

**Project Lead: Passiv UK**

**Partners: TBC**

**Funding:**

£989,691

# passiv

**The problem: Consumers have limited access to optimised heat pump operation due to a lack of heat pump-specific smart-controls.**

It is more difficult to install and operate heat pumps in a way that maximises efficiency than it is with other, more carbon-intensive heating methods. Current solutions typically only have an on/off control, which doesn't optimise flow for actual heat demand or weather patterns, leaving a lot of room for efficiency improvements. Additionally, current solutions are not integrated with smart meters, acting as a barrier to flexibility participation. Developing a solution which allows the use of smart controls would reduce the barriers to, and costs of, ownership.

## The solution

Passiv's smart thermostat (PST) directly modulates flow temperatures based on weather conditions, set points, thermal inertia, and costs to improve heat pump efficiency. New functionality will offer standalone connectivity and integration with the smart meter infrastructure, ensuring that all customer groups can benefit from energy flexibility services. As a result, consumers will benefit from heat pumps that automatically optimise against their electricity tariff and provide a fully automated response to demand flexibility opportunities without the need for consumer intervention or any loss of comfort.

“We're delighted to be part of the important Heat Pump Ready programme, which we see as key to supporting the roll-out of ASHPs across the UK. Passiv UK has long been leading heat pump optimisation, and this project will directly help us develop our market leading smart thermostat to address many of the concerns that prevent market take-up of ASHPs and ensure that all consumers are able to participate in emerging energy market opportunities to get the best value from their heat pump.”

**Ian Rose**

Sales & Strategy Director, Passiv UK



## Improving smart controls

### What are we going to do?

Through the project, Passiv will develop and trial a new version of their Passiv Smart Thermostat - including gaining feedback from 200 users on the current PST. This prototype will build on the existing functionalities of optimising heat pump operation and automating participation in Demand Flexibility Services. It will also improve the customer interface, removing the need for a separate hub and programmer, and will allow for non broadband use and smart meter connectivity.

### Why is this an improvement on current solutions?

The smart thermostat developed by the project will allow offline optimised operation for those without broadband, suitable for the less able-to-pay customers.

Passiv's control algorithms automatically learn the thermal characteristics of a building, eliminating the need to configure complex load and weather compensation curves. It also goes beyond simple on/off control, instead modulating the flow temperatures of the heat pump based on predictive modelling that quantifies thermal inertia, weather conditions, set points and costs.

The programmer also functions as a hub and wiring centre with screw-free connections to simplify the installation process, reduce costs by making it quick and error-free, and eliminate the need for extra wiring boxes.

### What would success look like?

Successful development and testing of the smart thermostat to increase functionality and unlock further cost reductions in heat pump operation compared to existing smart thermostat models.

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. Wave 2 of this stream supports solutions aiming to improve the ease of heat pump deployment in homes that are 'complex to decarbonise', develop innovative solutions to enable heat pumps to be deployed in 'distress purchase' situations, improve performance of domestic heat pumps with low-GWP refrigerants and improve the domestic consumer experience of using and living with a heat pump.

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

This project reduces installation complexity and, hence, installation cost. It also reduces customer bills through its use of demand-side response and efficiency improvements, which reduce operational costs. It doesn't need an internet connection, making it a suitable solution for the less able-to-pay consumer, such as those in social housing.

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