

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)

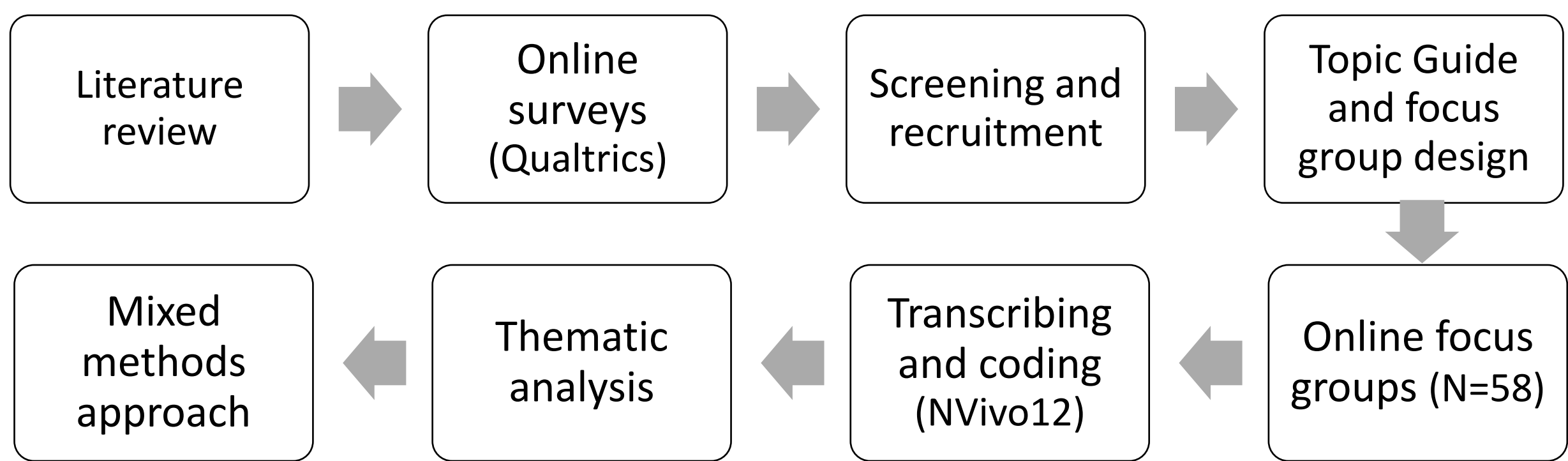
➤ Deep decarbonisation of the residential sector is critical to meeting net-zero targets

- 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



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

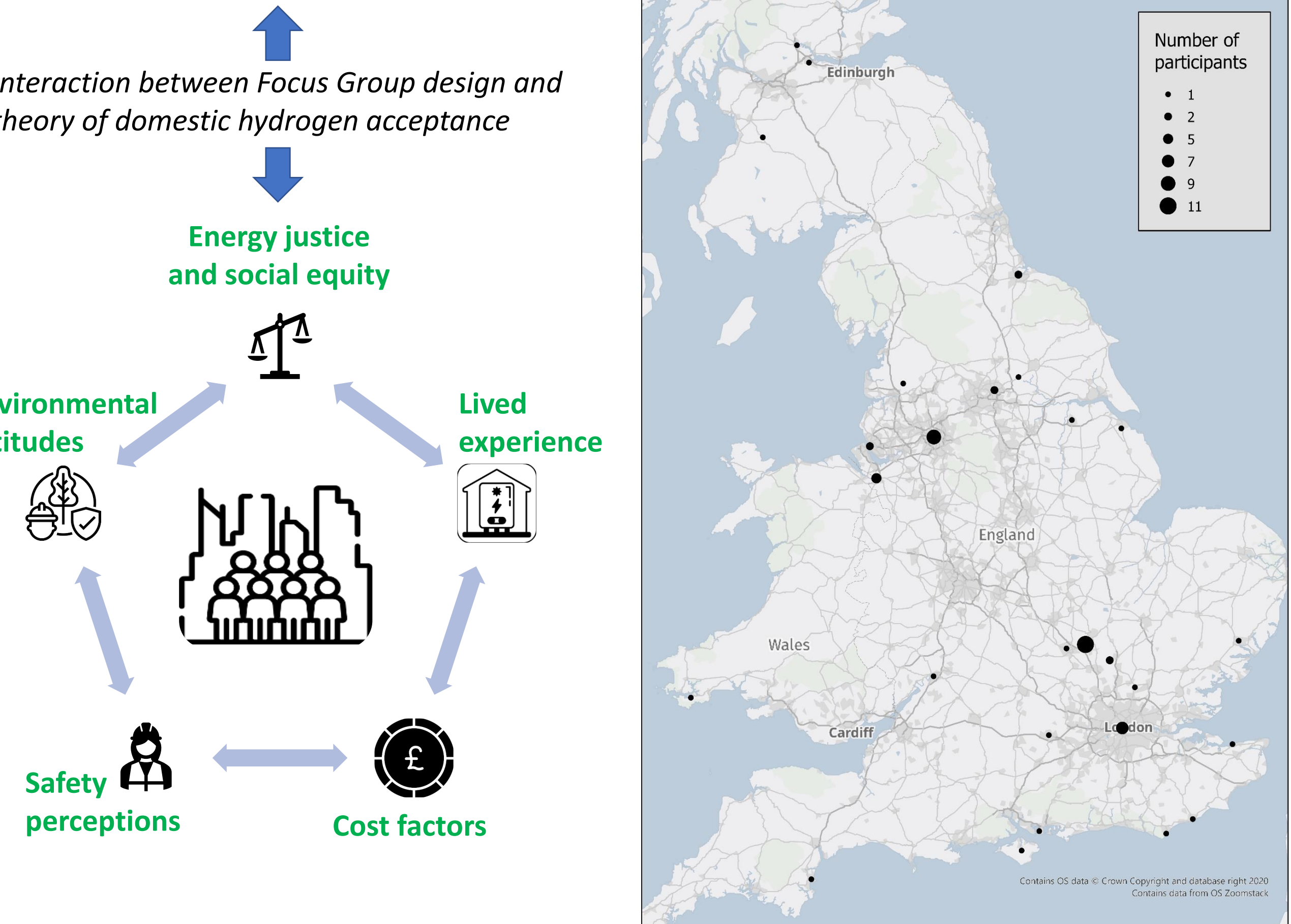


Fig. 1. Social barriers to domestic H₂ acceptance

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

Results

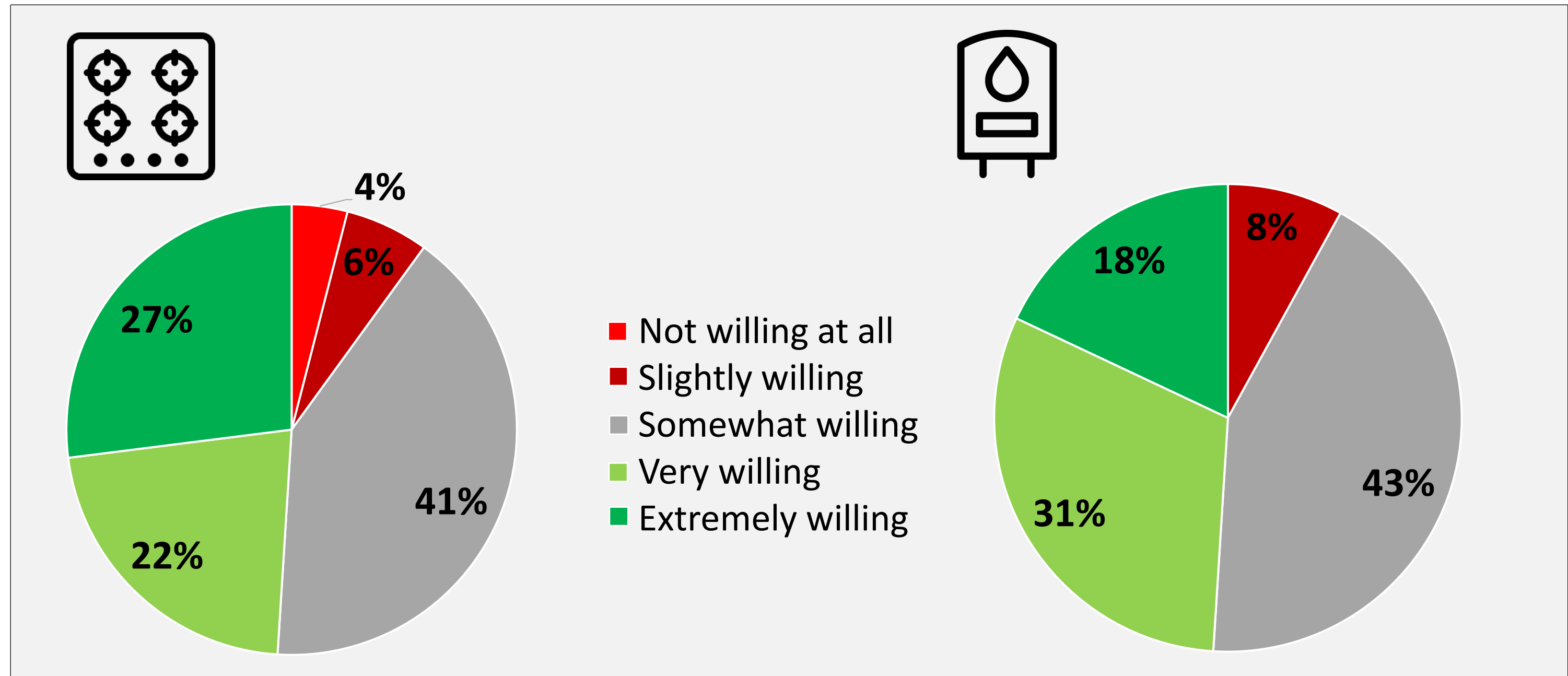


Fig. 3. Consumer willingness to switch to H₂ appliances

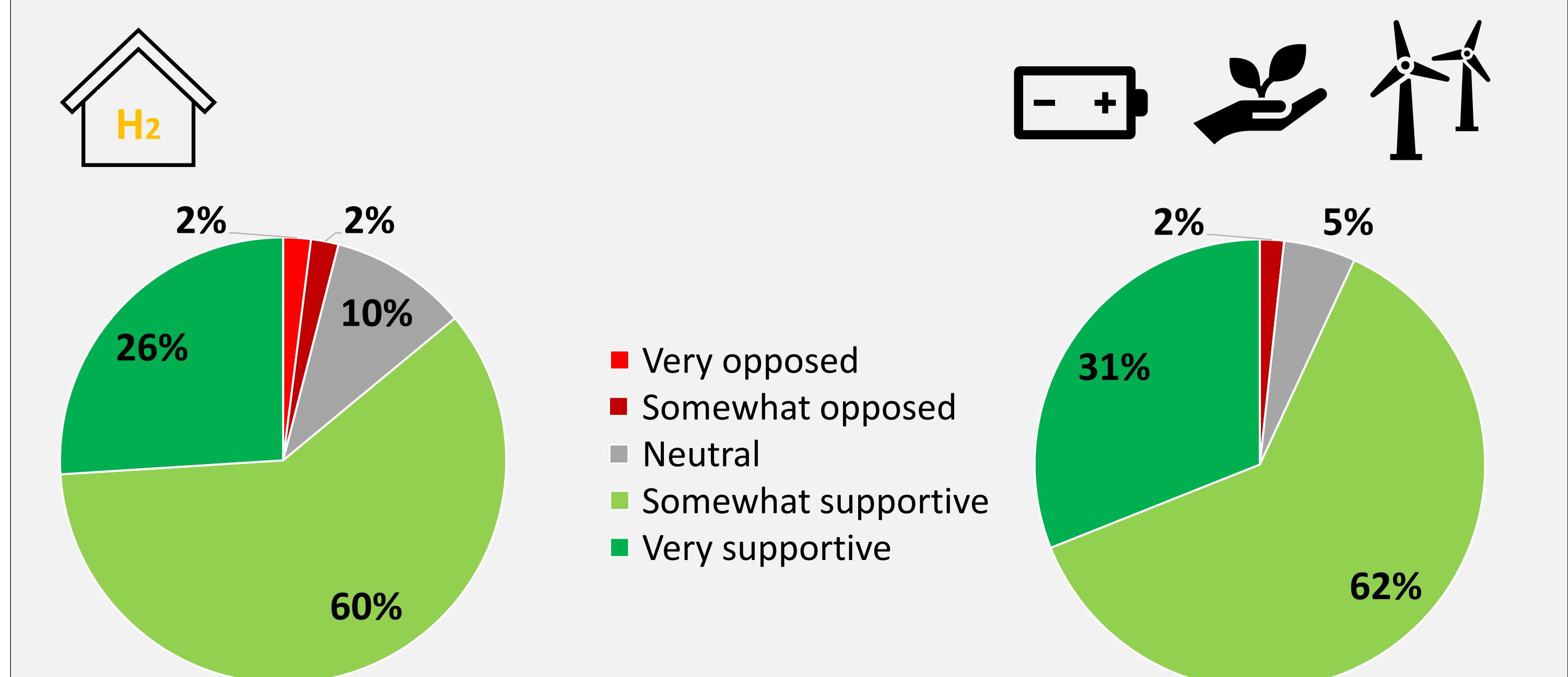


Fig. 4. Consumer preferences for living in a H₂ home

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

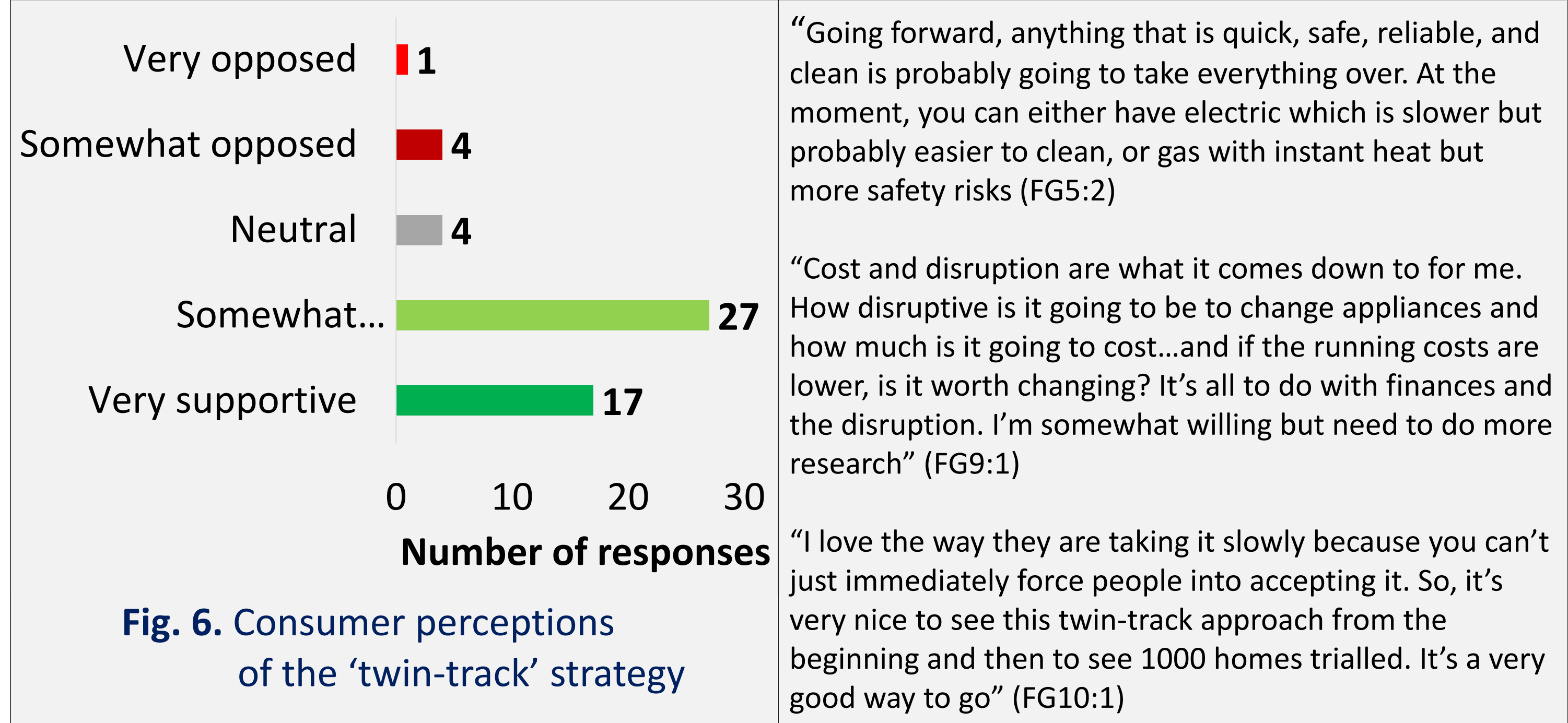


Fig. 6. Consumer perceptions of the 'twin-track' strategy

Discussion: H₂ futures

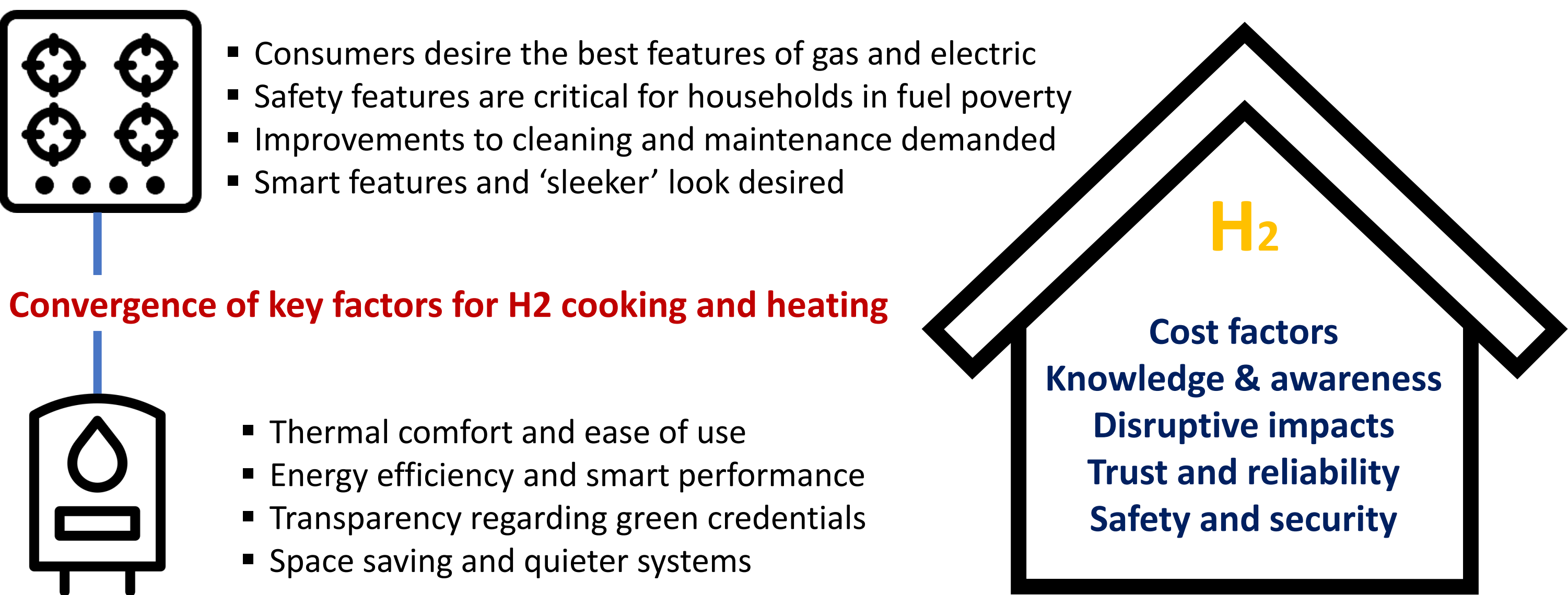


Fig. 7. Factors influencing the social acceptance of H₂ homes

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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