Introduction

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Transition towards Solar Economy

Solar Economy
- Solar based production with high overall system efficiency
  - Sun
  - Hydro
  - Ocean
  - Wind
  - Geothermal
  - Bio

Finite fuel resources
- Exhaustible fuels that burden the environment
  - Oil
  - Coal
  - Gas

Infinite fuel resources
- Emissions free production
- Advanced energy production
  - Energy efficient and/or low-emission production
  - Nuclear today
  - Nuclear tomorrow
  - CCS

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Promotion of high-efficient CHP will call for further deployment of regulatory incentives

<table>
<thead>
<tr>
<th>Directive/Accord</th>
<th>Description</th>
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<tbody>
<tr>
<td>Energy Efficiency Directive (EE-D 2012)</td>
<td>energy efficiency through promoting efficient district heating and cooling, and high-efficient CHP replacing existing CHP Directive 2004</td>
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<tr>
<td>Revision of State Aid Rules (ongoing)</td>
<td>setting EU wide pre-conditions for national support mechanisms</td>
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<td>Industrial Emissions Directive (IE-D 2011)</td>
<td>boosting refurbishments of outdated CHP assets</td>
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<td>Emission Trading Scheme Directive (ETS-D 2009)</td>
<td>preferred market-based climate instrument</td>
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<tr>
<td>Renewable Energy Directive (RES-D 2009)</td>
<td>promoting renewable electricity and high-efficient co-generation</td>
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<td>Energy Taxation Directive (ET-D 2003)</td>
<td>increasing tax burden on fossil fuels</td>
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<tr>
<td>Energy Performance of Buildings Directive (EPB-D 2002)</td>
<td>promoting increased energy efficiency through stricter building regulations</td>
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District heating and CHP in Europe – EU energy policy encouraging further deployment

DH market share ~15% in European heating markets

CHP market share ~11% in European electricity markets

Sources: Euroheat & Power, KPMG benchmarking, Fortum analysis.
Legislation of district heating/CHP under continuous developments across Baltic Rim and Russia

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<thead>
<tr>
<th>Country</th>
<th>1990-1999</th>
<th>2000-2010</th>
<th>2011-2012</th>
<th>2013...</th>
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<tbody>
<tr>
<td>Sweden</td>
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<td>District Heating Act 2009</td>
<td>Third Party Access (TPA) consultation concluded</td>
<td>Heat price adjustment mechanism</td>
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<td>Potential for industrial waste heat</td>
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<td>Finland</td>
<td>Act on competition restriction 1992</td>
<td></td>
<td>DH sector review by Finnish Competition Authorities</td>
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<td>Electricity Market Act 1995</td>
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<tr>
<td>Norway</td>
<td>Energy Act 1990</td>
<td></td>
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<tr>
<td>Estonia</td>
<td></td>
<td>District Heating Act 2003</td>
<td></td>
<td>Considerations on renewing heat legislation</td>
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<tr>
<td>Latvia</td>
<td></td>
<td>Energy Market Law 2004</td>
<td>Energy strategy 2030 to be finalized</td>
<td>Specific heat law to promote revised energy strategy 2030</td>
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<td>Lithuania</td>
<td></td>
<td>Law on Heat Sector 2003</td>
<td>DH price formation methodology revision</td>
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<tr>
<td>Poland</td>
<td>Energy Law Act 1997</td>
<td>Serious of amendments into existing energy law (heat reference price from CHP, return on capital)</td>
<td>New Energy, Gas and RES Laws drafted Related ordinances</td>
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</tr>
<tr>
<td>Russia</td>
<td></td>
<td>Law on Heat Supply 2010</td>
<td>Over 30 heat market related secondary acts under preparation</td>
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</table>
Our geographical presence today

Nordic countries
- Power generation: 53.1 TWh
- Heat sales: 17.2 TWh
- Distribution customers: 1.6 million
- Electricity customers: 1.2 million

Russia
- OAO Fortum
  - Power generation: 17.4 TWh
  - Heat sales: 26.7 TWh
- TGC-1 (~25%)
  - Power generation: ~7 TWh
  - Heat sales: ~8 TWh

Great Britain
- Power generation: 1.2 TWh
- Heat sales: 2.1 TWh

Poland
- Power generation: 0.6 TWh
- Heat sales: 4.3 TWh

Baltic countries
- Power generation: 0.4 TWh
- Heat sales: 1.1 TWh
- Distribution cust.: ~24,000*

Key figures 2011
- Sales: EUR 6.2 bn
- Operating profit: EUR 2.4 bn
- Balance sheet: EUR 23 bn
- Personnel: 10,800

* Distribution business sold Jan 1, 2012
Heat Division - delivering energy efficient CHP strategy

**Strategic aspiration**
- Providing sustainable and price competitive heat for local heat markets against main alternatives and locally produced electricity for electricity markets
  - **Profitability to invest into CHP in heat-only based DH systems**
- Replacing fossil fuels with biomass and waste-to-energy
- Long-term optimization in own DH networks
- Competitive access to third party DH networks
- **Renewal of outdated CHP assets**
  - Targeting improved energy efficiency
  - Efficiently incurred investments
- **Capturing access to and stable returns on capital from DH network operations**

**Operating areas**
- Finland, Sweden, Norway, Baltic countries and Poland

**Total sales**
- Heat sales 1,238 MEUR (22.7 TWh)
- Electricity sales 343 MEUR (6.2 TWh)

**Operating profit**
- 380 MEUR

**Net assets**
- 4,177 MEUR

**Production capacity**
- 23 CHP plants

**Employees**
- 2,504 (31.12.2011)

Making sustainability profitable. Flexible to continuous changes in business environment.
Current asset portfolio

Own DHC systems and connected CHP plants
- Stockholm DH network and CHPs
- Baerum DH
- Espoo, Joensuu, Keski-Uusimaa and Nokia DH networks and 3 CHPs
- Pärnu and Tartu DH networks and 2 CHPs
- Jelgava DH network and 1 CHP
- Wroclaw, Czestochowa and Plock DH networks and 1 CHP

Recently finalized projects 88 MW_e/165 MW_th
- Estonia, Pärnu: Biofuel and peat fired CHP plant. 24 MW_e/45 MW_th
- Poland, Czestochowa: Coal and biofuel fired CHP plant. 64 MW_e/120 MW_th

Under construction 66 MW_e/150 MW_th
- Sweden, Brista 2: waste 20 MWe / 60 MW_th
- Finland, Järvenpää: bio and peat 23 MW_e / 45 MW_th
- Latvia, Jelgava: bio and peat 23 MWe /45 MWth

Stand-alone CHP plants (long-term contacts)
- Kuusamo, Uimaharju, Kauttua, Kirkniemi and Naantali
- Swiebodzice, Zabrze and Bytom

Under construction
- Lithuania, Klaipeda: waste 20 MWe / 50 MWth
New CHP+ concepts – Integrated production adding value

Key rationale and potential

- New sustainable business opportunities and better utilization of assets
- Development of integrated technologies to produce upgraded higher value products e.g. traffic fuels or bio-chemicals
- Wider product range; new products in addition to electricity, heat and cooling from one plant
- Better management of fuel portfolio and prices; production of renewable fuels and replacement of fossil fuel oils
- New sustainable solutions to decrease emissions and use of fossil fuels, to improve energy efficiency and to create added value

CHP+ concept: Bio-oil production integrated to CHP-plant in Joensuu

- Investment 20 M€ to a industrial-scale demo plant
- Construction to be completed H1/2012-H2/2013
- Yearly bio-oil production of 50,000 tons equals 210 GWh to replace heavy fuel oil in existing heat boilers
Thank you!