

BEIS call for evidence: building a market for energy efficiency

Introduction

Researchers at the [Centre on Innovation and Energy Demand](#) (CIED) are driven by an interest in accelerating prospects for a more sustainable energy future. Our primary focus is on the processes of innovation – both technological and social – that will contribute to this objective, using a range of multi-disciplinary social science approaches.

We welcome the opportunity to contribute to the Government’s call for evidence on building a market for energy efficiency. We hope that the following insights from recent CIED research will provide a useful input to the process.

We would be delighted to contribute further to the Government’s ongoing engagement work in this area.

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Response to consultation questions

2. What information do you have on the remaining potential for energy efficiency improvements and what savings could be expected from these measures?

As noted in the consultation document, we have calculated the potential for energy savings under three scenarios: ‘limited ambition’ (which includes all energy efficiency measures that can be installed by 2035 whose energy cost savings, discounted over the lifetime of the measures, exceed the associated capital costs); ‘cost-effective’ (this includes all energy efficiency measures deployable to 2035 that are estimated to be cost-effective according to criteria in the HM treasury Green Book on Appraisal and Evaluation, that is, including the value of benefits such as improvement in comfort, air quality and reductions in carbon emissions); and ‘current technical potential’ (which includes all measures without regard to their cost effectiveness).

We found that under the ‘limited ambition’ scenario, there is potential to reduce energy consumption by 12% in 2035, relative to 2015 levels. In the ‘cost-effective’ scenario, there is

potential for a 25% reduction and in the ‘current technical potential’ scenario, the potential for a reduction of 53%.¹

5. Do you agree with our assessment of the current barriers to market growth?

We broadly agree with the assessment of the current barriers, those identified are all valid and relevant.

6. Are there other barriers that you think we should be addressing?

On the **demand side**, one barrier not explicitly mentioned is that investment in energy efficiency can be in competition with other ways of spending the same money, which might be considered more rewarding, for example, renovation of a kitchen or bathroom; buying a car; or other medium size investments. This strengthens the case for whole-house retrofits, which focus not only on energy and financial savings, but also on comfort, health benefits (of warmer houses), aesthetics and modernisation of the home. These aspects are important if energy efficiency retrofits are to compete with other priorities and interests.

A second **demand side barrier** not covered is that of social norms and conformity. One of the largest and most successful domestic retrofit schemes in the UK was the Kirklees Warm Zone programme. The success was attributed partly to an emphasis on the quality of installations and significant consumer engagement, including household visits and sustained marketing, which addressed the mentioned barriers of lack of trust in quality of installations and trusted salient advice.² However, the area-specific programme also created a critical mass of local change, where people saw installations happening on their streets and knew people who were taking part in the programme, creating a local shift in norms, where being part of the programme became conforming, not exceptional.

One **supply side barrier** not explicitly discussed is the massive scale of refurbishment which needs to happen in order to bring about significant energy and emission savings from the domestic sector. This means millions of homes with very different physical houses, households, financial situations and personal priorities. There is therefore a need to scale up not only the skills for refurbishment, but also the skills for assessment of houses, engagement with households, and to create a variety of programmes and policies targeting and supporting different households.

7. Do you think there are any other important lessons to learn from past attempts to stimulate the market?

Our research has identified a number of key lessons from the experience with the Green Deal.³

Firstly, as the Department has rightly identified, energy efficiency cannot be sold on energy savings alone. Studies have shown that **messages around comfort, health, wellbeing and home**

¹ J. Rosenow, N. Eyre, S. Sorrell and P. Guertler (2017) Unlocking Britain’s First Fuel: the potential for energy savings in UK housing, UKERC/CIED policy brief, available at: <http://www.cied.ac.uk/publication/unlocking-britains-first-fuel-potential-energy-savings-uk-housing/>

² Webber, P., Gouldson, A. & Kerr, N., 2015. The impacts of household retrofit and domestic energy efficiency schemes: A large scale, ex post evaluation. *Energy Policy*, 84, pp.35–43.

³ J. Rosenow, N. Eyre (2016) A post mortem of the Green Deal: Austerity, energy efficiency and failure in British energy policy, *Energy Research & Social Science*, 21, 141-144

improvement can be more effective in motivating energy efficiency improvements.^{4,5} In the Green Deal, we have argued, consumers were sold the loan when they should have been sold the car.

Secondly, evidence to support the key assumptions underpinning the design of the scheme was either ignored or not sought. For example, a large body of work about the barriers to energy efficiency exists, but was ignored in favour of a simplistic solution. The findings of pilot schemes were rejected and assumptions (that households would respond rationally to economic incentives and that a lack of finance was the major barrier to action) were never tested. Therefore, an important lesson to be learnt is to **base the design of policies on the existing evidence base**.

Third, the Green Deal was regarded as a ‘silver bullet’ solution to the problem of encouraging energy efficiency. But it is clear that a **consistent mix of policy instruments** is needed to support different types of measures, different tenures and different property types.

Finally, no **clear success criteria** were set out for the Green Deal, meaning it was not possible to monitor and evaluate performance, or spot early warnings that progress might be off track.

8) Are there other international examples we could learn from?

There are a number of examples of new business models that that could potentially also be adopted in the UK.

One-stop-shop residential retrofit (Scandinavia)

The ‘one-stop-shop’ involves an integrated supply chain and customer interface that provides a single point of contact for the customer. The supplier offers a ‘holistic’ design and build service where delivery is coordinated through either a single company or a well-integrated network of subcontractors. Some providers also include finance as part of the offer, while others operate as co-operatives.^{6,7}

Segel AS is a consultancy providing specialist guidance on the implementation of one-stop-shops in continental Europe and Scandinavia. There are also some examples of this business model in the UK, including the Retrofitworks project and the Brighton and Hove Energy Services Co-op (BHESCO).

In several of the Scandinavian examples, local SMEs collaborate with a larger company such as Bravida or national hardware chains as means of generating customers. In the case of Retrofitworks, the online portal is a key part of the customer interface where members of the co-operative can advertise works and have bids placed by the supply chain who are also co-operative members. Key to the success of these models is the role of specialist retrofit co-ordinators or project managers.

Energy Service Agreements (France, Latvia)

⁴ J. Rosenow, F. Porter, (2015), A comparative review of housing energyefficiency interventions. Report for ClimateXChange. Online: http://www.climateexchange.org.uk/files/8814/4594/0740/final_report_261015.pdf

⁵ J. Rosenow, R. Sagar, (2015), After the Green Deal: Empowering people andplaces to improve their homes. London: ResPublica Online: <http://www.respublica.org.uk/wp-content/uploads/2015/09/After-the-Green-Deal.pdf>

⁶ Mahapatra, K. et al. Business models for full service energy renovation of single-family houses in Nordic countries. Appl. Energy 112, 1558–1565 (2013).

⁷ Straub, A. Cohereno: COllaboration for Housing Nearly Zero-Energy RENOVation Publishable Report. (2016).

Like the Energy Service Contract (ESC) model, under an Energy Service Agreement (ESA), building occupants are provided with an energy performance guarantee for specific energy services (such as a specified internal temperature or volume of hot water at a specified temperature), usually over a period of 15 years or more. This model differs from the more common examples in the public and municipal sectors (where the debt for the retrofit measures is taken on by the building occupants or tenant) as measures are financed directly by the provider (the Energy Services Company – ESCO), or upstream through a third party financier.⁸ The client pays a service charge and does not enter into any finance agreements.

These projects typically consist of an integrated offering; covering a comprehensive residential retrofit of building fabric and heating measures, by a well-coordinated supply chain with *design, build and operate* phases under one contract. A comprehensive residential retrofit is a likely pre-condition to offering a temperature guarantee, thus ensuring modelled savings are realised and energy consumption is controlled.

Examples exist in France and Latvia. The French state-owned railway company SNCF also manages a significant number of social housing properties under its subsidiary; ICF Habitat. ICF have undertaken several schemes based on an ESA model, focused on medium-to-high-density multifamily buildings. The Energies POSIT'IF is an ESA model for privately owned or rented multifamily buildings in greater Paris. In addition, RENESCO is a social enterprise involved in the retrofit of dilapidated multifamily buildings in former Soviet-era housing in Eastern Europe, particularly Latvia. The Latvian example is notable for its value proposition involving a focus on structural improvement as a selling point.

These examples provide different approaches to financing. Under the ICF Habitat model, capital is supplied by the housing provider, with the financial agreement upstream from the tenant. RENESCO have chosen to use 'on balance sheet' finance, meaning the debt obligation is tied to the firm rather than the building owner. Based on their current cost of capital the renovation can be paid by the energy efficiency alone in 15 years (RENESCO). However, the economics of their offering are very sensitive to the financing terms, and the size of their portfolio. Therefore, RENESCO hope to sell off the cash-flows of the first 15 buildings under a forfeiting scheme they are developing in collaboration with the European Bank for Reconstruction and Development (EBRD). This means that RENESCO can shift successful projects off their balance sheet, and sell them on to investors in secondary markets, improving their borrowing conditions.

9) Are there any barriers preventing business models for energy efficiency that have developed in other countries from also developing in the UK?

Energiesprong

The consultation document mentions the example of the work Energiesprong are doing in the social housing sector. Whilst the Energiesprong initiative has laudable aims, achieving a supply chain that can offer the long-term energy performance contracts remains a significant challenge. The UK retrofit industry is dominated by SMEs who would find the transaction costs and risk of this approach too much of a challenge. The need for offsite manufactured facades and long term performance guarantees speak to the need to pair existing offsite housebuilders (of which there are

⁸The Rockefeller Foundation & DB Climate Change Advisors. United States Building Energy Efficiency Retrofits Market Sizing and Financing Models. (2012).

many using timber frame techniques in Scotland) with energy management companies and ESCOs. This is likely to mean that models like Energiesprong will be dominated by larger firms and thus could crowd out SMEs from the sector – however this may be an inevitable consequence of an industrialisation of the construction supply chain.

What is more, the potential for the Energiesprong model for the single family private rented/owner occupier market seem a way off. The high transaction costs and limited economies of scale mean the approach is likely to remain un-economic for a single home for the foreseeable future. The commercial viability of the model is dependent on an extremely low cost of capital for finance (<2%). Therefore, providing low cost capital should be a priority if the model is to become commercial.

There are various ways that this could be achieved: Public actors may provide all of the capital or provide credit enhancements including: sub-ordinated (at risk) debt with other finance providers with less risk and higher returns providing the senior debt;⁹ interest rate reductions;¹⁰ or create guarantee funds for private investors – all with the aim of reducing the cost of capital and leveraging private finance.¹¹ Examples of this already in operation include the London/Mayor's Energy Efficiency Fund (LEEF/MEEF), funded under the European Investment Bank's JESSICA initiative.¹²

One-stop-shop integrated business model

A significant barrier is a skills gap in co-ordinating retrofit projects.

Initiative such as the Retrofit Co-ordinator training and retrofit works project show how this skills gap could begin to be bridged. Local intermediaries such as the community social enterprise model explored in a recent report by the UK Green Building Council could also help to bridge this gap – with past examples such as Nottingham Energy Partnership (NEP) providing a model of how this could work.¹³

Energy Service Agreement / Energy Service Performance Contract (ESPC)

Engaging the SME supply chain in an ESA/ESPC type approach is likely to be challenging. While integrated business models have significant potential to drive demand for residential retrofit, it is worth noting that integrated business models also face barriers and their uptake has been slow in the residential sector. Business model innovation involves novel approaches and relationships for the delivery of products and services. However, incumbent business models may be heavily embedded with existing industry practices, technological artefacts and regulatory regimes. Therefore, adopting integrated energy service business models remains a challenge for an industry dominated by small scale SMEs.

Barriers identified by companies offering integrated energy services for buildings

⁹ EFIG. *Energy Efficiency – the first fuel for the EU Economy*. (2015).

¹⁰ Gouldson, A. *et al.* Innovative financing models for low carbon transitions: Exploring the case for revolving funds for domestic energy efficiency programmes. *Energy Policy* **86**, 739–748 (2015).

¹¹ Leventis, G., Kramer, C., Schwartz, L., Zetterberg, J. & Ludwig, V. Energy Efficiency Financing for Low-and Moderate-Income Households: Current State of the Market, Issues, and Opportunities Financing Solutions Working Group FOR MORE INFORMATION. (2017).

¹² <http://www.eib.org/products/blending/jessica/>

¹³ UK Green Building Council. *Regeneration and Retrofit Task Group Report*. (2017).

A recent study taking the perspective of energy service companies that provide novel business models and integrated solutions for whole house energy efficiency in Finland, found the following barriers most significant:

- (1) The *lack of technical skills* related to several different dimensions, including energy efficient building practices, building energy planning, building energy management and energy efficiency regulation, all leading to suboptimal building energy efficiency;
- (2) *lack of knowledge in building inspection*,
- (3) *Imperfect policy information*; resulting in lack of awareness about subsidies and other policy instruments in place, and how to apply for them;
- (4) *Frequent changes in policies* influencing building energy efficiency, creating uncertainty and difficulty for markets to cope with the changes and future uncertainty;
- (5) *disinterest of many actors in promoting energy efficiency* or developing energy efficiency solutions;
- (6) *low-priority of energy efficiency* and;
- (7) *non-functional regulation*.¹⁴

These give support to already identified barriers, but also highlight the importance of consistent long-term policy development, and policies that are clear to households and implemented well. The portfolio of policies should be consistent at any given moment but also over time.

It is likely that many of these barriers will also exist in the UK context.

In summary, we mustn't let the 'perfect be the enemy of the good', although the current fragmented business model definitely requires an overhaul.¹⁵

10. Do you agree with the set of proposed principles for guiding our approach?

We agree with the proposed principles but would also add that policies **must be consistent and should have long-term visibility to stakeholders**, in addition to being coherent.¹⁶

Recent research suggests that among both the energy efficiency and finance communities, the government is perceived to lack the direction and long-term vision needed for a major energy efficiency overhaul.¹⁷ The lack of continuity and changes in policy direction are damaging to the energy efficiency sector as investments in skills are not rewarded, and confidence in policy suffers as

¹⁴ Kangas, Hanna-Liisa; Lazarevic, David; Kivimaa, Paula (2017) Technical skills, disinterest and non-functional regulation: Barriers to building energy efficiency in Finland viewed by energy service companies. *Energy Policy* 114, 63-76

¹⁵ Brown, D. Business models for residential retrofit ; a critical assessment of 5 key archetypes. (2018). *Energy Efficiency*, accepted.

¹⁶ Kern, F., Kivimaa, P., Martiskainen, M., 2017. Policy packaging or policy patching? The development of complex energy efficiency policy mixes. *Energy Res. Soc. Sci.* 23, 11–25.

¹⁷ Bergman, N. & Foxon, T.J. (2017). *Reorienting finance towards energy efficiency: the case of UK housing*, SPRU Working Paper (forthcoming).

a result. The Zero Carbon Homes is an example where an unexpected change of policy led to companies preparing to deliver, only to find their market had effectively disappeared.

Below we comment on the principles outlined in the consultation document.

Policies must be coherent

Any attempts to improve policy coherence should take into account the mix of policies both within the administrative sector of building energy retrofits as well as other sectors, including but not limited to climate policy, innovation policy, and industrial policy. Equally, any assessments of the coherence of policies should take into account the “real world” policy mix (that typically crosses administrative boundaries) as well as how consistent the policy goals and instruments are over time.¹⁸ This aspect is already addressed partly in the call for evidence through making explicit the barriers in the form of “stop start policies” and “lack of long term signals from Government”. However, aims for coherence between policy goals and instruments crossing sectoral boundaries and over time should be made more explicit. In addition, a proposal of how these are evaluated is currently lacking.

Policies must align with consumer needs and motivation

Connecting policies to consumers’ needs and motivation is also important as identified. There is a clear benefit in connecting energy efficiency with improved comfort and quality of homes. A recent review of European case studies of building or retrofitting to achieve low energy homes found the motivations and drivers pertaining to design, health and comfort have been very rare in practice.¹⁹ This is likely to be partly due to retrofitting programmes frequently focusing solely on energy efficiency improvements rather than also including explicit design, health and comfort related goals. Making these additional benefits more explicit would create potential for more effective markets for retrofits.

Policies should exploit “what works”

While we agree that existing structures and trusted actors should be utilised in sharing advice for energy efficiency (the call for evidence identifies the building trade, mortgage lenders, solicitors and advice services not specific to energy efficiency), in addition *specific un-biased intermediaries offering advice* are vital. These intermediaries play an important role in providing impartial advice on energy efficiency and micro-generation as well as ‘translating’ complex and sometimes contradictory policies for people who are not familiar with them.

Research has shown the importance of local council bodies or Open House Events in advancing energy efficiency.²⁰ More attention to these intermediaries should be added, particularly in regions where they are lacking.

¹⁸ Kern, Florian; Kivimaa, Paula; Martiskainen, Mari (2017). Policy packaging or policy patching? The development of complex energy efficiency policy mixes. *Energy Research & Social Science*, 23: 11-25.

Kivimaa, Paula; Kern, Florian (2016). Creative destruction or mere niche support? Innovation policy mixes for sustainability transitions. *Research Policy*, 45(1) pp. 205-217.

¹⁹ Kivimaa, Paula; Martiskainen, Mari (2017). Innovation, low-energy buildings and intermediaries in Europe: Systematic case study review. *Energy Efficiency*, 11(1), pp. 31-51.

²⁰ Martiskainen, Mari; Kivimaa, Paula (2017). Creating innovative zero carbon homes in the United Kingdom – intermediaries and champions in building projects. *Environmental Innovation and Societal Transitions*, in press. Kivimaa, Paula; Martiskainen, Mari (2017). Innovation, low-energy buildings and intermediaries in Europe: Systematic case study review. *Energy Efficiency*, 11(1), pp. 31-51.

Policies should support innovation

This principle is crucial. It not only requires investments in new skills, products and business models as noted in the call for evidence, but also evaluating how the planned portfolio of policies as a whole support the emergence and diffusion of innovations. Innovation support should not only cover specific modular solutions for retrofit, but also innovative solutions in how to best design and realise whole house retrofits (i.e. system innovation) and in new business models. Thus, the support for innovation is crucially linked to the consistency of policies (see above) and the ambitiousness of policy goals.

The demand side measures aiming at “Improving awareness of measures, their benefits and advice to consumers” should design an architecture of policy instruments supporting advice and information provision, including support for existing intermediary actors (advice organisations, open house events) and the set-up of new dedicated and un-biased intermediaries providing both technical and policy knowledge, where they are missing.

The supply side plans for “Supporting innovative new energy efficiency products and services to market” should include mixes of policies that incorporate specific RD&D policies as well as long-term goal setting and regulation. It has been found across targets that foreseeable regulation acts as a stimulus for innovation, where the leading companies can gain an advantage.²¹

12. Which of the fiscal levers described here would drive the greatest consumer demand?

In addition to the ideas set out in the consultation document, a range of other retrofit finance mechanisms have been developed, in the UK, wider EU and USA including several that have been markedly more successful than the Green Deal.²² Examples include property assessed clean energy finance (PACE) programs in the USA repaid through property taxes;²³ ; utility funded on-bill-financing;²⁴ state backed guarantee funds²⁵ and energy service agreements (ESA) - where finance for measures is procured upstream by an ESCO as part of an energy performance contract.²⁶

Whilst the up-front capital cost of retrofit measures has been a key policy focus, there has been much less consideration of the nature of the *customer journey* in procuring finance. States with large

²¹ Kivimaa, Paula (2007). The determinants of environmental innovation: the impacts of environmental policies on the Nordic pulp, paper and packaging industries. *European Environment*, 17(2): 92-105. doi: 10.1002/eet.442; Rogge, Karoline S and Reichardt, Kristin (2016) Policy mixes for sustainability transitions: an extended concept and framework for analysis. *Research Policy*, 45 (8). pp. 1620-1635. ISSN 0048-7333

²² EEFIG. *Energy Efficiency – the first fuel for the EU Economy*. (2015).

²³ Kim, C., O’Connor, R. and Bodden, K. (2012) Innovations and Opportunities in Energy Efficiency Finance, Wilson Sonsini Goodrich & Rosati. Available at: <http://www.wsgr.com/publications/pdfsearch/wsgr-ee-finance-white-paper.pdf>.

²⁴ State and Local Energy Efficiency Action Network. Financing Energy Improvements on Utility Bills : Market Updates and Key Program Design Considerations for Policymakers and Administrators. (2014).

²⁵ Borgeson, M., Todd, A. & Goldman, C. *Getting the Biggest Bang for the Buck Exploring the Rationales and Design Options for Energy Efficiency Financing Programs*. (2013).

²⁶ Kim, C., O’Connor, R. and Bodden, K. (2012) Innovations and Opportunities in Energy Efficiency Finance, Wilson Sonsini Goodrich & Rosati. Available at: <http://www.wsgr.com/publications/pdfsearch/wsgr-ee-finance-white-paper.pdf>.

scale retrofit financing programs, such as Germany's KfW programme and California's PACE scheme, share an emphasis on ease and fairness for the customer.²⁷ Successful schemes typically include:

- A *cost of capital* that is low enough not to deter households and enable deeper retrofit measures to remain cost effective;
- A *point of sale* for finance integral to the offer of the retrofit; and
- Adopt an *existing repayment channel* (such as energy bills, property taxes or mortgage repayments).

This emphasis on the *customer journey* and *broader sources of value*, such as wider renovation work is likely to lead to increased uptake through a more compelling and streamlined offer.

16. What barriers, regulatory or otherwise, exist to financial institutions developing any of these products or incentives themselves?

There are a variety of barriers to financial institutions and other financial actors investing in energy efficiency. Recent research suggests a difficulty in linking financial investments to financeable energy efficiency projects, for a number of reasons.²⁸

First, financial investors consider energy efficiency investments as uncertain and risky, without sufficient rewards; a proven, sustained demand for energy efficiency, which can be invested in with low risk, is needed to attract investors.

Second, many finance investors are interested primarily in large-scale projects, not individual households; this means attracting finance requires aggregated projects of thousands of households, which could create a viable and attractive investment opportunity.

Third, the finance world is dominated by short-termism, whereas energy efficiency investments require long-term thinking and 'patient capital', which might best be provided by public institutions, such as the Green Investment Bank.²⁹

Finally, energy efficiency is currently not seen as an interesting topic, compared to breakthrough technologies, such as autonomous vehicles.

Put together, these are formidable barriers to significant investment. The combination of short-termism and risk avoidance in the finance world mean we cannot expect the markets on their own to solve the energy efficiency problem. We argue there is a need for clearer intermediation between investors and energy efficiency projects, through government policies, regulation and leadership.

It is likely that state actors will need to assist in reducing the cost of capital, particularly where customers face difficulties or high costs in accessing finance. Policy options include interest rate buy downs, the provision of first loss (high risk) capital, investor guarantee funds, or the direct provision of low cost finance by state actors, as has been the case in Germany's KfW programme.³⁰

²⁷ Schröder, M., Ekins, P., Power, A., Zulauf, M. & Lowe, R. *The KfW experience in the reduction of energy use in and CO2 emissions from buildings : operation , impacts and lessons for the UK*. Energy (2011).

²⁸ Bergman, N. & Foxon, T.J. (2017). *Reorienting finance towards energy efficiency: the case of UK housing*, SPRU Working Paper (forthcoming).

²⁹ Mazzucato, M., 2015. *The entrepreneurial state: Debunking public vs. private sector myths*, Anthem press.

³⁰ Gouldson, A. et al., 2015. Innovative financing models for low carbon transitions: Exploring the case for revolving funds for domestic energy efficiency programmes. *Energy Policy*, 86, pp.739–748; LEEF (2012) 'Welcome & Introduction', in The London Energy Efficiency Fund (LEEF).

Borgeson, M., Todd, A. & Goldman, C. *Getting the Biggest Bang for the Buck Exploring the Rationales and Design Options for Energy Efficiency Financing Programs*. (2013). Rosenow, J. et al. (2013) 'Overcoming the

18. How could we ensure that any trials would lead to the development a self-sustaining market for support?

First, the government could work to ensure long-term funding and incentives are secured, to avoid the start-stop problems that have plagued previous policies.

Second, carefully chosen and regulated investment vehicles, such as revolving funds, can become self-sustaining in the longer term. However, they need initial investment which could either come from public funds, or from private funds with appropriate guarantees and underwriting of loans from government.

Third, there is a need to build trust by ensuring high-level work and good information. This could be done partly through working with local authorities, as these can take advantage of local knowledge and social capital. This suggests area-specific programmes can be successful.

19. What price signals would best drive uptake of energy efficiency measures?

We have published a study of how stamp duty could be reformed to encourage energy efficiency improvements.³¹ If designed carefully, it could provide an important demand driver and financing mechanism for energy efficiency. Potentially, such a system could be a game changer and lead to a change in perception of energy efficiency improvements.

There are at least two options for how stamp duty might be reformed:

1. The rate of stamp duty could be adjusted so that more efficient properties pay a lower rate and less efficient properties attract a higher rate (resulting in a scheme that is revenue neutral overall).
2. There could be a rebate for those properties where energy efficiency improvements are made within a specified period of time after purchase of the property (for example, within six months of purchase).

It is important to note the relatively small number of property transactions compared to the overall size of the housing stock (around 4.5% in the UK). As a result, reforms to stamp duty alone would not be sufficient to achieve the scale of aspiration set out in the Clean Growth Strategy (for as many homes as possible to be EPC Band C by 2035). Additional, complementary, policies would be necessary to meet the ambition.

In addition, this type of mechanism (either a stamp duty discount or rebate) would be unlikely to provide sufficient support to fund high cost measures such as solid wall insulation.

While a differentiation of stamp duty levels according to energy performance would be relatively complex, a simple stamp duty rebate based on the improvements undertaken provides an easier option for making use of the trigger point that is the purchase of a house. Tying in an incentive for energy efficiency upgrades with the purchase of the property makes logical sense and further consideration should be given to this type of policy instrument.

Upfront Investment Barrier: Comparing the German CO2 Building Rehabilitation Programme and the British Green Deal', Energy & Environment, 24, pp. 83–104. doi: 10.1260/0958-305X.24.1-2.83.

³¹ A. Jahn and J. Rosenow (2017) [Property transfer tax reform – a game changer for energy efficiency retrofits?](#) *ECEEE Summer Study Proceedings* 6-129-17

20. What would be the impact on the housing market of such price signals?

Over time, one would expect house prices to reflect energy performance more visibly due to the reduction in stamp duty. Further research and piloting differentiated stamp duty rates according to energy performance levels is needed in order to get a better understanding of the long-term dynamic impacts on the housing market.

21. What protections would need to be in place to ensure that vulnerable or fuel poor customers are not unduly affected by these price signals?

We would recommend setting a cap to the maximum level of benefit (reduction in stamp duty or rebate received) in order to avoid the situation where buyers and sellers of the most expensive properties (who arguably would have the capital to invest in energy efficiency improvements and do not require large incentives) receive large incentives at the expense of the public purse.

In a system where higher levels of stamp duty were levied on more inefficient properties, there should be a maximum level of payment in order to protect households on low incomes. Further analysis is needed to determine the severity of this potential issue.

Properties with a value of less than £125,000 fall below the threshold for stamp duty. Around 30% of the UK's housing stock falls into this category. It can be expected that this category of homes is occupied predominantly by households on lower incomes, including those in fuel poverty. Therefore, a standalone stamp duty incentive would not be sufficient to support households within the low-income bracket an additional policy instruments would be required to ensure that support is not just offered to those living in more expensive homes. At the same time, they would not be subject to the 'penalty' payments under a graduated stamp duty system.

22. Could these ideas be rolled out in a smaller scale, to a particular subset of homes or in a particular geographic area, to test feasibility before a national rollout?

The concept of stamp duty incentives could be piloted at a regional level, perhaps a large city. HMRC usually sets stamp duty rate for the whole of England. However, the recent reduction in stamp duty announced in the budget will lead to a higher stamp duty threshold in London where first-time buyers will pay 0% stamp duty on homes with a value of <£500,000 (compared to <£300,000 outside of London). This suggests that a regional pilot may well be possible with different stamp duty rates in a specific city.

24. How could Government effectively deliver messages to promote energy efficiency through intermediaries and which are the most important intermediaries to target?

The call for evidence identifies intermediaries, such as banks, estate agents, surveyors and the building trade to carry forward the message. While this list is a start, it misses some intermediaries that (a) are important in stimulating the idea of energy efficiency in the first place (including organisations such as the Centre on Alternative Energy, Eco Open House events, local action networks) and (b) that are needed to support retrofit projects in practice (including sustainability or energy officers in local councils, architects, or small cooperatives).³² Local authorities have an

³² Martiskainen, Mari; Kivimaa, Paula (2017). Creating innovative zero carbon homes in the United Kingdom – intermediaries and champions in building projects. *Environmental Innovation and Societal Transitions*, in press. Kivimaa, Paula; Martiskainen, Mari (2017). Innovation, low-energy buildings and intermediaries in Europe: Systematic case study review. *Energy Efficiency*, in press.

important role in both increasing awareness and supporting action, so interaction between central and local government is key.

The intermediaries may need either direct financial support from Government or, as a minimum, the removal of barriers to operation. In particular, social housing providers have acted as leaders in using novel energy efficiency products and technologies.³³ However, the role of social housing providers has lately diminished through policies introducing rent caps and 'right to buy' schemes, meaning that less resources and scope exist for housing providers to carry out whole building retrofits in their own building stock.

The planned online replacement for the Energy Savings Advice Service may face some challenges in delivering messages effectively. While digital platforms have been found as important intermediaries in home energy investments, steps need to be taken to guarantee advice is tailored and context specific. Given the wide variety of housing types and local planning contexts, a one-size-fits-all approach to advice will not be appropriate.

Thought should also be given to how the service will give information on issues such as interpreting a subsidy scheme or building regulations in practice.

It is also uncertain how the digital service will serve those less able to use internet-based services.

37. What changes should be made to the Energy Company Obligation to ensure that it supports the development of innovative energy products and services?

We have suggested several ways in which ECO might play a more effective role in reducing energy demand.³⁴

1. **Low cost measures.** ECO should be used to support low cost measures until the successor scheme to the Green Deal is successfully up and running. ECO has a proven track record in delivering lower cost insulation measures and rates of progress in this area have fallen dramatically since the introduction of the Green Deal.
2. **Non-insulation measures.** ECO should also be used to support non-insulation measures, such as energy efficient lights and appliances. Previous supplier obligations (CERT, EEC and so on) did include these items, but they were excluded from ECO for reasons that were unclear. This is a cost-effective route to reducing the UK's electricity demand, particularly when compared with the scale of subsidies that have been promised to support the delivery of new generation capacity on the supply side.
3. **Deep refurbishment/whole house retrofits.** The high take up levels of the Green Deal Home Improvement Fund demonstrate the demand for more comprehensive refurbishment programmes, if the financial offer is sufficiently attractive. As it was originally conceived, ECO was intended to use socialised funding to incentivise private investment, which would be consistent with this approach.
4. **Non-domestic energy efficiency measures.** The UK is unique in the world in restricting its supplier obligation to households. Extending to non-residential customers would help to increase the scope for demand reduction.

³³ Kivimaa, Paula; Martiskainen, Mari (2017). Innovation, low-energy buildings and intermediaries in Europe: Systematic case study review. *Energy Efficiency*, in press.

³⁴ Rosenow, J. and Eyre, N. (2015) 'Re-energising the UK's approach to domestic energy efficiency.' In: ECEEE Summer Study Proceedings (1-6 June 2015), 1-6 June 2015, Club Belambra Les Criques, Presqu'île de Giens Toulon/Hyères, France.

- 5. Encourage innovation.** There could be a ringfenced amount of savings that suppliers can use for ‘innovation measures’, something which was the case during CERT for selected measures. Suppliers could be allowed to test and propose innovative solutions delivering energy savings currently not allowable under ECO. This would enable innovation and a search process for the most cost-effective solutions to deliver energy savings currently not supported. Some US states have used a ‘pay-for-performance’ approach rewarding only actual energy savings (measured or estimated ex-post) rather than ex-ante energy savings. A similar approach could be piloted under ECO.

About [CIED](#)

The Centre on Innovation and Energy Demand (CIED) is a collaboration between researchers from the Sussex Energy Group, the Transport Studies Unit at the University of Oxford and the Sustainable Consumption Institute at the University of Manchester, and is one of six Research Centres on End Use Energy Demand funded by the Research Councils UK Energy Programme. Researchers at CIED are driven by an interest in prospects for a more sustainable energy future and specifically, how demand for energy might be reduced. Our primary focus is on the processes of innovation – both technological and social – that will contribute to this objective, using a range of multi-disciplinary social science approaches.

About The Science Policy Research Unit ([SPRU](#)), University of Sussex

SPRU is internationally recognised as a leading centre of interdisciplinary research on science, technology and innovation policy. Research addresses pressing global policy agendas, including the future of industrial policy, inclusive economic growth, the politics of scientific expertise, energy policy, security issues, entrepreneurship, and pathways to a more sustainable future. Currently, with 50 research staff, over 70 doctoral students, over £7m of ongoing Research Council projects, as well as the leading journal in its field, Research Policy, SPRU is at the forefront of new ideas, problem-orientated research, inspiring teaching, and creative, high impact engagement with decision makers across government, business and civil society.

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