

Think Tank
of the Year
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Warm homes

Delivering energy efficiency improvements in the UK

Executive Summary

Each year around £1.25 billion is spent on a variety of Government schemes and grants intended to improve energy efficiency. Yet, the basic energy efficiency measures that everyone agrees need to be rolled out around the country, such as loft and ceiling insulation, draught proofing, hot-water tank insulation and double glazing, are far from ubiquitous. Only 22.5% of homes without loft insulation and 34% of homes without cavity wall insulation will have had such insulation installed under current Government plans¹. This will leave 14.3 million homes out of 25 million in the UK without one or both of these simple and cost effective energy efficiency measures².

The case for sorting this problem out quickly is overwhelming. Not only will basic energy efficiency measures significantly reduce greenhouse gas emissions, they can reduce energy bills for households that have them by over one-third. Given these significant benefits, it is essential that a strategy to do this quickly is developed.

Government efforts to date have been slow and expensive because they are too complicated to administer and have had to be applied for on a household-by-household basis, with those that do wish to upgrade required to cover a large part of the upfront costs. This has resulted in millions of homes not applying for the grants to which they are eligible and those unable to find the cash for upfront installation costs being excluded. In addition, such a variety of organisations are responsible for the delivery of energy efficiency improvements, including the Warm Front Scheme and the Energy Saving Trust, that effective joined up action is prevented and the costs of bureaucracy increased.

To quickly install basic energy efficiency measures in every household that needs them, the structures of energy efficiency finance and delivery have to change. In order to do this, we recommend the following:

- **The Carbon Emissions Reduction Target (CERT) should be abolished and replaced with a new Energy Efficiency Fund (EEF) of equal value (approximately £35 per household per annum) collected through energy bills from each household.** This would be much simpler to administer than CERT and would *not* increase anyone's energy bill. National Grid plc would collect the new EEF, in the same way that it already collects the Transmission Use of Systems (TUoS) charge from every household.³

- **At a minimum, every home in Britain should have cavity wall insulation, loft insulation, hot-water tank insulation, be draught proofed and have double glazing (with a C rating) by 2014.** This would reduce total energy bills by £84.6 billion and the average bill by £314 per annum. It would reduce greenhouse gas emissions from the UK building stock by 200 million tonnes in total (7.6% per annum) from 2006 levels. The total cost of this programme (£10 billion) would be funded by the EEF over 20 years, starting in 2009. To deliver basic energy efficiency measures nationwide by 2014, National Grid plc⁴ would use the money from the EEF to issue corporate bonds and frontload investment. After the bonds have been paid back, the EEF would be abolished, reducing energy bills by a further £51 in 2029. As a result of these policies, in 2014 annual energy bills will have fallen by an average of 35% for every household. By 2029 they would have fallen by a further 11.5%.
- **Investment in energy efficiency should be channelled through local energy service companies.** National Grid plc would deliver the installation of these energy efficiency measures through local energy service companies. This could create the opportunity to re-skill 558,000 workers. Where possible, lagging, glazing and other measures would be purchased centrally to benefit from economies of scale and cost savings.
- **Installing basic energy efficiency measures in every home should be as convenient for people as possible.** The installation of basic energy efficiency measures should be done in a way to minimise inconvenience. Households would be automatically opted in to the scheme but would have the option of opting out. People would not have to complete cumbersome applications to receive the benefits of the energy efficiency roll-out.
- **The poorest households and communities would receive the installation of basic energy efficiency measures first.** The poorest communities and households should have priority and be the first to receive reduced energy bills. This can be done relatively easily, by targeting investment using the income and social welfare statistics collected by energy suppliers and Local Authorities.
- **Energy supply companies should offer financing packages to customers who want to improve the energy efficiency of their homes further.** In tandem with the programme of investment proposed here, energy supply companies must be made to diversify their businesses by offering customers financing packages that would allow the installation of more advanced energy efficiency measures, such as heat pumps, solar PV, and Micro CHP. The cost of these advanced energy efficiency measures could be recouped through the savings on energy bills.
- **The Warm Front Scheme, which on average costs £323 million per annum, should be abolished.** The Scheme was created to help improve energy efficiency in the poorest households by offsetting some of the installation costs. The strategy recommended here would make the Warm Front Scheme redundant. It could therefore be abolished, saving approximately £3.55 billion by 2020.
- **The Energy Saving Trust, which on average costs £74.5 million per annum, should be abolished.** The strategy recommended here would make many of the activities of the Energy Saving Trust redundant. It could therefore be abolished, saving approximately £819.5 million by 2020. The *Energy Saving Recommended* label would be given to the Carbon Trust to administer or incorporate with its own labelling schemes.

Introduction

It is often said that the “low hanging fruit” of climate change mitigation is improving energy efficiency. There is much truth in this, as energy efficiency measures can significantly reduce greenhouse gas emissions and pay for themselves through reduced energy bills, whilst also reducing demand for insecure supplies of energy, such as Russian gas. According to McKinsey, energy efficiency measures yield the cheapest emission reductions of any carbon abatement option, they are “better than free”⁵.

Even with the urgency of climate change and the obvious financial benefits, delivering energy efficiency improvements in the UK’s existing housing stock has been slow. This is despite the fact that each year around £1.25 billion⁶ is spent on a variety of Government schemes and grants intended to improve it.

The barriers that prevent households installing energy efficiency measures are well known. These relate to a lack of access to capital, pay back periods that are often too long, a poor understanding of the benefits involved and also the fact that households have to be proactive to improve their energy efficiency—simply, there is too much inertia.

Energy efficiency policies need to be designed to tackle each one of these barriers. So far, Government efforts have failed to do this. Cumbersome application procedures make it harder for people to overcome inertia, whilst having to pay a large part of upfront costs prevents the poorest from benefiting. There has been some success in increasing awareness of the issue, but installing energy efficiency measures is still too difficult for millions of people.

If the recommendations in this Research Note are implemented, every home in the country could be fitted out with loft insulation, cavity wall insulation, double glazing, hot-water tank insulation and draught proofing by 2014.

Current policy

There are a variety of Government schemes and grants intended to improve energy efficiency. By far the largest such scheme is the Carbon Emissions Reduction Target (CERT), an obligation on energy suppliers to achieve targets for promoting reductions in carbon emissions in the household sector. CERT costs every household about £35 per annum. This translates into £875 million on average in total each year⁷. The scheme, collected directly through energy bills, accounts for around 70% of expenditure in this area. Government also spends on average £323 million per annum on the Warm Front Scheme⁸, which distributes grants of up to £2,700⁹ for energy efficiency measures for those on the lowest incomes¹⁰. In addition, the Government provides grants to fund the activities of the Energy Saving Trust, which together cost about £74.5 million annually¹¹.

The Climate Change Programme Review stated that in 2004 domestic housing accounted for approximately 27% of the total UK carbon emissions and that carbon emissions from this sector had fallen by only 2% below 1990 levels¹². To improve this performance, Government has put more funds in place through CERT, the Warm Front Scheme and the Energy Saving Trust to reduce emissions from the housing sector. The Government now aims to reduce emissions from the housing stock by around 16% below 1990 levels by 2010.

The existing CERT, Warm Front Scheme and Energy Saving Trust structure has, however, received criticism for a variety of reasons. The National Audit Office stated in 2003 that the Warm Front Scheme had failed to reach the poorest and least energy efficient homes and that part of the reason for this failure was an overly complicated application process and high upfront costs for eligible households¹³. The National Audit Office has also criticized the general approach of Government policy, which often focuses on building regulations and fails to adequately reduce the barriers to energy efficiency improvements in the existing housing stock¹⁴. This is a serious concern, as new homes add less than 1% to the housing stock each year¹⁵.

The other case for change in this policy area is that there is too much duplication with a variety of organisations having responsibility for delivering the same policy objectives¹⁶. Not only is there CERT, the Warm Front Scheme, and the Energy Savings Trust, but other organisations like Ofgem and the Carbon Trust share many of the same objectives. We also have targets, like the Government’s target to eradicate fuel poverty by 2010, which fails to address the underlying problem (energy efficiency) and as a result, confuses Government strategy¹⁷.

A fresh approach

The twin challenges of climate change and energy security, mean that more must be done to reduce emissions from the housing sector. Two things should occur in tandem if significant energy efficiency improvements are to be realized. First, basic energy efficiency measures, such as cavity wall insulation and double glazing, need to be installed in every home as soon as possible. Second, more advanced energy efficiency measures, such as heat pumps, solar PV, and micro CHP, need to be progressively introduced by energy service companies offering packages to customers. Both are part of a cost-effective strategy to reduce domestic emissions, but will require a transformation in the way Government delivers energy efficiency policy.

In this Research Note, given the significant benefits of doing so, we focus primarily on how to rapidly install basic energy efficiency measures throughout the UK. We define these as loft insulation, cavity wall insulation, double glazing (C rated), hot-water tank insulation and draught proofing.

The potential

The UK has some of the lowest levels of energy efficiency in Europe and there is significant potential to improve on our existing levels¹⁸. Based on the number of homes without basic energy efficiency measures, as well as the average costs and savings, the following table provides an overview of the benefits and costs associated with installing basic energy efficiency measures in every home that does not have them.

Table 1: Basic energy efficiency package: estimated costs, savings and emission reductions¹⁹

Package	Average cost per household (£)	Average energy bill saving per household (£/yr)	Total cost to fit to all houses that do not have measures by 2014 (million £)	Total CO ₂ e saved per home per year (kg/yr)	Total CO ₂ e saved (Mt/yr)	Reduction in annual housing sector CO ₂ e emissions from 2006 levels (%)
Installing the following measures in all homes that do not have them: Cavity wall insulation, loft insulation up to 270 mm, draught proofing, hot-water tank insulation and glazing to C rated.	907	314	10,000 ²⁰	765	7.29	7.59

The implementation of this package of energy efficiency measures would also create the opportunity to re-skill existing workers in the economy²¹. The number of workers who could benefit from this energy efficiency installation programme is 558,000²².

Finance and Delivery

The benefits of rolling out energy efficiency measures in the existing housing stock are clear, but how could they be delivered and how can the upfront costs be secured?

The first step must be to transform the existing delivery framework into a simpler and more cost effective one. This would mean abolishing CERT, the Warm Front Scheme, and the Energy Saving Trust. The Warm Front Scheme and the Energy Saving Trust would lose their *raison d'être* with the implementation of the energy efficiency package proposed here. Their abolition would save around £400 million a year or £4.4 billion for taxpayers by 2020. The *Energy Saving Recommended* label would be given to the Carbon Trust to administer or incorporate with its own labelling schemes.

CERT would be replaced with a new Energy Efficiency Fund (EEF) of equal value. This would yield the same amount of money as CERT: on average £35 per household per year or £875 million annually²³. It would be much simpler to administer than CERT and would *not* increase anyone's energy bill. National Grid plc would collect the new EEF, in the same way it already collects the Transmission Use of Systems (TUoS) charge from every household. The EEF would be adjusted annually in line with inflation.

To raise the £10 billion for energy efficiency measures for roll-out by 2014, National Grid plc would use the money from the EEF to issue corporate bonds and frontload investment in energy efficiency²⁴. The bonds would be issued from 2009 and paid back in 20 years by 2029. At this point the EEF would be abolished, reducing household energy bills further. The Government would have no liability and this would not increase Government debt.

National Grid plc using the funds raised from its bond issue would then deliver the installation of energy efficiency measures through local energy service companies. Where possible, National Grid plc would take advantage of economies of scale and bulk buying to lower the costs of delivery. The savings from this have been estimated to be 10%. Delivering through local energy service companies would help to roll-out energy efficiency measures rapidly, utilise existing businesses and provide the opportunity to re-skill 558,000 workers²⁵.

One key aspect of the 5 year roll-out of energy efficiency measures proposed here is that the poorest communities and households should have priority and would have measures installed first. This can be done relatively easily, by targeting investment using the income and social welfare statistics collected by energy suppliers and Local Authorities.

The installation of these energy efficiency measures would be done in such a way as to minimise inconvenience. Households would be automatically opted into the scheme, but would have the option of opting out. This would mean that households would not have to complete cumbersome applications to receive the benefits of the roll-out.

The roll-out of energy efficiency measures could also be combined with Energy Performance Certificate (EPC) assessments. Every home assessed could receive a free EPC. This would provide households with information about how to further improve their energy efficiency. The EPC also forms part of the mandatory Home Information Pack (HIP) introduced in the 2004 Housing Bill for residential homes marketed for sale in England and Wales.

To ensure that National Grid plc delivered the roll-out by 2014 in the manner outlined above, Ofgem (the current regulator of National Grid plc) would be given the task of monitoring and enforcing delivery. Elsewhere we have proposed that an Energy Agency should subsume the role of Ofgem, so this successor would obtain these responsibilities²⁶.

Conclusion

To overcome the barriers that have prevented the installation of essential energy efficiency measures in the UK, we need a break with existing policy. Grasping one of the most important low hanging fruits of climate change mitigation will require overcoming significant inertia.

If our recommendations are adopted, by 2014 every home in Britain will have a good level of energy efficiency, delivered through loft insulation, cavity wall insulation, double glazing (to C rated), hot-water tank insulation and draught proofing. This could be delivered quickly and to the poorest first, whilst promoting the businesses and skills needed to transition Britain to a low carbon economy.

Our recommendations would save £84.6 billion or 35% off the nation's energy bills, save the taxpayer £4.4 billion, reduce unnecessary bureaucracy, and reduce annual emissions from the housing sector by 7.6% on 2006 levels. All this would be delivered at no extra cost to households or the state.

References

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2. Ibid.
3. The EEF could be collected by a number of companies or a single company, who would then use the revenue to issue corporate bonds. The company or companies could be selected through a tendering process. For simplicity, we have suggested that National Grid plc collect the EEF, as it already collects the TUoS, is regulated by Ofgem and is large enough to issue the quantity of corporate bonds required.
4. Ibid.
5. *McKinsey Climate Change Special Initiative*, McKinsey, 2007.
6. The cost of the Carbon Emissions Reduction Target (CERT), the Warm Front Scheme and the Energy Saving Trust combined.
7. *Impact Assessment of Carbon Emissions Reduction Target 2008-2011*, DEFRA, 2007. See: http://www.opsi.gov.uk/si/si2008/em/uksiem_20080188_en.pdf
8. *The Warm Front Scheme Annual Report 2007/08*, Warm Front Scheme, 2008. See: <http://www.warmfront.co.uk/files/warm-front-report-08.PDF>
9. or £4,000 if oil central heating is recommended.
10. 1. Householders aged 60 or over and in receipt of either Income Support, Council Tax Benefit, Housing Benefit, Job Seekers Allowance (income-based), Pension Credit, or the Income-related Employment and Support Allowance. 2. Householders with a child under 16, or pregnant women with maternity certificate MAT-B1, and in receipt of either Income Support, Council Tax Benefit, Housing Benefit, Job Seekers Allowance (income-based), Pension Credit, or the Income-related Employment and Support Allowance. 3. Householders in receipt of either Working Tax Credit (with an income of less than £15,460, which must include a disability element), Disability Living Allowance, Child Tax Credit (with an income of less than £15,460), Housing Benefit (which must include a disability premium), Income Support (which must include a disability premium), Council Tax Benefit (which must include a disability premium), War Disablement Pension (which must include a mobility supplement or Constant Attendance Allowance), Industrial Injuries Disablement Benefit (which must include a mobility supplement or Constant Attendance Allowance) or the Attendance Allowance.
11. *Carbon Trust Annual Report 2007/08*, Carbon Trust, 2008. See: <http://www.carbontrust.co.uk/publications/publicationdetail.htm?productid=CTC735&metaNoCache=1> and *The Energy Saving Trust Annual Report 2007/08*, Energy Saving Trust, 2008. See: <http://www.energysavingtrust.org.uk/uploads/documents/aboutest/EST%20Annual%20Review%200607%20v2.pdf>
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18. *Household Energy Efficiency*, Parliamentary Office of Science and Technology, 2005. See: <http://www.parliament.uk/documents/upload/postpn249.pdf>
19. Compiled using data from: *Seventh Report*, House of Commons Communities and Local Government Committee, 2008. See: <http://www.publications.parliament.uk/pa/cm200708/cmselect/cmcomloc/432/43205.htm>; *The Supplier Obligation post-2011: potential commercial models to deliver demand reductions*, Climate Change Capital, 2007. See: <http://www.defra.gov.uk/environment/climatechange/uk/household/supplier/pdf/commercial-models.pdf>; *Potential carbon savings from energy efficiency and microgeneration appliances installed in the domestic sector over the period 2011-2020*, DEFRA, 2008. See: <http://www.defra.gov.uk/environment/climatechange/uk/household/supplier/pdf/carbon-savings.pdf>
20. The raw figure with a 10% saving from economies of scale and a 5% opt out rate is £9.975 billion. We have rounded up to provide a conservative estimate. The 10% estimate for economies of scale savings was provided by National Grid plc.
21. *Energy Efficiency and Job Creation*, American Council for an Energy-Efficient Economy, 1992. See: <http://www.aceee.org/pubs/ed922.htm>
22. *Sector Information*, Buildings Sector Skills Council, 2008. See: <http://www.summitskills.org.uk/aboutsector/77>.
23. *Impact Assessment of Carbon Emissions Reduction Target 2008-2011*, DEFRA, 2007. See: http://www.opsi.gov.uk/si/si2008/em/uksiem_20080188_en.pdf.
24. Assuming the current 20 year UK Government Bond yield of 4.25%, and a 0.4% spread to Gilts, a £10bn bond issuance would ensure that the project yielded a positive net present value. Network Rail issued corporate bonds at a similar spread in 2004; current spreads are much wider due to the credit crunch, but can be expected to narrow when the bonds are issued in 2010 due to the potential upturn in growth.
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