

Project Fact Sheet

Project Title Heat Pump with Two Regenerative Heat Sources (WP2Q)

Keywords Heat pump research, refrigerant cycle development, laboratory measurements, potential analysis

Project Details

Project Start	2023	Duration	1 Year
Grant Scheme	*)		
Funding Authority	*)	Project ID	*)
Project Budget	*)		
Project Leader	Prof. Dr.-Ing. Tobias Schrag		
Contact Person	Thorsten Summ		

Project Partners ratiotherm GmbH & Co. KG

Description

As part of the project, a heat pump is to be developed that uses two renewable heat sources. By connecting the circuits of the two heat sources, active regeneration of the ice storage during heating operation will be enabled, so that it is available as a heat source during peak load times with very low outside temperature.

In a previous project (Hybrid Heat Pump+), it was recognized that when circuits are interconnected, refrigerant and oil deposits can occur, and as a result, there can be efficiency losses and an increased risk of breakdown. This issue is to be solved with the newly developed interconnection. At the same time, despite lower complexity, no significant efficiency losses should occur compared to other hybrid heat pumps through optimized use of the heat sources. Lastly, the space requirement is to be significantly reduced compared to conventional brine heat pumps. Using a prototype, the refrigerant and oil displacement is to be analyzed and counter-strategies developed. In addition, a potential analysis by annual simulations will be carried out, allowing conclusions about the efficiency as well as the dimensioning of the peak load heat source and the refrigeration circuit for the active regeneration of the ice storage.

The goal of the project is for the developed WP2Q to have a higher efficiency compared to pure air heat pumps and, with significantly less space required, comparable efficiency to brine heat pumps (SCOP > 4.5 with underfloor heating). An ice storage volume of less than 5 m³ is targeted. This is intended to activate the urban area as a market (e.g. terraced houses, semi-detached houses).