Fortum's Annual Report 2014

Fortum is an energy company highly committed to sustainability. We strive to respond to the needs of our customers by generating, selling and distributing low-carbon electricity and heat and by offering energy-sector expert services.

Emissions

EN15 Direct greenhouse gas (GHG) emissions (Scope 1)

Our direct greenhouse emissions were 20.5 (2013: 20.7) million CO_2-equivalent tonnes.

The share of carbon dioxide from direct greenhouse gas emissions was over 99%.

The share of direct greenhouse gas emissions of our total greenhouse gas emissions was 80%.

Direct GHG emissions in 2012-2014

$MtCO_2eq$	2014	2013	2012[1)]
CO_2	20.3	20.5	20.7
CH_4	0.01	0.01	0.1
N_2O	0.15	0.14	0.2
HFCs	0.0	0.008	0.005
SF_6	0.0	0.001	0.001
Total	**20.5**	**20.7**	**21.0**

1) Includes joint venture AB Fortum Värme samägt med Stockholms Stad

Of the carbon dioxide emissions, 82% (2013: 75%) originated from the Russian operations and 11% (2013: 17%) from Finland. Carbon dioxide emissions increased in Russia with the commissioning of the new capacity and decreased in Finland due to the decline in condensing power production.

Fortum's direct biogenic carbon dioxide emissions were 1.3 (2013: 1.2) million tonnes.

Joint venture Fortum Värme's direct greenhouse gas emissions were 1,0 (2013: 1,0) million tonnes and direct biogenic carbon dioxide emissions 1.3 (2013: 1.2) million tonnes.

Carbon dioxide emissions as well as methane and nitrous oxide emissions have been calculated based on plant-specific fuel data.

Specific CO_2 emission factors are based on IPCC publications.

The specific CO_2 emissions from electricity generation, as requested by the document "Electric Utilities Sector Disclosures", are shown under the indicator EN18.

EN16 Indirect greenhouse gas (GHG) emissions (Scope 2)

Greenhouse gas emissions from the production of electricity purchased for our own use were 136,000 tonnes of carbon dioxide equivalent. Carbon dioxide emissions accounted for over 99% of this.

The share of Scope 2 greenhouse gas emissions of our total greenhouse gas emissions was 1%.

Scope 2 greenhouse gases of joint venture Fortum Värme were 56,000 tonnes.

The Scope 2 emissions have been estimated on the basis of country-specific breakdowns of electricity production.

Fortum Markets buys the electricity sold to customers from the Nordic electricity exchange. Scope 2 greenhouse gas emissions are not known for the production of the electricity sold in the electricity exchange. Consequently, we can not estimate the share of Scope 2 greenhouse gas emissions in the electricity sold to customers.

Indirect GHG emissions (Scope 2) by country in 2014

tCO_2eq	2014
Finland	5,000
Sweden	2,000
Russia	119,000
Other countries	10,000
Total	**136,000**

Indirect GHG emissions (Scope 2) in 2012-2014

tCO_2eq	2014	2013[1)]	2012[1)]

CO_2	136,000	309,000	143,000
CH_4	57	600	300
N_2O	389	5,200	3,300
Total	**136,000**	**315,000**	**147,000**

1) Includes joint venture AB Fortum Värme samägt med Stockholms Stad

EN17 Other indirect greenhouse gas (GHG) emissions (Scope 3)

Since 2013, we have reported the Scope 3 greenhouse emissions in accordance with requirements of the Corporate Value Chain (Scope 3) Accounting and Reporting standard.

The majority of our Scope 3 emissions are caused by the production and transportation of fuels, purchases of goods and services, and investments. Other activities (e.g. employee travel and waste management) account for less than 1%.

In 2014, our Scope 3 greenhouse gas emissions were an estimated 5.0 million tonnes. This was 19% of our total greenhouse gas emissions.

We estimate that all of our Scope 3 greenhouse gases come from fossil energy sources.

The Scope 3 greenhouse gas emissions of joint venture Fortum Värme were 260,000 tonnes.

The volumes describing the scope of the various activities have been obtained from our monitoring and reporting system. The specific emission factors used in calculating the greenhouse gas emissions are based on different literature sources.

Indirect GHG emissions (Scope 3) in 2013-2014

tCO_2eq	2014	2013[1)]
Fuel procurement	4,800,000	4,919,000
Purchased good and services	112,000	286,000
Capital goods	51,000	196,000
Other activities	21,000	61,000
Total	**4,984,000**	**5,462,000**

1) Includes joint venture AB Fortum Värme samägt med Stockholms Stad

EN18 Greenhouse gas (GHG) emissions intensity

Our specific CO_2 emissions (Scope 1) from total energy production were 189 (2013: 204) g/kWh. The five-year average, including 2014, increased to 198 (2013: 197) g/kWh. The five-year average of the specific CO_2 emissions from total energy production have been increasing during the last five years, although we are below the target level of <200 g/kWh. The increase in the specific emissions is a result of the increase in the relative share of our Russian energy production based on natural gas and coal in our total production.

Our specific CO_2 emissions (Scope 1) from power production in the EU were 39 (2013: 64) g/kWh and the five-year average, including 2014, was 60 (2013: 60) g/kWh. The specific CO_2 emissions from our power production are low compared to other European power producers. Our specific emissions in 2013 were about one-fifth of the 328 g/kWh average specific emissions of major European utilities.

Including our Russian power production, our specific emissions were about 60% of the average level of European utilities. European reference data for 2014 is not yet available.

The boundary for electricity production's specific carbon dioxide emissions differs from other environmental reporting. Fortum's production shares in associate companies are also included. This production is based on hydro and nuclear power, and it doesn't cause any direct carbon dioxide emissions.

The specific carbon dioxide emissions (Scope 1) by country from electricity production, as required by the document Electric Utilities Sector Disclosures, are presented in the following tables.

In the calculation of electricity production's specific emissions, CHP plant emissions have been allocated for electricity and heat using the efficiency method presented in the Greenhouse Gas Protocol guidelines, using heat production efficiency of 90% and electricity production efficiency of 40%.

Fortum Markets acquires all of the electricity it sells to end consumers from the Nordic electricity exchange. In 2014, a guarantee of origin was acquired for all the electricity (10.2 TWh) sold in Finland and Sweden, and the electricity was sold to the end user as carbon-free. In Norway, Fortum Markets sold 1.7 TWh of electricity, 0.3 TWh of which as carbon-free hydro electricity. The specific carbon dioxide emissions of the Nordic electricity exchange's residual distribution for 2014 will be known in June 2015. In 2013 it was 258 g/kWh.

Specific CO_2 emissions of total electricity generation in 2012-2014

g/kWh	2014	2013	2012

Finland	57	115	48
Sweden	0	0	0
Russia	464	506	508
Poland	675	631	659
Estonia	69	103	167
Latvia	75	182	337
Lithuania	154	286	-
India	0	0	-
Great Britain	365	359	368
Fortum total	**177**	**209**	**168**

Specific CO_2 emissions of electricity generation from fossil fuels in 2012-2014

g/kWh	2014	2013	2012
Finland	758	730	675
Russia	464	506	508
Poland	675	631	659
Latvia	330	333	337
Great Britain	365	359	368
Fortum total	**482**	**519**	**515**

EN21 NOx, SOx, and other significant air emissions

In 2014, our thermal energy production emitted 28,700 (2013: 30,800) of nitrogen oxides (NO_X), 20,400 (2013: 22,000) tonnes of sulphur dioxide (SO_2) and 21,300 (2013: 20,800) tonnes of particles. Reduction in sulphur and nitrogen emissions was caused primarily by decrased condensing power production in Finland.

Reporting of emissions from our European power plants is based on continuous measurement. At our Russian power plants and at most heat only boilers, emissions are calculated using fuel data and fuel specific emission factors. Emission factors can be based on measurements at regular intervals or information from the boiler manufacturer.

Fortum's SO_2, NO_X and particle emissions in 2012-2014

thousand tonnes	2014	2013	2012 [1)]
SO_2	20.4	22.0	19.8
NO_X	28.7	30.8	29.4
Particles	21.3	20.8	16.0

1) Includes joint venture AB Fortum Värme samägt med Stockholms Stad

77% (2013: 70%) of the flue-gas emissions (SO_2 and NO_X) and 98% (2013: 96%) of the particle emissions originated from the Russian operations. The most significant source of particle emissions (14,800 tonnes in 2014) was the Argayash power plant in Russia.

Our mercury emissions into air were 126 (2013: 122) kg.

The specific emissions for sulphur oxide, nitrogen oxides and particles are presented in the following table in line with the document "Electric Utilities Sector Disclosures".

Specific emissions of energy production in 2014

g/MWh	SO_2	NO_X	Particles
Total energy production	193	271	201
Energy production with fuels	333	468	348