

Barriers and solutions in the LTDH implementation process

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Basics of district heating in the Baltic Sea Region

- DH is **one of the most common** heating systems in urban areas in the BSR
- DH is considered as an **efficient heating system** especially when heat distribution distances are short and there is a high customer coverage
- It **competes against individual heating systems**, such as heat pumps and individual boiler units (oil, solid fuels or gas)
- The business model for DH is based on **economy of scale**



Figure: Baltic Sea Region, Source: ateneKOM, LowTEMP project

Fuels in DH generation in BSR

- DH is still strongly based on fossil fuels in BSR.
 - Natural gas and coal are used extensively in BSR.
 - In addition, peat has a firm foothold in specific markets.
 - Some countries have successfully converted their DH generation towards biomass, waste incineration and surplus heat
- Low temperature district heating opens new possibilities to phase out fossil fuels and use biomass more efficiently
- Climate investments in DH are large scale and give substantial impact



Figure: Baltic Sea Region, Source: ateneKOM, LowTEMP project



Potential for low temperature district heating

STRENGTHS

- DH has a well-established position in BSR
- A large proportion of DH companies are municipally owned
- Low temperature supply meets the heat demand of low energy buildings

OPPORTUNITIES

- Reduce fossil fuels
- Utilizable low temperature waste heat sources
- Integrate solar thermal heat and geoenery
- Decrease heat distribution-related heat losses
- Reduce combustion-based district heat generation



Barriers for low temperature district heating

WEAKNESSES

- High investment costs on the demand side
- Diversity of building stock
- Lack of seasonal heat storages
- Undefined pricing models for waste heat

THREATS

- Demand side attitudes towards low temperature DH
- Competition from other heating systems
- Lack of financing
- Political decisions
- Unexpected shutdowns of waste heat sources



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Examples barriers and solutions



Three paths to lower temperatures in district heating

1. Lowering supply temperatures in existing grids

- Enabled through optimization and modernization
- Customers' temperature requirement is a limiting factor
- Requires longterm strategy to shift an existing grid to low temperature levels

2. Secondary grid to the regular high temperature grid

- Can be supplied by local energy sources or by the main DH production
- Suitable in a new energy efficient neighborhoods

3. Establishing a new stand alone grid

- Both small scale and large scale systems are possible
- Could lower the initial investment for a new grid and could be a way to avoid investments in new large scale production units



Barrier – lack of knowledge and experience in LTDH

Baltic Sea Region

- Lack of knowledge and experience on LTDH in DH companies
- Lack of trust in new technologies/DH from customer side

Solution

- Pilot strategies to examine local barriers, bottle necks and suitable areas for LTDH locally
- Pilot measures to gain practical experience about LTDH in the DH company
- Information campaigns about benefits with LTDH, showcasing good examples



Figure: Baltic Sea Region, Source: ateneKOM, LowTEMP project

Barriers: market competition and securing return temperatures



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Halmstad, Sweden

- Many new individual houses in Sweden are sold with heat pumps as standard equipment – difficult to attract enough customers to district heating
- Risk of too high return temperatures when heat consumption is low

Solution

- Discounted connection fees and sub station free of charge for LTDH in new residential areas
- 3-pipe system, to circulate water in the third pipe when demand is low, expected to lower return temperature by 4°C, innovation by Halmstad Högskola



Figure: DH-areas in Ranagård and welding tests.
Source: [Halmstads Energi och Miljö AB](#)

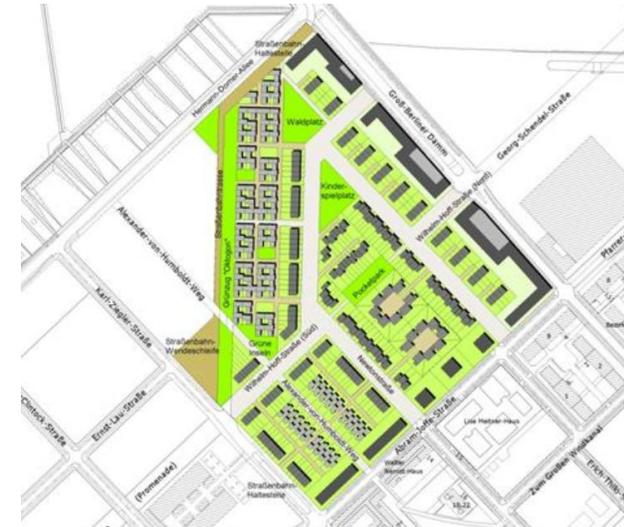
Policy barriers

Berlin Adlershof, Germany

- Lack of policy rules which support district heating solutions
- District heating must compete with gas and heat pump – although high investment cost for green field investment

Solution

- Implementation of a low-temperature network with bidirectional house connection and network feed-in stations
- District heating supplier enables any surplus thermal energy produced by the solar thermal system to be fed into the grid and use it later during 2-year period of clearing.



Source: BSM – Beratungsgesellschaft für Stadterneuerung und Modernisierung mbH

Barrier - Customers require a high supply temperature

Albertslund, Danmark

- Existing customers require high supply temperature
- Urgency to phase out fossile fuels vs available heat sources

Solution

- Extensive refurbishment program rolled out parallell with building the low temp network; insulating roofs, walls and basement, new energy efficient windows, new distribution system
- Energy costs for residents reduced by 50%, the difference pays off the refurbishment costs
- Area has become more attractive as a side effect

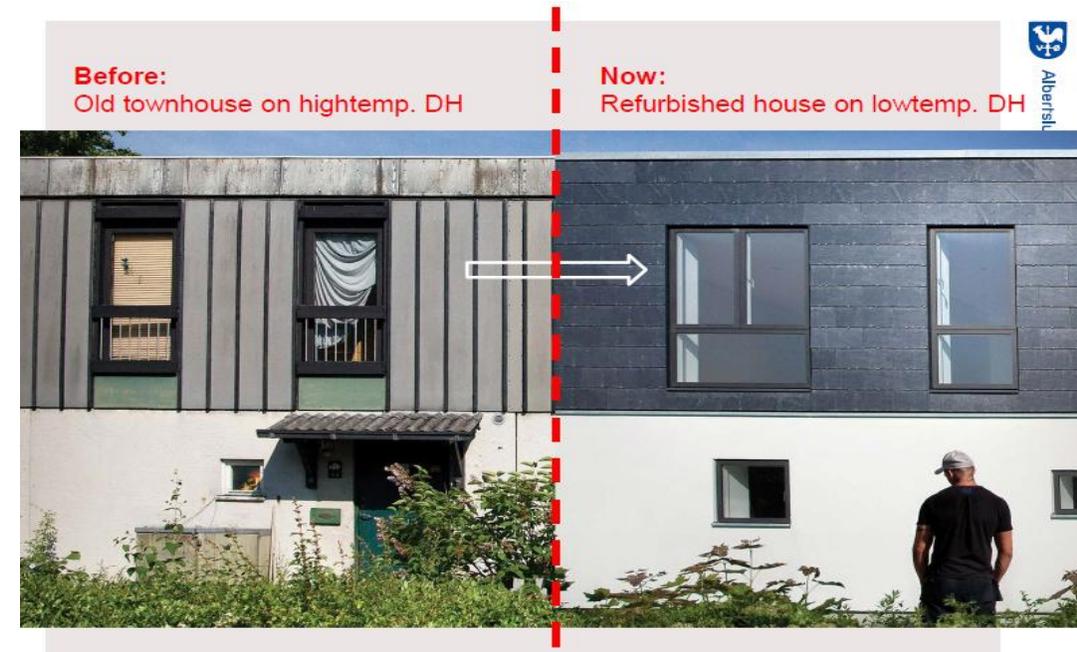


Figure: Building facade before and after refurbishment.
Source: Albertslund Kommune, Housing department, Denmark



Barrier: Challenges to utilize surplus heat

Obstacles for utilizing surplus heat

- Surplus heat projects require long planning due to technical, legal and contractual issues
- Business models for energy utilities often stretch over 10-20 years because of the major investments required
- Industries often operate with shorter investment cycles, which means decisions on shifting focus or down sizing could be made with short notice
- Such partnerships could lead to conflicts or create an increased uncertainty for the DH provider, who guarantees heat to the end customer

Solutions for longterm partnerships and reducing obstacles:

- Create financial incentives on both side of the agreement (surplus heat supplier and energy utility/customer)
- The incentives should lead to reduced costs and risks for the involved parties
- Identify and evaluate stakeholders with surplus heat that are bound to one place or which are new major investments (wastewater, shopping malls, service buildings, underground train stations, data centers, etc.)

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Several slides from the LowTEMP training material developed by project partners.