Project Lead: Q-Bot Ltd   **Funding:** £782,665

q-bot

The problem: How can heat pumps be sized correctly?

A property needs to be accurately surveyed to calculate the heating demand before designing and installing a heat pump system. Traditionally, this survey can take an engineer several hours, with a detailed installation or broader retrofit plan taking an experienced professional several days to process.

The solution

By enabling homeowners to conduct a free 15 minute survey, along with a short questionnaire and background data, they will be able to access a list of appropriately sized heat pumps and approved contractors to proceed with installation.

Q-Bot's innovation targets the demand for a simplified, accurate solution to survey, pre-qualify, cost up and secure commitments for heat pump installations. The simple and free-to-use app will be used by homeowners or surveyors to quickly scan the building, generate heat loss calculations, explore various installation options (including radiator sizing) and costs, and then secure initial commitments from customers. It will then be used by assessors, coordinators (if part of a broader retrofit) and contractors to simplify, de-risk and validate the installation process.

> The UK needs to be installing 600,000 heat pumps per year by 2028 to meet net zero targets.
>
> We are very excited to be taking part in the Heat Pump Ready programme to drive this revolution in low carbon heating.

Maddy Clifford
Head of Product, Q-Bot

Using artificial intelligence to size heat pumps accurately

What are we going to do?

The Free Heat Pump Home Survey and Design Tool will allow homeowners to conduct initial home heat loss assessments with 90% accuracy, and full SAP based modelling and cost estimates using a LiDAR-enabled smartphone.

The tool will then help consumers confidently match a heat pump to the thermal demand of their house and other specific needs, and match approved contractors to proceed with installation or broader retrofit options (if needed to facilitate the installation). The consumer will also receive quality assurance of the works carried out, through the retrofit solution platform already developed by Q-Bot.

Why is this an improvement on current solutions?

Alternative solutions take several hours to survey and the output is frequently over optimistic on costs (as enabling works are not included) and savings (using an oversimplified energy model), with a more realistic installation or broader retrofit plan taking an experienced professional several days to process.

Q-Bot will update this process by developing a unique solution that can survey a building, model thermal demand, identify the building's needs, match with appropriate heat pumps, manage the risks inherent with the process, select and specify in detail the most cost effective upgrade path.

What would success look like?

The completed tool will provide homeowners with a clear user-owned process for specifying and installing a heat pump and associated works.

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

Q-Bot are creating an innovative and Free Heat Pump Home Survey and Design Tool to dramatically improve the ease of accessing accurate building information specific to each property, as well as taking this forward to heat pump implementation stage.

This will improve the quality of installations and ultimately drive up the number of appropriate heat pump installations that successfully go ahead.

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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Key Findings

- The balance between keeping the user interface simple for homeowners vs capturing enough information to make sensible heat pump suggestions is a challenge.
- The potential for a negative impact on the property's EPC makes it harder to have clear messaging.
- There is some confusion over whether EPC data can be used in tools such as this, and whether that data fully and accurately describes the property's current condition enough to help property owners make better choices to reduce their carbon emissions.

HEAT PUMP READY
Department for Energy Security & Net Zero
Part of the Net Zero Innovation Portfolio

Free Heat Pump Home Survey and Design Tool Project Progress (Autumn 2023)

What progress have we made so far?

Project progress has been focused on development of the tool, then refining the user interface and the integration of background property datasets into the app algorithms, setting up the product to move into testing with consumers and installers. To date we have completed five of the eight project milestones.

We've achieved key partnerships with organisations to support AI training of the app moving forward, to further refine and develop the quality of the product we can provide to meet the needs of consumers.

What barriers have we identified and how has this changed our approach to delivering our project?
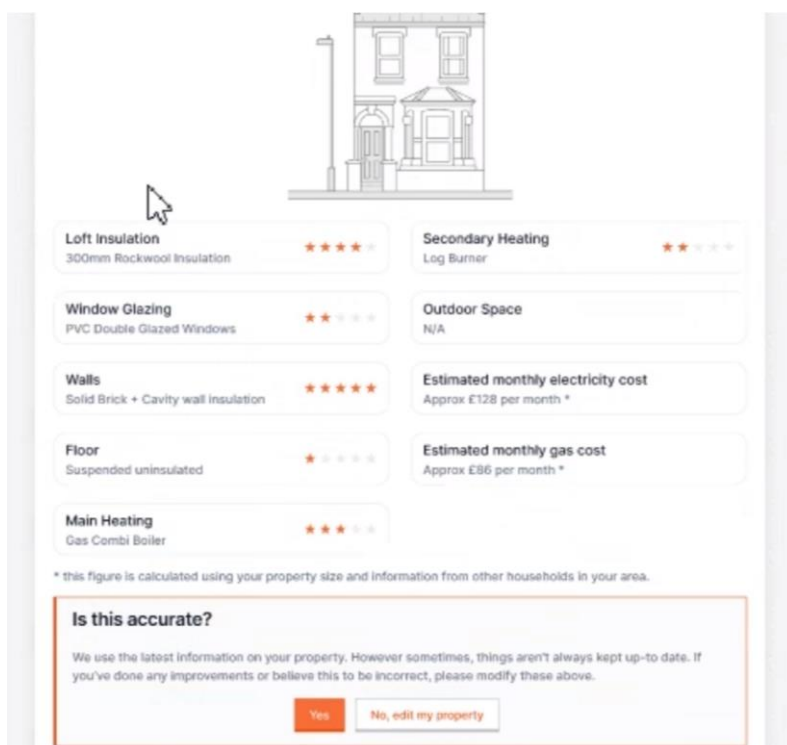
The way in which EPC ratings for homes currently interact with retrofit solutions and heat pump installations has been a learning that has come out of the initial development of the product.

This has adapted our thinking of displaying results to homeowners, as integration of heat pumps and retrofit solutions, whilst decarbonising home heating and improving home comfort levels, may not be presented as improving the EPC rating of a home.

What are our next steps?

In the coming months, we will be testing the user interface with homeowners to determine the usability of the user interface on the app, and the effectiveness of current messaging at engaging homeowners to decarbonise their home heating.

We will also be testing the accuracy of the data that is being pulled through from our API and integrated into the app currently, by asking installers to use the tool alongside home surveys, and compare their detailed in-home assessment results against app outputs