



Transformation of thermal networks and systems

Development of optimized and climate-neutral energy supply solutions

The planned phase-out of fossil fuels will have a direct impact on the district and process heat supply in Germany. A gradual transformation of heat supply systems and energy-intensive processes by switching to renewable energies, making intensive use of waste heat sources and using technologies that are as climate-neutral as possible is therefore urgently required. In this context, it is necessary to consider aspects of system integration with regard to grids, storage and heat generators as well as the coupling of heat supply with other sectors such as electricity, cooling and material infrastructures.

1.2 mil.
buildings are currently
supplied with district
heating. This figure is
expected to rise to over
2.5 million in the future.

Methodology and projects

Our Competence Center offers research, development and consulting services in the areas of transformation and operational optimization of existing heating networks as well as the design of future networks.

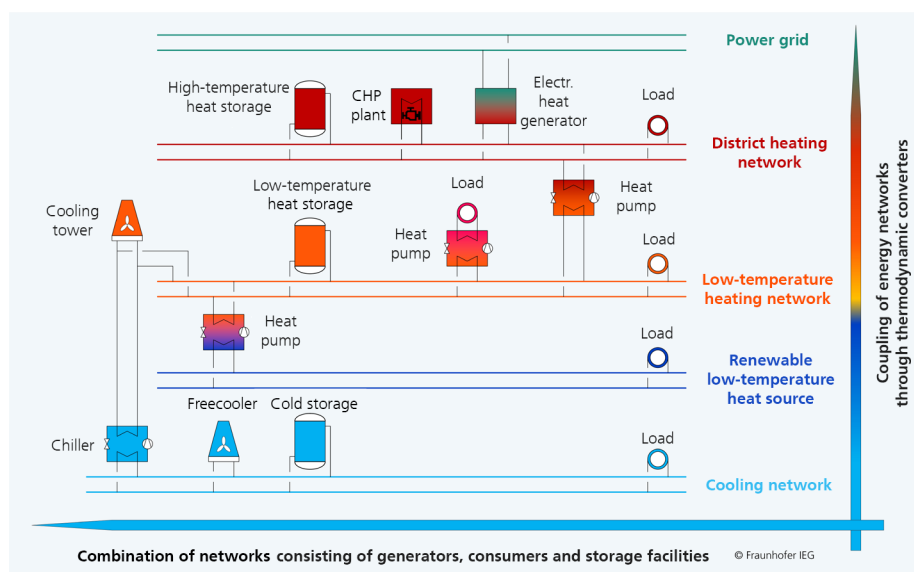
We investigate possible applications of high-temperature heat pumps for district heating networks where a reduction in the supply temperature is not readily possible in the near future. We also transfer suitable concepts into realisation. Against this background, we are developing ideas for the use of regenerative heat sources such as lakes and rivers, which also take into account the integration of short and long-term storage systems. We use intelligent operating strategies for all important grid components to ensure the efficient and sustainable operation of integrated thermal networks.

We also advise on combining thermal and material network infrastructures and analyze the potential for coupling the electricity and heating/cooling sectors.

As part of our projects, we consider the different levels of energy systems from a holistic perspective. Mathematical modeling of the individual components, the various thermodynamic processes and the overall energy system is an important method for economic optimization.

Our range of services

- Development of utilization concepts for low-temperature heat sources, e.g.
 - from near-surface and deep geothermal energy
 - from the production processes
- Concept development for grid integration of
 - thermodynamic converters
 - regenerative heat and cooling sources
 - of short and long-term storage systems
- Development of optimized operating strategies for new and existing systems
- Implementation of feasibility studies and realization of demonstration projects



Example of an integrated energy supply system (not all components are always present, but there is always an optimal combination).

Find out more about our current project
 »Transformation study on the decarbonization of heat supply in the Hoyerswerda, Weißwasser and Spremberg region«.



Contact

Dipl.-Ing. Anja Hanßke
 Head of the Competence Center
 Heating Grids 4.0
 anja.hansske@ieg.fraunhofer.de

Fraunhofer IEG
 Gulbener Straße 23
 03046 Cottbus
 www.ieg.fraunhofer.de



Dr.-Ing. Jan Albers
 Scientific Director of the
 Competence Center
 Heating Grids 4.0
 jan.albers@ieg.fraunhofer.de

Fraunhofer IEG
 Gulbener Straße 23
 03046 Cottbus
 www.ieg.fraunhofer.de

