ESRI
RESEARCH
BULLETIN
AUGUST 2018

WHO UPGRADES THEIR RESIDENTIAL HEATING SYSTEM?

JOHN CURTIS, DAIRE MCCOY, CLAUDIA ARAVENA

ESRI ECONOMIC & SOCIAL RESEARCH INSTITUTE

Who upgrades their residential heating system?[1]

*John Curtis (ESRI, TCD), Daire McCoy (Grantham Research Institute, LSE, ESRI), Claudia Aravena (Heriot-Watt)

ESRI Research Bulletins provide short summaries of work published by ESRI researchers and overviews of thematic areas covered by ESRI programmes of research. Bulletins are designed to be easily accessible to a wide readership.

OVERVIEW

In the context of moving to a low-carbon economy there is wide interest among policymakers to improve knowledge of decisions surrounding residential heating systems, as burning fossil fuels for heating comprises the greatest share of greenhouse gas emissions from the residential sector. This research examines four aspects of decision-making with respect to heating system upgrades: home-owner decisions on whether to upgrade, decisions on fuel choice, fuel switching patterns, and an examination of the reasons why home-owners make these decisions.

No clear trend emerges with respect to choices for replacement heating systems in terms of characteristics of the property's occupants. There is no substantial difference in the likelihood of choosing a particular heating system associated with factors such as income, education, working status, or families with higher numbers of children or elderly occupants. This means that heating system decisions entail more complex elements than only socioeconomic variables.

Home-owners' knowledge of energy or environmental issues or engagement in environmentally sustainable behaviours are also not aligned with decisions with respect to residential heating system upgrades. The a priori expectation was that environmentally conscious home-owners (i.e. those that engage in environmentally sustainable behaviours such as recycling, or energy saving behaviours such as installing insulation) would be more likely to opt for either electricity or gas when upgrading their heating systems, as these are among the least emissions intensive options per delivered energy. Homeowner's concern for the environment or climate change are not key drivers in terms of their decisions on home heating system upgrades.

An important determinant of home-heating choice is proximity to the natural gas network. Home-owners are substantially more likely to upgrade their heating

[1] This Bulletin summarises the findings from: Curtis, J., McCoy, D., Aravena, C., "Residential Heating System Upgrades: the role of knowledge, socio-demographics, building attributes and energy infrastructure", *Energy Policy*, 120, 183–196: https://doi.org/10.1016/j.enpol.2018.05.036.

*John.Curtis@esri.ie

system with a natural gas-fuelled system when the gas network is near their home; they are 59 percentage points more likely to do so compared to home-owners that believe gas is not an available option.

For home-owners upgrading their heating system the majority indicated the reason for doing so was for fuel cost reasons or that their existing system wasn't functioning very well. In addition to their own research, home-owners rely on their plumber as well as friends and neighbours for guidance on residential heating options rather than energy consultants. For home-owners deciding not to upgrade their heating system, approximately one-quarter indicated financial or budget constraints, whereas nearly half said they believed an upgraded system would not work any better. Just 3% decided not to upgrade due to the associated disruption.

BACKGROUND

The data for the analysis comes from a survey of households demographically representative of gender, age, region and principal-economic status in Ireland. This research focuses on 991 home-owners, as opposed to rental tenants, who were involved in their household's decisions related to the heating system and the fuels used within the home. The research uses statistical methods to estimate how factors such as building attributes, home-owner characteristics, as well as their knowledge and behaviours associated with energy and climate issues affects their decisions on home-heating choices.

POLICY IMPLICATIONS

EU and Irish climate policy seek to reduce greenhouse gas emissions. Residential sector heating is an important policy focus, given the high share of energy use for space heating. With this research finding no clear socio-demographic trends associated with decisions surrounding home-heating choice, there are no obvious demographics around which promotional or marketing initiatives can be developed to encourage home-owners to switch to low-carbon alternatives. Additionally, as home-owners who might be characterised as 'pro-environmental' are not any more likely than others to opt for low-carbon home-heating choices, relying on their environmental conscience to do the 'right' thing is unlikely to be particularly successful.

In so far as homeowners are switching from solid fuel or oil to gas, this move is welcome but there is also inertia with respect to oil and coal as home heating fuels. Decisions today entail technological lock-in, with potential life-spans of up to 20 years for new boiler equipment today. While grants are currently available for specific residential heating technologies (i.e. heat pumps and solar thermal) additional policy measures are needed so that home-owners face the right incentives as soon as possible to encourage adoption of heating systems consistent with the national low-carbon roadmap, which envisages strong growth in the gasification and electrification of heating in the residential sector.

Proximity to the natural gas network is a key determinant of heating system upgrade decisions. The fact that home-owners are considerably less likely to switch from gas as a heating fuel indicates strong satisfaction with gas-based heating systems. Policy measures to accelerate the transition to a biogas rather than a natural gas network would contribute to a low carbon transition and avoid the need for hundreds of thousands of individual decisions by home-owners to transition to low carbon alternatives.

Whitaker Square,
Sir John Rogerson's Quay,
Dublin 2
Telephone **+353 1 863 2000**
Email **admin@esri.ie**
Web **www.esri.ie**
Twitter **@ESRIDublin**

ESRI ECONOMIC & SOCIAL RESEARCH INSTITUTE