Why is the remaining service life of DH pipes important to manage current challenges?

Strategic Imperatives: the Crucial Role of District Heating Pipe Lifespan in Achieving Climate Objectives

Stefan Hay I webinar EHP, IEA DHC & AGFW I 25th January 2025

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

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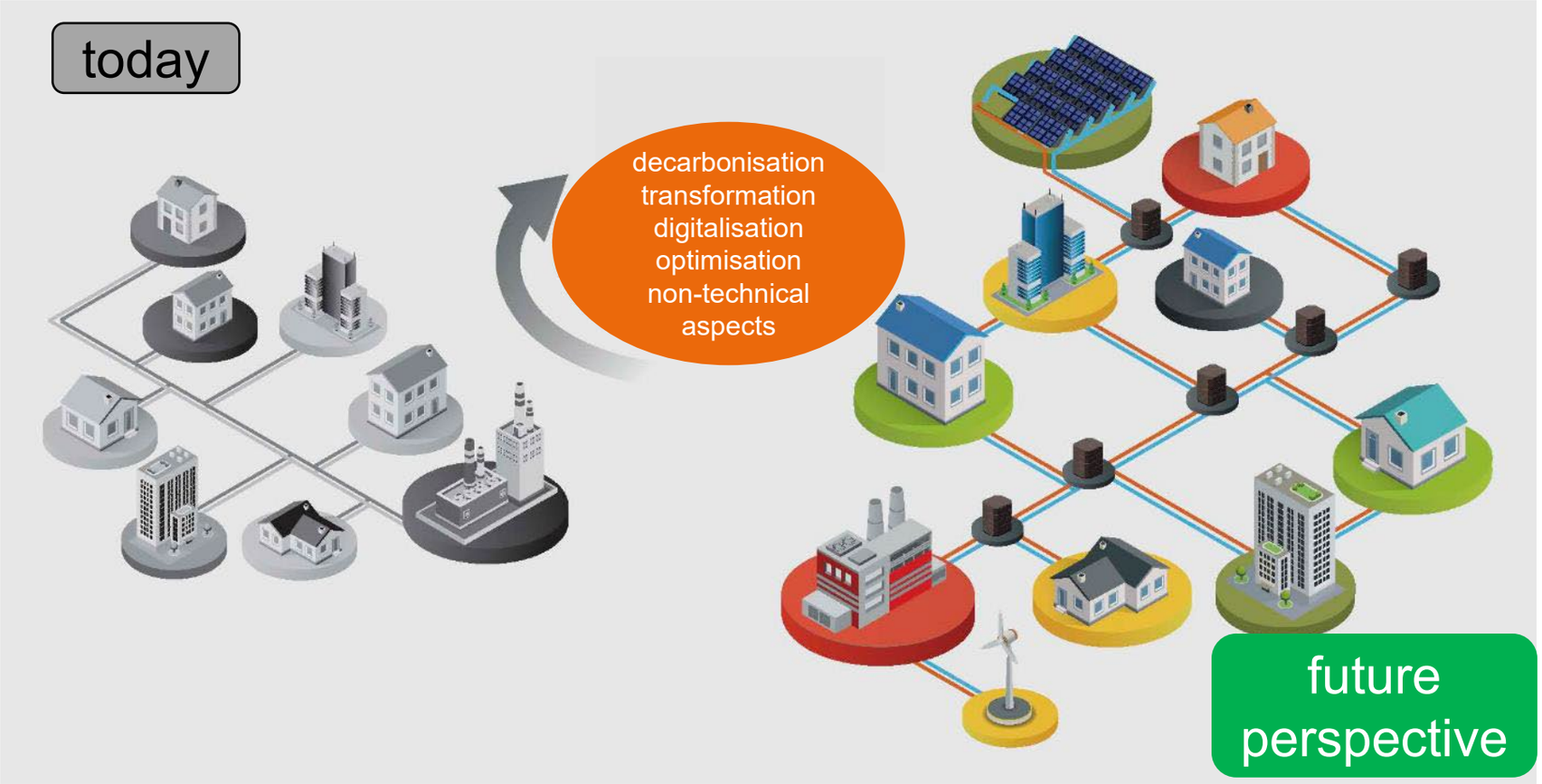
Current Challenges of our Sector



Source: AGFW

- **Time is limited**
- **Resources are limited**

Additional specific challenges in Germany?

- **Shortage of skilled labour**
- **Transparency (strengthen customer relationship)**
- **Price increases for materials (pipes, substations etc.)**

Why is the remaining service life of DH pipes important? *1


Source: Own depiction

Reduction of CO_2 emissions
by 65% until 2030

Climate neutrality by 2045

Source:[2]

» **Achieving the German climate targets requires the transformation of heat generation and the expansion of existing heating networks, as well as the construction of new heating networks.**

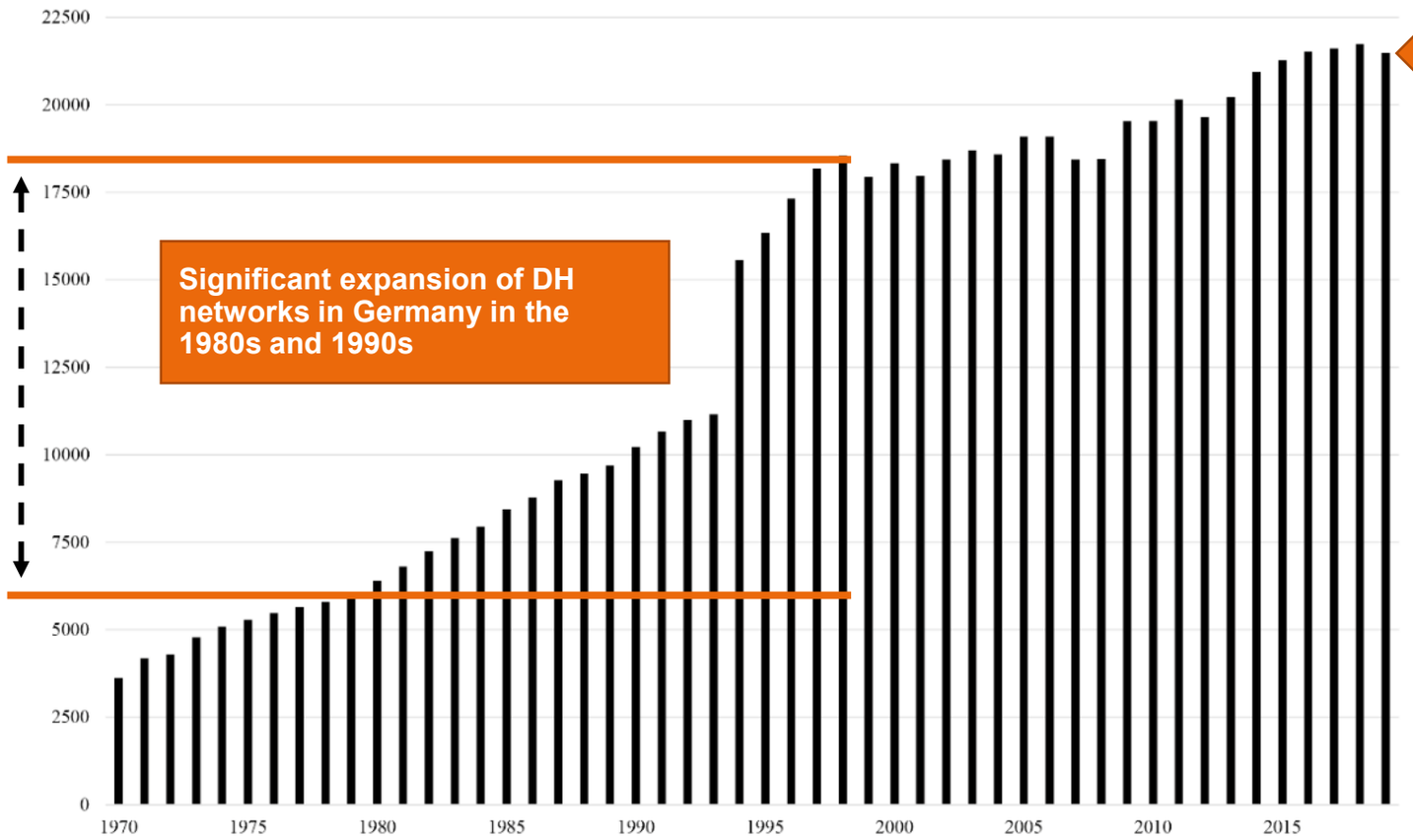
**This will require an estimated total investment of €33 billion by 2030,
of which €16 billion is estimated for the expansion and new construction of heating networks. [1].**

→ Maintenance of existing DH pipes was neglected in [1].

*1 all numbers used in this slide refer to specific goals in Germany related to the implementation of the European climate goals

Why is the remaining service life of DH pipes important?

- DH systems already contribute to efficient heat supply and the reduction of CO_2 emissions
- Existing DH networks / pipes are the pillar for the implementation of our climate goals
- Length trench of DH pipes in Europe: 186.590 km



In 2019: total length
21.500 km trace

Today: total length
31.255 km trace [4]

Target 2030 [1]
45.000 km trace

→ average age of existing DH systems rising

→ requirements for the security of supply

→ implementation of climate goals

→ technological improvements taking place

→ high investments needed

Targeted maintenance of existing networks is needed to manage these challenges!

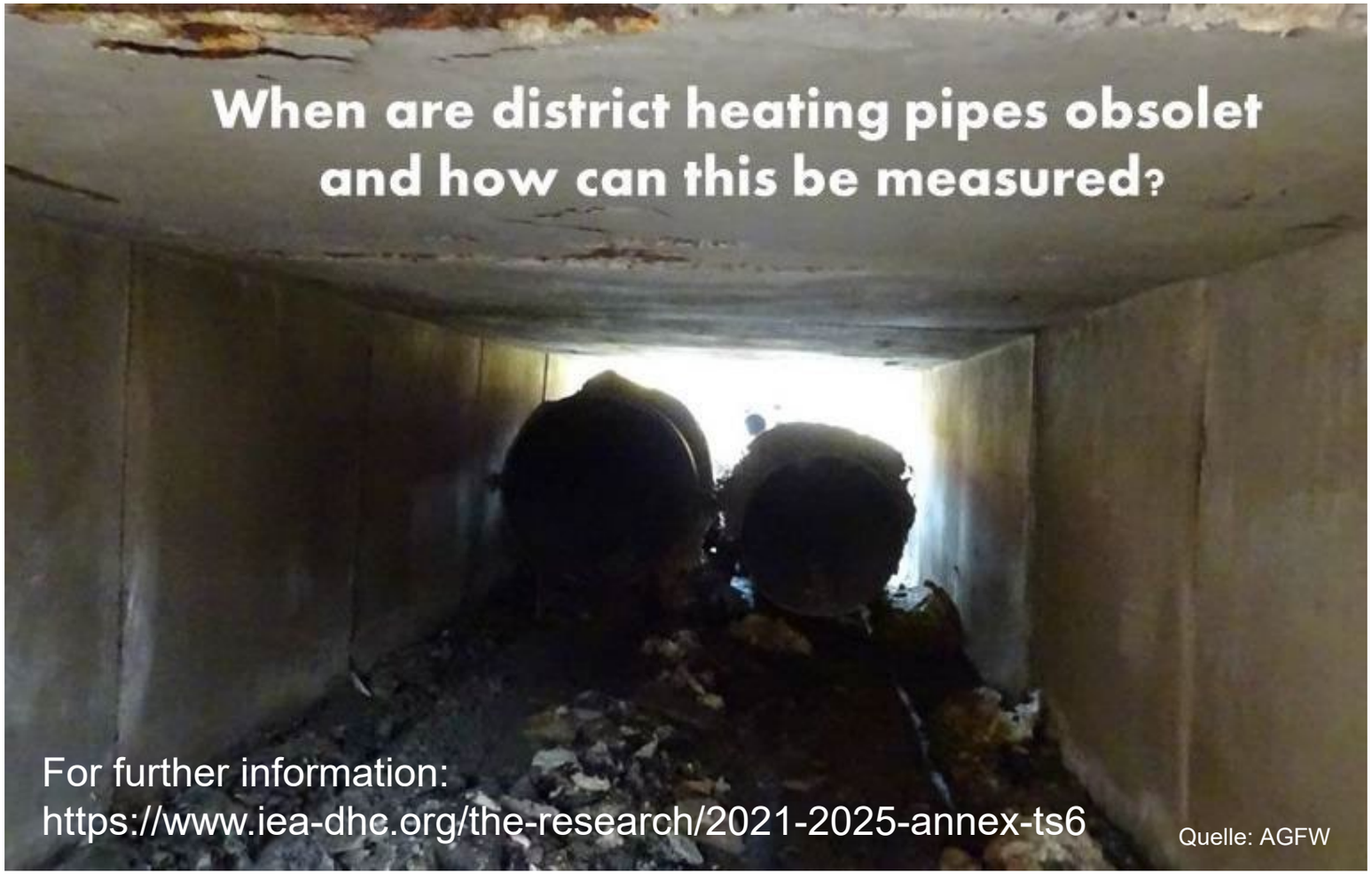
Development of the length trace [km] of DH networks in Germany since 1970 Source: AGFW Main report, 2019 [3]

Why is IEA DHC working on this topic?


Source: AGFW


Source: AGFW


Source: [5]



References

[1] Hamburg Institut and Prognos AG et al. (2020). Perspektive der Fernwärme - Maßnahmenprogramm 2030. public available: https://www.agfw.de/strategien-der-waermewende/perspektive-der-fw-7070-4040/, November 2020 (in German)

[2] Cover EuroHeat&Power international III/2020, AGFW

[3] AGFW (2020). AGFW Hauptbericht 2019. AGFW, Frankfurt am Main. (in German)

[4] AGFW (2023). AGFW Hauptbericht 2022. AGFW, Frankfurt am Main. (in German)

[5] AGFW (2020). Forschung & Entwicklung Heft 55: EnEff:Wärme - Technische Gebrauchsdaueranalyse von Wärmenetzen unter Berücksichtigung volatiler erneuerbarer Energien - Teil I: Untersuchungsergebnisse zur Materialdegradation, Februar 2020, Frankfurt am Main. (in German)

[6] IEA DHC Task Shared Project „Status Assessment, Ageing, Lifetime Prediction and Asset Management of District Heating Pipes", Project Website: https://www.iea-dhc.org/the-research/2021-2025-annex-ts6

[7] German Research Project „SAM-FW - Sustainable Asset Management Fernwärme: Nachhaltigkeitsbewertung von Wärmenetzen für die Erhöhung der Nutzungsdauer und Effizienzsteigerung im Betrieb", Project Website: https://www.agfw.de/forschung/sam-fw

darum fernwärme ...

fernwärme
rein ins haus.

denn sie ist stubenrein und hilft, CO_2 zu vermeiden.

Any more questions?

www.fernwaerme-info.eu

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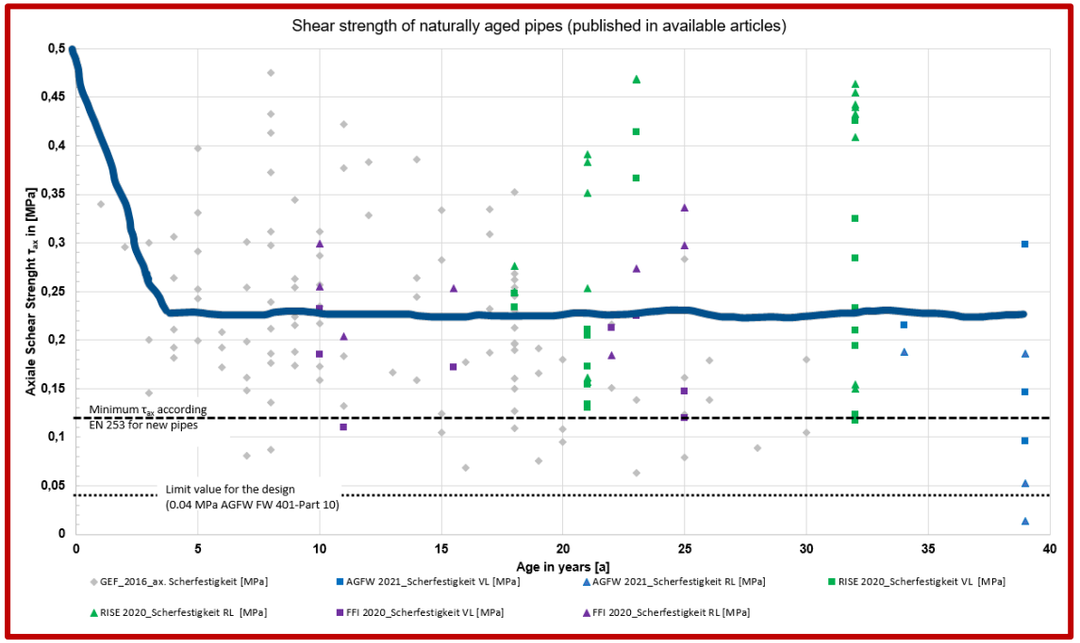
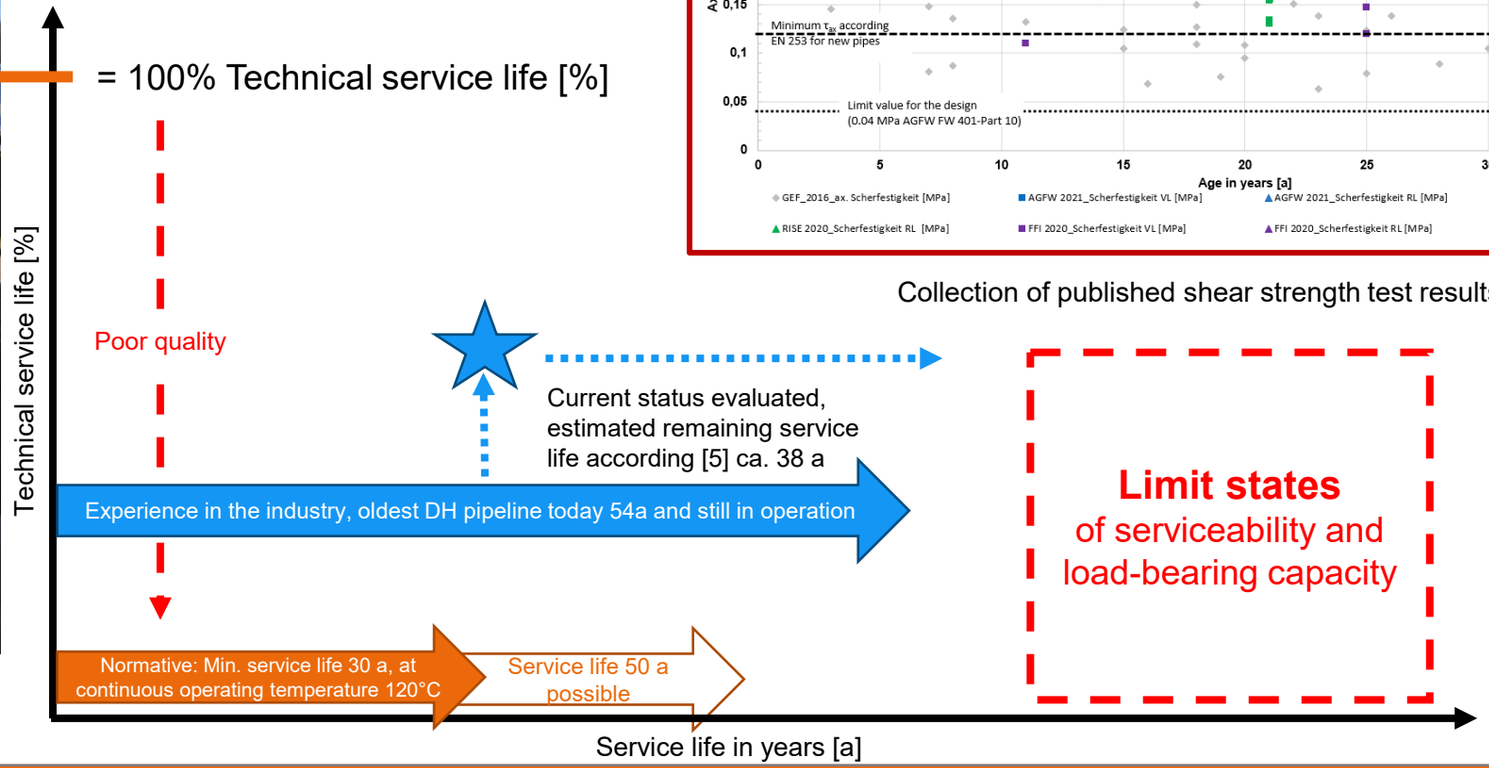
Why are investigations on ageing of DH pipes needed?

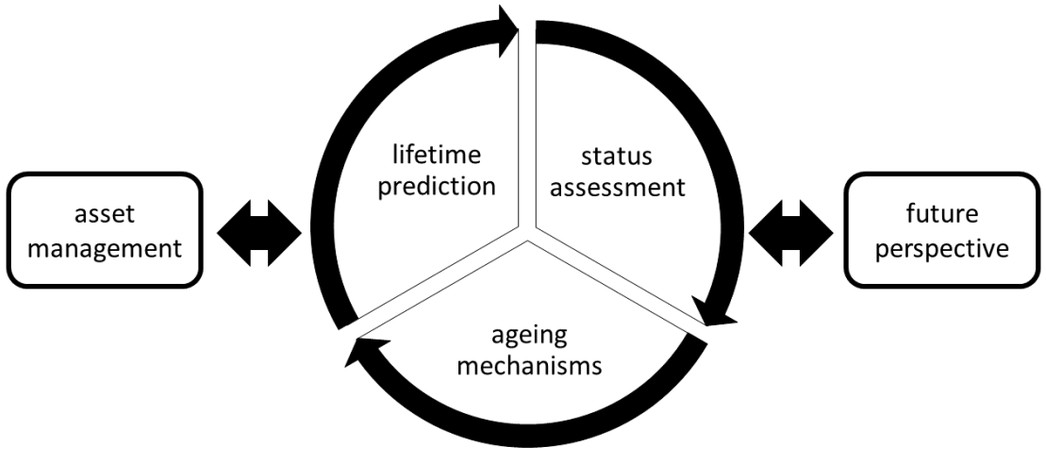
When are DH pipes obsolet & how can that be measured?



Collection of published shear strength test results, source: AGFW [4]



The international collaboration project – IEA DHC Task Shared 6



Approach of the TS 6 project to improve asset management in DH based on the needs of DH operators, Source: AGFW.

- Collection of research results available
- Harmonize latest results and make proposals for the improvement of related standards/recommendations

→ **Make research results available for DH utilities**

- Identify and close knowledge gabs
- Involve the international DH community (researchers, experts, municipalities a.s.o.)

→ We are still looking for further contributions!!!

For further information: https://www.iea-dhc.org/the-research/2021-2025-annex-ts6

The national founded researche project – SAM-FW

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.

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