



Department for
Business, Energy
& Industrial Strategy

CALL FOR EVIDENCE: BUILDING A MARKET FOR ENERGY EFFICIENCY



12TH October 2017

CALL FOR EVIDENCE: BUILDING A MARKET FOR ENERGY EFFICIENCY

The call for evidence can be found on the BEIS section of GOV.UK:
<https://www.gov.uk/government/consultations/building-a-market-for-energy-efficiency-call-for-evidence>

Acknowledgements

Call for Evidence: Building a Market for Energy Efficiency

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Any enquiries regarding this publication should be sent to eemarket@beis.gov.uk

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General information

Purpose of this consultation

Set out what Government is trying to achieve with the consultation and in particular whose views it is seeking.

Issued: 12th October 2017

Respond by: 9th January 2018

Enquiries to:

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Consultation reference: Building a market for energy efficiency

Territorial extent:

England

How to respond

Your response will be most useful if it is framed in direct response to the questions posed, though further comments and evidence are also welcome. Responses should be provided via Citizenspace here:

Confidentiality and data protection

Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information legislation (primarily the Freedom of Information Act 2000, the Data Protection Act 1998 and the Environmental Information Regulations 2004).

If you want information that you provide to be treated as confidential please say so clearly in writing when you send your response to the consultation. It would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded by us as a confidentiality request.

We will summarise all responses and place this summary on the [GOV.UK website](#). This summary will include a list of names or organisations that responded but not people's personal names, addresses or other contact details.

Quality assurance

This consultation has been carried out in accordance with the [Government's Consultation Principles](#).

If you have any complaints about the consultation process (as opposed to comments about the issues which are the subject of the consultation) please address them to:

Email: beis.bru@beis.gov.uk

Executive Summary

Affordable energy and clean growth are central objectives of the UK's Industrial Strategy. Improving how productively we use energy, through improved energy efficiency is an important component of how we meet those objectives.

Energy efficiency brings a wide range of benefits to households, businesses, society and the energy system as a whole. More efficient homes mean lower energy bills and improved health and comfort for homeowners and are worth more than less efficient homes. The energy efficiency products sector has a turnover of over £29 billion and employs over 100,000 people; and the UK is a net exporter of insulation and energy efficiency retrofit goods and services. Improving energy efficiency is also one of the most cost-effective ways the UK has for meeting carbon budgets, and can lead to greater efficiencies and cost-savings across the energy system.

The UK has made good progress on energy efficiency in recent years. In England and Wales gas consumption for the average homeowner has fallen by over 25% in the past ten years. Had consumption remained at 2006 levels, gas bills would have been around £200 per year higher in 2016. The average Energy Performance Certificate (EPC) rating for homes has improved steadily year on year since 2010. The Government has also acted to tackle the root causes of fuel poverty. In April 2017 the Government launched ECO: Help to Heat, which will upgrade the energy efficiency of around 300,000 homes per year, with a focus on those in most need of support.

The Clean Growth Strategy, published alongside this document, features a number of policies aimed at improving the energy efficiency of domestic properties, including an extension of the Energy Company Obligation in some form to 2028, a commitment to look at a long term trajectory for energy performance standards across the private rented sector, with the aim of all private rented homes being upgraded to EPC Band C by 2030, and an ambition for as many homes as possible, where practical, cost-effective and affordable, to reach EPC C by 2035. It has also committed the Government to publishing this call for evidence to gather data, evidence and ideas on additional measures to encourage energy performance improvements.

This document outlines a range of barriers to investment in energy efficiency on both the demand and supply side; invites views about the role of Government in overcoming those barriers and stimulating the market through more direct interventions; and considers a range of potential solutions, many of which have been advocated by businesses and industry representatives. The list is not exhaustive, and inclusion or exclusion should not be taken as an indication of Government policy. This document is about gathering evidence on the widest range of options. Additional ideas are welcome, as are views about the relative impact of the ideas listed here, and how they might be implemented to best effect.

Although this document focuses mainly on the owner occupied sector, many of the ideas set out here could have a positive impact across all tenure types, and could also be applicable to micro or small enterprises, especially home-based businesses.

A new set of principles

The approach set out in this document is informed by lessons from previous policies and discussions with stakeholders. It is based on the following principles:

- **Policies must be coherent:** there is no single ‘silver bullet’ policy for improving energy efficiency. Providing easier access to finance, for example, is important, but will not in itself drive demand for insulation and more efficient heating systems. There are a wide range of barriers to investment decisions; and policies to overcome them must be aligned.
- **Policies must be cost effective:** As set out in the Clean Growth Strategy, we will adopt policies which help to meet our domestic commitments at the lowest possible net cost to UK taxpayers, consumer and businesses; and which maximise the social and economic benefits for the UK from this transition.
- **Policies must align with consumer needs and motivation:** While energy efficiency measures are significant in cutting carbon emissions and reducing energy bills, these benefits are not always strong enough motivators for home-owners to invest in their properties. New policies should take into account the latest behavioural science and evidence about motivators in addition to rational calculations of economic gain, including householders’ desires to improve the comfort, quality and value of their homes.
- **Policies should unlock the full value of energy efficiency:** energy efficiency improvements bring benefits well beyond bill savings and carbon reduction, including lower costs for maintaining grid infrastructure, improved property values and reduced risk to mortgage lenders of defaults on mortgages. It will be important to explore how to turn this value into revenue streams for funding energy efficiency. This work complements the recently published Smart Systems and Flexibility Plan.
- **Policies should exploit “what works” in the current home improvement market:** we know that people are more likely to choose to invest in major renovation at natural trigger points such as moving home or having children. Also, they access advice from a wide array of trusted sources, including the building trade, mortgage lenders, solicitors and advice services not specific to energy efficiency. We want to explore how to exploit these opportunities in driving further demand for energy efficiency in future.
- **Policies should support innovation:** Government’s role should be to put in place a stable framework which gives industry the confidence it needs to invest in new skills, products and business models and bring down costs.

This call for evidence invites views and ideas about taking action in each of the following seven areas.

Demand side

1. **Developing new methods for financing energy efficiency** – different financing products tailored to the needs of different customer groups, such as equity loans for the asset rich cash poor, could help reduce the initial investment in energy efficiency measures. If delivered through financial institutions with a retail presence, this could be done in a low-cost way that fits with homeowners' existing routes for accessing finance. A number of ideas for delivering low-cost finance that have been suggested by stakeholders are explored in this document including equity loans, second charge mortgage extensions and low-interest loans.
2. **Price signals tied to the energy efficiency of properties** – some stakeholders have argued that price signals could make more efficient properties more financially attractive, whilst providing a continuous 'nudge' to consumers to encourage them to improve the efficiency of their properties. We are seeking further evidence on this.
3. **Improving awareness of energy efficiency products and technologies, their benefits and advice to consumers** – a new, digitally led information and advice service will be developed to give customers tailored support on what improvements they could make to their homes, replacing the existing Energy Savings Advice Service. Further steps could be taken to launch a targeted communications campaign – not necessarily led by Government – so that intermediaries (such as banks, estate agents, surveyors and the building trade) are well-placed to inform end users about the benefits of energy efficiency as a routine part of moving house or wider home improvement works.

Supply side

4. **Creating the conditions so that those who derive value from energy efficiency can be key players in the market** – Distribution Network Operators (DNOs), Clinical Commissioning Groups, and mortgage lenders already have a stake in energy efficiency. Ideas for how incentives could be further aligned to unlock this value are explored: for example, incentivising DNOs' to deliver energy savings, or agreeing voluntary targets for mortgage lenders to help encourage the development of innovative green mortgage products.
5. **Enabling innovative energy efficiency products and services** - The Government has launched a £10 million thermal efficiency innovation challenge fund. Other ways to ensure regulation and Government programmes like the Energy Company Obligation encourage innovation in energy efficiency products, services and business models are also explored.
6. **Improving data to open up the market for investment** – the roll-out of smart meters brings the opportunity of improved data on the actual thermal performance of buildings and

the impact of individual energy efficiency measures. This could offer greater assurance to homeowners and investors on the savings delivered by their investments. The recent LENDERS project demonstrated how collaboration between research institutions and Government can make the best use of available data with appropriate safeguards in place to guarantee consumer privacy.

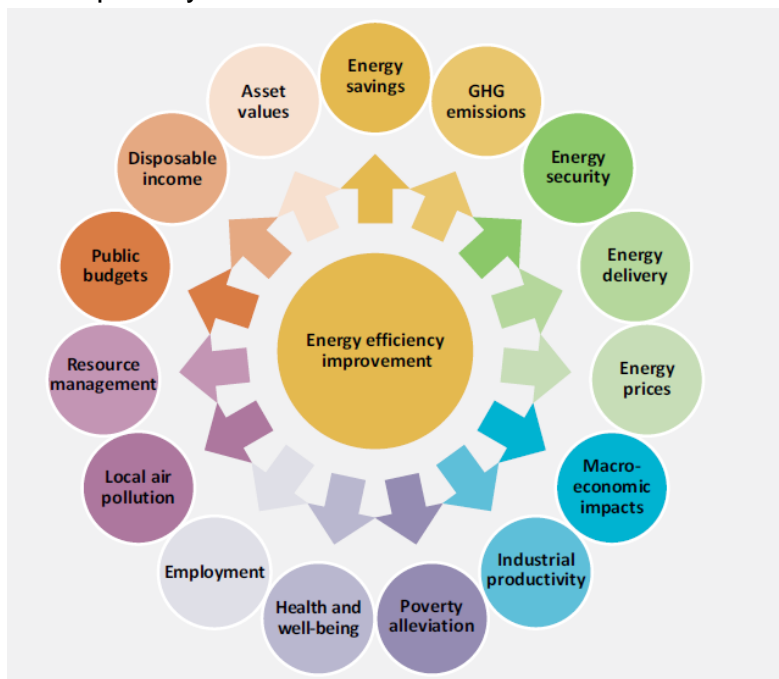
7. **Improving supply chain capability** - in some instances the local supply chain may lack the skills to deliver complex retrofit solutions, and problems have occurred particularly at the design stage of some retrofit projects. Ideas for providing further support to the supply chain and using the new advice service to support installers are explored.

Once the Government has analysed the responses to this call for evidence, we will publish our response to your evidence and ideas in 2018. Some of the ideas set out in this call for evidence could be implemented relatively quickly, whilst others would require more comprehensive changes and consultation. The intention is that this response will lay out a plan of action for the years to come.

1 INTRODUCTION

Benefits and Government priorities

1. Energy efficiency brings a wide set of benefits to different parts of society. These range from: **direct benefits that a homeowner can gain** in terms of reduced energy bills, improved comfort in their home, and improvements to the value of their property; **economic benefits** such as job creation and the creation of new services; and **energy system benefits** from reduced demand including greater energy security, lower generation costs and network reinforcement costs. There are also broader **societal and social benefits** such as reduced greenhouse gas emissions, and the alleviation of fuel poverty.¹



Source: International Energy Agency, [‘Capturing the multiple benefits of energy efficiency’](#)

2. The energy efficiency products sector is the largest subsector in the low-carbon and renewable economy, with a turnover of over £13.9 billion and employing over 100,000 people². The insulation and retrofit subsector is also one of the three parts of the low carbon economy where the UK is a net exporter³.

¹ International Energy Agency, [‘Capturing the multiple benefits of energy efficiency’](#), 2014, pages 18-27 (viewed on 31 August 2017)

² Office for National Statistics, [‘UK environmental accounts: Low carbon and renewable energy economy survey, final estimates: 2015’](#), 2017, (viewed on 31 August 2017)

³ LSE/Grantham Institute, [‘UK Export Opportunities in the Low Carbon Economy’](#), 2017, (viewed on 31 August 2017)

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3. Domestic energy efficiency makes a vital contribution against the Government's statutory obligations and manifesto commitments. The Secretary of State has a legal duty under the Energy Act 2011 to set a target to alleviate fuel poverty. Tackling the root cause of fuel poverty depends crucially on better insulation and more efficient heating.⁴
 4. Homes also account for 13% of the UK's greenhouse gas emissions or 22% when electricity is taken into account⁵. The Climate Change Act 2008 committed the Government to reducing greenhouse gas emissions by at least 80% of 1990 levels by 2050. Scenario analysis undertaken by the Government and others suggests that buildings would likely need to meet near zero emissions to reach that target, primarily through energy efficiency and low carbon heat⁶.
 5. In the Clean Growth Strategy (CGS), which this document is being published alongside, the Government has set out its plan for achieving the 5th Carbon Budget (2028-32), as required by the Climate Change Act. The CGS outlined a series of proposals for reducing energy in homes, including the commitment to publish this call for evidence.
 6. In January 2017, the Government published its green paper, 'Building our Industrial Strategy', which highlighted affordable energy and clean growth as a priority for UK growth. It set out an approach for energy comprising three pillars: delivering affordable energy, in line with the Government's commitment to ensuring the UK has 'the lowest energy bills in Europe'; making the UK one of the most advanced economies for mainstream smart grids; and ensuring that the UK can harness the industrial opportunities from new energy technologies.⁷
 7. Energy efficiency is at the heart of this approach. Reducing energy use is one of the most effective ways of delivering affordable energy. Smart meters and smart home technologies can provide consumers with the data to inform tailored solutions to making individual homes more efficient, and can help households manage their energy use more efficiently.

⁴ Department for Energy and Climate Change, '[Cutting the cost of keeping warm – a fuel poverty strategy for England](#)', 2015 (viewed on 30 August 2017)

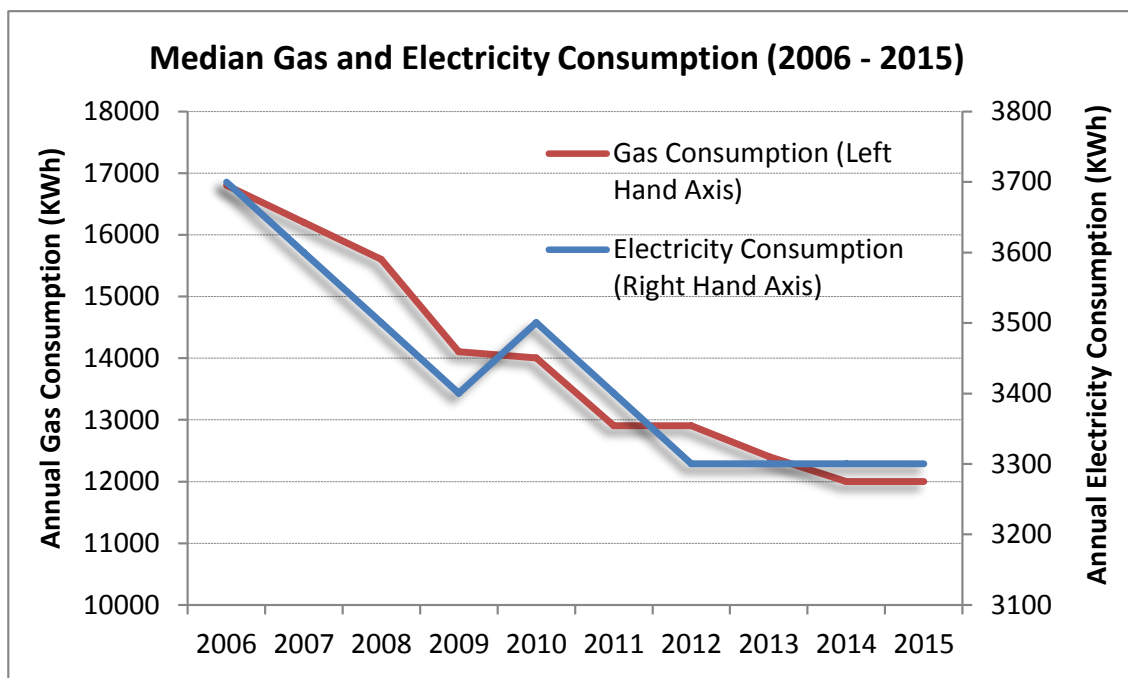
⁵ CHECK – if changes in CGS

⁶ Committee on Climate Change '[Advice on the fifth carbon budget](#)', 2015 (viewed on 30 August 2017)

⁷ Department of Business, Energy and Industrial Strategy, '[Building our Industrial Strategy](#)', 2017 (viewed on 30 August 2017)

Progress and existing policies

8. The energy efficiency of homes in England and Wales has been steadily improving for many years. Median gas consumption has decreased from 16,800 kWh in 2006 to 12,000 kWh in 2015.⁸ Had consumption remained at 2006 levels, gas bills would have been around £200 per year higher in 2016. Whilst the average Energy Performance Certificate (EPC) rating of homes in England and Wales has improved from 45, a low 'E' in 1996 to 61, a 'D' in 2014⁹. Upgrading energy efficiency from an EPC E to an EPC D can reduce energy costs by up to £380 per year on average¹⁰. For example, the annual running cost of a C rated home is £270 lower than the average D rated home and £650 less than the average E rated home.



Source: National Energy Efficiency Data framework (2017)

9. Government policy has been a significant factor in this improvement, including:

- **Building Regulations** – part L (conservation of fuel and power) of the building regulations set standards for new build properties and for improvements to existing buildings, including heating systems and requirements to improve the insulation of walls any time changes are made to those walls. Minimum standards for boilers have

⁸ Department for Business, Energy and Industrial Strategy, '[National Energy Efficiency Database](#)', 2017, viewed on 30 August 2017

⁹ Department for Communities and Local Government, '[English Housing Survey](#)', Headline report 2014-15, viewed on 30 August 2017

¹⁰ Department for Communities and Local Government, '[English Housing Survey](#)', Headline report 2014-15, viewed on 30 August 2017

mandated that all new or replacement boilers installed from 2010 must be condensing boilers.

- **Supplier Obligations** – the UK pioneered the use of obligations on energy suppliers to install energy efficiency measures in people’s homes in 1994. Since 2013, the Energy Company Obligation (ECO) has delivered well over 2 million insulation and heating measures, primarily cavity wall and loft insulation and boiler upgrades.¹¹

10. Further fabric energy efficiency improvements have been delivered by the ‘Green Deal’, which has led to around 14,000 homeowners taking out Green Deal finance as of August 2017. In January 2017, the Government sold the business and assets of the Green Deal Finance Company to a private investor, and under its new ownership the company has begun to launch new loans to the market. Over 40,000 measures, primarily solid wall insulation, were part-financed by vouchers given out under the Green Deal Home Improvement Fund. Around 18,000¹² measures were installed by local authorities using money distributed under Green Deal Communities.

11. Additional policies are due to come into force soon. From 1 April 2018, homes rented out by private landlords will have to secure an Energy Performance Certificate of at least Band E before the landlord can enter into a new tenancy agreement, or renew or extend an existing one, except in some specific circumstances.

12. This document is being published alongside the Clean Growth Strategy (CGS)¹³, the Government’s long-term plan for meeting carbon budgets. The CGS contains a number of new policy commitments to improve homes including:

- to develop a long term trajectory to improve energy performance standards of privately-rented homes, with the aim of upgrading private rented homes to EPC Band C by 2030, and to consult on introducing minimum standards for social housing to reach EPC Band C by 2030;
- an aspiration for as many homes as possible, where practical, cost-effective and affordable to reach EPC C by 2035;
- a commitment to extend support for home energy efficiency to 2028 at least at the current levels of funding under ECO;
- a call for evidence on how to reform and streamline the Green Deal framework to make the “Pay as You Save” system more accessible to businesses, while ensuring adequate protection for consumers;

¹¹ National Statistics, [Household Energy Efficiency National Statistics, headline release](#) (August 2017), viewed on 30 August 2017

¹² National Statistics, [Household Energy Efficiency National Statistics, headline release](#) (August 2017), viewed on 30 August 2017

¹³ Department of Business, Energy and Industrial Strategy, Clean Growth Strategy, 2017

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- to consult on strengthening part L of the Building Regulations to ensure that improvements to new and existing homes meet improved energy performance standards;
 - to launch a call for evidence on the possibility of extending EPCs to other trigger points, as well as seeking wider views on how EPCs could be further improved, in light of new sources of data and capabilities;
 - the introduction of new standards for domestic boiler installations in England.

13. We are looking for further evidence on what measures we can take to incentivise more investment in energy efficiency by home-owners, in particular owner occupiers who are not covered by the minimum standards for the private rented and social housing sectors. Although some of these homeowners are eligible for support under ECO, no one policy can be a ‘silver bullet’ for energy efficiency, and ECO is increasingly being focussed on those most in need of support, in particular the fuel poor. 70% of the current ECO funding is open only to the ‘affordable warmth’ group¹⁴; and 93% of owner occupiers are not in fuel poverty. Other policy mechanisms are therefore likely to be required to incentivise households to improve the energy efficiency of their homes and deliver the savings required for carbon budget 5 and beyond.

14. This document aims to address the barriers that stop people from improving the efficiency of their homes. We are seeking evidence on how the ideas presented here could increase demand for and investment in energy efficiency and make the market work more effectively for consumers. Depending on the impact of these measures, we may consider additional regulatory measures in the future.

15. The remainder of this document sets out:

- **the current state of the market** for energy efficiency measures,
- **the barriers to growth**;
- **lessons learned** from previous attempts to stimulate the uptake of measures both in the UK and internationally; and
- **a range of ideas** informed by discussions with stakeholders which could form part of a new approach to building a sustainable market for energy efficiency in homes.

¹⁴ Department of Business, Energy and Industrial Strategy, ‘[Consultation ECO: Help to Heat](#)’, 2016, viewed on 30 August 2017

2 STATE OF THE MARKET

Remaining potential

16. Homeowners can improve the energy efficiency of their home in many ways. These include changes to the fabric of the building such as loft, cavity wall and solid wall insulation; upgrades to a more efficient boiler or heating system and products for controlling energy use such as smart heating controls. These can be installed in isolation or as part of a whole house retrofit. Homeowners' behaviour and their management of their heating and electricity systems can also contribute substantially to how efficiently their homes are run.
17. To ensure these measures are safe and of high quality, it is important that they are delivered in adherence to building regulations. The need to ensure compliance with fire safety regulations in particular has been highlighted by the recent Grenfell Tower tragedy.
18. According to the English National Housing Survey, 98% of the housing stock could benefit from at least one of the energy efficiency improvements set out by the Energy Performance Certificate¹⁵. Around 28% of dwellings with cavity walls are not insulated, 24% of dwellings with lofts could benefit from loft insulation. Around 92% of solid wall homes (nearly 8 million properties) remain to be insulated.¹⁶ If it was possible to install all measures in all dwellings the mean SAP rating would improve from 62 to 81 and the average modelled fuel bill would go down from £1,018 to £473 per dwelling¹⁷.
19. Further studies have suggested that many of these other measures such as floor insulation could be delivered cost-effectively. A recent report by the UK Energy Research Centre claimed that "cost-effective investments to 2035 could save around one quarter of the energy currently used, an average saving of £270 per household per year at current energy prices."¹⁸

¹⁵ National Statistics, [English Housing Survey Potential stock improvements, 2015](#), viewed on 30 August 2017

¹⁶ National Statistics, [Household Energy Efficiency National Statistics, headline release](#) (March 2017), viewed on 30 August 2017

¹⁷ DCLG, [English Housing Survey Potential stock improvements 2015](#), viewed on 11 October 2017

¹⁸ UKERC, [Unlocking Britain's First Fuel: new report on energy efficiency](#), 2017, viewed on 7 September 2017

Measure	Remaining potential	Annual bill savings	Payback period
Loft insulation (top up)	24% of properties with lofts – 5.8 million properties	£10-20 pa	10-20 years
Cavity wall insulation	28% of CWI properties – 5.4 million properties	£100-200 pa	0-10 years
Solid wall insulation	92% of SW properties – 7.8 million properties	£200-300 pa	30+ years

Market for energy efficiency measures

20. Energy efficiency measures are the subject of distinct markets with separate supply chains, installer bases, sources of finance and different regulatory drivers. Whilst the Government keeps detailed records of all measures delivered under Government-funded schemes such as ECO, we are aware that many more consumers undertake improvements independent of any Government support. This is particularly the case for measures that are valued by consumers independently of their energy-saving properties such as double-glazing and smart heating controls. We are keen to gain a clearer picture of the wider market for energy efficiency measures.

- **Cavity wall and loft insulation** have been delivered mainly through ECO. We estimate that no more than 14% of these installations take place without some form of supplier contribution or Government subsidy.¹⁹ This 14% includes ‘DIY’ installations. We understand the primary sources of demand generation for these measures to be direct marketing by the energy suppliers and installers.
- **Solid wall insulation.** In the year to June 2017, just fewer than 23,000 properties have received solid wall insulation through UK Government schemes across the residential sector.²⁰ Many of these are part-funded by Scottish and Welsh Government or local authority schemes. Part L of the building regulations also states that when any renovation work takes place to walls, the insulation of those walls must also be improved. As such, we suspect that further solid wall insulation work is taking place

¹⁹ Department of Energy and Climate Change (DECC), ‘[Green Deal assessment research, methodology note](#)’ (p21-3), 2015, viewed on 30 August 2017

²⁰ National Statistics, [Household Energy Efficiency National Statistics, headline release](#) (August 2017), viewed on 30 August 2017. This 23,000 includes solid wall insulation delivered to private and social rented sectors and owner-occupied homes.

outside of Government schemes as part of wider renovation works people carry out to their homes. We would welcome further evidence of this, including the costs of these works.

- A number of other measures including **floor insulation**, **draught proofing**, **boiler tank insulation**, more efficient **lighting**, and **double glazing** all take place outside Government programmes. We would welcome further evidence on installation rates of all these measures.
- **Lighting** accounts for 12% of a household's electricity use²¹ and more efficient lighting is a recommended measure on EPCs. Though previously eligible under the CERT (Carbon Emissions Reduction Target) supplier obligation scheme, recent government programmes have focused on gas savings rather than the electricity savings delivered by efficient lighting. The main driver of improvement is therefore the EU energy labelling and Ecodesign requirements. Under the Ecodesign directive, manufacturers are required to decrease the energy consumption of their products by establishing minimum energy efficiency standards.
- Despite its comparatively low level of energy savings compared to cost, **double glazing** has a particularly high level of market penetration. This reflects that consumers place value on the security, comfort, noise reduction and aesthetic properties of glazing, in addition to bill savings. It is often recommended by estate agents and surveyors as a way to increase the value of a property²². A number of 0% interest finance products are available on the market from installers and manufacturers. Products and finance packages are marketed in hardware stores, online and through direct door to door marketing.
- **Boilers.** Boiler replacements tend to be a 'distress purchase', made when an existing boiler has broken down and the consumer needs an urgent replacement. Owing to boiler standards set through Building Regulations, most replacements now result in energy efficiency improvements. Around 475,000²³ boiler replacements had been funded through ECO up to March 2017, mainly for low income houses. Although far more take place outside Government funded schemes and since April 2017 the number of gas boiler replacements has been capped. Many of the energy suppliers have substantial boiler sales, installation and servicing arms.
- The Government is committed to ensuring that every home and small business in the country is offered a **smart meter** by the end of 2020. Smart meters will help consumers

²¹ National Statistics, [Energy Consumption in the UK](#), 2017

²² Zoopla, '[Top ten value adding improvements you can make to your home](#)', 2017, viewed on 30 August 2017

²³ National Statistics, [Household Energy Efficiency National Statistics, headline release](#) (August 2017), viewed on 30 August 2017

understand their energy use better and also act as a gateway to other smart energy-saving products.

- **Smart home products.** In 2016, over 350,000 smart heating controls were installed in the UK²⁴, offering customers greater and more automated control of their heating systems. A number of the larger energy suppliers are selling these products or offering leasing arrangements for their customers, with products also being offered through retail outlets. Some manufacturers provide free training for Gas Safe Registered installers who want to learn to install certain smart controls. Alongside the Clean Growth Strategy, the Government announced new standards for boiler installations that provide consumers with a choice of technologies allowing them to choose the setup that best fits their lifestyle. Demand for smart heating controls has grown significantly in recent years and the new standards are likely to accelerate this growth further.
- **Whole house retrofit** approaches go beyond a collection of single measures to consider the whole building and put together a comprehensive plan for insulation, air tightness of the fabric and ventilation. This approach often involves off-site manufacturing with properties being wrapped in pre-fabricated wall and roof panels. With solar PV built in, insulation panels and air or ground source heat pumps, it can deliver near net-zero energy homes. In the UK this approach is in its very early stages but has been pioneered by Energiesprong in the social housing sector. In Nottingham a pilot of 10 homes are planned during 2017 and early 2018.

Broader market for home improvement

21. Most energy efficiency measures involve changes to the fabric of properties, and so should be viewed in the context of the wider market for home improvement. In 2016 homeowners in the UK spent around £18 billion on repair, maintenance and improvement to their homes.²⁵ This includes extensions to their living space such as loft conversions, kitchen replacements or upgrades and general repairs, as well as energy efficiency measures.

22. Research suggests that apart from ‘distress purchases’ such as replacing a broken boiler, fabric energy efficiency improvements are prompted by the same set of triggers and motivations as other home renovation decisions²⁶. These include consumers wishing to improve the value of their homes, make them more comfortable or pleasing

²⁴ Figures provided to BEIS by [Delta EE](#)

²⁵ Construction Products Association, Construction Industry Forecasts 2017-2018, spring 2017 edition.

²⁶ UKERC, [Understanding Homeowners’ Renovation Decisions: Findings of the VERD Project](#), 2013, viewed on 30 August 2017

to live in, adapt them to suit their needs (such as when expecting a child), or make changes as way of expressing their identity²⁷.

23. Research suggests that most households undertaking home improvements (79%) are planning to finance them through their savings, with 10% taking out a bank loan and a further 10% using a mortgage extension²⁸. In a study from 2013, amongst homeowners considering renovation of some kind, 35% were considering a mixed project of amenity measures and energy efficiency. Such as redoing a kitchen and installing loft insulation at the same time, compared to just 11% who were considering energy efficiency-only projects²⁹.

24. The tradespeople who carry out energy efficiency improvements for owner occupiers are typically drawn from the same network of largely sole traders as those for repairs and renovations³⁰. This is in contrast to the energy efficiency retrofits on behalf of social housing providers and local authorities which are mainly carried out by larger companies.

²⁷ Energy Saving Trust, [Trigger Points: An Inconvenient Truth, Promoting Energy Efficiency in the Home](#), 2010, viewed on 30 August 2017

²⁸ Ibid.

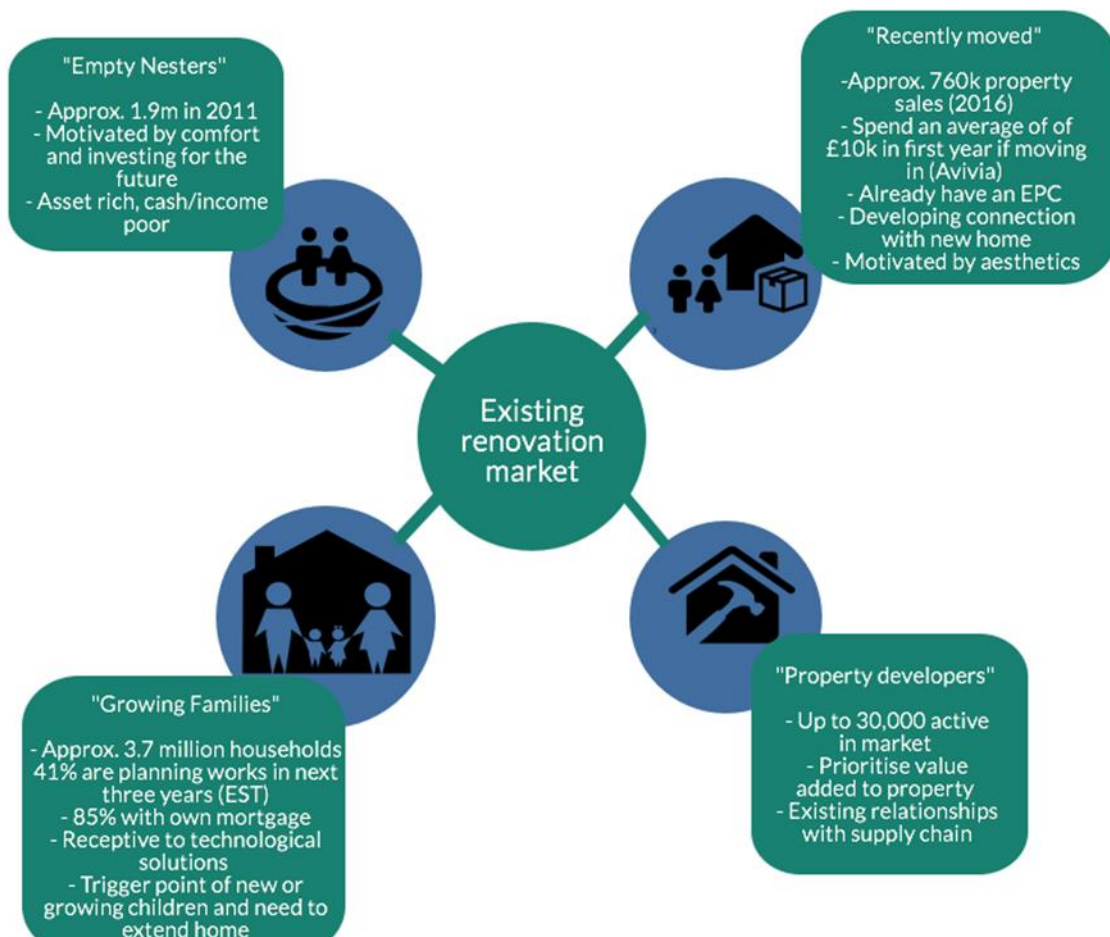
²⁹ UKERC, [Understanding Homeowners' Renovation Decisions: Findings of the VERD Project](#), 2017, viewed on 21 June 2017

³⁰ C Maby and A Owen, Severn Wye Energy Agency and University of Leeds, [Installer Power](#), 2015 viewed on 30 August 2017

Consumer groups and trigger points

25. Research shows that particular groups, spurred on by specific 'trigger points' in their lives, are more likely to carry out home renovation, including energy efficiency retrofit³¹. Policies encouraging energy efficiency are likely to be more effective if they are aimed at these groups.

26. Various quantitative and qualitative studies³² have indicated that these groups include: *empty nesters* who have more time to spend on improving their homes; *young recently moved in couples* who want to improve the look and feel of their home and add value to their new asset; *growing families* who are focused on adding additional space; and *property developers* who prioritise adding value to dilapidated properties to increase profit at the point of sale.



³¹ Energy Saving Trust, [Trigger Points: An Inconvenient Truth, Promoting Energy Efficiency in the Home](#), 2010, viewed on 30 August 2017

³² UKERC, [Understanding Homeowners' Renovation Decisions: Findings of the VERD Project](#), 2017, viewed on 21 June 2017 and Energy Saving Trust, [Trigger Points: An Inconvenient Truth, Promoting Energy Efficiency in the Home](#), 2010, viewed on 30 August 2017

Figure 1 – of key groups at natural ‘trigger points’ for home improvement³³

Questions:

- 1) *What information do you have on current rates of delivery of measures outside of Government programs, including through DIY etc.?*
- 2) *What information do you have on the remaining potential for energy efficiency improvements and what savings could be expected from these measures?*
- 3) *Do you agree with our assessment of the current market for energy efficiency amongst owner occupiers, including the trigger points and supply chain relationships?*
- 4) *Do you agree that it makes sense to prioritise those groups most likely to be open to investing in energy efficiency? And do you agree with our assessment of who those groups are most likely to be?*

³³ Created with Piktochart 19th August 2017 using the following icons from “The Noun project” : Nick Bluth- “Empty nest” illustration; Gregor Cresnar- “Empty nest illustration”; Nikita Cozin- “Growing families illustration”., Adrien Corquet “Property developers” illustration., Yazmin Alamin; “Recently moved illustration” , Gregor Cresnar; “Recently moved illustration”.

3 BARRIERS TO MARKET GROWTH

27. From discussions with stakeholders, customer research panels, and feedback from Government schemes, we believe that there are a number of barriers to the growth of the energy efficiency market. These can be grouped as **demand** side barriers and **supply / investment** side barriers. In addition to these barriers, there is a lack of a strong incentive to act and a poor value proposition for consumers and investors.

Demand side barriers and lack of incentive

28. **Low awareness.** There remains low awareness of the existence of many energy efficiency measures and their benefits. This is particularly pronounced for some measures like solid wall insulation (SWI). An analysis of Green Deal assessments showed that 70% of people who had SWI installed following an assessment had not considered it an option before the assessment³⁴. Few intermediaries who might discuss energy efficiency with homeowners as part of their home renovation decisions (e.g. estate agents) are aware of the potential for improvements beyond well-known measures such as double glazing.

29. **Lack of trust in the quality of installation.** Poor quality installations damage the reputation of the industry and dissuade people from installing measures. Surveys show that most people express satisfaction with the quality of energy efficiency installations³⁵. But examples of poor practice and a more general lack of trust in the industry have acted as a barrier to growth.³⁶ Published in December 2016, The Each Home Counts independent review of Consumer Advice, Protection, Standards and Enforcement for Energy Efficiency and Renewable Energy explored many of these issues. Industry stakeholders are developing the proposals contained in the report, with a view to developing detailed implementation plans by Spring 2018.

30. **Lack of trusted, salient, tailored advice.** People currently receive energy efficiency advice and recommendations when they purchase a home through their EPC. The Energy Savings Advice Service provides free energy efficiency advice and signposting for homeowners and received just over 100,000 calls in 2016/17. However, the ESAS service is currently a telephone only service. Whilst other online services exist, none

³⁴ Department of Energy and Climate Change, '[Green Deal assessment customer research](#)', 2014, viewed on 30 August 2017

³⁵ Department of Energy and Climate Change, [Green Deal customer journey survey: summary report - quantitative survey wave 5](#), 2015, viewed on 30 August 2017

³⁶ Supply Chain Insight Group, [Trust and certainty, energy efficiency market viability and supply chain deliverability](#), 2015, viewed on 30 August 2017

draw on all relevant and available data sources meaning advisors cannot deliver fully tailored advice on what measures homeowners should install.

31. **High upfront cost/ few finance offers.** Research by DECC conducted in the build-up to the launch of the Green Deal in 2013, supported by further academic research, has shown that cost was a key barrier to consumers installing many energy efficiency measures.³⁷ The average cost of improving a property with all the EPC recommended measures is £15,000³⁸. Depending on the home type, external solid wall insulation costs, for example, can range from £5,000 to £16,000.³⁹ In mature parts of the home renovation market and for measures like double glazing, finance offers presented as low cost or 0% are packaged by installers alongside renovation projects. For measures like solid wall insulation, however, similar offers do not exist.
32. **High hassle/disruption factor.** Some measures, in particular solid wall insulation, require substantial disruption and a high degree of hassle for the homeowner unless the home is already undergoing refurbishment. External solid wall insulation can only be installed in dry weather, involves scaffolding and can take weeks to install.⁴⁰
33. **Energy savings are not a sufficient incentive.** Many measures have either small annual savings or long payback periods. The typical payback period for solid wall insulation is 30 - 45 years, and the payback from cavity wall insulation is typically 5 - 15 years. Non-fuel poor consumers on the whole express relatively low levels of concern about their energy bills, and future savings are heavily discounted. Loss aversion⁴¹ means that the potential gains from savings are further undervalued with comparison to any potential losses in terms of hassle costs. However, as demonstrated by double glazing, where there are other factors in play, for example improved aesthetics or a tendency to conform to social norms, a measure can prove popular despite having a relatively long payback period (up to 50 years).
34. **Low perception of wider value of energy efficiency.** Although homeowners see a clear value proposition in measures like double glazing as they add to property values, reduce noise and increase comfort, other measures are not perceived in the same way. EPCs are rarely considered by homebuyers in their property decisions, with many people purchasing a home and not seeing the EPC. This is despite the fact that evidence shows more efficient properties attract a higher price than equivalent,

³⁷ Department of Energy and Climate Change, [Research summary: understanding potential consumer response to the Green Deal](#) 2011, viewed on 31 August 2017

³⁸ DCLG, [English Housing Survey Potential stock improvement, 2015](#), viewed on 31 August 2017

³⁹ UCL "Understanding Best Practice in Deploying External Solid-Wall Insulation in the UK", 2017 (in press)

⁴⁰ Ibid

⁴¹ Kahneman and Tversky, [Prospect Theory: An Analysis of Decision under Risk](#), 1979, viewed on 31 August 2017

less efficient properties⁴². Currently there is a lack of evidence on the contribution of individual measures to the value of a property.

35. **Some measures can detract from the appearance of some homes.** Solid wall insulation can lead to a loss of space if internal or can alter the external appearance of buildings. While in some cases this can offer an opportunity to significantly improve the appearance of the building, this is not the case for all property types.
36. **Lack of incentive to act.** As with all behaviour there is a high attrition rate between intention and action. Even for customers willing to consider energy efficiency measures, many put off decisions for a variety of reasons. The lack of a trigger, regulatory lever or risk of missing out on a limited offer means that people often delay or do not follow through with decisions to undertake energy efficiency improvements⁴³.

Supply side barriers and lack of incentive to invest

37. **Lack of certainty in savings.** Many potential sources of investment for energy efficiency depend on being able to have a high degree of certainty over the savings of any measures. For example, some mortgage lenders have suggested that in order to offer additional lending capital to homeowners to help them invest in energy efficiency, thereby bringing down their bills, they would need to be more confident about the level of savings delivered by measures. District Network Operators (DNOs) need to be certain that projects will deliver electricity savings in constrained networks in order to prioritise energy efficiency projects over network reinforcement.
38. **Low trust in the quality of measures.** For players such as mortgage lenders to enter the market for energy efficiency, they need to have confidence that the installations they fund will be completed to a good standard and will therefore protect the brand of the lender. For unsecured lending, the Consumer Credit Act holds lenders responsible for any additional costs incurred as a result of poor workmanship paid for with finance provided by the lender. As a result, lenders are hesitant to enter a market without greater confidence that this risk to them can be mitigated.
39. **Supply chain lacks skills to deliver some measures in some locations.** In some areas of the country there is a lack of installers and tradespeople with the knowledge and expertise to deliver complex retrofit projects to a high standard. This covers a

⁴² Department of Energy and Climate Change, [An Investigation of the Effect of EPC ratings on House Prices](#), 2013, viewed on 31 August 2017

⁴³ UKERC, [Understanding Homeowners' Renovation Decisions: Findings of the VERD Project](#), 2013, viewed on 21 June 2017

wider range of issues including avoiding cold-bridging when installing insulation measures and dealing with non-standard or harder to treat properties.⁴⁴

40. **Lack of long-term signals from Government.** Some stakeholders have suggested that additional regulatory or other signals from Government of future expectations on energy efficiency would give them greater confidence to invest in the energy efficiency market and to invest in innovation, new services and new business models.
41. **Wider beneficiaries not incentivised/ required to prioritise energy efficiency.** For many beneficiaries of energy efficiency, such as DNOs, the savings from offset network costs would not be sufficient to justify full investment in a project on their own. Whilst for mortgage lenders, there is not a strong drive to develop a compelling financial offer for consumers, considering the additional barriers that exist as outlined above.
42. **Energy efficiency not perceived as adding to the value of properties.** As well as being a barrier to consumer demand, the lack of information about the contribution of individual measures to property prices means it is also a barrier to the development of green mortgages and finance.⁴⁵

Lessons learned from previous attempts to address barriers

43. A variety of Government policies have attempted to overcome these barriers and generate a demand for improvement measures over the last three decades. Whilst supplier-led schemes like ECO have successfully delivered measures with high levels of subsidy, demand-led schemes, in particular the Green Deal, have underperformed against high initial expectations.⁴⁶ A number of important lessons may be drawn from these experiences, and from the experiences of other countries:
44. **Finance is not the only barrier to energy efficiency.** One reason why consumer take up of the Green Deal was low was because it addressed only one of the multiple barriers to energy efficiency: access to finance. There remain many other obstacles to take-up.
45. **Complexity of schemes prevents wider market growth.** The Green Deal as it was originally launched created an entirely new system of compliance, monitoring, laws,

⁴⁴ BEIS/DCLG, [Each Home Counts: Review of Consumer Advice, Protection, Standards and Enforcement for Energy Efficiency and Renewable Energy](#), (December 2016), viewed 29 August 2017

⁴⁵ European Mortgage Federation, [Energy Efficient Mortgages Action Plan](#), viewed on 29 August 2017

⁴⁶ National Audit Office (2016), [Green Deal and Energy Company Obligation](#)

type of company and methodology. This led to a complex customer journey and dissuaded companies from entering the market and offering Green Deal products. This is why the Government has also announced a call for evidence on the simplification of the Green Deal Framework.

46. **Energy efficiency cannot be sold on energy savings alone.** The ‘golden rule’ of the Green Deal restricted loans to measures that could be paid back within 25 years, with repayments added to electricity bills. It also focused on bill savings as the major benefit, despite evidence that only 30% of the public are either very or fairly worried about paying their energy bills⁴⁷.
47. **Stop-start policies can weaken the market.** In 2014 the Government reduced the size of the energy company obligation (ECO) and subsequently launched three tranches of funding under the Green Deal Home Improvement (GDHIF). While these changes were necessary to balance energy efficiency support with affordability and costs on consumer bills, feedback from the supply chain was that these changes in the availability and terms of funding made it difficult for installers to build a sustainable business model.⁴⁸

Lessons from other countries

48. **Simple finance offers through established channels are more attractive to consumers.** A number of countries have relied largely on low-cost finance offers to drive energy efficiency. In Germany, around 220,000 additional retrofit measures are delivered per year through 0.75% interest loans, offered through Germany’s national bank, KfW. The loans can cover energy efficiency retrofit and wider home repairs⁴⁹. In the Netherlands, homeowners can extend their borrowing limit as determined by the loan to property value of their mortgage by an additional 6% to make energy efficiency improvements.⁵⁰

⁴⁷ Public Attitude Tracker (page 21), <https://www.gov.uk/Government/statistics/energy-and-climate-change-public-attitude-tracking-survey-wave-21> Last released: May 2017. viewed on 21 June 2017

⁴⁸ National Audit Office, [Green Deal and Energy Company Obligation](#), 2016

⁴⁹ Association for the Conservation of Energy (ACE), [Financing energy efficiency in buildings: an international review of best practice and innovation](#), viewed August 2017

⁵⁰ Riccardo AEA, [A comparative review of housing energy efficiency Interventions](#), viewed on 21 June 2017

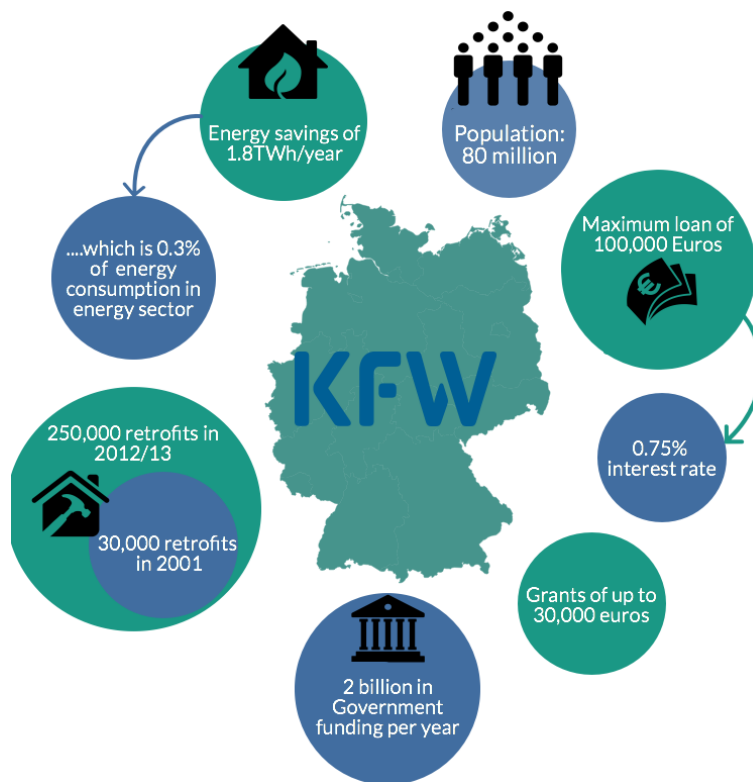


Figure 2 – Infographic illustrating the key features of the KfW Energy Efficient Refurbishment and KfW Energy Efficient Construction programmes⁵¹

49. **Extending additional credit for more energy efficient properties through a ‘green mortgage’ can make them more attractive.** In the Netherlands, prospective homeowners can borrow an additional €25,000 to buy a ‘net zero meter home’. This has helped drive an innovative market of whole house retrofit to bring old homes up to high efficiency standards.

50. **Tax credits are used in other countries to incentivise energy efficiency improvements.** In Italy, tax credits are offered to households for retrofit measures. These are worth up to 65% of the amount of the energy efficiency investment, with a ceiling on the amount for each measure.⁵² In France, Crédit d’Impôt pour la Transition Énergétique (CITE) provides tax credits of up to 30% on all types of efficiency

⁵¹ Created with Piktochart 19th August 2017 using the following icons from “The Noun project”: Mooms - Population 80 million illustration; Kate T - 250,000 retrofits illustration; Adrien Corquet; 2 billion in Government funding illustration; Orin Zuu- maximum loan of 200,000 euros illustration.

⁵² Energy Saving Policies and Energy Efficiency Obligation Scheme (ENSPOL), [D3.1: Report on Alternative schemes to Energy Efficiency Obligations under Article 7 implementation](#), 2015, viewed on 2015

measures (max €8000 in total)⁵³. VAT for relevant equipment is also lowered to 5.5%. Homeowners claim the refund when completing their tax return.

- 51. Work with DNOs can offer a cost effective, market based route to engaging an existing beneficiary of energy efficiency.** Since 2006, there has been a voluntary agreement between the Danish Government and grid and distribution companies in the electricity, natural gas, district heating and oil sectors. This agreement commits utility companies to deliver energy savings, focusing on final energy consumption. The companies are free to choose the methods they use to deliver savings in the most cost effective way. This includes allowing utility companies to carry out measures outside their own supply area and outside their own energy type. The average cost of savings reported in 2011 was approximately EUR 0.05 per kilowatt hour (kWh) in first year savings, equivalent to EUR 0.005 per kWh when assuming an average savings lifetime of 10 years⁵⁴.
- 52.** Since 2005, Italy has had the tradable White Certificates system, a trading incentive scheme that requires electricity and natural gas distribution operators with more than 50,000 customers to achieve yearly energy saving targets⁵⁵. Financial penalties for non-compliance targets are imposed in order to satisfy annual obligations. WhCs generated by interventions implemented by other operators or non-obliged parties can be bought on the market. The first phase of the programme, which ran from 2005-2012, cost €172 million a year and led to energy efficiency savings of approximately 35 GWh per year⁵⁶. A new phase of the scheme launched in 2013, introduced rewards for large industrial and infrastructure projects capable of generating savings of at least 35,000 GWh per year⁵⁷. ENEA estimates that at a cost of €3 billion, the scheme will leverage energy investment valued at more than €20 billion (ENEA, 2014)⁵⁸.
- 53. Whole house retrofit that brings an uplift in property value and a significant bill saving can be appealing to customers when combined with additional aesthetic improvements.** In Denmark and Sweden (BetterHome) and the Netherlands (Energiesprong) whole house retrofit has included wider modernisation works to a property, including kitchens and bathrooms. Both models have demonstrated that where there is an uplift in property value, homeowners are more interested in making changes and finance providers are more willing to offer low-interest credit. In Denmark banks provide long-term secured loans, usually to owner occupiers, using the predicted value increase in house price⁵⁹. We would be interested in understanding

⁵³ Ricardo AEA, [A comparative review of Housing Energy Efficiency Interventions](#), 2015, viewed on 31 August 2017

⁵⁴ IEA, [Energy Policy Highlights](#), Denmark, 2013, viewed on 31 August 2017

⁵⁵ IEA, [Energy Policy Highlights](#), Italy, 2013, viewed on 31 August 2017

⁵⁶ IEA, [Energy Policies of IEA Countries](#), Italy, 2016, viewed on 31 August 2017

⁵⁷ Ibid.

⁵⁸ Ibid.

⁵⁹ Figures provided to BEIS by [Delta EE](#)

how the lessons learned from the development of these business models could be adapted to the UK context.

Questions:

- 5) *Do you agree with our assessment of the current barriers to market growth?*
- 6) *Are there other barriers that you think we should be addressing?*
- 7) *Do you think there are any other important lessons to learn from past attempts to stimulate the market?*
- 8) *Are there other international examples we could learn from?*
- 9) *Are there any barriers preventing business models for energy efficiency that have developed in other countries from also developing in the UK?*

4 PROPOSED APPROACH

54. In light of the barriers mentioned and the lessons learned from previous policies, we suggest a new approach is required for building the market for energy efficiency amongst owner occupiers. The ideas explored in this document are not, at this stage, policy proposals from the Government, but are a summary of options and ideas either put forward by stakeholders or are drawn from existing local or international examples. We are keen to obtain evidence on how these and other ideas might operate in practice, in order to come to a view on whether and what further Government action might be required.

55. The approach should be based on the following principles:

- **Policies must be coherent:** there is no single ‘silver bullet’ policy for improving energy efficiency. Providing easier access to finance, for example, is important, but will not in itself drive demand for insulation and more efficient heating systems. There are a wide range of barriers to investment decisions; and policies to overcome them must be aligned.
- **Policies must be cost effective:** As set out in the Clean Growth Strategy, we will adopt policies which help to meet our domestic commitments at the lowest possible net cost to UK taxpayers, consumer and businesses; and which maximise the social and economic benefits for the UK from this transition.
- **Policies must align with consumer needs and motivation:** While energy efficiency measures are significant in cutting carbon emissions and reducing energy bills, these benefits are not always strong enough motivators for home-owners to invest in their properties. New policies should take into account the latest behavioural science and evidence about motivators in addition to rational calculations of economic gain, including householders’ desires to improve the comfort, quality and value of their homes.
- **Policies should unlock the full value of energy efficiency:** energy efficiency improvements bring benefits well beyond bill savings and carbon reduction, including lower costs for maintaining grid infrastructure, improved property values and reduced risk to mortgage lenders of defaults on mortgages. It will be important to explore how to turn this value into revenue streams for funding energy efficiency.
- **Policies should exploit “what works” in the current home improvement market:** we know that people are more likely to choose to invest in major renovation at natural trigger points such as moving home or having children. Also, they access advice from a wide array of trusted sources, including the building trade, mortgage lenders, solicitors and advice services not specific to energy efficiency. We want to explore how to exploit these opportunities in driving further demand for energy efficiency in future.

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- **Policies should support innovation:** Government's role should be to put in place a stable framework which gives industry the confidence it needs to invest in new skills, products and business models and bring down costs

56. In addressing the barriers and in light of these principles, we are interested in exploring ideas and options in the following areas below. These are split into two sections, demand side and supply side, in line with the two sets of barriers set out above.

Demand side measures

1. Developing new methods for financing energy efficiency;
2. Price signals to encourage homeowners to prioritise energy efficiency;
3. Improving awareness of measures, their benefits and advice to consumers.

Supply side measures

4. Better aligning incentives of beneficiaries;
5. Supporting innovative new energy efficiency products and services to market;
6. Improving data to open up the market for investment ;
7. Supporting the supply chain to deliver low carbon retrofit.

Questions:

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

11) Do you agree that the policy areas we have set out are the correct ones to focus on?

5 DEMAND SIDE MEASURES

Developing new methods for financing energy efficiency

Rationale

57. As outlined above, high upfront costs and a lack of finance are barriers for some people wishing to carry out energy efficiency improvements. The experience of the Green Deal showed, however, that one single financial product is unlikely to suit the needs of all consumers, and is not in itself sufficient to stimulate demand for energy efficiency. Nevertheless, targeted financial incentives, particularly when combined in a simple package with a plan of works, can play a role in encouraging homeowners to carry out energy efficiency measures⁶⁰.
58. Building on the experience of the Green Deal and the lessons from other countries such as the Netherlands and Germany, we believe that to be successful, any financing product for energy efficiency must be simple to access and apply for, be readily available at a time when people are most likely to be considering renovating their home, and ideally be delivered through the organisations that people traditionally use for accessing finance, such as retail banks/building societies.

Current actions

59. In January 2017, the Government sold the business and assets of the Green Deal Finance Company to a private investor and under its new ownership the company has begun to launch new loans to the market. The Green Deal Framework, which underpins the mechanism of 'Pay-As-You-Save', is still in place. This allows for loans for energy efficiency to be repaid through household energy bills and to be tied to the property. Alongside the Clean Growth Strategy, the Government launched a call for evidence on simplifying and improving the Green Deal Framework. It is hoped that through this process more companies will begin to offer Green Deal plans to the market.

Potential further actions

60. Stakeholders have put forward a number of ideas for methods for financing energy efficiency that span across from subsidising interest rates, to direct subsidy. The list is

⁶⁰ Carbon Co-Op, '[People Powered not Fossil Fuelled](#)' viewed on 30 August 2017

not exhaustive and inclusion or exclusion should not be taken as an indication of Government policy. Suggestions include:

- **low interest loans**, as suggested by the Institute for Public Policy Research⁶¹ the Committee on Climate Change's Next Steps for Heat Policy⁶², the Association for the Conservation of Energy (ACE)⁶³, the Sustainable Energy Association (SEA)⁶⁴, and E3G/ The Energy Bill Revolution⁶⁵;
- **home equity loans**, similar to the pilot currently being run by the Scottish Government⁶⁶, and suggested by SEA⁶⁷;
- **conditional mortgages/ bolt on products**, suggested by SEA⁶⁸ and the Confederation of British Industry (CBI)⁶⁹;
- **direct subsidy**, as suggested by EST⁷⁰.

61. **Low interest loans:** There are international examples showing that low-interest finance incentivises energy efficiency improvements. Germany's KfW scheme includes 0.75% finance loans that can cover energy efficiency as well as wider improvements to the home or small business, which aligns with people's renovation decisions and takes advantage of the natural trigger points referred to earlier in this document. Delivering a similar system in the UK would most likely require arrangements between the Government and financial institutions with a retail presence such as high-street banks, with a commitment from Government to provide a subsidy to reduce the effective interest rate of the loans.

⁶¹ Reg Platt and Jan Rosenow, IPPR, '[Up against the \(solid\) wall](#)', viewed on 30 August 2017

⁶² Committee on Climate Change, '[Next Steps for UK Heat Policy](#)', viewed on 30 August 2017

⁶³ Association for the Conservation of Energy (ACE), '[Buildings and the 5th Carbon Budget](#)', viewed on 31 August 2017

⁶⁴ Sustainable Energy Association, '[Energy Efficiency – A policy pathway, addressing the able to pay Sector](#)', viewed on 31 August 2017

⁶⁵ Verco & Cambridge Economics, '[Building the Future: The economic and fiscal impacts of making homes energy efficient](#)', viewed on 30 August 2017

⁶⁶ Energy Savings Trust, 'Scottish Home Equity Loans Scheme', <http://www.energysavingtrust.org.uk/scotland/grants-loans/heeps/heeps-equity-loan-scheme>, viewed on 10 July 2017

⁶⁷ Sustainable Energy Association, '[Energy Efficiency – A policy pathway, addressing the able to pay Sector](#)', viewed on 31 August 2017

⁶⁸ Sustainable Energy Association, '[Energy Efficiency – A policy pathway, addressing the able to pay Sector](#)', viewed on 31 August 2017

⁶⁹ CBI, '[Effective policy, efficient homes: Refreshing the UK's approach to retrofitting homes](#)', viewed on 31 August 2017

⁷⁰ Energy Saving Trust, '[The Clean Growth Plan: An offer to all householders](#)', viewed on 31 August 2017

CASE STUDY: Zero interest loans enable whole house retrofit in Manchester with improved comfort and significant bill savings

A 0% finance offer in the Community Green Deal was successful in drawing people to participate. Householders were as keen to improve the comfort of their homes as they were to reduce energy bills, and were prepared to invest in comfort and a healthy living environment even if this entailed a net outlay years into the future. Whole house retrofit cut energy use by around 50% and carbon emissions by around 60%.

Before retrofit, households had energy bills ranging from around £500 to £2,000 a year. After retrofit, these fell decisively, with households saving from £200 (off an already small bill) up to £650 per year. Adding in the income from the Feed-in Tariff from solar generation, savings effectively rose to between £800 and £1,100 per year for these homes. Many of the householders reported an improvement in comfort, and post-retrofit, commented that homes were warmer, including first thing in the morning, they felt less damp and the air felt fresher.

62. **Home equity loans:** Equity loans have been used by both Sheffield Council and more recently the Scottish Government to fund energy efficiency alongside general repairs to the home. No regular payments are required, with the loan repaid in full at the time the property is sold or when the homeowner dies. In Scotland, homeowners give up a percentage stake in their house in exchange for the funds, and they then pay back the lowest of either the same percentage value when they sell their home, or the original amount plus an annual interest rate of 2%. This 'double lock' protects homeowners from paying high amounts in the case of a significant rise in property prices.
63. A minimum of 55% of the loan must be spent on energy efficiency and a maximum 45% on repairs. Therefore the loans help with both energy efficiency and repairing low quality housing. They are an attractive idea for homeowners who are asset rich but cash poor, and yet want to improve their homes. There is an existing equity release market of £2.15bn⁷¹ with pension providers the main players currently, although none offer a product of this type, which would represent a change from the typical equity release products available.
64. **Second charge or conditional mortgages:** In the Netherlands, homeowners are allowed to borrow additional sums of money alongside their mortgage, as long as this money is spent 'primarily on energy efficiency'. The money can be requested by a homeowner at any point, and is then placed into a special account by the lender. Once an invoice is provided for the works, the money can then be paid directly to the

⁷¹Equity Release Council, [Equity Release Market Report](#), Spring 2017, viewed on 31 August 2017

contractor or homeowner. Similar ‘second charge’ mortgage products for energy efficiency could allow UK homeowners to fund energy efficiency improvements alongside other works, which both lower customers’ outgoings and improve property values. However under the Mortgage Credit Directive⁷², any second charge mortgages are subject to the same affordability assessments as traditional mortgages.

65. **Direct subsidy** for energy efficiency under the Green Deal Home Improvement Fund (GDHIF) proved to be popular at a high rate of subsidy. Likely fuelled by a sense of scarcity, the three tranches of vouchers totalling £162 million were allocated quickly. One of the aims of the scheme was to drive uptake of solid wall insulation, to compensate for the change in focus of ECO. It therefore delivered savings at a higher rate of £/tonne of CO₂ and was less cost-effective than ECO. It proved unsurprisingly that subsidy could drive demand, however it also raised expectations of future subsidy from installers and so might have acted as a block on works carried out without subsidy. It also created a ‘stop-start’ flow of work for the supply chain.
66. Behavioural research indicates, ‘use it or lose it’ incentives in particular can draw on people’s natural sense of loss aversion and help overcome inertia where people are inclined to put off making decisions about energy efficiency improvements⁷³. Therefore, for example, small offers of ‘cashback’ or ‘rewards’ for making energy efficiency improvements within the first year of moving into a home or when carrying out energy efficiency improvement ideas at the same time as existing home improvement work could potentially act as a spur to act.
67. The cost-effectiveness of these different ideas would depend on the details of scheme design and profile of customers who took up the offer. For example, the interest rate of low cost loans or the price paid in a feed out tariff would both have an impact on cost. Any proposals for additional direct subsidy would need to carefully consider the impact on taxpayers and on bill payers, and deliver value for money.
68. The Government is aware that detailed qualitative analysis of the strengths and weaknesses of the different options has already been carried out in a series of reports that have been referenced extensively in this document. We therefore would like to seek further evidence on examples of where these approaches have been trialled, how they could be scaled up, and further empirical evidence that would justify why some options would likely to be more effective than others.
69. Most of the ideas here would be advanced through existing channels that people use to access finance for home improvement – trusted financial institutions such as high

⁷² Financial Conduct Authority, [Mortgage Credit Directive](#) Information, 2016, viewed on 31 August 2017

⁷³ Kahneman and Tversky, [Prospect Theory: An Analysis of Decision under Risk](#), 1979, viewed on 31 August 2017

street banks and private finance providers. The Government would therefore welcome evidence from stakeholders including high street banks and private finance providers on ways that they could trial these approaches. We are interested in hearing from lenders about what barriers they would need to overcome to do this, and how Government could support them in this. We are also interested in whether similar approaches would be useful for Small and Medium Enterprises investing in energy efficiency.

Questions:

- 12) *Which of the fiscal levers described here would drive the greatest consumer demand?*
- 13) *Is there evidence to suggest that any other fiscal levers not described here could drive consumer demand?*
- 14) *What would be the profile of homeowners likely to take up these different incentives?*
- 15) *How could these incentives be designed to deliver the best value for money for Government and best savings for consumers?*
- 16) *What barriers, regulatory or otherwise, exist to financial institutions developing any of these products or incentives themselves?*
- 17) *How could Government assist financial institutions with a retail presence, local authorities and other actors to run trials of these ideas?*
- 18) *How could we ensure that any trials would lead to the development a self-sustaining market for support?*

Price signals to encourage homeowners to prioritise energy efficiency

Rationale

70. Price signals can be used to reduce the running or purchase costs of more efficient properties, or to increase the costs of a less efficient property. The purpose of this is partly to strengthen the economic case for homeowners making energy efficient improvements by increasing the potential payoff and decreasing payback times. An equally important role is to provide a salient reminder of the efficiency of a property and a 'nudge' to the property owner to make improvements, thereby increasing awareness of energy efficiency.

71. For this reason price signals do not need to be set at a level that would impose a cost on a homeowner greater than the cost of installing measures. Instead they can be smaller amounts that nevertheless provide a 'nudge' to homeowners. A benefit of price signals is that could be designed in way that can be cost neutral for Government and taxpayers, with cash flows ultimately going from owners of less efficient properties to those of more efficient properties. However, it is important to ensure that a heavy burden does not fall on the fuel poor or those without the means to improve their property.

Questions

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

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

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?

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?

Improving awareness of energy efficiency products and technologies, their benefits and advice to consumers

Rationale

72. Consumers can get recommendations about the energy efficiency improvements they can make to their homes through their Energy Performance Certificate (EPC), and receive impartial advice over the telephone through the Energy Savings Advice Service (ESAS)^[1]. Under current regulations, an EPC must be commissioned before a building is placed on the market, and all advertisements in the commercial media must clearly show the energy rating of the building (where this is available).^[2] There is scope for exploring additional trigger points at which an EPC could be required beyond simply at the point of sale, to ensure consumers are made aware of the improvements they could make to their homes more often.
73. There are currently 2.6 million people looking to purchase a home using online comparison sites such as Rightmove or Zoopla^[3]. On these websites, there is a link to each property's EPC in the detailed listing of each individual property. However, there could be scope for including information from the EPC more prominently at earlier stages so that homeowners were able to easily compare the EPC bands of different properties. In the United States, two websites, RealEstate.com and Redfin have recently begun displaying energy ratings of properties more prominently on their listings pages.⁷⁴
74. When people go through the process of deciding what improvements to make to their homes more generally, there are various other sources of information they will draw on before making a decision^[4]. For example, when purchasing a new home, they might receive advice from an estate agent on what steps they could take to improve the value of their home once they buy it. When looking for further inspiration, they might be influenced by social media platforms such as Pinterest and Houzz. Later when deciding on specific improvements, they might listen to local tradespeople or seek advice from neighbours or community websites. To raise the awareness of the benefits of energy efficiency and increase the likelihood that people will consider

^[1] Energy Savings Trust, ESAS contact, <http://www.energysavingtrust.org.uk/about-us/contact-us>, viewed on 31 August 2017

^[2] Department for Communities and Local Government, [Improving the energy efficiency of our buildings](#), viewed on 31 August 2017

^[3] Estate Agent Today [The current state of play in the property portal market](#), viewed 23 August 2017

⁷⁴ Corvidae, Jacob and Gold, Rachel. [An MPG for Homes: Driving Visible Value for Home Energy Performance in Real Estate](#). Rocky Mountain Institute, 2017, viewed on 31 August 2017

^[4] UKERC, [Understanding Homeowners' Renovation Decisions: Findings of the VERD Project](#), viewed on 21 June 2017

energy efficiency measure alongside other home improvements, it will be necessary to work through these different intermediaries.

Current actions

75. In the Clean Growth Strategy, the Government set out its intention to develop a new **digital replacement for the Energy Savings Advice Service (ESAS)**. This tool will seek to draw together information from existing Government datasets to give consumers advice tailored to their property about potential energy efficiency improvements they could make to their home, signpost them clearly towards available support, and potentially link them with trusted installers in their area.
76. It could be possible to extend the requirement to obtain an EPC to other trigger points, such as where building work is being carried out. The Government will issue a Call for Evidence by spring 2018 seeking views in this area, as well as wider views on **how EPCs could be further improved**, in light of new sources of data and capabilities.

Potential further actions

77. Further **research** is needed on **how much individual energy efficiency measures can improve the value of homes**. This could include on-the-ground research of the impact on property values of the installation of measures, such as a comparison of pre and post valuations of homes that have had major measures like Solid Wall Insulation installed. The findings of this research could then be distributed to relevant intermediaries to help them make the case to homeowners to prioritise energy efficiency if they want to increase the value of their home. We would be interested in exploring with relevant stakeholders how to take this research forward.
78. In conjunction with some of the other actions highlighted above, some stakeholders have suggested that the Government could also work with others on a **targeted communications campaign** on strengthening the link between energy efficiency and wider renovation work. The aim would be to communicate the findings of some of the research highlighted above on the benefits of energy efficiency measures to trusted intermediaries who could steer homeowners towards considering energy efficiency alongside renovation works, whilst also promoting any additional incentives available to householders. As highlighted above, to be successful, the campaign would need to work through existing channels and intermediaries that influence people's decision-making for home renovation.
79. Further steps could be taken to improve the uptake and salience of EPCs. We will issue a Call for Evidence by spring 2018 seeking views on **additional trigger points** when an EPC could be required, as well as wider views on **how EPCs could be**

further improved, in light of new sources of data and capabilities. We would welcome ideas on this from stakeholders in advance of the Call for Evidence. In terms of salience and display of EPCs, we would be interested in exploring ways to ensure the information from **EPCs is displayed more prominently**. In particular we would be interested to hear from price comparison sites on whether their systems could accommodate showing the EPC bands of properties on the initial page of results that consumers see, thereby allowing them to compare the efficiency of properties at a glance.

Questions:

- 23) *What evidence do stakeholders have on the link between installing an energy efficiency measure and the value of property? What research could bolster this evidence base?*
- 24) *How could Government effectively deliver messages to promote energy efficiency through intermediaries and which are the most important intermediaries to target?*
- 25) *At which additional points could homeowners be required to have an EPC, and how could this improve their value and the awareness of potential energy efficiency improvements?*
- 26) *How could EPCs be displayed more prominently to prospective homebuyers at different stages of the home buying process?*

6 SUPPLY SIDE MEASURES

Creating the conditions so that those who derive value from energy efficiency can be key players in the market

Rationale

80. Energy efficiency brings value to a number of different market players, yet up until this point most of these have had only limited involvement in funding energy efficiency due to the barriers set out above. Some of the measures highlighted below, such as the move to more accurate measurement of energy savings, should support these players to invest in energy efficiency. But there are additional steps that could be taken to accelerate this process.
81. The **Distribution Network Operators (DNOs)** are responsible for maintaining the wires and substations that deliver electricity to people's homes. They also play an active role in managing the load on the network to ensure that it can handle periods of high demand for electricity from consumers. DNOs can benefit from energy efficiency as a reduction in demand, or more effective management of demand through demand side response and storage, can in some instances delay or entirely offset the need to invest in making upgrades to the network such as the replacement of substations.⁷⁵ Energy efficiency can also reduce line loss, and could theoretically offset the additional capacity required for connections for new customers. The contractual arrangements and business models of DNOs means they may be suited to delivering energy saving projects because unlike the energy suppliers, their profits are essentially decoupled from the volume of electricity they deliver and their contracts are agreed with Ofgem for long periods.
82. As regional monopolies, they could offer area-based electricity savings schemes to specific geographic areas and make savings from economies of scale. Their customers also do not 'switch' and so it would be much easier for DNOs to spread out the cost of measures with a long payback over many years. Furthermore, their long-term contracts mean that they may be able to borrow at lower costs than other industry actors, reducing the investment costs passed through to consumers. For these reasons, many DNOs across Europe, such as those in Denmark and Italy, are already obligated to deliver energy efficiency savings.
83. Although DNOs have incentives to carry out energy efficiency under their existing contractual arrangements, there are barriers to pursuing this such as uncertainty over savings delivered by energy efficiency, the lack of DNO experience in delivering

⁷⁵ UK Power Networks, '[Low carbon Networks Fund Bid](#)', 2013, viewed on 31 August 2017

projects, and an inability to monetise the additional benefits of energy efficiency that do not accrue to the DNO such as reduced generation costs.

84. The Government has commissioned an independent review of energy, led by Professor Dieter Helm CBE, which will report at the end of October. The review will cover the full supply chain of electricity generation, including distribution, and look at extending the scope of auctions and other competitive mechanisms.
85. **Mortgage lenders:** Around 9.24 million owner occupier households have mortgages on their properties (just under half of owner occupied homes)⁷⁶. Mortgage lenders have a significant financial stake in these properties and an interest in the quality and value of the asset. Energy bills are customers' highest regular outgoing after mortgage payments, and so the size of their bills has an impact on how much they can afford to borrow on a mortgage. Lenders are the most common source of finance for people making repairs to their homes, and therefore an important player in most homeowners' decisions about renovation to their homes.
86. Evidence from other countries such as the United States suggests that default rates tend to be lower for more efficient properties (although it can be difficult to untangle the role of the property from the homeowner in these calculations).⁷⁷ There is an opportunity for lenders to deepen their relationship with customers, reduce defaults due to high energy bills, and generate new lines of business by offering loans to homeowners to improve the efficiency of their homes when they are already planning home improvement.
87. **Other players:** The **Transmission Operators**, National Grid in England, and the **System Operator**, National Grid Electricity Transmission plc (NGET), can benefit from energy efficiency as energy efficiency can lead to less pressure on the network. The **Gas Distribution Networks** also benefit to some extent from encouraging energy efficiency to reduce the cost of delivering gas to homes. However, unlike DNOs, the GDNs do not face the same costs of maintaining a network of substations, and so their incentives are less clearly aligned with promoting energy efficiency. Warmer, less draughty homes can also lead to fewer cases of respiratory disease and other illnesses. This means that energy efficiency can help reduce the need for hospital visits and hence ease pressure on healthcare budgets. **Clinical Commissioning Groups and healthcare providers** therefore have an interest in energy efficiency too.

⁷⁶ Council of Mortgage Lenders, '[Key UK mortgage facts](#)', viewed on 12 September 2017

⁷⁷ UNC Centre for Community Capital, '[Home energy efficiency and mortgage risks](#)', viewed on 31 August 2017

CASE STUDY: Electricity Northwest prove the energy-saving potential of DNOs

Electricity Northwest's Power Saver Challenge was set up to encourage customers to reduce household energy consumption by making small changes and to make Electricity North West's infrastructure upgrades more sustainable in the long term. The project took place in Stockport where the electricity substation would soon need to be replaced due to increased demand. The company wanted to see if this upgrade could be delayed by reducing local families' electricity consumption. A community of around 1,000 homes were encouraged to take part in a four month challenge to see if they could reduce their electricity consumption by 10%.

The company encouraged people to take part in the challenge through a roadshow, partnering with community groups, social media, press activity and prize incentives. It carried out home energy audits, held regular advice workshops and set up a website with a community forum. Within 3 months, 60% of participating teams had saved their target of 10% electricity or more. The project therefore achieved a sustained 5% peak demand reduction (over two years) with a mix of simple measures (e.g. led bulbs, and shower timers) and behaviour change campaigns. Electricity North West concluded that if the Power Saver Challenge was scaled up to meet their entire customer base of 2.4 million properties, and received a take-up rate of 25% (as it did in this project), the result would be an energy saving of approximately 330kwh per property. This would be enough to power 60,000 homes for a year.

Current actions

DNOs

88. Under their current contract arrangements with Ofgem as set out in the RIIO model (Revenue=Incentives+Innovation+Outputs), DNOs are already incentivised to reduce their costs whilst delivering the same outputs; which could be done for example by carrying out energy efficiency or demand-side response projects. In these instances, DNOs keep a proportion of the savings, defined by their efficiency incentive rate (or Totex Incentive Mechanism) and must pass the rest on to their customers.⁷⁸ DNOs all get a set allowance for small innovation projects known as the Electricity Network Innovation Allowance (NIA). They are also able to apply for funding for innovative approaches to delivering energy efficiency from Ofgem's Electricity Network Innovation Competition (NIC), and previously through the Low Carbon Networks Fund (LCNF). A number of projects, including Scottish and Southern's Solent Achieving Value from Efficiency (SAVE)⁷⁹ and UK Power Network's Energywise⁸⁰, are already

⁷⁸ OFGEM, '[Guide to the RIIO-ED1 electricity distribution price control](#)', 2017, viewed on 31 August 2017

⁷⁹ Scottish and Southern Electricity Networks, <https://www.ssepd.co.uk/save/>, viewed on 31 August 2017

⁸⁰ UK Power Networks, <http://innovation.ukpowernetworks.co.uk/innovation/en/Projects/tier-2-projects/Energywise/>, viewed on 31 August 2017

testing the potential of DNOs to deliver cost-effective energy savings through energy efficiency and demand-side response. However, there are few ‘behind the meter’ (end-use) energy efficiency focussed projects outside of these innovation schemes.

89. The Government recently released its Smart Systems Plan⁸¹, which set out a range of policies for delivering a smarter energy system. It included plans to assist DNOs to become more active in managing their networks as a system - implementing innovative techniques and exploring market-based solutions as alternatives to network reinforcement. This mode of operation would see the DNOs operating more akin to distribution system operators (DSOs) and means that if storage, demand-side response, heat networks, energy efficiency or other actions can deliver better value to consumers than traditional reinforcement, the proposals would better facilitate these solutions.

Lenders

90. There has already been some work on the link between energy efficiency and mortgage lending through the LENDERS project.⁸² The research project investigated the link between energy costs, affordability assessments and borrowing. It created a formula for estimating a homeowner’s energy costs by using information from their publicly available Energy Performance Certificate (EPC) and occupancy details such as the amount of residents. If lenders were to adopt this methodology in their affordability calculations, it would mean that prospective homeowners would be able to borrow more on more efficient properties and less for less efficient properties.

91. The Bank of England has been conducting research to understand the extent to which mortgage lenders are exposed to the physical risks of climate change, such as flooding damage to property, and the transition risks of the shift to a low carbon economy, such as the repricing of more carbon intensive assets including energy efficient homes due to regulatory action being taken by Government in the future. This research suggests that some banks are exposed to a greater risk during the transition to low carbon economy because they hold more inefficient properties on their loan books.

92. The European Mortgage Federation and the European Covered Bond Council are currently running a project, the Energy efficient Mortgages Action Plan (EeMAP), that is aiming to develop a standardised energy efficient mortgage product across Europe based on the idea that more efficient homes have a lower risk of default to lower bills

⁸¹ LENDERS project, [Improving energy costs in mortgages, promoting energy efficiency in homes](#), 2017, viewed on 7 September 2017

⁸² LENDERS project, [Improving energy costs in mortgages, promoting energy efficiency in homes](#), 2017, viewed on 7 September 2017

and are more valuable than less efficient properties.⁸³ A key difference with the LENDERS project is that this tries to justify lower interest rate products for more efficient homes based on their lower risk of default, whereas the LENDERS project aims to extend additional credit to more efficient homes, which could in itself alter any differential default rate between more and less efficient properties.

Clinical Commissioning Groups/ healthcare providers

93. A number of Local Authority healthcare providers and other organisations have trialled methods for prioritising energy efficiency projects for those at risk of health problems and for leveraging funding for these projects. For example, the Fuel Poverty health booster fund⁸⁴, and the Fuel Poverty Health and Innovation Programme (delivered by the NEA using fines levied on suppliers for failing to meet past energy efficiency obligations), have both explored methods for linking energy efficiency to health outcomes, including GP referrals for energy efficiency improvements for draughty homes.

Potential Further Actions

94. The Government intends to carry out an analysis of the benefits of energy efficiency in the UK, drawing on methodology set out by the International Energy Agency, to gain a clearer understanding of where the greatest potential sources of value are that we should focus on unlocking.

DNOs

95. In the long-term, other solutions could be explored to help encourage DNOs to deliver additional energy savings, taking into consideration the findings of Professor Helm's independent review on energy savings.

96. Some stakeholders have suggested that one option would be to require DNOs to move towards a system of competitively auctioning for different solutions including storage, demand-side response and energy efficiency, to deal with network constraint issues.

97. Another option suggested by stakeholders⁸⁵ would be to provide specific incentives or requirements on DNOs to deliver energy reductions beyond those that are currently in the RIIO framework. These could be tied to DNOs being able to demonstrate actual, metered rather than estimated savings which would incentivise high quality interventions, and increase the likelihood that additional funding and investment could

⁸³ European Mortgage Foundation and European Covered Bond Council, EEMAP Energy Efficient Mortgages Action Plan, <http://energyefficientmortgages.eu/> viewed on 31 August 2017

⁸⁴ DECC, [The Fuel Poverty and Health Booster Fund, March 2015](#), viewed 29 August 2017

⁸⁵ The Regulatory Assistance Project (RAP), Efficiency First: Reinventing the UK's Energy System, in press.

be leveraged from other sources. It would also help to build up a rich dataset on how effective different interventions are, and help move the market towards a model based on paying for actual savings.

98. Any incentives or requirements could be aligned with other objectives resulting in greater grid stability. For example, they could be focused on properties off the gas grid, which will need a high level of insulation to be suitable for low-carbon heating solutions like heat pumps in the future. Separately, incentives or requirements could also be extended to GDNs where appropriate within license conditions.

Lenders

99. Building on the findings of the LENDERS project, Government would hope to see lenders swiftly adopt a methodology in their affordability assessments for prospective homeowners that more accurately takes into account the energy efficiency of a property. This in turn would make more efficient properties more attractive for homeowners.

100. A follow up to the Lenders project could look at **how mortgage default rates vary with the efficiency of home**, building on a similar study carried out in United States.⁸⁶ Such a project would likely again need to bring together Lenders and other partners such as credit reporting agencies.

101. Lenders could use the recently released EPC register to run analysis and could be required to **publish data on the average efficiency rating** of all the properties they currently lend to. They could also detail how much investment in energy efficiency they have driven amongst homeowners, which would provide a basis for comparison between different lenders and encourage a greater consideration of energy efficiency amongst lenders.

102. Lenders could also offer '**Green Mortgages**', meaning a preferential mortgage product for more efficient homes, which in turn could influence the value of the home and provide an incentive to other homeowners to improve the efficiency of their own homes in order to receive a 'green mortgage'. This could take the form of a reduced interest rate for more efficient homes. This could be justified if a link between these properties and lower defaults was proven.

103. Alternatively green mortgages could include, as mentioned before, a 'conditional mortgage' offered on the basis that a homeowner carries out certain energy efficiency

⁸⁶ UNC Centre for Community Capital, '[Home energy efficiency and mortgage risks](#)', 2013, viewed on 31 August 2017

improvements to a property.⁸⁷ The preferential rates might stem from the lower default rate of more efficient properties, or could receive additional underwriting from Government. This could be tested using a sandbox allowance from the Financial Conduct Authority, which is used to waive financial regulation temporarily to allow the testing of new financial products.⁸⁸

104. Beyond this lenders could commit to **a voluntary target** to improve the average energy efficiency of the properties they lend to. For example, lenders could commit to improve the average score of their properties by 10 EPC points within 10 years. These targets could then be achieved through the use of the mechanisms and incentives mentioned above, including preferential lending ideas for more efficient properties, and the provision of finance ideas for making energy efficiency improvements. Government could then review progress to decide if further action was required to ensure a level playing field.

Questions:

27) *Have we captured all the main sources of additional value of energy efficiency?*

28) *What other ways could we seek to monetise the benefits of energy efficiency?*

29) *How could both Distribution Network Operators (DNOs) and Gas Distribution Network (GDNs) be incentivised or required to deliver energy efficiency savings?*

30) *Do current market arrangements allow for DNOs and GDNs to fully realise the potential of energy efficiency savings? If not, what needs to change?*

31) *What are mortgage lenders' plans for improving the way they factor energy efficiency into lending decisions?*

32) *What support would lenders need in order to be able to commit to a voluntary target for improving the average energy efficiency of the properties they lend to?*

33) *How can lenders develop a more accurate model of fuel bill savings, and would they be willing to lend 'green mortgages' on this basis?*

34) *What other changes would encourage lenders to offer more 'Green Mortgage' products?*

⁸⁷ European Mortgage Foundation and European Covered Bond Council, EEMAP Energy Efficient Mortgages Action Plan, <http://energyefficientmortgages.eu/>, viewed on 31 August 2017

⁸⁸ Financial Conduct Authority, [Regulatory Sandbox](#), viewed on 31 August 2017

Enabling innovative energy efficiency products and services

Rationale

105. As highlighted above, many of the barriers to take-up of energy efficiency measures – in particular solid wall insulation and deeper whole house retrofit, centre on the hassle of installation, the lack of certainty around savings, and the cost of the measures. There is a strong case for supporting innovation to bring new technologies, installation approaches, and business models for retrofit to market.
106. There are already some promising potential ideas for the future both in terms of technologies and business models. There are products that already exist that, it is claimed by their manufacturers, can deliver a substantial proportion of the savings of traditional measures at a fraction of the cost and installation time, such as ‘thin wall’ internal insulation. These products could be appealing to homeowners looking to improve the thermal efficiency of their homes but who would be unwilling or unable to undertake lengthy retrofit projects. Whilst in the Netherlands, ‘Energiesprong’ has delivered whole-house retrofits that include kitchen upgrades and bring a house down to zero emissions.⁸⁹
107. Recent research published by BEIS also suggests that there are potential new technologies and methods of installation that could bring down the cost installing solid wall insulation.⁹⁰ There is also potential for new business models that deliver guaranteed savings for particular measures using real-time performance data, thereby increasing the possibility of outside investment.
108. We are aware that many ‘thin wall insulation’ products are unlikely to be compliant with part L of the building regulations, which state that when any alterations are made to the walls of a property, they must be improved to a thermal efficiency (U) value of 0.3 W K⁻¹ m⁻², where this is technically, economically and practically feasible as well as safe. So at present, many of these products might not have a viable route to market.
109. Most of the Government’s current subsidy schemes for energy efficiency are currently based on modelled or ‘deemed’ savings for energy efficiency measures, based on modelled savings produced by the Standard Assessment Procedure (SAP) that underlies Energy Performance Certificate calculations. The Energy Company Obligation (ECO) allows for ‘alternative methodology’ for measures that cannot currently be scored using SAP. However, to date, no new technologies have become eligible for the scheme through this route.

⁸⁹ [Energiesprong UK](#) website (viewed on 31 August 2017)

⁹⁰ Cambridge Architectural Research Ltd, Internal Wall Insulation: Best Practice and Innovation, 2017 (in press)

110. There could be a role for Government in providing direct financial support for innovative new technologies, and also in ensuring current Government regulations and programmes do not themselves stifle innovation and provide a route to market for new technologies.

Current actions

111. The Government is launching **a research project** into the performance of various types of ‘thin wall insulation’ products that will gather evidence over the coming of winter on the thermal performance, moisture control and safety of these technologies. This will help set a benchmark on what performance can currently be expected from these products. Depending on the outcome of this study, further research projects could be launched on other emerging technologies.

112. In the Clean Growth Strategy, the Government announced the launch of a **£10 million thermal efficiency innovation fund**. This fund covers new approaches to installation of measures that reduce cost, avoid unintended consequences and improve the desirability of measures. Grants of up to £2 million will be awarded. Depending on the success of the calls for projects, further funding could be allocated.

Potential further actions

113. Under the Energy Performance of Buildings Directive, the Government cannot make any changes to the $0.3 \text{ W K}^{-1} \text{ m}^{-2}$ minimum requirement for improving walls as this is the ‘cost-optimal’ level for making improvements. However, we would welcome evidence from stakeholders of instances where they feel that meeting the $0.3 \text{ W K}^{-1} \text{ m}^{-2}$ value for homes is not ‘technically, economically and practically feasible’, and where cheaper, less intrusive thin wall insulation products might be the only viable option. We would also welcome **suggestions on how these products could be made to be compliant with building regulations in the future**, and what could Government do to support this.

114. As part of the future Energy Company Obligation from 2018 to 2022, the Government could **allow a small proportion of the scheme spend to be allocated to new, innovative measures or performance based on results**. For example, new measures could receive an up-front ‘deemed score’ on the basis of energy savings demonstrated by the manufacturer of the product, which could then be verified by measurement of actual performance in homes. Or suppliers could be allowed to deliver part of their obligation purely based on demonstrated meter savings rather than using deemed scores at all. Both these options would provide a quicker route to market for technologies that could deliver energy savings that struggle to obtain a score under the current SAP methodology. It would also begin to build up a further evidence of the actual performance of energy efficiency measures, and could increase

the chance of match-funding for projects from actors more concerned with having accurate energy savings, such as DNOs.

Questions:

35) How could thinner, less intrusive insulation products be made to be compliant with building regulations?

36) Are there any ways that current regulations are preventing innovative energy efficiency products and services coming to market?

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

Improving data to open up market for investment

Rationale

115. Projects such as the Investor Confidence Project and the Energy Efficiency Financial Institutions Group's Energy Efficiency DEEP project (De-risking Energy Efficiency Platform) seek to overcome barriers to investment through standardisation of the way energy efficiency projects are developed, documented and measured with open-sourcing of data for benchmarking.
116. Further to this, a move towards more accurate measurement of the actual thermal performance of buildings and energy efficiency improvements and away from a reliance on modelled or estimated energy use could address many of the barriers to investment in energy efficiency. Data about actual rather than modelled energy requirements would give groups like lenders and DNOs much more confidence in the degree to which energy use and costs would go down when energy efficiency improvements are made. By measuring actual improvements achieved it could potentially also improve the quality of installations and encourage solutions tailored to an individual property's needs. This could also lead to new business models offering guaranteed savings for consumers from measures with performance contracts being offered on retrofit projects.
117. The state of California has passed legislation requiring its residential energy efficiency programs to be based on payment for actual energy saved rather than modelled savings.⁹¹ This approach is based on the availability of detailed energy consumption data. The changes were only recently introduced so it is too early to analyse their impact, although the utility Pacific Gas and Electricity Company (PGE) has already launched a residential pay for performance programme.⁹² As outlined above, similar approaches could be trialled within ECO.
118. A number of potential technologies could theoretically be used for establishing a baseline of thermal performance and improvements due to energy efficiency improvements, such as combination of smart meters and temperature sensors, or smart heating controls. Scoping work has been carried out to consider the potential for smart metering to support such measurement⁹³. However, these have not been tested for this purpose on a broader scale in the UK.

Current actions

⁹¹ [Energy Incentive Programs California](#) (viewed on 31 August 2017)

⁹² Pacific Gas and Electric Company, [Submission of High Opportunity Projects and Programs \(HOPPs\) Proposal](#), 2016, (viewed on 31 August 2017)

⁹³ BEIS and TEDDINET, [Smart Metering-based Innovation and Building Performance, 2016, \(viewed on August 2017\)](#)

119. In 2018, the Government intends to launch a two year research project to develop a new methodology for measuring the actual thermal performance of buildings using a combination of smart meter data and other sensor data. This project could result in the development of a '**virtual EPC**' generated without the need for an assessor visit, giving a more accurate reflection of a building's performance than the current SAP methodology. This would enable consumers to accurately compare their energy use for heating with similar homes, and provide information on how to use their heating system and improve the fabric of their homes to reduce consumption. It could also lead to improved quality of installation, more tailored to individual households, and greater investment in energy efficiency.

120. One of the recommendations of the 'Each Home Counts' review⁹⁴ was for industry and Government to develop a 'data warehouse' that will hold all relevant information on a property including past measures installed, property characteristics and other Government-held data. This information could be combined with 'virtual EPC' data to provide more detailed advice on the characteristics and best approach for retrofitting a home. Where data is being held, shared or used, customer privacy must be paramount at all times and security and privacy arrangements will need to be a primary consideration in the design of any such mechanism.

Potential further actions

121. The Government has previously worked with stakeholders to make the National Energy Efficiency Database⁹⁵, which contains information on householders metered energy use and all past energy efficiency improvements, available to researchers for specific projects such as the LENDERS project⁹⁶. We would be interested in exploring with stakeholders additional ways to make this and other datasets easier for researchers working on energy efficiency in the future, whilst still protecting consumer data and privacy.

Questions

38) *Are there other ways that Government could help improve access to data energy efficiency and performance of homes for research purposes?*

39) *What would be the impact on the market and investment in energy efficiency of the availability of better data on the actual performance of homes?*

⁹⁴ BEIS/DCLG, [Each Home Counts: Review of Consumer Advice, Protection, Standards and Enforcement for Energy Efficiency and Renewable Energy](#), (December 2016), viewed 29 August 2017)

⁹⁵ Department for Business, Energy & Industrial Strategy, [National Energy Efficiency Data-Framework](#) (NEED) viewed on 7 September 2017

⁹⁶ LENDERS project, [Improving energy costs in mortgages, promoting energy efficiency in homes](#), (viewed on 7 September 2017)

Improving supply chain capability

Rationale

122. As mentioned already, in some areas we understand that the skills might not exist to deliver high-quality retrofit projects. Our evidence suggests that the existing routes for upskilling and training for builders are largely through their personal networks, through training and advice provided by manufacturers and suppliers of products like insulation products, and through online forums.⁹⁷
123. We have also seen evidence that, for more complex retrofit projects, including whole house retrofit programs, dedicated funding set aside for project coordination (particularly at the design stage of projects), quality assurance, trades matching and high-skilled technical support can lead to cost-savings.⁹⁸ It can also lead to higher quality installations and a better customer journey.⁹⁹

Current actions

124. The 'Each Home Counts' review and subsequent implementation is aiming to address issues of quality and standards. Each Home Counts was an independent review led by Dr Peter Bonfield (BRE) focusing on Consumer Advice, Protection, Standards and Enforcement for UK home energy efficiency and renewable energy measures. The report was published on 16 December 2016. The Review has moved to an implementation phase being led by industry. It has the support of Government but the recommendations have been made by industry and it is for industry to take them forward.
125. The key recommendation proposed by the Review is to establish a quality mark for all energy efficiency and renewable energy measures, and for companies operating in this sector. This approach is to be underpinned by strong standards and enforcement, including a Code of Conduct, Consumer Charter and Codes of Practice for those wishing to use the quality mark. The implementation of the recommendations provides an opportunity to place the sector on a more robust footing and create a sustainable future where demand for products is maintained and enhanced.

Potential further actions

⁹⁷ Catrin Maby & Alice Owens (2015) *Installer Power: The key to unlocking low carbon retrofit in private housing*

⁹⁸ Dr Peter Bonfield, [Each Home Counts: review of consumer advice, protection, standards and enforcement for energy efficiency and renewable energy](#), viewed on 31 August 2017

⁹⁹ Carbon Co-Op, ['People Powered not Fossil Fuelled'](#) viewed on 30 August 2017

126. The first priority for the new online replacement for the **Energy Savings Advice service** will be to provide consumers with tailored advice to help them improve the energy efficiency of their home and save energy. However, we would be interested in hearing from stakeholders on whether and how the service could also play a role supporting installers.

127. If the Government launched any of the demand-led price finance offers or price signals listed above, it could also explore the potential of allocating additional programme funding to third-party organisations to **provide support for local supply chain growth and coordination**. This could cover training, project coordination, trades matching etc. We believe a strong case would need to be made that this would be necessary and would lead to additional retrofit measures.

Questions:

40) Would the supply chain benefit from having a feature in the new Energy Savings Advice service for installers to share best practice and access a repository of advice?

41) Would funding for local supply chain growth and coordination lead to additional retrofit measures?

42) Is there anything else that central Government could do to support local retrofit supply chain growth and to support builders to carry out retrofit projects?

Catalogue of consultation questions

State of the market

1.	What information do you have on current rates of delivery of measures outside of Government programmes, including through DIY etc?
2.	What information do you have on the remaining potential for energy efficiency improvements and what savings could be expected from these measures?
3.	Do you agree with our assessment of the current market for energy efficiency amongst owner occupiers, including the trigger points and supply chain relationships?
4.	Do you agree that it makes sense to prioritise those groups most likely to be open to investing in energy efficiency? And do you agree with our assessment of who those groups are most likely to be?

Barriers to market growth

5.	Do you agree with our assessment of the current barriers to market growth?
6.	Are there other barriers that you think we should be addressing?
7.	Do you think there are any other important lessons to learn from past attempts to stimulate the market?
8.	Are there other international examples we could learn from?
9.	Are there any barriers preventing business models for energy efficiency that have developed in other countries from also developing in the UK?

Proposed approach

10.	Do you agree with the set of proposed principles for guiding our approach?
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| 11. | Do you agree that the policy areas we have set out are the correct ones? |
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Developing new ways for financing energy efficiency

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| 12. | Which of the fiscal levers described here would drive the greatest consumer demand? |
| 13. | Is there evidence to suggest that any other fiscal levers not described here could drive consumer demand? |
| 14. | What would be the profile of homeowners likely to take up these different incentives? |
| 15. | How could these incentives be designed to deliver the best value for money for Government and best savings for consumers? |
| 16. | What barriers, regulatory or otherwise, exist to financial institutions developing any of these products or incentives themselves? |
| 17. | How could Government assist financial institutions with a retail presence, local authorities and other actors to run trials of these ideas? |
| 18. | How could we ensure that any trials would lead to the development a self-sustaining market for support? |

Price signals to encourage homeowners to prioritise energy efficiency

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| 19. | What price signals would best drive uptake of energy efficiency measures? |
| 20. | What would be the impact on the housing market of such price signals? |
| 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? |
| 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? |

Improving awareness of energy efficiency products and technologies, their benefits and advice to consumers

23.	What evidence do stakeholders have on the link between installing an energy efficiency measure and the value of property? What research could bolster this evidence base?
24.	How could Government effectively deliver messages to promote energy efficiency through intermediaries and which are the most important intermediaries to target?
25.	At which additional points could homeowners be required to have an EPC, and how could this improve their value and the awareness of potential energy efficiency improvements?
26.	How could EPCs be displayed more prominently to prospective homebuyers at different stages of the home buying process?

Creating the conditions so that those who derive value from energy efficiency can be key players in the market

27.	Have we captured all the main sources of additional value of energy efficiency?
28.	What other ways could we seek to monetise the benefits of energy efficiency?
29.	How could both Distribution Network Operators (DNOs) and Gas Distribution Networks (GDNs) be incentivised or required to deliver energy efficiency savings?
30.	Do current market arrangements allow for DNOs and GDNs to fully realise the potential of energy efficiency savings? If not, what needs to change?
31.	What are mortgage lenders' plans for improving the way they factor energy efficiency into lending decisions?
32.	What support would lenders need in order to be able to commit to a voluntary target for improving the average energy efficiency of the properties they lend to?

33.	How can lenders develop a more accurate model of fuel bill savings, and would they be willing to lend 'green mortgages' on this basis?
34.	What other changes would encourage lenders to offer more 'Green Mortgage' products?

Enabling innovative energy efficiency products and services

35.	How could thinner, less intrusive insulation products be made to be compliant with building regulations?
36.	Are there any ways that current regulations are preventing innovative energy efficiency products and services coming to market?
37.	What changes should be made to the Energy Company Obligation to ensure that it supports the development of innovative energy products and services?

Improving data to open up the market for investment

38.	Are there other ways that Government could help improve access to data on energy efficiency and performance of homes for research purposes?
39.	What would be the impact on the market and investment in energy efficiency of the availability of better data on the actual performance of homes?

Improving supply chain capability

40.	Would the supply chain benefit from having a feature in the new Energy Savings Advice service for installers to share best practice and access a repository of advice?
41.	Would funding for local supply chain growth and coordination lead to additional retrofit measures?
42.	Is there anything else that central Government could do to support local retrofit supply chain growth and to support builders to carry out retrofit projects?

7 NEXT STEPS

128. Once the Government has analysed responses to this call for evidence, we will publish our response to these in 2018. Some of the ideas set out in this call for evidence could be implemented relatively quickly, whilst others would require more comprehensive changes and the ideas will require further development and consultation. The intention therefore is that this response will lay out a programme of work for the years to come.

