

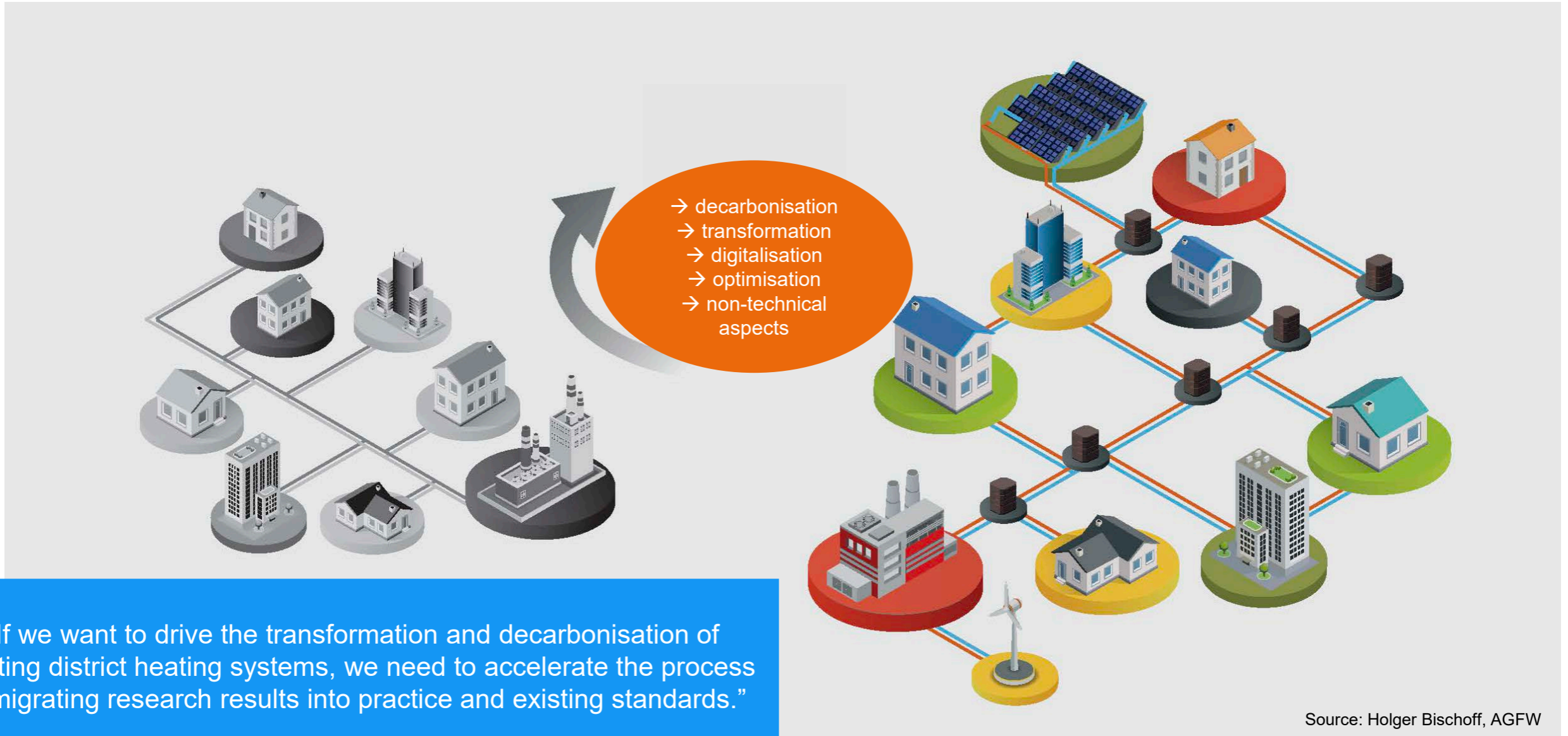


Research Results for District Heating Utilities: The Main Objective of the IEA DHC Task Shared 6 Project

Dipl.-Ing. Stefan Hay | Linnaeus Eco-Tech 2022 | 22nd November 2022



- » **AGFW** is an independent, impartial German association promoting energy efficiency, (district) heating, cooling and CHP – Combined Heat and Power – at national and international levels
- » **AGFW** comprises more than 550 regional und municipal energy suppliers, consultants, experts manufacturing companies including component and system manufacturers, assembling companies and testing institutes within Germany and Europe
- » **AGFW** represents approx. 95% of the heat load connected to German district heating systems – the largest scale in Western Europe
- » **AGFW** with over five decades of expertise in the district heating sector covers the entire process chain of efficient district heating, district cooling and CHP

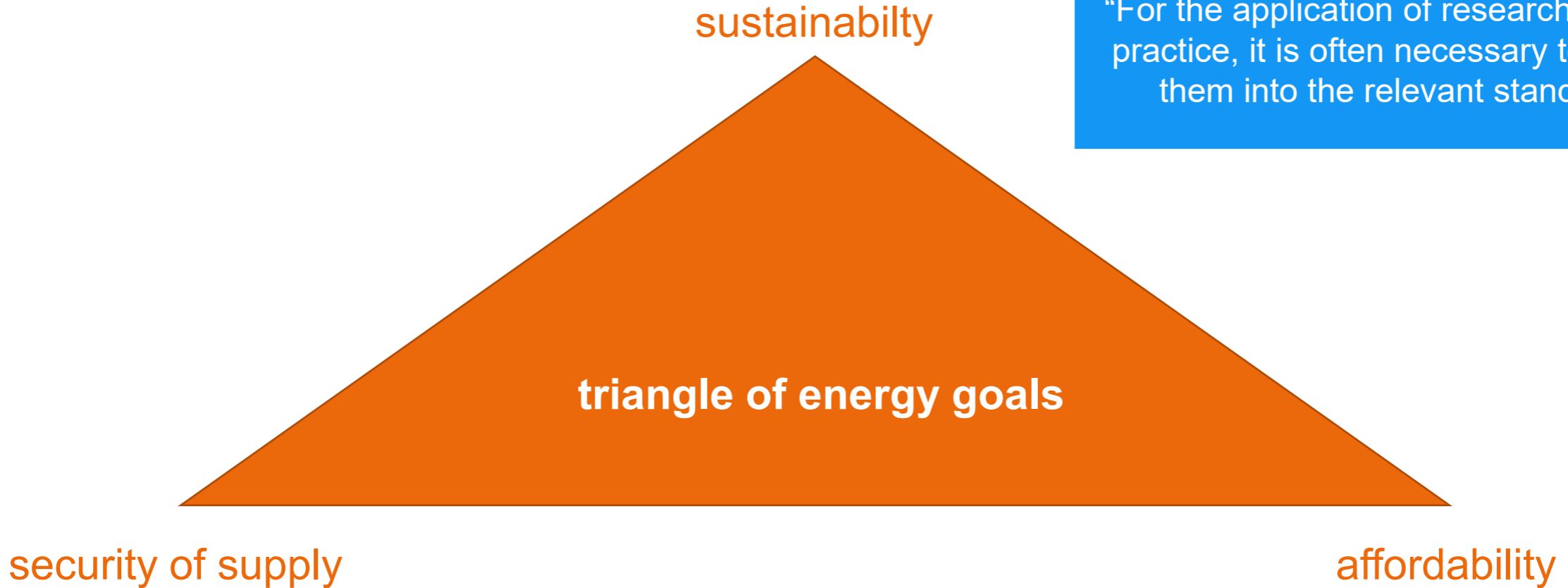


“If we want to drive the transformation and decarbonisation of existing district heating systems, we need to accelerate the process of migrating research results into practice and existing standards.”

Source: Holger Bischoff, AGFW

Principle of decision making process in DH utilities

“For the application of research results in practice, it is often necessary to transfer them into the relevant standards.”



→ Find an optimum according to the triangle of energy goals

“Development must take place during ongoing operation while ensuring security of supply!”



Source: , AGFW

Long Term
(up to 2045/2050)

- Reach national climate goals
- ...

Mid Term
(up to 2030)

- Implementation of transformation strategies
- ...

Short Term
(up to 3 years)

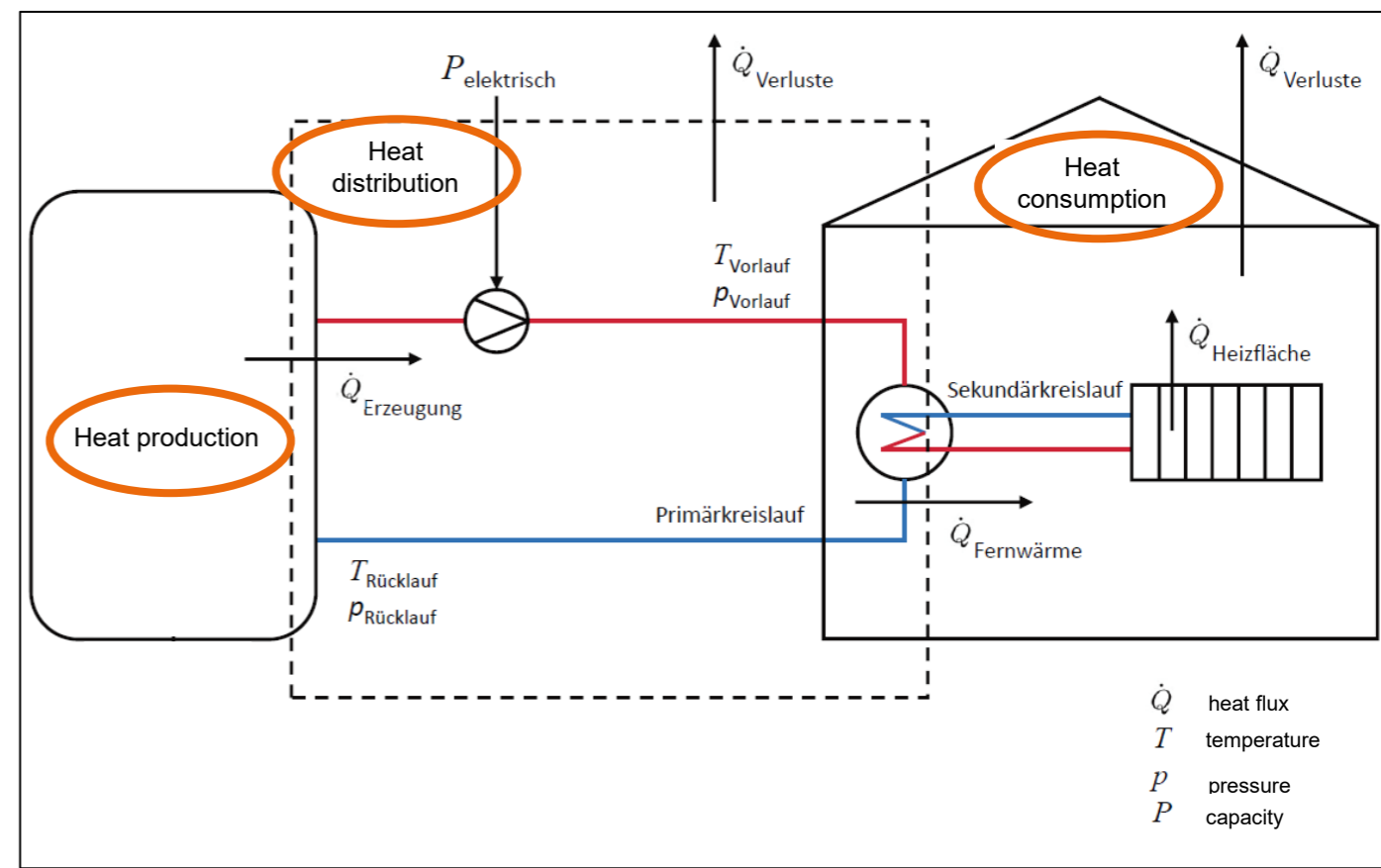
- Solve the current energy crisis
- Elaborate transformation strategies
- ...

“High investments are needed!”

DH in Germany



Research on DH in Germany (based on the needs of DH utilities)



Schematic representation of a district heating system, Source: [1]

DH in Germany

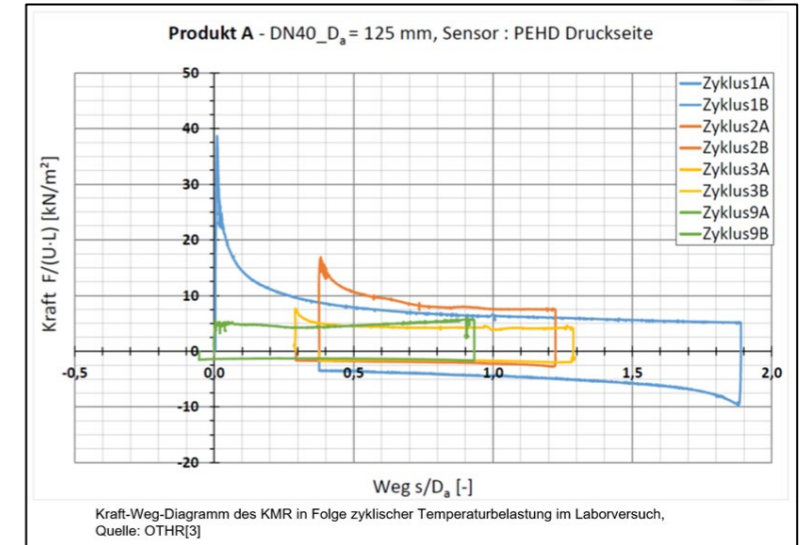
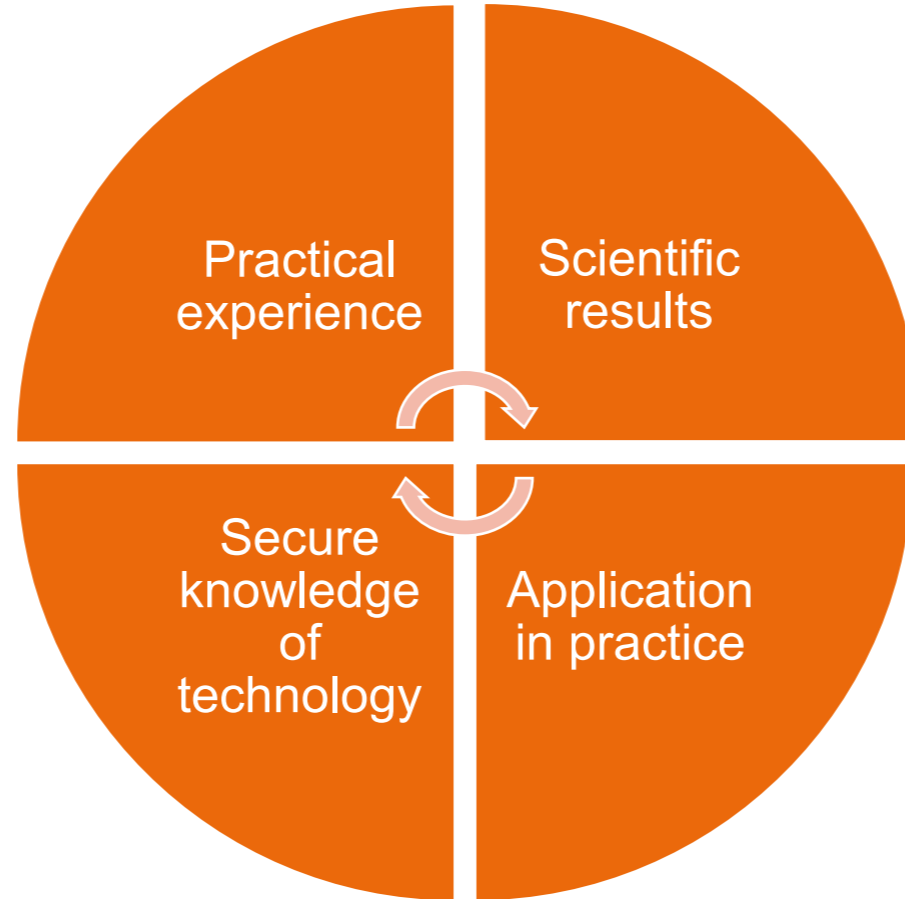
- » Ø 3 heat generation plants (1 CHP, 2 heating plants) per DH system [4]
- » High share of fossile fuels (48% natural gas, 19% coal, 1% oil [6])
- » DH systems designed for temperatures > 110°C
- » Total length trace of 21.482 kilometers [4]
- » Digital recording of the operating parameters (temperature, pressure and volume flow) at heat generation plants, defined points in the DH network (e.g. pressure increase stations) and for special customers [7]
- » Market share round about 14 % [12]
- » Widely used in urban areas, total amount of 377.305 substations [4]

Research on DH in Germany

- » Improving all parts of the existing system
- » Increasing the share of Renewable Energy Sources in DH
 - Potential RES available
 - Integration of RES → decrease of operating temperatures
 - Decentralized heat production → change in network hydrolics
- » Possible changes in the DH network/grid
- » Heat consumption
 - Decrease of heat demand (refurbishment of buildings)
 - Decrease supply and return temperatures
 - New business models / customer relationship
- » Digitalisation: Create a data base for system optimisation, demand site management and asset management
- » Increasing the performance and efficiency of existing DH systems by measuring data



Source: MVV [3]



Source: OTHR [2]



Source: AGFW

The Main Objective of the IEA DHC Task Shared 6 Project

Annex Task Shared Project 6

Status assessment, ageing, lifetime prediction and asset management of District Heating Pipes

Stefan Hay (AGFW) in cooperation with

Nazdaneh Yarahmadi (Research Institut of Sweden) and Ingo Weidlich (HafenCity University)

About IEA DHC



IEA DHC

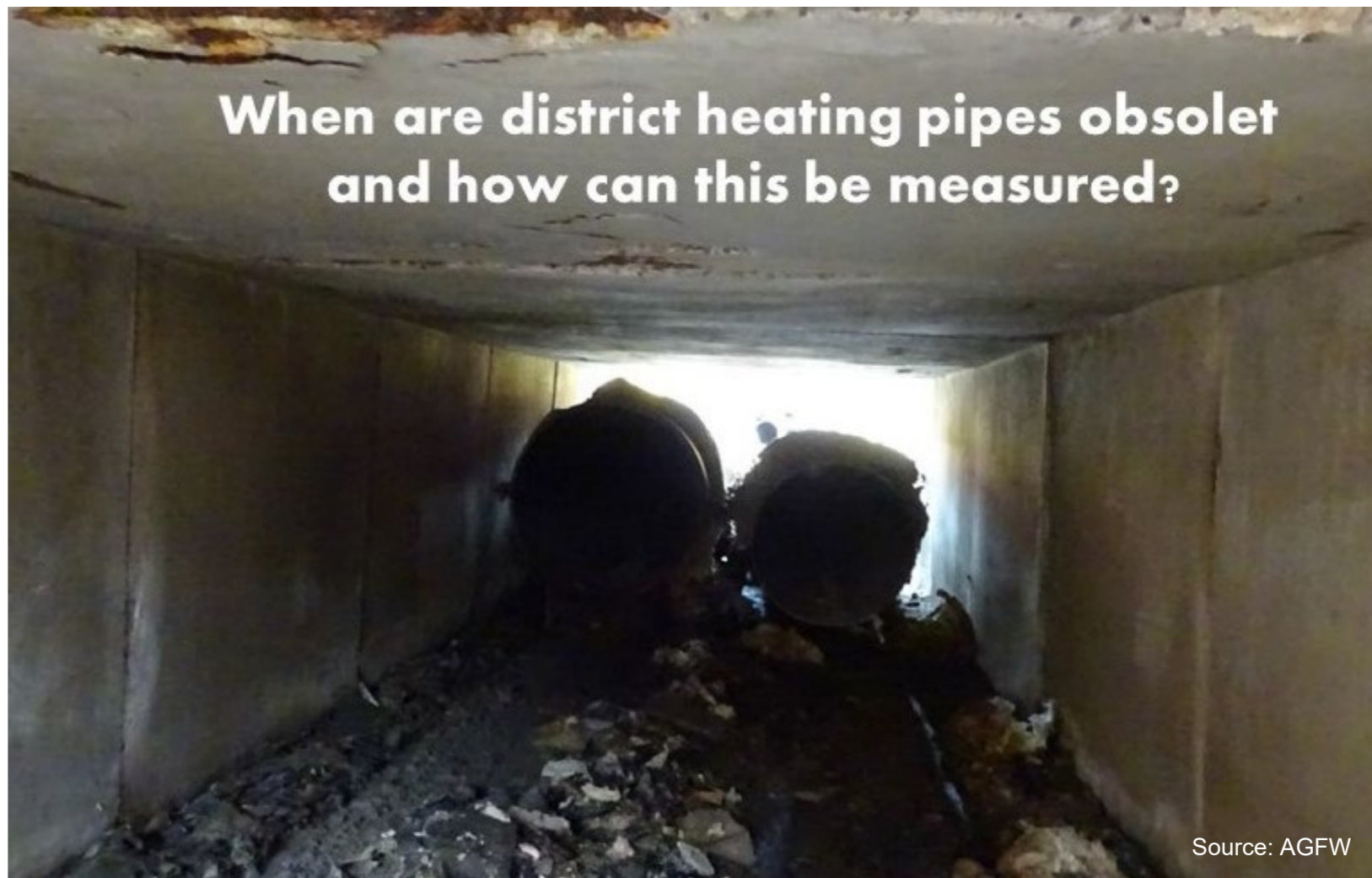
HUB FOR INTERNATIONAL
DISTRICT ENERGY RESEARCH

The members:

- Austria, Belgium, Canada, China, Denmark, Germany, Finland, France, Italy, Korea, Norway, Sweden and the United Kingdom
- Executive Committee
- Research since 1983 (Annex I)
- Projects: Cost shared / task shared

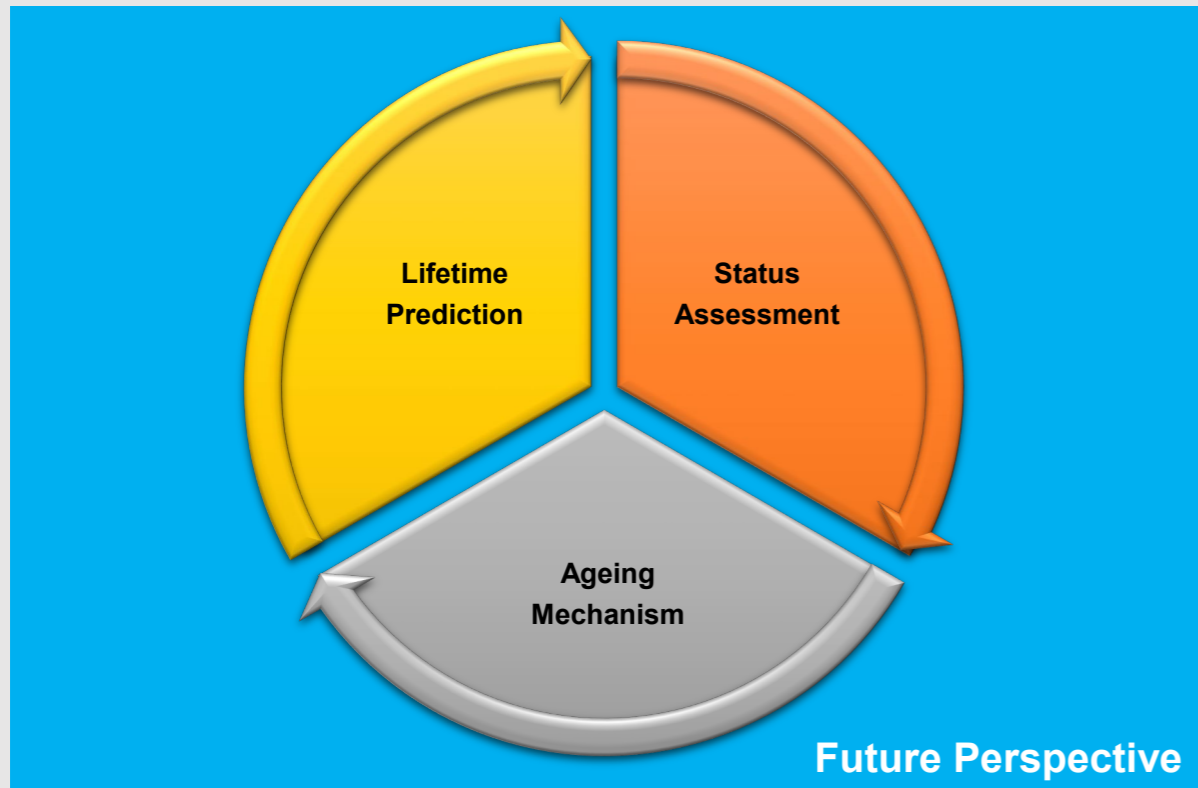
For further information: <https://www.iea-dhc.org/home>

Scope & the leading questions



Approach, subtasks & goals

Asset Management



maintenance, investments &
software tools
information on pipes (today)
laboratory testings & real life
application
equations for predictions
impact of DH evolution on
existing systems

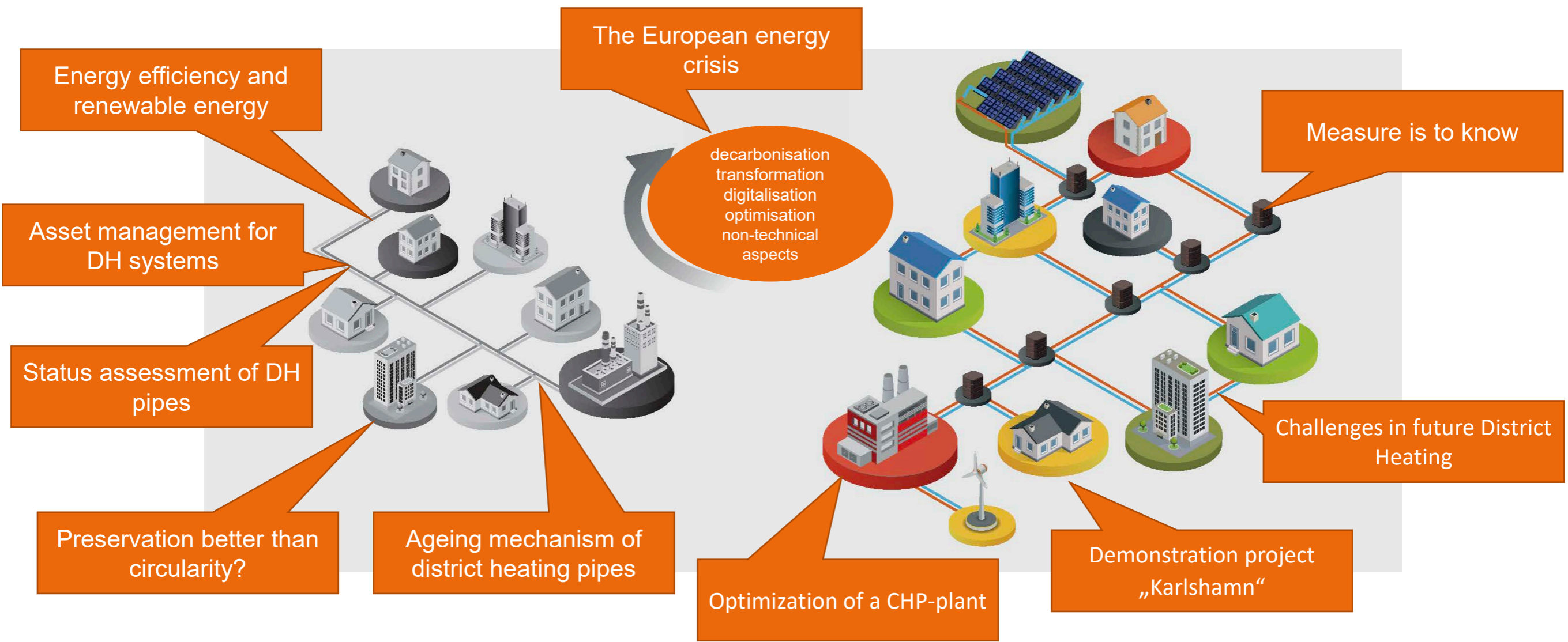
The Main Objective of the IEA DHC Task Shared 6 Project



- 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 gaps
 - 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>



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- [3] Abschlussbericht des Forschungsvorhabens „EnEff:Wärme - Kostengünstiger Fernwärmetransport für den effektiven Ausbau der Kraft-Wärme-Kopplung“, erschienen in AGFW Forschung und Entwicklung als Heft 32, ISBN 3-89999-052-8, Hrsg. AGFW (2015)
- [4] AGFW (2020), AGFW Hauptbericht 2019. Statistik des Bereiches Energiewirtschaft und Politik.
- [5] Gerbert, P. Herold, P. Kirchner, A. et al. (2018), Klimapfade für Deutschland. The Boston Consulting Group GmbH, freely available under: <https://bdi.eu/publikation/news/klimapfade-fuer-deutschland/> (website accessed on 19th October 2021).
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- [7] Schantey, L., Roes, J., Thommessen, C. et al. (2020) Studie zur Digitalisierung in Wärmenetzen. freely available under: <https://fourmanagement.salessation.com/studie-digitalisierung-waermenetze> (website accessed on 19th October 2021).
- [8] Federal Climate Change Act (2019) - <https://www.bmuv.de/en/law/federal-climate-change-act/>, <https://www.bundesregierung.de/breg-de/themen/klimaschutz/klimaschutzgesetz-2021-1913672> (website accessed on 03rd February 2022).
- [9] Coal Phase-out Law (2019), <https://www.bundesregierung.de/breg-de/themen/klimaschutz/kohleausstieg-1664496> (website accessed on 03rd February 2022).
- [10] Federal Climate Change Act (2021) - <https://www.bmuv.de/en/law/federal-climate-change-act/>, Amendment (2021) – <https://www.bundesregierung.de/bregde/themen/klimaschutz/klimaschutzgesetz-2021-1913672> (website accessed on 03rd February 2022).
- [11] Wunsch, M., Thamling, N., Maas, C. et al. (2020), Perspektive der Fernwärme. Im Auftrag des AGFW | Der Energieeffizienzverband für Wärme, Kälte und KWK e. V., Frankfurt, Germany.
- [12] BDEW (2020), Beheizungsstruktur des Wohnungsbestandes. <https://www.bdew.de/service/daten-und-grafiken/beheizungsstruktur-wohnungsbestand-deutschland/> (website accessed on 19th October 2021).

darum fernwärme ...

denn sie ist stubenrein und hilft,
CO₂ zu vermeiden.

www.fernwaerme-info.eu

fernwärme 
rein ins haus.

**Any more
questions?**



Stefan Hay
R & D
s.hay@agfw.de
+49 69 6304-345

