

Transformation plan for the Munich-Riem island network

LOCATION: Munich, Germany

SYSTEM/TECHNOLOGY: Regenerative heat generation

SERVICES: Solution development / Feasibility studies

INDUSTRY BRANCH/TYPE OF PLANT: Green Energy

CLIENT: Stadtwerke München

ACTIVITY PERIOD: 2023-2024

POINTS OF CONTACT



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Tasks

Stadtwerke München GmbH (SWM) is a pioneer in the field of deep geothermal energy and one of the major operators of inner-city integrated district heating networks. Munich Riem is a young district in the east of Munich, which was built on the site of the former airport of the same name. The residential area is home to approx. 16,000 people and has a connected load of approx. 48 MW. Heat is provided at the Riem heating plant by means of a deep geothermal plant and three peak load gas boilers. A complete decarbonization of the network was investigated. For this purpose, a two-stage variant study was carried out, which is subdivided into a potential analysis and a variant elaboration. The study was based on the specific conditions of the Riem island grid. General statements were also to be made in order to be able to evaluate the transferability of the results to other district heating networks.

Project description

The study was carried out in accordance with the guidelines for the preparation of a transformation plan under the BEW funding program (federal funding for efficient heating networks). The following aspects were examined, among others:

- Increasing the funding volume flow of deep geothermal energy
- Ground-mounted solar thermal energy
- Central large heat pumps
 - Return flow of the thermal water
 - Return flow of the heating network to increase the temperature difference in the geothermal plant
 - Industrial waste heat
 - Groundwater
 - Ambient air
 - Waste water
- Decentralized heat pumps: Heat network return flow
- Daily storage
- Seasonal storage
- Solid biomass

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- Electric heaters
- Climate-neutral liquid fuels
- Change in operating mode

The potential of the technologies investigated was evaluated and a recommendation drawn up. SWM used the potential examined to define four supply variants, which were worked out in more detail in the second step. In each case, a daily storage facility to compensate for power fluctuations was also considered. For each variant, the investment and operating costs, space requirements, approval costs and electrical energy requirements were determined. Possible risks were also identified. Furthermore, a P&I flow diagram, a rough schedule and an installation concept were drawn up for each variant.

INP Services

- Load profile analysis
- Detailed potential analysis
- Evaluation of the potential
- Supply recommendation based on the potential analysis and potential assessment
- Holding a decision-making workshop
- Detailed analysis of variants
- Investment cost estimate of the variants
- Estimation of the operating costs of the variants
- Comparison of space requirements, electrical energy requirements and approval costs
- Preparation of P&I flow diagrams
- Preparation of a layout concept with associated operating buildings
- Preparation of a rough schedule
- Presentation of results