

Energy Efficiency

Large-Scale Heat Pumps Coupled to Heat Grids in German Field Tests

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Decarbonizing the building sector is crucial to the success of the energy transition. The majority of energy used in Germany's buildings is for space heating and is often delivered by fossil-gas- or oil-burning boilers. However, emission-free alternatives are available.

One such technology is the heat pump. Like an air conditioner in reverse, a heat pump concentrates heat from the environment and delivers it to where it's needed instead of transporting heat from inside to outside. By using thermodynamic effects to their advantage, heat pumps can achieve remarkable levels of efficiency of 300 percent or even more.

Germany is now carrying out field tests as part of its "real laboratory of the energy transition" scheme in which industrial-scale heat pumps supplement supply in existing district heat networks. The tests, which are being conducted in Berlin, Stuttgart, Mannheim and Rosenheim, are based on industrial and commercial sources of waste heat or renewable sources.

Andreas Feicht, State Secretary at Germany's Federal Ministry for Economic Affairs and Energy commented: "The integration of large-scale heat pumps into heating networks offers great potential for decarbonizing residential, commercial and administrative buildings in cities. The large-scale heat pump real laboratory is helping to bring high-efficiency heat pump technology to dense, urban, built-up areas where there is no room for decentralized systems."

The research consortium is one of 20 winners of an ideas competition held by the Federal Ministry for Economic Affairs and Energy in 2019 to accelerate the transfer of innovations into practice. The experts selected different constellations of size and structure and will investigate aspects such as grid efficiency and the decarbonizing effect.

The "real laboratories" are anchored in the Seventh Energy Research Program of the Federal Government. They are designed to address the challenges of the energy transition and bring together and test innovative technologies in real-world settings on an industrial scale. The aim is to bring technically feasible innovations to market quickly and make them competitive through economies of scale.

A more detailed project description and the project partners can be found at:


<https://projektinfos.energiewendebauen.de/projekt/neu-grosswaermepumpen-in-deutschen-fernwaermenetzen> 

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Bénédicte Winter

 +49 30 200 099 261

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