

Barriers and solutions in the LTDH implementation process

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Cecilia Thapper, Sustainable Business Hub, Sweden



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 geoenergy
- 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 an 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

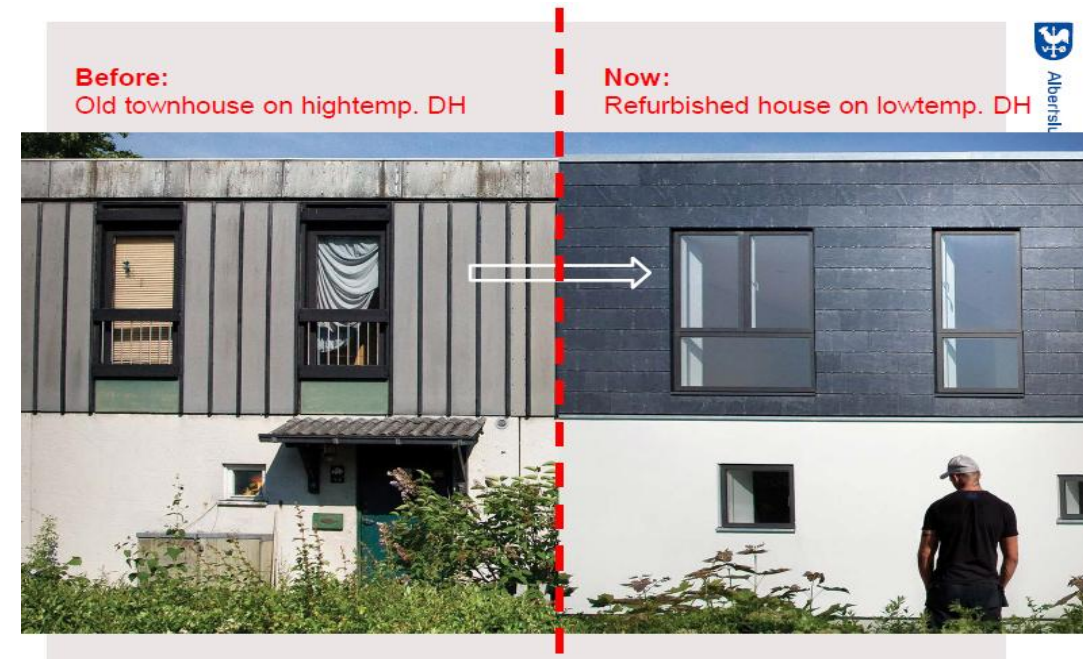


Figure: Building facade before and after refurbishment.
Source: Albertslund Kommune, Housing department, Denmark



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.)

Contact

Sustainable Business Hub

Cecilia Thapper
Project manager

Nordenskiöldsgatan 24
211 19 Malmö
Sweden

E-mail: cecilia.thapper@sbhub.se
Tel: +46 733 347633
www.sbhub.se
www.lowtemp.eu

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