Project Case Study: Thermly Distress Diagnostics

Project theme:

Improving the customer journey for heat pumps

Project lead:

Thermly

Partners:

Lendology CIC

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What were the objectives of the project?

In Wave 1 of the Heat Pump Ready programme, Thermly developed, and user tested a Beta version of the Thermly platform, offering an end-to-end website that educates and supports prospective heat pumps customers in their journey from initial enquiry to installation. In this Wave 2 project, 'Thermly Distress Diagnostics', they aimed to improve the journey specifically for customers in 'distress purchase' situations. A distress purchase is when a householder's heating system needs be replaced urgently due to the imminent or actual loss of heating or hot water.

The project aimed to:

- **Reduce the number of households experiencing a distress purchase situation** by identifying households likely to experience a boiler failure and offering a service to encourage a proactive transition to heat pump adoption
- **Facilitate the installation of heat pumps in a distress purchase situation** by providing a temporary heating solution to afford the additional time typically needed to install a heat pump

Why is this important?:

Research undertaken by Energy Saving Trust and Ipsos MORI[1] indicates that 30% of all heating system replacements occur once the system has broken down, with a further 28% replaced when they are 'on their last legs'. With the average domestic heat pump adoption journey lasting several months, households experiencing a distress purchase scenario due to boiler failure will likely opt for a 'like-for-like' boiler replacement as the simplest and quickest solution to their actual or anticipated heating system breakdown. Thermly took two approaches to address this challenge:

The proactive journey: Thermly aimed to reduce the number of households that experience boiler failure and, consequently, are pressured to urgently choose a replacement heating system. To achieve this, it is important to identify when households are likely to be approaching a 'distress situation' and to support their adoption of a heat pump system before encountering potential heating system issues.

The reactive journey: Some households will still experience heating system failure, and it is important to offer a customer journey that allows the additional time necessary for heat pump adoption without compromising consumer health and comfort (i.e. through not having a heating system). Thermly aimed to address this by providing a temporary heating solution between the occurrence of heating system failure and heat pump installation.

What activities were funded?

- Assessing, procuring and processing available data sources that can be used to predict the likelihood of a household experiencing a distress purchase in the near future, and the design, build and test of an associated predictive algorithm.
- Customer and market engagement: researching the needs of households in distress situations, considering how to build awareness, and how to better engage and secure the households' trust.
- Researching the options (e.g. temporary boiler installation or emergency boiler repair), implications (legal, commercial, digital engagement) and feasibility of helping homeowners to deal reactively to a distress or approaching distress scenario.
- Research and testing of a proactive response to a predicted future distress scenario (i.e. a planned transition to a heat pump), including researching and designing pricing packages and the digital journey that the homeowner would take.
- Creating a platform to identify the risk/likelihood of any household in the UK requiring a heating system replacement, and to guide customers through their reactive/proactive pathway to heat pump adoption.

What did the project achieve?:

Thermly adapted its existing web platform to provide an additional customer journey pathway, specifically marketed at key personas most likely to adopt a heat pump. These personas were developed through a combination of quantitative and qualitative research that homed in on those

[1] Ipsos MORI and the Energy Saving Trust (2013), "Homeowners' Willingness To Take Up More Efficient Heating Systems", p39

demographics most likely to adopt the technology. Thermly's research showed that heat pumps offer a more compelling business case to a resident when installed as part of a package of retrofit works, assuming that these 'early adopters' have enough capital/access to finance. As a result, Thermly has also expanded its offering to include solar PV and batteries in addition to heat pumps based on its market research.

Thermly has also created **a solution for households who have already experienced boiler failure to create the additional time needed to transition to adopting a heat pump**. Extensive market research found that the most effective approach was to offer to reimburse a homeowner for the cost of their boiler repair (up to £450) when a heat pump is fitted within six months of the repair. The installation of a temporary new boiler was deemed logistically and commercially unviable.

Project objective 1: Reduce the number of households experiencing a distress purchase situation by identifying households likely to experience a boiler failure and offering a service to encourage a proactive transition to heat pump adoption

What activities were funded?:

- Research with consumers who had previously changed their heating system (mainly boiler to boiler) to understand their motivations regarding heating system replacements.
- Analysing available home and heating system data (primarily building control data) to develop a predictive capability to identify homes approaching heating system failure and, consequently, a distress purchase.
- Consumer research through focus groups and surveys to inform the development of customer personas.
- Developing tailored messaging to customer personas to motivate platform users to drive awareness and avoid a 'distress purchase' by proactively adopting a heat pump.

What were the project findings and did the project achieve this objective?:

Personal circumstances and attitudes have a greater influence than boiler age on customers' inclination to proactively replace a heating system

Thermly commissioned an Ipsos survey to investigate the factors that influence households to proactively replace their heating system before it fails. Key findings included:

- Personal circumstances and attitudes influence proactive heating system replacement more than boiler age.
- Younger adults with children are more likely to consider getting a heat pump and prioritise proactive replacement. Those over 45 are far less likely to consider getting a heat pump, and those without children prefer to let their boiler age and risk distress.
- Groups most likely to adopt a heat pump (who don't already have one) are those who currently use solid fuel sources or solar thermal.
- Homeowners on lower incomes are more likely to have an older heating system whilst also being more financially vulnerable to the impacts of boiler failure. 25% of those on an income of £19,000 or below have a heating system older than 15 years, compared to just 8% of those on an income of £35,000 or above.

Gas Safe Register data could support the identification of households most at risk of heating system failure but is not yet publicly available

Thermly intended to use data from the Gas Safe Register[2] to identify households most at risk of heating system failure. Thermly's ongoing engagement with the Health and Safety Executive (HSE) resulted in the drafting of a Gas Safe Register data sharing agreement and broad agreement on the principles and basis of data sharing. However, Thermly was not granted access to Gas Safe Register data by the HSE within the lifetime of the project. Due to multiple requests for the data from other organisations, the HSE decided in September/October 2024 that an umbrella data sharing agreement with the Department for Energy Security and Net Zero should be implemented, with sub-agreements for organisations such as Thermly. As of April 2025, that umbrella data sharing agreement is still in development and has not been finalised. The intention remains that Gas Safe Register data will be shared with the Department for Energy Security and Net Zero, with individual organisations requiring a controlled data sharing agreement with the Department.

To mitigate for the absence of Gas Safe Register data, Thermly instead collected Building Control data from over 40 local authorities. This produced a dataset of over 750,000 homes, including around 75,000 repeat-address records indicating boiler replacements, which allow for the calculation of boiler age at the point of replacement. Thermly analysed the Building Control data to identify factors, other than boiler age, that most strongly correlate with boiler failure. The analysis assessed 30 variables against boiler age at the point of replacement. However, a weak correlation between features was observed, meaning that the Building Control dataset did not provide sufficient insight to identify homes most likely to experience a distress purchase scenario. It was therefore insufficient to support the development of a detailed predictive algorithm. However this did not disprove the hypothesis that such an algorithm could be created using suitable data, like that in the Gas Safe Register. Instead, Thermly used Building Control data to quantify the proportion of boilers replaced at or before a certain age (e.g. almost 98% of boilers are replaced within 15 years of being commissioned) and integrated this insight into the Thermly platform's customer messaging.

Thermly believes access to the Gas Safe Register would improve its algorithm's predictive capabilities due to the increased quantity of data, enhanced data quality and additional data features (including boiler make and model, and reason for installation). Thermly has structured its software so that Gas Safe Register data can be easily integrated into the existing software architecture if it does become available. Thermly has committed to providing the public sector with access to the tool once it is created.

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[2] The Gas Safe Register contains high volumes of data across different regions and includes a comprehensive list of boiler installation information, including boiler age, make and model. The dataset has significant potential to identify households most at risk of heating system failure and, therefore, a heat pump 'distress purchase' scenario. A potential limitation of the Gas Safe Register is that data is held for 15 years before being removed – jeopardising valuable boiler lifetime data since average boiler lifetimes are around 15 years.

Thermly was not able to obtain Gas Safe Register data within the lifetime of the project but has created a clear legal case and pathway for its release and has helped to generate momentum and industry buy-in about the value of Gas Safe register data.

Three key customer personas most likely to purchase a heat pump

Thermly conducted interviews with householders to discuss heating system replacement, heat pump options and Thermly's emerging proposition for repair/distress. This research led to the identification of three key customer personas most likely to purchase a heat pump – namely 'Green Tech Innovators', 'Value Maximisers' and 'Progressive Aspirers' (see **Figure 1** for descriptions). Of these personas, Thermly identified homeowners aged 30-50 who have children as the most likely demographic to purchase a heat pump. These became Thermly's target personas and demographics for motivating a proactive, or supporting a reactive, transition to heat pump adoption.

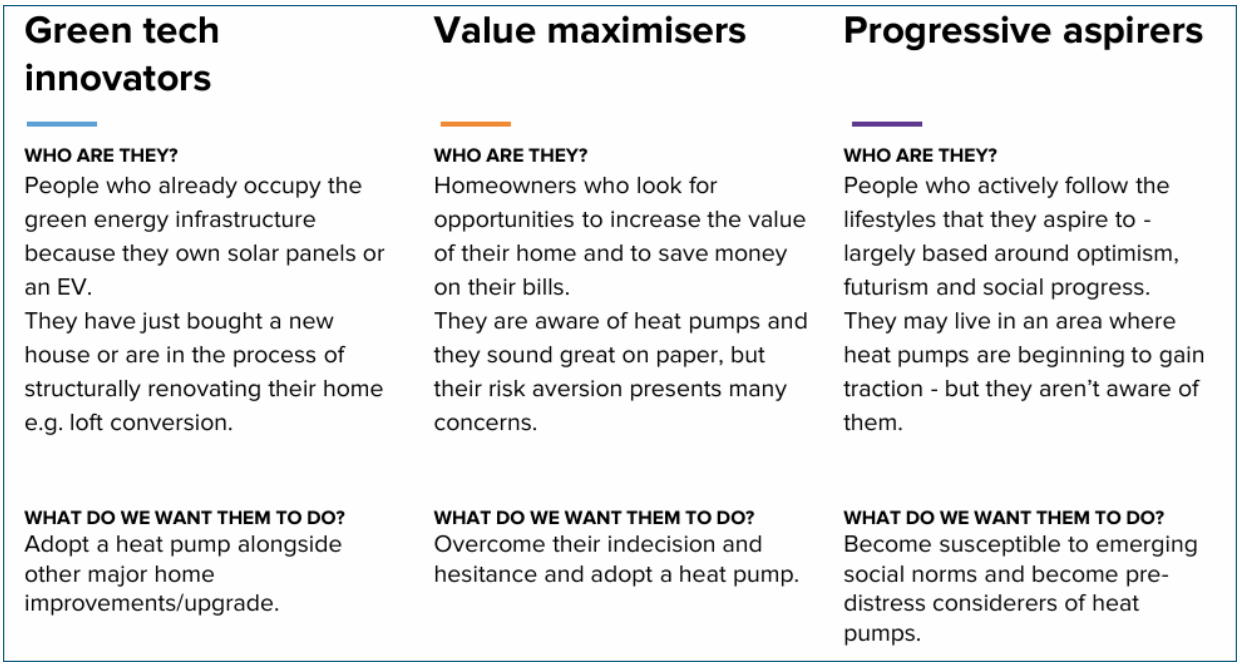

Figure 1: Thermly's target demographics for motivating a proactive or supporting a reactive transition to heat pump adoption.

Thermly aims to identify consumers fitting the personas through Google's Pmax features, with targeted messaging and creative assets used to motivate platform users to avoid a 'distress purchase' by proactively adopting a heat pump. With careful audience segmentation, Thermly aims to reach key audiences with tailored messaging aligning with the relevant demographic data, motivations, and needs. For example, for Green tech innovators:

	Green tech innovators
Persona insight:	Eco-conscious individuals already invested in green energy solutions.
Customer intent:	Interest in green technologies, renewable energy, sustainable living. Custom intent signals include recent searches for “energy-efficient home upgrades" or “sustainable renovation."
Messaging:	Showcase heat pumps as a logical next step for their green homes, emphasising compatibility with existing green systems (like solar) and their efficiency benefits.
Creative assets:	Use visuals of eco-modern homes with integrated green tech (solar heat pump) and messaging that reinforces environmental impact, energy independence, and long-term cost savings.
Goal:	Encourage adoption as a continuation of their eco-friendly lifestyle, positioning heat pumps as both an environmental and economical upgrade.

Cost remains the most important factor in homeowners’ decision-making

A key finding from the focus groups and interviews was that, whilst there is good interest in heat pump adoption, cost is the most important factor influencing homeowners’ decision-making. Thermly commissioned two Ipsos Omnibus surveys, each engaging over 2,000 participants as a representative population sample. Key findings include:

- Almost 1 in 3 respondents were ‘very likely’ or ‘fairly likely’ to consider replacing their heating system in the next three years, demonstrating the potential market size for those looking to replace their fossil fuel heating system with a heat pump either proactively (in advance of boiler failure) or reactively (once boiler failure has occurred).
- 27% of those survey participants classified as ‘able to pay’ were ‘very likely’ or ‘likely’ to take up Thermly’s distress purchase offer[3] (17% of all participants). The two most common reasons for not taking up the offer went beyond the offer itself; either because the person did not want a heat pump or because they regard a heat pump as too expensive.
- Respondents were asked what would help motivate them to get a heat pump instead of an alternative heating system. Roughly 2 in 5 respondents would like information on cost savings

[3] Thermly’s distress purchase offer is a reimbursed boiler repair (up to £450) when a heat pump is fitted within six months of the repair. For more information, see section ‘Project objective 2: Facilitate the installation of heat pumps in a distress purchase situation by providing a temporary heating solution to afford the additional time typically needed to install a heat pump’

on their heating bills, with a similar proportion interested in the likelihood of receiving government grants or wanting to know more about how heat pumps work.

As a result of this finding, Thermly has pivoted from offering only heat pump installations to offering a multi-measure approach, including solar PV and domestic batteries. This strategy aims to offer customers a more appealing overall financial incentive, encouraging them to proactively adopt a heat pump before their boiler fails. Thermly is now in the process of integrating the ability to offer solar PV and domestic batteries into the Thermly platform and their installer network.

Project objective 2: Facilitate the installation of heat pumps in a distress purchase situation by providing a temporary heating solution to afford the additional time typically needed to install a heat pump

What activities were funded?

- Developing potential business models for the 'reactive journey', namely emergency gas boiler repair and temporary gas boiler replacement and assessing commercial viability.
- Consumer testing (including two Ipsos surveys, interviews and focus groups) of business models.

What were the project findings and did the project achieve this objective?

Emergency boiler repair is preferable as an interim heating solution

Thermly assessed the commercial viability of a reimbursement or discount model, in which consumers could be offered a temporary heating solution with the costs recouped against a subsequent heat pump installation. This could be delivered by the consumer paying for the temporary heating solution, with the cost being credited against a subsequent installation, or Thermly paying and writing off the cost if the consumer proceeds to installation.

Thermly explored two options for the temporary heating solution – an emergency boiler repair and a temporary gas boiler/heating system replacement – across various scenarios, including location and technology bundles (solar PV, battery storage, and insulation). In all scenarios explored, installing a temporary new boiler (after the original boiler has failed) was deemed logistically and commercially unviable. Although there are no legal barriers to installing a temporary replacement boiler, as long as it meets regulatory standards, the additional sunk costs of replacement (estimated at £1,200-£1,400 per home) and the logistical costs of boiler storage, transport and removal make the commercial case unviable.

Conducting an emergency boiler repair, estimated at an average cost of £450, was profitable in all scenarios. This provides confidence that Thermly can offer a reimbursable boiler repair if the customer commits to a heat pump installation. Whilst returns were sub-optimal with a heat pump-only installation, bundling a heat pump with additional low-carbon technologies, such as solar PV and battery storage, increased the commercial attractiveness of the offer for the service provider.

Homeowners do not want to be pressured into making a decision about their heating system, even when their boiler has broken

Thermly commissioned market research (including two Ipsos surveys, interviews and focus groups) that showed that homeowners prefer not to rush a decision as important and costly as adopting a heat pump, even in a 'distress purchase' scenario. The research concluded that customers need time to explore and understand the implications of adopting a heat pump, do not want to feel pressured, and that an interim 'holding' solution to buy more time was deemed necessary. Six months was identified as an appropriate length of time for customers to research and feel able to make an informed decision.

The research also found that a reimbursement model is preferable to Thermly paying for boiler repair upfront. Participants felt that Thermly (or any company) paying for a boiler repair would make them feel indebted and, consequently, pressure them into getting a heat pump, whereas a reimbursement model

empowers homeowners in the decision-making process. Additionally, participants expressed a preference for using their own installer for a boiler repair rather than Thermly's repair service. Based on this feedback and commercial analysis, Thermly deemed the most attractive 'reactive' customer journey to be a boiler repair service (either through Thermly or another installer) that qualifies for a £450 credit towards a heat pump if installed within six months of the boiler repair.

Whilst this reimbursed boiler repair solution is an opportunity to engage homeowners and persuade them to switch to using a heat pump, a proactive approach to boiler replacement (i.e. prior to boiler failure) remains preferable as it ensures a smoother and less pressured transition.

Potential further research

Opportunities for future research

Explore predictive capability of Gas Safe Register data. Thermly intended to identify households at most risk of a boiler failure but was not granted access to Gas Safe Register data – the most comprehensive data source regarding geographical coverage and parameters (e.g. boiler age, manufacturer and model) – by the Health and Safety Executive. Instead, Thermly used Building Control data from over 40 local authorities covering 750,000 homes to develop tailored messaging for customers about the proportion of boilers that have been replaced at or before the age of their own boiler. However, Thermly found this dataset to be insufficient for supporting the development of a predictive algorithm due to the lack of information on boiler model and manufacturer, and its smaller size compared to the Gas Safe Register. Thermly regards the Gas Safe Register as a key data source for identifying households at risk of boiler failure, which could help to guide customers towards pre-emptive action to adopt a heat pump. In addition, this data would also be valuable for local, regional and national governments to make more informed policy decisions and to target households effectively.

Summary:

Thermly has evolved its existing customer journey platform, which was created as part of a previous Heat Pump Ready project, to:

- Encourage proactive replacement of boilers nearing the end of their life with heat pumps
- Support households who have experienced boiler failure to adopt a heat pump rather than opting for a like-for-like boiler replacement as a distress purchase
- Expand Thermly's offering beyond heat pumps into a multi-measure platform offering low-carbon technologies such as solar PV and batteries. Thermly's research showed that heat pumps offer a more compelling business case to residents when installed as part of a package of retrofit measures. (This activity is beyond the Heat Pump Ready project's scope but has emerged from the project's research outputs).

What impact could this have on accelerating the heat pump rollout?:

Thermly's platform could help to support the significant proportion (~58%) of homeowners who currently replace their heating as a distress purchase. The project's solutions could afford homeowners more time, making heat pump adoption a viable option, rather than simply defaulting to a boiler replacement.

What next?

Thermly continues to extend its reach via its regional pilot initiatives and will integrate the findings from this project into its platform. As mentioned, Thermly are also looking to extend its offering from exclusively heat pumps to various low-carbon technology options. Thermly intend to continue their engagement with the Department for Energy Security and Net Zero and the Health and Safety Executive to acquire Gas Safe Register data – and continue to reinforce the point that the tools created as a result of this data access will be made available to the public sector. This is a hugely important future opportunity for both Thermly and its stakeholders, and they have committed to providing this beyond the end of the HPR funded aspect of their work.

Where to find out more

www.thermly.co.uk

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