

# The Green Deal and the Energy Company Obligation – will it work?

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## Abstract

Current UK energy efficiency policy is very fluid with a number of new policies due to be introduced in 2012 and 2013, including the Green Deal and Energy Company Obligation. These mark a substantial change from the existing policy regime in a number of ways, notably the explicit aim of supporting higher cost energy efficiency technologies in housing and an attempt to engage new sources of private sector finance. Our research suggests that the Green Deal / Energy Company Obligation will only deliver carbon reduction at a rate of approximately 18% of the policies it replaces - the Carbon Emissions Reduction Target and the Community Energy Savings Obligation. This paper provides a critical analysis of the proposed policy changes both in terms of the institutional changes and the implications of a new finance mechanism for energy efficiency policy as well as the overall impact on carbon reduction. While recognising the innovative nature of the new policies and some potential benefits, the paper points out a number of concerns. First, there is a risk that the attractiveness of the Green Deal approach is being over-estimated as commercial rate loans may not prove attractive to households and the approach of attaching payments to the electricity meter is new. Second, the impact on the delivery of measures, particular insulation, implies a radical shift from well-known energy efficiency measures with an established supply chain towards more sophisticated and expensive technologies. Third, Government will not underwrite the Green Deal and therefore Green Deal providers bear the risk of credit default risk. Finally, the current proposals indicate that fewer resources will be directed to address fuel poverty than under existing policies, making the delivery of targets to eliminate for fuel poverty even less plausible.

**Notes:** Parts of this paper are based on the UK Energy Research Centre's response to the consultation on the Green Deal and the Energy Company Obligation (Eyre et al., 2012).

# 1 Introduction

*'The vision for the Green Deal and the new Energy Company Obligation (ECO) is an ambitious and far-reaching one. It's a world where the UK leads with a dynamic new energy efficiency market, with nationwide brands, local businesses and community organisations competing to deliver the best proposition for the consumer' (DECC, 2011a, p. 10).*

This quote taken from the UK Government's proposals illustrates the ambition and the scale of the new policies that are going to be introduced. The Green Deal is a new policy instrument, untested in the UK, allowing financing of energy efficiency retrofits of buildings via an on-bill charge, which is attached to the property rather than the occupant. Similar instruments have been in place in the US with mixed results (Bird and Hernández, in press; Fuller et al., 2009; Jewell, 2009; Johnson et al., 2012). ECO is a continuation of previous obligations on energy companies to deliver energy efficiency measures across the housing stock, but with a much stronger emphasis on higher cost insulation measures. In combination, the two instruments are supposed to achieve a large-scale reduction of carbon emissions from existing buildings in the UK.

This paper discusses to what extent the Green Deal and the ECO are likely to deliver the scale of carbon reductions projected by Government. Because the Green Deal / ECO proposals are very detailed and cannot be discussed in their entirety, the paper focuses on key aspects and critically discusses the major policy changes. First, the paper sets the scene by providing the background to the policy proposals as well as the policy instruments they will replace. Second, a number of concerns are pointed out. Third, the implications of the concerns raised are discussed. Finally, the paper concludes that although the Green Deal comprises an innovative policy instrument that could potentially leverage additional resources for low carbon building refurbishment, the current proposals are unlikely to deliver significant carbon savings. In fact, the official projections indicate a drop of 82% in terms of carbon reduction compared to the policy status quo. This is contrary to the recently proposed EU Energy Efficiency Directive, which requires member states to implement energy savings obligations achieving savings each year of at least 1.5% of annual energy sales to final customers of all energy distributors or all retail energy sales companies (European Parliament and Council of the European Union, 2012).

## 2 Background

In the UK, policies aimed at reducing carbon emissions from the existing housing stock have evolved over many years and mainly consist of obligations on energy companies to save energy and carbon in existing homes. Supplier obligations have been in place since 1994 and although they have been modified, the general approach has been consistent (Rosenow, 2012). The basic concept of the supplier obligations is that Government, in this case the Department of Energy and Climate Change (DECC), imposes an energy or carbon savings target on large energy companies that has to be achieved by installing defined energy and carbon saving measures in houses. Energy suppliers choose different strategies to meet the obligations. Some suppliers, such as British Gas, developed their own subsidiary businesses in order to carry out the installation of measures themselves. Other companies, for example ScottishPower, outsource most of their obligation to third parties which deliver the measures on their behalf. Promotion of energy efficient technologies via retailers and supermarkets, as well as work with social housing providers, comprise additional delivery routes.

The key policies for carbon reduction in households in place at the moment are the Carbon Emissions Reduction Target (CERT) and the Community Energy Saving Programme (CESP) (DECC, 2011b). Both policies will come to an end in December 2012 and will be succeeded by the Energy Company Obligation (ECO). The major Government fuel poverty programme (Warm Front) will also end at this time, and therefore the ECO has been designed to replace both carbon saving and fuel poverty programmes. ECO places three obligations on energy companies: A Carbon Saving target similar to previous obligations, a Carbon Saving Communities target focused on the delivery of carbon reduction measures to the 15% most deprived areas and eligible rural households, and an Affordable Warmth obligation requiring a defined reduction in energy costs in low income households (DECC, 2012b).

Alongside ECO, the Green Deal is supposed to deliver significant carbon reductions across the UK housing stock and will, according to Government, cause 'a revolution in British property' (DECC, 2011a, p. 10). The Green Deal is based on the idea of attaching loans for low carbon refurbishment of buildings not to the owner, but to the property itself, technically the electricity meter in the property. Repayment of the loan is then via a surcharge on the electricity bill, collected by the electricity supplier and paid on to the Green Deal provider. If the value of the energy savings triggered by the measures installed is greater than this surcharge, the occupant is better off financially. Similar programmes have been in place in the US for some years (Bird and Hernández, in press; Fuller et al., 2009; Jewell, 2009; Johnson et al., 2012). The Green Deal approach was tested in the UK from November 2009 to July 2011 in so-called Pay As You Save (PAYS) pilots, an initiative put forward by the previous government. PAYS was led by DECC in partnership with the Department for Communities and Local Government and it was administered by the Energy Saving Trust. However, the Green Deal differs from PAYS in a number of ways and particularly with regard to the finance mechanism: The Green Deal is subject to a 'Golden Rule' which prescribes that estimated savings must be greater than repayments (DECC, 2012c). Households taking part in the PAYS pilot schemes were not subject to this Golden Rule and could also install measures that would not pay back within the chosen repayment timeframe (DECC and Energy Saving Trust, 2011).

Because the Green Deal focuses on the most cost effective measures, ECO is supposed to cover those measures that do not meet the Golden Rule and provide assistance to customers living in fuel poverty. The two policy instruments will not operate separately but are linked via various mechanisms. Green Deal providers, i.e. businesses that offer Green Deal packages to occupants, may offer finance plans that combine funding from ECO and the Green Deal mechanism. Those measures that do not fulfill the Golden Rule can be funded by ECO and be bundled with Green Deal funded measures. A brokerage mechanism is supposed to allow Green Deal providers to access ECO funding from the energy companies by offering carbon savings in competition with other providers (DECC, 2012c).

### **3 Critical assessment**

While the Green Deal is an innovative policy instrument that has the potential to create new markets and mobilise additional funding streams, there are a number of concerns with regard to the short- and mid-term impacts of the policy changes proposed.

In this section we discuss a) the projected contribution to carbon reduction, b) potential barriers to uptake, c) the design choices made and their implications, d) the supply chain's capacity to deliver, e) the credit default risk, and f) the implications for fuel poverty.

### 3.1 Contribution to carbon reductions

The effectiveness of a policy aimed at reducing carbon emissions ultimately depends on its overall contribution to carbon reduction efforts. In the past, Government increased the carbon and energy savings targets imposed on energy companies every time a new obligation period started (Rosenow, 2012). Given the challenge of reducing the UK's carbon emissions by 80% by 2050 based on 1990, one would expect the level of current reduction activities to increase or at least remain stable. However, the proposals on the Green Deal and ECO indicate that the opposite will be the case.

The overall carbon target for ECO set between January 2013 to March 2015 is 27.8 MtCO<sub>2</sub>, it comprises 20.9 MtCO<sub>2</sub> for the Carbon Saving obligation target and 6.8 MtCO<sub>2</sub> for the Carbon Saving Communities target (DECC, 2012b). Initially, the carbon target was only equivalent to about 19 Mt CO<sub>2</sub> (lifetime) (Eyre et al., 2012).<sup>1</sup> As a result of including more cost effective measures such as hard-to-treat cavity wall insulation (CWI), and allowing the delivery of CWI and loft insulation under the Carbon Saving Community target, the carbon target is now 46% higher than originally planned. Still, compared to the existing policies ECO will result in significantly lower carbon savings. Per year, current policies (CERT and CESP) deliver about 68 Mt CO<sub>2</sub> (lifetime) in savings (based on DECC, 2009; DECC, 2010). Given that ECO is going to operate for 2.25 years, the implicit annual carbon savings targets are just about 12 Mt CO<sub>2</sub> (lifetime), less than a fifth of CERT and CESP. Based on the following analysis, Green Deal and ECO will only deliver 18% of the carbon savings that the current policies (years 2009-2012) achieve.

There are a number of factors that contribute to the reduction:

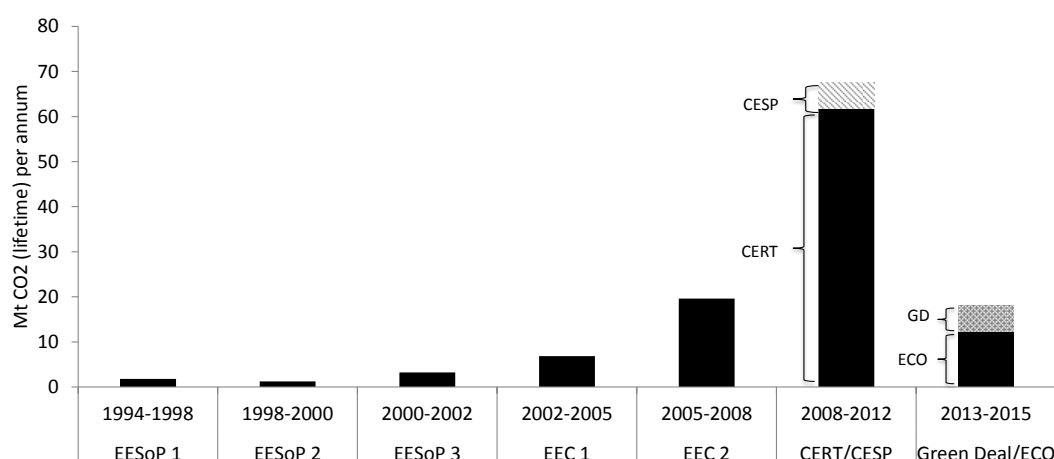
1. The estimates of savings from individual measures are lower now than in CERT, e.g. 2.673 MWh/year for CWI compared to an estimate of 3.54 in MWh/year in CERT. This is due to a change in methodology, from an approach that may lead to an over-estimate to one likely to produce an under-estimate.
2. ECO and Green Deal are focused on buildings, so that the lighting and appliance measures which contributed significantly to CERT, and even more to earlier obligations, are not included. There has been no real justification of this policy change (see Section 3.3. below).
3. The Green Deal Impact Assessment shows a negative contribution to carbon savings due to the Affordable Warmth element of ECO. This is largely a methodological artifact of assuming that savings in electricity (from taking out inefficient electric heating systems) have no carbon benefit, because these are included within the benefits of the EU Emissions Trading Scheme (ETS) (although clearly not caused by the EU ETS).
4. Last, but probably most important, there is a significant reduction in the projected rate of installation of key insulation measures – cavity wall insulation and loft insulation – which is not compensated for by rising rates of solid wall insulation (SWI). This is driven by excluding standard CWI and loft insulation from the Carbon Saving obligation target.

Compared to past supplier obligations, the proposals are now at similar levels as under the Energy Efficiency Commitment 2, which ran from 2002 to 2005 (Figure 1).

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<sup>1</sup> In the proposals the target was not set in lifetime emissions but annual emission reductions. The original target was 0.52 Mt CO<sub>2</sub> per annum by 2015 (DECC, 2011a).

**Figure 1: Changing ambition of energy efficiency programmes in the UK<sup>2</sup>**



Source: based on various sources (DECC, 2012b; OFGEM, 2005, 2008, 2011a, 2012; OFGEM and Energy Saving Trust, 2003; Rosenow, 2011, 2012)

This is consistent with the observation that the proposed level of energy supplier investment is broadly similar (DECC, 2009, 2010, 2012b) and that the costs of delivering solid wall insulation and hard-to-treat CWI are much higher than for the measures that have dominated CERT and its predecessors. While CESP incentivises SWI, its overall contribution to carbon reduction is only a fraction of the CERT target (see figure above).

The availability of low cost options in the form of loft insulation and CWI will decline over the next few years if recent rates of installation are maintained. It is therefore to be expected that as energy saving measures transition to higher cost measures, cost effectiveness will fall. But the scale of change proposed between the last round of CERT / CESP and Green Deal / ECO is very large – a factor of more than 5 reduction in scale of carbon saving. The underlying reason is the focus on high-cost measures of ECO, with much lower uptake rates of the key lower cost measures in the Green Deal than in CERT. The projected Green Deal contribution could, of course, be an underestimation and much higher carbon savings may be generated through the Green Deal if uptake is exceeding projections. However, the sections below illustrate that this is very unlikely to be the case.

### 3.2 Barriers to uptake

The approach of attaching payments for energy efficiency investment to the electricity meter is new and therefore the outcomes are uncertain. However, there is evidence from which some conclusions can be drawn.

There is an extensive literature on the barriers to energy efficiency (Brown, 2001; Eyre, 1997; Hirst and Brown, 1990; Jaffe and Stavins, 1994; Sanstad and Howarth, 1994; Sorrell et al., 2004; Tietenberg, 2009; Weber, 1997). This identifies upfront cost and decisions that place much greater emphasis on that cost than on energy savings as a barrier. The underlying approach of the Green Deal is to remove this barrier by enabling investments at zero upfront cost to energy users, with the cost of the investments paid back out of the energy savings achieved. In principle the Green Deal therefore addresses this barrier.

However, initial cost is not the only barrier. Other issues are potentially more important, notably the hassle and disruption of building work, low priority given to energy issues by many consumers, the lack of reliable advice at the point of installation and the

<sup>2</sup> EESoP: Energy Efficiency Standards of Performance; EEC: Energy Efficiency Commitment

current, poor integration of the supply chain. It is therefore unlikely that the availability of Green Deal finance alone will make a major difference to the attractiveness of investments. This analysis is supported by the fact that energy suppliers have found it necessary to offer quite significant discounts (typically 50%-100%) under CERT to householders to incentivise purchases. Recent analysis of 30 years of experience with energy efficiency programmes in the United States also shows that addressing the financial barriers on their own is by no means sufficient to generate high enough customer demand (Borgeson et al., 2012; Fuller et al., 2010).

CERT and most of its predecessors were designed to incentivise energy suppliers to deliver energy efficiency investments at minimum costs to themselves. It has therefore been in their interest to use loans rather than grants, but they have not found attractive loan offers to customers. Similarly, loans at lower rates than those proposed under Green Deal (assumed to be 6-8%) have always been available to most owner-occupiers in the form of mortgages, but no major market of this type has developed. It therefore seems unlikely that loans, especially at a commercial rate, will prove more attractive to householders than significant grants, even if the former are explicitly linked to payment out of reduced bills. In this context it should be noted that most Green Deal customers will pay loan charges from a different bill (electricity) from the one in which costs will be reduced (gas), so the intuitive linkage is not so clear as implied in some Green Deal literature.

For the low cost measures, on which delivery of short term targets depends, market research undertaken for the Government showed that commercial loans have very limited attractiveness for most consumers (Dawson, 2005). Loans can be effective for some customers in some contexts. The best example of a large and successful loan scheme is the KfW scheme in Germany, which has broadly similar carbon saving outcomes to supplier obligations in the UK (Rosenow, 2011). But this does not operate at market interest rates and is underpinned by 1.5 billion Euros of government funding every year - similar in scale to current CERT spending (Rosenow, 2012).

The Green Deal proposals in their entirety are more significant than a financing package alone. Independent energy ratings of buildings and accreditation of installers potentially address barrier related to knowledge of energy saving options and distrust in the supply chain. Provided these elements of the package can ensure adequate quality in energy rating and installation, they can provide significant benefits. However, it should not be assumed that consumer interest in energy ratings and energy efficiency installation can be implemented simply by Green Deal legislation. These elements of the Green Deal 'customer journey' are already available but have had limited impact on markets outside those driven by supplier obligations. A critical question for Green Deal success is therefore the extent to which existing and new market entrants can raise salience and commitment to energy efficiency improvements.

The Green Deal package is not a complete solution for a number of reasons. First, enabling consumers to choose accredited suppliers and finance packages does not fundamentally address the difficulties of 'raising awareness' as these choices necessarily follow on from rather than precede awareness. Second, studies show that most consumers are actually aware that insulation can save them money on heating bills (Thornton, 2009). But they are equally aware that the time, effort, disruption, uncertainty, etc. of efficiency improvements are good reasons not to proceed. The challenge is less one of awareness and more one of commitment, intention, or disposition. The Green Deal will affect the renovation decision process of those already interested in efficiency improvements. But the 'conversion' of non-interested to interested remains a key problem. If and how Green Deal changes the marketing of efficiency to homeowners and the delivery supply chain is therefore key and, inevitably, uncertain.

### 3.3 Design choices

Research indicates that every major energy supplier obligation has been designed to promote minimum cost delivery of energy savings, i.e. to utilise cheap measures, both in the North America (York, 2008) and Europe (Eyre et al., 2009). And the best known example of a successful loan programme in energy refurbishment, the KfW scheme in Germany (Kuckshinrichs et al., 2010; Rosenow, 2011; Schroeder et al., 2011), is designed to incentivise high cost, high performance refurbishment. Essentially, the former have been driven by energy regulation with an emphasis on marginal cost optimization; and the latter by housing policies looking more broadly at building refurbishment.

ECO and Green Deal turn this experience on its head: Green Deal (a building refurbishment programme) aims to finance low cost measures whereas ECO (an energy regulation programme) mostly focuses on high cost measures such as SWI and hard-to-treat cavity wall insulation (DECC, 2012c). Initially, ECO was supposed to only fund SWI as part of the Carbon Savings obligation (DECC, 2011a). However, after several stakeholders, including the Government's Committee on Climate Change (2011), pointed out that this would have significant repercussions for the established markets of CWI and loft insulation and that the SWI supply chain would be unable to deliver such a rapid increase in SWI installations, Government modified the initial proposals. CWI and loft insulation can now be funded under ECO as part of the Carbon Saving Communities obligation (DECC, 2012c), but this makes up only a small share of the overall target (see section 3.1).

Current policy is not clear whether it is envisaged that, over the long term, ECO will support all future SWI installations. The total investment cost of these, at the costs set out in the Government's impact assessment, is in the range £30-60 billion. Even with a contribution from Green Deal finance, that would be a significant sum to fund from an obligation on electricity bill payers, most of who will not benefit from SWI. Whilst that is a possible political choice, it would clearly be a controversial one and therefore susceptible to reversal, with a risk of leaving no effective policy for SWI. A safer policy strategy, consistent with what has worked effectively in different countries, would be to retain a policy like CERT proven to deliver low cost measures and to seek to introduce other sources of capital for higher cost measures. A Green Deal type-financing instrument could achieve this, but the combination of the Golden Rule and commercial interest rates in the current proposals effectively excludes Green Deal finance alone from being able to fund higher cost measures.

The proposed focus of the ECO on insulation also implies that supplier funded subsidies will be removed for all lighting and appliance energy efficiency measures. And the focus of Green Deal on building thermal performance means that these measures are not covered there either. There has been significant, and justifiable, criticism of the use of compact fluorescent lamps in recent CERT programmes. However, this should not obscure the bigger picture that incentives from CERT and predecessors have played a part in market transformation in both lighting and appliance markets (Lees, 2006, 2008). Incentives paid by energy suppliers to retailers of lights and appliances have been an important part of raising the market share of energy efficient options. Given the rising share of demand for these end uses and their dominance of electricity end uses, abandoning this approach is a very significant policy change. At a technical level, the domestic sector now incorporates large numbers of tungsten halogen fittings, which have a luminous efficacy barely distinguishable from conventional incandescent. Replacing these with LEDs is now possible and to first order, would reduce energy use by a factor of ~5 (Reineke et al., 2009). The objective should be not to abandon support for efficient lighting, but to refocus it.

### **3.4 Supply chain**

Effective delivery of energy efficiency measures not only depends on sufficient demand (which the Green Deal and the ECO is supposed to increase), but also on a well-developed and integrated supply chain. Past experience in the UK shows that the supply chain responds to policy incentives, an example is the expansion of CWI installations from less than 100,000 per year before 1994 (Lees, 2006) to an average of 550,000 per year since 2005 (OFGEM, 2006, 2007, 2008, 2009, 2010, 2011c). The pace of change, however, is limited by the capacity of the supply chain to deliver measures and can only increase to a certain extent every year, even if policy incentives are significant (Shorrocks, 1999).

There are concerns that some of the assumptions made about the uptake of measures under Green Deal / ECO are overly optimistic. For example, with regard to the uptake of SWI, the Green Deal / ECO impact assessment assumes SWI to be delivered at an average rate of roughly 100,000 installations per year for 10 years, i.e. almost 1,000,000 by 2022. In 2013, about 45,000 SWIs are expected to be installed, in 2014 uptake is predicted to be about 75,000 per annum, and from 2015 100,000 SWIs are supposed to be delivered every year (DECC, 2012b).

According to the last CERT annual review, during the first three years 39,672 SWIs were installed under CERT (OFGEM, 2011c), i.e. on average 13,200 SWIs per year. Sources for the whole market indicate ranges for external wall insulation of 15,000 to 21,000 installations per year and for internal wall insulation of 10,000-16,000 installations per year (Purple Market Research, 2009). DECC (2012b) quote 22,000 SWIs per year in 2011 in the Green Deal / ECO impact assessment. An increase to 100,000 per year within three years is therefore very ambitious. The insulation industry itself raised concerns that the pace of expected uptake of SWI is likely to be too optimistic and urged Government to rely less on SWI (NIA, 2012).

DECC also expects a rapid increase in the installation of hard-to-treat CWI projecting that more than 150,000 properties will receive this type of measure in 2013 (DECC, 2012b). Historically, energy companies focused on easy-to-treat CWI in order to minimise the cost associated with obligations. The authors are not aware of reliable estimates for the current installation rate of hard-to-treat CWIs, but it is likely to be at a very low level compared to 150,000 installations per year.

The capacity in the supply chain may not allow for such a quick uptake, so focusing solely on solid wall and hard-to-treat cavity wall properties under the Carbon Savings target of ECO could risk that carbon target not being achieved.

### **3.5 Credit default risk**

Customer repayments to Green Deal providers will be through electricity bills. Therefore, the default rate for Green Deal loans will be the same as for electricity payments. DECC argues that 'existing tools available to energy companies for collecting debt will be sufficient for Green Deal purposes' (DECC, 2012c, p. 52). Suppliers attempt to collect outstanding debt by a variety of means including the installation of pre-payment meters. However, at some point outstanding debt is written off and in this case, according to the Electricity Retail Association, 'suppliers will relinquish responsibility for collecting the Green Deal arrears and the Green Deal provider will have sole responsibility for pursuing the outstanding Green Deal arrears' (ERA, 2011, p. 7). In 2010, about 3.2% of all domestic electricity customers were repaying a debt through an agreed repayment arrangement with their supplier (OFGEM, 2011b). While the Green Deal makes provisions for excluding customers already in debt and not all customers in arrears fail to pay off their debt, there is the risk that at least some customer will not be



able to repay the Green Deal loan. In this case the risk lies fully with the Green Deal provider.

The recent establishment of a Green Investment Bank in the UK, an initiative to accelerate private sector investment in the UK's transition to a green economy, potentially offers an opportunity to underwrite loans and minimise the risk to investors. This idea had been promoted by the Green Investment Bank Commission (2010), but was subsequently rejected by Government because 'Government's primary aim remains for this [the Green Deal] to be a private-sector led scheme' (BIS, 2011, p. 7). However, more recent documents indicate that there may be some support of the Green Investment Bank for the Green Deal. According DECC (2012d), the Green Deal has been identified as a 'priority sector' for the Green Investment Bank and the Bank is in discussions with a number of private sector entities regarding potential investments of up to £300m. However, whether the Bank supports the Green Deal and to what extent remains to be seen.

Alternatively, a system similar to the Property Assessment Clean Energy (PACE) mechanism in the US could be established. PACE, which since 2008 started in 24 states and the District of Columbia (Hejmanowski et al., 2011), facilitates repayment of energy efficiency loans through a special tax on the property's tax bill (both domestic and commercial properties). This special tax is secured by placing a lien on the property which is senior to all other payment liabilities related to the properties including mortgages, thus reducing the default risk significantly (Ya He, 2012). However, more recently residential the expansion of PACE programmes reversed after the regulators agreed with Fannie Mae and Freddie Mac which suggested PACE violated standard mortgage provisions (Zimring et al., 2010).

### **3.6 Fuel poverty**

The changes to CERT proposed for the new ECO include explicit goals for affordable warmth. CERT has historically focused on insulation measures, primarily to deliver carbon savings, even in priority group homes, whilst Warm Front (and related devolved country programmes) has undertaken heating system investment primarily to deliver affordable warmth. CERT has neither attempted nor allowed effective targeting of fuel poverty. With the removal of Warm Front, there has been increased political pressure for ECO to target fuel poverty, resulting in the proposed new approach, within which there is an explicit affordable warmth target more closely related to this policy goal.

The proposals indicate that the fuel poverty impact of ECO will be to take 125,000 – 250,000 households out of fuel poverty by 2023 (DECC, 2012b). The number of households currently in fuel poverty is about 20-40 times this figure (DECC, 2012a). Analysis by the Association for the Conservation of Energy (ACE) shows that the Green Deal/ ECO proposals will cause a 29% reduction in total fuel poverty spending (ACE, 2012). The proposals are therefore clearly insufficient to deliver the Government's statutory obligation with respect to eradicating fuel poverty by 2016 as far as reasonably possible (DTI, 2001). To the contrary, the Fuel Poverty Review commissioned by DECC concludes that Green Deal and ECO 'would be expected to increase fuel poverty' (Hills, 2012, p. 112) due to distributional impacts of the policy proposals.

In the current economic climate it seems obvious that no other significant measures are planned, and therefore that fuel poverty obligations will not be delivered.

The Green Deal could potentially provide a finance mechanism for households in fuel poverty if carefully designed and some potential providers are looking at options for doing this, at least in social housing. Experience from the US shows that the impact of on-bill financing of energy efficiency measures on fuel poor households has been a

major concern. One option to make such programmes available to low income customers is to provide subsidies to finance zero or low interest rate on-bill financed loans (Bird and Hernández, in press).

## 4 Conclusion

The Green Deal proposals seek to introduce greater use of private (non-energy sector) finance into low carbon building refurbishment. This is consistent with the goal of limiting costs to Government and energy consumers of the very substantial investment required to bring the UK building stock to low carbon standards. Mobilising new funding streams for low carbon refurbishment, in theory, is a step in the right direction as neither energy company obligations nor public expenditure seems likely to be the source of all of the required investment.

However, the scale of activity set out in the details of the Green Deal / ECO proposals is not sufficient to meet ambitious carbon reduction targets or fuel poverty goals. Indeed the impact assessment of the proposals implies a significant reduction in the rate of energy efficiency improvement from that achieved in recent years. In particular, there is projected to be a major reduction in the rate of key low cost insulation measures such as loft insulation – with negative implications for both carbon reduction and the insulation industry.

But there is also the risk that even the modest ambition of the Green Deal / ECO may not be achieved for a number of reasons. First, the Green Deal is very much based on the premise that financial considerations are the major barrier to uptake and that a new finance mechanism, which attaches loans to the property instead of the owner, can leverage additional low carbon refurbishment. However, there is a rich literature on other, non-financial, barriers to energy efficiency improvements and the Green Deal does not sufficiently address those. As a result, demand may not be as high as expected. Second, the new policy framework made design choices that have been unprecedented. Countries that have implemented obligations on utilities mainly used these programmes to roll out low cost measures. Loan programmes, such as the well-known KfW programmes in Germany, generally focus on high cost measures. Under Green Deal / ECO this will be exactly the opposite: Green Deal focuses on low cost measures whereas ECO mostly provides support for high cost technologies such as SWI and hard-to-treat CWI. Given that this approach has not been tried before, there is a significant risk that carbon savings will not materialise on the scale expected. Third, the proposals for ECO imply a radical transition from low cost measures to high cost measures. Historic installation rates of expensive measures such as SWI and hard-to-treat CWI have been at a low level, but will need to rise at a very fast pace if the targets of ECO are going to be achieved. There are concerns that the supply chain may not be able to deliver within the timeframes defined. With regard to the credit default risk of Green Deals, no underwriting is currently planned by the Government, so the Green Deal provider will bear the risk of non-payment. Current default rates for electricity bills are significant and this will be reflected in interest rates charged. Finally, the proposals are projected to make only a limited contribution to the alleviation of fuel poverty, because, even though the ECO contains an explicit fuel poverty target, it is insufficient to compensate for planned reductions in Government funded programmes.

To answer the question raised in the title of this paper, the Green Deal and the ECO will certainly generate resources for energy efficiency improvements and help the uptake of more expensive measures such as SWI and hard-to-treat CWI. However, it is highly unlikely that the proposed policies will lead to a 'a revolution in British property'. Rather, the Green Deal and the ECO will operate at a much lower than expected scale. Compared to the existing policy framework, the proposals are weak in the sense that

they will deliver significantly lower carbon reductions. A more sensible way to proceed seems to be to keep the existing policy approach in order to allow a more gradual transition, and the Green Deal could be introduced alongside. Within this context, the Green Deal might prove more effective in beginning to address the more costly housing refurbishment measures than have ever been addressed in existing programmes. This seems likely to require modification of the Green Deal with Government support to ensure low interest rates needed to be attractive to energy users, relaxation of the Golden Rule to enable more ambitious refurbishment and restoration of carbon targets in ECO to the levels of the later years of CERT.

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