

Renewing district heating

Improving the performance of District Heating Systems in Central and Eastern Europe

Modernisation of the heat distribution network in DHS Brno



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DHS Brno - introduction

- Operating since: **1930**
- Ownership: statutory city of Brno
- Core business: heat generation and distribution, electricity generation and trading, gas trading
- Grid: 291 km (owned by the DHS)
- Customers: **4 000**
- Boiler output: 763 MW (13 boilers)
- Type of DHS: steam, hot-water
- Current fuel: natural gas, heat from WtE plant
- Potential renewables nearby: wood chips, Forests of Brno city





The end of the century of steam in Brno

- The strategy of DHS Brno is to increase the efficiency of heat and electricity generation. In order to meet these goals, they plan to convert steam pipelines to hot water, resulting in a further reduction in heat distribution losses
- The average heat losses in DHS Brno distribution is 18 %
- The **new pre-insulated** hot water distribution system losses are only up to 6 %
- The use of steam pipelines in many areas ends for both **moral and physical reasons**. Morally, with the decline in industrial production requiring steam and physically, which is mainly caused by corrosion, to which condensate pipes are most susceptible.
- DHS Brno plans to replace all pipelines by 2023
- New distribution systems have a **minimum lifetime of 30 years** and can be extended up to 50 years with regular maintenance



How does it work?

EXISTING STEAM EXCHANGER STATIONS

- They work with a high temperature difference between the inlet medium (steam) and the outlet medium (warm water). This creates losses, in addition the technology is burdened.
- Pumping work is required for condensate drainage

MODERN HOT WATER EXCHANGER STATIONS

- They work with a lower temperature difference between the inlet medium (hot water) and the outlet medium (warm water). They are therefore significantly more economical in this respect.
- Pumping work is also saved (no condensate drainage required).
- From the regulation point of view, measurement and operation of hot water is more friendly than steam, and the technologies are not so much burdened.

Steam heat supply



Hot water heat supply



Benefits of modernisation

- **SAVINGS**. Supplying customers with heat via hot water will bring heat savings of 8 15%
- **COMFORT**. Hot water puts less strain on the distribution and equipment of transfer stations, it is also easier to operate, regulate and measure heat supplies. Changing the heat transfer medium also brings higher safety
- CLEAN ENVIRONMENT. Each replaced kilometer of steam pipelines will reduce CO₂ emissions in Brno by 336 tonnes per year
- **STABLE HEAT PRICE**. Reducing heat losses will save heat distribution costs in the range of tens of millions of Czech crowns. These funds will then be used to stabilize the price of heat to end customers
- **PEACE**. In the future, the people of Brno can look forward to fewer excavations, because some parts of the hot water network use a system of secondary collectors.
- A significant benefit of the reconstruction beyond the savings of customers and DHS Brno are the newly repaired surfaces of streets and sidewalks.



Modernisation costs

- The financing of the entire project is realized from DHS Brno's own resources. DHS Brno also makes intensive use of subsidies from the OP PIK (ERDF funds)
- The cost of replacing steam distribution systems varies according to local conditions. On average, one kilometer
 of the route through the grassy area costs € 635 thousand. If the route is under roads and sidewalks, the costs
 increase to € 846 thousand. Adding the cost of connections to the supplied buildings, the average cost of
 replacing a kilometer of the route will rise to € 962 1 154 thousand
- The whole project of replacing steam network will cost around € 25 million
 - € 18 mil own investment
 - € 7 mil subsidy from EU funds
- Because of high cost and construction constrains (only summer) the project is divided to multiple years





Reconstruction schedule

YEAR	2019	2020	2021	2022	2023
Length of reconstru cted pipeline	8,2	2,8	6,1	5,1	5,1
Number of supply points	53	13	18	56	85





Potential for further reconstructions in CR

2021 -2030 further **344 km** of steam networks should be replaced with hot water ones in **3 coal regions**

Total investment cost is estimated at € 400 million

Steam network replacment shoud by supported from Modernization fund + JTF