even if the share of natural gas use is 63% of Fortum's total fuel consumption in energy production, only a small amount of Fortum's greenhouse gas (GHG) emissions is generated in supplier chain of fuels, including e.g. methane leaks related to the natural gas distribution. Natural gas is a naturally occurring hydrocarbon gas mixture consisting primarily of methane.

Predictive and preventive maintenance management reduce proactively leaks of methane and other greenhouse gas emissions into air. Fortum carries out planned refurbishments and

preventive maintenance activities regularly at all sites under its operational control in 10 countries.
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)
19,040,000

Comment

Scope 2 (location-based)

Base year start
January 1, 2013

Base year end
December 31, 2013

Base year emissions (metric tons CO2e)
127,700

Comment

Scope 2 (market-based)

Base year start
January 1, 2016

Base year end
December 31, 2016

Base year emissions (metric tons CO2e)

94,700

Comment

C5.2

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

19,270,400

Comment

In 2019, Fortum's Scope 1 greenhouse gas (GHG) emissions accounted for about 77% of Fortum's total GHG emissions. The share of Scope 1 carbon dioxide emissions from Fortum's direct Scope 1 GHG emissions was 99%.

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

In 2019, Fortum's Scope 2 greenhouse gas (GHG) emissions accounted for 0.3% of Fortum's total GHG emissions.

C6.3

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

Reporting year

Scope 2, location-based

134,100

Scope 2, market-based (if applicable)

84,200

Comment

In 2019, about 94% of Fortum's market-based Scope 2 greenhouse gas emissions have been estimated based on data from electricity suppliers. Scope 2 greenhouse gas emissions in Russia have been estimated based on a country-specific breakdown of electricity production and emission factors.
The electricity used in electric boilers in Norway has been added to Fortum's Scope 2 emissions calculation. Fortum's Scope 2 emissions calculation for 2019 also takes into consideration life-cycle greenhouse gas emissions. Scope 2 carbon dioxide emissions accounted for 92% of Fortum's Scope 2 greenhouse gas emissions.

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 gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO2e

319,900

Emissions calculation methodology

(i) The volumes and categories of purchased goods and services are based on Fortum's purchasing databases. Fortum has assessed our 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 the 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

Please explain

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

273,340

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 the 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

Please explain

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

Evaluation status

Relevant, calculated

Metric tonnes CO2e

5,195,700

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 storages. 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

Please explain

Upstream transportation and distribution

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

240

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 Horsepower service. 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

Please explain

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

5,630

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 bio-originated waste, 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

Please explain

Business travel

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

7,500

Emissions calculation methodology

(i) The data consists of air travel, which is the most important source of business travel emissions (6,255 metric tonnes CO2) for Fortum as it operates in 10 countries. The data also includes use of car as a mean of transportation. Train and ship travelling is used only to minor extent. 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

Please explain

Employee commuting

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

6,620

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

Please explain

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Please explain

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 relevant upstream leased assets that would be reported on Group level. When applicable, emissions from the operation are accounted for in Scope 2 emissions (Purchased electricity).

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Please explain

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 downstream, transportation is classified as not relevant.

Processing of sold products

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

370

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 approximately 1,600 tons in 2019.

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

100

Please explain

Use of sold products

Evaluation status

Not relevant, explanation provided

Please explain

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 emit greenhouse gases during the use phase. Previously, the use of town gas has been reported in this category, but it is being reported separately by Stockholm Exergi (earlier Fortum Värme) since 2014. Therefore, the category does not apply to Fortum's operations.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Please explain

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

Please explain

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

Franchises

Evaluation status

Not relevant, explanation provided

Please explain

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

Investments

Evaluation status

Not relevant, explanation provided

Please explain

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

Other (upstream)

Evaluation status

Not relevant, explanation provided

Please explain

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

Please explain

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.

C6.7

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

Yes

C6.7a

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

	CO2 emissions from biogenic carbon (metric tons CO2)	Comment
Row 1	1,764,800	In 2019, Fortum's total direct biogenic carbon dioxide emissions were about 1.8 million tons. The biogenic carbon dioxide emissions are generated in bio-fueled power and heat 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

0.0036

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

19,354,600

Metric denominator

unit total revenue

Metric denominator: Unit total

5,447,000,000

Scope 2 figure used

Market-based

% change from previous year

8

Direction of change

Decreased

Reason for change

Fortum's Scope 1 and 2 GHG emissions decreased by about 5% and revenue increased by about 4% from 2018, resulting in total decrease of 8% in Fortum's GHG emissions per revenue.
Decrease of Fortum's GHG emissions resulted, among others, transition of Meri-Pori coal-fueled power plant to peak-load capacity reserve for 440 MW of production capacity in July 2020, which decreased Fortum's direct GHG emissions in Finland in 2019, decommissioning of Fortum's old, coal-fueled Zabrze CHP and Bytom CHP plants in Poland, as well as increased use of biomass identified at four Fortum's CHP plants in the Baltic countries and Finland, and increased use of bio-originated fuels identified at three Fortum's waste-to-energy plants in the Nordic countries and Lithuania.

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	19,142,400	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	12,400	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	115,600	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	Gross Scope 1 methane emissions	Gross Scope 1 SF6 emissions	Total gross Scope 1 emissions	Comment

	(metric tons CO2)	(metric tons CH4)	(metric tons SF6)	(metric tons CO2e)	
Fugitives	0	0	0	0	Not relevant for Fortum's operations
Combustion (Electric utilities)	19,141,000	12,400	0	115,600	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	Not relevant for Fortum's operations
Combustion (Other)	0	0	0	0	Not relevant for Fortum's operations
Emissions not elsewhere classified	1,400	0	0	0	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	16,354,870
Finland	1,346,540
Poland	820,530
Norway	225,540
Denmark	151,100
Lithuania	145,900
Sweden	121,700
Estonia	72,000
Latvia	32,220

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	16,354,870
City Solutions	2,750,590
Generation	164,940

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	3,627,400	62.1365	65.403
Tyumen CHP2	2,937,700	57.0876	65.6298
Tyumen CHP1	2,100,600	57.1471	65.6048
Chelyabinsk CHP4 (GRES)	2,067,400	55.2014	61.4053
Chelyabinsk CHP3	2,017,900	55.2353	61.4906
Chelyabinsk CHP2	1,464,300	55.1339	61.4697
Argayash CHP	1,599,200	55.7333	60.7166
Suomenoja CHP plant	846,000	60.1499	24.7179
Chelyabinsk CHP1	540,000	55.1338	61.4768
Meri-Pori power plant	162,400	61.6319	21.4056
Other sites	1,907,500	0	0

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

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

	Gross Scope 1 emissions, metric tons CO2e	Comment
Electric utility activities	19,270,400	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 2019, the share of carbon dioxide from Fortum's Scope 1 GHG emissions was 99%. The share of Scope 1 GHG emissions accounted for about 77% of Fortum's total GHG emissions.

C7.9

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

Decreased

C7.9a

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

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	103,090	Decreased	0.5	Increased use of biomass identified at four Fortum's CHP plants in the Baltic countries and Finland, and increased use of bio-originated fuels identified at three Fortum's waste-to-energy plants in the Nordic countries and Lithuania. These decreased Fortum's emissions about 103,090 t CO2e. Emission value calculated as = (actual emissions (2019) - production (2018) * specific emission (2018)) / total emissions (2018). Emission value: (-13,357-1,798-19,265-15,791-6,500-27,896-18,483)/20,299,677=(-103,090)/20,299,677=-0.5%

Other emissions reduction activities	0	No change	0	No other emission reduction activities in 2019
Divestment	649,873	Decreased	3.2	Divestment of Chelyabinsk HOBs in Russia, and decommissioning of Fortum's old, coal-fueled Zabrze CHP and Bytom CHP plants in Poland decreased Fortum's GHG emissions about 649,873 t CO2e from 2018. Emission value: (-445,215-125,740-78,918)/20,299,677=(-649,873)/20,299,677 =-3.2%
Acquisitions	305,548	Increased	1.5	Commissioning of Fortum's new Zabrze CHP plant in Poland increased Fortum's GHG emissions about 305,548 t CO2e from 2018. Emission value: (305,548)/20,299,677=1.5%
Mergers	0	No change	0	No mergers in 2019
Change in output	876,415	Decreased	4.3	Fortum's GHG emissions decreased, because of the decreased power and heat production, mainly at Fortum's CHP plants in Russia and Meri-Pori coal-fueled power plant in Finland. Meri-Pori power plant has included in the peak-load capacity reserve for 440 MW of production capacity in July 2020. Emission value calculated as = (production (2019) * specific emission (2018) - actual emissions (2018)) / total emissions (2018). Emission value: (-876,415)/20,299,677=-4.3%
Change in methodology	0	No change	0	No change in methodology in 2019
Change in boundary	0	No change	0	No change in boundary in 2019
Change in physical operating conditions	0	No change	0	No change in physical operating conditions in 2019
Unidentified	0	No change	0	No unidentified reasons for change in emissions in 2019

Other	176,593	Increased	1	Other causes for changes in Fortum's GHG emissions are caused by changes in fuel mix and changes in the electricity and heat production ratio at Fortum's power plants. Emission value calculated as = (actual emissions (2019) - production (2018) * specific emission (2018)) / total emissions (2018). Emission value: 176,593/20,299,677=0.9%

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 35% but less than or equal to 40%

C8.2

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

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	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 (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	5,242,000	109,118,000	114,360,000
Consumption of purchased or acquired electricity		706,000	154,000	860,000
Consumption of self-generated non-fuel renewable energy		23,239,000		23,239,000
Total energy consumption		29,187,000	109,272,000	138,459,000

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

71,820,000

MWh fuel consumed for self-generation of electricity

1,990,000

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

Emission factor

199

Unit

kg CO2e per MWh

Emissions factor source

Statistics Finland, Fuel classification 2019: 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 emissions trading system (ETS) are audited annually on a per plant basis by an external certification authority 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%.

Fuels (excluding feedstocks)

Coal

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

10,885,000

MWh fuel consumed for self-generation of electricity

420,000

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

Emission factor

334

Unit

kg CO2e per MWh

Emissions factor source

Statistics Finland, Fuel classification 2019: Hard 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 emissions trading system (ETS) are audited annually on a per plant basis by an external certification authority 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%.

Fuels (excluding feedstocks)

General Municipal Waste

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

3,190,000

MWh fuel consumed for self-generation of electricity

240,000

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

Emission factor

144

Unit

kg CO2e per MWh

Emissions factor source

Statistics Finland, Fuel classification 2019: General municipal waste, 50% share of bio-originated 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 emissions trading system (ETS) are audited annually on a per plant basis by an external certification authority 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%.

Fuels (excluding feedstocks)

Other, please specify

Hazardous waste

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

800,000

MWh fuel consumed for self-generation of electricity

50,000

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

Emission factor

421

Unit

kg CO2 per MWh

Emissions factor source

Statistics Finland, Fuel classification 2019: 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 emissions trading system (ETS) are audited annually on a per plant basis by an external certification authority 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%.

Fuels (excluding feedstocks)

Wood

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

3,370,000

MWh fuel consumed for self-generation of electricity

180,000

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

Emission factor

403

Unit

kg CO2e per MWh

Emissions factor source

Statistics Finland, Fuel classification 2019: Forest fuel wood, Recovered wood, Wood pellets and briquettes

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 emissions trading system (ETS) are audited annually on a per plant basis by an external certification authority 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%.

Fuels (excluding feedstocks)

Agricultural Waste

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

340,000

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

Emission factor

360

Unit

kg CO2e per MWh

Emissions factor source

Statistics Finland, Fuel classification 2019: Vegetable-based fuel (agro-biomass)

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 emissions trading system (ETS) are audited annually on a per plant basis by an external certification authority 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%.

Fuels (excluding feedstocks)

Peat

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

440,000

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

Emission factor

387

Unit

kg CO2e per MWh

Emissions factor source

Statistics Finland, Fuel classification 2019: Peat (milled)

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 emissions trading system (ETS) are audited annually on a per plant basis by an external certification authority 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%.

Fuels (excluding feedstocks)

Fuel Oil Number 1

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

130,000

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

Emission factor

263

Unit

kg CO2 per MWh

Emissions factor source

Statistics Finland, Fuel classification 2019: 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 emissions trading system (ETS) are audited annually on a per plant basis by an external certification authority 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%.

Fuels (excluding feedstocks)

Other, please specify

Uranium

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

23,385,000

MWh fuel consumed for self-generation of electricity

1,070,000

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

Emission factor

0

Unit

kg CO2e per MWh

Emissions factor source

Statistics Finland, Fuel classification 2019

Comment

Use of uranium is not emitting CO2 emissions. Nuclear power production is CO2-free electricity.

C-EU8.2d

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

Coal – hard

Nameplate capacity (MW)

1,161

Gross electricity generation (GWh)

2,590

Net electricity generation (GWh)

2,266

Absolute scope 1 emissions (metric tons CO2e)

1,819,300

Scope 1 emissions intensity (metric tons CO2e per GWh)

803

Comment

In 2019, Fortum used coal in Russia, Finland and Poland. Russia accounted for 57% of Fortum's total use of coal. Finland accounted for 23% and Poland for 20% 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

In 2019, lignite was not used in Fortum's electricity generation.

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

In 2019, fuel oil was not used in Fortum's electricity generation. A small volume of fuel oil was used in start-ups at Fortum's power plants, for Fortum's heat production at heat only boilers (HOBs), and also in waste-to-energy plants as subsidiary fuel, if feasible.

Gas

Nameplate capacity (MW)

4,824

Gross electricity generation (GWh)

29,830

Net electricity generation (GWh)

28,228

Absolute scope 1 emissions (metric tons CO2e)

11,565,960

Scope 1 emissions intensity (metric tons CO2e per GWh)

410

Comment

In 2019, Russia accounted for 99% 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. Additionally, Fortum used natural gas in Finland and Latvia.

Biomass

Nameplate capacity (MW)

142

Gross electricity generation (GWh)

965

Net electricity generation (GWh)

802

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

In 2019, Fortum used biofuels in electricity generation in Finland, in the Baltic countries and Poland.

Waste (non-biomass)

Nameplate capacity (MW)

110

Gross electricity generation (GWh)

620

Net electricity generation (GWh)

452

Absolute scope 1 emissions (metric tons CO2e)

237,390

Scope 1 emissions intensity (metric tons CO2e per GWh)

526

Comment

In 2019, Fortum used waste-derived fuels at waste-to-energy plants in Finland and other Nordic countries, and Lithuania. Waste-derived fuels consist of both non-biomass (about 50 %) and biomass originated waste (about 50%).

Nuclear

Nameplate capacity (MW)

2,821

Gross electricity generation (GWh)

23,945

Net electricity generation (GWh)

23,515

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Fortum has consolidated nuclear power production in Finland and Sweden. In 2019, Fortum's nuclear capacity was 1,487 MW in Finland and 1,334 MW in Sweden, and in total 2,821 MW.

Fossil-fuel plants fitted with CCS

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Fortum has ongoing carbon capture and storage (CCS) pilot project at the Klemetsrud waste-to-energy plant in Oslo, in Norway. Fortum's plan is to capture 400,000 tonnes, i.e. 90%, of the waste-to-energy plant’s total CO2 emissions (both fossil and bio-originated CO2 emissions).

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

Fortum has ongoing the geothermal plant project in Espoo, Finland. The new geothermal plant is expected to be commissioned in late 2020.

Hydropower

Nameplate capacity (MW)

4,677

Gross electricity generation (GWh)

20,300

Net electricity generation (GWh)

20,264

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Fortum has consolidated hydropower production in Finland and Sweden. In 2019, Fortum's hydropower capacity was 1,553 MW in Finland and 3,124 MW in Sweden, and in total 4,677 MW.

Wind

Nameplate capacity (MW)

194

Gross electricity generation (GWh)

483

Net electricity generation (GWh)

483

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, Russia and also in Latvia. In 2019, Fortum's wind power capacity was 157 MW in the Nordic countries and 35 MW in Russia.

Solar

Nameplate capacity (MW)

285

Gross electricity generation (GWh)

204

Net electricity generation (GWh)

204

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 and India. In 2019, Fortum's solar power capacity was 35 MW in Russia and 250 MW in India.

Marine

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Other renewable

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

Other non-renewable

Nameplate capacity (MW)

16

Gross electricity generation (GWh)

80

Net electricity generation (GWh)

80

Absolute scope 1 emissions (metric tons CO2e)

54,450

Scope 1 emissions intensity (metric tons CO2e per GWh)

681

Comment

In 2019, Fortum used a small volume of peat in electricity generation in Finland and Estonia.

Total

Nameplate capacity (MW)

14,230

Gross electricity generation (GWh)

79,017

Net electricity generation (GWh)

76,295

Absolute scope 1 emissions (metric tons CO2e)

13,677,100

Scope 1 emissions intensity (metric tons CO2e per GWh)

179

Comment

In 2019, Russia's share of the total fuel consumption was about 67%. Of the direct carbon dioxide emissions, 85% originated from the Russian operations, 7% from Finland and 4% from Poland.

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

67

Metric numerator

The material recovery rate of the waste, %

Metric denominator (intensity metric only)

The material recovery rate of the waste , %

% change from previous year

14

Direction of change

Increased

Please explain

Fortum's aim is to promote the transition towards a more comprehensive circular economy and resource efficiency. By circular economy, Fortum means that materials are utilised as efficiently as possible and hazardous materials are removed from circulation. The aim is to make new raw material from waste whenever possible and to keep valuable materials in circulation. In 2019, the material recovery rate of the waste

received from Fortum's customers was 67% (2018: 59%).
Fortum's circular economy services utilise waste stream materials as efficiently as possible and reduce the formation of greenhouse gases (GHG) generated from biodegradable waste at landfills. Additionally, the use of non-recyclable and non-recoverable waste in energy production replaces the use of fossil fuels, such as virgin oil.

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	100,000,000	15	2020	Fortum estimates its capital expenditure (CAPEX), including maintenance but excluding acquisitions, to be approximately EUR 700 million in 2020, excluding Uniper. This includes approximately EUR 200 million of solar and wind investments, which are subject to the capital recycling business model. Solar activities are included in the City Solutions segment.
Wind	100,000,000	15	2020	Fortum estimates its capital expenditure (CAPEX), including maintenance but excluding acquisitions, to be approximately EUR 700 million in 2020, excluding Uniper. This includes approximately EUR 200 million of solar and wind investments, which are subject to the capital recycling business model. Wind activities are included in the Generation segment.
Hydropower	70,000,000	10	2020	Fortum estimates its capital expenditure (CAPEX), including maintenance but excluding acquisitions, to be approximately EUR 700 million in 2020, excluding Uniper. The maintenance capital expenditure in the Generation segment can be roughly divided in hydropower and nuclear

				power. Fortum's total maintenance capital expenditure in 2020 is estimated to be approximately EUR 300 million, well below the level of depreciation.
Nuclear	70,000,000	10	2020	Fortum estimates its capital expenditure (CAPEX), including maintenance but excluding acquisitions, to be approximately EUR 700 million in 2020, excluding Uniper. The maintenance capital expenditure in the Generation segment can be roughly divided in hydro and nuclear power. Fortum's total maintenance capital expenditure in 2020 is estimated to be approximately EUR 300 million, well below the level of depreciation.
Gas	70,000,000	10	2020	Fortum estimates its capital expenditure (CAPEX), including maintenance but excluding acquisitions, to be approximately EUR 700 million in 2020, excluding Uniper. The maintenance capital expenditure in the Russia segment is based mainly on natural gas, and it is estimated to be approximately EUR 70 million. Fortum's total maintenance capital expenditure in 2020 is estimated to be approximately EUR 300 million, well below the level of depreciation.

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
Energy management services	The Consumer Solutions segment offers smart energy services, which are digital all-in-one solutions for apartments and buildings, including e.g. optimization of heating and	60,000,000	9	2020

	monitoring of energy usage. Additionally, the Consumer Solutions segment provides digital solutions for management of electric vehicle (EV) charging networks.			
Other, please specify Circular economy	The City Solutions segment provides services for optimal use of resources and change towards a low-carbon energy system. Recycling and Waste Solutions in the City Solutions segment support customers' business by promoting circular economy and resource efficiency, ensuring the recovery of valuable materials and the safe removal of hazardous waste and harmful substances from the material cycle.	80,000,000	11	2020

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

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

	Investment in low-carbon R&D	Comment
Row 1	Yes	In 2019, Fortum spent EUR 67 (2018: 56) million on research and development. Over 80% of this amount targeted R&D on mitigating climate change, and the majority of the R&D results are expected to be in use within the next five years.

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

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

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Other, please specify CO2-free energy, energy	Small scale commercial deployment	81-100%	67	In 2019, Fortum spent EUR 67 million on R&D, or 1.2% of sales; over 80% of this amount

storages, demand response, utilisation of bio-originated materials				targeted R&D on mitigating climate change. Fortum's R&D activities aim at building a platform for future growth in, for example, wind and solar power, batteries and other energy storages, and demand response, which are necessary for low-carbon energy system in the future. Fortum's development activities of smart solutions have included, among others, the excess energy storage capacity in data centers, connecting customers' water heaters, home batteries, and developing digital solutions for operations of electric vehicle (EV) charging. For developing circular economy and improving resource efficiency, Fortum is also focusing on material recovery, as well as bio-originated materials, such as bio-textiles. Fortum develops continuously activities that increase the proportion of waste materials kept in circulation. For example, Fortum has developed an innovation that enables over 80% of EV (electric vehicle) lithium-ion battery materials to be recycled with a low-CO2 hydro-metallurgical recycling process. This improves Fortum's position and importance in the recycling of high-value materials in Europe.

C10. Verification

C10.1

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

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

C10.1a

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

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Fortum CDP Addendum 2019.pdf

Page/ section reference

Fortum's Greenhouse Gas Emissions verification in 2019; Addendum to the Independent limited assurance report, pages: 1-2

Relevant standard

ISAE 3410

Proportion of reported emissions verified (%)

100

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

VerificationStatement_14-05-20-08-33.pdf

Page/ section reference

Verification Statement in 2019 (Suomenoja CHP plant); Pages: 1-5

Relevant standard

European Union Emissions Trading System (EU ETS)

Proportion of reported emissions verified (%)

11

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

VerificationStatement_29-04-20-07-22.pdf

Page/ section reference

Verification Statement in 2019 (Meri-Pori power plant); Pages: 1-5

Relevant standard

European Union Emissions Trading System (EU ETS)

Proportion of reported emissions verified (%)

11

C10.1b

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

Scope 2 approach

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

Fortum CDP Addendum 2019.pdf

Page/ section reference

Fortum's Greenhouse Gas Emissions verification in 2019; Addendum to the Independent limited assurance report, pages: 1-2

Relevant standard

ISAE 3410

Proportion of reported emissions verified (%)

100

Scope 2 approach

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

Fortum CDP Addendum 2019.pdf

Page/ section reference

Fortum's Greenhouse Gas Emissions verification in 2019; Addendum to the Independent limited assurance report, pages: 1-2

Relevant standard

ISAE 3410

Proportion of reported emissions verified (%)

100

C10.1c

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

Scope 3 category

Scope 3 (upstream & downstream)

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

Fortum CDP Addendum 2019.pdf

Page/section reference

Fortum's Greenhouse Gas Emissions verification in 2019; Addendum to the Independent limited assurance report, pages: 1-2

Relevant standard

ISAE 3410

Proportion of reported emissions verified (%)

100

C10.2

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

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 2019 and the previous year 2018.
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 2019 and the previous year 2018.
C7. Emissions breakdown	Year on year change in	International Standard on Assurance Engagements	The verification referred to in C7. includes a comparison of annual

	emissions (Scope 3)	ISAE3410, Limited assurance.	emissions of 2019 and the previous year 2018.
C7. Emissions breakdown	Year on year emissions intensity figure	International Standard on Assurance Engagements ISAE3410, Limited assurance.	The verification referred to in C7. includes a comparison of annual emissions of 2019 and the previous year 2018.

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 schemes you are regulated by.

EU ETS

% of Scope 1 emissions covered by the ETS

11

% of Scope 2 emissions covered by the ETS

59

Period start date

January 1, 2019

Period end date

December 31, 2019

Allowances allocated

733,140

Allowances purchased

1,373,310

Verified Scope 1 emissions in metric tons CO2e

2,106,450

Verified Scope 2 emissions in metric tons CO2e

50,000

Details of ownership

Facilities we own and operate

Comment

In 2019, Fortum had a total of 50 plants in six member countries within the EU emissions trading system (ETS). Fortum owns power and heat plants and also operates them, or Fortum has outsourced the operation activities of its power and heat plants to the partner.

In 2019, about 75% of direct carbon dioxide emissions from Fortum's energy production in the Nordic countries, in the Baltic countries and Poland were within the sphere of the EU emissions trading system (ETS). In total, 11% of Fortum's Scope 1 emissions were covered by the EU ETS.

C11.1d

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

Fortum's strategy for complying with the EU ETS comprises of two main elements: emission reduction measures including efficiency upgrades in Fortum's own installations (in-house abatement) and investment in low-carbon production and operation in the emissions trading scheme (purchase and selling of allowances). The individual compliance and trading strategies are defined by the relevant business divisions.

In 2019, Fortum commissioned the first wind turbines of the total 97-MW Sørfjord wind park in Norway. Fortum also has the 90-MW Kalax wind farm under construction in Finland. In 2019, Fortum also implemented refurbishments of hydropower plants in Sweden and Finland and increased their annual electricity production by 30 GWh. Additionally, Fortum's Tartu district heating and cooling construction projects in Estonia increased annual energy savings by 10 GWh. In 2019, estimated annual CO2 savings from wind and hydropower projects as well as energy efficiency improvements in Europe were about 10,000 metric tonnes CO2.

C11.2

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

Yes

C11.2a

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

Credit origination or credit purchase

Credit origination

Project type

Hydro

Project identification

Project number GT606, El Canadá Hydroelectric Project, that has been implemented in the framework of the Prototype Carbon Fund (PCF) of the World Bank.
The web site of the CDM (Clean Development Mechanism):
https://cdm.unfccc.int/Projects/DB/DNV-CUK1158755634.57/

Verified to which standard

CDM (Clean Development Mechanism)

Number of credits (metric tonnes CO2e)

36,000

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

36,000

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)

24.9

Variance of price(s) used

Carbon pricing is one of the economic parameters used in Fortum. The figure disclosed for the internal price on carbon is an example based on the actual average of EU ETS price in 2019: 24.9 EUR/ton CO2.

The allowance price in the EU ETS (emissions trading system) has varied significantly (from almost 0 up to 30 euros) during the years 2005-2019. At the end of 2019, price was around EUR 25 and this was about three times higher than in the beginning of 2018. Consequently, the internal price on carbon based on the EU allowance price has also varied. The carbon price varies not only with time, but also between different scenarios.

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.

The impacts of carbon pricing scenarios on the new investment projects proposals are reviewed in light of the specific context of the location country and of its regulatory framework, and inform decision making. Fortum has decided to no longer pursue new developments in coal, believing that the European carbon price will significantly increase in the future in line with the tightening emission reduction targets and a carbon price will steadily be established also in the world's other regions and that coal-fired power plants will be adversely affected in the future.

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

9

% total procurement spend (direct and indirect)

69

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

75

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 2019, 69% of Fortum's total spend came from qualified suppliers. In addition to that, 76% of Fortum's fuel spend came from qualified suppliers.

In 2019, 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 89%. Fortum's Scope 3 emissions were caused by the purchases of goods and services and the investments, 6% and 5% respectively, which are related to Fortum's suppliers. Other activities (e.g. employee business travel and waste management) accounted for less than 1% of Scope 3 GHG emissions.

Impact of engagement, including measures of success

If potential risks in the supplier's operations are identified through Fortum's supplier questionnaire, the more extensive self-assessment questionnaire is sent or a supplier audit is conducted. As of May 2020, nearly 400 suppliers have been qualified based on the more extensive self-assessment questionnaire and 14 suppliers based on a supplier audit.

An example of positive impact of engagement achieved by Fortum's supplier audits related to improved climate strategies: Four potential or current suppliers to Fortum were given a corrective action of setting environmental targets, including energy efficiency targets, as a result of audit. One of our Chinese suppliers made a commitment to cleaner production and efficient use of resources, setting targets for energy saving and emission reduction in the whole process of production by adopting advanced technology and equipment, as well as improving environmental management and monitoring.

Comment

C12.1d

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

Engagement with NGOs in the energy value chain

Non-governmental organisations (NGOs) are one important stakeholder group for Fortum and they have high expectations regarding , e.g., Fortum's responsibility for operations and risk management, promoting renewable energy production and discontinuing the use of coal, as well as transparent and reliable reporting. The dialogue about Fortum's Uniper investment and Uniper's coal power production continued actively with NGOs in 2019. The NGOs were particularly opposed to Uniper's plan to commission the new Datteln 4 coal-fired power plant in Germany. In 2019, Fortum published the "Fortum and coal" press kit and responded to the concerns by NGOs in social media, at face-to-face meetings and at Fortum's General Annual Meeting. Fortum's experts have also responded to presented questions, through blogs postings and by giving numerous media interviews. Fortum's key messages included that the transition to clean energy must be implemented systematically, without compromising the security of supply and with consideration to regional aspects. Reliable energy supply for consumers and industry at affordable price is also an important factor.

Engagement with partners in the circular economy value chain

Fortum offers sustainable circular economy services and expert solutions and provides resource-efficient recycling and waste solutions regarding, among others, plastic, oil, metals, and also lithium-ion batteries. Fortum takes hazardous waste out of circulation in a sustainable manner and cleans the hazardous substances from materials that end up in recycling. Fortum utilises materials of waste stream as efficiently as possible and reduce the formation of greenhouse gases (GHG) generated from biodegradable waste at landfills. Fortum also process slag, sludge, and other masses for reuse in environmental construction and earthwork projects.

Fortum has the plastic refinery in Riihimäki, Finland. At the Riihimäki plastic refinery, Fortum produces mechanically recycled plastic from packaging waste recycled by consumers and industry, saving energy and natural resources. Many types of plastics can technically be recycled several times. When mechanical recycling is used, the carbon footprint for recycled plastics expressed as Global Warming Potential (GWP) can be up to 10 times smaller and save 1.0–1.5 kg of CO2/kg of resin compared to using virgin plastic materials, thus supporting the EU's low-carbon path.

Waste that is unsuitable for recycling or reuse as a material is incinerated in Fortum's waste-to-energy (WtE) plants. At the same time, Fortum produces electricity and heat. Fortum has five WtE plants in Finland, Sweden, Denmark, Norway, and Lithuania; the three first of which are high-temperature incineration plants. High-temperature incineration is the best available solution for the destruction of hazardous substances safely.

As part of waste treatment services, Fortum incinerates also ODS (ozone depleting substances) and F-gases at its WtE plants. GWPs from IPCC Assessment reports is used to calculate avoided emissions of ODS and F-gases. For example, Fortum destroyed about 57 tonnes of ODS and F-gases at the Kumla waste-to-energy plant in Sweden in 2019. The avoided CO2eq emissions were about 422,000 tonnes (GWP100). The avoided CO2eq emissions can be compared to the total amount of direct fossil CO2 emissions generated at the Kumla waste-to-energy plant in 2019: 119,800 tonnes. Therefore the annual direct fossil CO2 emissions generated in waste incineration were less than 30% of avoided CO2eq emissions.

In 2019, Fortum received a total of 2.2 million tonnes of waste from consumers and industry, 62% of which was recovered in its waste-to-energy plants. Of the received waste, about 1.6 million tonnes was non-hazardous, conventional municipal or industrial waste and about 620,000 tonnes was hazardous waste.

In 2019, Fortum commissioned the new Zabrze CHP plant in Poland; the trial-run of the plant was in 2018. The new Zabrze plant combusts also Refuse-Derived Fuel (RDF), and the share of waste is about 40% of the fuel use. Incineration of waste reduces the use of virgin fossil fuels e.g. coal and fuel oil in electricity and heat production and, furthermore, reduce specific carbon dioxide emissions, because of energy-efficient power and heat production. Fortum has estimated that the new Zabrze CHP plant will reduce CO2 emissions by about 200,000 tonnes in relation to the produced energy. In 2019, Fortum also started the use of REcovered Fuel (REF) at the Järvenpää power plant in Finland. The REF is delivered from Fortum's Riihimäki plant.
Additionally, Fortum offers in Finland a survey-based plan to its partners, which are interested in improving the whole waste management chain for a cleaner and more sustainable world. Based on a waste survey, Fortum is able to design the entire waste management system, 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
Cap and trade	Support with minor exceptions	In 2019, Fortum actively promoted a market-based energy and climate policy framework 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 climate neutrality objective and increasing the climate targets 2030-2050. Fortum welcomed the European Green Deal Communication, a set of initiatives to reform the energy and climate policy during the next few years. Fortum highlighted the need to strengthen the ETS by modifying the MSR, increasing the linear reduction factor (LRF) and	Fortum is strongly committed to climate change mitigation and supports cap and trade-based emissions trading as the main climate policy instrument in Europe, because it is market based, technology neutral, cost efficient and flexible. Fortum considers the following measures necessary to strengthen the incentives generated by the EU ETS: - Short-term (2020-2030): revision of the ETS Directive in 2021 with the focus of revising the Market Stability Reserve parameters, revision of the linear reduction factor (LRF) in line with the 2030 and 2050 climate targets and extension of the ETS to new sectors (especially heating and

		improving the coherence between the EU ETS and complementary policies. The extension of the EU ETS was also highlighted, especially regarding heating and cooling sector. Fortum had extensive dialogue with several governmental organisations and politicians in the EU, the European Commission and the Parliament in particular, and member states. 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.	cooling). - 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. In 2019, Fortum supported the establishment of an ambitious EU long-term climate target (climate neutrality for 2050). In 2019, Fortum also welcomed the communication

			from the Commission for the European Green Deal. 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, a well-functioning and efficient internal energy market is essential for reaching the decarbonisation target in the most cost-efficient way, and lowering the overall social costs of decarbonisation. - 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 the revision of the EU energy efficiency legislation, 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.
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 decarbonisation target in the most cost-efficient way and lowering the overall social costs of decarbonisation. - 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 2020-2050 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 2019, eurelectric continued the promotion of its Decarbonisation Pathways Study highlighting that with electrification the EU can reduce 80-95% of CO2 emissions by 2050. eurelectric supported the EU climate neutrality objective for 2050 and welcomed the Commission's proposal for the European Green Deal.

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 Decarbonisation and several other groups at eurelectric and has been actively contributing to the development of positions at eurelectric. Fortum's representative is currently vice chair of the Working Group Climate Change and Decarbonisation and has a continuous dialogue with the association.

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's representative is currently a member in an ad hoc group developing IETA's 2050 Vision Document. 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), in the energy and climate policy committee as well as in the supplier centric model committee 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.

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 the international network for district energy, promoting sustainable heating and cooling in Europe and beyond. Representing members from over 30 countries it is a non-for-profit association uniting the district energy sector and headquartered in Brussels, Belgium.
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 decarbonise 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.
The district energy sector takes continuous steps in improving environment and climate action. The use of district energy leads to significant emissions reduction and ensures the transition to renewable energy and low-carbon technologies for heating and cooling. A number of current EU policies ensure the reduction of environmental impact and trigger modernisation of existing district heating and cooling networks.
The EU emissions trading system (ETS) covers district heating installations, whereas individual boilers do not fall under the scope of the current rules. Fortum believes that a

revised ETS must help foster the development of efficient district heating networks and, more generally, the evolution of the heating sector in line with the EU's overall climate and energy ambitions. For example, a mechanism designed to expose individual (non-ETS) boilers to a carbon price signal should be established.
In addition, EHP has 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. In 2019, EHP has been 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 primary energy efficiency benefit, providing competitive heat base load capacity for industries and DH systems and security of supply in the electricity markets, 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 its views and positions mostly related to Energy Efficiency Directive, Renewable Energy Directive and to the role of co-generation in climate mitigation 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_financials2019.pdf

Page/Section reference

Fortum's Financials 2019 report: The part of Fortum’s TCFD (Task Force on Climate-related Financial Disclosures) report in 2019 is included in the Financials 2019, pages: 20–22, 27–28 and 31; Fortum’s Non-Financial Information report is included in the Financials 2019, pages: 9 and 20–24

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Publication

In mainstream reports, in line with the CDSB framework (as amended to incorporate the TCFD recommendations)

Status

Complete

Attach the document

fortum_sustainability_2019.pdf

Page/Section reference

Fortum's Sustainability 2019 report: Climate and Resources, pages: 14-42; Fortum’s TCFD (Task Force on Climate-related Financial Disclosures) report for 2019 is included in the section Climate, pages: 23–30

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Publication

In mainstream reports

Status

Complete

Attach the document

fortum_ceo_s_business_review_2019.pdf

Page/Section reference

Fortum's CEO's Business Review 2019, pages: 2-9, 13-17, of total pages: 1-18

Content elements

Strategy
Emissions figures

Emission targets
Other metrics

Comment

Publication
In voluntary sustainability report

Status
Complete

Attach the document

sustainability_at_fortum_2019.pdf

Page/Section reference
Sustainability at Fortum -presentation, pages: 2-8, 10-12, 15-19, of total pages: 1-30

Content elements
Emissions figures
Emission targets
Other metrics

Comment

Publication
In voluntary communications

Status
Complete

Attach the document

meidan_ymparistomme_2019_en_final.pdf

Page/Section reference
Our environment 2019, Loviisa power plant, pages: 2, 6 and 8, of total pages: 1-12

Content elements
Emissions figures
Other metrics

Comment
As a producer of clean energy, Fortum's Loviisa nuclear power plant and carbon-free nuclear power play a significant role in mitigating climate change. The greenhouse gas

emissions over nuclear power's life cycle are equivalent to those of wind, hydro and solar power. As a result of the Loviisa nuclear power plant's electricity production, Finland emits about 6 million tonnes less carbon dioxide emissions compared to the equivalent amount of fossil fuel-based electricity.

Publication
In voluntary communications

Status
Complete

Attach the document
fortum_plastics_review_2019.pdf

Page/Section reference
Fortum Plastics Review, September 2019, Plastics recycling in a circular economy, pages: 12 -15 and 18-20 of total pages : 1-20

Content elements
Strategy
Risks & opportunities
Other metrics

Comment
When mechanical recycling is used in plastic recovery, the carbon footprint for recycled plastics expressed as Global Warming Potential (GWP) can be up to 10 times smaller and save 1.0–1.5 kg of CO2/kg of resin compared to using virgin materials, thus supporting the EU's low-carbon path.
Fortum produces Circo granulates at its plastic refinery in Riihimäki, Finland, where plastic waste bound for recycling is efficiently separated and cleaned. Producing the recycled plastic granulates only uses about 15% of the energy needed to make virgin plastic. Therefore using the recycled plastic as raw material reduces the carbon footprint of plastic product manufacturers while enabling them to give plastic waste new life in a different form.

Publication
In voluntary communications

Status
Complete

Attach the document
fortum-energy-review-grid-planning-11-2019.pdf

Page/Section reference

Fortum Energy Review, November 2019, From national to regional grid planning, Differences and harmonisation opportunities in the operations of the Nordic TSOs (Transmission System Operators), pages: 2-3, 6-8, 27-30, of total pages: 1-31

Content elements

Strategy
Risks & opportunities
Other metrics

Comment

Fortum believes that the regional Nordic electricity market is a key enabler for the Nordic countries' high ambitions for climate neutrality, energy transition and electrification at a lower cost than if each country were to optimise the electricity market from a national perspective. All Nordic countries aim to become climate neutral during the 2030s.

C15. Signoff

C-FI

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

C15.1

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

	Job title	Corresponding job category
Row 1	President 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

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

Please confirm below

I have read and accept the applicable Terms