

The Importance of Asset Management of District Heating Pipes for the Implementation of Climate Goals in Europe

Stefan Hay | ISEC 4th International Sustainable Energy Conference 2026, Graz | 14th-16th April 2026



IEA DHC ITS 6

AGFW | Energy efficiency association for heating, cooling and CHP
www.agfw.de



Supported by:
 Federal Ministry for Economic Affairs and Energy
on the basis of a decision by the German Bundestag

Research Instituts



District Heating utilities



Industrial companies



→ Investigations of district heating pipes aged due to operation

→ Installations of measurement technology to record operating parameters in DH networks of participating utility companies

→ Software developments for predictive maintenance

→ Development of sustainability criteria

→ Results will be transferred into a marketable asset management software and validated through application at the utilities.



The IEA DHC Task Shared 6 Project

Scope on:

- **Directly buried DH pipes** (pipes laid in concrete ducts, prefabricated bonded pipes, flexible / plastic service pipes)

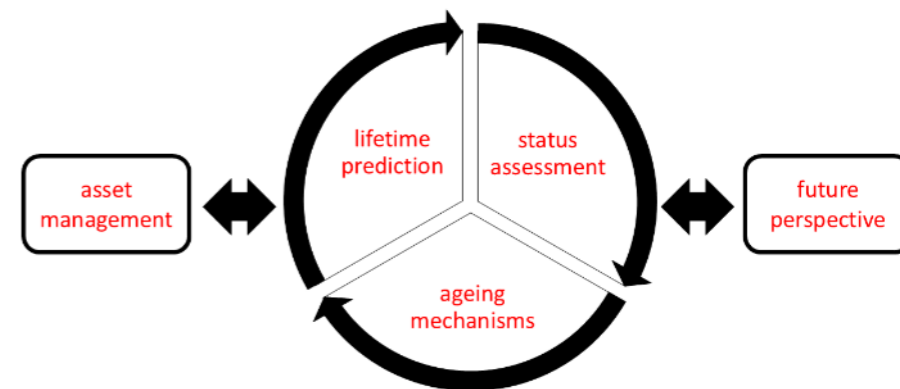
Contributions from

- Austria, Denmark, Germany, Italy, South Korea and Sweden

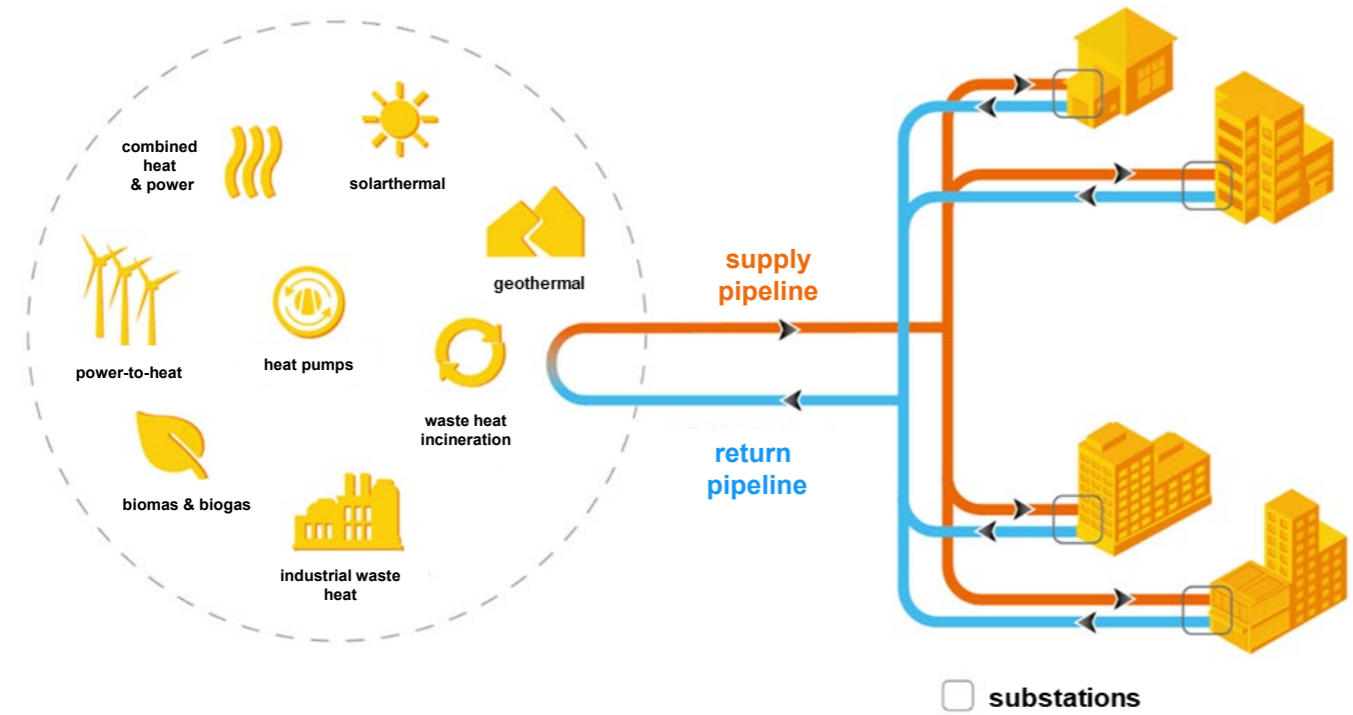
Observers (people that participated in workshops)

- Finland, Belgium, Netherlands, Estonia, Lithuania, the United Kingdom, China

IEA DHCITS 6



Participants during the TS6 meeting in Dresden, site visit: district heating chanel built in 1900



Schematic diagram of a district heating system, source: AGFW

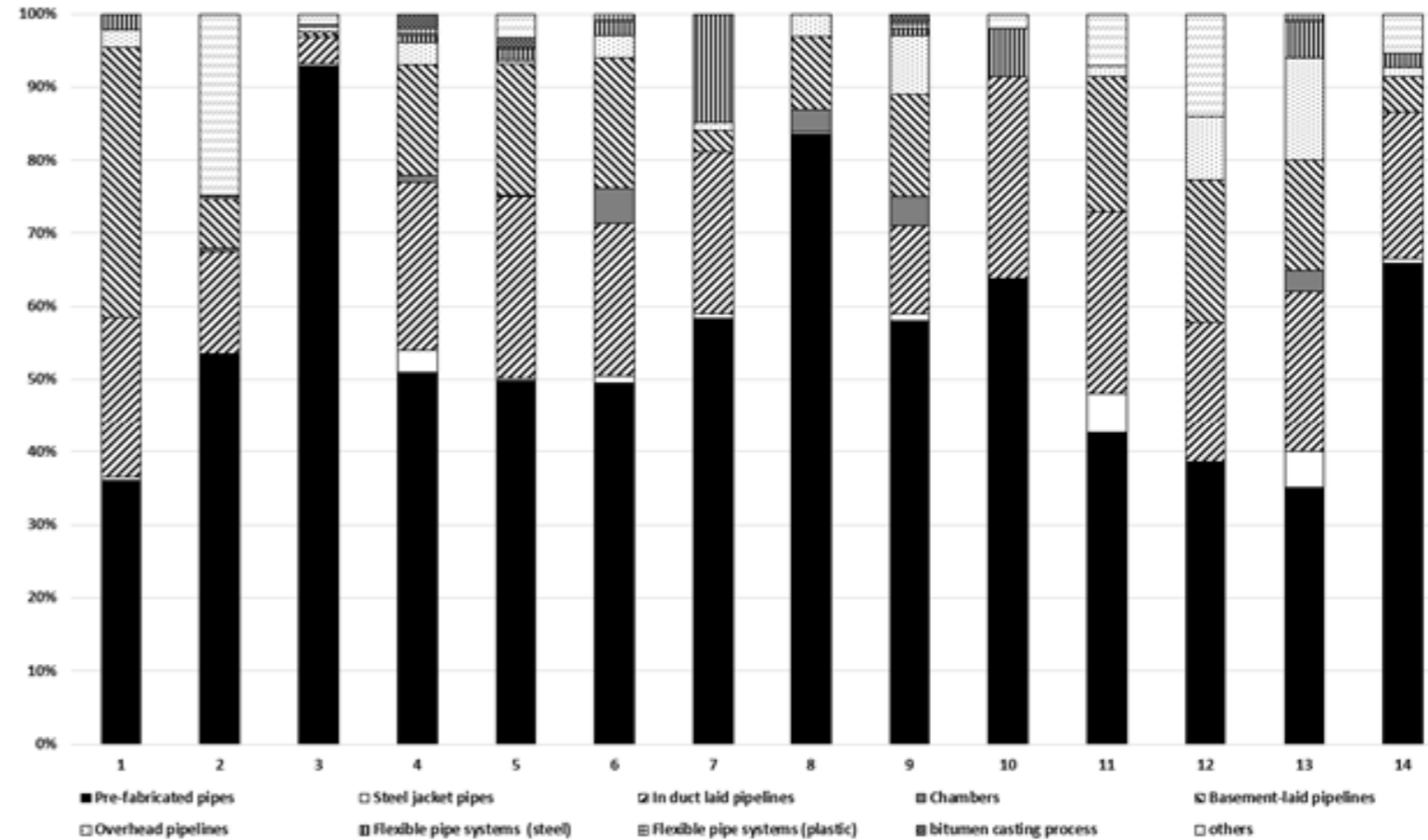
DH systems in Europe

- » More than 19,000 DH networks [1]
- » Over 199,000 km pipeline route length [1]
- » Supply heat to over 80 million inhabitants in the EU [1], market share of 13% [2]

District heating networks have developed as infrastructure in urban areas under various technical, ecological and economic conditions.

Example of 14 heating networks in Germany

- » total length trace 5,100 km
- » average age of the pipes 21.6 years
- » Different pipe systems used
(51% pre-fabricated DH Pipes,
20% DH pipes laid in concrete duct systems,
16% basement laid pipes)



Hares of DH pipes in 14 district heating system in Germany, source: [3]



DH pipe construction in Chemnitz, source: AGFW

Summary of EU policy [4, 5, 6, 7, 8]

- » The EU directives strongly focus on the heat generation side.
- » There are no EU expansion targets for DHC market share or network length.

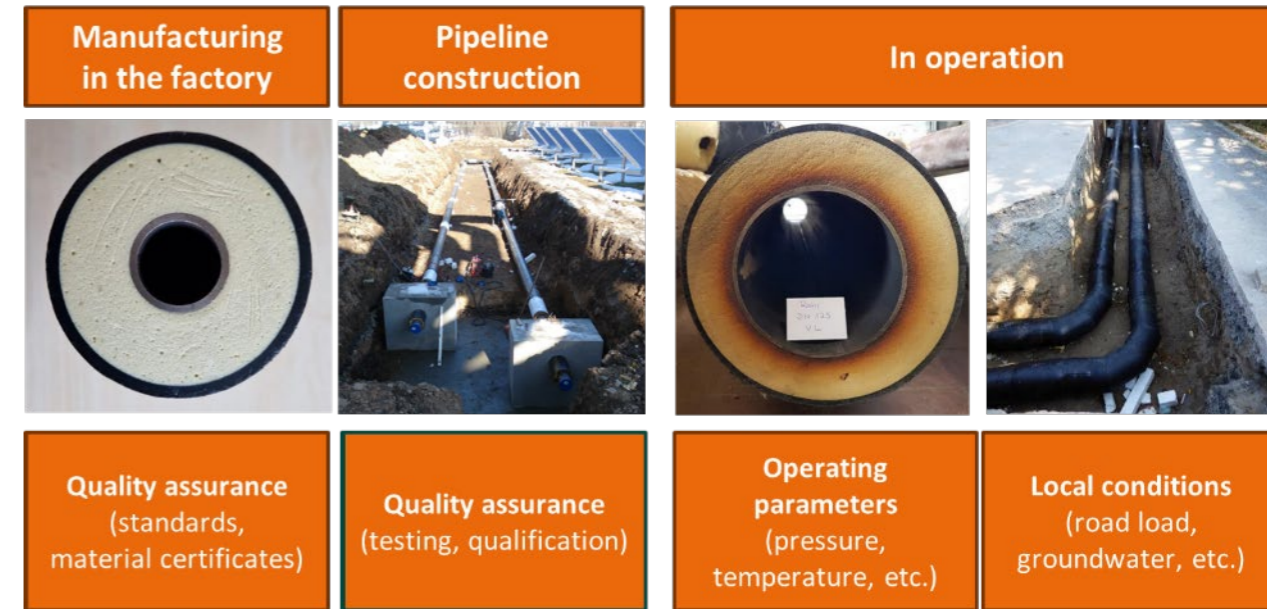
Transition of existing and new DH networks according EU policy

- » Market share for currently 13% to 55% in 2050 [2]
- » Estimated investments 1,16 trillion € [2]
- » The maintenance for existing pipe systems are included in the total investment requirements at €190 billion. [2]

Asset management of pipes in DH systems includes...

- » Company goals on security, economics and sustainability
- » Risk assessment & decision making
- » Maintenance of DH Pipes
- » Development and implementation of climate goals
- » Etc.

What affects the service life of DH pipes?



General aspects affecting service life of DH pipes, source: AGFW

Asset management of DH pipes provides the financial framework for a reliable, affordable and ecological heat supply.



Basement-laid pipes

chambers

Pre-fabricated bonded DH pipes

DH pipes laid in concrete ducts

Overhead pipelines

For reliable service life estimations in a certain district heating grid, it is important to identify the critical ageing mechanism and their impact on materials used based on the local boundary conditions.

Investigations and experiences on different DH pipes show that service life of more than 60 years is achievable!

All pictures, source: AGFW

- » Existing DH systems, their transformation and expansion as well as new DH systems are essential for the achievement of European climate goals.
- » Asset management of DH pipes provides the financial framework for a reliable, affordable and ecological heat supply.
- » The transition of DH systems in Europe according to the EU policy needs high investments and leads to further requirements as well as improvements in asset management.



DH operators require reliable asset management tools for implementing the European climate goals!

- [1] Piel, E., Mata, C., Maréchal A. et al., (2025), DHC Market Outlook 2025 – Executive Summary, Euroheat & Power, Brussels, Belgium (<https://www.euroheat.org/data-insights/outlooks/dhc-market-outlook-2025>)
- [2] Mathiesen, B. V., Gonzalo, E. G., Georgati, M., Nielsen, S. & Nikolic, J., (2025), Heat Roadmap Europe 5: Towards a sustainable, resilient and competitive heating sector by 2050, Aalborg Universitet, Aalborg, Denmark (<https://vbn.aau.dk/en/projects/hre5-heat-roadmap-europe-5/>)
- [3] Hay S., Deselaers T., Huther H., Langroudi P., Dollhopf S., Weidlich I., Kropp I., Schwarze M., Cadenbach A., Lottis D., Dittmer H., Urbaneck T., Zimmerling N., „Sustainable Asset Management Fernwärme - aktueller Stand und zukünftige Entwicklungen –“, Hrsg. AGFW e.V. im April 2025 (Download unter: <https://www.agfw.de/forschung/sam-fw>)
- [4] European Green Deal, (2019), <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52019DC0640>
- [5] Fit-for-55, (2022) <https://www.consilium.europa.eu/en/policies/fit-for-55/>
- [6] Energy Efficiency Directive (EED), (2023), <https://eur-lex.europa.eu/eli/dir/2023/1791/oj/eng>
- [7] Renewable Energy Directive (RED III), (2023), <https://eur-lex.europa.eu/eli/dir/2023/2413/oj/eng>
- [8] Energy Performance of Buildings Directive, (2024), <https://eur-lex.europa.eu/eli/dir/2024/1275/oj/eng>

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