

# Householder Preferences for the Design of an Energy Efficiency Retrofit Subsidy in Ireland

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## Introduction

Improving the energy efficiency of residential buildings provides an opportunity for households to save money on their energy bills, improve the comfort of their homes and reduce their carbon footprint. There is considerable evidence for the positive benefits gained from residential energy retrofits (e.g. Cajias and Piazzolo, 2013; Galvin, 2010; Suter and Shammin, 2013), as well as for new energy efficient properties (e.g. Deng et al., 2012). Other benefits from energy efficiency retrofits include reductions in greenhouse gas emissions and wider economic benefits in terms of jobs and competitiveness at sector, national and international levels (European Commission, 2011; Figus et al., 2017; Ryan and Campbell, 2012).

Many households are willing to invest in retrofit measures despite the long-term payback and investment returns (Collins and Curtis, 2017b; Havas et al., 2015). Also, new-build, energy-efficient properties are not always economically efficient (e.g. Deng and Wu, 2014). There is a case for government intervention subsidising energy efficiency retrofits in the residential sector. Kerr et al. (2017) examine energy efficiency policy across several countries, including Ireland. They find noticeable differences between the recognition of benefits and ensuing policy rationale between countries, which are due to a mix of political, social and economic influences. In general, energy efficiency support schemes are intended to encourage private investment but do not cover the full cost. For example, the value of the subsidy in the Better Energy Homes scheme in Ireland is approximately 35 per cent of the cost of certain energy efficiency retrofit measures (Collins and Curtis, 2017).

The benefits of energy efficiency retrofits are reflected in lower energy bills, improved comfort and environmental benefits (Aravena et al., 2016; Clinch and Healy, 2001; Gillingham et al., 2009). Additionally, improved health outcomes (Curl et al., 2015; Maidment et al., 2014) have been noted along with improved property values (Brounen and Kok, 2011; Hyland et al., 2013; Fuerst et al., 2015). The design of public subsidy

schemes is known to affect participation and outcomes (Bird and Hernandez, 2012; Hoicka et al., 2014). A key concern is whether public funds, through energy efficiency retrofit subsidies, contribute to distributional inequalities across socio-demographic groups. This paper examines the design of energy efficiency subsidy schemes from the perspective of the household. The research question is to identify households' preferences for design features of energy efficiency retrofit subsidies.

## Background

In Ireland the Sustainable Energy Authority of Ireland (SEAI) administers the Better Energy Homes (BEH) grant scheme for energy efficiency retrofits of residential properties. The scheme originated as the Home Energy Savings scheme in March 2009. Grants are available for roof/attic insulation, one of three types of wall insulation (cavity insulation, external wall insulation or internal dry lining), three types of heating system upgrade (oil or gas boiler with heating controls upgrade or heating controls upgrade only) and solar collector (panel or tube) installation. This means that a household may adopt up to a maximum of four measures, as only one type of wall insulation or heating system upgrade may be awarded grant aid. Upgrades must meet SEAI standards for grant applications to be successful. The level of grant aid available has changed over time. The level of the subsidy support in Ireland is approximately 35 per cent of the cost of eligible measures (Collins and Curtis, 2017), which is relatively high compared to elsewhere in Europe.

## Data and Methodology

To gain an understanding of how preferences vary across characteristics of the population for certain forms of subsidies this paper looks at data provided by SEAI from cross-sectional surveys of homeowners in Ireland in 2014 and 2016. Only those with responsibility, including joint responsibility, for making decisions about energy usage and energy improvements in the home were interviewed. In total a sample for analysis of 1,290 respondents was obtained.

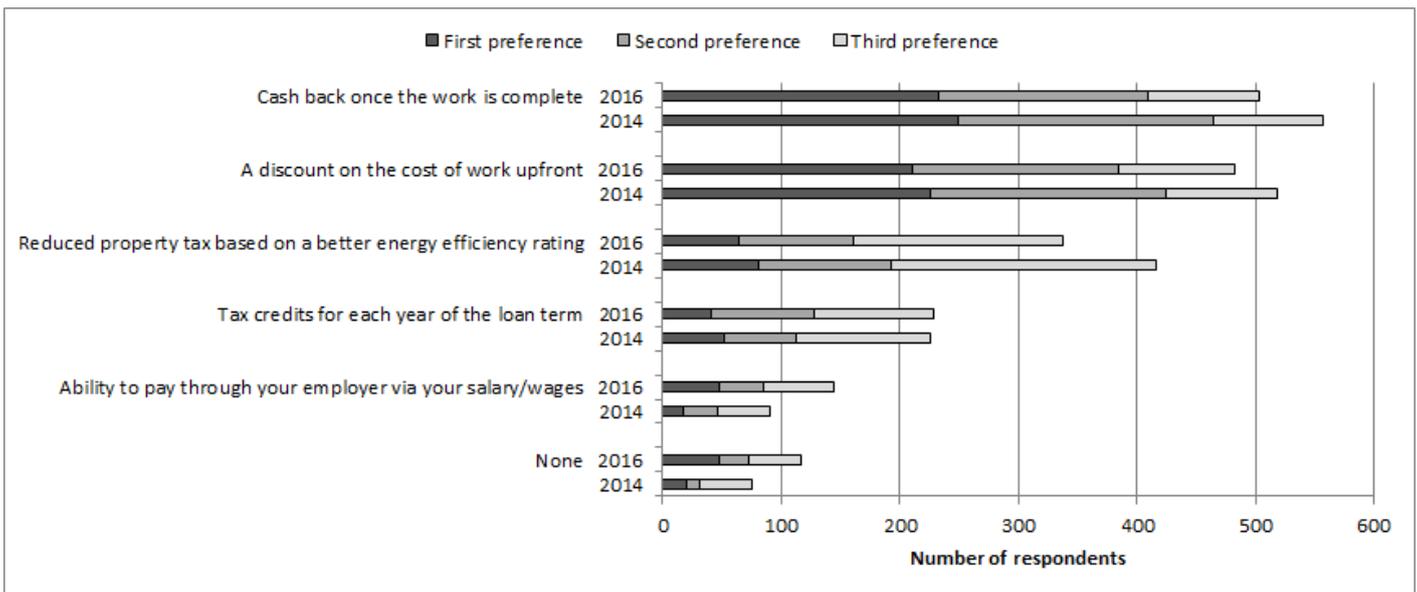
This paper looks at a part of the survey which asked about stated preferences toward the structure of financial incentives for homeowners to undertake energy efficiency retrofit works. Respondents were asked the following question and provided with a set of responses asking their first, second and third preferences:

“Different incentive options may be considered to encourage investment in energy efficiency measures. For example, if you undertook to complete attic insulation or another measure you might receive a financial incentive in one of the following forms. Which of these would you prefer?

1. Reduced property tax based on a better energy efficiency rating
2. Tax credits for each year of the loan term
3. Cash back once the work is complete

- 4. Ability to pay through your employer via your salary/wages (along the lines of the bike to work scheme<sup>3</sup> where you save on the purchase price with tax relief
- 5. A discount on the cost of work upfront
- 6. None”

**Figure 1**



The order of preferences for each survey is presented above in Figure 1. A similar pattern in preferences can be seen in both surveys. Cash back once the work is complete the most preferred form of financial incentive. This is closely followed by an upfront discount on the cost of work. Although both options are quite similar, the first requires a greater cash flow in order to first cover total costs, relative to the cash flow required to cover a partial cost. The third-most popular choice is reduced property tax followed by tax credits for each year of a loan term and, lastly, the ability to make repayments through an employer.

### Results

Comparing females to males only in the 2016 sample and for just two subsidy schemes, ‘reduced property tax’ and ‘via employer’ are female preferences different from males. Those in the older age cohorts, ‘56-65’ and ‘65+’, are significantly less likely to prefer incentive structures involving tax credits or making repayments through an employer, relative to the ‘18-35’ cohort. This reflects that members of this age cohort are more likely to be retired and so unable to avail of the scheme. In the 2016 sample respondents with a mortgage had a higher preference for the upfront discount scheme versus the ex-post cash payment. In the 2014 sample there was no practical difference

between preferences of urban and rural dwellers for subsidy schemes except in the case of no subsidy support, in which case rural respondents favoured more than urban dwellers. In the 2016 sample rural dwellers are less in favour of subsidy support via either property taxes or upfront discounts versus the status quo ex-post cash payment. There were only small differences in preferences based on respondents' dwelling types. Those living in terraced and semi-detached properties had less support for a subsidy implemented via property taxes compared to detached house dwellers in both sample years.

## Conclusions

Improving the energy efficiency of the residential building stock leads to many private benefits for homeowners, including lower energy costs, health benefits, and improved property values. There are also broader positive factors such as reduced greenhouse gas emissions and wider economic benefits in terms of jobs and competitiveness. This paper considers homeowners' preferences across different types of potential subsidy schemes, a better understanding of which should aid the design of residential energy retrofit subsidy schemes going forward.

The clear message from the survey is that respondents strongly prefer cash payment subsidies versus other indirect methods of financial support, roughly by a 70:30 ratio. One clear result is that preferences on type of subsidy scheme differ depending on whether respondents have previously availed of an energy efficiency retrofit grant. Second, though the results from the two sample years are not identical it can be seen that preferences vary by respondents' property type, tenure, location and age. The findings with respect to age and whether respondents previously availed of a grant, in particular, suggest support schemes need to cater for a greater variety of situations. Incentives to encourage older age cohorts to invest in energy efficiency may need to be tailored to their particular circumstances.

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