

# Examining consumer attitudes towards hydrogen homes: socio-spatial aspects

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## Introduction

- 12.7 million gas cookers (hobs and ovens) in UK homes
- 2% of total UK carbon emissions
- Emissions from cooking are embedded in the wider energy system (food, water, transport)

➤ Deep decarbonisation of the residential sector is critical to meeting net-zero targets

- 21.2 million gas boilers in UK homes (approx. 84%)
- 14% of total UK carbon emissions
- Gas and oil boilers banned from newbuild homes by 2025

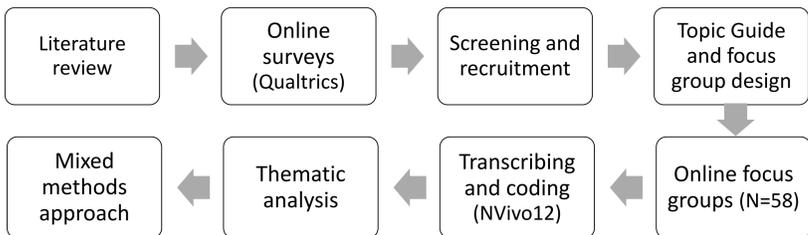


Scaling up of hydrogen ambitions, policy commitments, trials and demonstrations



Through online focus groups (Feb–Apr 2022), this study sets out to advance the discourse on the UK hydrogen transition by eliciting consumer attitudes towards hydrogen (H2) homes; composed of hydrogen-fuelled appliances for domestic space heating, hot water and cooking

## Methods



| Focus Group category and sample size  | Location  |
|---|---|
| Moderate interest in renewable energy (RE) and some willingness to join a RE community<br>N=5 (Pilot group) | Marston Moretaine, Bedfordshire   |
| Strong interest in RE and desire to join a RE community<br>N=6  | Marston Moretaine, Bedfordshire   |
| Owners of solar PV panels and smart devices<br>N=11   | Kilmarnock, Lancashire, Lincolnshire, London, Manchester, North Wales, Portsmouth, Torquay              |
| Engaged in environmental issues<br>N=12   | Gloucester, Ipswich, Kent, Leeds, London, Middlesbrough, Milton Keynes, Pembrokeshire, Stirling, Sussex |
| Living in industrial cities/towns<br>N=5  | Falkirk, Flint, Liverpool, Scunthorpe, Yorkshire  |
| Facing fuel poverty or high levels of fuel stress<br>N=13   | Cheshire, Isle of Wight, Leeds, Liverpool, London, Manchester   |
| Baseline group<br>N=6   | Deeside, Eastbourne, Hertfordshire, Reading   |

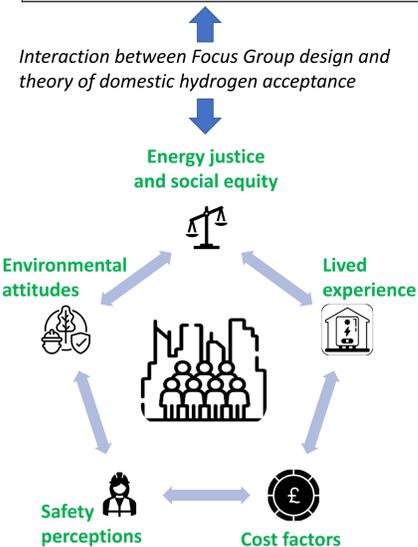


Fig. 1. Social barriers to domestic H2 acceptance

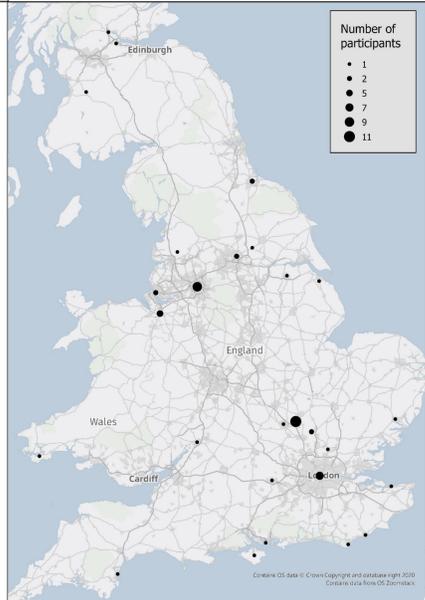


Fig. 2. Distribution of focus group participants (N=58)

## Results

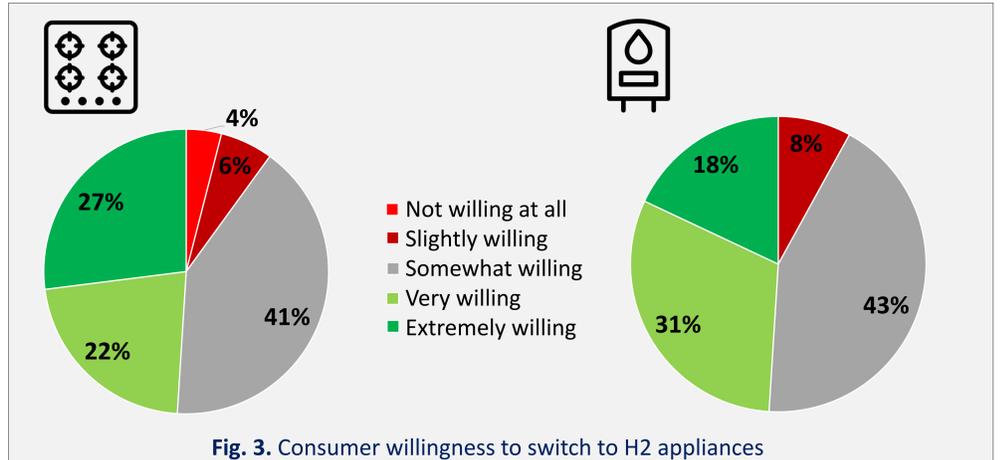


Fig. 3. Consumer willingness to switch to H2 appliances

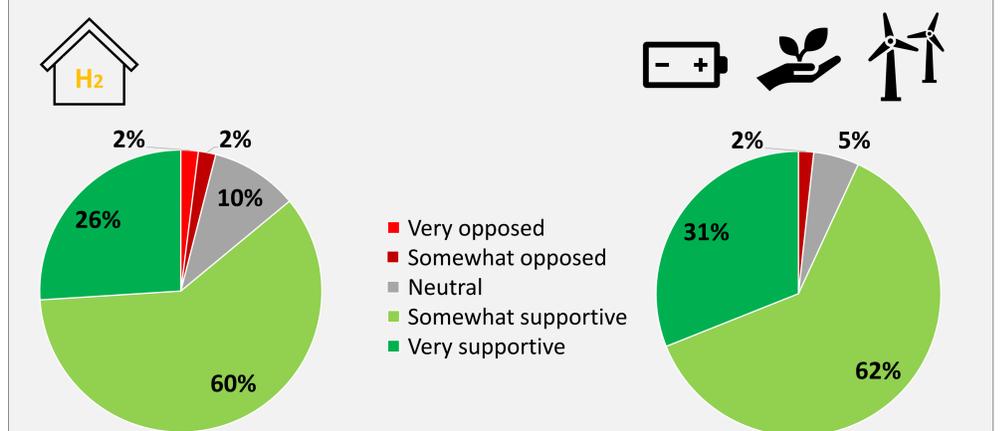


Fig. 4. Consumer preferences for living in a H2 home

Fig. 5. Consumer preferences for H2 in the UK's energy future



Fig. 6. Consumer perceptions of the 'twin-track' strategy

## Discussion: H2 futures

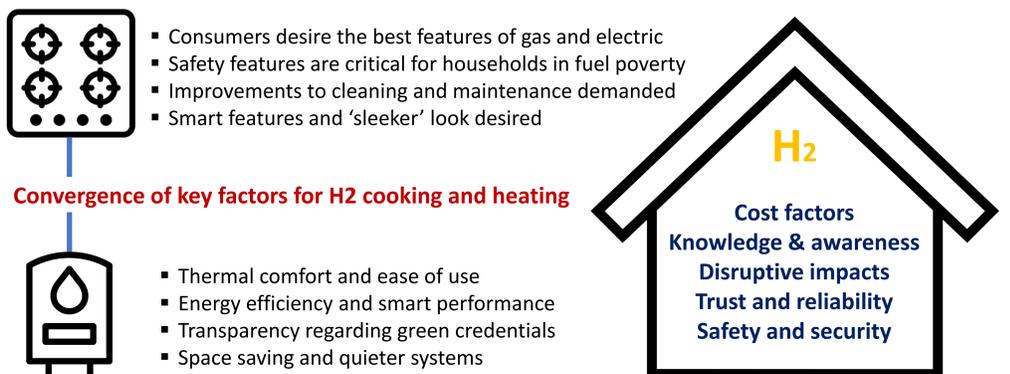


Fig. 7. Factors influencing the social acceptance of H2 homes

## Conclusions

- Hydrogen awareness is yet to enter the public consciousness in a meaningful way
- Cost factors and disruptive impacts are the 'make or break' factors for most consumers
- On average, households will tolerate disconnection from the gas grid for around two days
- Public trust in the government, gas industry and energy suppliers needs significant bolstering
- Sustained public acceptance for the twin-track strategy rests on narratives around blue H2
- Consumer acceptance is sensitive to technology engagement, environmental attitudes, socio-economic status (i.e. fuel poverty/stress) and geographic factors (e.g. proximity to H2 hubs)
- Consumer heterogeneity must be internalised into policymaking for residential decarbonization

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