

Project Lead: Parity Projects Ltd

Funding:

Partners: London South Bank University, ICAX Ltd,
Cambridge Energy, RetrofitWorks

£670,708



The problem: Reducing consumer costs for low carbon retrofits

The capital costs of installing a heat pump system and the supporting retrofit improvements are high and can be unexpected. Traditional loans can have high interest rates, and payback mechanisms are not designed to take into account savings made through improved building performance.

The solution

The ability to accurately predict the future energy use in dwellings once energy efficiency retrofit measures and heat pumps are installed, will allow customers and, crucially, financial institutions to determine the financial benefits of the measures, which can be insurable through financial institutions.

The Performance project aims to directly address the cost and quality assurance barriers to decarbonising heat in homes by creating a low-cost, cost-effective options analysis and verification protocol to enable the offer of a financially insurable performance guarantee to homeowners and landlords. Software will be developed that integrates existing retrofit supply chain components to ensure improved assurance of design and installation of a suitable package of measures, with a particular focus on managing financial risk.

“ We’re really excited to be taking part in such an important project that will use monitoring data to help shape finance mechanisms to support the heat pump and retrofit industry. ”

Jo Coleman

Project Manager, Parity Projects



Addressing cost and assurance barriers in heat pump deployment

What are we going to do?

Through detailed monitoring of dwellings the Performance project will look to create a tool that disaggregates the heat transfer coefficient into different rooms within a property so that an accurate prediction of the cost and carbon benefits of heat pumps and energy efficiency retrofit measures can be made for the property.

By achieving a very high degree of accuracy for the cost and carbon benefits, the proposed measures can be insurance-backed by a financial lender. This helps the lender manage their risk and they will therefore be able to offer more preferable interest rates to the consumer, reducing the overall cost of the low carbon retrofit.

Why is this an improvement on current solutions?

It is well reported that the upfront capital required for heat pumps and energy efficiency measures within domestic homes is a key barrier for their widespread adoption. By creating a highly accurate tool that can be used to insure potential savings, financial lenders can have increased confidence in the cost savings expected. This will help them mitigate their risk and allow them to offer rates below the current market options to homeowners. This has the potential to reduce the cost to homeowners and accelerate the lending market for heat pumps and energy efficiency, supporting the UK decarbonisation ambitions.

What would success look like?

The creation of software that successfully improves assurance of energy efficiency retrofits so that financial risk can be accurately managed for lenders.



How will this project help towards the target of installing 600,000 heat pumps per year by 2028?

The target will require significant financial resources, through public funding, homeowner capital and lending from financial institutions.

The Performance project will look to support this target by reducing the financial burden to homeowners, as well as, supporting financial institutions' ability to lend by helping them to manage their financial risk and offer lending at more preferable rates to homeowners.

The Optimised solutions development stream of the Heat Pump Ready programme supports the development of innovative tools, technologies and processes to overcome specific barriers to heat pump deployment in the UK. This stream supports solutions aiming to reduce the life time cost and increase the performance of domestic heat pumps, minimise home disruption whilst providing high quality installations, develop and trial financial models to support heat pump deployment, improve the heat pump consumer journey and provide a smart and flexible home energy system.

Heat Pump Ready is funded by the Department for Energy Security and Net Zero through the NZIP programme. The Collaboration & Learning stream is managed by the Carbon Trust with support from Ipsos and Technopolis. We give no warranty and make no representation as to the accuracy of this document, and accept no liability for any errors or omissions.

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www.heatpumpready.org.uk

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Key Findings

- Installing the in-home monitoring equipment can be a challenge. Many houses can appear suitable on paper but the nuances of the British housing stock can increase the time required and the suitability of installs.
- The algorithms to compare predicted and measured building performance are promising, giving confidence to the project.
- LSBU have been finding some really interesting results from their work and will be looking to publish research papers as a result of the project work.
- An understanding of data science and building physics, and the SAP methodology in particular, have been important for accurate modelling.



Performance Project Progress (Autumn 2023)

What progress have we made so far?

There have been 16 Phase 1 installations completed so far and Phase 2 recruitment is progressing well, with a target of 40 homes to have the monitoring equipment installed by the end of January 2024. Project partners at ICAX have completed their milestones, and LSBU's research is yielding interesting findings and they are expecting to publish research papers on their results. The software algorithms are promising and we are looking forward to testing and refining them more rigorously with the full Phase 1 and Phase 2 datasets in 2024. The alpha release is expected to be released for initial testing before the end of 2023.

What barriers have we identified and how has this changed our approach to delivering our project?

The main challenge has been around Phase 1 installs. The project requires certain conditions in the homes to be able to install the heat meters; many properties initially recruited for Phase 1 have been found to be unsuitable due to nuances in the home. This has delayed Phase 1 installs and reduced the total number of planned installs. Whilst this doesn't materially impact the project it is a useful learning for the future. Understanding the relationships between SMETER and SAP methodologies has also been shown to be key in the modelling and creating an accurate software tool.

What are our next steps?

The next steps for the project are to progress the Phase 2 installs over the winter of 2023/24 and to work towards the beta release by developing the alpha version of the software through continuing to refine the algorithm by incorporating further building performance metrics such as ventilation and thermal mass parameters.

Additionally, in the spring of 2024 the project will move into its next phase, of working with financial providers to provide the financial offering to go alongside the software.