

case study

Domestic heat pumps field trial

Project Summary

Problem: Domestic heat pumps are rapidly gaining market share in the UK, but there is little independent evidence of their performance and carbon saving in real installations.

Solution: This project is measuring the performance of heat pumps in a large sample of UK homes. Factors that affect heat pump performance including system design and user behaviour will be included. The consumer acceptability of heat pumps and their potential in helping to reach UK CO₂ reduction targets will be determined.

Partnership

- The Open University
- The Energy Saving Trust
- Partnership incorporating DEFRA; The Scottish Government; North West Regional Development Agency; Centrica; EDF Energy; E.ON; Northern Ireland Electricity; npower; Scottish Power; Scottish and Southern Energy; Baxi; Danfoss; Mitsubishi; NIBE; Worcester Bosch; Earth Energy

Inspiration

The use of heat pumps for domestic space and water heating is long established in the USA and continental Europe. In the UK heat pump sales are expected to grow rapidly as energy suppliers, housing associations and grant programmes roll out this technology and heat pumps become eligible for subsidy under the Carbon Emissions Reduction Target (CERT). An estimated half million units could be installed by 2020 and 3 million by 2030. However, there is little measured evidence of heat pump performance in real UK installations and carbon savings are generally based on manufacturers' claims or modelling studies.

This project will establish the seasonal performance and CO₂ savings of air and ground source heat pumps in about 90 UK private and social housing properties, taking into account the affects of user behaviour and operating experience. The project's results will inform government, installers, manufacturers, housing associations and consumers how heat pumps can be most effectively installed and used and their role in achieving CO₂ savings.

Innovation

This project is the largest independent UK heat pump field trial to date. It is the first that attempts to relate monitored technical performance with consumers' understanding and use of, and satisfaction with, the technology. Consumer feedback should also provide manufacturers with ideas and specifications for improving heat pumps, especially the design of more user-friendly controls.

Development

Results from this project should enable heat pump parameters in the official SAP and CERT assessments of CO₂ savings from UK homes to be updated and clarify the potentially major role of heat pumps in the Zero Carbon Homes policy.

