Are Large Thermal Energy Storages a key element of the future energy system?

IEA-ES Task 39, Online Workshop

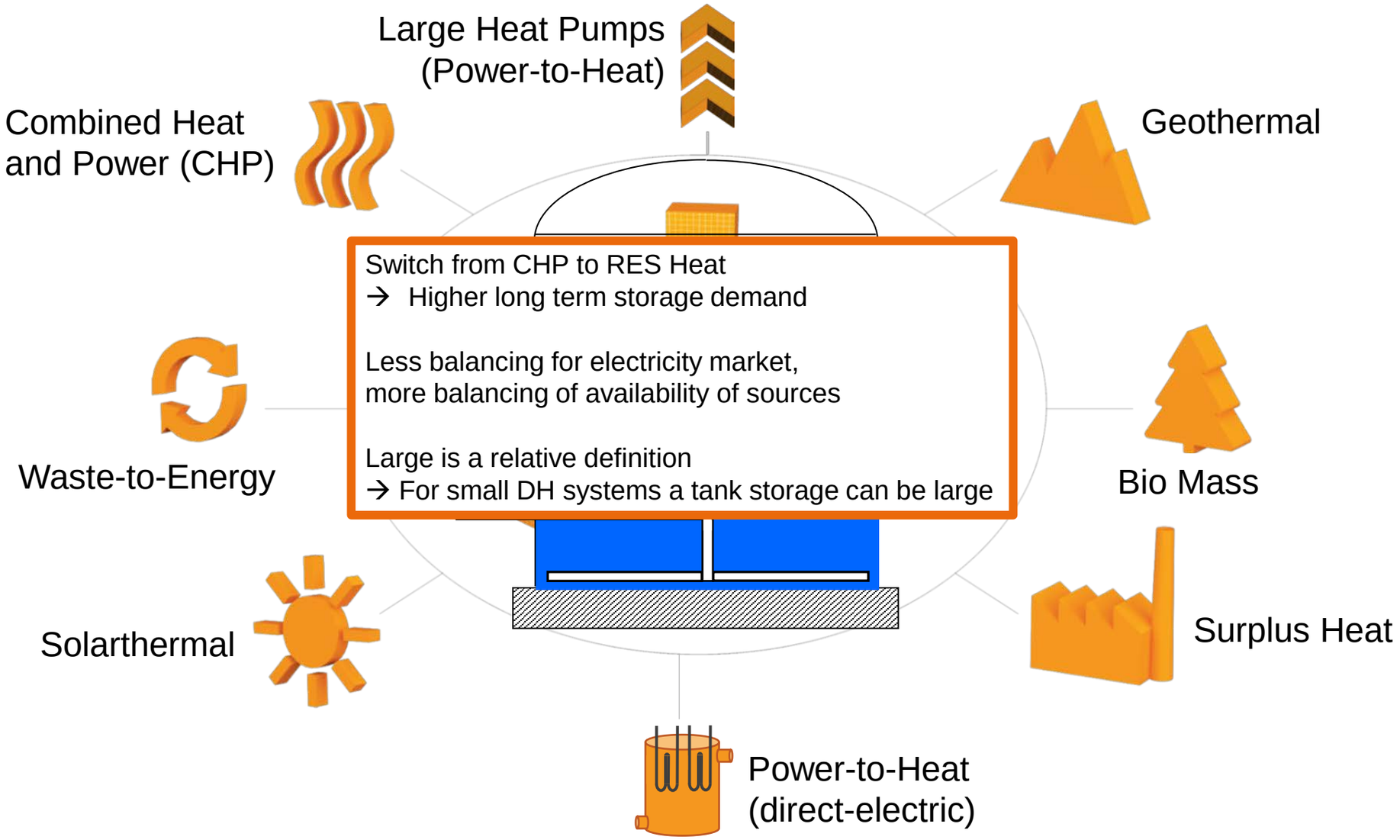
Dr. Jens Kuehne | December 5th 2023

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

AGFW?!?

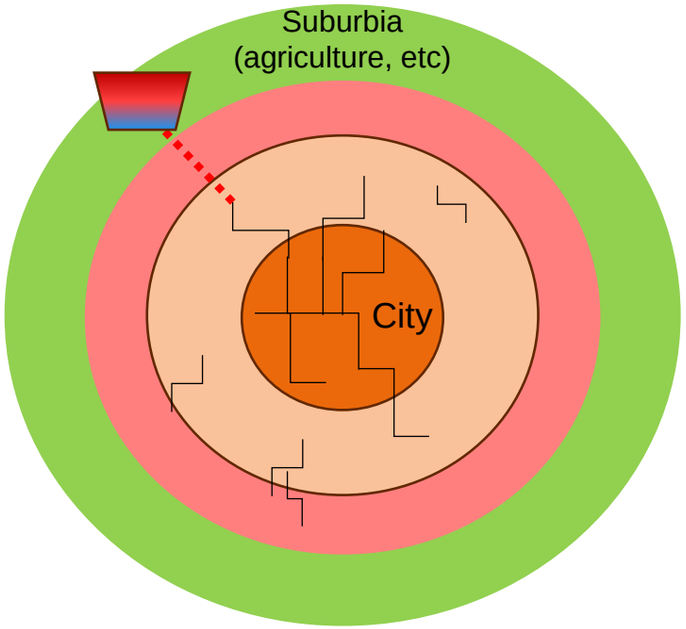
- **AGFW** is an independent, impartial German association promoting energy efficiency, (district) heating, cooling and CHP – Combined Heat and Power – at national and international levels
- **AGFW** comprises more than 600 regional und municipal energy suppliers, consultants, experts manufacturing companies 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

The Role and Significance of Heat Storages in DH Systems



Challenges for Large Heat Storages

- **DH in Germany mainly situated in large cities**
  - Different situation as in Denmark
- **Areas with high**
  - specific heat demand
  - property prices
- **Transport pipes might be an opportunity**
  - acceptable property prices, but
  - high costs for piping
  - difficult thermohydraulics
  - no feasible customers



BUT!!!

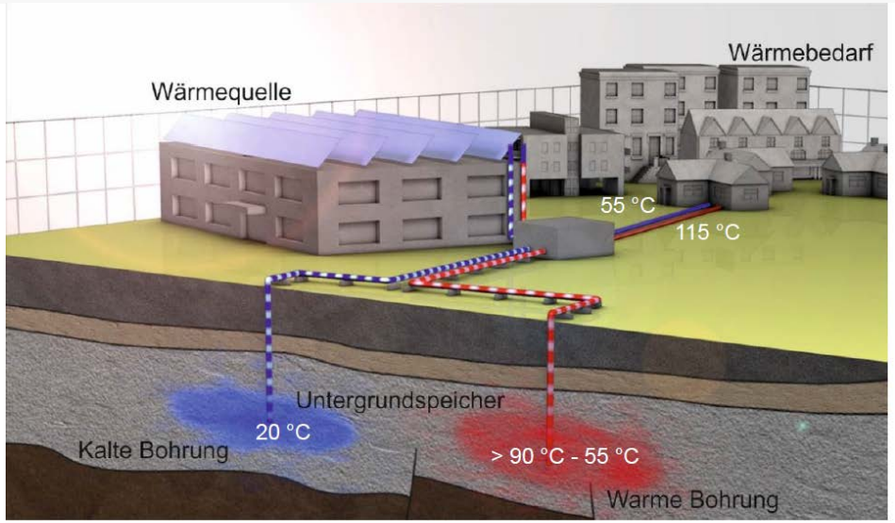
Promising Concepts and Projects

» **No need to copy Denmark‘s small DH systems**
- different circumstances (political, geologically, etc.)

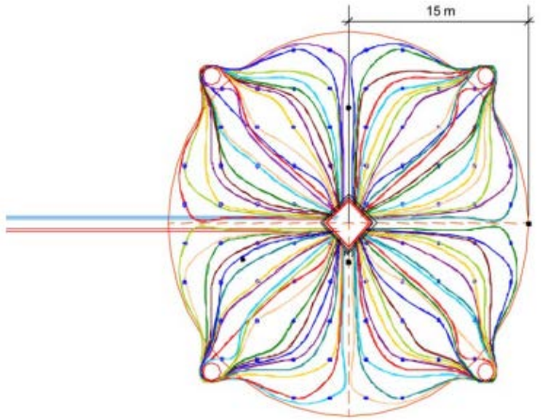
» **Different but fitting concepts for Germany‘s DH systems**
- Aquifer storages in Berlin (planned, > 20 GWh, BTB)
- Aquifer storage in Hamburg (in construction, 5 GWh, Hamburger EnergieWerke)
- Borehole storages (37,500 m³, Stw. Crailsheim)

» **Aquifer storages**
- low demand in terms of area
- High investment costs
- Need for specific geological circumstances

» **Borehole storages**
- High demand in terms of area
- Construction under e.g. solarthermal collectors



Quelle: GFZ



Source: Stw. Crailsheim

darum fernwärme ...

fernwärme
rein ins haus.

denn sie ist stubenrein und hilft,
CO_2 zu vermeiden.

www.fernwaerme-info.eu

City Structure of Hamburg