

Project case study: Cherwell Home Efficiency Hub

Theme: High-density deployment of heat pumps

Heat Pump Ready: This project was part of Heat Pump Ready Stream 1, a UK government funded programme designed to test innovative methodologies for achieving high density deployment of heat pumps in homes. Further details on Stream 1, including scope and eligibility are available here: [Heat Pump Ready Programme: Stream 1, Phase 2 - GOV.UK](#)

Project name: Home Efficiency Hub

Location: Cherwell, Oxfordshire

Lead organisation: City Science

Partner organisations: Oxfordshire County Council, National Energy Foundation (NEF), Scottish and Southern Energy Networks (SSEN)

Key sub-contractors and suppliers: Growth Guides, Trustmark, Hiber Finance (who replaced Lendology during the project), Carbon Rewind, Daikin

Funding:

Budget: £1,799,245

Amount spent: £697,099

Dates active:

Phase 1 (feasibility): July 2022 to December 2022.

Phase 2 (mobilisation): March 2023 – March 2024. See [feasibility report](#) here.



1. The project at a glance: Home Efficiency Hub

Where?

- The Home Efficiency Hub project targeted a neighbourhood of 515 homes near Kings Meadow Primary School in Bicester, Oxfordshire.
- This area was chosen due to its relatively affluent population, the lack of constraints on the local electricity network, and the high proportion of bungalows, which were thought to be well-

suiting to the proposition. These factors allowed properties in this area to be considered “ready” for a heat pump.

Who?

- City Science led the consortium, with key roles delivered by Oxfordshire County Council, The National Energy Foundation, Scottish and Southern Energy Networks (SSEN), and Growth Guides (a digital marketing agency). Sub-contractors, including Trustmark, Hiber, Carbon Rewind and Daikin were also engaged to provide services.

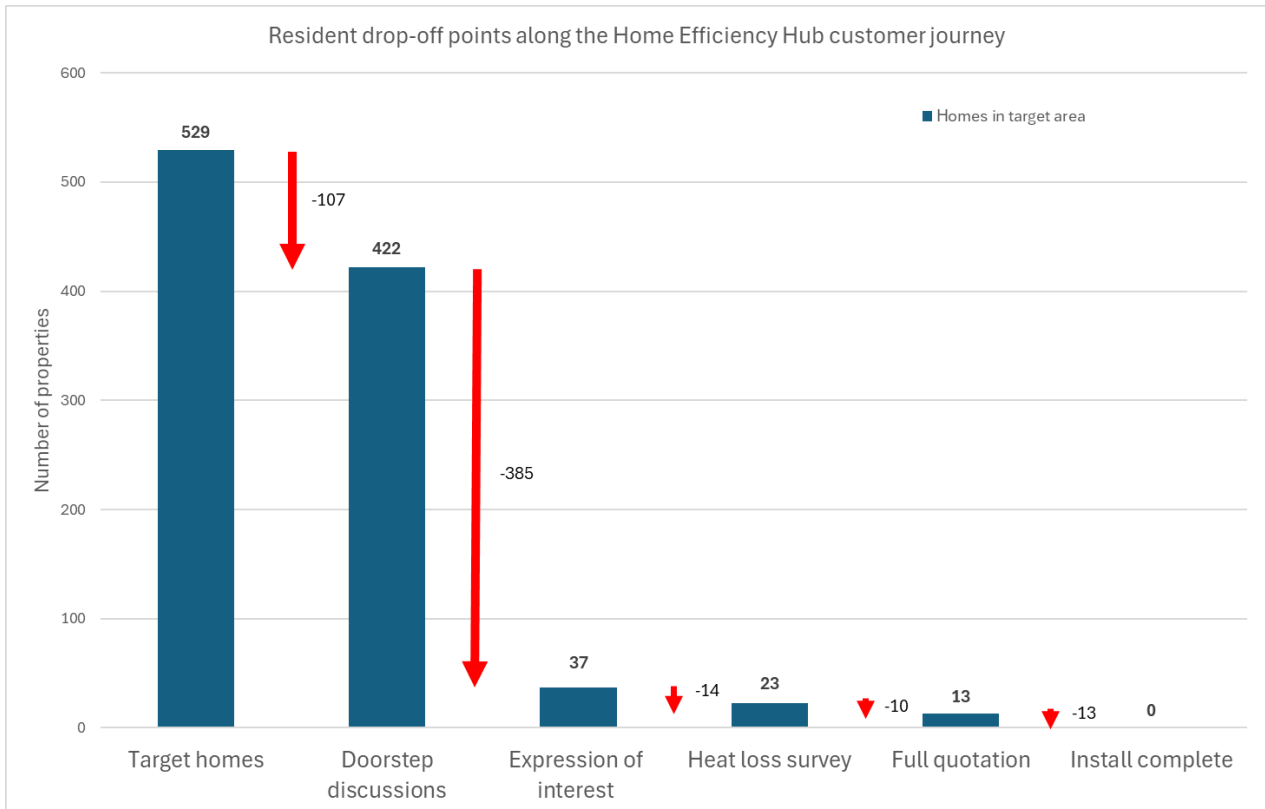
What?

- The customer value proposition focused on the ‘prosumer model,’ whereby heat pumps would be paired with solar PV, battery storage, and thermal fabric improvements to transform customers’ home energy systems. Free home energy surveys were offered to engage customers and outline the potential costs and benefits. Low-interest loans were made available to support the up-front costs.
- Creation of the Home Efficiency Hub to provide an online one-stop-shop for homeowners to have a survey with an accompanying Home Efficiency Plan. The ambition was to have 129 homes sign up to the programme and install a heat pump with solar PV, alongside any potential fabric improvements.
- A combination of in-person and digital marketing was deployed to engage customers.

Results

- In total, 23 home surveys were carried out, 21 Home Efficiency plans were produced for customers, and 13 homes proceeded to a heat pump quotation, as shown in Figure 1. However, no consumers opted to accept their quotes, therefore no heat pump installations occurred under the project. The up-front cost was cited as the primary reason homeowners did not progress.

Figure 1: Resident drop-off points along the Home Efficiency Hub customer journey for homes within the target area



1.1. Overview of mobilisation activities

The key activities funded during the mobilisation phase for the Home Efficiency Hub included:

- **Identifying households that would not require upgraded connections to the grid, had sufficient outside space and large roof space, to be considered ready for a heat pump** e.g., through spatial mapping and data visualisation tools, building performance data and DNO network capacity analysis.
- **Development of consumer engagement strategy** with key subcontractors.
- **Raising awareness of the project and of heat pumps** through a dedicated community engagement officer role alongside indirect engagement e.g., social media marketing and online advertising.
- **Customer recruitment via targeted engagement activities** hosting community events e.g., door knocking, producing and delivering leaflets, hosting community events (figure 2).
- **Developing a customer relationship management tool and branding** e.g. Growth Guides' One Stop Shop.
- **Contracting an installer for home surveys and Home Efficiency Plan installations**, via a tender exercise and eventually using suppliers identified by NEF.

Figure 2: Community events



- **Fully funded detailed heat measurement surveys in homes** carried out by Carbon Rewind, included heat loss calculations and heat pump sizing.
- **Delivering Home Efficiency Plans** allowing customers to decide whether to proceed with the prosumer model measures.
- **Attending collaboration, learning and dissemination events across the Heat Pump Ready programme;** including quarterly learning workshops, the annual Heat Pump Ready conference, and external industry events.
- **Project management** e.g. consortium engagement, KPI tracking, milestone reporting, monthly reporting meeting with the project monitoring officer and collaboration and learning manager, collating evidence for funding claims, producing a final project report.

1.2. Delivery partners and roles

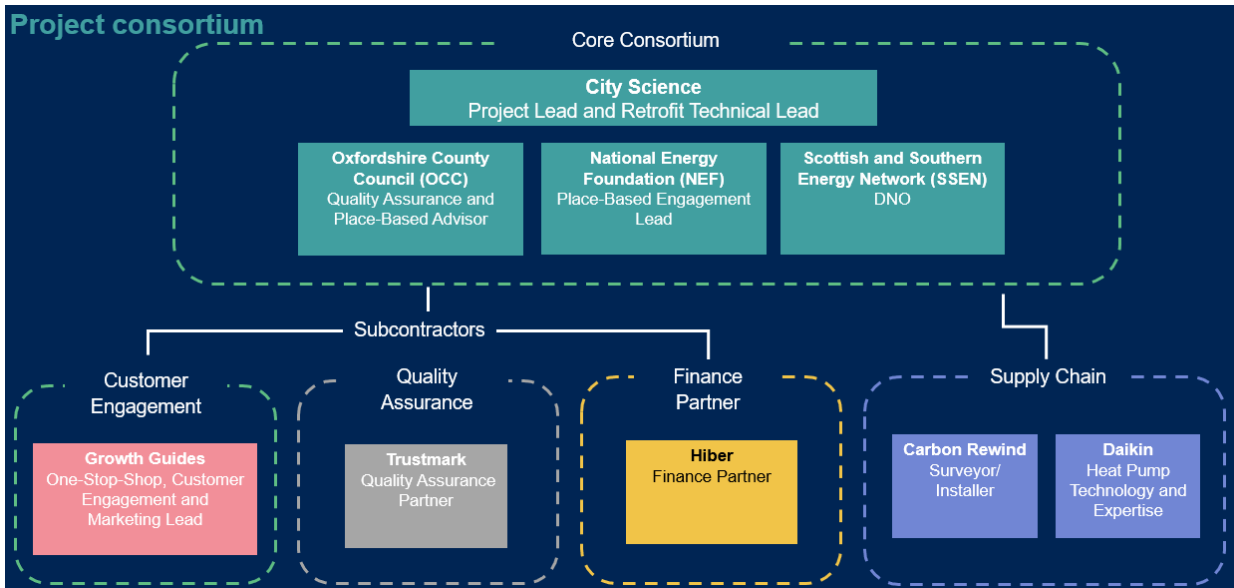
Table 1: Summary of delivery partners and roles

Delivery partner	Roles
City Science	<p>Project lead</p> <ul style="list-style-type: none"> • Consortium development and lead partner • Project management and reporting • Building level modelling and analytics • Neighbourhood identification • Proposition development

Oxfordshire County Council	Local authority <ul style="list-style-type: none"> • Advised on neighbourhood selection • Reviewed the value proposition to ensure strategic fit with local authority decarbonisation goals • Added a trusted brand to in-person and digital communications campaigns
National Energy Foundation (NEF)	An independent domestic energy and sustainability charity <ul style="list-style-type: none"> • Contributed to developing the value proposition, recruitment strategy and local project communications • Employed a community engagement officer to lead awareness raising in the community, including door-knocking • Worked with Carbon Rewind to develop the Home Efficiency Plans
Scottish and Southern Energy Networks (SSEN)	Distribution Network Operator (DNO) <ul style="list-style-type: none"> • Responsible for the local electricity distribution network and new connections • Assisted in identifying potential areas of low grid constraints where high-density deployment of heat pumps would be feasible • Sub-station monitoring • Developed new procedures for bulk applications of heat pumps
Growth Guides	Experts in digital engagement <ul style="list-style-type: none"> • Carried out market research with consumers to inform the project strategy, branding and value proposition. • Developed the Home Efficiency Hub brand and logo • Digital marketing and engagement strategy via social media • Created a dedicated website, including an online customer journey • Developed a CRM platform • Designed and developed the letters and flyers used by the community engagement officer
Trustmark	Quality assurance body <ul style="list-style-type: none"> • Quality assured installations
Hiber	Finance partner <ul style="list-style-type: none"> • Provided low-interest finance packages to customers at the point of sale • Replaced Lendology's role during the project
Supply chain	Roles

Carbon Rewind	<p>Technology installers</p> <ul style="list-style-type: none"> • Installed heat pumps, solar PV and building fabric upgrades • Worked with NEF to deliver Home Efficiency Plans • Provided a single point of contact for the installation of all technologies
Daikin	<p>Heat pump manufacturer</p> <ul style="list-style-type: none"> • Provided heat pumps and associated equipment • Provided training to installers

Figure 3: Consortium organisation chart



1.3. Location and target homes

City Science conducted housing stock modelling and analysis across Cherwell District Council in Oxfordshire during the feasibility stage. This analysis identified a target area within North West Bicester as the most suitable for high-density heat pump deployment. The consortium selected a neighbourhood of 515 homes (with a target of 129 installs) near Kings Meadow Primary School as the location for the project. This area was chosen because:

- Initial work with Scottish and Southern Electricity Networks (SSEN) suggested that the area would not require any significant upgrade work to the network to accommodate heat pumps at high density.
- The area is characterised by a high number of bungalows whose large roof areas made them good prospects for installing solar PV.
- Bungalows often have open plan spaces, which facilitate even heat distribution throughout the home, and the single-level layouts allow for generally simpler installations.
- The Energy Performance Certificates for houses in the areas suggested that most homes did not require significant improvements to their thermal fabric.

- Over 90% of properties were heated by gas at the time (this was a pre-requisite for progression to the delivery phase of the programme).

The project area was separated into four target groups. Table 2 and Figure 4 summarise the numbers of targeted homes and levels of engagement in each target group.

Figure 4: Map of target neighbourhood in NW Bicester, highlighting the different target groups



Table 2: Target group summary table

Target group	Total number of homes in target group	Number of homes targeted (25%)	Total number of homes engaged to date	Total number of homes with doorstep discussions	% of homes with doorstep discussions	Surveys completed	Surveys as % of total
1	56	14	56	46	82%	1	2%
2	72	18	72	65	90%	6	8%
3	87	22	87	74	85%	4	5%
4	300	75	300	237	79%	12	4%
Total	515	129	515	422	82%	23	4%

1.4. The value proposition for customers

There were several core elements to the Home Efficiency Hub value proposition:

1. Enabling homeowners to become energy prosumers

The value proposition was centred around a 'prosumer model' whereby heat pumps are combined with solar PV and other measures to maximise energy bill savings for customers and give them greater energy independence.

During the customer research phase, the project identified some negative attitudes towards heat pumps in the community but more positive attitudes towards solar PV. In light of the different attitudes to the two technologies, a joint technology approach was taken through the prosumer model. The Home Efficiency Hub became a recognised local project, allowing the project teams to build trust with the local community and to do some myth-busting around heat pumps.

2. A one-stop shop for energy upgrades

By packaging multiple measures together, the project hoped to attract customers drawn to the concept of a 'one-stop-shop' for home energy upgrades rather than engaging with multiple suppliers for different measures. This approach was compounded by the availability of the local Community Engagement Officer to guide people through the customer journey.

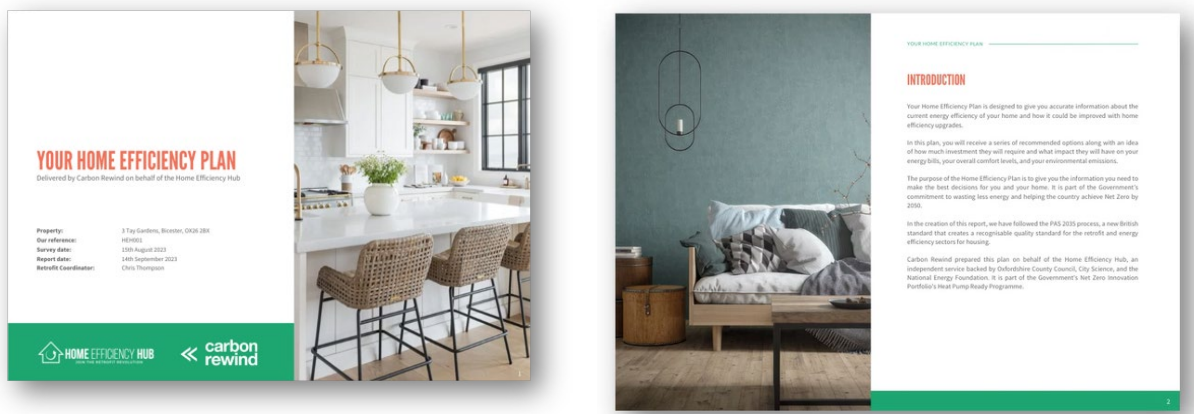
3. A trusted brand with the endorsement of the local council

The involvement and endorsement of Oxfordshire County Council was seen as adding a key point of differentiation and value to the proposition. The market research confirmed that customers were unsure how to verify the project was legitimate and that installers were of high quality. Consumers viewed the endorsement of the local authority positively.

4. A free, zero-obligation, Home Efficiency Survey and Plan

The project aimed to differentiate itself from other services by providing interested customers with a free, in-depth, high-quality home survey. This was followed by the Home Efficiency Plan, which outlined all the potential energy efficiency measures, including the costs, which would be appropriate for their home (Figure 5).

Figure 5: Example of a Home Efficiency Plan



5. Low-interest finance to overcome the up-front cost barrier.

The project sought to address the barrier of high up-front costs by providing customers with two low-interest loan alternatives to cover the capital costs of the technologies in the prosumer model. Option 1 was a 12-month interest-free loan, and the second was a 3-year loan at an interest rate of 3.6%. Borrowing costs increased significantly during the project, which put upward pressure on financing costs. Given that no customers accepted their quotes and no installs took place under the programme it has been suggested by the consortium that these finance options were not sufficiently attractive to consumers. However, as no customers signed up to the finance options the appeal and potential benefits of these options could not be fully tested with customers.

1.5. Approach to customer engagement and recruitment

The project used multiple approaches and different forms of communication to engage with the residents in the target area to promote their offer. An initial wave of digital marketing and individually delivered leaflets was used to introduce the project, the project team, and raise awareness of heat pumps and their benefits. This was followed up by in-person visits by a Community Engagement Officer.

Consumer research in the target area

NEF completed 83 door-to-door surveys in the target area of NW Bicester (515 doors knocked). These surveys aimed to test interest in the prosumer model, the concept of a Local Green Energy Advice Service (via the project's proposed One Stop Shop model) and interest in being involved in further project stages.

The consumer surveys found that 27% of those surveyed were very interested in adopting the prosumer system, and the One Stop Shop model concept was generally well received. However, 68% quoted up-front cost as the highest barrier to heat pump adoption, which is a challenge for the prosumer model, as the upfront costs are generally higher due to multiple technologies being installed.

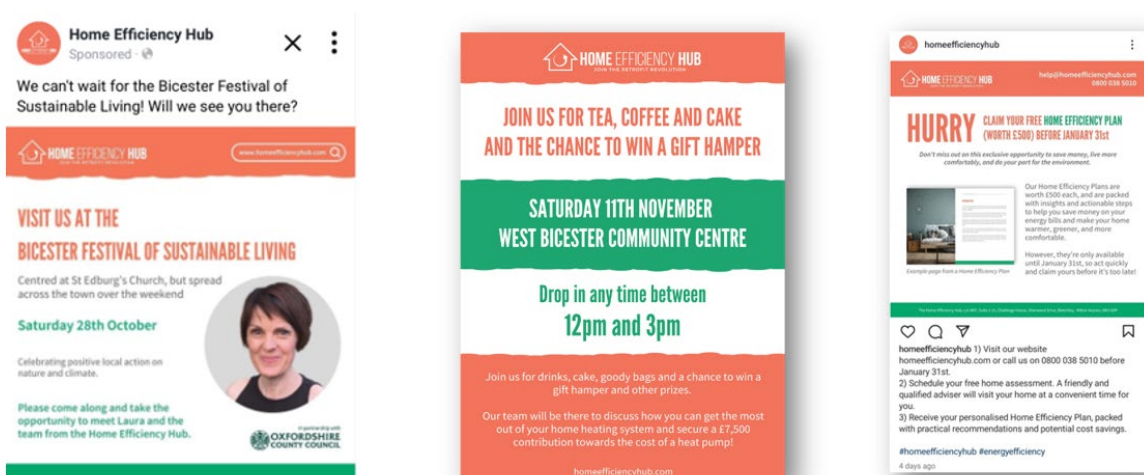
Digital engagement

Digital engagement was core to the project's awareness-raising and recruitment approach. Growth Guides designed and delivered digital communications, including social media adverts targeted at people in the area (Figure 6). Geographically centred, targeted paid advertising through Facebook and search engine optimisation for Google were tools employed to engage customers in the neighbourhood.

Face-to-face engagement

The digital engagement strategy was supplemented by community engagement and door-knocking. The Community Engagement Officer from project partner NEF led the delivery of this, including delivering leaflets, pamphlets, and letters (including the Local Authority logo) to homes in the target area. The community engagement officer also delivered community engagement events in the local area, and the Home Efficiency Hub participated at larger local events (e.g., Bicester Festival of Sustainable Living) to help raise awareness, answer questions from customers, and encourage sign-ups.

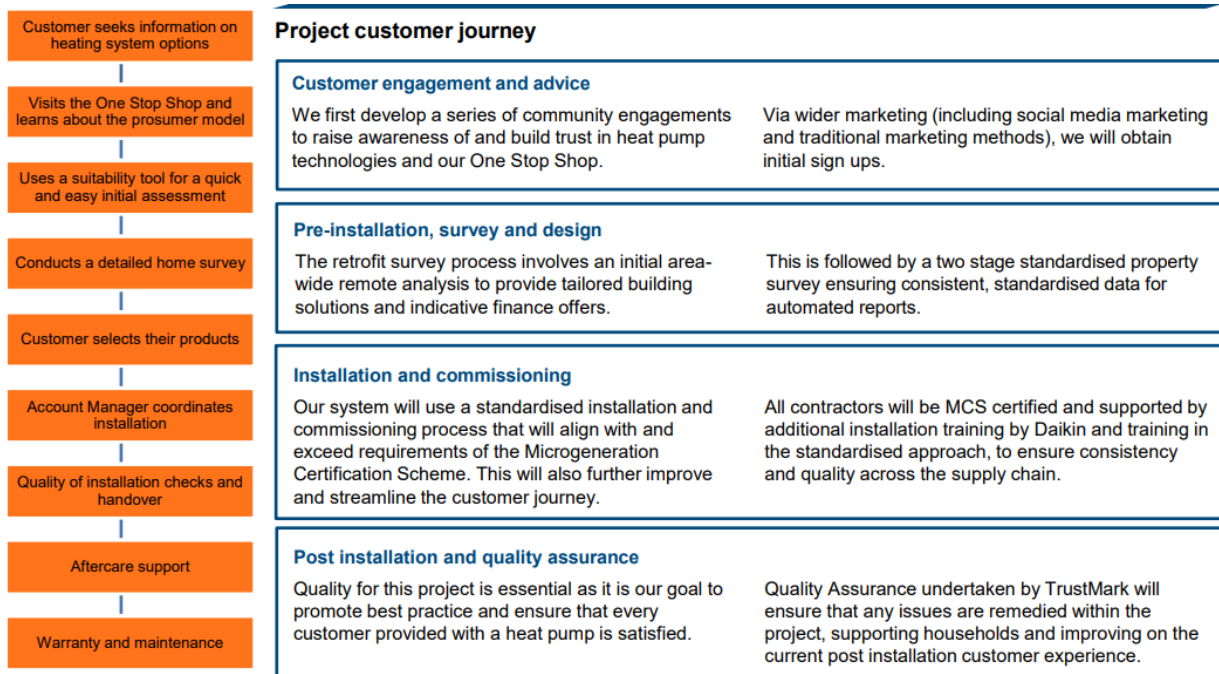
Figure 6: Example of paid social media advertising



1.6. Proposed customer journey

While no customers accepted their quote, and therefore no heat pumps were deployed during the project, the Home Efficiency Hub developed a detailed customer journey to guide customers from enquiring about heat pumps to installing one and receiving aftercare support. This is shown in Figure 7.

Figure 7: Outline of proposed customer journey



Customer engagement and advice

The digital marketing and community engagement officer activities raised awareness for the project and provided a pathway for initial sign-ups for home surveys.

Pre-installation, survey and design

The Home Efficiency Hub's one-stop shop design meant that there would have been a clear path between the initial home survey, which would then be followed up by a Home Efficiency Plan and, ultimately, a quote for the installation. Carbon Rewind was responsible for producing these plans, but City Science and the Home Efficiency Hub platform would have managed the processing of the customer journey.

Installation and commissioning

If the customer were to have accepted a quote, Carbon Rewind could have scheduled the work by integrating the Home Efficiency Hub API and its CRM software.

Post-installation and quality assurance

Trustmark would have conducted post-installation quality assurance checks and provided any follow-on support after installation. The customer's position throughout this journey could have been monitored and tracked via the Home Efficiency Hub one-stop shop.

2. Project outcomes

2.1. Awareness of the project, surveys completed and heat pumps installed

Awareness of the project in the target area was high, with 90% of the residents contacted in small monthly sample surveys being aware of the project by the later stages. In total, 23 home surveys were carried out, 21 Home Efficiency Plans were produced for customers, and 13 homes proceeded to a heat pump quotation. However, no heat pump installations occurred under the project as no residents accepted the quotation.

Under the requirements of the Heat Pump Ready programme, the project needed 25% of people within each target group area to sign up for heat pumps for funding to be provided for heat pump deployment.

City Science categorised the customer prospects across their four target group areas as follows:

Figure 8: Customer lead status key

Customer Lead Status	Description
Informed	Customers who have received information about the Home Efficiency Hub via post/leaflet/flyer.
Cold Lead	Customers who have stated they are not interested.
Warm Lead	Customers who have shown an interest but are not actively engaged.
Hot Lead	Customers who are actively engaged and progressing through the customer journey.
Dropped Off	Customers who have progressed through the customer journey but have withdrawn from the programme due to financial reasons and payment required on top of the grant funding.

Across the four target areas, the highest number of 'hot' leads was 5.6% within target group 2.

Figure 9: Snapshot of statistics from the target groups engagement study

Target group	Total number of homes	Hot Leads	Warm Leads	Cold Leads	Dropped Off
1	56	3.6%	0.0%	66.1%	0.0%
2	72	5.6%	0.0%	75.0%	2.8%
3	87	3.4%	1.1%	60.9%	1.1%
4	300	3.3%	0.0%	51.8%	1.3%
Total	515	3.7%	0.2%	58.1%	1.3%

The project also reported very low levels of engagement with the in-person community events held in the area.

2.2. Barriers faced through consumer recruitment:

Interviews with the project partners and key delivery stakeholders suggested that the following reasons were most significant in explaining the lack of uptake of the Home Efficiency Hub proposition:

- The value proposition for the 'prosumer model' was not compelling enough to overcome **the high up-front cost barrier** despite the availability of low-interest finance. Some customers were unwilling to consider the scale of investment unless the long-term cost savings were more compelling.
- The project team reported a **high level of scepticism from customers in the area towards heat pumps and the offer of a free survey**. Customers were reported as being highly fearful of scams and hard sales tactics sometimes associated with door-knocking approaches. This meant that initial engagement in the free survey was low despite efforts to develop a trusted brand with the endorsement of the local authority.
- **A lack of customer understanding of the technology and the inability to offer a demonstration or show home**. The project had intended to deliver a demonstration unit in the area to let people see a heat pump unit firsthand. However, this proved unfeasible in the project due to logistical challenges from the manufacturer. In hindsight, the project expressed that show homes could also have been helpful as technology demonstrators. The consortium partners felt that the lack of technology demonstrations hampered their ability to improve customer perceptions of heat pump technology and provide 'social proof'.
- **A lack of pre-existing community energy social infrastructure**. The project partners reported that engaging the target community proved more challenging than anticipated due to the community's lack of eco-consciousness and a perceived lack of social cohesion within the neighbourhood. It was felt that targeting an area with a pre-existing sustainability group or community energy group could have helped gain credibility and traction with the local community.
- **There was a low level of engagement in community events held by the project**. The project believed that factors such as the weather and time of the events (during typical working hours) were cited as potential reasons for the low engagement. However, this was also thought to reflect the proposition's overall low interest and scepticism.
- **Timescales**. Project partners reported that more time than expected was required to engage residents and build trust in the programme.

2.3. What other challenges did the project encounter?

The project partners noted that there were additional challenges in the following area:

- **Supply chain engagement**: There was a much more limited response to the tender process from the supply chain than had been anticipated, with only 3 of the 100 suppliers reached out to responding to the tender. Also, there was a marked variation in responses to the tender in price points, deviations from the specification, and the consortium's confidence in the skillsets of the suppliers to deliver the project to a high standard, making it difficult to select a project partner through the initial procurement approach. Carbon Rewind (who didn't respond to the initial

tender) had worked with the National Energy Foundation on previous projects, so conversations between the two organisations facilitated the selection of Carbon Rewind as the supplier.

2.4. Which aspects of the project worked well?

Interviews with the project partners and key stakeholders suggest that several elements of the project worked well despite the lack of progress toward heat pump installations:

- **High levels of awareness of the project within the target areas:** The main outcome of the project was the high level of Home Efficiency Hub awareness the project achieved (9 out of 10 people surveyed in small monthly sample surveys carried out by the community engagement officer) and the improved education around heat pumps in the neighbourhood, which can hopefully pave the way for individual heat pumps to be installed in this neighbourhood in the future. Whilst sign-ups to the Home Efficiency Hub were not as high as hoped, the awareness of the project remained high, demonstrating an effective marketing and engagement strategy which can be replicated in other areas. Although nothing is currently planned, it's hoped this increased awareness around retrofit and heat pumps could facilitate future projects if they took place in the same area.
- **Hyper-local marketing through a dedicated community engagement officer:** The project partners felt that the community engagement officer was particularly valuable in building trust with homeowners and overcoming some initial scepticism around heat pumps and the Home Efficiency Hub proposition. The extent of the community engagement officer's role increased throughout the project, as in-person engagement was critical to building trust and credibility.
- **An effective consortium with close collaborative working:** The project partners reported that they worked well together to try and deliver on the project's aims. Having a local council, DNO, both digital and community engagement specialists and building energy efficiency experts as part of the consortium was deemed to be essential. This collaborative approach covered all aspects of the proposition and allowed all parties to take ownership of the project. The local council was identified as particularly helpful to have on board and build trust with consumers; the DNO was essential for understanding grid implications right the way through from initial feasibility and site selection to mobilisation (a single point of contact at the DNO also proved to be an effective method of communication). The combination of digital engagement leads with face-to-face community engagement leads also required close collaboration between partners, but it worked well in developing a coherent overarching engagement strategy. Finally, a supplier that could supply all propositions was helpful in streamlining the supply chain and allowing a more direct integration between the supplier CRM and Home Efficiency Hub platform. The close collaboration was shown in monthly and quarterly meetings that were always well attended with insights being shared from each of the main consortium members.
- **Early and close engagement with the Distribution Network Operator (DNO):** SSE was engaged early on as a project partner, which enabled quick and effective dialogue between all parties. Whilst no heat pumps were eventually installed, limiting the DNO's role, early planning was well established and would have proved fruitful.

2.5. What lessons would the project partners pass on to other organisations looking to deliver neighbourhood-based approaches to high-density heat pump deployment?

- Working with the local authority was important in building trust in the proposition for a population wary of scams and sceptical of heat pumps.
- The timing of community events (e.g., prioritising evenings and weekends) and ensuring strong press coverage are important considerations for maximising engagement at events for future projects.
- Real-world demonstrations of heat pump technology are essential for raising awareness from typically very low levels and helping the technology gain legitimacy through social proofing.
- Further evaluation of the prosumer model is required to test its appeal with consumers.
- Engage with the DNO early in the process to establish effective processes and lines of communication.
- Early supply chain engagement and development of an effective procurement strategy are both critical to prepare installers and suppliers and to manage costs.
- Maintaining clear and efficient communication channels between the consortium and the installer partner is key as any delays or unclear communications can cause delays in supporting customers and have knock-on impacts on the customer experience.
- Ensure that the project consortium has the requisite skillsets for each deployment stage, including proposition development, community engagement, home surveys, installation, digital and in-person marketing, customer relationship management, finance provision and project management.
- Ensure that project timescales are sufficient to build trust and allow consumers to familiarise themselves with the technology for a lengthy period before signing up and installing it. This includes time to overcome any scepticism of the technology or programme that may exist.
- Engaging areas with pre-existing community energy groups is likely to be an effective way to gain an 'in' to local neighbourhoods rather than starting from scratch.

3. Next steps

There has been a definite improvement in attitudes to retrofit in the local area, and several residents have taken up PV and insulation measures since having their homes surveyed.

This project has produced a sound basis for rolling out a similar high-density heat pump offer in other locations, which requires coordinating multiple distinct elements to streamline the journey for consumers and installers.

City Science has developed a suite of solutions to address the challenges of delivering retrofit at scale:

- **Advanced Analytics Platform:** City Science's street-by-street and house-by-house investment modelling allows for precise, data-driven decision-making. Developed through retrofit

programmes including Heat Pump Ready, and using live cost data, the solution aims to provide an evidence base for strategic investment management.

- **Recommendations Engine:** leveraging the latest Standard Assessment Process (SAP) to tailor retrofit recommendations to individual properties. Recommendations can be provided fully remotely or combined with a digital survey or in-home monitoring to enhance accuracy. This builds on the work of the Home Suitability Tool developed in the Home Efficiency Hub Cherwell project.

City Science is continuing to refine its Net Zero Partnerships offering, and its HPR learnings will inform the approach to hyper-local retrofit strategies, helping local authorities across the UK accelerate their transition to sustainable, energy-efficient communities.

Since finishing the HPR project, City Science has been working with the installer from the project, Carbon Rewind, and Cambridgeshire County Council on the Action on Energy Tool. This tool will be a retrofit model based on the Home Energy Model (HEM) rather than SAP10. This newer model will provide more representative energy usage than SAP10, which uses data that is now over 12 years out of date.

City Science has also been working with another HPR ready project, Clean Heat Streets, and Cosy Homes from Oxfordshire County Council on the Investment Grade Proposals for Portfolio Retrofit project through an [Innovate UK-funded programme](#).

Oxfordshire County Council is now using the lessons learned from HPR in future projects, such as a new app (through Alternative Energy Markets) that will offer retrofit support. For similar projects in the future, they will look to work in areas with good community energy action groups.