



# Guru Smart Heat Pumps

## Developing tools for social housing landlords to enable heat pump installation at scale across the UK

**Project Lead: Guru Systems Ltd**

**Funding:**

£445,943



### The problem: How to manage ongoing heat pump performance

For larger landlords, such as housing associations and local authorities, who manage buildings or sites that contain multiple homes, the decision to install heat pumps can be complex, as the physical and operational requirements differ between properties. In addition, once installed it can be difficult to monitor their ongoing effectiveness and benefit. Engaging large landlords is essential if we are to reach the target of 600,000 heat pump installations a year by 2028 - owner occupiers alone will not be enough.

### The solution:

The Guru Smart Heat Pumps project is focused on finding solutions for large landlords who manage buildings or sites that contain multiple homes, such as housing associations and local authorities, by providing a holistic solution that understands the context of the heating system prior to the installation of heat pumps.

Through continuously monitoring and analysing ongoing performance, the objective is to ultimately provide operators the ability to remotely adjust the settings as required.

Heat Pump Ready is supporting us to create a solution to help large landlords in the social housing sector as they transition from gas boilers to heat pumps across their portfolios.

**Nic Mason**

Chief Product Officer, Guru Systems Ltd



## Increasing performance of domestic heat pumps

### What are we going to do?

Firstly, our Guru Smart Heat Pump device will be installed alongside existing boilers to monitor performance in advance of a heat pump retrofit. This will allow us to provide feedback to clients to enable them to correctly size the incoming system.

Secondly, as the Guru Smart Heat Pump product is heating system agnostic, it will remain in place to monitor the performance of the new heating system. To do this we will redesign our award-winning Guru Pinpoint analytics platform to provide clients the capability to actively manage system performance remotely.

Finally, we will complete an integration with heat pumps that allows remote recommissioning of the heat pump by landlords or contractors.

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

This product solves two common themes that determine whether a heating system is optimised: if the overall system is not designed correctly, it will never reach the promised efficiencies; and, if a system is not monitored and actively managed while in operation, its performance will degrade over time.

### What would success look like?

The overall outcomes of the project will be reduced initial capex spend, and improved heat pump performance in operation, resulting in fewer maintenance callouts, lower carbon emissions, and most importantly, more comfortable residents with reduced heating costs.



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

To meet the target, it is vital to engage with large landlords who manage buildings or sites that contain multiple homes, such as housing associations and local authorities.

Guru has created a solution for this sector; our product is designed specifically to assist landlords with large property portfolios keep track of the performance and maintenance of their fleet of heat pumps.

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.

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## Key Findings

- A smart thermostat that works with boilers and heat pumps from a variety of manufacturers is not currently a viable commercial option.
- In order to capture the standalone heat pump market, we would need to extend the connectivity options for Guru hardware (e.g. develop cellular based comms).
- Since the start of the project, the heat network market has undergone a fundamental shift towards Ambient Loop heat networks (i.e. heat networks that use water source heat pumps).
- As such, an offering that understands and can take inputs from both heat pumps and heat networks is especially timely, and where this project is increasingly focused.

## Guru Heat Smart for Heat Pumps Project Progress (Autumn 2023)

### What progress have we made so far?

We have completed our first three milestones, the first of which, Integrate, was focused on researching how (and whether) to reposition the existing Guru Heat Smart product from boilers to heat pumps.

Two further milestones were focused on researching and then delivering an improved integration with heat pumps, enabling the retrieval of data-over-modbus, which will form an essential requirement for the delivery of analytics work in 2024. We have worked with an Altherma heat pump at Daikin's test lab in Surrey to prove this functionality.

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

After looking into the competitor market for thermostats, and difficulties with electromagnetic EMS emissions tests on new display screens, we have decided to remove the in-home smart thermostat from the scope of this project. This will allow us to focus on the integration phase of the project, called Pinpoint. This is the analytics platform that takes data from the heat pump and other sensors within the property, allowing a view of the whole operating system.

### What are our next steps?

We are looking to test our Integrate and Pinpoint products in domestic properties, so are keen to find social housing landlords to partner with.

We are developing our COP and SPF calculations for use with both standalone heat pumps and Ambient Loop heat networks using heat pumps and are investigating whether other analyses are appropriate for use in these situations.

