INP Reference

Feasibility Study – Utilization of Waste Heat from Lake- , Mining- Water and Industrial Waste Heat

LOCATION: Profen, Germany

SERVICES: As-built status and data recording, Solution development / Feasibility studies

INDUSTRY BRANCH/TYPE OF PLANT: Green Energy

CLIENT: MIBRAG GmbH

ACTIVITY PERIOD: 09/2024-01/2025

POINTS OF CONTACT

Michael Ohmer
Leiter Energie- und WärmeVersorgung
INP Deutschland GmbH
Werkstraße 5
67354 Römerberg
Deutschland
Tel. +49 6232 6869-0
michael.ohmer@inp-e.com
www.inp-e.com

Tasks

As part of the decarbonization of the district heating supply in Profen, MIBRAG GmbH is evaluating a concept for the use of a large-scale heat pump system.
In future, the heat-pump- system should be part of the new low-carbon heat supply, together with a power-to-heat (PtH) plant and a large-scale thermal energy storage system.
Potential heat sources include mining- water, lake- water as well as industrial waste heat.

Project description

INP got the contract to assess the technical and economic feasibility, compare different plant concepts, and establish a robust basis for further planning.
INP's task was to design a comprehensive preliminary technical assessment of the feasibility of a heat pump system utilizing multiple potential heat sources. Especially included was the analysis of switching between various heat sources , the use of natural refrigerants, and operating strategies under fluctuating source temperatures.
The integration into existing and planned systems such as PtH units and thermal energy storage required a detailed technical conceptual coordination. A particular challenge was the development of multiple concept variants while taking site-specific conditions as well as the special energy efficiency requirements for this plant.

INP Services

The following services were provided by INP at the level of basic evaluation and preliminary design:

- Identification and assessment of potential heat sources (mining-water, lake- water, industrial waste heat)
- Definition of operating modes and scenarios of switching with various

sources
- Development of preliminary system design concepts for heat pump systems up to 20 MWth
- Preparation of variant comparisons and evaluation matrices
- Technical analysis of integration into the district heating network
- Layout planning considering structural and site-specific boundary conditions
- Preparation of process flow diagrams, mass- and energy- balances
- Design of a control system interface concept
- Conceptual design of the electrical power supply
- Preparation of cost estimation in accordance with BEW requirements
- Definition of a zero-schedule baseline and project timeline up to completion
- Documentation of results