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The appeal of the green deal: Empirical evidence for the influence of energy efficiency policy on renovating homeowners

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HIGHLIGHTS

- Examines the impact of a major new energy policy, the Green Deal, on intentions towards energy efficiency.
- 502 households questioned four months prior to, and seven months after the launch.
- Renovating itself is mechanism through which households engage with the Green Deal.
- Strengthening beliefs in energy savings accelerates intentions to renovate energy efficiently.

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ABSTRACT

The Green Deal is a major new energy policy designed to support the diffusion of energy efficiency measures in UK homes. This paper provides one of the first empirical examinations of the Green Deal's success in influencing homeowners' renovation decisions. Using a repeated measures design in which households were questioned before and after the Green Deal's launch in January 2013, we assess the policy's success in raising awareness of energy efficiency. In particular, we test the effectiveness of the Green Deal's positioning to overcome barriers to renovation among homeowners already interested in or considering energy efficiency measures. Using the innovation decision process (Rogers, 2003) as a conceptual framing of the renovation decision process, we examine whether new information on energy efficiency provided by the Green Deal strengthened intentions and its antecedents. We find that (1) energy efficiency is of potential appeal to all renovators regardless of their attitudes about energy efficiency, (2) energy efficiency opportunities need to be identified in the early stages of renovation when homeowners are thinking about ways to improve their home, and (3) homeowners' intentions towards energy efficiency are weakened by uncertainty about financial benefits, helping to explain the relatively slow uptake of the Green Deal to-date.

1. Introduction

The UK government's Energy Efficiency Strategy is structured around overcoming barriers to the adoption of cost-effective energy efficiency measures (DECC, 2012). A flagship policy, the Green Deal, has been designed to accelerate the diffusion of energy efficiency within the current building stock in England, Scotland and Wales (DECC, 2010). Underpinned by the premise that some energy efficient renovations will pay for themselves through savings in energy bills, the Green Deal creates a financing mechanism provided by third parties to pay for the upfront costs of installing energy efficient measures in the home. These measures include those requiring larger investment such as boiler replacement, solar water or solar heating, and also measures to improve general thermal insulation of the home including loft insulation or cavity wall insulation (DECC, 2010). The relationship between improved energy efficiency and savings in energy bills is a fundamental component of the policy and has been labelled 'the Golden Rule'. Financing under the Green Deal rests with the property and not the owner, and so is repaid by whoever pays the energy bills. In accordance with the Golden Rule, this is at an annual rate no higher than the estimated annual energy savings gained from new efficiency measures installed in the home. In order to qualify for Green Deal financing, properties undergo an energy efficiency assessment estimating the potential for savings in energy costs

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Fig. 1. The Green Deal process. An illustration of the five main stages involved in the Green Deal

(Fig. 1). The assessment report makes recommendations for proposed work. Households then have to seek quotations for costs from Green Deal accredited contractors before financing can be secured.

To support this process the Green Deal brings together an accredited network of assessors, installers, financial providers and other suppliers who provide knowledge and expertise to address information and financing barriers to efficiency renovations. The Green Deal was launched in January 2013 but take-up was slow both in terms of home assessments and financing deals. Between the period January-December 2013, 117,454 Green Deal assessments were carried out (DECC, 2013), representing a penetration of approximately 0.5% of the UK housing stock. Only a small proportion of these assessments resulted in Green Deal financing plans being pursued (approximately 1 in every 100 assessments) reflecting a conversion rate of only about 0.4% (DECC, 2013).

Although DECC has reported other outcome statistics including levels of general awareness and satisfaction of households undergoing Green Deal assessments (DECC, 2013; GfK, 2013b), the effect of the Green Deal on intentions towards energy efficiency has not been measured. This is the purpose of this study. Evaluating the Green Deal as a new policy innovation, we test the impact it has made on household intentions towards energy efficient renovations. Using an experimental design we compare three different groups of household. In each case we focus on owner-occupied households which comprise 64% of the UK market. The first group are households who, in line with the Green Deal positioning, should have found the new policy particularly salient, having expressed some interest in doing energy efficient renovations in their homes prior to the Green Deal launch. The second group of households are those considering other forms of major renovations in their home.[1] Finally, the third household type, are those who had no intentions towards renovating either before or after the Green Deal launch. By comparing these three groups we consider whether the Green Deal made any impact on changing intentions towards incorporating energy efficiency measures into homes.

2. Methods

2.1. Literature review

2.1.1. The energy efficiency gap

There are many efficiency improvements that can be made to domestic buildings, the most effective involving structural changes such as cavity wall insulation and triple-glazed windows, or upgrades to the heating and hot water systems such as high efficiency boilers (Gardner and Stern, 2008; Dietz et al., 2009). As well as energy cost savings from these efficiency measures there are other benefits to the homeowner such as reduced draughts and condensation, improved thermal comfort, and increased property value (Jakob, 2006). Despite these benefits, adoption rates of these major efficiency improvements are slow. This 'energy efficiency gap' between technical and economic potential on the one hand and actual adoption on the other is well documented (Jaffe and Stavins, 1994). Explanations vary, but all tend to suggest there are many 'barriers' to otherwise cost-effective technology adoption decisions (Brown, 2001; DECC, 2012). These barriers include capital availability, an aversion to delayed gains and the perceived lack of credible and available information on efficiency measures. Lack of trust in contractors, access to information, lack of financing, complexity and uncertainty, and hassle and inconvenience are also repeatedly emphasised in studies and reports by policymakers, service providers, and consumer behaviour/market researchers (DEFRA, 2009; Skelton et al., 2009; EST, 2010a; Bioregional, 2011; Cabinet Office, 2011). In their major UK review of attitudes and behaviours towards low carbon energy Whitmarsh et al. (2011) find other barriers including lack of awareness and unrealistic expectations (see also DEFRA, 2009; EST, 2010a; Roy et al., 2007) as well as hassle and disruption (see also Skelton et al., 2009).

2.1.2. The Theory of Planned Behaviour, the Innovation Decision Process, and the design of the Green Deal

The Green Deal was based on the premise that the energy efficiency gap could be closed by lowering behavioural barriers to incorporating energy-efficiency measures into the home. Current policy makers view this as both valid and fundamental to engaging households with energy efficiency (DECC, 2012). Intentional models of behaviour such as the Theory of Planned Behaviour (TPB) (Ajzen, 1991) provide some theoretical basis for these assumptions.

Applied in this context, TPB represents individuals making rational decisions to incorporate energy-efficiency measures into their homes based on the expected values or outcomes of such decisions. A central factor in TPB is an individual's intention towards the behaviour in question: the stronger the intention, the more likely they are to perform the behaviour (Ajzen, 1991). The three factors influencing intentions in TPB are motivations (attitudes, compliance with perceived norms) subject to constraints (perceived behavioural control). Attitudes are formed from an individual's beliefs about the behaviour (installing energy efficiency measures) as well as an evaluation of its likely outcomes (e.g., reduction in energy bills). Perceived norms are similarly formed from normative beliefs which describe an individual's perception of what valued peers think about the behaviour as well as an evaluation of the importance of those peers. However, intentions can only be followed through if the behaviour in question is within the perceived control of the individual. In TPB this is represented by perceived behavioural control (PBC) which consists of the resources and opportunities available to the decision maker. PBC is therefore a subjective assessment of the extent to which both personal and contextual factors influence the behaviour. This is particularly relevant in decision contexts in which action is constrained or individuals do not otherwise have full control (Ajzen, 1991; Armitage and Connor, 2010).

The Green Deal was designed to address this gap between intentions and behaviour by addressing PBC. It was built on the understanding that householders face not only financial constraints to investing in energy-efficiency measures but also those barriers related to uncertainty and lack of information. The Green Deal process was designed to overcome these barriers by guiding households through a series of stages from home energy assessments to certified contractor selection.

Rogers' conceptual model of the Innovation Decision Process (Rogers, 2003) provides an alternative perspective. It frames the

[1] This includes installing new kitchens and bathrooms, building extensions, adding loft conversions or adding conservatories