Business models to accelerate uptake of domestic heat efficiency and decarbonisation measures

Summary of dissertation research completed as part of MSc Environmental Entrepreneurship

Investigator: Chris Carus, chriscarus@gmail.com @chris_carus Supervisor: Dr Jen Roberts

University of Strathclyde Glasgow

Context

Residential buildings contribute around 20% of the UK's greenhouse gas emissions[1], mainly from gas boilers. The UN Paris Agreement requires developed countries to largely eliminate fossil fuels by 2035[2]. Glasgow has committed to net zero emissions by 2030; Scotland by 2045.

Retrospective energy efficiency treatment of existing buildings is a 'low regrets' climate response: abating emissions, reducing requirements for renewable generation, reducing heating costs, improving occupant comfort and health and extending the life of buildings. However, treatments are ***difficult***: costly, disruptive to households, and often challenging to design, contract and execute. Current rates of efficiency retrofit are too low[3].

Innovative business models may reduce barriers[4].

Conventionally, homeowners contract trades separately leading to poor integration of measures.

Alternatives: 'one-stop shop' coordination; community-based intermediaries; heat as a service; 'room in a day' interventions; off-site production of customised elements.

Approaches to heat efficiency[5]

Insulation: Wall, loft and underfloor insulation, better windows and doors, eliminating draughts and controlling ventilation.

Heating: Optimizing boilers for condensing operation, heat pumps in houses, connections to district or communal heating for flats.

Langside case study

This research used a case study approach to examine drivers and barriers to retrofit in the Langside area of south Glasgow, UK. The area is characterised by mostly privately owned pre-1919 traditional and interwar constructions. The population is largely outside the scope of most social support programmes. 137 usable questionnaire responses were received from homeowners in the case study area (blue dots in Figure 1) and five homeowner interviews deepened insights. Interviews with five building energy professionals were used to strengthen the transferability of conclusions.

Findings

'There's only so much you can do with this type of building'

- Views of efficiency retrofit are dominated by cost and bill savings. Homeowners may underestimate the scope for, and benefits of, comfort improvements.

"I want to see proof from engineers not suppliers'

- A common category of comment was expressions of demand for advanced, unbiased, personalised advice.

'Someone doing all the thinking for me … otherwise it just never makes it up the to do list'

- An intermediary organisation could help ensure opportunities to implement efficiency measures are not missed – including moving in, laying new flooring, decorating, extending.

Interpersonal recommendations are key

- Homeowners have difficulties finding reliable tradespeople and many rely on friends and social media groups. Homeowners are largely unaware of accreditations like Trustmark and PAS2035/2030.

Strategies to manage cost and quality

- Some professionals view new consumer protection standards (PAS2035/2030:2019) positively. Another believes that increased paperwork will not be a barrier to rogue traders.
- Homeowners and professionals expressed support for scaled approaches to managing cost in the private sector.

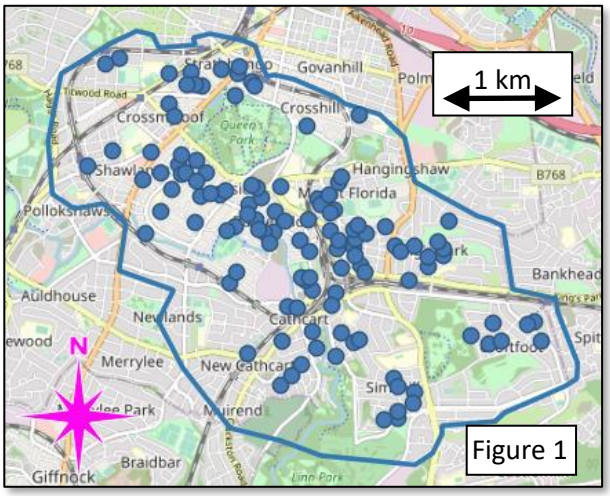


Figure 1

Figure 2

Recommendations

- Government should emphasise comfort benefits, as well as fuel savings. It should recognise the value of interpersonal recommendations in forthcoming Energy Efficient Scotland programmes for 'able to pay' homeowners.
- Business should provide integrated services including advanced personalised assessments.
- Further research should consider perceptions of comfort and assess the impact in winter of any extended COVID work from home policies.

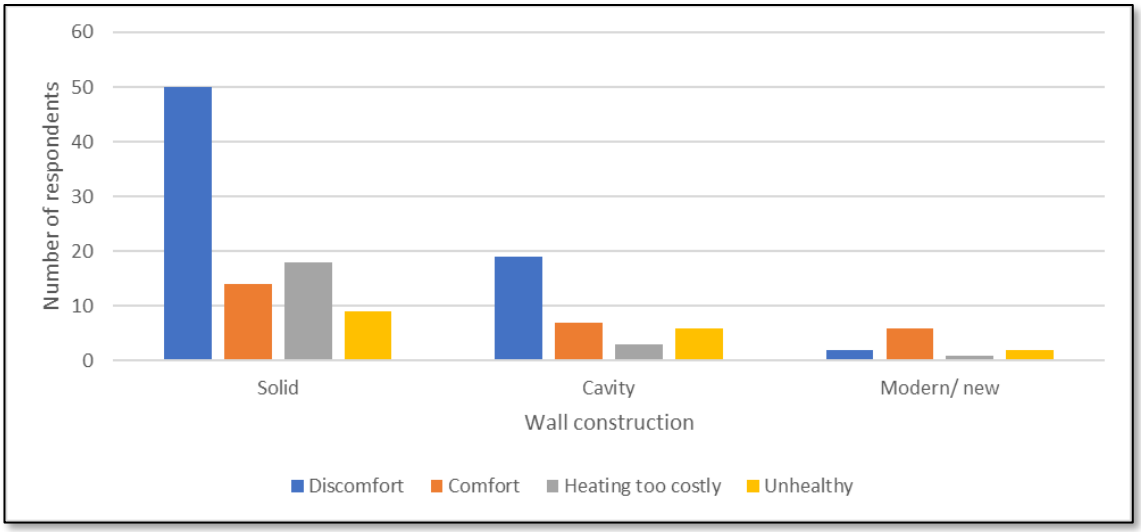
I would like to thank the Southsiders and building professionals who generously contributed their time to this research.

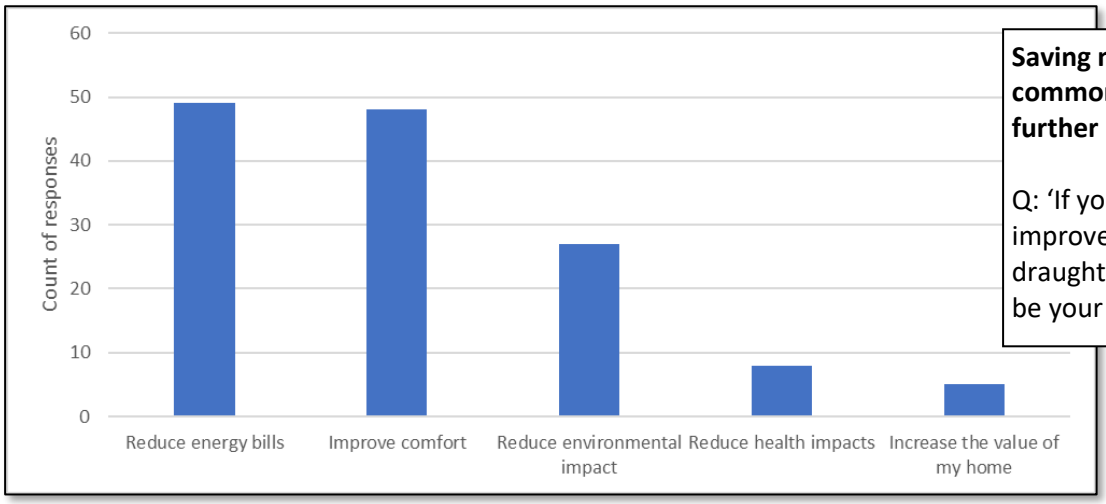
Annex

Key questionnaire data are reported below. Please feel free to contact me for further information. chriscarus@gmail.com.

Many homeowners perceive their home as cold or draughty in winter.

Q: 'Thinking about your home in winter, which phrases apply' Responses categorised into four categories.

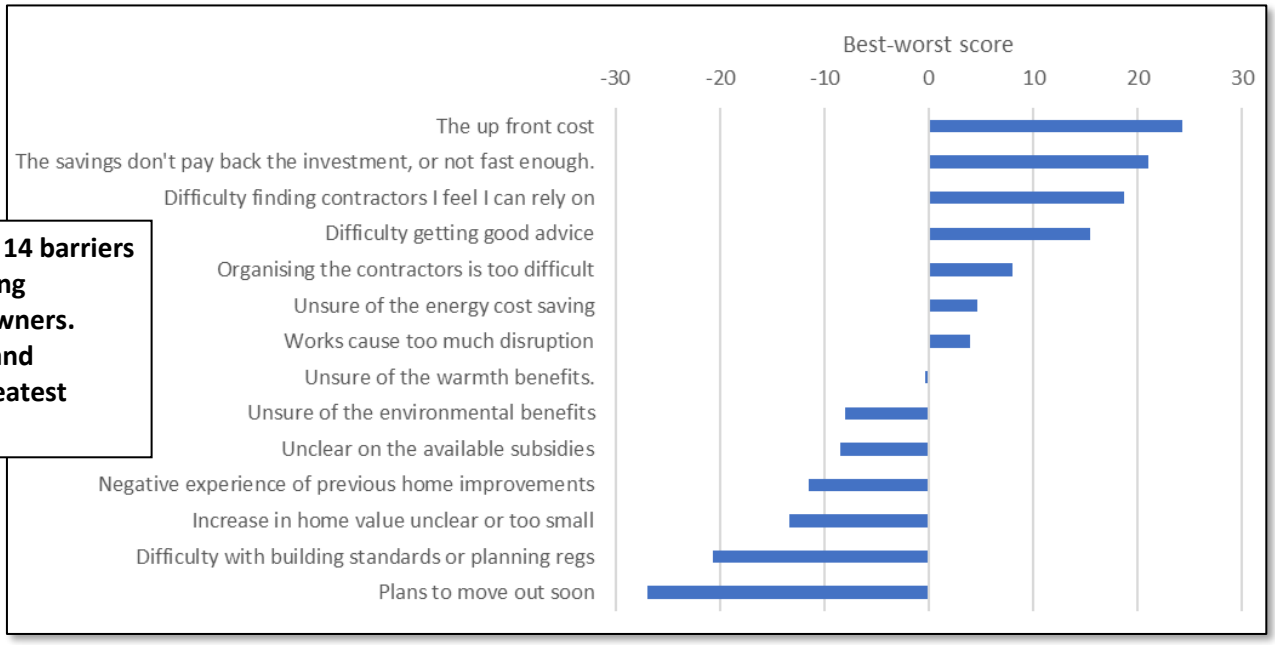




Saving money and comfort are the most common top reasons for considering further heat efficiency measures.

Q: 'If you were to make additional improvements to your home insulation, draught-proofing, or heating, what would be your reasons?

Best-worst scaling put 14 barriers into order of descending importance to homeowners. Cost/savings, advice, and contractors are the greatest barriers to retrofit.



References

1 Committee on Climate Change (2016). Next steps for UK heat policy.

2 Anderson, K., Broderick, J, (2017) Natural gas and climate change.

3 Committee on Climate Change (2020). Progress Report to Parliament

4 Brown, D (2018). Business models for retrofit in the UK: a critical assessment of five key archetypes. *Energy Efficiency*, 11(6), pp.1497–1517.

5 Morgan, C (2018). Sustainable Renovation. Dingwall: The Pebble Trust.