

Module: Introduction

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0.1 Introduction

Please give a general description and introduction to your organization

Fortum's purpose is to create energy that improves life for present and future generations. Competence in CO₂-free nuclear, hydro and energy-efficient CHP production and operating in competitive energy markets are the foundation of the company strategy. The company's activities cover the generation, distribution and sales of electricity and heat as well as related expert services. Fortum's operations focus on the Nordic countries, Russia and Baltic Rim area. In the future, fast-growing and liberalising energy markets in Europe and Asia provide additional growth opportunities. In 2010, Fortum's sales totalled EUR 6.3 billion and comperable operating profit was EUR 1.8 billion. The company employs approximately 10,500 people. Fortum's shares are quoted on NASDAQ OMX Helsinki.

Sustainability is at the core of the company strategy and we want to address economic, environmental and social responsibility in a balanced way in our operations. Fortum's long-term aspiration is to be a carbon dioxide-free energy company. Climate change mitigation has for years been a fundamental business driver. Today we rank among the least carbon intensive power producers in Europe. Since 2008 Fortum's total emissions have however been increasing mainly due to our extensive operations in Russia.

0.2 Reporting Year

Please state the start and end date of the year for which you are reporting data.

The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.

We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.

Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

Enter Periods that will be disclosed

Fri 01 Jan 2010 - Fri 31 Dec 2010

0.3

Country list configuration

Please select the countries for which you will be supplying data. This selection will be carried forward to assist you in completing your response

Select country
Finland
Sweden
Norway
Estonia
Latvia
Lithuania
Poland
United Kingdom
Russia

0.4

Currency selection

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.

EUR(€)

0.5

Please select if you wish to complete a shorter information request

0.6 Modules

As part of the Investor CDP information request, electric utilities, companies with electric utility activities or assets, companies in the automobile or auto component manufacture sectors and companies in the oil and gas industry should complete supplementary questions in addition to the main questionnaire.

If you are in these sectors (according to the Global Industry Classification Standard (GICS)), the corresponding sector modules will be marked as default options to your information request. If you want to query your classification, please email respond@cdproject.net.

If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below. If you wish to view the questions first, please see <https://www.cdproject.net/en-US/Programmes/Pages/More-questionnaires.aspx>.

Further Information

Additional information on our company in general and on operations in the countries selected in question 0.3 can be found in the attached Annual Report 2010 and in our web pages www.fortum.com

Attachments

[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/Introduction/Fortum_AR2010_eng.pdf](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/Introduction/Fortum_AR2010_eng.pdf)

1.1 Where is the highest level of direct responsibility for climate change within your company?

Individual/Sub-set of the Board or other committee appointed by the Board

1.1a Please identify the position of the individual or name of the committee with this responsibility

Fortum Management Team (FMT) has the highest level of direct responsibility for sustainability as a whole and for climate change particularly.

1.2 Do you provide incentives for the management of climate change issues, including the attainment of targets?

Yes

1.2a Please complete the table

Who is entitled to benefit from these incentives?	The type of incentives	Incentivised performance indicator
Corporate executive team	Monetary reward	Incentivised performance indicators for Executive Vice president, Corporate Relations and Sustainability (Member of Corporate Executive Team) include an index which compiles Fortum's performance in terms of sustainability (including climate change issues), Fortum's image and reputation and media performance. The same index is applicable to every Vice President in the CR&S function.
Chief Executive Officer (CEO)	Monetary reward	Incentivised performance indicators for CEO include an index which compiles Fortum's performance in terms of sustainability (including climate change issues), Fortum's image and reputation and media performance. The same index is applicable to Executive Vice president, Corporate Relations and Sustainability and to every Vice President in the CR&S function.
Business unit managers	Monetary reward	Depending on the business unit, the incentivised performance indicators include e.g. a growth index of CO2-free hydro and nuclear power production capacity.
Environment/sustainability managers	Monetary reward	Fortum's Annual Bonus system is based on company's financial result and on the individual/team performance result. The individual/team bonus targets for each individual are agreed upon with each employee. For environment/sustainability managers bonus targets include climate change issues, when appropriate, depending on the responsibilities and tasks of the manager.

Further Information

Fortum has unambiguous line responsibility in climate change issues and these have been integrated into our business processes and daily management. The Business Division heads and ultimately the President and CEO and the Board of Directors are accountable for the company's climate performance. CEO has designated the Executive Vice President Corporate Relations and Sustainability as the lead in managing sustainability (including climate change). The Executive Vice President is a member of the Fortum Management Team and responsible for reporting to the CEO on all climate change matters. In the Board, Fortum's Management Team is represented by the President and CEO. Fortum has not nominated any individual Board member responsible for climate affairs. The Board deals with climate issues when brought up by the Management Team or by the Sustainability and Public Affairs Steering group headed by the Executive Vice President, Corporate Relations and Sustainability.

Fortum's sustainability management and governance has been described more in detail in Sustainability Report 2010 on pages 10-11. Additional information is also available in our web pages www.fortum.com/sustainability

Attachments

[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/1.Governance/Sustainability report 2010.pdf](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/1.Governance/Sustainability%20report%202010.pdf)

2.1 Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities

Integrated into multi-disciplinary company wide risk management processes

2.1a Please provide further details (see guidance)

The assessment of risks related to climate change is included in the assessment of business risks. Fortum's CR&S function assesses the risks related to Group operations and its own operations as part of the annual planning. The divisions assess the risks identified by the CR&S function in their own annual planning and prepare for their control. This process is facilitated by Corporate Risk Management and Corporate Sustainability.

The scope of the process, i.e. the type of risks and opportunities considered by the process

The process includes regulatory, physical (e.g. weather-related), customer behavior changes and reputational risks. For further details see attachment "ORM Guidelines" in 2.3.

How risks/opportunities are assessed at a company level

Based on Divisions' input Corporate Sustainability consolidates and evaluates the overall risk level.

How risks/opportunities are assessed at an asset level

Depending on Division this analysis is done on facility or asset level (e.g. hydro power), business area or Division level. E.g. in power distribution business the assessment covers the whole business area. For nuclear energy the assessment is done at site level.

The frequency of monitoring

Risks are being assessed on a continuous basis, but a more profound review is made annually in connection to the annual business planning process.

Criteria for determining materiality/priorities

According to Fortum impact criteria Fortum is risk averse to environmental risks. Priorities are defined by impact probability analysis. Magnitude and probability of a risk are the key criteria.

To whom are the results reported

Results of the risk analyses are reported to Business Division management team, to Corporate Risk Management, Corporate Sustainability and to Fortum's Management team depending on the materiality.

2.2 Is climate change integrated into your business strategy?

Yes

2.2a Please describe the process and outcomes (see guidance)

How the business strategy has been influenced,

During 2010 Fortum has revised its business strategy. The revised strategy is based on a comprehensive operating environment analysis. Sustainability and climate change have been areas considered in the strategy revision. A large number of Fortum experts have been involved in the strategy revision process and after approval the strategy has been extensively communicated and discussed throughout the organisation.

What climate change aspects have influenced the strategy

Climate change (need to significantly decrease GHG emissions and increasing price of CO₂) is one of the drivers of Fortum's business strategy. Fortum's long term aspiration is to be a CO₂-free power and heat company. Fortum's strategy is based on CO₂-free nuclear and hydro production and on energy-efficient combined heat and power production (CHP). CO₂-free production offers Fortum opportunities as the cost of CO₂ is increasing.

The most important components of the short term strategy that have been influenced by climate change

Fortum aims to increase the use of low carbon or CO₂-free fuels in energy production and to increase the operational efficiency of energy production plants. During 2010 we have made investment decisions on several new CHP plants using bioenergy and/or waste derived fuels. In 2010 Fortum drafted a Roadmap to a CO₂-free future and revised the CO₂ targets for the next five years. Climate change has influenced the short term strategy so that almost 100% of the ongoing investment programme in Europe until 2015 is CO₂-free. At the moment Fortum ranks among the lowest emitting electricity companies in Europe, see the attached illustration on carbon exposure.

The most important components of the long term strategy that have been influenced by climate change

Fortum's long-term aspiration is to be a CO₂-free power and heat company. As described in Fortum's Roadmap (attached), we are of the opinion that there will be a gradual transition from the traditional energy production towards a solar economy. The shift to solar economy is the only way to get the world's natural resources to last for future generations and to find a solution for climate change.

How this is gaining you strategic advantage over your competitors

Fortum is among the best companies in Europe regarding the carbon exposure (specific CO₂ emission of energy production). Value of CO₂-free energy production assets is increasing and also the demand for low carbon energy products is supposed to rise.

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

In 2010 Fortum made investment decisions on the following energy production plants:

- biomass and waste fuelled CHP plant in Klaipeda, Lithuania
- a new waste fuelled unit at Brista, Sweden
- acquisition of 40% share in Blaiken wind farm in Sweden

These investments will result in additional CO₂-free energy production.

Investments in electricity network and smart metering during 2010 aim to increase consumers' possibilities to monitor their consumption and encourage energy saving thus reducing climate impact.

R&D activities during 2010 focused to a large extent on climate change mitigation. For additional information on R&D activities, see Fortum's Sustainability Report 2010, pages 27 and 40-41. R&D information also available at www.fortum.com

2.3 Do you engage with policy makers to encourage further action on mitigation and/or adaptation?

Yes

2.3a Please explain (i) the engagement process and (ii) actions you are advocating**Engagement process**

Fortum has a continuous dialogue with key decision makers in the EU and in the countries where we operate. This enables us to bring our views to the political and administrative processes and gives us relevant information on regulatory developments in advance. We also communicate with numerous climate related NGOs.

Fortum is engaged with policy makers directly as a company, through energy industry organisations (national, EU) and via industry driven organisations like WBCSD and 3C (Combat Climate Change).

Topics include development and implementation of climate policy, regulation and legislation, technology R&D activities and energy policy issues like electricity market regulation and taxation.

Fortum participates in public consultations (e.g. by EU), submits statements and opinions, is involved in policy research etc.

Actions advocated

Fortum has taken a proactive and encouraging approach to climate change mitigation. As an energy company we want to be a solution provider on mitigation and adaptation. Fortum has a clear preference for market based policy tools in mitigation efforts: emissions trading and Kyoto mechanisms. Advocating of a global carbon market and carbon price are key issues for Fortum. We are also advocating technology neutrality in mitigation efforts so that all CO₂-free or low carbon energy technologies should be available for companies.

Fortum has analysed the impact of climate change to energy production and e.g. studied measures needed for adaptation in Fortum's hydro power production.

Further Information

Fortum's Operational Risk Management Guidelines (attached) describe more in detail the risk management procedures.

Attachments

[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/2.Strategy/110310 Fortum_Roadmap.pdf](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/2.Strategy/110310%20Fortum_Roadmap.pdf)
[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/2.Strategy/110518 Fortum's carbon exposure 2009_eng.ppt](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/2.Strategy/110518%20Fortum's%20carbon%20exposure%202009_eng.ppt)
[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/2.Strategy/110518 ORM-Guidelines 2011 final.pdf](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/2.Strategy/110518%20ORM-Guidelines%202011%20final.pdf)

3.1

Did you have an emissions reduction target that was active (ongoing or reached completion) in the reporting year?

Intensity target

3.1b

Please provide details of your intensity target

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Base year emissions (metric tonnes CO2e)	Target year	Comment
1	Scope 1	17%	14%	metric tonnes CO2e per megawatt hour (MWh)	2007	3257825	2020	In electricity generation in the EU, the target was that the 5-year average specific CO2 emission of electricity does not exceed 80 gCO2/kWh by 2020. Fortum's CO2 targets were revised in January 2011. In the revision this target was adjusted to be valid for the next five years instead of 2020.
2	Scope 1	25%	10%	metric tonnes CO2e per megawatt hour (MWh)	2006	4941000	2020	In heat production the target was at least 10% reduction in specific CO2 emission (g/kWh) from the 2006 level in each country in the EU by 2020. Fortum's CO2 targets were revised in January 2011. After the revision this target was cancelled and replaced by the target for the specific CO2 emission of the total energy production.
3	Scope 3: Employee commuting	0.08%	10%	grams CO2 per kilometer	2007	9500	2010	Fortum company cars shall meet the carbon dioxide emission limit under 180g/km from April 1st, 2009. The average CO2 emission of Fortum's company cars has decreased by approximately 15 g/km from 2007.
4	Scope 3: Business travel	0.07%	10%	Other: %	2007	4140	2009	Target has been met in 2009.

3.1c

Please also indicate what change in absolute emissions this intensity target reflects

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comments
1	Increase	20%	Increase	10%	Despite of the decrease in the specific CO2 emission of electricity production (target ID1) in the EU, Fortum's total absolute emissions are likely to increase by 2020 due to significant increase of electricity production in Russia. - Since 2011 Fortum's revised CO2 targets include all operations, also in Russia.
2	Increase	20%	Increase	10%	Despite of the decrease in the specific CO2 emission of heat production (target ID2) in the EU, Fortum's total absolute emissions are likely to increase by 2020 due to significant increase of electricity production in Russia. - Since 2011 Fortum's revised CO2 targets include all operations, also in Russia.
3	No change		No change		Emissions from employee commuting and business travel represent such a small share of total emissions that reaching those intensity targets as such do not change the absolute total emissions. Targets for employee commuting and business travel are however important for motivating and engaging all employees for climate change mitigation.
4	No change		No change		Emissions from employee commuting and business travel represent such a small share of total emissions that reaching those intensity targets as such do not change the absolute total emissions. Targets for employee commuting and business travel are however important for motivating and engaging all employees for climate change mitigation.

3.1d

Please provide details on your progress against this target made in the reporting year

ID	% complete (time)	% complete (emissions)	Comment
1	21%	100%	After 2010 the 5-year average specific CO2 emission of electricity in the EU was 69 g/kWh. This is under the target level 80 g/kWh for year 2020.
2	29%	50%	In 2010 the average specific CO2 emission of heat production was 5% below target year 2006 level. This is 50% of the target (10% reduction).
3	100%	100%	All new company cars purchased during 2010 fulfilled the emission requirement; their CO2 emission was below 180 g/kWh.
4	100%	100%	Target has been met in 2009. In 2010 Fortum had no quantitative target for reducing emissions from business travel. However, the continuous target is to reduce the environmental impact of company's business travelling.

3.2 Does the use of your goods and/or services directly enable GHG emissions to be avoided by a third party?

Yes

3.2a Please provide details (see guidance)

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

Fortum offers consulting services for energy efficiency improvements for our customer companies. E.g. Fortum Ecotuning® is a year-long project to determine the weak links in a power plant's operational economy. The solution encompasses optimisation of the power plant's processes and training of the personnel. We optimise the energy efficiency of the customer's power plant and we guarantee that the power plant's energy efficiency will achieve a savings or revenue gain of at least 500,000 euros during the one-year review period.

Fortum is not considering generating CERs or ERUs out of the avoided GHG emissions by a third party.

3.3

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

Yes

3.3a

Please provide details in the table below

Activity type	Description of activity	Annual monetary savings (unit currency)	Investment required (unit currency)	Payback period
Energy efficiency: processes	Refurbishments of hydro power plants continued in 2010 and three projects were completed at Montta, Finland, and at Långströmmen, Frykfors and Höljes, Sweden. The annual additional energy from these plants is about 20 GWh. Fortum's hydropower refurbishment programme will increase electricity production capacity by 10 – 20 MW per year by 2015. The projects included e.g. modernisation, service and maintenance operations of the generator, turbine and electricity and automation systems.			>3 years
Energy efficiency: processes	Upgrading and modernisation of nuclear power plants is an important measure to increase CO2-free electricity production. Capacity upgrade programmes were under way in 2010 at Fortum's co-owned Oskarshamn (Fortum's share 43%) and Forsmark (23%) nuclear power plants in Sweden. Fortum's share of the planned additional capacity is about 290 MW. During the projects, the thermal power of several Fortum's wholly or partly owned reactors have been upgraded and together with these and certain other measures to improve the turbine efficiency, an increase of about 778 MW in the electrical output of the power plants have been possible. The main goals of the modernisation projects were ensured safety, additional generation capacity, extended plant life time and more competent and motivated staff.			>3 years
Low carbon energy installation	Fortum has shares in several wind power companies that have constructed wind mills. The installed capacity (Fortum's share) is about 6 MW and estimated annual generation about 11 GWh. In May 2011 Fortum together with the Swedish Skellefteå Kraft announced purchase of 60 wind turbines for the Blaiken onshore wind farm under construction in Northern Sweden. Fortum's share of the turbines to be ordered is 12. Blaiken Vind AB, a joint venture of Fortum and Skellefteå Kraft, will have a maximum of 100 wind turbines on its wind farm and a total capacity of 250 megawatts.			>3 years
Low carbon	CHP plants that utilise partly biofuel for energy production were commissioned in Czeřstochowa,			>3 years

Activity type	Description of activity	Annual monetary savings (unit currency)	Investment required (unit currency)	Payback period
energy installation	Poland, and in Pärnu, Estonia. A biomass fuelled heating plant was commissioned in Hanko, Finland. Fortum made investment decisions on a biomass- and waste-fired CHP plant in Klaipeda, Lithuania, and a new waste-fired unit in Brista, Sweden. The Klaipeda plant is the first waste-fired plant in the Baltic Rim area.			
Energy efficiency: processes	Fortum made decision to improve the quality of coal used in Russia by gradually changing to coal with lower ash and sulphur content and better heat value. Coal change was started in late 2010. Better quality improves the energy efficiency and consequently reduces CO2 emissions.			1-3 years

3.3b

What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Marginal abatement cost curve	Fortum has used MACC as a climate tool since 2003. MACC will be updated in 2011. With this approach we can rank the emission reduction measures in the order of cost efficiency and emission reduction volume.
Dedicated budget for energy efficiency	The Power Division's energy efficiency programme, for example, covers the power plants subject to the Finnish energy efficiency agreement based on the EU Energy Services Directive (Directive on the Promotion of End-use Efficiency and Energy Services, 2006/32/EC) and our Swedish hydropower plants. Other divisions also have their own projects to improve energy efficiency and increase CO2-free production. For instance, the power plant modernisation programmes and the investments in new technology and capacity within the framework of our investment programme in Russia will improve energy efficiency when completed.
Internal incentives/recognition programs,	The purpose of Fortum's Innovation Award 2010 was to inspire all employees to actively initiate ideas and innovations that increase the efficiency of current operations, create growth, promote sustainability including emission reduction activities, and secure long-term business and technology opportunities.
Dedicated budget for low carbon product R&D	The long-term aspiration of Fortum's R&D is to enable a sustainable CO2-free future for Fortum. Each new development activity is assessed against the criteria of emission reduction and resource-efficiency.

Further Information

For additional information on Fortum's performance against targets see attached quarterly Sustainability performance report and Fortum's Sustainability Report 2010, pages 36-39. For additional information on Fortum's emission reduction initiatives, see Sustainability Report 2010 pages 25-27 and 36-43.

Attachments

[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/3.TargetsandInitiatives/Sustainability report 2010.pdf](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/3.TargetsandInitiatives/Sustainability%20report%202010.pdf)

[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/3.TargetsandInitiatives/110113 Fortum Sustainability performance Q1-Q4-2010.ppt](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/3.TargetsandInitiatives/110113%20Fortum%20Sustainability%20performance%20Q1-Q4-2010.ppt)

4.1

Have you published information about your company's response to climate change and GHG emissions performance for this reporting year in other places than in your CDP response? If so, please attach the publication(s)

Publication	Page/Section Reference	Identify the attachment
In annual reports (complete)	16-17, 28-32, 38, 49-50, 54	Annual Report 2010 (Fortum_AR2010_eng.pdf)
In voluntary communications (complete)	8-9, 15-16, 25-28, 31-43	Sustainability Report 2010 (Sustainability report 2010.pdf)
In voluntary communications (complete)	1-19	GHG Scope 1, 2 and 3 Analysis 2010 (110224 Fortum_GHG_value_chain_2010_final.pdf)
In voluntary communications (complete)	Sustainability	Fortum web pages

Further Information

Fortum has responded to several investor and other stakeholder questionnaires during 2010. Information about the risks and opportunities related to climate change, our climate targets and actions to reduce emissions, statistics on the emissions and measures to adapt to climate change are widely communicated through different company communication media (Annual Report, Sustainability Report, internet, customer and personnel magazines, investor relations presentations etc). A separate climate report "Fortum and Climate Change" was published in 2009 (attached).

Attachments

[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/4.Communication/Fortum_AR2010_eng.pdf](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/4.Communication/Fortum_AR2010_eng.pdf)
[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/4.Communication/090605 FortumandClimateChange2009_final.pdf](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/4.Communication/090605FortumandClimateChange2009_final.pdf)
[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/4.Communication/110224 Fortum_GHG_value_chain_2010_final.pdf](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/4.Communication/110224Fortum_GHG_value_chain_2010_final.pdf)
[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/4.Communication/Sustainability report 2010.pdf](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/4.Communication/Sustainability%20report%202010.pdf)

5.1

Have you identified any climate change risks (current or future) that have potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

- Risks driven by changes in regulation
- Risks driven by changes in physical climate parameters
- Risks driven by changes in other climate-related developments

5.1a

Please describe your risks driven by changes in regulation

ID	Risk driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
1	International agreements	The future GHG reduction obligations and value of carbon are uncertain which poses a risk to us in all countries where we have operations. The global climate policy framework (the Kyoto Protocol) has been agreed for the period 2008–2012. The outcome of the ongoing negotiations on post-2012 international agreement on climate policy is not known yet. Although the EU has committed itself to emission reduction also beyond 2012 and to the continuation of the emissions trading system (ETS) the uncertainty related to the post-2012 global policy is the main regulatory risk for the future investments of the energy industry. This might result in wrong investment decisions (technology, fuels, location).	Other: wrong investment decisions due to uncertain regulation	1-5 years	Direct	About as likely as not	Medium-high
2	Cap and trade schemes	Most of the climate regulation concerning Fortum is originating from the EU. Fortum prefers emissions trading as the key climate instrument. In the EU countries emission trading will continue at least until 2020. In the period 2013–2020 there will be new rules for emission trading (e.g. auctioning of allowances for electricity production). Therefore, possible setbacks in the implementation	Increased operational cost	1-5 years	Direct	Likely	Medium

ID	Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact
		(e.g. malfunctioning of the allowance auctions) of the future EU ETS can be interpreted as a risk. Also the volumes of free allocation for existing and new heat production installations during the period 2013-2020 in all EU countries is one example of the risks. In the "new" EU countries (Baltic countries and Poland) certain derogations in the new emissions trading directive may allow free allocation for power production also to some extent, but the implementation of the rules remains uncertain.					
3	Lack of regulation	Russia's legislative and political operating environment related to the climate issue differs significantly from that of Europe. In general the regulatory framework is uncertain and regulatory risks can evolve in the future in Fortum's Russian business. It is difficult to foresee how the regulation concerning e.g. timelines, 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. Carbon price doesn't seem likely in the near future either. Uncertainty of regulation can be seen as a risk also in the EU countries. 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. Disability to take long-term regulatory prospects into consideration when planning investments can lead to wrong investment decisions.	Increased operational cost	1-5 years	Direct	More likely than not	Medium-high
4	Other regulatory drivers	Renewable energy targets and support systems are considered a risk especially in the EU countries. In addition to the EU ETS this is an overlapping steering instrument leading to significant inefficiencies and sub-optimisation of production. For example national renewable energy obligations may lead to significant regional price fluctuations in the market. This is a risk in all the countries we have operations in, except Russia. Share of Fortum's renewable sources in electricity generation was 35% in 2010. For heat production the corresponding figure was 18 %.	Increased capital cost	6-10 years	Direct	More likely than not	Medium

5	Fuel/energy taxes and regulations	Uncertainty regarding fuel and energy taxes in the EU member states remains a risk, as taxation remains under the scrutiny of the member states. For example in Finland, the taxation for fossil fuels used in heating was heavily tightened from 2011 onwards. Changes in taxation result in changes in fuel prices and change the merit order of energy production plants. In August 2010 the minister of Trade and Employment proposed introducing a tax for uranium for the Finnish nuclear power companies. However, there was no government proposal on that but it is possible that introducing the tax is discussed later on in the government negotiations of 2011, for example. In 2010 the Finnish government withdrew from introducing windfall taxes for old hydro and nuclear. If a tax on the profits which electricity generators earn from free carbon credits would be introduced in the future in Finland or in other Nordic countries, Fortum would not be able to take full advantage of its CO2-free production.	Increased operational cost	1-5 years	Direct	Likely	Medium
6	International agreements	The UN Climate Change Conference in Cancún in 2010 failed in creating a binding, global agreement for reducing CO2 emissions. If such agreement is not achieved in the future either and the EU's climate related legislation remains tight at the same time, there is a risk that companies from diverse industries move their operations to countries where climate change regulation does not exist or is at lower level than in Europe. For Fortum this would mean losing important industrial customers and being not able to take competitive advantage of its low-carbon production portfolio. Decreased demand for energy products would impact on energy prices and thus Fortum's revenues.	Reduced demand for goods/services	1-5 years	Direct	Unlikely	Medium-high

5.1b

Please describe (i) the potential financial implications of the risk before taking action; (ii) the methods you are using to manage this risk; and (iii) the costs associated with these actions

ID1 International agreements

(i) As a company with low CO2 emissions, Fortum will be a relative winner if the international climate agreement results in tighter emission reduction requirements which are likely to increase carbon and energy prices. If such agreement is not achieved Fortum can't take full advantage of its low-carbon production portfolio. If CO2 price increases e.g. EUR 1 the increase in electricity price approximates EUR 0.7-0.8/MWh.

(ii) We are involved in the climate policy discussion and development and promoting market driven energy and climate policy both at the EU level and in countries where we operate. In Russia economic value for emissions is created through Joint Implementation (JI) projects.

(iii) Lobbying costs cannot be separated from other communications and PR costs.

Based on current estimates, Fortum will receive about 3.5 million tonnes of ERUs from Russia during the Kyoto period 2008–2012. Assuming CO2 allowance price of EUR 15 the value of ERUs approximates EUR 52.5 million.

ID2 Cap and trade schemes

(i) The price of CO2 allowances is a major financial risk for the company since it is one of the most important short-term factors affecting electricity prices in Europe where about 90–95% of Fortum's CO2-emissions are subject to the EU Emissions Trading Scheme. Scheme will require expenditures in purchase of CO2 allowances in 2013–2020, as most of the allowances will be auctioned. Decreasing amount of free allowances and increasing price of CO2 would lead to increasing production cost of fossil fuelled power plants. A properly designed market-based regulatory system will minimize the regulatory risks. A poorly designed system could result in CO2 price spikes and crashes imposing risks and additional costs.

(ii) We manage the risk by using CO2 forwards and taking the costs of allowances into account in production planning. Uncertainty of the regulatory regime and CO2 allowance pricing are taken into account in the investment calculations, too. 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.

We are engaged in the development of the future climate policy framework, related legislation and in the development of the emissions trading schemes.

Fortum has also invested in the World Bank's Prototype Carbon Fund (PCF) and in the Nordic Environment Finance Corporation's Testing Ground Facility (TGF) and is implementing Joint implementation projects in Russia.

(iii) Lobbying costs cannot be separated from other communications and PR costs.

The total amount of emission reduction units for Fortum through carbon fund investments is estimated to be 1–1.5 million tonnes CO2 which approximates EUR 15–22.5 million if CO2 price is assumed to be EUR 15.

ID3 Lack of regulation

(i) Our energy production in Russia is based on fossil fuels. Any cost of CO2, even though we don't see it probable in near future, would increase our production cost. If this couldn't be passed to energy price, profitability of our operations would decrease. Our CO2 emissions in Russia totalled 14.6 Mt in 2010 and we estimate them to be 15–20 Mt per year in the future. Uncertainty of legislation can lead to losses in other countries, too. Payback times for investments may change notably if for example taxation of fuels changes.

(ii) We develop the operating environment related to better energy efficiency in Russia, and thereby reduce emissions by hundreds of thousands of tonnes. However, the new capacity will increase our annual emissions by about six million tonnes. An EHS action plan for 2009–2015 guides our work to bring environmental, occupational health and safety related management system and performance in Russia closer to the level of the plants in Europe. The automation and upgrade of the Chelyabinsk district heating system, for example, will reduce energy losses by over 30% and decrease our CO2 emissions by approximately 5 % in the area.

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.

(iii) The total estimated value of the investment programme in Russia from January 2011 onwards (extending to 2014) is EUR 1.5 billion covering seven units.

Efficiency improvement in OAO Fortum will be approximately EUR 100 million in 2011. The investment in the Chelyabinsk operation is over EUR 100 million.

ID4 Other regulatory drivers

(i) National subsidy schemes will easily lead to distortions of competition and to distorted renewable energy price.

(ii) We are engaged in the development of the future climate policy framework, related legislation and in the development of the emissions trading schemes. We are promoting market driven regulation that should be transparent and predictable.

(iii) Lobbying costs cannot be separated from other communications and public relations costs. In 2010 Fortum invested EUR 182 million in renewable energy production.

ID5 Fuel/energy taxes and regulations

(i) Heavier taxation of fuels could affect fuel prices and increase our operational cost. On the other hand the higher fuel price could affect the market price for electricity and increase our sales. Fuel price is normally indexed to heat and steam prices in bilateral contracts. The decisions on changing the district heating price are case-specific and made according to the present market conditions.

We have estimated that if Fortum's CO₂-free power production in the Nordic countries was taxed an additional tax of EUR 1–10/MWh the annual tax would approximate EUR 40–400 million.

(ii) Versatile production portfolio and flexibility in using of different fuels is a way to manage the risk. Fuels, goods and services are purchased from local and global suppliers and fuels are used efficiently. These methods also reduce the risk.

(iii) Materials purchased were EUR 1,804 million in 2010 and contained mainly coal, gas, and nuclear fuels.

ID6 International agreements

(i) If many industrial companies moved their energy-intensive production (e.g. steel) overseas it would mean decreased demand for power and could result in lower price for electricity and thus decreased demand of our products and lower revenues.

(ii) Our interest promotion is carried out through European (e.g. Eurelectric) and national industry organizations (e.g. Svensk Energi, Finnish Energy Industries), and directly with EU institutions or national governmental institutions. We are also members of international business-driven organisations and networks focusing on climate change mitigation (e.g. Combat Climate Change).

(iii) Lobbying costs cannot be separated from other communications and public relations costs.

5.1c

Please describe your risks that are driven by change in physical climate parameters

ID	Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact
1	Change in precipitation pattern	Droughts might increase the probability of forest fires which in turn could have an impact on our production facilities and distribution networks in the affected area. In Russia, for example, the worst heat wave for decades destroyed homes and wildlife in August 2010. There were also fires in Southern Ural where we have operations but not in immediate proximity to our plants.	Reduction/disruption in production capacity	Current	Direct	Likely	Low-medium
2	Snow and ice	Storms, heavy snowfalls and ice set requirements for maintenance of power distribution etc. These may result in losses of energy production and increased maintenance costs of distribution networks in Finland, Sweden, Norway and Estonia.	Reduction/disruption in production capacity	Current	Direct	Likely	Low
3	Change in temperature extremes	Increasing temperature results in increasing cooling water temperature for condensing power plants and 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. Increase in water temperatures also affects the cleanliness of the systems (e.g. algae, mussels) and hence the system's reliability.	Reduction/disruption in production capacity	>10 years	Direct	Unlikely	Low-medium
4	Sea level rise	Many of our thermal power plants are situated on seaside and consequently exposed to the rise of the sea level. Sea level rise is a long-term climate change impact and thus more likely to affect the next generation of our plants. The elevation of Loviisa nuclear power plant yard area is +3.00 meters. Studies show that the threat of a high sea level will not occur suddenly, it will be predictable. The probability of a sea level of more than three meters is very small. The occurrence of a high sea level at Loviisa requires heavy storms to rage in the North Sea for a long period of time – typically a couple of weeks – resulting in an exceptionally large volume of water flowing through the Strait of Demark	Increased capital cost	>10 years	Direct	Very unlikely	Low-medium

ID	Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact
		into the Baltic Sea. Strong south-western and western winds over the Baltic Sea, lasting several days, will have to push water from the central areas of the sea into the Gulf of Finland. If additionally there is high pressure over the Baltic Sea and low pressure over the Loviisa area, the pressure difference will raise the sea level at Loviisa. Spillover (the bathtub effect) of the water level in the Gulf of Finland can also raise the water level locally. The tidewater effect caused by the moon also has a small impact. The Finnish Institute of Marine Research has estimated that, as a result of the above-mentioned phenomena, the maximum explainable water level at Loviisa is +213 cm. The Gudrun storm on 9 January 2005 raised the sea level at Loviisa to +177 cm, according to the Finnish Institute of Marine Research.					
5	Other physical climate drivers	Baltic Sea is a low sea which together with temperature raise and eutrophication creates good growth circumstances for algae. For smaller energy production plants, algae doesn't pose a risk but for bigger production plants, such as our Loviisa nuclear power plants in Finland, masses of algae could be a problem if they drifted close to the water intake place due to e.g. storms or sea level rise. In such situations algae could cause business interruptions.	Reduction/disruption in production capacity	>10 years	Direct	Very unlikely	Low-medium
6	Other physical climate drivers	Extreme weather conditions are becoming more frequent especially in coastal areas where many of Fortum's distribution networks are located. With a mild climate, the storm resistance of forests becomes weaker. This poses a risk to secure reliability of power supply in Sweden, Finland, Norday and Estonia where we have electricity distribution.	Increased operational cost	Current	Direct	Likely	Medium
7	Change in mean (average) temperature	Long term increase in temperature may result in decreased demand for heat, but on the other hand increasing demand for cooling in all areas where Fortum operates.	Reduced demand for goods/services	6-10 years	Indirect (Client)	Likely	Low-medium

5.1d

Please describe (i) the potential financial implications of the risk before taking action; (ii) the methods you are using to manage this risk; and (iii) the costs associated with these actions

ID1 Change in precipitation pattern

(i) Forest fires could damage our production plants and distribution grids. Losses of energy production and increased maintenance costs of networks could result in lower revenues and increased expenses. Also the statutory compensation fees due to long power failures could increase. In 2010 we paid appr. EUR 0.4 million customer compensations due to power failures.

(ii) In Russia, fire safety assurance levels are defined by the Ministry of Civil Defence. When we come into yellow zone ,we issue local order to reinforce following measures:

- Walks through territory surrounding the plant by security personnel several extra times a day
- Extra fire extinguishes available outside the plant
- Cutting and transporting dry grass/bush etc away from the plant premises
- Fire brigade standby organised with the municipality
- Daily reporting to the State Technical Inspection and weekly or daily to the Ministry of Civil Defence and the Ministry of Energy.

(iii) We have not separated the costs related to the methods to manage the risk.

ID2 Snow and ice

(i) Snow, ice and storms could result in lower revenues or increased expenses via e.g. losses of energy production and maintenance costs of distribution networks. They may also result in increased statutory compensation fees in cases of long power failures and increased need for investments in distribution grid reliability. In 2010 we paid appr. EUR 0.4 million in customer compensations. Maintenance costs were appr. EUR 20 million. Estimated cost for a large outage, like storm Gudrun in Sweden in 2005, could approximate EUR 10 million.

(ii) Physical risks related to disturbances in power distribution are a part of Fortum's risk management and hedging policies. We have an ongoing investment programme in network reliability to maintain and improve reliability and quality of the network.

(iii) An EUR 200 million Reliability Investment Programme was launched in 2005. In 2010, a total of EUR 213 million was invested e.g. in securing overhead lines and replacing overhead lines by cables in the ground.

ID3 Change in temperature extremes

(i) Water temperature rise would affect the availability of nuclear power plants since back-flow condensation water is not allowed to exceed 32° C, in Loviisa, Finland, for example. If water temperature would rise too much the plant should be shut down. The energy loss of a production interruption of Loviisa nuclear power plant is appr. 1000 MWh/hour. If the electricity price was EUR 45/MWh the loss would be EUR 45,000/hour.

(ii) At the moment there is no need to take cooling water from further away in the sea where water is cooler. If the amount of measurable constraints on the availability of nuclear power plants became common due to water temperature, investments in a new water intake place could be considered.

(iii) In Loviisa, investment cost of changing the water intake place could be in the order of EUR 10 million or more.

ID4 Sea level rise

(i) A sudden sea level rise could lead to shutdowns of power plants. E.g. the energy loss of a production interruption of Loviisa nuclear power plant is approx. 1000 MWh/hour. If the electricity price was EUR 45/MWh the loss would be EUR 45,000/hour. In the long run, sea level rise could lead to locating our plants further away from the sea which would increase the costs of building water intake systems and water intake.

(ii) Loviisa plant has anticipatory sea-level monitoring and operating instructions in place in the event of high sea levels. Additionally, it has been agreed that the relevant authorities will provide the Loviisa power plant's control room with a separate preliminary warning of a high sea level.

Even if the seawater level were to rise somewhat over three meters and cover Hästholmen island, where the power plant is located, the reactor can be cooled using the diesel-powered pumps that do not require electricity. The reactor core in both Loviisa power plant units is located 10 meters above sea level inside a gas- and water-tight containment building. Thus the seawater could not directly flood the interior of the containment building.

Sea level rise is also taken into consideration in the decisions concerning the location of our new plants.

(iii) Fortum's operation and maintenance costs totalled EUR 248 million in 2010.

ID5 Other physical climate drivers

(i) Algae cleaning can cause business interruptions. The energy loss of a production interruption of Loviisa nuclear power plant is approximately 1000 MWh/ hour. If the electricity price was e.g. EUR 45/MWh the loss would be EUR 45,000/hour.

(ii) The system for algae cleaning already exists at our Loviisa plant since algae, fishes etc. need to be taken away from the condensation water although they don't pose a problem at this stage.

(iii) There is no need for new investments.

ID6 Other physical climate drivers

(i) Losses of energy production and increased maintenance costs of distribution networks could lower revenues and increase expenses. Also statutory compensation fees might increase due to long power failures. In 2010 we paid approx. EUR 0.4 million in customer compensations. Maintenance costs (defined as fault repair) approximated EUR 20 million. Estimated cost for a large outage, like storm Gudrun in Sweden in 2005, could approximate EUR 10 million.

(ii) We systematically maintain, renew and develop our networks to secure reliability of power supply. Physical risks related to disturbances in power distribution are also a key part of our risk management and hedging policies.

(iii) In 2010, a total of EUR 213 million was invested securing e.g. overhead lines, replacing overhead lines by cables in the ground and installing remote disconnectors.

ID7 Change in mean (average) temperature

(i) Increased temperature could result in lower demand for heat and thus affect our sales. An 1 % decrease in Fortum's heat sales would correspond EUR 17.7 million.

(ii) We produce district heating mainly in combined heat and power (CHP) plants, in which heat and electricity is produced in the same process, and invest in new CHP. We also own and run the district cooling operations in Stockholm and have the world's largest district cooling network. We could run cooling at our CHP plants, too, with relatively low costs. E.g., if 160 customers switched their traditional refrigeration to district cooling they could reduce their carbon dioxide emissions by 23,000 tonnes a year.

(iii) E.g. the investment cost of Pärnu CHP-plant in Estonia was around EUR 80 million (production capacity 24 MW electricity, 50 MW heat). The district cooling supply is assured year-round with minimal maintenance needed, which reduces operating costs and lowers investment requirements for customers.

5.1e

Please describe your risks that are driven by changes in other climate-related developments

ID	Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact
1	Changing consumer behaviour	There are risks related to decreased demand of our products and services (electricity, electricity transmission, district heat) if the consumer behaviour and general attitude change so that they favour decreased use of these energy forms. Also the demand of our energy products may change due to increased awareness of climate change mitigation: increasing demand for carbon-free electricity and decreasing demand for electricity with high carbon dioxide emission may occur. These are risks in all the countries we operate in, especially in Europe. In Russia, the consumer interest in climate change mitigation is lower. For example, there are no ecolabelled electricity products in the Russian market yet.	Reduced demand for goods/services	1-5 years	Indirect (Client)	Likely	Medium
2	Reputation	Fortum's long term aspiration is to be a CO2-free power and heat company. However, our emissions are increasing in the near future. This is because we are committed to carrying out OAO Fortum's 2,300-megawatt investment programme by the end of 2014 in Russia. The capacity increase is based on natural gas. Upon completion of our ongoing investment programme, which will almost double our electricity production capacity, OAO Fortum's CO2 emissions will increase by several million tonnes, even by as	Reduced stock price (market valuation)	1-5 years	Direct	Unlikely	Medium-high

ID	Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact
		much as 70%. However, the specific emissions per produced energy unit will remain unchanged or will decrease slightly because the new units are more energy efficient than the old plants. Fortum's target in Russia is to bring environmental, occupational health and safety performance closer to the level of the plants in Europe. Failing in this work would be a reputational risk for the good track record that Fortum has as a power and heat production company with low carbon dioxide emissions.					
3	Uncertainty in market signals	Uncertainties in energy market signals make it more difficult for investors to decide in which energy technologies they should invest. Energy industry is sensitive to changes in the political environment and also any sudden events may change the market. E.g. the recent nuclear accident in Japan has given a market signal that will have major effect on the investment decisions.	Reduction in capital availability	1-5 years	Direct	Unlikely	Medium-high

5.1f

Please describe (i) the potential financial implications of the risk before taking action; (ii) the methods you are using to manage this risk; (iii) the costs associated with these actions

ID1 Changing consumer behaviour

(i) Financial implications include e.g. potential loss of income due to decreasing demand for heat energy. In 2010 Heat Division's sales made 28 % of Fortum's total sales. If the demand for heat decreased e.g. by 1 % this would mean an EUR 17,7 million decrease in sales (Heat sales 2010 EUR 1,770 million).

Mitigation of climate change can increase the demand for renewable energy sources (e.g. bioenergy) and price for low-carbon/carbon-free fuels (e.g. biomass) may therefore increase. As bioenergy is a desired raw material for several purposes, the competition on bioenergy may increase. This can affect the availability and price of different biomass based fuels and increase Fortum's costs. On the other hand, biomass availability may be improved due to better climate conditions. The financial implications of climate change on fuel pricing are complex and difficult to quantify at this stage.

(ii) As our production is CO₂-free to a large extent (in 2010, 66 % of our power production was CO₂- free) we are well positioned in the market and able to meet the increasing demand. Fortum has developed several products to meet the customer demand: in 2009 Fortum began selling only electricity that is produced without CO₂ emissions to its private and business customers in the Nordic countries.

Fortum has also extensive development activities ongoing related to sustainable cities, e.g. smart grid, distributed energy production, electricity as energy source for transport and eco-efficient heating solutions to respond to the changing consumer behaviour.

(iii) At the moment the financial implications due to pricing of carbon-free electricity products are minor. Most of the labelled electricity is sold without an extra fee. In the future, price differentiation may result in increased income from these products and also the volume of them will increase. Fortum's R&D costs which cover e.g. activities related to the electric car infrastructure and smart grids, were EUR 30 million in 2010. Fortum, ABB and the KTH Royal Institute of Technology received 13.4 MSEK funding from Swedish Energy Agency and Vinnova for a pre-study on the design and installation of a smart and flexible large-scale electricity grid in the sustainable Stockholm Royal Seaport commercial and residential area.

ID2 Reputation

(i) Failing to gain customer recognition as an enabler of a low-carbon society could have an impact on our market share and thus revenue. Also our ability to influence governments in order to engage in the development of the future climate policy framework, related legislation and in the development of the emissions trading schemes could weaken. This in turn, could result in unfavourable operating environment and impact our profitability.

(ii) We have drafted a comprehensive Environmental, Health and Safety (EHS) programme for 2009–2015 in Russia. Action plan consists of both short and long term actions with identified targets. The CO₂ challenge is managed through energy efficiency improvements in existing power plants and networks, construction of new energy efficient capacity in CHP plants and studying possibilities to replace coal with waste fuels.

There is a big improvement potential in energy efficiency as well as in reduction of heat and water losses in district heating networks. In Chelyabinsk there is a project ongoing to reduce heat losses by 30 % and CO₂ emissions by 5 %. In Tyumen we will replace 25 km piping by 2015 in order to reduce losses.

(iii) For instance, the investment in the automation and upgrade of the Chelyabinsk district heating system is more than EUR 100 million.

ID3 Uncertainty in market signals

(i) Uncertainty in the market can make investors hesitate their investment decisions. For Fortum, as for any company, this may mean a challenge in raising capital.

(ii) Fortum continuously screens the environment and assesses the risks. In 2010 we revised our strategy and goals for Fortum's operations for a longer perspective of time (next decade) than before. Fortum's operations, its future, challenges and opportunities were assessed on the basis of the global megatrends.

(iii) Costs related to screening of operational environment and risk assessment cannot be separated.

6.1

Have you identified any climate change opportunities (current or future) that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

- Opportunities driven by changes in regulation
- Opportunities driven by changes in physical climate parameters
- Opportunities driven by changes in other climate-related developments

6.1a

Please describe your opportunities that are driven by changes in regulation

ID	Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact
1	Voluntary agreements	Fortum has been actively involved in the development of market based climate instruments. All Fortum's power plants in Finland are within the scope of the energy efficiency agreement between the Confederation of Finnish Industries EK and the Ministry of Employment and the Economy based on the EU Energy Services Directive (Directive on the Promotion of End-use Efficiency and Energy Services, 2006/32/EC). The voluntary agreement covers e.g. the annual planning and drafting of the energy efficiency programme, follow-up monitoring and annual reporting to Motiva (an expert company promoting efficient and sustainable use of energy and materials in Finland, operates as an affiliated Government agency), and training of the entire plant personnel. Participating in this programme helps us in focusing in our energy efficiency and strengthens our position as an energy efficiency expert.	Reduced operational costs	Current	Direct	Very likely	Medium-high

2	Other regulatory drivers	<p>Fortum is one of the leading suppliers for operation and maintenance services in the field. We operate in the Nordic countries, the Baltics, Russia, Continental Europe and UK as well as in selected international markets such as Middle East and Asia. Fortum's services in energy efficiency improvements and other energy services for the industrial customers will benefit from further energy efficiency initiatives and carbon constraints. Energy efficiency solutions market is predicted to grow strongly at least for the coming two decades. The new EU energy strategy emphasises tapping into the biggest energy-saving potential – buildings and transport. This is an opportunity for Fortum, since we have extensive development activities related to sustainable cities, e.g. smart grid, distributed energy production, electricity as energy source for transport and eco-efficient heating solutions. Fortum also improves the energy efficiency of its own operations which is an opportunity since it brings both financial gain and environmental benefits. A large share of our production is based on combined heat and power production (CHP) with high overall efficiency. There is potential to increase the use of CHP in our market area, so this is a commercial opportunity for Fortum.</p>	Increased demand for existing products/services	Current	Indirect (Client)	Likely	Medium
3	Cap and trade schemes	<p>Basically our opportunities increase as far as the greenhouse gas emission reduction requirements become stricter, because we are better placed than our competitors to meet those regulations. The value of carbon free energy production increases, because the cost of emitting CO2 may increase in the future. The associated countries/regions are basically the EU countries and especially the countries of the Nordic power market. Over 95% of our CO2 emissions in the European Union are included in the EU emissions trading system. According to the revised directive the trading scheme will continue starting from year 2013. The rules will be more harmonised and the allocation of emission allowances will be increasingly based on auctioning. This offers us opportunities, because most of our production is CO2 free and we do not need to buy allowances for that production. The associated timescale of the anticipated regulatory opportunities will be the next 1-5 years.</p>	Other: increasing product price	1-5 years	Direct	Very likely	Medium-high
4	International agreements	<p>Basically our opportunities increase as far as the greenhouse gas emission reduction requirements become stricter, because we are better placed than our competitors to meet those regulations. The value of carbon free energy production increases, if the cost of emitting CO2 increases in the future. As a power and heat production company with low carbon dioxide emissions, Fortum will be a relative winner if the international agreement on a global market and carbon price is achieved. Clean Development Mechanism (CDM), one of the Kyoto Protocol's</p>	Reduced operational costs	1-5 years	Direct	Likely	Medium

		flexible mechanisms that can be used to supplement national emissions reduction measures is likely to continue on the post-2012 agreement. Fortum is a participant in two carbon funds that implement CDM and JI projects.					
5	Fuel/energy taxes and regulations	The Implementation of the EU Renewable Energy Sources (RES) target of 20% by 2020 also proceeded when the Member States had to submit their national action plans to the Commission by the end of June 2010. Finland has a target to increase the share of RES in final consumption to 38 % by 2020. The Swedish RES target is set at 49% by 2020. As the climate change mitigation requires reduction of fossil fuels e.g. in transportation there is a possibility to increase electricity consumption e.g. through electrification of transportation. Fortum has already taken an active role in this development work.	Increased demand for existing products/services	1-5 years	Indirect (Client)	Likely	Low-medium

6.1b

Please describe (i) the potential financial implications of the opportunity; (ii) the methods you are using to manage this opportunity; (iii) the costs associated with these actions

ID1 Voluntary agreements

(i) Increased efficiency in our own operations results in material and CO2 allowances cost savings. E.g. improving fuel efficiency by 0.5 percentage points generates total savings of up to half million euros in a 150-megawatt power plant.

(ii) Power Division's energy efficiency programme in 2008-2016 covers the power plants subject to the Finnish energy efficiency agreement and our Swedish hydropower plants. Other divisions also have their own energy efficiency projects. In Finland and Sweden Fortum targets 606,000 MWh/a energy efficiency improvements in 2008-2016.

The power plant modernisation programmes and the investments in new technology and capacity will improve energy efficiency in Russia, too. In 2010 Fortum and the Chelyabinsk Region Administration in Russia signed a Memorandum of Understanding on cooperation in the area of energy efficiency. The largest operation is the automation and upgrade of the Chelyabinsk district heating system, which will reduce energy losses in the area by over 30% and decrease our CO2 emissions by approximately 5 % in the area.

(iii) Power division's energy efficiency programme costs in 2008-2016 approximate EUR 80 million. For Heat Finland the cost is about EUR 5.3 million for the same period. Growth investments in new Russian energy efficient power generation capacity approximate EUR 1.5 billion from January 2011 onwards. The investment in the automation and upgrade of the Chelyabinsk district heating system is more than EUR 100 million.

ID2 Other regulatory drivers

(i) Increased demand for energy efficiency services and building sustainable cities could result in more demand for our operation, maintenance and expert services for power plants and industrial facilities as well as in large-scale business opportunities related to the infrastructure for sustainable cities. For example, an 1 % increase in our Performance Services sales would approximate EUR 60,000 (Performance Services 2010 sales EUR 5.9 million).

(ii) We help our customers achieve top availability and energy efficiency at their power plants with optimal operating and maintenance costs. We operate and maintain about 17,000 megawatts of electricity and 25,000 megawatts of heat generation capacity in Europe. Our portfolio covers structural modifications, systematic and preventive maintenance, and training of personnel in optimal operation and in monitoring the plant's operational economy.

Fortum is participating in the European electricity sector's Energy Wisdom programme and reports about its projects that improve energy efficiency and reduce greenhouse gases to the programme.

(iii) Fortum Ecotuning® is a year-long project to determine the weak links in a power plant's operational economy. The solution encompasses optimisation of the power plant's processes and training of the personnel. We optimise the energy efficiency of the customer's power plant and guarantee that the energy efficiency will achieve a savings or revenue gain of at least 500,000 euros during the one-year review period.

ID3 Cap and trade schemes

(i) The potentially higher price of CO2 allowances and the auctioning of CO2 allowances after the Kyoto period are likely to increase Nordic power prices and consequently Fortum's profitability. In electricity production, the key financial impact and future opportunity stems from higher achievable power sales price in the Nordic region. Basically, one euro in the achieved Nordic sales price increases Fortum's annual operating profit by approximately 50 million euros, assuming stable generation mix between different forms of power production, and excluding Russian operations.

(ii) Our investments in Europe target mainly CO2-free production. The investments will add 793 MW of electricity production capacity and 290 MW of heat production capacity by 2015.

(iii) In 2010 Fortum invested a total of EUR 214 million in CO2-free production. For example the value of investment for the new combined heat and power plant which Fortum is building in Klaipeda, Lithuania is around EUR 140 million. The new power plant will use municipal and industrial wastes and biomass as fuels. The production capacity will be approximately 50 megawatts (MW) heat and 20 MW electricity.

ID4 International agreements

(i) The value of our carbon free energy production increases, if the cost of emitting CO2 increases in the future. If CDM and JI are part of the post-2012 agreement Fortum can continue acquiring emissions units also through international carbon funds and Russian JI projects.

(ii) Our long-term goal is to be a carbon dioxide emissions-free power and heat company. The investments in Europe target mainly CO2-free production adding 793 MW of electricity production capacity and 290 MW of heat production capacity by 2015.

The Nordic electricity market functions as an example for the integration of Europe's electricity markets. Therefore, Fortum is very qualified to be a frontrunner in understanding, monitoring and anticipating the markets, in terms of investment choices or anticipating price development also on an international market.

Fortum has invested in the World Bank's Prototype Carbon Fund (PCF) and in the Nordic Environment Finance Corporation's Testing Ground Facility (TGF), a carbon fund operating in the Baltic Sea region.

(iii) In 2010 Fortum invested a total of EUR 214 million in CO2-free production.

We have invested a total of EUR 10 million in the mentioned carbon funds. The total amount of ERUs/CERs we will receive is estimated to be 1–1.5 million tonnes CO2 which approximates EUR 15–22.5 million if CO2 price is assumed to be EUR 15.

ID5 Fuel/energy taxes and regulations

(i) Developing infrastructure for electric cars in a large-scale offers Fortum new business opportunities. At the same time we create circumstances in which electricity can replace other energy forms. The demand for the electricity produced by us can therefore increase. E.g. 1 % increase in our electricity sales would approximate EUR 18 million.

(ii) We investigate and create conditions for the large-scale introduction of electric cars. This includes e.g. the planning and development of recharging systems and recharging points. Two pilot projects are currently ongoing in Sweden and Finland. An electric car can save about 60–70% of the energy used by a gasoline- or diesel-fuelled car.

(iii) Fortum's R&D costs which also cover the activities related to the electric car infrastructure development were EUR 30 million in 2010.

6.1c

Please describe the opportunities that are driven by changes in physical climate parameters

ID	Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact
1	Change in mean (average) temperature	Due to increasing temperature the demand of cooling energy will increase in the future. The increased demand for cooling offers new business opportunities for Fortum's business. We have opportunities to provide district cooling from our CHP plants in the Nordic and Baltic countries, Russia and Poland. District cooling is furthermore more climate friendly than individual house cooling.	Increased demand for existing products/services	6-10 years	Indirect (Client)	Likely	Low-medium
2	Change in precipitation pattern	Changing temperature and rainfall change the prerequisites for energy production and distribution. Changes in temperature would affect snow amount, seasonal river flow patterns and thus hydro power production. Changes in timing of river flow affect water regulation patterns and production planning. Fortum has studied the impact of climate change on hydrology in rivers with Fortum's	Increased production capacity	>10 years	Direct	About as likely as not	Low-medium

ID	Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact
		hydropower in Sweden and Finland. Hydropower is a very competitive form of production due to its CO2-free nature and in terms of variable costs. With hydropower, we can react quickly to different market conditions and operate competitively in the electricity markets.					
3	Snow and ice	Fortum has a long experience from operating in Nordic conditions. We are used to harsh winters and can deliver our customers the power they need also during heavy snowfalls. The experience gained in Northern Europe can be useful in our other operating countries, too. Climate change can increase the probability of heavy snowfalls for example in Poland. We are prepared to manage the challenges set by snow e.g. in storing of fuel or maintaining the district heating pipelines.	Reduced operational costs	Current	Direct	Likely	Medium
4	Induced changes in natural resources	Enhanced biomass growth due to higher average temperature may result in new bioenergy production opportunities. Nordic operating environment and the region's strong roots in the forest industry make biomass in particular a competitive alternative.	Reduced operational costs	6-10 years	Indirect (Supply chain)	Likely	Low-medium
5	Change in mean (average) temperature	Due to higher temperatures during the winter the Baltic Sea may be covered with ice for a shorter time during the year or not at all in the future. This can be an opportunity for our wind power production since operational and maintenance cost are lower in the sea areas due to milder winters. In the Nordic conditions sea-based wind power has better profitability than on-shore wind power due to more windy conditions.	Investment opportunities	6-10 years	Direct	More likely than not	Low-medium

6.1d

Please describe (i) the potential financial implications of the opportunity; (ii) the methods you are using to manage this opportunity; (iii) the costs associated with these actions

ID1 Change in mean (average) temperature

(i) Increased demand in district cooling would bring Fortum additional revenue. For example in Stockholm, the production capacity for district cooling is currently about 270 MW and we estimate that the need for cooling in downtown Stockholm will increase at a rate of about 10 MW per year. This means that the demand for district cooling will reach 375 MW by 2020.

(ii) We produce district heating mainly in combined heat and power (CHP) plants, in which heat and electricity is produced in the same process, and invest in new CHP. We could run cooling at our CHP plants, too, with relatively low costs. E.g., if 160 customers switched their traditional refrigeration to district cooling they could reduce their carbon dioxide emissions by 23,000 tonnes a year.

(iii) E.g. the investment cost of Pärnu CHP-plant in Estonia was around EUR 80 million (production capacity 24 MW electricity, 50 MW heat). The district cooling supply is assured year-round with minimal maintenance needed, which is reflected in reduced operating costs and lower investment requirements for our customers.

ID2 Change in precipitation pattern

(i) Hydropower is a very competitive form of production due to its CO₂-free nature and in terms of variable costs. With hydropower, we can also react quickly to different market conditions and operate competitively in the electricity markets. In some cases temperature increase may shift inflows to high demand season. As temperature changes also affect power demand, production and electricity prices, the financial impact is difficult to estimate.

(ii) In 2008–2011 Fortum carried out an internal R&D project on impacts of climate change on hydro production. In the project needs to adjust our methods to changing climate were assessed. Especially the methods for regulation and production planning need to be altered due to the changes in climate. Also the needs to change regulation limits were analysed to assure functional and secure water regulation in the future. Climate change impact can be taken into account in hydro power refurbishment projects.

Fortum's hydropower refurbishment programme will increase electricity production capacity by 10–20 MW per year by 2015. It includes investments in several hydropower plants to increase capacity, improve safety and maintain good plant availability.

Permit conditions for power plants and lake regulation define the limits for water level and flow variations. The permits also define obligations to prevent and compensate for other environmental impacts. In addition, in Sweden and Finland Fortum has voluntarily worked with authorities and local interest groups to agree on and implement additional restrictions and other projects to improve the environment and the use of the water systems. An example of the voluntary measures in Finland are the target values for water levels set for the regulated lakes of the Oulujoki river system, values that are more stringent than required in the permit, and the Oulujoki multiple use agreement.

In Sweden Fortum has set voluntary target values for water levels, the so-called soft limits, in several water systems. These water systems have been selected on the basis of social and environmental values, such as fishing and recreational use.

(iii) The costs of the R&D project on impacts of climate change on hydro production were appr. EUR 400,000. The costs of adjusting our methods such as production planning have not been assessed.

Fortum invests annually approximately EUR 50-60 million to hydropower of which about 30-50 % energy efficiency and maintenance investments and one third to dam safety.

Fortum's Environmental Fund supports projects that reduce the adverse environmental impacts of hydropower production and support biodiversity in built-up water systems. Funds come from the sales of "Ekoenergia" eco-labelled electricity in Finland and Bra Miljöval-labelled electricity in Sweden. At the end of 2010 the fund had a total of 1.6 million euros. The Fund's targets of research are chosen in collaboration with national nature conservation organisations.

ID3 Snow and ice

(i) The experience of Nordic winters can make the maintenance costs of grids lower in comparison to our competitors. This in turn, makes us to pay less compensation costs to customers due to power cuts. In 2010 Fortum paid appr. EUR 0.4 million in customer compensation due to power cuts. Maintenance costs (defined as fault repair) approximated EUR 20 million. We can also gain cost savings by appropriate storing of fuel and maintaining the district heating pipelines during winter.

(ii) To maintain and further improve reliability and quality we continuously invest in our electricity network. We secure overhead lines, replace overhead lines by cables in the ground, instal remote disconnectors to increase grid automation, and new connections of wind power parks to our network.

(iii) An EUR 200 million Reliability Investment Programme was launched in 2005. The aim of the programme is to halve the average yearly power outage time by 2011. In 2010, a total of EUR 213 million was invested in our network.

ID4 Induced changes in natural resources

(i) Enhanced biomass growth would increase the supply of biomass which in turn could decrease fuel price and Fortum's costs. Materials purchased were EUR 1,804 million in 2010 and contained mainly different fuels. In 2010 the share of biofuels of all energy sources used was 6 %.

(ii) In 2010 Fortum continued development work on pyrolysis technology in collaboration with Metso, UPM and VTT Technical Research Centre of Finland. Additionally, new fuel tests were conducted using e.g. crushed olive stones as fuel at the Värtan power plant in Stockholm.

(iii) Fortum's R&D costs which also include projects related to biomass use totalled EUR 30 million in 2010.

ID5 Change in mean (average) temperature

(i) Buiding offshore windmills would help us in meeting customer's increasing demand for renewable energy and bring Fortum additional revenues. In the Nordic conditions offshore wind power has better profitability than on-shore wind power due to more windy conditions in the sea.

(ii) Fortum has currently a few land-based wind power projects in the planning stage in Finland and Sweden. We could utilize the experience gained in these projects in offshore projects, too. In August 2010, Fortum announced that it will acquire a 40% stake in the Blaiken wind power project in Sweden.

(iii) According to the plan, the Blaiken wind farm will be built in phases, with construction to begin in 2011 and completed in 2015. The total investments during the project will amount to a maximum of 400 million euros, of which Fortum's share is 40%.

6.1e

Please describe the opportunities that are driven by changes in other climate-related developments

ID	Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact
1	Reputation	We believe that a good track record as a climate change mitigating company helps us to attract talented employees who are committed to the mitigation of climate change. Our good reputation thus helps us to meet the current and future competence needs and to develop and retain employee competence. The effort of every Fortum employee is needed to be able to meet the company's long-term aspiration of being a carbon dioxide-free power and heat company. We also have a good track record among other actors in the electric utility sector. This creates us new business opportunities since we can use our expertise in other companies' projects not only in the countries where we have operations but also in other countries.	New products/business services	Current	Direct	Very likely	Low-medium
2	Changing consumer behaviour	Urbanisation, re-localisation of industries and the rise in living standards, particularly in the big growth centres of Asia, are changing consumer habits and increasing energy consumption. The growing environmental awareness of consumers in Europe is motivating energy companies to make their operations and service offering more eco-friendly. Climate change and local environmental problems create a need for Fortum's core competence, CO2-free and energy-efficient solutions both in the countries where we already operate and in the new markets. The frequency at which consumers switch electricity suppliers is clearly on rise in all Nordic electricity markets. In Finland, for example, some 200.000 customers switched suppliers during 2009. An increasing number of household and business customers expect electricity retailers to provide information about the origin of the electricity they sell. As our production is CO2-free to a large extent (in 2009 about 91% of our power production was CO2-free in Europe) and we are working for the smart grids, we are well positioned to meet these needs. In 2010 66% of our power production was CO2- free. The	Increased demand for existing products/services	1-5 years	Direct	More likely than not	Low-medium

ID	Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact
		corresponding figure in Europe was 86 %. In Russia production based entirely on fossil fuels.					
3	Other drivers	Fortum's strength is the flexible, cost-efficient and climate-benign generation portfolio – and that will be our main asset also in the future. Use of a diverse range of energy sources in the production guarantees that for example changes in water reservoirs or prices of fuels don't effect us as much as if we produced energy using only one energy source. In 2010 the shares of different energy sources were: natural gas 40%, hydropower 18%, nuclear power 18%, coal 10%, biofuels 6%, oil 2%, waste fuels 1%, peat 1%, and heat pumps, wind power and other sources totalling 4%. In 2010 electricity produced at CHP plants accounted for some 30% of the total electricity production and CHP heat accounted for some 70% of total heat production. The role of new, renewable energy forms in production will still be minor in the near future: with the exception of hydropower, other pure solar-economy production forms are still in the development phase and will require significant support from society. Changes in the energy production system are slow, and the transition towards an emissions-free future will happen gradually. Our generation portfolio is also geographically diversified which helps in spreading the risk, too. We believe that being present in different countries and having a versatile production portfolio make Fortum share an attractive investment.	Increased stock price (market valuation)	Current	Direct	Likely	Medium-high
4	Other drivers	Diminishing natural resources, growing environmental problems and the rising prices of fuels are increasing electricity's relative share of total energy consumption. With electricity replacing other energy use, the total energy need and emissions are decreasing. A challenge for the energy sector is to boost the efficient use of energy while bringing electricity and modern energy systems to an increasing number of people. With energy-efficiency, the role of electricity is emphasised in the energy sector, a fact that offers opportunities for Fortum both in the markets we already operate in and in new markets.	Increased demand for existing products/services	1-5 years	Direct	Very likely	High

Please describe (i) the potential financial implications of the opportunity; (ii) the methods you are using to manage this opportunity; (iii) the costs associated with these actions

ID1 Reputation

(i) We have a good track record in the electric utility sector. Good reputation can result in new business opportunities and increase our sales in e.g. expert services we offer.

Reputation also affects the employee commitment. Talented and committed employees are the prerequisite for achieving the goals related to climate change mitigation and being a profitable company.

(ii) Our strong expertise in hydro power development and operation could be applied in new operating countries. We are e.g. preparing to participate in the tender processes for hydropower concessions in France.

The purpose of the Fortum Innovation Award is to inspire all employees to initiate ideas and innovations that increase the efficiency of current operations, create growth, promote sustainability, and secure long-term business and technology opportunities. In 2010 the winning team's initiative was a solution for the combustion of gas, created during the gasification of biofuels and waste, in a power plant boiler. The invention could have an impact on Fortum's CHP solutions-based growth. It also improves flexibility in the use of fuels.

(iii) Costs related to building good reputation are difficult to estimate since Fortum's reputation consist of all the actions we take and how we engage in dialogue with our stakeholders.

In 2010 the total sum granted to the winners of the Innovation Award was EUR 195,000.

ID2 Changing consumer behaviour

(i) Changing consumer behaviour can increase the demand for our low-carbon products which in turn can result in more sales. For example 1 % increase in sales for our 1.2 million private and business customers would represent EUR 18 million (electricity sales 2010 EUR 1,798 million).

At the moment the financial implications due to pricing of carbon-free electricity products are minor. Most of the labelled electricity is sold without an extra fee. In the future, price differentiation may result in increased income from these products and also the volume of them will increase.

The demand for our energy efficiency services can increase, too, if customers require more energy-efficient products from other industries. Entering to new markets is a growth opportunity for the company.

(ii) Fortum is investing substantially in CO₂-free production. Fortum is one of the world's leading companies in CHP production-related know-how. CHP production is environmentally-benign and energy-efficient because virtually all of the energy content of the fuel can be utilised. Our goal is to further reduce the environmental impacts by increasing energy production based on biofuels and waste.

Fortum has revised its product portfolio to meet the customers' expectations. In 2009 Fortum began selling only electricity that is produced without CO₂ emissions to its customers in the Nordic countries.

We also help our customers to save energy by installing smart meters to all our distribution customers in Norway, Finland, Sweden and Estonia. In Sweden about

900,000 meters are already installed and in Finland the installation of about 600,000 meters is on progress and to be done by the end of 2013. In Norway and Estonia the work will be done by the end of 2016.

(iii) In 2010 Fortum invested a total of EUR 214 million in CO2-free production.

Fortum's Environmental Fund supports projects that reduce the adverse environmental impacts of hydropower production and support biodiversity in built-up water systems. Funds come from the sales of "Ekoenergia" eco-labelled electricity in Finland and Bra Miljöval-labelled electricity in Sweden. At the end of 2010 the fund had a total of 1.6 million euros.

Eg. in Sweden the total value of the procurement of the smart meters approximated EUR 240 million. By monitoring energy consumption more closely than before customers can save approx. 5-10 % energy and the corresponding amount in their electricity bill.

ID3 Other drivers

(i) We believe that being present in different countries and having a versatile production portfolio affect Fortum's share value. During last ten years we have generated a EUR 26.2 billion increase in shareholder value and our share has outperformed most of its European peers.

Additionally, nuclear power and hydropower are very competitive forms of production due to their CO2-free nature and in terms of variable costs. With hydropower, we can react quickly to different market conditions and operate competitively in the electricity markets. CHP production is environmentally-benign and energy-efficient because virtually all of the energy content of the fuel can be utilised.

(ii) The investments in Europe target mainly CO2-free production. The investments will add 793 MW of electricity production capacity and 290 MW of heat production capacity by 2015. The investment programme to be finalised in Russia is based mainly on the use of natural gas. The investments in Russia will add 2,360 MW of electricity production capacity and 740 MW of heat production capacity.

Future growth opportunities can be foreseen in the liberalising energy markets in Europe and Asia. For example, we inaugurated a CHP plant in Czestochowa, Poland in 2010, and acquired two power and heat companies at the beginning of 2011.

We also continue our hydropower refurbishment programme and modernisation, capacity upgrade and lifetime extension projects in nuclear power.

(iii) In 2010 Fortum's investments totalled EUR 1.2 billion, 214 million of which was for CO2-free production. Investments in renewable energy forms were EUR 182 million.

In the beginning of 2011 Fortum acquired 85% of shares of two Polish power and heat companies for approximately EUR 20.6 million (PLN 82 million). EC Zabrze's sales in 2009 totalled EUR 20 million and ZEC Bytom's EUR 19 million.

ID4 Other drivers

(i) Increased demand of electricity would be likely to increase Fortum's electricity sales. Also the demand for our sustainable solutions related to future sustainable living would be likely to increase.

(ii) Fortum is developing solutions to reduce the climate impacts of energy use in housing, transportation and electricity distribution. Already today smart meters are helping our customers monitor electricity consumption and conserve electricity.

We are investing in more electricity generation capacity. In Europe the investments will add 793 MW of electricity production capacity and in Russia 2,360 MW. We are also continuing our hydropower refurbishment programme and modernisation, capacity upgrade and lifetime extension projects in nuclear power.

(iii) Fortum's R&D costs which cover e.g. activities related to the electric car infrastructure and smart grids, were EUR 30 million in 2010. Eg. in Sweden the total value of the procurement of about 900,000 smart meters approximated EUR 240 million. In 2010 Fortum's investments totalled EUR 1.2 billion, 214 million of which was for CO2-free production.

Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading [Investor]

Page: 7. Emissions Methodology

7.1

Please provide your base year and base year emissions (Scopes 1 and 2)

Base year	Scope 1 Base year emissions (metric tonnes CO2e)	Scope 2 Base year emissions (metric tonnes CO2e)
Sun 01 Jan 2006 - Sun 31 Dec 2006	11000000	400000

7.2

Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

Please select the published methodologies that you use

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

7.2a If you have selected "Other", please provide details below

7.3

Please give the source for the global warming potentials you have used

Gas	Reference
CO2	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	IPCC Fourth Assessment Report (AR4 - 100 year)
PFCs	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	IPCC Fourth Assessment Report (AR4 - 100 year)

7.4

Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data

Fuel/Material/Energy	Emission Factor	Unit	Reference
			Statistic Finland (attached)

Further Information

After the base year 2006 Fortum has invested heavily in Russia. No recalculated base year emission figures are available, however. Therefore, when comparing base year and current scope 1 emissions, the increase of approximately 14.6 Mt CO₂e from new Russian capacity should be accounted for.

Attachments

[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/7.EmissionsMethodology/Tilastokeskus polttoaineluokitus 2010.xlsx](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/7.EmissionsMethodology/Tilastokeskus%20polttoaineluokitus%202010.xlsx)

8.1

Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory

Financial control

8.2a

Please provide your gross global Scope 1 emissions figure in metric tonnes CO2e

25600000

8.3a

Please provide your gross global Scope 2 emissions figure in metric tonnes CO2e

104279

8.4

Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions which are not included in your disclosure?

No

8.5

Please estimate the level of uncertainty of the total gross global Scope 1 and Scope 2 figures that you have supplied and specify the sources of uncertainty in your data gathering, handling, and calculations

Scope	Uncertainty Range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	More than 2% but less than or equal to 5%	Published Emissions Factors	40% of the emissions are subject to EU emission trading and are very accurately followed and verified by a third party and have an uncertainty below 2%. Major part of the remaining 60% are calculated with appropriate national or international emissions factors and have an uncertainty from 2% to 5%. The result is an estimated total uncertainty from 2% to 3%.
Scope 2	More than 2% but less than or equal to 5%	Assumptions Published Emissions Factors	Most of Fortum's scope 2 emissions are from purchased electricity. Over 90% of the electricity purchases are from CO2-free sources. The emissions of the remaining share are calculated with net average factors. The assumption that net average emission factors give the actual GHG impact of Fortum's electricity purchases give an estimated uncertainty from 2% to 5%. The average factors consider an average annual production mix instead of real-time hourly changing mix. The actual specific average emissions in the Nordic electricity net varies heavily over the year.

8.6

Please indicate the verification/assurance status that applies to your Scope 1 emissions

Verification or assurance complete

8.6a

Please indicate the proportion of your Scope 1 emissions that are verified/assured

More than 90% but less than or equal to 100%

8.6b

Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Type of verification or assurance	Relevant standard	Relevant statement attached
Limited assurance (qualified)	AA1000 Assurance Standard	Excerpt of the assurance statement by PricewaterhouseCoopers Oy: "Based on our limited assurance engagement nothing has come to our attention that would cause us to believe that Fortum Corporation would not adhere, in all material respects, to the AA1000 AccountAbility Principles. Furthermore nothing has come to our attention that would cause us to believe that Fortum Corporation's Sustainability information has not been prepared, in all material respects, in accordance with the Reporting criteria, or that the Sustainability information would not be reliable, in all material respects, based on the reporting criteria." For full statement see Fortum's Sustainability Report 2010 pp.66-67.
Verification	EC Directive 2003/87/EC Annex V and 2007/589/EC as amended	40% of scope 1 emissions are subject to verification in accordance with the emissions trading scheme procedure. The verifications are performed by local third party auditors at each of the sites under the emission trading scheme.

8.7

Please indicate the verification/assurance status that applies to your Scope 2 emissions

Verification or assurance complete

8.7a

Please indicate the proportion of your Scope 2 emissions that are verified/assured

More than 90% but less than or equal to 100%

8.7b

Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Type of verification or assurance	Relevant standard	Relevant statement attached
Limited assurance (qualified)	AA1000 Assurance Standard	Excerpt of the assurance statement by PricewaterhouseCoopers Oy: "Based on our limited assurance engagement nothing has come to our attention that would cause us to believe that Fortum Corporation would not adhere, in all material respects, to the AA1000 AccountAbility Principles. Furthermore nothing has come to our attention that would cause us to believe that Fortum Corporation's Sustainability information has not been prepared, in all material respects, in accordance with the Reporting criteria, or that the Sustainability information would not be reliable, in all material respects, based on the reporting criteria." For full statement see Fortum's Sustainability Report 2010 pp.66-67.

8.8

Are carbon dioxide emissions from the combustion of biologically sequestered carbon (i.e. carbon dioxide emissions from burning biomass/biofuels) relevant to your company?

Yes

8.8a

Please provide the emissions in metric tonnes CO₂e

3830000

Further Information

See the Independent Assurance Report on pages 66-67 of Fortum's Sustainability Report 2010.

Attachments

Page: 9. Scope 1 Emissions Breakdown - (1 Jan 2010 - 31 Dec 2010)

9.1

Do you have Scope 1 emissions sources in more than one country or region (if covered by emissions regulation at a regional level)?

Yes

9.1a

Please complete the table below

Country	Scope 1 metric tonnes CO2e
Finland	7780000
Sweden	1450000
Norway	15800
Russia	14700000
Estonia	305000
Latvia	63000
Lithuania	10000
Poland	550000
United Kingdom	755000

9.2 Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)

By business division
By facility
By GHG type
By activity

9.2a Please break down your total gross global Scope 1 emissions by business division

Business Division	Scope 1 metric tonnes CO2e
Power	4700000
Heat	6200000
Russia	14700000

9.2b Please break down your total gross global Scope 1 emissions by facility

Facility	Scope 1 metric tonnes CO2e
Tyumen CHP2	3010000
Loviisa	556
Tobolsk CHP	2540000
Tyumen CHP1	2110000
Chelyabinsk CHP3	1580000
Värtaverket, Stockholm	883000
Grangemouth	755000
Suomenoja	1020000
Meri-Pori	2810000
Naantali	1640000

9.2c

Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 metric tonnes CO2e
CO2	25300000
N2O	260000
CH4	51000

9.2d

Please break down your total gross global Scope 1 emissions by activity

Activity	Scope 1 metric tonnes CO2e
Power generation	12950000
Heat production	12650000
Business travel by road	5000

Further Information

The facilities reported here are Fortum's ten largest facilities by total production volumes in 2010.

10.1

Do you have Scope 2 emissions sources in more than one country or region (if covered by emissions regulation at a regional level)?

Yes

10.1a

Please complete the table below

Country	Scope 2 metric tonnes CO2e
Finland	33600
Sweden	179
Norway	23000
Other: Others	47500

10.2

Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

By business division

By facility

By activity

10.2a

Please break down your total gross global Scope 2 emissions by business division

Business division	Scope 2 metric tonnes CO2e
Russia	35000
Heat	59279
Power	10000

10.2b

Please break down your total gross global Scope 2 emissions by facility

Facility	Scope 2 metric tonnes CO2e
Tyumen CHP2	10000
Loviisa	0
Tobolsk CHP	7800
Tyumen CHP1	8000
Chelyabinsk CHP3	6000
Värtaverket, Stockholm	100
Grangemouth	0
Suomenoja	0
Meri-Pori	0
Naantali	0

10.2c

Please break down your total gross global Scope 2 emissions by activity

Activity	Scope 2 metric tonnes CO2e
Power generation	41500
Heat generation	62500

Further Information

The facilities reported here are Fortum's ten largest facilities by total production volumes in 2010. The figures per facility are based on shares of purchased electricity and heat, all figures are not accurate.

Page: 11. Emissions Scope 2 Contractual

11.1

Do you consider that the grid average factors used to report Scope 2 emissions in Question 8.3 reflect the contractual arrangements you have with electricity suppliers?

No

11.1a

You may report a total contractual Scope 2 figure in response to this question. Please provide your total global contractual Scope 2 GHG emissions figure in metric tonnes CO2e

104000

11.1b**Explain the basis of the alternative figure (see guidance)**

Major part of the need of external electricity at Fortum's power plants are covered by internal purchases of Fortum's CO2-free electricity. This quantities are earmarked for the company's own use of CO2-free electricity and thus the green value cannot be sold elsewhere. Minor parts of the demand for external electricity is covered by purchases from the market, and here grid averages are applied.

11.2

Has your organization retired any certificates, e.g. Renewable Energy Certificates, associated with zero or low carbon electricity within the reporting year or has this been done on your behalf?

Yes

11.2a Please provide details including the number and type of certificates

Type of certificate	Number of certificates	Comments
Other: Certified emission reductions	3540	Retired as a compensation of CO2 emissions from Fortum's business travelling by air during 2009. This offsetting was carried out during 2010. Corresponding emissions for 2010 will be offsetted during 2011.
Renewable Energy Guarantees of Origin (RE-GO)	3900285	Guarantees of Origin have been used for different environmentally labelled electricity products in Sweden and Finland.

12.1 What percentage of your total operational spend in the reporting year was on energy?

More than 20% but less than or equal to 25%

12.2 Please state how much fuel, electricity, heat, steam, and cooling in MWh your organization has consumed during the reporting year

Energy type	MWh
Fuel	139181000
Electricity	2765000
Heat	0
Steam	2357000
Cooling	0

12.3 Please complete the table by breaking down the total "Fuel" figure entered above by fuel type

Fuels	MWh
Natural gas	76726000
Sub bituminous coal	23802000
Distillate fuel oil No 4	2929000
Peat	1352000
Wood or wood waste	8822000
Biogas	38600
Refuse-derived fuel	1485000
Other: Nuclear fuel	23910000
Other: Other fuels	115000

13.1

How do your absolute emissions (Scope 1 and 2 combined) for the reporting year compare to the previous year?

Increased

13.1a

Please complete the table

Reason	Emissions value (percentage)	Direction of change	Comment
Acquisitions	1	Increase	Acquisition of Nokia CHP plant.
Change in output	15	Increase	Total production volumes of power and heat increased by 7 percent. Almost 50% of the growth was in coal, which has higher emissions than Fortum's other energy sources. The use of coal increased mainly due to colder than usual winter.
Emissions reduction activities	3	Decrease	Fortum's CO ₂ -free production increased with 8% in total. This includes a 3% growth in nuclear power, 12% growth in biofuelled power and heat, and a 129% growth in other renewables like wood waste-derived fuels.
Emissions reduction activities	2	Decrease	Inauguration of 3 new CHP plants have increased energy efficiency and decreased emissions by replacing separated power and heat production.
Emissions reduction activities	9	Decrease	Upgrade and modernisation of nuclear power plants has increased the output of CO ₂ free electricity by almost 5 TWh. The alternative would have been a coal-fired power plant. Thus avoided emissions can be estimated at 2 Mt CO ₂ .
Emissions reduction activities	1	Decrease	Hydropower production has increased by approximately 170 GWh due to refurbishment of over 20 hydropower plants in Finland and Sweden. Avoided emissions are estimated at 150 kt CO ₂ annually.
Emissions reduction activities	6	Decrease	Fuel switch in Kirkniemi, Kauttua, Värtan, Hässelby and Joensuu power plants give an annual emission reduction of 1.4 Mt CO ₂ . In the projects coal has been replaced with natural gas and biofuels.
Emissions reduction activities	1	Decrease	Fortum's energy efficiency programme covers sites in Loviisa, Inkoo, Meri-Pori, hydropower plants in Finland and Sweden, other sites in Heat division Finland and additional wind power capacity. The total energy savings are estimated at 600 GWh which corresponds to roughly 1% in CO ₂ emissions when production with coal and gas is avoided.

13.2

Please describe your gross combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Explanation
0.0041	metric tonnes CO2e	unit total revenue	0.4	Decrease	Fortum divested 30 small heat plants with higher than average emission intensity. Simultaneously new energy efficient CHP plants with lower emission intensity were inaugurated (3) and acquired (1).

13.3

Please describe your gross combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per full time equivalent (FTE) employee

Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Explanation
2304	metric tonnes CO2e	FTE Employee	37	Increase	Number of employees decreased by 16% and production increased by 8% from previous year. The share of coal condensing in the production mix was higher than normal due to colder than usual winter.

13.4

Please provide an additional intensity (normalized) metric that is appropriate to your business operations

Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Explanation
0.196	metric tonnes CO2e	megawatt hour (MWh)	14	Increase	Due to colder than usual winter, the use of coal increased with almost 50%.

14.1

Do you participate in any emission trading schemes?

Yes

14.1a

Please complete the following table for each of the emission trading schemes in which you participate

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO2e	Details of ownership
European Union ETS	Fri 01 Jan 2010 - Fri 31 Dec 2010	5600000	4100000	9700000	Facilities we own and operate

14.1b

What is your strategy for complying with the schemes in which you participate or anticipate participating?

Fortum's strategy complying with the EU ETS comprises of three main elements: emission reduction measures including efficiency upgrades in our own installations (in-house abatement), operation in the emissions trading scheme (purchase and selling of allowances) and the use of project based emission reduction credits (Kyoto mechanisms). The individual compliance and trading strategies are defined by the relevant business divisions. Fortum's Trading and Industrial Intelligence Unit is responsible for the daily operations in allowance trading including the market follow-up and analysis. They provide other business units information and forecasts on the carbon market. In addition to own production Fortum has proprietary trading book. At 31 December 2010 the trading volumes of sold and bought CO2 allowances were 5,225 kilo- tonnes CO2 and 8,882 kilotonnes CO2. The respective net fair values were EUR 7 million and EUR -7 million.

EU ETS applied to 38% of Fortum's total CO2 emissions in 2010. Fortum had 129 installations in the scheme in six EU countries.

14.2 Has your company originated any project-based carbon credits or purchased any within the reporting period?

Yes

14.2a Please complete the following table

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes of CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits retired	Purpose e.g. compliance
Credit Purchase	Other: several CDM project types in the Fund	Credits originate from the project portfolio of the World Bank's Prototype Carbon Fund (PCF). PCF has 18 CDM projects ongoing.	CDM	90022	90022	No	Other: purpose not yet defined
Credit Purchase	Other: several JI project types in the Fund	Credits originate from the project portfolio of the World Bank's Prototype Carbon Fund (PCF). PCF has 6 JI projects ongoing.	JI	36319	36319	No	Other: purpose not yet defined
Credit Purchase	Hydro	Credits originate from the Chinese Xiaogushan hydro power project of the World Bank's Prototype Carbon Fund (PCF).	CDM	3540	3540	Yes	Voluntary Offsetting
Credit Origination	Energy efficiency: own generation	Fortum's project at Tyumen CHP-1 plant was approved as a Joint Implementation project by the Russian Government in December 2010. Verification of the emission reduction will be completed later, so the number of credits is not yet available.	JI			No	Other: purpose not yet defined

Further Information

The carbon credits received are verified and issued according to the United Nations CDM and JI procedures. The retirement of the credits is carried out according to the EU ETS rules when the credits are used for compliance purposes under the EU ETS. When credits are sold to the secondary market, they are transferred from our accounts to the corresponding accounts of the buyer. Part of the credits have been used for voluntary offsetting (compensation of the emissions of air travelling of Fortum's employees)

15.1

Please provide data on sources of Scope 3 emissions that are relevant to your organization

Sources of Scope 3 emissions	metric tonnes CO2e	Methodology	If you cannot provide a figure for emissions, please describe them
Fuel- and energy-related activities (not included in Scope 1 or 2)	5580000	Value chain of fuels: production, processing, transmission and storage. Natural gas pipeline emissions from literature. Fugitive emissions by IPCC Guidelines. Use of diesel in peat extraction and handling; fugitive emissions from stockpile and milling; emissions from road transport of peat; according to research. Nuclear fuel extraction, enrichment; nuclear power plant operation, building and decommissioning; waste facilities operations, building and decommissioning of waste facilities; according to environmental product declarations.	
Business travel	3840	Fuel consumption factors from calculation system for traffic exhaust emissions and energy consumption in Finland (LIPASTO). CH4 and N2O calculated with IPCC factors.	
Use of sold products	70900	Use of town gas (in Stockholm). CO2-emission factor 77,5 /MJ /Naturvårdsverkets författningssamling, NFS 2005:6. IPCC Guidelines: default emission factors for stationary combustion in the residential and agriculture/forestry/fishing/fishing farms categories, "Gas Works Gas".	

15.2

Please indicate the verification/assurance status that applies to your Scope 3 emissions

Verification or assurance complete

15.2a

Please indicate the proportion of your Scope 3 emissions that are verified/assured

More than 90% but less than or equal to 100%

15.2b

Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Type of verification or assurance	Relevant standard	Relevant statement attached
Limited assurance (qualified)	AA1000 Assurance Standard	The total scope3 emissions have been assured. Excerpt of the assurance statement by PricewaterhouseCoopers Oy: "Based on our limited assurance engagement nothing has come to our attention that would cause us to believe that Fortum Corporation would not adhere, in all material respects, to the AA1000 AccountAbility Principles. Furthermore nothing has come to our attention that would cause us to believe that Fortum Corporation's Sustainability information has not been prepared, in all material respects, in accordance with the Reporting criteria, or that the Sustainability information would not be reliable, in all material respects, based on the reporting criteria." For full statement see Fortum's Sustainability Report 2010 pp.66-67.

15.3

How do your absolute Scope 3 emissions for the reporting year compare to the previous year?

Increased

15.3a

Please complete the table

Reason	Emissions value (percentage)	Direction of Change	Comment
Change in output	10	Increase	99% of Fortum's scope 3 emissions originate from the value chain of fuels. Production was increased by 7% and fuel consumption by 9% because lower efficiency condensing power plants had to be run during the colder than usual winter months.

Further Information

For detailed information, see attached Fortum's GHG Analysis 2010.

Attachments

[https://www.cdproject.net/Sites/2011/82/6582/Investor CDP 2011/Shared Documents/Attachments/InvestorCDP2011/15.Scope3Emissions/110224Fortum_GHG_value_chain_2010_final.pdf](https://www.cdproject.net/Sites/2011/82/6582/Investor%20CDP%202011/Shared%20Documents/Attachments/InvestorCDP2011/15.Scope3Emissions/110224Fortum_GHG_value_chain_2010_final.pdf)

Module: Electric utilities**Page: 2011-Investor-Electrical 1 Reporting Years**

EU0.1**Reference dates**

Please enter the dates for the periods for which you will be providing data. The years given as column headings in subsequent tables correspond to the “year ending” dates selected below. It is requested that you report emissions for: (i) the current reporting year; (ii) one other year of historical data (i.e. before the current reporting year); and, (iii) one year of forecasted data (beyond 2015 if possible).

Year ending	Date range
2010	Fri 01 Jan 2010 - Fri 31 Dec 2010
2006	Sun 01 Jan 2006 - Sun 31 Dec 2006
2016	Fri 01 Jan 2016 - Sat 31 Dec 2016

EU1.1

In each column, please give a total figure for all the countries for which you will be providing data for the “year ending” periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)
2006	10900	54200	5800000	0.107
2010	14300	69800	12800000	0.189
2016	17600	87000	18500000	0.210

Further Information

The emissions reported here include all absolute CO2 emissions related to electricity generation. Production of heat is not included in capacities, production or emission figures. The increase is mainly due to investments in Russia.

EU2.1

Please select the energy sources/fuels that you use to generate electricity in this country

Solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity(metric tonnes of CO2e/MWh)

Total thermal including solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)

Total figures for this country

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emission intensity (metric tonnes CO2e/MWh)

Further Information

No significant operations

EU2.1

Please select the energy sources/fuels that you use to generate electricity in this country

Coal - Hard
 Nuclear
 Hydro
 Other

Coal - Hard

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)
2006	1600	4630	4020000	0.87
2010	1600	4540	3800000	0.84
2016	1600	3300	2800000	0.85

Nuclear

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
2006	1430	11500
2010	1440	11500
2016	1840	14700

Hydro

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
2006	1450	5600
2010	1520	6600
2016	1560	6800

Other

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2006	2200	13600	3771000	0.28
2010	2360	12400	3265000	0.26
2016	2360	12400	3265000	0.26

Solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity(metric tonnes of CO2e/MWh)
2006	350	3800	0	0
2010	350	3085	0	0
2016	350	3100	0	0

Total thermal including solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)
2006	3800	18300	7791000	0.43
2010	3960	16600	7065000	0.43
2016	3960	15700	6065000	0.4

Total figures for this country

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emission intensity (metric tonnes CO2e/MWh)
2006	8280	35400	7791000	0.22
2010	8520	34700	7065000	0.20
2016	8960	37200	6065000	0.16

Further Information

There are no official records for country specific activities broken down by energy source. The figures are best estimates. The projection is based on the investment programme disclosed in Fortum's Annual Report and Sustainability Report 2010.
For CHP, the figures include capacity, production and emissions for both power and heat.

EU2.1 Please select the energy sources/fuels that you use to generate electricity in this country

Solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity(metric tonnes of CO2e/MWh)

Total thermal including solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)

Total figures for this country

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emission intensity (metric tonnes CO2e/MWh)

Further Information

No significant operations

EU2.1 Please select the energy sources/fuels that you use to generate electricity in this country

Solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity(metric tonnes of CO2e/MWh)

Total thermal including solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)

Total figures for this country

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emission intensity (metric tonnes CO2e/MWh)

Further Information

No significant operations

EU2.1 Please select the energy sources/fuels that you use to generate electricity in this country

Solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO ₂ e)	Emission intensity(metric tonnes of CO ₂ e/MWh)

Total thermal including solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO ₂ e)	Emission intensity (metric tonnes CO ₂ e/MWh)

Total figures for this country

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO ₂ e)	Emission intensity (metric tonnes CO ₂ e/MWh)

Further Information

No significant operations

[Page: 2011-Investor-Electrical 2 - EnergyFuelSelection - Poland](#)

EU2.1

Please select the energy sources/fuels that you use to generate electricity in this country

Solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity(metric tonnes of CO2e/MWh)

Total thermal including solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)

Total figures for this country

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emission intensity (metric tonnes CO2e/MWh)

Further Information

No significant operations

[Page: 2011-Investor-Electrical 2 - EnergyFuelSelection - Russia](#)

EU2.1

Please select the energy sources/fuels that you use to generate electricity in this country

CCGT
Other

CCGT

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2006	0	0	0	0
2010	0	0	0	0
2016	1250	3500	1200000	0.4

Other

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2006	0	0	0	0
2010	15100	42100	14600000	0.347
2016	16950	47300	16400000	0.35

Solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity(metric tonnes of CO2e/MWh)
2006	0	0	0	0
2010	0	0	0	0
2016	0	0	0	0

Total thermal including solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)
2006	0	0	0	0
2010	15100	42100	14600000	0.347
2016	18200	50800	17600000	0.35

Total figures for this country

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emission intensity (metric tonnes CO2e/MWh)
2006	0	0	0	0
2010	15100	42100	14600000	0.347
2016	18200	50800	17600000	0.35

Further Information

There are no official records for country specific activities broken down by energy source. The figures are best estimates. The projection is based on the investment programme disclosed in Fortum's Annual Report and Sustainability Report 2010.
For CHP, the figures include capacity, production and emissions for both power and heat.

EU2.1

Please select the energy sources/fuels that you use to generate electricity in this country

- Oil & gas (excluding CCGT)
- Nuclear
- Hydro
- Other renewables
- Other

Oil & gas (excluding CCGT)

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emissions intensity (metric tonnes CO2e/MWh)
2006	300	59	47000	0.8
2010	300	47	38000	0.8
2016	300	50	40000	0.8

Nuclear

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
2006	1670	12800
2010	1780	10500
2016	1940	14000

Hydro

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
2006	3150	14200
2010	3160	15500
2016	3220	15800

Other renewables

Please complete the following table for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)
2006	0	0
2010	0	0
2016	100	280

Other

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO ₂ e)	Emissions intensity (metric tonnes CO ₂ e/MWh)
2006	1800	5500	800000	0.15
2010	1800	5800	1047000	0.18
2016	1880	6000	1047000	0.17

Solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity(metric tonnes of CO2e/MWh)
2006	1200	3000	0	0
2010	1200	3360	0	0
2016	1200	3360	0	0

Total thermal including solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)
2006	3300	8550	850000	0.1
2010	3300	9200	1100000	0.1
2016	3380	9400	1100000	0.1

Total figures for this country

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emission intensity (metric tonnes CO2e/MWh)
2006	8120	35500	850000	0.02
2010	8140	27900	1100000	0.04
2016	8640	28300	1100000	0.04

Further Information

There are no official records for country specific activities broken down by energy source. The figures are best estimates. The projection is based on the investment programme disclosed in Fortum's Annual Report and Sustainability Report 2010. For CHP, the figures include capacity, production and emissions for both power and heat.

EU2.1

Please select the energy sources/fuels that you use to generate electricity in this country

Solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity(metric tonnes of CO2e/MWh)

Total thermal including solid biomass

Please complete for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes CO2e)	Emission intensity (metric tonnes CO2e/MWh)

Total figures for this country

Please enter total figures for this country for the "year ending" periods that you selected in answer to EU0.1

Year ending	Nameplate capacity (MW)	Production (GWh)	Absolute emissions (metric tonnes in CO2e)	Emission intensity (metric tonnes CO2e/MWh)

Further Information

No significant operations

Page: 2011-Investor-EU3 Renewable electricity sourcing regulations

EU3.1

In certain countries, e.g. Italy, the UK, the USA, electricity suppliers are required by regulation to incorporate a certain amount of renewable electricity in their energy mix. Is your company subject to such regulatory requirements?

No

Page: 2011-Investor-EU4 Renewable electricity development

EU4.1

Please give the contribution of renewable electricity to your company's EBITDA (Earnings Before Interest, Tax, Depreciation and Amortisation) in the current reporting year in either monetary terms or as a percentage

Please give:	Monetary figure	%	Comment
Renewable electricity's contribution to EBITDA		40%	Estimated figure. In 2010, 35% of Fortum's power generation was renewable. Fortum's Electricity Sales purchases electricity from the Nordpool market and sells it to customers. All Fortum's electricity products to customers are CO2 free. Additionally Fortum sells district heat, cooling, town gas and expert services.

EU4.2

Please give the projected contribution of renewable electricity to your company's EBITDA at a given point in the future in either monetary terms or as a percentage

Please give:	Monetary figure	%	Year ending	Comment
Renewable electricity's contribution to EBITDA		40%	2016	It can be estimated that the contribution of renewable electricity stays roughly on the current level.

EU4.3

Please give capital expenditure (capex) planned for the development of renewable electricity capacity in monetary terms and as a percentage of total capex planned for power generation in the current capex plan

Please give:	Monetary figure	%	End year of capex plan	Comment
Capex planned for renewable electricity development	52000000	8%	2015	The monetary figure is the EUR amount invested in renewable electricity capacity in 2010. The percentage is the share of renewable capacity in MW in the current investment plan until end of 2015.

Module: Sign Off

Page: Sign Off

Please enter the name of the individual that has signed off (approved) the response and their job title

Kari Kankaanpää,
Sustainability Manager, Climate and Environmental Affairs,
e-mail: kari.t.kankaanpaa@fortum.com
Tel. +358 10 4532330