Customers’ expectations towards the modern energy supply company

Esa Hyvärinen, SVP Fortum Corporation
Next generation energy company

We generate, distribute and sell electricity and heat, and offer related expert services.

8,800 people passionate about creating energy that improves life for present and future generations.

We operate in the Nordic and Baltic countries, Russia, Poland and India.

Sales: 4,751
Comparable operating profit: 1,351
Balance sheet: 21,000
(EUR million in 2014)
DH and CHP operator in Baltic Rim and Russia

Heating and CHP operations in 2014

Note: Fortum’s total power generation 73 TWh and total heat production 35 TWh in 2014

<table>
<thead>
<tr>
<th>Total heat sales, TWh</th>
<th>35</th>
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<tbody>
<tr>
<td>Finland</td>
<td>3.2</td>
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<tr>
<td>Baltic countries</td>
<td>1.2</td>
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<tr>
<td>Poland</td>
<td>3.4</td>
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<tr>
<td>Great Britain (sold in 2014)</td>
<td>1.5</td>
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<tr>
<td>Russia</td>
<td>26.0</td>
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</tbody>
</table>

In jointly owned companies, heat sales, TWh**

Fortum Värme in Sweden 8
TGC-1 in Russia 28

CHP plants accounted for
28% of total power generation and 90% of total heat production

European heat production 8 TWh
(Heat production capacity 3,900 MW)

- Coal 38%
- Natural gas 29%
- Biomass 25%
- Oil 1%
- Heat pumps, electricity 1%
- Waste 3%
- Peat 3%

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

Note: Fortum’s total power generation 73 TWh and total heat production 35 TWh in 2014
Our customers

To our district heating customers we offer:

- Intelligent district heating solutions
- New production methods: heat pumps, geothermal heat, biogas, pellets, bio-oil, etc.
- Waste heat recovery: e.g. data centres and hospitals
- Open a district heating network: customers can sell the surplus heat to district heating network

We develop products and services for our 1.3 million electricity customers

- Solutions for energy management and energy savings:
  - Smart homes
  - The new “Fiksu” (“Smart”) product family, that helps the customers to lower their cost for energy
  - Electricity micro production, including connection to the electricity distribution network
  - Home charging station for Electric Vehicles and charging solutions for business customers
  - Solar panels
Investment program in Europe
Competitiveness of district heating via diversified investments

- **Naantali**
  - co-owned bio-CHP (ongoing)

- **Brista**
  - co-owned waste-CHP

- **Värtan**
  - co-owned bio-CHP (ongoing)

- **Jelgava**
  - Bio-CHP

- **Klaipeda**
  - Waste-CHP

- **Częstochowa**
  - Coal/bio-CHP

- **Järvenpää**
  - Bio-CHP

- **Joensuu**
  - Pyrolysis oil production in CHP plant

- **Espoo**
  - Sewage water heat pump
  - Geothermal heat pump (ongoing)
  - Heat recovery from hospital (ongoing)
Defining space heat markets in urban areas

Heat markets should be driven by customers and competition

1. Free customer choice enhances engagement and trust
2. Fair competition between alternatives contributes to affordability
3. Equal competition requires equal regulatory burden
4. Competition promotes new technologies
5. and drives for best resource and system efficiency
New solutions in district heating

Demand side management

• The aim is to increase the flexibility in heat demand to increase combined heat and power plant flexibility and thus reduce consumers’ heating costs

• Fortum is carrying out pilots in commercial building and apartment houses to demonstrate technologies and building energy storage capacities

Open district heating network

• Open district Heating allows customers that generate waste heat to sell recovered energy at market price to Fortum

• Waste heat from datacenters in Stockholm equals the heat demand for approx. 55000 apartments.
Development of district heating
Open DH networks encouraging new heat sources

- Always the best and cheapest heat sources are used competitively and on a market-based manner!
- Heat customers becoming also producers:
  - data centers,
  - hospitals,
  - shopping centers,
  - apartment buildings
- New solutions to have an easy access to the network:
  - heat pumps utilising the heat from waste water treatment
  - industry waste heat,
  - heat storages, etc.
Sustainable district solution in Espoo

- Data centre
- Heat pump facility
- District heating network
- CHP plant
- District cooling network
Conclussions

Key words for future heat markets:

“customer” and “competition”
“dialogue and responsiveness”
“free choice of heating method”
“efficiency and sustainability”
“new technologies and renewables”
Thank you!

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