

# Estimating the willingness to pay for a heat pump

March 2022

## Summary

**The Behavioural Insights Team (BIT) and Nesta have tested people's willingness to pay (WTP) for heat pumps.** We recruited a UK representative sample of 1,801 UK homeowners currently heating with a gas boiler for an online experiment that took place in December 2021. Participants were randomly

assigned to different heat pump price points ranging from £2,000 to £12,000 (covering unit cost and installation, inclusive of subsidies) and then asked to make a hypothetical choice between a heat pump at this price and a boiler at £2,000 – in a scenario where their current boiler needs replacing in the next year.

**Below, we present the key findings from this experiment, subject to the following limitations:**

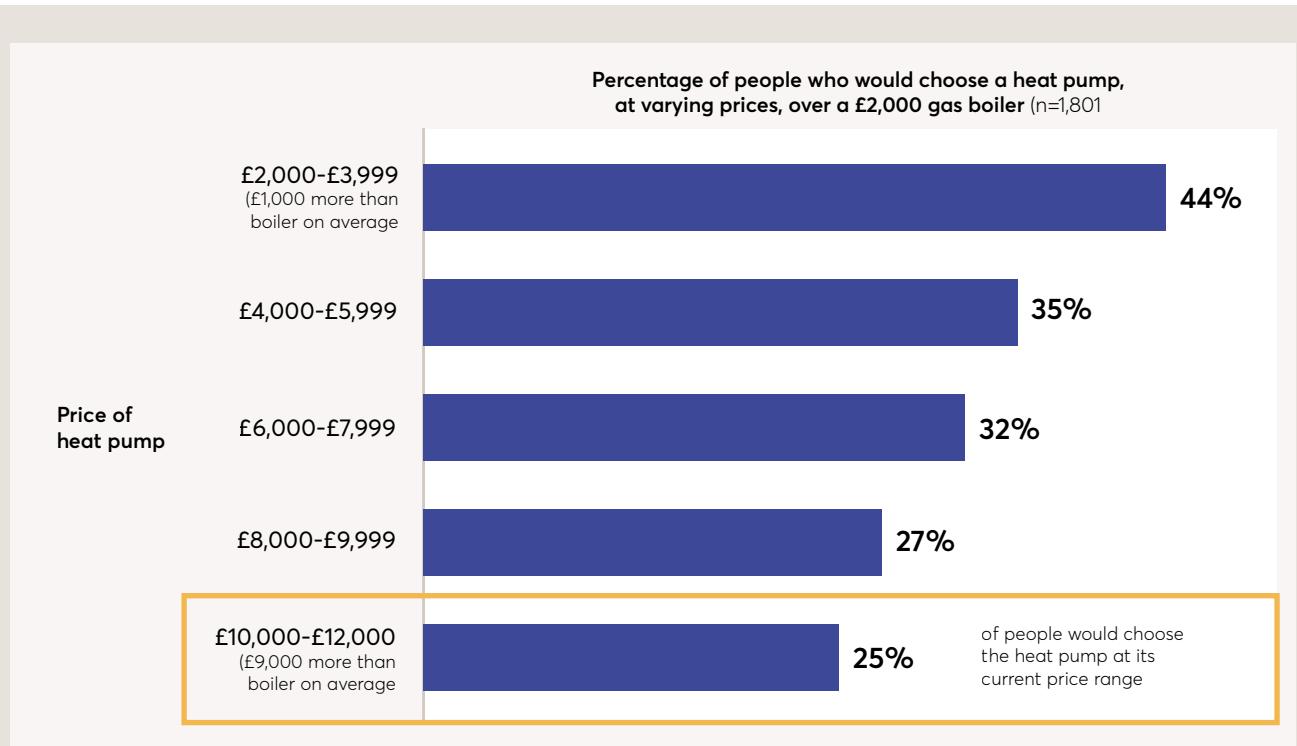
- > Our estimates of heat pump adoption/willingness to pay are likely to be on the **upper bound of actual adoption**. This is because (i) we presented the best case scenario in the hypothetical scenario, where we've eliminated most of the frictions in the consumer journey for the participant and (ii) we measured stated intentions in an online experiment, not fully reflecting the actual hassle of heat pump adoption. If the heat pump adoption journey presents friction to customers, this difference could be quite substantial.
- > Our estimate is **noisy**. The 95 per cent confidence interval includes negative values [-105.03, 4488.73] around the main finding of £1,500 (see point 2).
- > Our estimates are relevant for **homeowners**.
- > This was a small pilot experiment intended to help shed light on WTP but more research with bigger samples is needed in the future.

# Findings

1. **There is a clear 'early adopter' group, equivalent to approximately 25 per cent of homeowners who say they are willing to pay the full current cost of heat pumps of £10–12k (Figure 1).**

While we must take this 25 per cent cohort with a pinch of salt (not all would complete the real-life decision), this is still a reassuringly high proportion of potential early adopters. When asked to reflect on

the next five years, the proportion willing to buy a heat pump at this cost increases to one in three. This group of would-be-early-adopters is critical to drive the uptake of heat pumps initially.



**Figure 1.** Uptake of heat pumps at different price points in our experiment

**Important note:** These are likely upper **bound estimates** on heat pump adoption, given these are stated intentions in an online experiment, not fully reflecting the actual hassle of heat pump adoption.

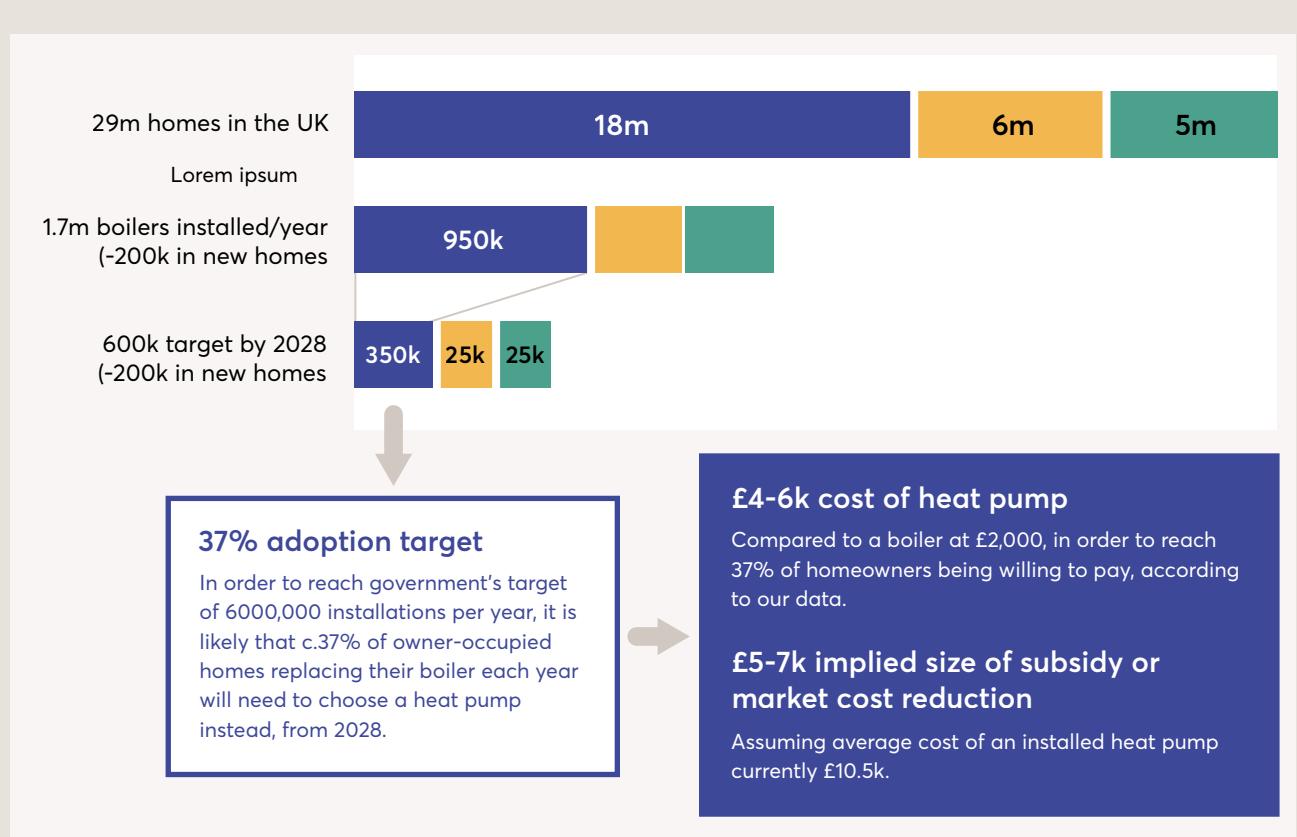
Primary analysis: Conditional logit model. Data collected by BIT on 9-14 December 2021.

2. There is also a potential bigger buyer group of roughly one in three homeowners, willing to pay a bit extra for a heat pump (but still requiring substantial cost reductions). This cohort may be crucial to achieve UK government targets.

Figure 1 above shows that as many as a third of homeowners might be willing to pay in the region of £4,000–8,000 for a heat pump. This is helpful, because the combination of subsidies and market price reductions is unlikely to bring the cost of heat pumps down to that of boilers in the short-to-medium term.

What does this mean for UK government targets? The UK government is aiming for 600,000 installations per year from

2028, with around 200,000 of those going into new homes after gas boilers are phased out from new builds from 2025. As explained in Figure 2, with a few simple assumptions, this means as many as 35–40 per cent of annual boiler replacements in owner-occupied homes would need to opt for a heat pump instead. Our results suggest this requires a target cost no higher than £4,000– £6,000, which is around half the current market cost of installing a heat pump.



**Figure 2.** Policy implications of the current WTP



### 3. Though this gives cause for optimism, cost remains a major barrier to widespread adoption of heat pumps.

We can't rely forever on those 'early adopter' homeowners – at some point, heat pumps also need to be in reach and appealing to those less willing to pay a premium. Our experiment shows that the majority of homeowners wouldn't choose a heat pump even if they cost the same as a boiler (£2,000). Indeed they may have to be quite a lot cheaper to persuade the majority – from our data, we estimate that the average consumer is willing to pay around £1,500 less for a heat pump than a gas boiler (i.e. just £500).

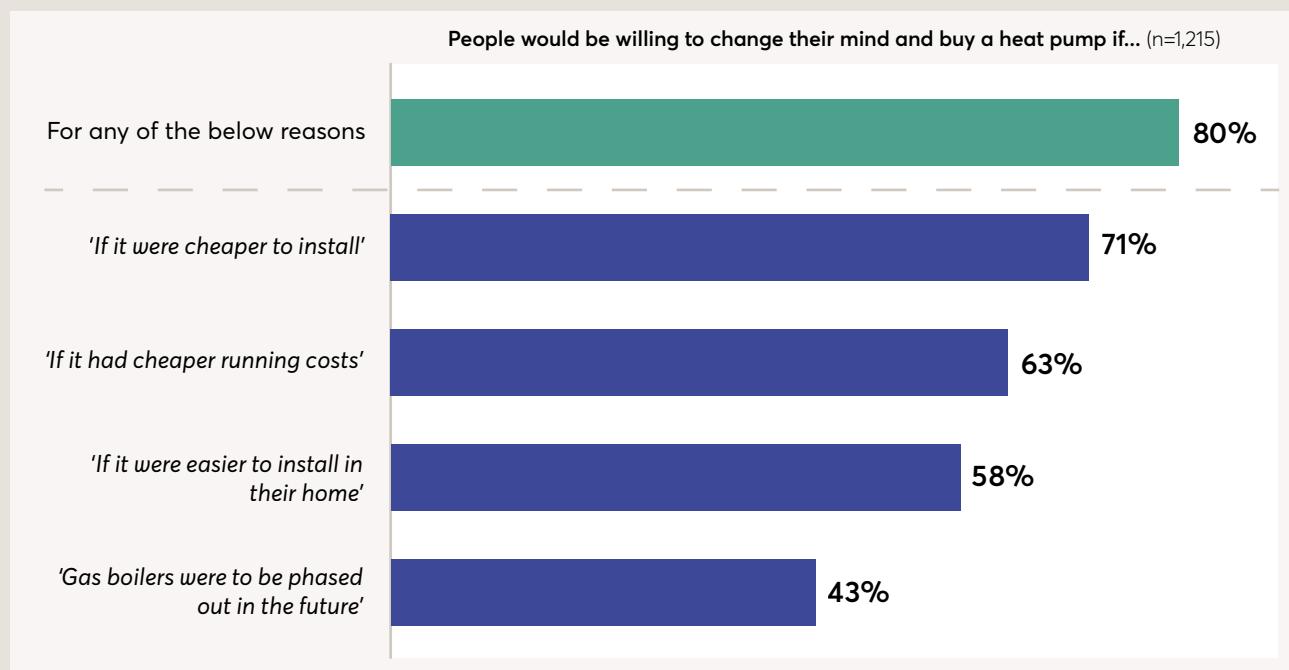
Surveying respondents, we found that cost has been cited as the biggest barrier – nine in ten said they would not choose heat pumps because of installation costs. Eight in ten were discouraged by high levels of disruption, and seven in ten by high running costs. Asked what would change their mind, seven in ten said they would opt for a heat pump if they were cheaper

to install, and six in ten would be swayed by lower running costs (Figure 3). There are feasible policy mechanisms to achieve this, since environmental levies are currently making electricity costs high, and these could readily be switched to gas tariffs instead: an idea being considered by the UK government.

However, costs are not the only barrier, as knowledge about heat pumps remains quite limited. While eight in ten have heard about them, just five in ten understood their basic principles of operation. Moreover, almost half of those who opted for gas boilers in the choice experiment were not convinced by the claimed benefits of heat pumps to the environment.

It is reasonable to assume that appetite for heat pumps may grow in the coming years.\*

**Seven in ten said they would change their mind** and buy a heat pump **if they were cheaper to install**. Other drivers were cheaper running costs and ease of installation.



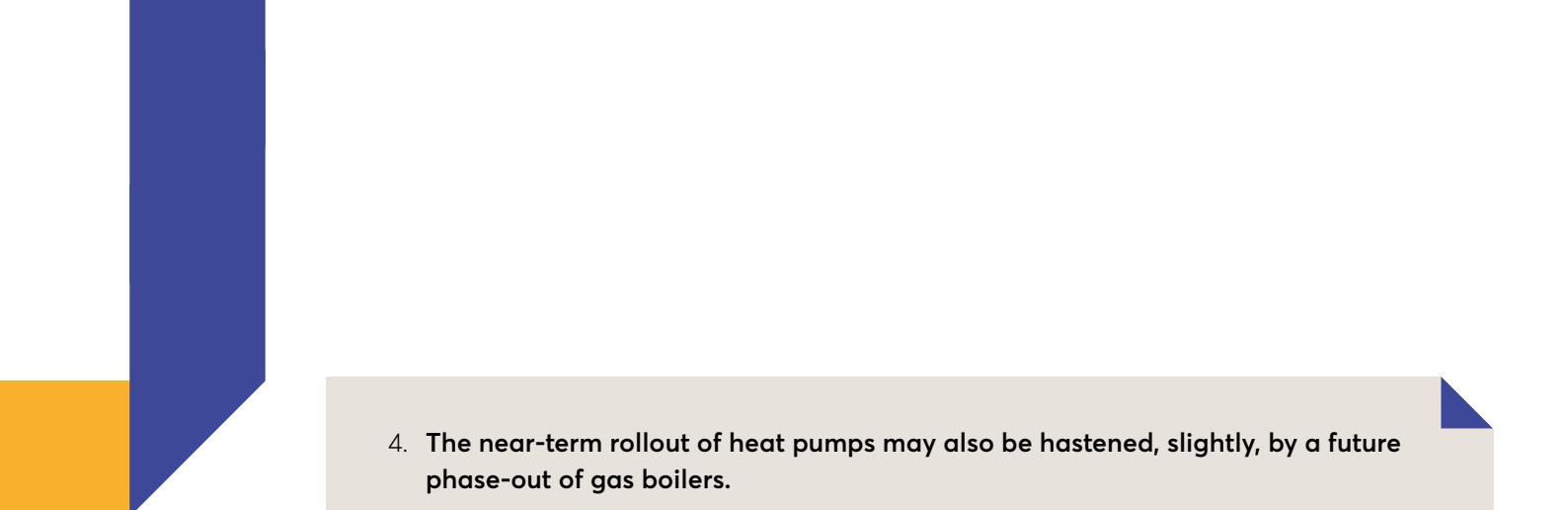
**Figure 3.** Reasons that would convince people to change their mind on heat pumps

Participants could select more than one answer. The green bar indicates the percentage of participants who chose one or more of the below options. Data collected by BIT on 9-14 December 2021.

However, it is unlikely that the average consumer will ever tolerate a very large premium over current boiler prices, and there will always be a substantial cohort who simply will not or cannot afford to pay a premium. All of these results, therefore, show

the importance of significant cost reductions over the medium-term (via any combination of subsidies, market mechanisms and innovation), even though early adopters with less price sensitivity can help to make progress on short-term targets.

\*There are multiple reasons to believe this, though also reasons to be cautious. Heat pump knowledge and familiarity is still nascent, meaning the well evidenced 'familiarity bias' is likely to act against heat pumps, for now. As they become normalised among consumers and installers the strong default for like-for-like boiler replacement will also be eroded. Moreover, we see a significant difference in the willingness to pay results here, compared to a 2019 study (<https://www.ssen-transmission.co.uk/media/3455/consumers-willingness-to-pay-final-0107.pdf>), suggesting appetite for heat pumps has already increased. However, we also should not disregard the risk of countervailing forces, such as bad consumer experiences spreading very fast and undermining public confidence in the technology.



4. **The near-term rollout of heat pumps may also be hastened, slightly, by a future phase-out of gas boilers.**

Among adopters, a common reason was wanting to future-proof their home. And among those who said they would not adopt one in the next five years, 14 percent would change their mind in the knowledge of a 2035 phase out of gas boilers. This

shows that such a policy wouldn't just force us away from gas boilers after that date, but could be a crucial extra slice to get the UK government on target, by accelerating early voluntary adoption.

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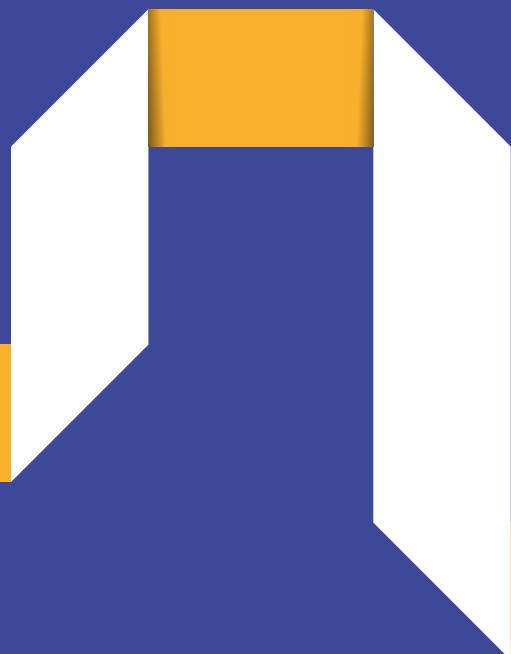
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