



Raising standards, cutting bills

Healthy homes: a costed proposal to end fuel poverty through higher standards and fairer funding

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Summary

Investment in home energy improvements must be a priority for future Government spending, whatever the source of funds. There could not be a better investment opportunity: jobs and economic growth at both the local and national level; reduced pressure on health services; improved energy security and reduced carbon emissions; and most importantly affordable fuel bills and warm, healthy homes for all consumers.

Britain's current energy efficiency policies are not working. The Government's flagship Green Deal policy has failed to capture consumer interest and the Energy Company Obligation (ECO) has not reached the fuel poor. In 2013 Consumer Futures, now part of Citizens Advice, funded research from the Institute of Public Policy Research (IPPR) to establish whether there are more efficient and effective ways to deliver energy efficiency and fuel poverty programmes. IPPR recommended radical reform of the energy efficiency and fuel poverty policy framework, replacing it with a new programme called '*Help to heat*'.¹

In brief, the research proposes:

- decentralising the delivery of energy efficiency programmes by moving them away from fuel companies and towards local contractors.
- systematic, 'house by house' assessment in concentrated geographic areas.
- free assessments to all households regardless of their financial circumstances.
- free grants to 'fuel poor' households and low or zero interest loans to all other households to pay for improvement works.

'*Help to heat*' assessed what could be achieved by spending existing energy efficiency resources better. However, current resources are nowhere near sufficient to end fuel poverty or set up a programme at the scale and speed required to reach all UK homes. This research therefore builds upon the '*Help to heat*' delivery model by demonstrating how many more homes can be helped by increasing investment in home energy efficiency.

This research proposes providing grants to all low income households, rather than just fuel poor ones. It warns that low income households not defined as 'fuel poor' would otherwise fall through a gap, neither qualifying for free grants nor able to afford low-interest loans.

The research assesses the cost and impact of improving the homes of low income households to three minimum energy efficiency standards, as measured on the Energy Performance Certificate (EPC) scale; where homes with a rating of EPC G have the worst standards and those rated EPC A have the highest. The research assesses the cost of improving homes to EPC D (the standard proposed by '*Help to heat*'), to EPC C and B.

Households living in homes rated below EPC D face risks to their health due to the difficulty in keeping their homes warm. Those living in homes rated EPC B or above benefit from both warm homes and affordable fuel bills; these homes are in effect 'fuel poverty proofed'. Building regulations require homes built today to meet a minimum standard of EPC B.

The research found that it would cost £500 million per annum (pa) to improve homes to EPC D by 2020 (assuming a 2015 start date). Thus, a modest outlay would end the scandal of low income households living in dangerously cold homes in a relatively short time period. However, a more ambitious budget of £2 billion pa would enable the homes of all low income households in England to be improved to EPC C by 2025, while £2.8 billion pa is sufficient to improve homes as close as possible, given technical limitations, to EPC B by 2030. These budgets assume a £10,000 cap on grants.

¹ Platt R et al, 2013, *Help to heat – a solution to the affordability crisis in energy*, IPPR

The research then assessed the cost of improving the homes of 'middle/higher' income households to EPC C by providing low or zero interest loans. It advocates reducing the loan period to 10 years rather than the typical 20-year period currently attached to Green Deal loans. The shorter loan period reduces the total interest payable considerably, is more in line with average occupancy rates and reduces consumer concerns that long-term loans will reduce future house values. It also reduces Government costs.

The research found that a Government guarantee to the Green Deal Finance Company (GDFC) for 10-year loans to enable it to offer loans at 5 per cent interest would cost £308 per household. Further subsidy to reduce the interest rate to 2 or 0 per cent would cost £1,004 or £1,630 per household respectively; or £1,312 or £1,938 in total. The cost of providing such loans to all 14 million 'middle/higher' income consumers to enable improvements to EPC C is £18 billion at a loan rate of 2 per cent or £27.1 billion at a loan rate of 0 per cent (although it is unlikely all households would take advantage of such loans). However, this cost could be offset by additional tax receipts, as is the case in Germany.

The research then assessed what might be achieved with fixed annual budgets of £2 billion, £3 billion and £4 billion. If expenditure of over £2 billion pa is committed, it becomes possible to improve at least 1 million homes of both low income and 'middle/higher' income households to an EPC C standard each year.

An annual budget of £3 billion pa² would fund home improvements sufficient to reach EPC C of 410,000 low income households and 840,000 (2 per cent loans) or 580,000 (0 per cent loans) 'middle/higher income' households. Thus, by 2025 the vast majority of low income households in England would live in warm, comfortable homes with a rating of at least EPC C. This would represent a major stride towards eradicating fuel poverty in England. An annual budget of £3.5 billion for the whole of Britain is likely to make a similar impact on fuel poverty across the nations, although the research was not able to establish the precise level of resources required in Scotland and Wales.

The improvements would result in an average annual bill saving of £337 for 'middle/higher' income households and £269 for lower income households. A more generous budget would allow homes to be improved to even higher standards.

Finally, the research assessed potential sources of funds for an ambitious energy efficiency and fuel poverty programme. It assumes a reformed ECO programme continues to provide around £860 million pa (England's 'share' of ECO). A regulatory requirement on private landlords to improve homes to at least an EPC D standard by 2020 would represent another source of funds and would not require public funding. The introduction of a minimum EPC D standard in social housing, as is already the case in Scotland, would be less onerous given the generally high existing standards in this sector. Together, private and social landlords could provide around £313 million pa towards costs.

The 'Allowable Solutions' provision in which new build developers fund retrofits in existing homes to help meet the zero carbon standard for new homes provides another potential source of funds. The research found that on projected rates of house building, 'Allowable Solutions' could provide around £190 million pa towards costs – enough to improve 397,000 low income households' homes to EPC C by 2025.

However, Government funding is also required to meet the shortfall from the above sources. Government expenditure of £1.62 billion pa plus the revenue streams outlined above would provide a total £3 billion pa for energy efficiency improvements – at least until 2020. The research outlines the advantages of linking funds for energy efficiency to a secure long-term revenue stream, such as that provided by carbon taxes. It suggests this would provide long-term certainty to the energy efficiency industry and encourage investment by reducing risk.

² The research only modelled data from the English Housing Survey. Assuming resources are allocated to Scotland and Wales on a proportionate (by population size) basis to England, this would imply a total budget of around £3.5 billion pa.

1. Introduction

1.1 Context

Britain's current energy efficiency policies are not working. The Government's flagship Green Deal policy has failed to capture consumer interest and the Energy Company Obligation (ECO) has not reached the fuel poor. Low income consumers in Scotland and Wales are in a slightly better position in that the Scottish and Welsh governments still fund programmes to improve energy standards in their homes. However, these programmes critically depend on ECO while Green Deal is all that is on offer to middle and higher income consumers.

Now part of Citizens Advice, Consumer Futures, like its predecessor organisations, has long urged the UK and devolved governments to drastically increase their ambitions with respect to transforming the energy standards of our homes – both for low income and better off consumers. Energy prices have soared to record heights since 2003 and will continue to rise in the near future. As a result both the level and depth of fuel poverty have soared, while middle income consumers report energy bills as an increasing burden on household budgets. Reducing consumers' need for energy by cutting waste protects consumers, particularly those on low incomes, from high prices.

Yet energy efficiency represents the 'Cinderella' of energy policy, despite it being much more cost effective when compared with, for example, investment in new generation or energy infrastructure. And that is before the quality of life and health benefits arising from warm, affordable to heat homes are taken into account. The Scottish and Welsh Governments, to their credit, have made sterling efforts to prioritise spending on improving home energy standards. However, they are limited in their scope to go much further than existing spending commitments. The UK Government meanwhile has cut virtually all public funding for home energy improvements in England and instead made energy companies responsible for fuel poverty and energy efficiency programmes using consumers' money.

We have produced a wide range of reports that make the case for improving energy efficiency and fuel poverty policy in this country.³ These address such issues as consumer interest in energy efficiency, assessing health benefits, area delivery of programmes, macro-economic benefits of energy efficiency and the case for minimum energy standards in housing. Our current work focuses on two broad areas:

- **Demand reduction** – why energy policy should make demand reduction a central priority.
- **Delivery** – improving the delivery of energy efficiency and fuel poverty programmes to consumers. This report forms part of this area of work.

1.2 Improving the delivery of energy efficiency programmes

In 2013 we funded research from the Institute of Public Policy Research (IPPR) to establish whether there were more efficient and effective ways to deliver energy efficiency and fuel poverty programmes. IPPR recommended radical reform of the energy efficiency and fuel poverty policy framework, replacing it with a new programme called '*Help to heat*'. The research showed how the proposed reforms would be much more cost effective than current arrangements with respect to the number of fuel poor households helped and Green Deal loans delivered each year.

In brief the report proposes:

- decentralising the delivery of energy efficiency programmes by moving them away from fuel companies and towards local contractors.

³ See for example, ACE (2014), *Ending cold homes*; Cambridge Econometrics & Verco (2012), *Jobs, growth and warmer homes*; Wade J & Impetus (2012), *Going local – local authorities' work to tackle fuel poverty*; Consumer Futures Scotland (2013), *Keeping the heat in Scotland's homes*; Consumer Focus (2012), *What's in it for me? Using the benefits of energy efficiency to overcome the barriers*; Laine (2011), *Green deal or no deal*

- systematic, ‘house by house’ assessment of housing and household circumstances in concentrated geographic areas to establish both the energy efficiency improvements required and the ability of occupants to pay for improvements.
- the use of trusted intermediaries to carry out assessments which are provided free to all households, regardless of their financial circumstances.
- the provision of free grants to pay for improvements to the homes of ‘fuel poor’ households and low or zero interest loans to cover the cost of improvements to all other households.

Getting the most out of the resources currently deployed – predominantly those available from ECO – is essential to help households reduce their energy costs. However, it is not sufficient to tackle the growth of fuel poverty, transform Britain’s energy inefficient housing stock or to achieve carbon reduction targets.

This research considers what could be achieved with a higher budget commitment than ‘ECO-level’ resources, using the ‘*Help to heat*’ delivery model. We wanted to know how many more people would not have to live in dangerously cold homes; how many more people could take advantage of low interest loans to cut energy wastage; and how many more people could benefit from radical home retrofits sufficient to make their fuel bills truly affordable.

In brief, we wanted to know how quickly the Government could rid the country of fuel poverty, reduce households’ energy bills and make serious progress towards meeting its carbon reduction targets, if it committed a higher level of resources towards improving the energy standards of our homes.

1.3 ‘*Help to heat*’: the basic proposition

‘Help to heat’ consists of two complementary policies: ‘House by house’ and the ‘Great Deal’. ‘**House by house**’ is intended to drive consumer demand for energy efficiency by engaging households within certain areas, initially low income areas. Trusted local intermediaries market the scheme, provide information and advice and make sure every household receives a free energy efficiency assessment, similar to the current Green Deal assessment. The area-based nature of the scheme would encourage social norms around the benefits of energy efficiency, as well as reduce costs due to economies of scale, for example through scaffolding a whole street or block of flats and reducing travel between jobs.

The home assessment would also identify whether households are fuel poor or not, according to the Government’s new ‘Low Income High Costs’ (LIHC) fuel poverty definition for England.⁴ Households identified as ‘fuel poor’ would receive a free grant to improve their home to an Energy Performance Certificate (EPC) D rating. This is the average rating of the English housing stock.

‘House by house’ also aims to encourage large numbers of households not identified as ‘fuel poor’ to install energy efficiency measures through Green Deal loans. The provision of free assessments would help boost initial consumer interest in the Green Deal. However, the current Green Deal loan interest rate at around 8 per cent is not sufficiently attractive to consumers to encourage them to take advantage of loans. Substantially reducing the interest rate to help ensure consumers take action could transform the Green Deal into a ‘**Great Deal**’.

The introduction of a new **standard for social housing** would require the installation of solid wall insulation in all solid wall properties in the social housing stock within a given timeframe. However, the cost of upfront capital subsidies to social housing providers to help them meet the standard is not included in the ‘*Help to heat*’ assessment of costs.

⁴ DECC, 2013, *Fuel poverty: changing the framework for measurement – Government response*

Finally, 'Help to Heat' proposes a new **local contractor delivery model** in which local authorities or third sector bodies become the main delivery organisations, rather than the current fuel supplier-led model. Local bodies would receive funds from the UK Government to oversee the delivery of area-based programmes and make sure programmes are tailored to meet local circumstances.

1.4 Improving the effectiveness of existing resources

'Help to heat' shows how existing resources could be reallocated to meet the different elements of the new delivery model.⁵ This consisted of:

1. **£540 million pa** from the Affordable Warmth and Carbon Saving Communities (CSCO) element of ECO. IPPR proposes this is allocated to local delivery bodies to fund energy improvement works to the homes of 'fuel poor' households sufficient to bring them up to an EPC D standard.
2. **£760 million pa** from the Carbon Emissions Reduction (CERO) element of ECO. 'Help to heat' proposes this should fund a Government guarantee for Green Deal loans and free assessments (worth an estimated £120 per household) for all households in targeted areas. The guarantee would enable the Green Deal Finance Company (GDFC) to reduce the interest rate on Green Deal loans from 8 to 5 per cent by reducing the risk associated with an unknown financial product. IPPR then proposes several options for further interest rate reductions. However, these would require additional public sector finance.
3. **£80 million pa** from the Government-funded consumer incentive scheme. 'Help to heat' proposes this should fund set-up costs for local organisations to deliver 'House by house' and coordinate the provision of free assessments.

1.5 'Help to heat': the benefits

Modelling carried out for 'Help to heat' shows that the proposed delivery model would have the following benefits:

- 197,000 fuel poor households would receive free energy efficiency improvements every year – 117,000 more than under the current ECO model.
- Fuel poor households receiving help would on average save £230 per year on their energy bills, as well as benefit from warmer, more comfortable homes.
- The cost of energy efficiency improvements could potentially reduce by as much as 30 per cent due to the economies of scale made possible by area approaches.
- 1.1 million more households would receive a free energy efficiency assessment each year and could therefore potentially take out a low or zero cost Green Deal loan.
- Government subsidies to reduce Green Deal interest rates would enable 200,000 consumers each year to take out Green Deal loans at a cost of £17 million in the first year, rising to £46 million in the fifth year (this figure will increase in subsequent years as more people take out loans). This will fund improvements that meet the Green Deal's 'golden rule'⁶ and provide zero interest loans to the first 200,000 consumers, 2 per cent loans for the next 400,000 consumers and 5 per cent loans for the next 400,000 consumers.

⁵ The research was carried out before the Government's 2013 autumn statement announcements on ECO. The Government intends to cut the Carbon Obligation (CERO) element of ECO by 33 per cent. The low income elements of ECO would remain at the same level, around £540 million pa.

⁶ This states that loans will only be provided for measures that can be funded through the bill savings made possible by those measures. As interest rates reduce, the range of measures meeting the golden rule increase.

1.6 A more ambitious fuel poverty and energy efficiency programme

The *'Help to heat'* delivery model would improve the effectiveness of current spend under the ECO and the Government's consumer incentive scheme considerably. However, it still only raises housing standards to just above the dangerously cold category for 200,000 'fuel poor' households. This standard (EPC D) is sufficient to substantially reduce the risk of physical ill-health due to cold homes. However, it is not sufficient to make energy bills affordable. Many households will continue to struggle to pay their energy bills and many may suffer stress and anxiety because of this. Thus, EPC D is not sufficiently high to end fuel poverty.

'Help to heat' proposes providing low interest Green Deal loans to 200,000 households each year, with interest rates rising from 0 to 5 per cent over 5 years. However, many consumers, particularly those with relatively modest incomes, are struggling to pay their energy bills. These consumers are getting poor value for the energy they consume due to wastage through poorly insulated homes and inefficient heating systems. Home energy improvement rates need to increase considerably if we are to meet our carbon targets (80 per cent reduction by 2050 from a 1990 baseline), much of which must be achieved in the country's housing stock (26 million homes).

Citizens Advice considers a truly 'Great Deal' requires interest rates to be kept permanently low. We are not convinced that 5 per cent rates are sufficiently attractive to consumers to encourage them to take out loans. A more generous budget would allow a larger number of households to take out very low interest rate loans.

'Help to heat' proposes providing free grants only to those defined as 'fuel poor' under the LIHC fuel poverty definition.⁷ All other low income households would be encouraged to take out low interest Green Deal loans with perhaps a small proportion benefitting from zero interest loans.

Citizens Advice does not consider it appropriate to offer loans to low income households. Many of these households are facing considerable strains on budgets. Many are debt adverse and therefore reluctant to take out loans, even with the golden rule's reassurance that loan costs are met through energy bill savings. Many are already cutting back on their energy consumption and therefore cannot make the savings necessary to pay off Green Deal loans.

We therefore consider these households will 'fall through a gap in the middle' – they will not be eligible for free grants nor will they take out low interest loans. We also consider policy should aim to prevent low income households falling into fuel poverty in the future as a result of rising fuel prices or changes in circumstances.

While it is essential that low income consumers should not have to live in 'dangerously cold homes', **a minimum standard of EPC D is inadequate for making sure homes are affordable to heat and power.** We therefore consider the Government should set a much more ambitious standard – one that is capable of 'fuel poverty proofing' homes for the vast majority of occupants. This entails improving homes as close as possible to an EPC B standard – the minimum standard building regulations require for homes built today. We need an ambitious energy efficiency programme that is capable of meeting both fuel poverty and carbon targets and a level of resource much higher than that available through ECO and the consumer incentive scheme.

For this report, we commissioned Verco to carry out additional modelling to explore what might be possible with a more ambitious energy efficiency budget than that assumed by the *'Help to heat'* research, while still using the *'Help to heat'* delivery model.

⁷ The new fuel poverty definition states that a household is fuel poor if it has a low income and higher than median fuel costs (see Appendix 3 for further details).

1.7 Research methodology

The research methodology took the *'Help to heat'* delivery model as its starting point, namely house by house delivery in concentrated geographic areas, free assessments and local coordination. *'Help to heat'* produced evidence to show that this model would use existing resources much more effectively than current practice. This is due to the economies of scale made possible through area delivery, the accurate targeting of the fuel poor, the offer of a better deal to 'non-fuel poor' households and the provision of free assessments to further encourage householders to take action.

This research aims to show what the delivery model could achieve with a more ambitious programme and a more generous budget. Two sets of parameters were selected for assessing costs and impact.

1. **Minimum standards** – the research modelled 2011 English Housing Survey (EHS) data to assess the cost of improving low income households' homes to certain minimum standards. Many organisations advocated setting minimum standards for low income consumers' homes during the passage of the 2013 Energy Bill (now Act).⁸ The Department of Energy and Climate Change (DECC) is currently investigating this approach as part of its forthcoming Fuel Poverty Strategy. This research investigated the following targets:
 - i. Improving homes to EPC D by 2020. Band D is currently the average energy efficiency rating of the English housing stock.
 - ii. Improving homes to EPC B by 2030. Band B corresponds to current new-build standards and is considered sufficiently high to 'fuel poverty proof' homes for the vast majority of occupants.
 - iii. Improving homes to 'mid EPC C' standard by 2025 as an interim step towards the Band B target.
 - iv. Two variations were also investigated in which the costs of meeting the EPC C and B targets were assessed after applying a £10,000 grant cap. This was intended to avoid a large amount of money potentially being spent on improving a relatively small number of extremely 'hard to treat' properties.
 - v. Improving the homes of 'middle and higher income' households to an EPC C standard by providing zero or low costs Green Deal loans.
2. **Set budgets** – modelling was carried out to establish what might be achieved should expenditure of £2 billion, £3 billion or £4 billion pa be made available. This uses the same minimum standards as above but does not set target dates. Instead it aims to show how many homes of both low income and 'middle/higher income' households could be improved each year given certain fixed annual budgets.

The modelling assumed a 60:40 split of total expenditure between low income and 'middle/higher income' households. This is based on the current split between Affordable Warmth/CSCO and CERO budgets in which the former is assumed to go to low income households and the latter to 'middle/higher' income households.

1.8 Research assumptions

Targeting – this research, like the *'Help to heat'* research, assumed perfect targeting of the 'target group' (fuel poor households in the case of the *'Help to heat'* research, low income households in the case of this research). A major benefit of 'house by house' assessment is that it allows accurate identification of the target group and thus high targeting efficiency.

⁸ A briefing on these targets is available at: <http://ow.ly/xXICj> (PDF)

However, it should be easier to target the 'low income' group than the 'fuel poor' group for the following reasons:

- The low income group is larger than the fuel poor group and more geographically concentrated.
- Desk-top methods can be used to identify likely concentrations of low income households prior to house by house assessment; whereas it is difficult to use such methods to identify concentrations of fuel poor households (since this requires assessment of fuel costs and housing circumstances).
- Churn – the rate at which households move into and out of low income or fuel poverty – is likely to be lower for low income than fuel poverty (churn is an integral feature of the new fuel poverty definition – see Appendix 2).

Geographic coverage – this research, like the '*Help to heat*' research, only modelled EHS data. It does not provide detailed breakdowns of the costs required to improve homes in the devolved nations. Unit improvement costs in the devolved nations may differ from those identified for England due to the differences in the scale of the problem (for example, a high proportion of Welsh housing is off the gas grid) and differences in the nature of the housing stock (for example, a high proportion of Scottish housing is tenements).

Yet ECO applies to the whole of Great Britain; thus any re-allocation of ECO resources would need to benefit Welsh and Scottish consumers as well as English. The equivalent programme to ECO in Northern Ireland is known as the Northern Ireland Sustainable Energy Programme (NISEP). Furthermore, while ECO provides the only substantial resources for improving energy efficiency standards in low income consumers' homes in England, the Scottish, Welsh and Northern Ireland governments provide public funds to complement ECO and NISEP. It is therefore important that new delivery models are integrated with existing programmes in the devolved nations.

Finally, the research assesses the level of resources required to provide grants to low income consumers and loans to middle/higher income households to enable the improvement of homes to minimum standards in English homes only (sections 2 & 3). The modelling was not able to assess the extent of further resources required to meet minimum standards in homes in the devolved nations. Section 4 assesses how many homes can be improved for fixed annual budgets which can of course be distributed across Britain. However, the research does not take into account possible unit cost variations between the nations due to their different housing circumstances, as explained above.

Citizens Advice advocates investing far more resources than at present to improve consumers' homes throughout the UK. We consider the devolved governments, as well as the UK Government, should set minimum standards for housing, although we recognise the prerogative of the devolved governments to adopt standards pertinent to housing circumstances in their nations. We also consider the main responsibility for increasing resource provision lies with the UK Government, although we favour devolution of responsibility for delivering programmes to the devolved governments working in partnership with local agencies.

1.9 Variations between this research and '*Help to heat*'

As well as modelling the impact of more generous budgets, this research varied a number of other factors that informed the original '*Help to heat*' research.

They include:

1. The target group for receiving free grants is all low income households, rather than the *'Help to heat'* target group of LIHC fuel poor households only. We consider many low income households not defined as 'fuel poor', particularly those in smaller properties, would benefit from cost effective energy efficiency improvements (see Appendix 2 for further explanation of the difference between the two groups). We also consider it important that these households do not fall into fuel poverty in the future, as argued above.
2. For 'middle and higher income' households, the research assumed loans would be provided to improve homes to EPC C without applying the golden rule restriction. *'Help to heat'* assumed loans would only be provided for measures that met the golden rule, resulting in an average loan size of £2,625. We consider the golden rule unnecessarily limiting in that it prevents consumers installing more extensive improvements. We doubt consumers themselves regard it as an important safeguard. More ambitious improvements are required if we are to meet the 2050 carbon reduction target.
3. We consider a 5 per cent interest rate to be insufficiently attractive for consumers to take out improvement loans on the scale required. We therefore modelled the impact of zero and very low interest loans. We also investigated the cost of a 10 and 20 year loan period whereas *'Help to heat'* only modelled a 20-year period. We consider consumers might find shorter-term loans more attractive, given the implications of long-term loans for the amount of interest paid and their impact on consumer perceptions of future house values.
4. The research assumed 60 per cent of funds would go to low income consumers, reflecting the current notional proportion of ECO going to this group. *'Help to heat'* assumed 40 per cent of funds would go to low income consumers, reflecting the pre-autumn statement split of notional ECO funds.

2. Meeting the fuel poverty challenge now

The research investigated the impact and costs associated with improving the homes of low income households in England to three alternative minimum energy efficiency standards by specific dates:

- EPC band D by 2020
- EPC band C by 2025
- EPC band B by 2030

The modelling was based on the 2011 EHS – the most recent data available at the time of the research. However, many homes will already have been improved to EPC D by 2015 through existing policies – primarily the Carbon Emissions Reduction Target (CERT) and ECO programmes. These programmes will have generally installed ‘cheaper’ measures such as loft and cavity wall insulation, suggesting that more expensive measures are likely to be required to improve the remaining properties to band D.

Existing programmes are likely to have excluded many low income households, although the ‘leakage’ will not be as high as that reported in *‘Help to heat’* (ECO was found to exclude 80 per cent of ‘fuel poor’ homes). This is because the target group for this research includes all low income households and not just LHC fuel poor households.

2.1 Research assumptions

To calculate the average annual costs of meeting the minimum standards, the research made the following assumptions:

1. Minimum standards and *‘Help to heat’* delivery are introduced in 2015.
2. £80 million is allocated to fund the set-up costs for local organisations to deliver ‘house by house’. We suggest a similar sum is provided on an annual basis to fund on-going coordination activities, stock profiling and referrals to further services such as income maximisation.
3. Existing policies will have improved 510,000 low income homes to Band D between 2011 and 2015.⁹ However, the research was not able to differentiate between the cost of measure packages installed before 2015 (which are generally lower cost) and those required after 2015 to meet the target standards.
4. There is perfect targeting of low income households. The costs identified are primarily the ‘core costs’ of measures, plus the £120 assessment fee.
5. Further resources would be required to meet any minimum standards the devolved administrations decide to introduce (note: the Scottish Government has already introduced minimum standards for social housing and is currently considering whether similar standards are required in the private sector).¹⁰

2.2 Meeting minimum standards: costs and impact

Table 1 below shows the average annual costs of meeting the targets by the dates specified from a 2015 start date. These figures do not include a cap on the costs of measures to reach the standards.

⁹ ACE, 2014, *Ending cold homes – modelling the cost and impact of introducing ambitious new fuel poverty targets*, Consumer Futures

¹⁰ Scottish Government, 2013, *Energy efficiency standards for social housing*

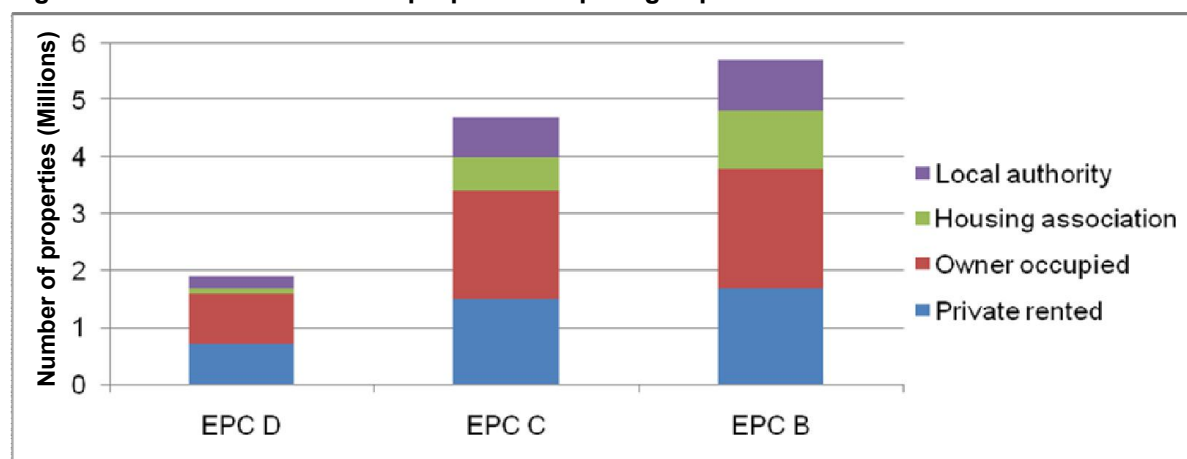
Table 1: Cost and impact of retrofitting homes to three energy efficiency standards

	EPC D 2015 – 2020	EPC C 2015 – 2025	EPC B 2015 – 2030
Number of properties needing improvement (million)	1.4	4.7	5.7
Average SAP pre improvement (2011)	43	54	57
Average SAP post improvement	58	72	78
Average bill savings due to improvements	£204	£283	£323
Average cost of improvements	£1,714 ¹	£5,500	£15,498
Total cost of improvement programmes (billion)	£2.6	£26.6	£88.9
Annual cost of improvement programmes (billion)	£0.5	£2.7	£5.9

¹ Assuming the average cost of improving homes to EPC D is the same after 2015 as it is before. In reality the post 2015 costs are likely to be higher.

Details of how these costs break down by household type and tenure are given in Appendix 3. The differences by tenure are particularly striking. Figure 1 below illustrates the differences between tenures with respect to the level of improvements required to meet the minimum standards.

Figure 1: Tenure breakdown of properties requiring improvement to meet standards



No. of households	EPC D	EPC C	EPC B
Private rented	723,278	1,478,466	1,699,602
Owner occupied	868,379	1,917,385	2,120,506
Housing association	136,991	643,889	960,832
Local authority	180,716	686,397	909,122

Note

The table and graph include all properties that needed improving to the minimum standards in 2011, some of which will have benefitted from improvements carried out between 2011 and 2015.

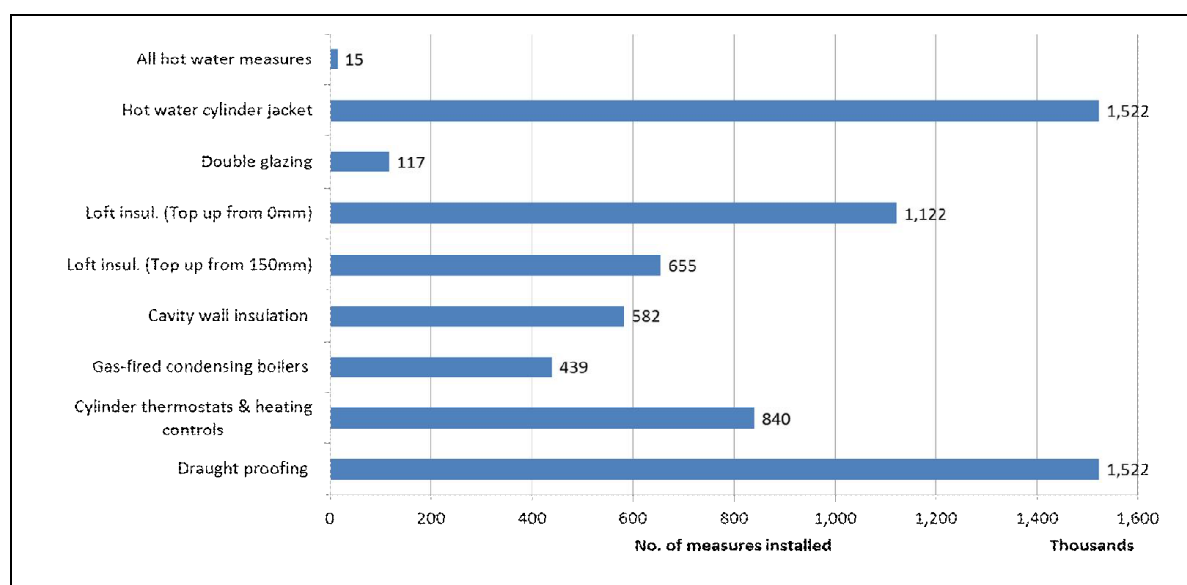
Figure 1 illustrates the relatively small number of local authority and housing association properties that require upgrades to meet the EPC D target. This reflects the generally higher energy efficiency standards currently found in social housing. Figure 1 also illustrates the high proportion of private rented housing that require improving – a reflection of the generally poor standards in this sector. 38 per cent of private rented properties are below EPC D yet private rented housing only represents 17 per cent of all housing.

2.3 Meeting the EPC D standard by 2020

Table 1 shows that in 2015 1.4 million low income households will live in homes below EPC D. It would cost an average of £1,714 per household to install energy efficiency packages sufficient to meet the EPC D target. Figure 2 below gives details of the measures required. The improvements would save consumers an average £204 pa on their energy bills, based on current energy costs. This does not take into account improved comfort but does take into account in-use factors relating to the installed energy efficiency measures.

Improving homes to a minimum EPC D standard would require an annual expenditure of £500 million between 2015 and 2020. Furthermore, it would mean low income households no longer have to live in dangerously cold, unhealthy homes.

Figure 2: Measures required to retrofit to EPC D



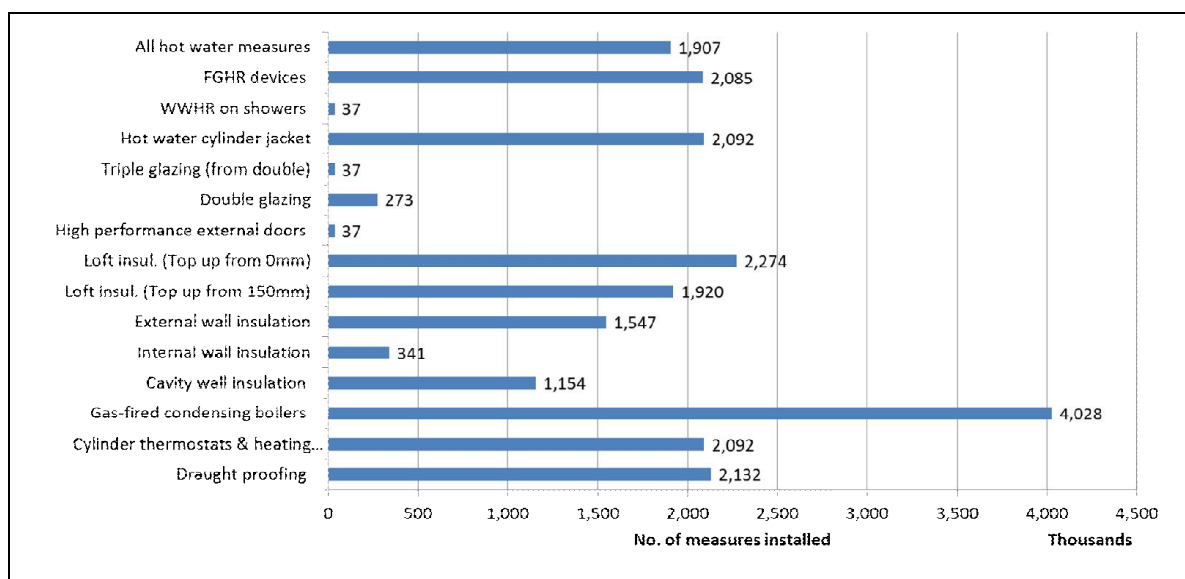
The graph includes measures to all properties that needed improving to the minimum standards in 2011, some of which will have benefitted from improvements carried out between 2011 and 2015.

2.4 Meeting the EPC C standard by 2025

Table 1 shows that 4.7 million low income households live in homes below EPC C. These homes can be upgraded with a package of energy efficiency measures at an average cost of £5,500 per household to an average score of SAP 72 (mid band C). Figure 3 below gives details of the measures required. The improvements would save consumers an average £283 pa on their energy bills.

Improving homes to a minimum EPC C standard would require an annual expenditure of £2.6 billion pa between 2015 and 2025.

Figure 3: Measures required to retrofit to EPC C



The graph includes measures to all properties that needed improving to the minimum standards in 2011, some of which will have benefitted from improvements carried out between 2011 and 2015.

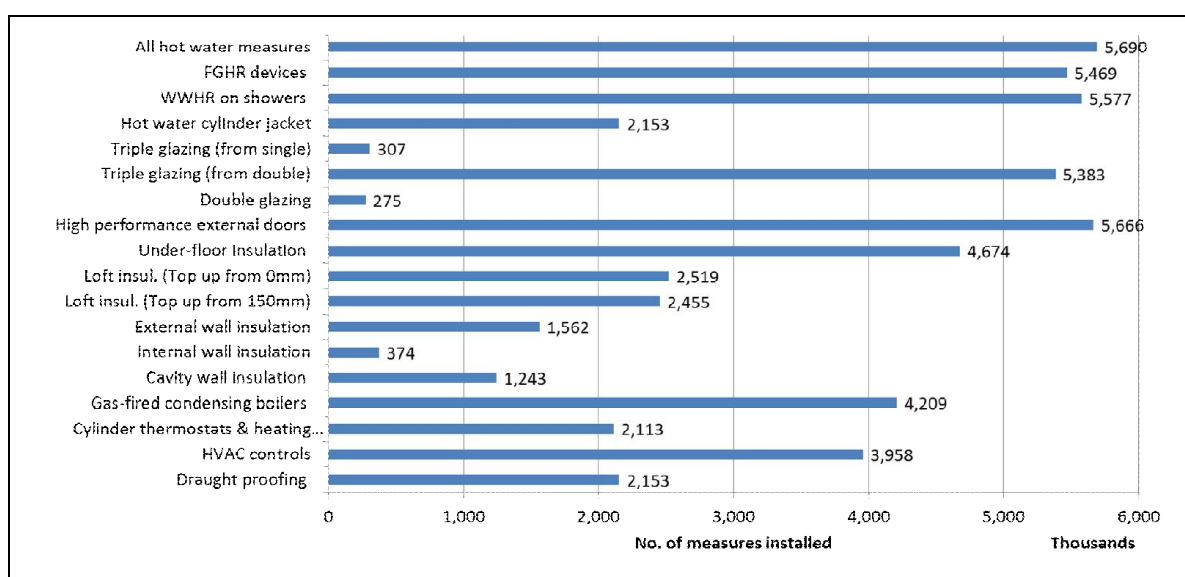
2.5 Meeting the EPC B standard by 2030

The modelling carried out for this target assessed the measures required to improve homes to a SAP score of 81 – the lower bound of EPC B. All 5.7 million low income households in England live in homes below this target. Many properties cannot be improved to an EPC B standard with existing technologies. Other properties can only reach this standard after installing very expensive measures.

Table 1 shows that the average SAP score achieved after improvements is 78, with 80 per cent of properties achieving this standard (see Figure 4 below for details of measures). In this sense, it is more appropriate to refer to the target as 'near EPC B'. The improvements would save consumers an average £323 pa on their energy bills.

Improving homes to a target EPC B standard would require an annual expenditure of £5.7 billion pa between 2015 and 2030. 80 per cent of homes can be improved to SAP 78.

Figure 4: Measures required to retrofit to EPC B



The modelling shows that a substantial amount of additional expenditure is required to meet an EPC B target, compared to EPC C. The exponential increase of investment needed for each incremental SAP score increase (above SAP 72) is due to the fact that the more cost effective measures are installed first.

It is also important to appreciate that the modelling carried out for assessing costs sets the desired EPC score for each property archetype in the EHS dataset (for example the target mid band C score). Energy efficiency measures are included in the package until the post retrofit score is close to the target score. This results in some high cost measures being included if the target score is high. For example, 15 per cent of the retrofitted dwellings for the EPC C target require a package of measures that cost in excess of £10,000.

2.6 Capping the expenditure required to meet the EPC C and B targets

The research investigated how the introduction of a £10,000 cap on individual property expenditure would affect the total costs of meeting the EPC C and B targets (all homes can be improved to EPC D for less than £10,000). The package of measures required to meet the targets was re-modelled but with a cap of £10,000. This has the benefit of potentially preventing a large amount of expenditure going towards very expensive measures for a relatively small number of properties.

A cap is also likely to improve the political acceptability of the targets proposed, given that a high proportion of the funds is likely to come from either Government or energy consumers (through supplier obligation programmes). Of course many social housing providers may chose not to cap expenditure at the individual property level, particularly if energy efficiency improvements are carried out as part of wider housing regeneration programmes.

Table 2 shows that the introduction of a £10,000 cap reduces the total cost of meeting the targets considerably, particularly in the case of the B target. However, it also reduces the average bill savings and average SAP standard achieved following improvements, although the difference is only minor in the case of the EPC C target. The introduction of a cap on improvements required to meet the B standard would mean that the final average SAP standard achieved (75) is below the B target (at least 81).

Table 2 shows that the cap has the effect of reducing the average cost per home improved from £5,500 to £4,071 for the EPC C target and from £15,498 to £7,300 for the EPC B target. The average bill savings are reduced from £283 to £269 for the EPC C target and £323 to £294 for the EPC B target.

Table 2: Impact of retrofitting homes to minimum standards with cap

	EPC C <£10k 2015 – 2025	EPC B <£10k 2015 – 2030
Number of properties needing improvement (million)	4.7	5.7
Average SAP pre improvement (2011)	53	56
Average SAP post improvement	71	75
Proportion of homes that do not reach minimum standard	15%	97.5%
Average bill savings due to improvements	£269	£294
Average cost of improvements	£4,071	£7,300
Total cost of improvement programmes (billion)	£19.8	£42.2
Annual cost of improvement programmes (billion)	£2.0	£2.8

Improving homes to a minimum EPC C standard, with a £10,000 cap, would require an annual expenditure of £2.0 billion pa between 2015 and 2025.

Improving homes to a minimum EPC B standard, with a £10,000 cap, would require an annual expenditure of £2.8 billion pa between 2015 and 2030. However, the cap reduces the average SAP achieved to 75, 6 SAP points below EPC B.

Figures 5 and 6 below list the measures required to meet the new capped targets. Comparison with Figures 3 and 4 shows that certain measures are excluded as a result of introducing the caps.

Figure 5: Measures required to retrofit to EPC C, with £10k cap

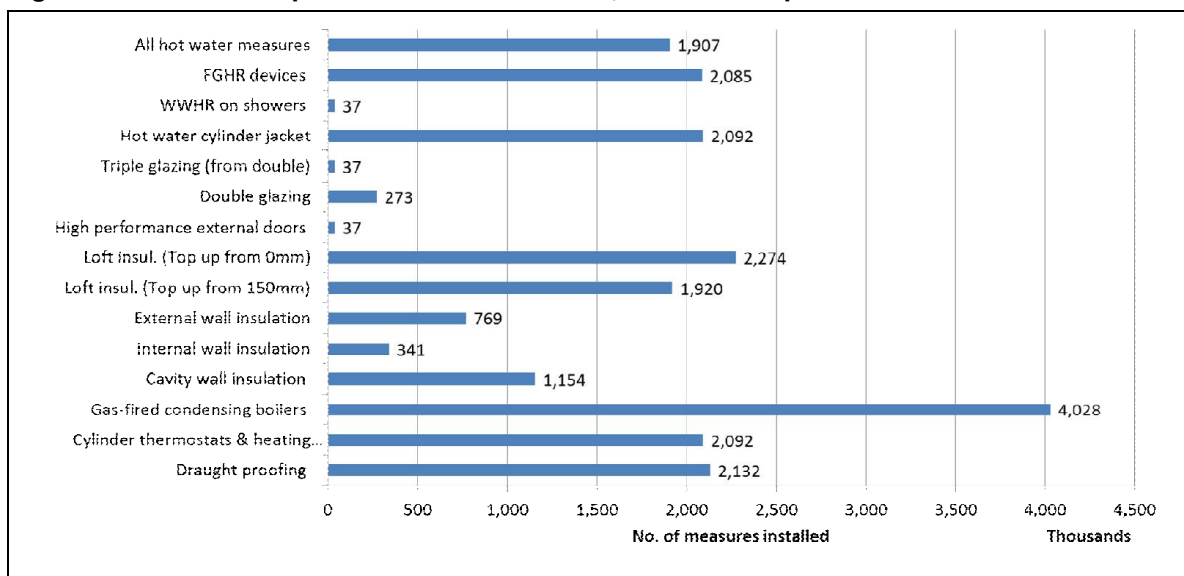
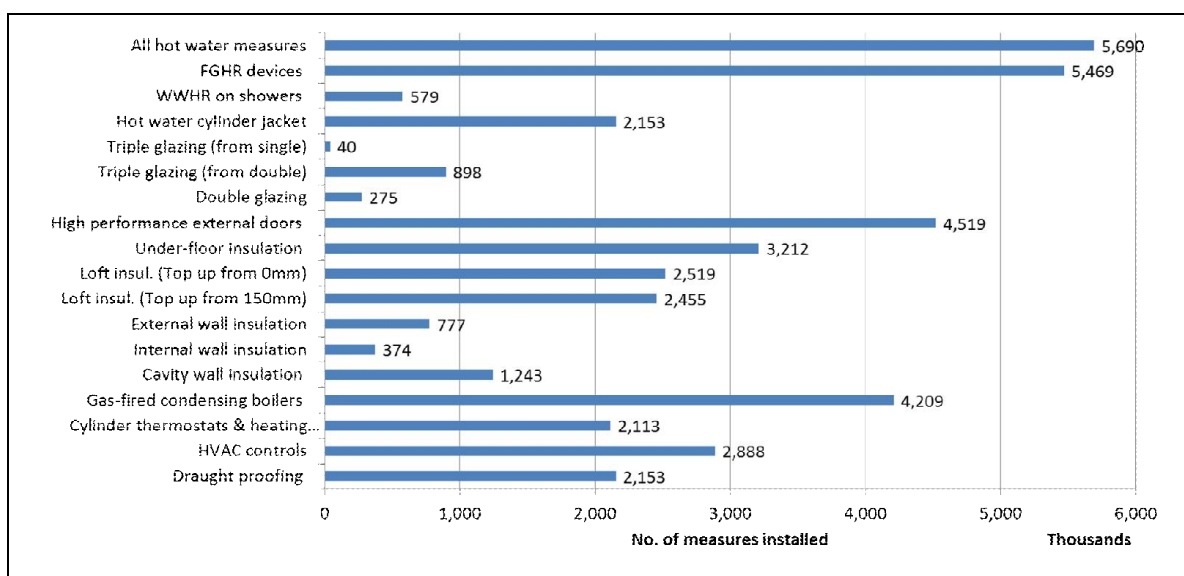


Figure 6: Measures required to retrofit to EPC B, with £10k cap



3. Meeting the energy efficiency challenge now

This chapter assesses the costs and impact of providing zero or low interest rate loans to encourage the 16.2 million ‘middle and higher income’ households in England to install energy efficiency measures.

3.1 Research assumptions

- Homes are improved to mid EPC band C.
- The package of measures installed to meet EPC C are not subject to the golden rule.
- Loans are attached to the meter; this reduces the risk normally associated with unsecured loans since they are paid alongside fuel bills.
- The interest rate charged for loans is 8 per cent, in line with the current rate offered by the GDFC for 20 year Green Deal loans.¹¹
- A Government guarantee to the GDFC reduces its cost of borrowing and allows it to reduce the interest rate offered to consumers from 8 to 5 per cent. This is a key recommendation of ‘*Help to heat*’.
- All households benefit from a free energy assessment, valued at £120.
- Direct Government subsidies allow further reductions in interest rates.

The 2011 EHS suggests that ‘middle and higher income’ households make up 72 per cent of households in England – 16.2 million in total. 2.2 million of these households already live in homes with an EPC rating of band C or above.

3.2 Improving the homes of ‘middle and higher income’ households

Table 3 below shows the average cost and impact of improving homes of ‘middle and higher income’ households to a mid C standard.

Table 3: Improving the homes of ‘middle/higher’ income households to EPC C

‘Middle/higher’ income households	EPC C
Average SAP pre improvement	54
Average SAP post improvement	72
Number of properties requiring improvement (million)	14.0
Average bill savings ¹	£337
Average cost per household	£5,523

Note

¹ The bill saving for ‘middle/higher’ income households is higher than that found for low income households because the former group tend to live in larger properties and have higher levels of consumption.

A loan for this amount at an interest rate of 8 per cent for 20 years entails a total payment of £11,250 over the loan period. This equates to a payment of £5,728 over and above the capital cost of the energy efficiency works carried out. To reduce the financial burden on the householder (effectively a doubling of the cost of works), the Government could provide subsidies to help households pay the interest elements of the loans.

The research investigated the cost of providing subsidies to improve all 14 million properties at a range of different interest rate loans to householders. It also investigated the cost of providing loans over 20 and 10 year periods.

¹¹ GDFC currently provides finance at around 8 to 10 per cent APR, depending on size and term of the Green Deal loan. For a loan amount of £5,000 over 20 years, the APR is 7.9 per cent, inclusive of all charges and expenses.

The following scenarios were assessed:

- Reducing interest rates to 0 per cent over 20 and 10 years
- Reducing interest rates to 1 per cent over 20 and 10 years
- Reducing interest rates to 2 per cent over 20 and 10 years

3.3 20-year interest rate loans

Table 4 below shows the monetary benefit to the householder of reducing the 8 per cent interest rate to 5 per cent is £2,387 over the life of the loan due to the Government guarantee to the GDFC. Table 4 also shows the impact and cost of further reductions in interest rates offered. The Government could provide these reduced interest rates to householders in the form of direct subsidies.

Assuming that the Government guarantee to underwrite the GDFC's debt is estimated at 1 per cent interest of the total loan amount the company provides, it would cost the Government £598 per household to reduce the interest rate to 5 per cent. This equates to a total of £8.2 billion for the 14 million households requiring home improvements.

Table 4: Cost of providing zero and low interest 20-year loans to 'middle/higher income' households

	Average benefit to the household	Per household cost to Government	Total cost to Government (£bn)
Guarantee	£2,387	£598	£8.228
Subsidy: 5% to 0%	£3,341	£3,341	£46.8
Total (guarantee & subsidy)	£5,728	£3,939	£55.0
Subsidy: 5% to 1%	£2,742	£2,742	£38.4
Total (guarantee & subsidy)	£5,129	£3,341	£46.6
Subsidy: 5% to 2%	£2,108	£2,108	£29.5
Total (guarantee & subsidy)	£4,495	£2,706	£37.8

Table 4 shows that the total cost to the Government of reducing interest rates to 0, 1 and 2 per cent over a 20 year period is £55 billion, £46.6 billion and £37.8 billion respectively (these figures do not include the cost of providing loans to households in Scotland and Wales). This will allow 14 million households to benefit from a retrofit package worth on average £5,523. In reality, it is very unlikely that all middle/higher income households would take advantage of the loan offer.

3.4 10-year low interest rate loans

The original Green Deal proposition was that long-term loans would be offered to consumers, with loans transferring to subsequent occupants should consumers move house before the end of the loan period. This was achieved by attaching the loan to the electricity meter, rather than the consumer. However, very few consumers are taking out Green Deal loans.¹² This might be because Green Deal interest rates are not sufficiently attractive – the central argument of 'Help to heat'. But it might also be because consumers are put off by the large amount of interest attached to long-term loans and concern that loans will decrease future house values.

¹² Platt R et al, 2013, *Help to heat – a solution to the affordability crisis in energy*, IPPR

Reducing the loan period from 20 years to 10 years might help improve the attractiveness of loans because 10 years is more in keeping with average occupancy periods. Should consumers move before 10 years, they may regard the prospect of paying off outstanding loans as less daunting than the amount they would have to repay on a 20-year loan. Reducing the loan term from 20 to 10 years decreases the interest repayment part of the loan considerably. On a £5,523 retrofitting project, the 8 per cent interest repayment on a 10-year loan is £2,708, rather than £5,728 for a 20-year term. However, the principle part of the loan (the cost of installing the measures) is now spread over a shorter time period. The annual repayments will therefore increase, and be greater than the savings on the energy bill over the loan period.

Consumers will still continue to benefit from energy savings considerably beyond the loan period. Investment in energy efficiency may therefore still represent an attractive proposition, particularly when potential increases in house value arising from improvements are taken into account. The value consumers place on energy efficiency improvements is likely to increase considerably from the current situation should energy efficiency installations become more widespread and delivery improve, as advocated by *'Help to heat'* and this report. Improved consumer education and improved visibility of EPC ratings and associated recommended improvements during the marketing of property sales may also help.

Table 5 shows that the cost to the Government of guaranteeing loans over a 10-year period is £308 per household, rather than £598. Table 5 also shows the direct subsidy costs of reducing the interest rates by varying levels.

Table 5: Cost of providing zero and low interest 10-year loans to 'middle/higher income' households

	Average benefit to household	Per household cost to Government	Total cost to Government (£bn)
Guarantee	£1,078	£308	£4.24
Subsidy: 5% to 0%	£1,630	£1,630	£22.8
Total (guarantee & subsidy)	£2,708	£1,938	£27.1
Subsidy: 5% to 1%	£1,321	£1,321	£18.5
Total (guarantee & subsidy)	£2,400	£1,630	£22.7
Subsidy: 5% to 2%	£1,004	£1,004	£14.1
Total (guarantee & subsidy)	£2,082	£1,312	£18.3

Table 5 shows that the total cost to the Government of reducing interest rates to 0, 1 and 2 per cent over a 10-year period is £27.1 billion, £22.7 billion and £18.3 billion respectively (these figures do not include the cost of providing loans to consumers in Scotland and Wales). This is based on providing loans to 14 million households to pay for retrofits worth on average £5,253. In reality, it is very unlikely that all middle/higher income households will take advantage of loans, despite the considerable bill savings resulting from improvements.

Generating consumer interest in energy efficiency improvements represents a considerable challenge, although we have suggested a range of ways this can be achieved.¹³ In the long term, the Government may need to consider introducing regulations that require owners to improve very low efficiency homes before they can be marketed for sale. The provision of a long-term notice period coupled with attractive low or zero interest loans to improve homes to a minimum standard may help improve the acceptability of such regulation.

¹³ See, for example, Consumer Focus (2012), *What's in it for me? Using the benefits of energy efficiency to overcome the barriers*

4. Assessing the impact of fixed annual budgets

The previous chapters have set out the cost of improving low income homes to set minimum standards and the cost of improving ‘middle/higher income’ homes to an EPC C standard. This chapter explores how much could be achieved if fixed annual budgets are made available for retrofitting the homes of both low income and ‘middle/higher income’ households. Three scenarios were explored: £2 billion pa, £3 billion pa and £4 billion pa.

4.1 Research assumptions

- The annual budget is split 60:40 between low income and ‘middle/higher income’ households, which approximately reflects the current ECO split.
- The £120 assessment fee is included in the costs.
- The £80 million set-up and on-going costs for local delivery arrangements is additional to each of the fixed budgets.
- Low income households’ homes are improved to either EPC C or B at an average cost of £5,500 and £15,498 (without cap) respectively and £4,071 and £7,300 (with cap). Improvement works are provided free (up to the cap) to low income households.
- ‘Middle/higher income’ households’ homes are improved to EPC C by providing either 2 or 0 per cent loans over a 10-year period at an average cost of £1,312 or £1,938 respectively per household.

The research modelled three different energy efficiency standards for low income households – EPC D, C and B. Two different loan rates are modelled for middle/higher income households – 2 and 0 per cent. Loans are provided to fund works sufficient to reach EPC C.

4.2 Improvement rates for fixed annual budgets

Table 6 below shows the number of properties that can be improved for fixed annual budgets in which the homes of low income households are improved to EPC D.

Table 6: Number of properties retrofitted with varying funding levels

	‘Middle/higher income’ h/hds EPC C		Low income h/hds EPC D
	2% loans	0% loans	
# properties retrofitted for £2bn pa	558,659	388,727	654,290
# properties retrofitted for £3bn pa	837,989	583,090	981,435
# properties retrofitted for £4bn pa	1,117,318	777,454	1,308,579

Table 6 shows that even at the lowest annual budget investigated – £2 billion pa – 654,000 low income homes can be improved to EPC D while many middle/higher income homes would benefit from 2 or 0 per cent loans. Thus, over three times more low income homes can be improved to an EPC D standard each year than is possible if only ECO-level resources are made available (197,000 homes¹⁴).

Table 7 below shows the number of homes of ‘middle/higher income’ households that can be improved to mid EPC C and the number of homes of low income households that can be improved to either EPC C or B, with and without the £10k cap, for the three annual budgets.

¹⁴ See Table 3.5, p41 in Platt R et al, 2013, *Help to heat – a solution to the affordability crisis in energy*, IPPR

Table 7: Number of properties retrofitted with varying funding levels

	Middle/high income h/hds EPC C		Low income h/hds EPC C		Low income h/hds EPC B	
	2%	0%	uncapped	capped	uncapped	capped
# properties retrofitted: £2bn	558,659	388,727	206,742	274,201	76,086	158,465
# properties retrofitted: £3bn	837,989	583,090	310,112	411,302	114,129	237,697
# properties retrofitted: £4bn	1,117,318	777,454	413,483	548,403	152,172	316,929

Table 7 shows that the number of low income homes that can be improved to the minimum standards for fixed budgets increases substantially when grants are capped at £10,000. However, as noted above, the cap reduces the average SAP achieved for the EPC B target to 75 – considerably lower than the lower bound of EPC B at SAP 81. It also means that 15 per cent of properties cannot be improved to EPC C because they require more than £10,000 expenditure.

Nevertheless, the benefits of a programme designed to provide 10-year, low or zero interest loans to middle/higher income households and grants of up to £10,000 to low income households to enable home improvements sufficient to reach EPC C are considerable:

An annual budget of £3 billion pa would fund improvements sufficient to reach an EPC C standard for 410,000 low income households and 840,000 (2 per cent loan rate) or 580,000 (0 per cent loan rate) 'middle/higher income' households. In effect, very few low income households would need to live in a home below EPC C by 2025¹⁵ with this level of budget commitment.

Setting a target of EPC B for low income households would reduce the number of homes that can be improved for fixed annual budgets considerably. However, ACE observes in its report, 'Ending cold homes',¹⁶ the additional measures required to reach EPC B are often roof-mounted renewable technologies. It may therefore not be more disruptive, or more costly (not least because costs are expected to fall), to re-visit homes to install these technologies at a later date.

This would suggest putting in place a programme to initially improve homes to EPC C, then re-visiting homes at a later date to improve homes to the higher standard.

4.3 Spreading the benefits of improvement throughout the UK

The modelling carried out for assessing rates of improvement was based on assessing the extent of work required to improve the English housing stock to the minimum standards. The nature of work required to improve housing in the devolved nations may well vary from this, particularly in Scotland (for example, Scotland has a much higher proportion of flats and tenements than England). Thus, the precise number of homes that could be improved each year across the UK may vary a little from that shown in this section, once the different housing and household circumstances in each of the devolved nations is taken into account.

Nevertheless, the research suggests that the injection of more generous resources than is currently the case, coupled with the 'Help to heat' delivery reforms, would result in dramatic improvements to the energy performance of a considerable number of properties each year. The research shows that considerably more than a million homes – both low income and middle/higher income – could be improved each year to a high energy efficiency standard (at least EPC C) should resources of at least £2 billion pa be committed to this objective.

¹⁵ Excluding properties requiring more than £10,000 to reach EPC C. However, these homes will still be improved considerably above their current levels.

¹⁶ ACE, 2014, *Ending cold homes – modelling the cost and impact of introducing ambitious new fuel poverty targets*, Consumer Futures

4.4 Sources of funds for retrofit programmes

The research clearly shows the benefits of a more generous budget for energy efficiency retrofit. Citizens Advice has long advocated increased investment in energy efficiency, alongside complementary income and fuel price measures. Energy efficiency investment represents a long term, sustainable solution to fuel poverty and improved quality of life. It reduces cold-related ill health and hence pressure on health and social care services. And it has major economic benefits – Consumer Futures research¹⁷ found that it represents one of the most cost effective routes for creating jobs and boosting the economy.

We propose a number of potential sources of funds for increased energy efficiency investment:

- ECO is maintained at current levels – £860 million pa (England’s ‘share’ of ECO resources) – with responsibility for delivery transferred to local contractors, as proposed by ‘*Help to heat*’ and this report.
- Private landlords are required to meet the EPC D standard through regulation rather than through tenants paying for improvements through ‘Green Deal’ loans.¹⁸ This would entail landlords spending about £230 million pa to improve the 723,000 private rented homes below EPC D by 2020 (see Fig. 1), assuming a start date of 2015.
- Similarly, a minimum EPC D standard by 2020 is set for all social housing, as is already the case in Scotland (the standard is EPC C for gas heated homes). This would require social housing providers spending around £85 million pa¹⁹ to improve the 317,000 social properties below EPC D by 2020 (see Fig. 1), assuming a start date of 2015.
- New housing developers provide around £190 million pa from 2017 onwards as part of the ‘Allowable solutions’ provisions (see section below).
- Government provides funds of £1.62 billion pa from public expenditure. Many organisations advocate using a secure long-term revenue stream, such as that provided by carbon taxes, for these funds. This would provide long-term certainty to the energy efficiency industry and reduce investment costs due to reduced risk (see Appendix 1).

The above sources would provide a total funding package of around £3 billion pa for energy efficiency improvements in England, at least until 2020. This would imply around £3.5 billion pa is required to improve homes across Britain, assuming funds are scaled up on a pro rata basis according to population size. This research was not able to establish whether this amount is sufficient to meet minimum standards in Scotland and Wales. Responsibility for setting standards lies with the Scottish and Welsh governments. The Scottish Government has already set minimum standards for social housing and is currently considering whether similar standards are required for private sector housing. A number of Welsh organisations are proposing that the Welsh Government should similarly set minimum standards.

It is debatable whether private landlords would contribute towards the cost of meeting the 2025 EPC C standard. Social landlords may be able to find the resources required, given that many social homes already meet this standard. ‘Allowable solutions’ and ECO funds are likely to continue well beyond 2020.

¹⁷ Cambridge Econometrics & Verco, 2012, *Jobs, growth and warmer homes*, Consumer Futures

¹⁸ In its evidence to the Energy and Climate Change Committee 6/2/13, NEA argued that landlords should pay for the cost of improvements out of their own funds, although many are likely to recoup these costs through increased rents.

¹⁹ Social landlords could potentially access EU and urban regeneration funds to help meet their costs, although Government funds would also be required.

4.5 Allowable solutions

The research explored the potential for new housing developers to contribute towards costs through the 'allowable solutions' provisions (see Appendix 4 for a more detailed briefing on this). From 2016, building regulations require all new build homes to be 'zero carbon'. Under the revised definition for 'zero carbon homes', developers are required to ensure that all carbon emissions arising from energy use are abated. The regulations specify measures that can be incorporated within or on the dwelling (on-site measures) to meet the requirement. The 'Allowable Solutions' provisions allow developers to potentially meet the zero carbon standard by installing measures off-site.

Thus, the funds generated via Allowable Solutions could potentially be used by local authorities to roll-out area-based retrofit programmes, as advocated in *'Help to Heat'* and this report.

The Government consulted in 2013 on the main principles for delivering Allowable Solutions. At this stage, it has not defined the precise list of eligible measures funded through Allowable Solutions. The Government's current preference is to outline a range of criteria for choosing solutions with a view to encourage flexibility and innovation.

A Department for Communities and Local Government (CLG) impact assessment²⁰ estimates the total cost for delivering Allowable Solutions for the first 10 years between 2017 and 2026. The costs are projected to range from £1.16 billion to £2.89 billion (discounted from 2013), with a central forecast of £1.93 billion based on a price cap. The cost estimates are based on building 160,000 homes in 2017 followed by a steady increase in annual build rate in the subsequent three years, flattening out at 190,000 new homes per year between 2020 and 2026.

Verco modelled the potential for using these revenues to contribute towards the cost of meeting the minimum standards proposed in this research. The analysis found that 'Allowable Solutions' will provide around £670 million in the first four years (2017-2020), or £168 million pa. This is sufficient to upgrade around 365,000 properties, or more than a quarter of poor performing 'low-income' properties, to EPC band D by 2020.

Around £1.7 billion will be available in total between 2017 and 2025, or £190 million pa. This is sufficient to upgrade around 309,000 low income properties to EPC C. If maximum capital expenditure is capped at £10,000, the available revenues are sufficient to upgrade around 414,200 homes.

Assuming an annual build out rate of new homes beyond 2026 in line with the CLG impact assessment, and extending the projected revenues to 2030, £2.6 billion would become available over the 2017-2030 period. This is sufficient to upgrade 168,700 homes to EPC B. This number increases to nearly 355,000 homes if maximum expenditure is capped at £10,000.

In conclusion, the research suggests that 'Allowable solutions' revenues could make a significant contribution towards improving low income consumers' homes.

²⁰ Department for Communities and Local Government, 2013, *Next steps to zero carbon homes – Allowable Solutions. Impact Assessment*, August 2013

CONCLUSION

The report *'Help to heat'* calls for radical reform of the country's energy efficiency and fuel poverty policy framework and for it to be replaced with a new programme. In brief, the report proposes decentralising the delivery of energy efficiency programmes away from fuel companies and towards local contractors; systematic, 'house by house' assessment in concentrated geographic areas; free assessments to all households regardless of their financial circumstances and the provision of free grants to 'fuel poor' households and low or zero interest loans to all other households to pay for improvement works.

'Help to heat' argues that the reformed delivery model would improve the cost effectiveness of energy efficiency programmes considerably. Thus, the re-allocation of existing resources (at the time of the research) – essentially £1.3 billion from ECO and £80 million from the consumer incentive scheme – would result in the following benefits:

- 197,000 fuel poor households would receive free energy efficiency improvements sufficient to improve their homes to EPC D every year – 117,000 more than under the current ECO model. They would on average save £230 per year on their energy bills.
- 1.1 million households would receive a free energy efficiency assessment each year and could therefore potentially take out a low or zero cost Green Deal loan.
- Government subsidies to reduce Green Deal interest rates would enable 200,000 consumers each year to take out Green Deal loans sufficient to improve their homes to EPC C (subject to the golden rule).

This research builds upon the *'Help to heat'* reforms. It shows that a much more ambitious programme could be delivered by providing additional resources to the proposed delivery model. This would benefit both low income and 'middle/higher' income households. The research proposes providing grants to all low income households, rather than fuel poor households only. It warns that low income households not defined as 'fuel poor' would otherwise fall through a gap in the middle – they do not qualify for free grants nor are likely to take out low interest loans due to debt aversion and low levels of energy consumption.

The research assesses the cost of improving the homes of low income households to both EPC D (the standard proposed by *'Help to heat'*) and to higher standards. More extensive retrofits to EPC C or B would allow consumers to benefit from much higher fuel bill savings.

The research then assesses the cost of improving the homes of 'middle/higher' income households to EPC C. It models the cost of offering 0, 1 or 2 per cent loans to all such households.²¹ The research shows that the cost of providing such loans is reduced considerably if the loan period is reduced to 10 years, rather than the 20 years described in *'Help to heat'*. This also reduces the cost to Government of providing a guarantee to the GDFC and the further cost of householder subsidies. It would require ending the requirement to only fund measures that meet the Green Deal's golden rule.

The research suggests that consumers are likely to be more amenable to 10-year loans because this reduces the total interest payable considerably, is more in line with average home occupancy rates and reduces consumer concerns that long-term loans attached to electricity meters will reduce future house values.

The research investigates a number of scenarios for improving the homes of both low income and middle/higher income households to minimum standards with fixed annual budgets. For example, it found that even at the lowest annual budget investigated – £2 billion pa – over three times more low income households would benefit from free energy efficiency upgrades to an EPC D standard than that found in the *'Help to heat'* research: 654,000 households compared to 197,000.

²¹ IPPR also proposes providing zero interest loans to an initial 200,000 'early adopters'.

This would also fund 10 year, 2 or 0 per cent loans to a further 560,000 or 390,000 respectively 'middle/higher' income households to enable them to improve their homes to EPC C.

The research found that should expenditure of over £2 billion pa be committed, it would be possible to improve at least 1 million homes of both low income and 'middle/higher' income households to an EPC C standard each year.

One scenario is summarised here. It is based on providing 10 year, 2 or 0 per cent loans to 'middle/higher' income households and free grants to low income households up to a maximum of £10,000. A target standard of EPC C is set for both sets of households. It also includes a £120 assessment fee per household. It assumes an additional £80 million pa is allocated to set-up costs for local delivery arrangements and the on-going coordination of local delivery and referrals to other services, such as income maximisation advice.

An annual budget of £3 billion pa²² would fund improvements to the homes of 410,000 low income households and 840,000 (2 per cent loans) or 580,000 (0 per cent loans) 'middle/higher' income households. This would mean that by 2025 the vast majority of low income households in England would benefit from warm, comfortable homes rated at least EPC C.²³

The improvements would result in an average annual bill saving of £337 for 'middle/higher' income households and £269 for lower income households.

Finally, the research assessed potential sources of funds for an ambitious energy efficiency and fuel poverty programme. Assuming an annual expenditure of £3 billion pa, the research found that nearly half of these costs could be met, at least until 2020, through regulation of the private rented and social housing sectors, continued ECO funding and the new 'allowable solution' provisions. The other half would have to be met from Government funds.

The research outlines the advantages of linking funds for energy efficiency to a secure long-term revenue stream, such as that provided by carbon taxes. It suggests this would provide long-term certainty to the energy efficiency industry and encourage investment by reducing risk.

'Help to heat' proposes a radical shake-up of the current energy efficiency and fuel poverty delivery model. This research shows how additional resources would allow the reformed delivery model to transform the country's housing stock and suggests sources of funds for the ambitious programme advocated.

We now need to show how a local delivery model for the national programme might work. For example, how do we set up local contractual arrangements for delivering ECO, central government funds and allowable solutions? How do we allocate funds to local areas? What is the role of local government and housing associations? How do we make sure the voluntary and community sectors are able to help? How do we make sure there is an orderly transition from current delivery arrangements to those proposed in *Help to heat* and this report? We plan to answer these questions over the next year.

²² This would imply an annual budget of £3.5 billion to improve homes across Britain, assuming resources are scaled up on a pro rata basis according to population size.

²³ Excluding properties requiring more than £10,000 to reach EPC C. However, these homes will still be improved considerably above their current levels.

Appendix 1: Carbon taxes and energy efficiency

Over the next 15 years the Government will receive £63 billion from the carbon floor price and EU Emissions Trading System (ETS) auctions – an average of £4 billion pa. The Government's Fuel Poverty Advisory Group (FPAG) and Energy Bill Revolution (EBR) Alliance²⁴ argue that these funds should be invested in a major programme to improve the energy efficiency of our homes. FPAG and EBR set out the following benefits of linking energy efficiency investment to carbon tax revenues, it would:

- provide long-term certainty to the energy efficiency industry.
- reduce risk and investment costs because of this certainty. The industry has been plagued by the 'stop/start' nature of previous energy efficiency schemes.
- compensate consumers for the average increase of £67 pa²⁵ in consumers' energy bills due to the impact of ETS and Carbon Floor Price on bills.
- fulfil the EU's objective that at least 50 per cent of ETS auction revenues should be used to fund climate change mitigation measures.²⁶
- meet the principle that 'green taxes' should be used to fund 'green measures'.
- bring the UK into line with many other European countries that have already agreed to use all or a large part of ETS auction proceeds to fund energy efficiency and other climate change programmes.²⁷

Even if the UK Government does not support the case for a direct link between carbon taxes and energy efficiency investment, it should still recognise that a much higher level of resources is required than at present to fully realise energy efficiency benefits. These include economic growth, increased local jobs, reduced NHS and social care costs due to reduced ill health from cold homes, improved quality of life, increased energy security due to less reliance on gas imports and a substantial reduction in fuel poverty.

²⁴ See FPAG 2013 annual report (<http://ow.ly/xXJ7r>) and Energy Bill Revolution alliance (www.energybillrevolution.org).

²⁵ DECC, 2013, *Estimated impacts of energy and climate change policies on energy prices and bills*

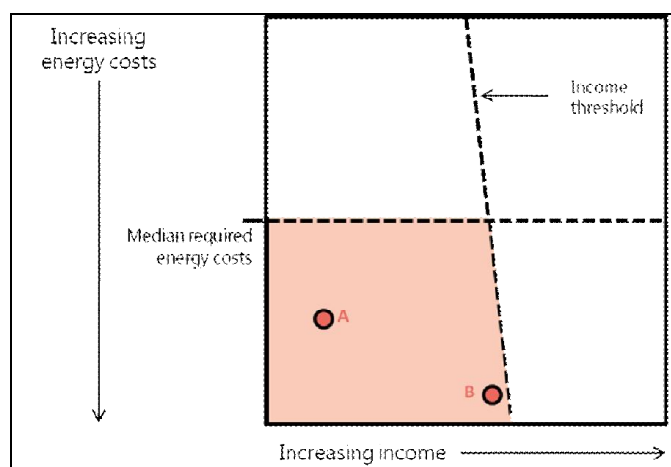
²⁶ Official Journal of the European Union, 2009, 'Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009, amending directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the community', *Official Journal of the European Union*, 5/6/2009

²⁷ For example, the French Government intends to insulate one million homes per year from the proceeds of auctioning its allocation of EU-ETS allowances: <http://ow.ly/xXJG0>

Appendix 2: Low income and fuel poor households

Figure 7 below gives a diagrammatic representation of the Government's new LIHC fuel poverty definition.

Figure 7: Low income High Costs (LIHC) definition of fuel poverty



IPPR proposes providing grants to only those defined as fuel poor, that is those in the bottom left hand shaded quadrant. Consumer Futures proposes providing grants to all low income households, that is all those to the left of the income threshold. Thus, our definition of low income is the same as the Government's, namely households with an income less than 60 per cent of the median after housing costs and fuel costs.

We advocate making low income, rather than LIHC fuel poor, households the target group for the following reasons:

1. We do not consider it appropriate to provide loans to low income households for the reasons stated in the main report.
2. 1.3 million low income households with fuel costs below the median fuel cost threshold (and therefore not defined as LIHC fuel poor) struggle to afford their fuel bills and can benefit from cost effective energy efficiency improvements.²⁸
3. Improvements to the homes of households below the median fuel cost threshold are generally less expensive than those required for those above the threshold because they tend to live in more efficient homes. The additional cost of providing help to these households is therefore relatively modest.
4. It is important that low income households not in LIHC fuel poverty are helped so that they do not fall into fuel poverty in the future.
5. If only LIHC households are targeted with help, then households with low incomes and costs just below the median costs threshold would subsequently fall into fuel poverty following the installation of improvements in LIHC homes. This is because the median fuel costs threshold would shift as a result of carrying out improvements due to the relative nature of the LIHC definition. This process would continue as more homes are improved. A target that encompasses all low income households provides a more tangible and straightforward measure for assessing the size of the task and monitoring progress.

²⁸ ACE, CSE, Richard Moore, 2012, *Improving Hills*, Consumer Futures

6. By providing energy efficiency improvements to all low income households, and not just those in LIHC fuel poverty, fuel poverty is substantially reduced, both with respect to the 'headcount' LIHC indicator and the LIHC gap indicator. By 'fuel poverty-proofing' homes to Band B, and seeing who remains in fuel poverty, it is possible to establish what other non-energy efficiency help might be required, for example through fuel price or income measures.

In 2011, there were 5.7 million low income households, of whom 2.5 million were in LIHC fuel poverty.

Appendix 3: Impact and costs of minimum standards

This appendix gives more detailed information about the impact and cost of improving the homes of low income households to the different minimum standards.

Table 8: Breakdown of average costs by household type for different minimum standards

Average costs	EPC band D	EPC band C	EPC band B	EPC C <£10k	EPC B <£10k
Couple with dependent child(ren)	£1,655	£5,691	£16,527	£4,287	£7,581
Couple, aged 60 or over, no dependent child(ren)	£1,580	£5,302	£16,426	£3,980	£7,584
One person under 60	£1,641	£5,370	£13,350	£4,249	£7,333
One person aged 60 or over	£1,506	£4,719	£14,632	£3,935	£7,702
Other multi-person households	£1,817	£6,472	£15,969	£4,786	£7,519
Couple, aged under 60, no dependent child(ren)	£2,133	£6,603	£16,923	£4,427	£7,118
Lone parent with dependent child(ren)	£1,831	£5,878	£15,758	£4,228	£7,266

Table 9: Breakdown of energy bill savings by household type for different minimum standards

Average bill savings	EPC band D	EPC band C	EPC band B	EPC C <£10k	EPC B <£10k
Couple with dependent child(ren)	£203	£314	£368	£296	£325
Couple, aged 60 or over, no dependent child(ren)	£192	£329	£364	£304	£323
One person under 60	£199	£261	£280	£269	£290
One person aged 60 or over	£201	£286	£321	£269	£303
Other multi-person households	£203	£323	£355	£314	£322
Couple, aged under 60, no dependent child(ren)	£241	£354	£392	£322	£334
Lone parent with dependent child(ren)	£200	£288	£326	£277	£295

Table 10: Breakdown of average costs by tenure for different minimum standards

Average costs	EPC band D	EPC band C	EPC band B	EPC C <£10k	EPC B <£10k
Private rented	£1,894	£6,852	£15,896	£5,107	£7,429
Owner occupied	£1,645	£5,629	£17,246	£4,123	£8,532
Housing association	£1,530	£4,430	£13,659	£3,462	£9,964
Local authority	£1,667	£4,910	£13,772	£3,809	£9,495

Table 11: Breakdown of average energy bill savings by tenure for different minimum standards

Average bill savings	EPC band D	EPC band C	EPC band B	EPC C <£10k	EPC B <£10k
Private rented	£212	£333	£367	£303	£308
Owner occupied	£208	£342	£402	£318	£395
Housing association	£173	£223	£249	£207	£300
Local authority	£179	£224	£253	£204	£283

The following graphs are based on Tables 8 and 9. Figure 8 shows the breakdown of average cost by household type for the three scenarios. Single person households on average benefit from a less costly package compared to other household types in order to reach the same EPC band. Small households generally live in small dwellings, mostly flats, and benefit from lower cost of installation for measures like insulation, double glazing, etc.

Moreover, for higher EPC bands, the difference between average cost of household types becomes more prominent. This is demonstrated by the increased difference in costs between household types for the EPC B standard, compared to EPC D.

Figure 8: Average cost of improving homes to minimum standards by household type

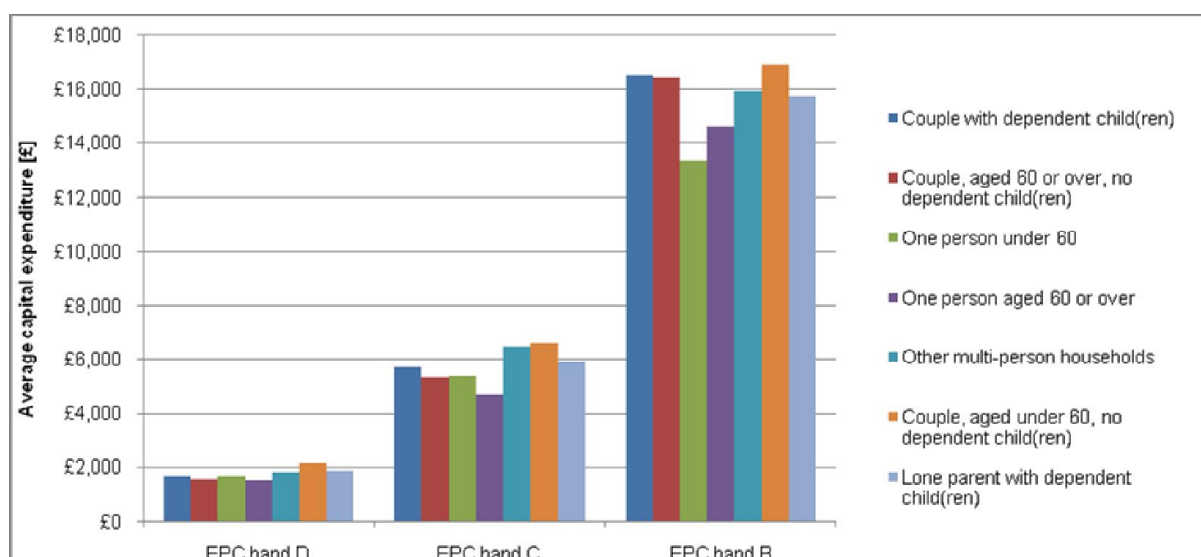


Figure 9 illustrates how average bill savings vary by household type for the different standards and shows similar trends as Figure 8. Single person households save less on their energy bills and this becomes more prominent for higher standards of retrofitting.

Figure 9: Average bill savings – improving homes to minimum standards by household type

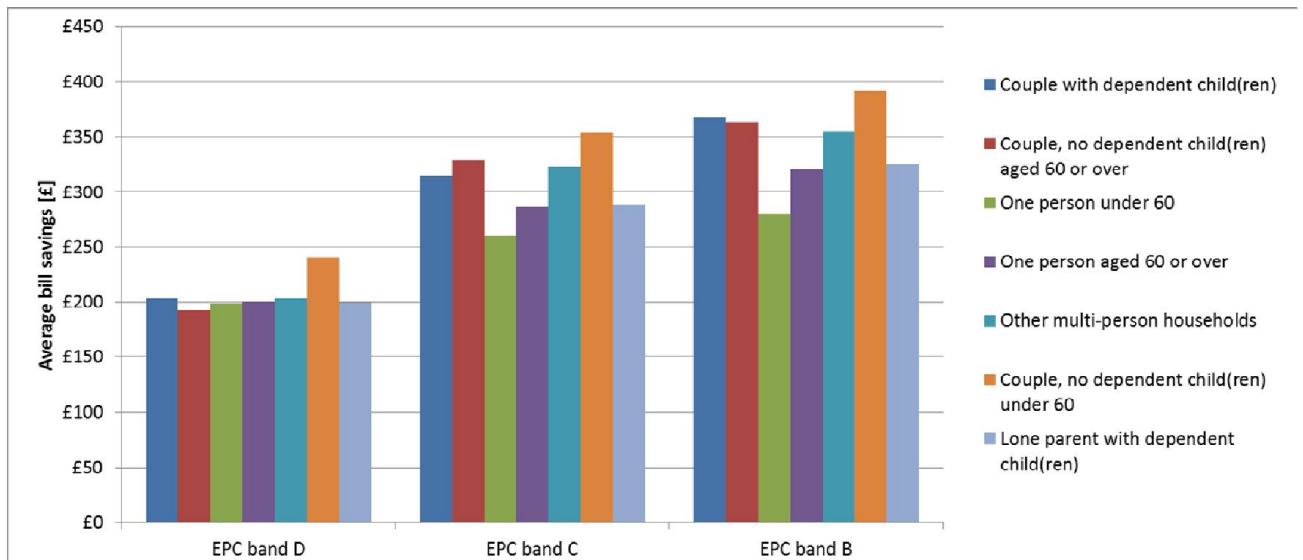
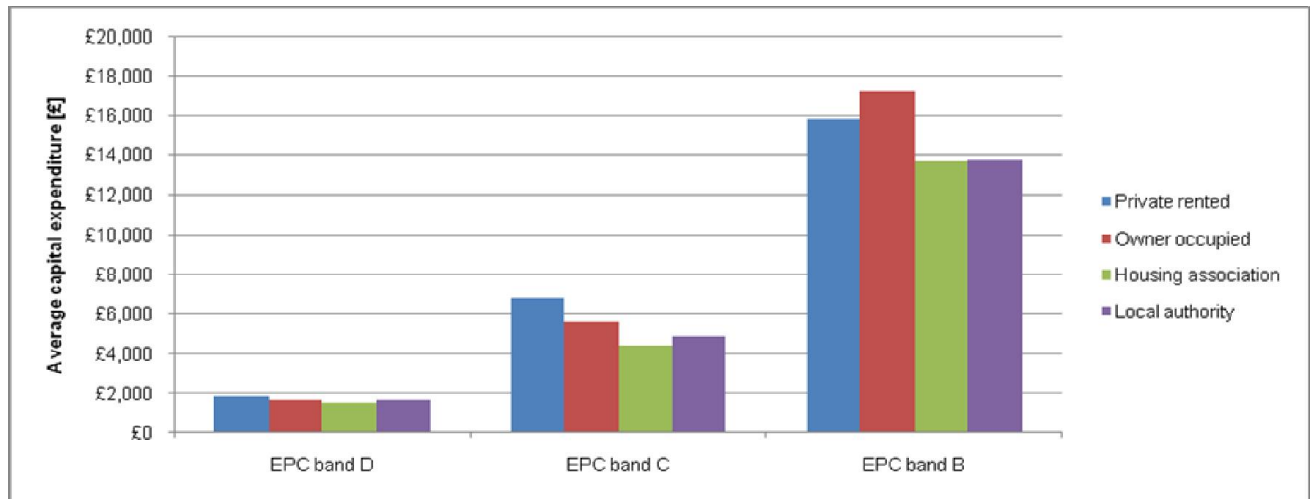


Figure 10 illustrates the average cost of improving homes to the minimum standards by tenure. Housing association and local authority households on average have better energy performance and therefore on average cost less to improve than private rented or owner occupied households. For EPC C, the average costs for social housing is £4,400 to £4,900. The corresponding figures for owner occupied and private rented homes are £5,630 and £6,850 respectively.

Figure 10: Average cost by tenure for meeting minimum standards



The improved original energy performance of social housing stock results in lower average bill savings compared to private households. This is linked to the extent of the energy efficiency package installed and thus average costs. Hence, Figure 11 illustrates a similar trend to the previous graph.

Figure 11: Average energy bill savings by tenure for meeting minimum standards

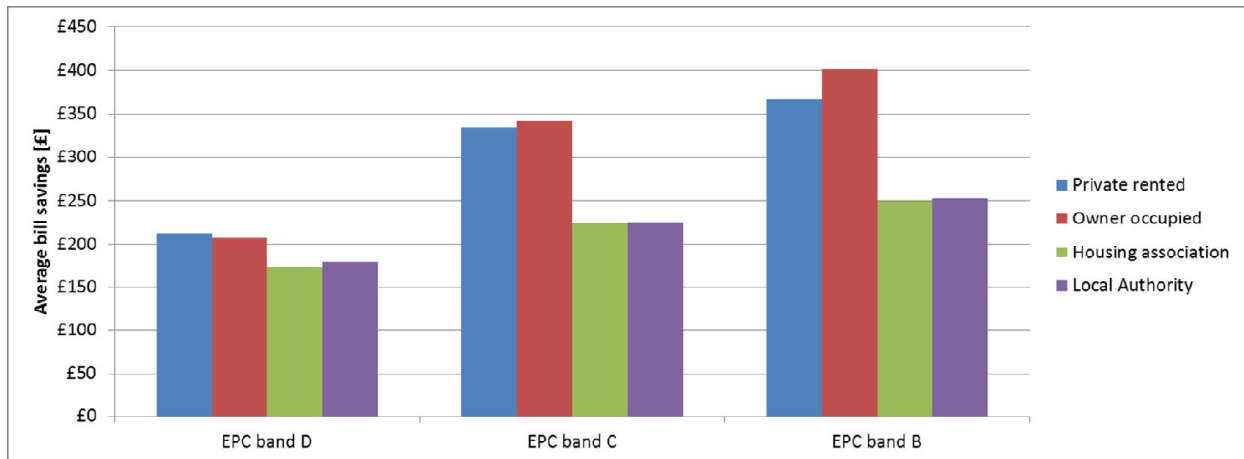
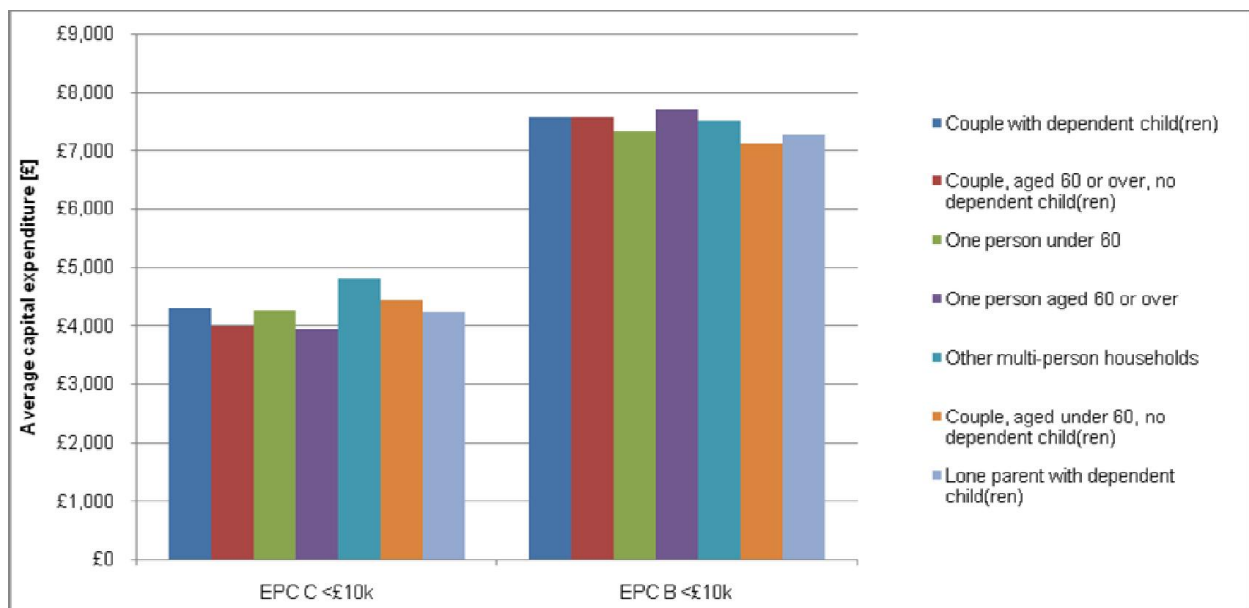


Figure 12 below shows that the £10,000 cap ‘flattens’ the difference in average costs between the different household types. This is due to the fact that larger households (two or more person households) are more affected by the cap than the smaller ones (single person households).

Fig. 12: Average cost of improving homes to minimum standards by household type, with cap

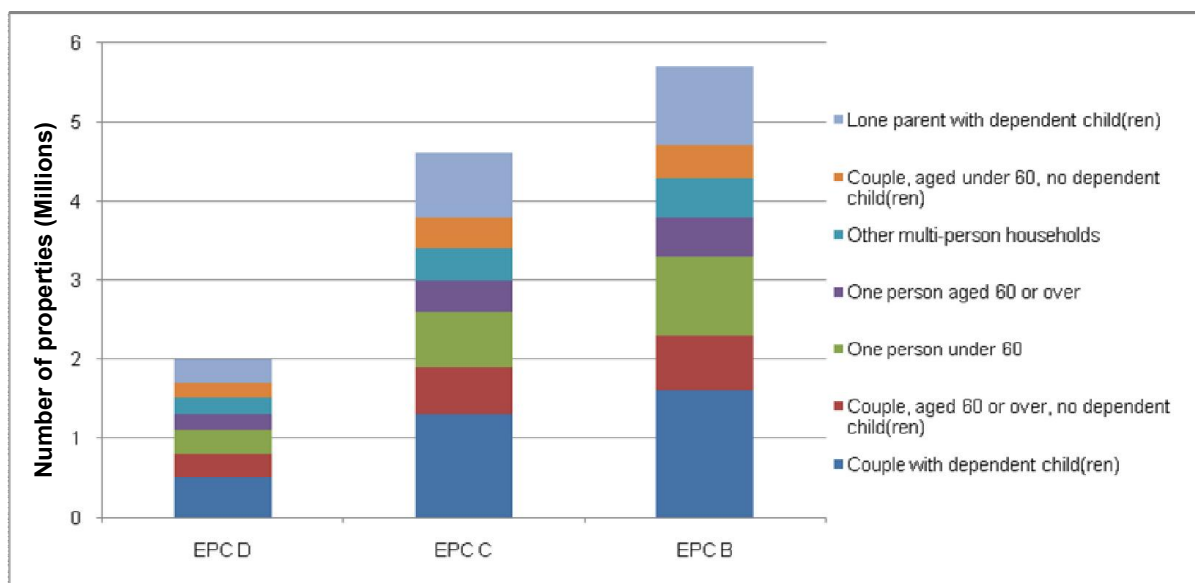


Finally, Table 12 and Figure 13 below show the number of households in each household type that would benefit from improving homes to the minimum standards.

Table 12: No. of households benefitting from meeting minimum standards by household type

	EPC D	EPC C	EPC B
Couple with dependent child(ren)	494,085	1,369,265	1,594,616
Couple, aged 60 or over, no dependent child(ren)	300,267	634,262	701,684
One person under 60	284,259	723,004	983,770
One person aged 60 or over	180,934	388,832	484,604
Other multi-person households	191,224	418,590	489,506
Couple, aged under 60, no dependent child(ren)	180,452	379,208	438,429
Lone parent with dependent child(ren)	278,143	812,976	997,453

Figure 13: No. of households benefitting from meeting minimum standards by household type



Appendix 4: Allowable solutions

Briefing note, Pratima Washan, Verco

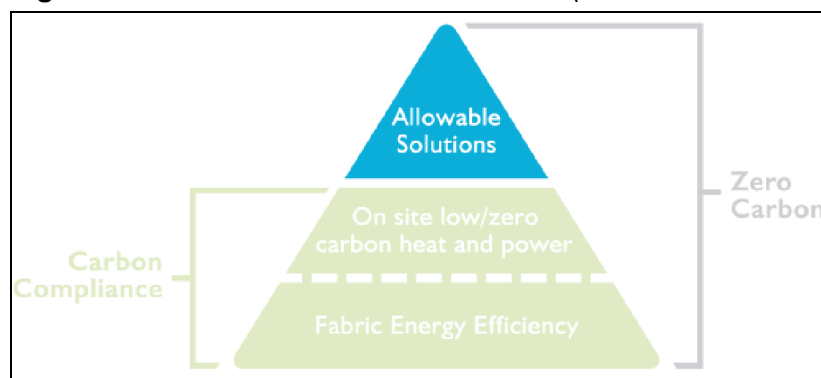
Introduction

This research outlines the cost of upgrading the energy performance of low income and 'middle/higher' income households to different EPC standards. However, not all these costs will necessarily have to be borne by the Government. Some of the associated costs can effectively be passed on to the private sector through targeted policies, including among others, consequential improvements and minimum standards for the private rented sector.

This Appendix explores the potential for 'Allowable Solutions' as a funding route to improve the energy performance of existing housing, particularly low-income households, using a 'local-authority' led delivery model. The funds generated via Allowable Solutions could be used by local authorities to roll-out area-based retrofit programmes, as advocated in 'Help to Heat' and this report. At the same time, local authorities can capitalise on economies of scale and are well placed to align local priorities (for example areas earmarked for regeneration) when designing and delivering such programmes.

Policy background

Figure 14: Zero carbon homes standard (Source: Zero carbon hub)



All new build homes are required to be 'zero carbon' from 2016 onwards. Under the revised definition for 'zero carbon homes', all carbon emissions arising from energy use covered by Building Regulations must be abated. This includes energy used for heating, hot water, lighting and ventilation. At the bottom of the zero carbon abatement pyramid are specific requirements around fabric energy efficiency and an on-site carbon compliance standard that are to be achieved by measures incorporated within or on the dwelling (on-site measures). Allowable Solutions sit at the top of the zero carbon abatement pyramid, as measures that can potentially be delivered off-site to meet the zero carbon standard.

Based on Zero Carbon Hub recommendations regarding on-site carbon compliance targets,²⁹ the residual emissions that would need to be abated through Allowable Solutions range from 10 -14 kgCO₂/m² depending on the dwelling type.

The Government ran a consultation in autumn 2013 to seek views on the main principles and processes for the delivery of Allowable Solutions. The precise list of eligible Allowable Solutions measures was not defined. The Government's preference is to outline a range of criteria for choosing solutions with a view to encourage flexibility and innovation. The proposed criteria for choosing measures include, among others, cost-effectiveness and verifiable carbon impact.

²⁹ Zero Carbon Homes, 2010, *Carbon Compliance for Tomorrow's New Homes – A Review of the Modelling Tool and Assumptions. Overview of Findings and Recommendations*

The Government intends to set a ceiling price for Allowable Solutions. At present it has outlined a range of options that could be adopted to set this price cap. Depending on the option the cost of Allowable Solutions could range from £36 to £90 per tCO₂ abated.

The consultation also puts forward potential delivery approaches including a range of house builder-led options and an alternative mandated local authority delivery route. Under the latter option the local authority will manage the disbursement of funds to invest in local Allowable Solutions that meet pre-defined criteria. This has similarities with the Community Infrastructure Levy under which developers make a payment to the local authority to support local infrastructure projects.

Projected revenues available from Allowable Solutions

The design stage impact assessment³⁰ published by CLG in August 2013 estimates the total present cost for delivering Allowable Solutions for the first 10 years between 2017 and 2026. The costs are projected to range from 1.16 billion to 2.89 billion (discounted from 2013), with a central forecast of £1.93 billion based on a price cap scenario of £60/tCO₂. The cost estimates are based on 160,000 homes being built in 2017 followed by a steady increase in annual build rate in the subsequent three years, flattening out at 190,000 new homes per year between 2020 and 2026.

The available revenues will be around £670 million in the first four years (2017 to 2020), sufficient to upgrade around 365,000 properties or more than a quarter of poor performing 'low-income' properties to EPC band D by 2020. The figure on number of upgraded properties takes into account both the cost of installing the energy efficiency measures as well as the £120 retrofitting assessment fee.

Around £1.7 billion will be available between 2017 and 2025, sufficient to upgrade around 309,000 low income properties to EPC C. Where the maximum capital expenditure is capped at under £10,000, the available revenues are sufficient to upgrade around 414,200 homes.

Assuming an annual build out rate of new homes beyond 2026 in line with the design stage impact assessment, and extending the projected revenues to 2030, gives a total present cost of £2.6 billion between 2017 and 2030, sufficient to upgrade 168,700 homes to EPC B. This number increases to nearly 355,000 homes under the £10,000 capped EPC B scenario.

The cost of carbon abatement

The cost per tonne of CO₂ abated was worked out for the range of EPC targets investigated in the main report. These are summarised in Table 13 below.

Table 13: Cost of improving homes to minimum standards

	EPC D	EPC C	EPC B	EPC C <£10k	EPC B <£10k
Number of low income properties to be upgraded (million)	1.4	4.7	5.7	4.7	5.7
Average cost	£1,714	£5,500	£15,498	£4,071	£7,300
Cost per lifetime carbon savings (£/tCO ₂)	£67	£159	£347	£142	£209

The £/tCO₂ lifetime figures in the table above were calculated according to the expected lifetime of individual energy efficiency measures. They include an allowance for the potential gap between predicted and actual performance by applying measure-specific in-use factors.

³⁰ Department for Communities and Local Government, 2013 *Next steps to zero carbon homes – Allowable Solutions. Impact Assessment*

At £67/tCO₂, upgrading low-income households to EPC D is unsurprisingly the most cost-effective option and largely in line with the central price cap scenario of £60/tCO₂ indicated in the Allowable Solutions Impact Assessment.

In addition, existing verification and quality assurance systems in place for Green Deal and ECO will reduce the administrative burden associated with monitoring and verification of Allowable Solutions.

Conclusions

The projected revenues from Allowable Solutions are not sufficient alone to address the scale of investment needed to upgrade homes. However, in combination with other potential sources of revenues, they would enable local authorities to rollout a large scale area-based retrofit programme. Around 82 per cent of local authorities have Community Infrastructure Levy arrangements already in place³¹ and are well placed to use these existing arrangements to administer Allowable Solutions funds. An arrangement of this nature would allow local authorities to exploit economies of scale at marginal administrative burden, and deliver tangible social and health benefit for local communities in addition to environmental and economic benefits.

³¹ DCLG, 2013, *Next steps to zero carbon homes – Allowable Solutions – Impact Assessment*