

# Project Fact Sheet

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|----------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Project Title</b> | <b>Optimized operation of Air-Source Heat Pumps using predictive operation control based on weather prediction (optLWP)</b> |
| <b>Keywords</b>      | predictive control, Operation optimization of air-source heat pumps, energy storage                                         |

## Project Details

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|--------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------|-----------|
| <b>Project Start</b>     | 2022                                                                                                               | <b>Duration</b>   | 4 Years   |
| <b>Grant Scheme</b>      | 7. Energieforschungsprogramm                                                                                       |                   |           |
| <b>Funding Authority</b> | Federal Ministry for Economic Affairs and Climate Action                                                           | <b>Project ID</b> | 03EN1054A |
| <b>Project Budget</b>    | 450.000 €                                                                                                          |                   |           |
| <b>Project Leader</b>    | Prof. Dr.-Ing. Tobias Schrag                                                                                       |                   |           |
| <b>Contact Person</b>    | David Schmitt                                                                                                      |                   |           |
| <b>Project Partners</b>  | Hoval GmbH, Gebäudeenergieberater Ingenieure Handwerker – Bundesverband e.V. (GIH), Bundesverband Wärmepumpe (BWP) |                   |           |

## Description

The research project aims to develop and test a predictive operating strategy for heat pumps with outside air as a low-temperature source. The novel operating strategy aims to enable an improvement of the coefficient of performance achieved during operation and thus significantly reduce the electrical energy demand, without increased material or manufacturing costs. The efficiency is dependent on both source and sink temperatures. It should be noted that the sink temperature is already highly optimized in modern heat transfer systems. Therefore, to increase efficiency, the source temperature used should be increased. Since the outdoor air temperature shows significant fluctuations both during the course of the day and during the course of the week, the definition of operating times can bring about an increase in efficiency when the outdoor temperatures are particularly high. For this purpose, the use of thermal storage units is mandatory, which are loaded at high air temperatures and can also cover the heat demand in subsequent, colder periods. This is achieved by a predictive operating strategy based on temperature forecasts.