



# Clean future for heating and cooling

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# Clean future for heating and cooling

Heating and cooling is the biggest energy end-use sector in Europe, representing about half of the total energy consumption. Heating and cooling is responsible for approximately 40% of carbon emissions in Europe. It also represents a higher share of household spending than electricity utilised for other purposes.

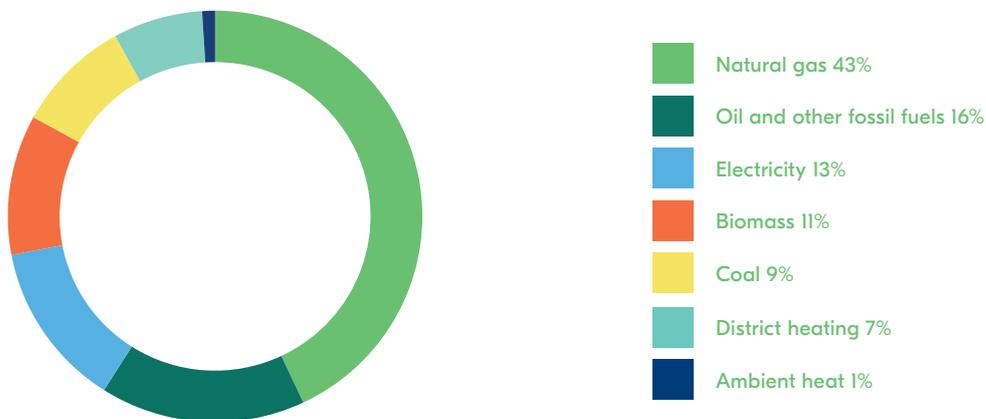
Heating and cooling is produced and consumed for the purposes of space heating and cooling, cooking and supplying hot water in buildings, as well as for industrial processes. Space heating and cooling, including hot water consumption and cooking,

account for about 66% of the total heating supplied in the EU. This amounted to an estimated final energy consumption of about 3,886 TWh (334 million TOE) in 2017.

The residential sector represents 45%, industry 37%, and services 18% of the total heating and cooling consumption in Europe.

District heating and cooling is one of several solutions to supply heat and cooling to the end users.

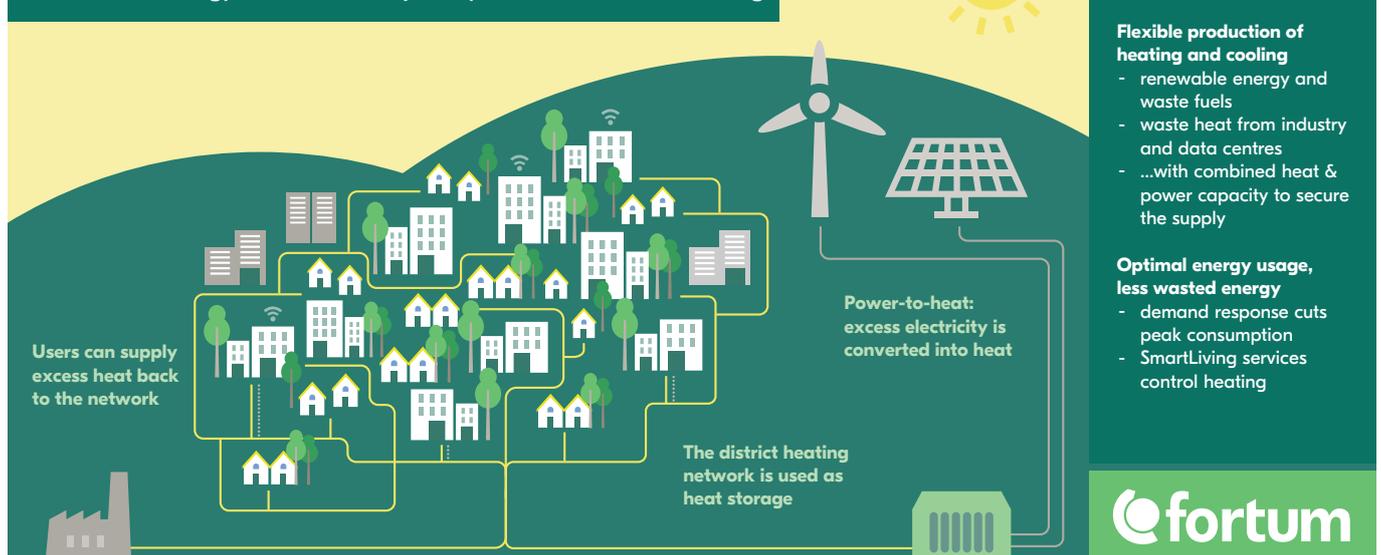
## FINAL ENERGY BY FUELS AND SOLUTIONS



## District heating and cooling to battle climate change

### How does your neighbourhood receive heating and cooling?

A comprehensive sustainable and smart DHC solution with renewable energy sources is a major step towards sustainable living.



# Fortum's view on the development of heating and cooling markets

The owners and tenants of residential, tertiary and industrial buildings are the main customers in heating and cooling markets. Heating and cooling supplies are primarily designated for the space heating, as these customers account for the vast majority of heat demand in the EU. To fulfil this demand, a number of heating delivery options are in use: district heating, direct electricity heating, heat pumps, and individual gas, pellet or coal boilers.

District heating (DH) is often treated differently compared to other alternative heating methods because it is linked to a physical infrastructure and a strong market position in the network area. Some European countries have profound district heating regulation covering pricing, network access, competition, environment, etc. Other countries have chosen to rely on competition with no or very little heating-specific regulation.

Based on Fortum's extensive operational experience in district heating and cooling sector within several countries, under different regulatory models we can conclude that in all of them there is a room for further development. Heating and cooling markets needs the development to be able to contribute to the established energy and climate policy targets, as well as to increase competitiveness and economic efficiency of the sectors. It is also important to incentivise and enable customers to influence their own environmental footprint as well as the price tag of their heating and cooling consumption. We believe that increasing competition between different heating methods benefits customers and suppliers alike, as competition normally leads to better service levels and promotes innovations in technologies and business concepts.

District heating and cooling can contribute to all these targets.

## Key messages

- **As the biggest end-use energy sector, heating and cooling deserves better policies to enable it to contribute to decarbonisation and economic wealth.**
- **Better decision-making requires better statistics and quality of available information on the sector.**
- **Regardless of the regulatory approach, the competition between different heating and cooling options should be enhanced. Customers should be able to choose between different alternatives, also in terms of their environmental footprint.**
- **Fair competition between different heating and cooling solutions implies equal treatment in legislation and regulation (decarbonisation, renewables, access to heat supply and consumption, building codes, zoning and city planning, etc.).**
- **District heating and cooling operators must come up with new innovations related to technologies and services as well as business concepts to meet the customer demands.**
- **Innovations are also needed to create coupling with other related sectors: Since CHP production, heat storage, large-scale heat pumps and electric boilers contribute significantly to increasing balancing needs of the electricity market, it is important to create and incentivise mechanisms for sector coupling.**
- **To safeguard fair competition, different regulations must address suppliers equally and regulatory overlaps should be removed. This applies to environmental regulations, including CO<sub>2</sub> reduction measures (participation in ETS and/or CO<sub>2</sub> taxation schemes) and other fiscal measures.**
- **When district heating is subject to cost-based price regulation, any incentives to meet policy objectives, customer engagement, system optimisation and security of supply are less easy to implement compared to markets with liberalised pricing.**

# Fortum's heating and cooling

Fortum began operating its district heating and cooling business in the 1990s and has continuously expanded its geographical presence.

## Our operations



We produce heat in CHPs, heat-only boilers and heat pumps. We also use recovered heat



We deliver district cooling in Estonia, Sweden and Finland



We supply heat in several cities in the EU and Russia:

- In Finland: Espoo, Kauniainen, Kirkkonummi, Tuusula, Järvenpää and Joensuu
- In Poland: Wrocław, Częstochowa and Płock
- In the Baltic countries: Jelgava, Parnu, Tartu and small networks in Lithuania
- In Norway: Oslo (Fortum Oslo Varme)
- In Sweden: Stockholm (Exergi)
- In Russia: Novogorny, Chelyabinsk, Tyumen

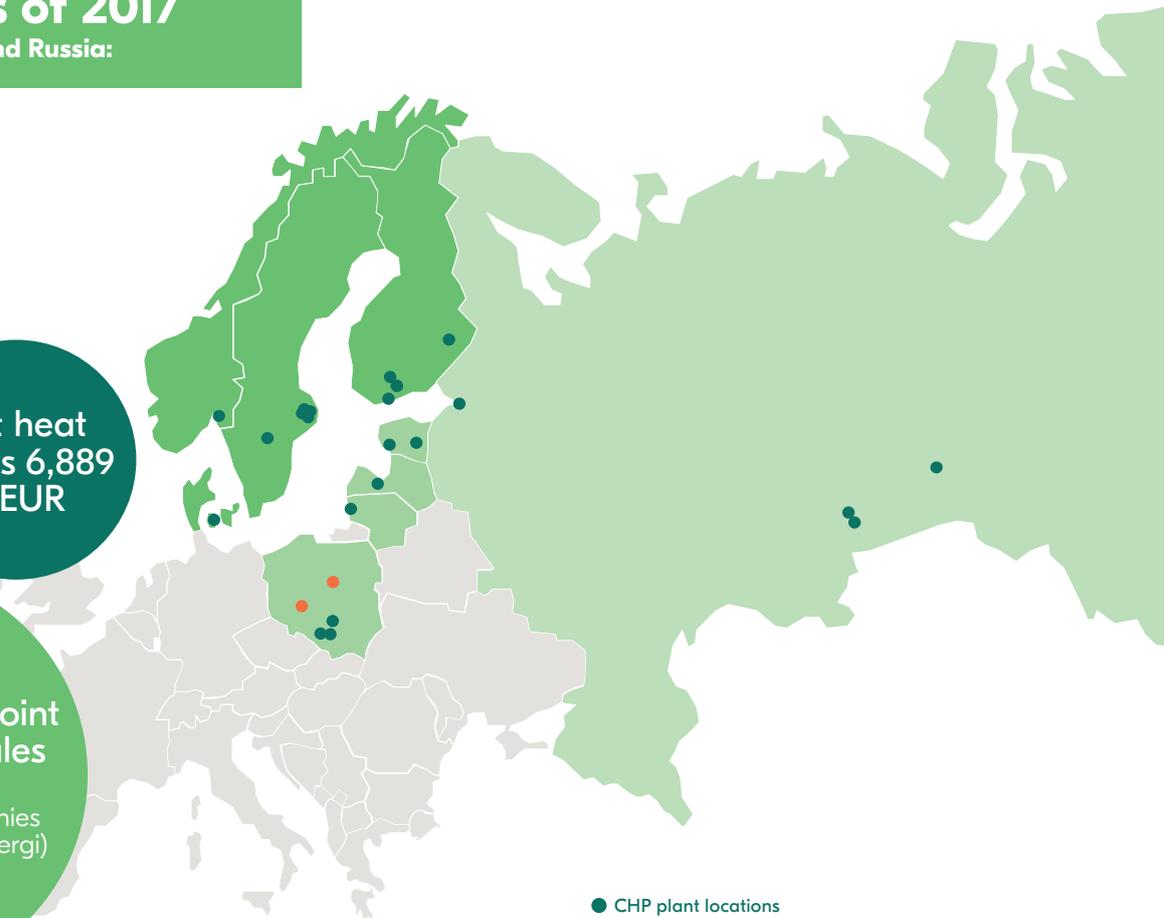
## Key figures as of 2017

Divisions City Solutions and Russia:

DH sales  
~ 30 TWh  
and 782  
MEUR

Net heat  
assets 6,889  
MEUR

About 67 TWh of joint  
district heating sales  
to customers  
(with associated companies  
TGC-1 and Stockholm Exergi)



● CHP plant locations  
● District heat supply/networks w/o own production