Costs of the ECO: 
*The impact on low income households*

Final Report to eaga Charitable Trust
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Summary
This report, for eaga Charitable Trust, assesses the way that the costs of the forthcoming Energy Company Obligation (ECO) could be passed on to consumers by energy companies, in order to minimise the regressive nature of the policy. Through a combination of stakeholder interviews, a literature review and modelling, it assesses the pass-through of costs due to supplier obligations to date, before considering potential alternatives and their likely impact.

It concludes that, for the majority of low income consumers, the pass-through of costs as part of the per unit charge is preferable. However, regardless of whether these costs fall upon the gas or electricity bill, there will be a minority of households that are worse off as a result, since they consume more electricity and/or gas than is typical. In order to minimise the impact upon these households, the optimal solution would be to spread the costs of the policy across the amount of both gas and electricity consumed. By sharing the burden equally between each kWh of gas and electricity supplied, it is expected that gas bills would account for 71% of the ECO costs, with 29% on the electricity bill.

 Whilst this would reduce the magnitude of the additional costs to the low-income, high-consuming households, the group would still remain. These households should be protected through additional policy mechanisms: ensuring the ECO benefits are targeted at those low income households disadvantaged by the per unit pass-through; similarly targeting the Warm Home Discount credit; and investigating options for households who may be income-poor but asset-rich.

The nature of the competitive energy market makes it difficult to be sure that costs do fall upon customers in the way that is desired. In addition to splitting the obligation by kWhs supplied, Ofgem should use their Retail Market Review proposals to ensure the standing charges on tariffs do not include costs that, by policy design, are expected to be passed through to consumers in the unit charge of energy. This would include the costs of the ECO if levied per unit.
1 Background

This report looks at the Energy Company Obligation (ECO), to be introduced at the start of 2013, with specific regard to the way the costs of this policy will be passed on to households. This background section sets out some of the key issues pertaining to the discussion: tariffs and social impacts, energy and climate change policy costs, the ECO, and fuel poverty eradication.

1.1 Energy tariffs and social impacts

Domestic energy tariffs are currently constructed in such a way that the more energy a household consumes, the cheaper each unit of energy becomes, as illustrated Figure 1. The reason for this is that the competitive market has delivered energy tariffs that are ‘cost-reflective’ – that is, costs are passed on to consumers in the same way that they are incurred by suppliers. Since there is a ‘fixed’ charge associated with supplying energy to each customer, these costs are passed on in the unit price of the tier 1 energy band, or in the standing charge. As a result, the first units of energy purchased each year by consumers are more expensive than the marginal ones.

Whilst ‘cost-reflective’ pricing is logical and potentially helps keep costs to consumers at a minimum, it has some drawbacks:

- Higher consumption is rewarded with a lower average price per unit of energy, since the fixed costs are diluted over a greater number of units
- Energy efficiency investment becomes less cost-effective, since the marginal unit cost saving is lower than the average unit cost, in turn because the ‘fixed’ charge is not affected by reduced consumption.

For a two tier tariff, these points are illustrated in Figure 1. As consumption increases the average unit cost reduces from the tier 1 price to the tier 2 price. The marginal unit cost is the tier 2 price – below the average price paid per unit.

![Figure 1 - Energy and unit costs with increasing consumption for a two-tier tariff](image-url)
The first of these points is of importance when assessing the social impact of tariffs. As Figure 2 illustrates, on average low-income households consume less energy than those on high incomes. Therefore typical tariff structures which give a higher average unit cost with reduced consumption result in low income households paying a higher price per unit for energy than higher income households.

Several reports have looked at this issue, and the potential for alternative tariff structures\(^2\),\(^3\). Ultimately they conclude that reversing this structure could only be achieved if mandated by Government, and that such approaches would have disadvantages in creating the biggest profits for suppliers on the marginal units sold – removing any incentive for them to help their customers in reducing energy demand. Solutions proposed included using the tax system to reverse the structure of tariffs (higher taxes on higher quantities of energy consumed), or a focus on how the costs of energy and climate change policies fall upon suppliers (policy structure could be adjusted to encourage pass-through of costs in a manner that least impacts upon low income households).

### 1.2 Energy and Climate Change policy costs

An increasing number of policies designed to support the transition to a secure low carbon economy are being funded through levies on energy bills. The cost of policies typically fall upon electricity and/or gas bills, and are assumed to impact upon either the standing charge (or tier 1 unit price) or unit price (tier 2 unit price) paid by consumers.

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1. CSE and ACE (2010) Distributional impacts of UK Climate Change Policies
1.2.1 The split between electricity and gas

The costs of energy and climate change policies impact differently upon gas and electricity prices. Figure 3 presents the breakdown of a typical gas and electricity bill, illustrating that in 2010 energy and climate change policies accounted for approximately 12% of a typical electricity bill, and 4% of a typical gas bill.

Figure 3 - Estimated breakdown of an average annual domestic gas and electricity bill in 2010 (DECC)\(^4\)

The policy costs incorporated into the electricity bill at present cover CERT, CESP, the Renewables Obligation, the EU ETS, and FiTs, whilst the gas bill currently covers just CERT and CESP.

Figure 4 - Estimated impact of energy and climate change policies on average domestic retail gas and electricity prices in 2010, 2015, and 2020 (including VAT) (DECC 2010\(^5\))

\(^4\) DECC assumes an average consumption of 4.2MWh/yr for electricity and 16.4MWh/yr for gas in 2010; as derived from total consumption estimates published in Digest of United Kingdom Energy Statistics, 2009 and CLG household assumptions.

Future policy developments look set to accentuate the difference between policy costs upon electricity and gas bills. Figure 4 presents the likely spread of costs in 2015 and 2020, with electricity bills continuing to bear the majority of the costs. In fact, this is likely to underestimate the difference: the DECC analysis presenting this chart assumed that the costs of the RHI would be met by gas consumers, yet (at least until the end of the current spending round in 2014/15) the costs will be met through general taxation. In addition, the electricity price will be impacted upon by the Electricity Market Review. Plans to introduce a capacity mechanism, contracts for difference Feed-in-Tariffs, and a carbon floor price, will all add further costs to the price of each electricity unit. Even without these expected additional policies, energy and climate change policies will cause domestic electricity prices to increase by 36%, but gas prices by only 8%. This is illustrated in Figure 5.

![Electricity price increase through energy & climate change policies in 2020 (%)](image1.png)

![Gas price increase through energy & climate change policies in 2020 (%)](image2.png)

Figure 5 – Additional costs on the domestic unit price of electricity (left) and gas (right) from energy and climate change polices in 2020. Doesn’t include additional costs resulting from the Electricity Market Review. Adapted from: ACE and CSE (2010) Distributional impacts of UK Climate Change Policies.

1.2.2 Standing charges and unit price

As well as the question of costs falling upon gas or electricity bills, policies can either fall upon suppliers based on the number of customer accounts they hold, or the number of units of energy they supply. It is expected, but not certain, that the way costs fall upon suppliers will translate into the method of cost recovery they employ with consumers: costs that fall upon suppliers based on the number of customer accounts are fixed costs, and therefore likely to be passed on in standing charges (or tier 1 unit prices). Costs borne by suppliers due to the number of units of energy that they supply are variable costs, and likely to be passed on in the unit price (or tier 2 unit prices).

Several policies fall into this latter group: the Renewables Obligation (where suppliers have to purchase a set proportion of the electricity they supply from renewable sources) and the Feed-

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7 In the vast majority of cases the tier 1 allowance is exceeded by consumers. As such, there is no practical difference between a two-tier and standing charge tariff. For simplicity we will only refer to standing charge tariffs from here onward, but the arguments pertain equally to a two-tier structure.
in-Tariff (where costs are levelised between suppliers based on the quantity of electricity they supply) are two examples.

Policy costs falling upon suppliers according to the number of accounts they hold include the Carbon Emission Reduction Target (CERT) and the Community Energy Saving Programme (CESP), since the targets under CERT and CESP\(^8\) are split based on the total number of gas and electricity accounts held. The assumption is that these costs are passed on as part of the standing charge.

The nature of these differences is that the underlying tariff structure – where the average costs of energy per unit are cheaper the more energy is consumed – is accentuated by a ‘fixed-cost’ pass-through (CERT, CESP), but moderated slightly if the costs fall evenly upon each unit consumed. Given our understanding of income and consumption in Figure 2, the ‘per unit’ approach helps mitigate the impact of those policy costs on the majority of low income households, who consume below the average quantity of energy.

1.3 The Energy Company Obligation

The delivery of energy efficiency and sustainable energy to UK households is undergoing a significant transformation. Under the banner of the Green Deal, the Government is putting together a policy framework that consists of coordinated elements: funding and finance, quality assurance and consumer protection, supply chain measures and incentives.

One part of this new framework comes in the form of a new supplier obligation, known as the ECO. The Energy Bill, introduced into the House of Lords in December 2010, briefly outlines the objectives for the ECO (emphasis added):

*The objective of the powers in the Energy Bill for the Energy Company Obligation (ECO) is to ensure that there is the flexibility to design an obligation that underpins the effectiveness of the Green Deal and contributes towards carbon and fuel poverty targets in a cost effective and fair manner.*

(Energy Bill 2011: Impact Assessment, p44)\(^9\)

*The new obligation will underpin the green deal and focus particularly on those householders (e.g. the poorest and most vulnerable) and those types of property (e.g. the hard to treat) which cannot achieve financial savings without a measure of support.*

(Energy Bill 2011 Brief)\(^10\)

Therefore the priorities for the new ECO will be to continue the work of CERT and CESP to deliver carbon reductions. In England\(^11\), it will also bear the largest part (if not all) of the burden for eradicating fuel poverty by 2016. It will be responsible for kick-starting the delivery of solid wall insulation and more expensive measures into hard to treat homes, which have been

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\(^8\) Half of the obligation under CESP falls upon electricity generators. This portion is split based on the units of electricity generated.


\(^10\) Ibid.

\(^11\) Scotland and Wales are expected to keep their publicly funded fuel poverty programmes beyond 2013.
under-improved to date\textsuperscript{12}. Finally it will be required to underpin the Green Deal Finance mechanism in an as yet undefined way and to an unknown extent.

Two factors combine to make it critical that the scheme carefully considers who participates, both in benefiting from and paying for the scheme. Firstly, with the demise of Warm Front from 2013, the ECO will be the primary mechanism in England for addressing fuel poverty, and allowing Government to achieve its statutory duty to eliminate fuel poverty by 2016.

To date, Government’s strategy for achieving this aim has included support to increase incomes (Winter Fuel Payments), support to reduce energy bills (social price support, now structured as the Warm Homes Discount), and energy efficiency investment to reduce the number of cold, inefficient homes. The latter component has been delivered through the Warm Front programme, supplemented by the Priority and Super-priority subsets of the supplier obligations.

Figure 6 illustrates the annual Warm Front budget since 2001, and the number of households in fuel poverty in England. Interestingly, up until 2008, both the budget and the number of households who needed support followed the same pattern: most likely the increasing number of households in fuel poverty requiring Government to respond by increasing the level of support. Though this budget was never close to providing sufficient support to all those in need [even in 2008, Warm Front only supported 180,000 households – just 4\% of all fuel poor households in the UK], the budget has fallen in recent years. The programme is set to be curtailed radically, with a 68\% cut in funding in 2011 and its cessation after 2012/13. Scotland and Wales are expected to retain their publicly-funded fuel poverty programmes beyond 2013.

![Warm Front budget (£m) and fuel poor households in England (000s)](image)

\textbf{Figure 6 - Warm Front budget and number of fuel poor households. Source: DECC\textsuperscript{13}}

\textsuperscript{12} EEPH (2010) \textit{A review of the delivery tools used to improve hard to treat homes}. Available at: http://www.ukace.org/publications/77948-EEPH-DELIVERY%20TOOLS-Revised%20for%20web
Addressing fuel poverty through a supplier obligation has a big drawback: the costs are passed-through to household energy bills, potentially exacerbating the problem you are hoping to solve. In order to best achieve a reduction in the number of fuel poor households, it is important that the costs of the policy are minimised for those in, or at risk of, fuel poverty. Figure 7 illustrates how the costs of CERT and Warm Front are met across different income quintiles. Warm Front is paid through general taxation and so the costs are spread in the same proportion as the overall tax burden\(^{14}\). CERT, which, as identified, is likely to be passed on to all consumers equally, sees the burden being shared equally between quintiles.

![Figure 7: Burden of policy costs across income quintiles](chart.png)

Figure 7: Burden of policy costs across income quintiles

It is crucial that the costs of the ECO are passed on to households in the most progressive way possible.


\(^{14}\) Based on data from ONS: The effects of taxes and benefits on household income, 2008/09
2 Options for ECO cost-pass through

A study into the optimal design of the ECO (size, targeting, metrics, integration) in order to meet its objectives has been undertaken by ACE in a paper for Eaga PLC\textsuperscript{15}. This report instead focuses on the way in which the costs of the policy, however large, are passed-through to households in their energy bills.

As outlined in section 1.2.2, the costs of supplier obligations to date have likely been passed-through on a per account basis: that is each customer pays an equal share - a regressive way to pay for the policy. This section presents different options for the pass through of the ECO.

2.1 Methodology

The impact of the different options for charging back the ECO has been assessed using an ECO scenario from ACE's report on the design of the new ECO 'A future obligation on energy companies\textsuperscript{16}'. The scenario is constructed as follows:

- Using English House Condition Survey 2006/07 data and information on measures delivered during intervening years through impact assessments for current polices, a virtual 2013 picture of the English housing stock has been created.

- A base-case ECO was created that distributed measures costing £1.7bn per year between 2013-2016 to the homes in England, based on cost-effective carbon reduction.

- For these first four years, (in order to prioritise fuel poverty) the measures were delivered exclusively to an eligible group consisting of households that were:

  1. both low income (we have assumed to be the lowest three income deciles) and vulnerable (household member under 16 or over 60 or long term ill or disabled)

  2. households on low incomes and living in solid wall homes.

This results in an eligible group of 5.6m households, 59% of which are fuel poor\textsuperscript{17}, and which makes 71% of fuel poor households eligible for support.

- To account for under-consumption within households, heat and power consumption were adjusted based on income quintile and property type using a match-up between the EHCS and the Living and Food Cost Survey\textsuperscript{18}. This enables an assessment of the average impact of different pass-through options upon each income quintile.

- Options for different approaches to the cost pass-through are identified through a combination of stakeholder interviews, and a literature review. The impact of these are assessed with costs passed-through to the standing charge and/or the unit rate of different fuels\textsuperscript{19}

\textsuperscript{15} ACE (2011) A future obligation on energy companies
\url{http://www.ukace.org/index.php?option=com_content&task=view&id=624&Itemid=26}

\textsuperscript{16} ibid

\textsuperscript{17} Based on the official 'full income' definition of fuel poverty

\textsuperscript{18} A full methodology for this match up can be found in Consumer Focus (2011) Green Deal: Access of All
\url{http://www.consumerfocus.org.uk/files/2011/03/Access-for-all.pdf}

\textsuperscript{19} In our modelling all households will consume more kWh than the tier 1 rate limit. As such there is no difference in the way that households will be charged between these two alternatives. To simplify the results we have modelled all billing using the standing charge structure
In this way, modelling has focused on the way costs fall upon household bills, rather than accounting for the uncertainties resulting from suppliers' accounting systems. These issues are addressed in section 2.2.

Options are assessed in terms of their distributional impacts: what proportion of the ECO costs are met by the lowest income deciles.

This approach enables some of the 'Low-income, high-user’ aspects to be assessed, such as the presence of electric heating and the size of the home. However, it does not allow for an assessment of household behaviours: those households who spend a high proportion of their time at home. Usually these households comprise of the elderly, large families or families with young children, and the unemployed.

Options are assessed accounting for the application of the energy efficiency measures across the first 4 years of the ECO. Since the measures are targeted exclusively at an eligible group closely aligned to the fuel poor/low income, it means that these households on average consume less energy than they would were the ECO not so well targeted.

2.2 Household Bills and Obligation split

The method by which energy suppliers recoup the costs of supplier obligations is uncertain. Whilst many expect that the ‘per gas and electricity account’ division of the obligation between the suppliers would lead them to incorporate these costs into the standing charge portion of the energy tariffs, in fact suppliers are free to set their tariffs as they like. Whilst a perfectly effective competitive market would force them to be fully cost reflective, at present, as one respondent told us: “suppliers have costs, but their products are priced according to what the market will bear”.

This has clear ramifications for the design of the ECO. As illustrated in Figure 8, several options exist for placing the obligation upon suppliers. It could be done based on their supply of gas or electricity, or perhaps on the carbon content of the fuels they supply. Similarly, it could be split between suppliers based on the customer accounts of the selected fuel type, or the overall quantity of fuel or carbon supplied.

In a perfect market we would expect this to translate into a direct impact on consumers. Placing the obligation on a specific fuel would see the impact felt on that fuel only. Dividing the obligation by accounts or units sold would see the standing charge and unit price impacted respectively. However, the commercial nature of the energy companies and the lack of transparency over costs means that we cannot be sure that the policy design we recommend will have the impacts we desire.

This has implications for the presentation of results in this report as well. Rather than suggesting the optimal policy in terms of obligation split and hoping for the corresponding outputs, this report assesses the optimal outcomes for consumers, before going on to discuss how those outputs can be achieved using the mechanisms available to Government and Ofgem.
2.3 Basic options for costs of ECO

In its most basic form, the costs of ECO for consumers can be thought of in terms of two questions: should the levy be passed through in electricity and/or gas bills, and should the cost be passed through in the standing charge, or the per unit charge. Each has inherent advantages and disadvantages, as set out in the sections below.

Standing charge vs per unit

The first option for the pass-through of costs is whether it is preferable for the ECO charge to be met through the standing charge or within each unit consumed. The assumption is that certain policies at present are passed on to consumers in the standing charge (CERT, CESP and the Warm Home Discount) whilst others are passed through in the unit charge (Renewables Obligation, Feed-in-Tariff, EU ETS costs). The relative advantages and disadvantages of placing the costs on the standing charge vs per unit are set out in Table 1.

<table>
<thead>
<tr>
<th>Costs added to Standing Charge:</th>
<th>Issue</th>
<th>Costs added to each unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No, households will all pay an equal share of the ECO obligation</td>
<td><em>Is it in line with the Polluter Pays principle?</em></td>
<td>Yes, those who consume more will pay for a greater share of the ECO obligation</td>
</tr>
<tr>
<td>Negative. Low incomes typically consume less energy. Standing charge makes up a greater proportion of bill and expenditure.</td>
<td><em>What is the distributional impact?</em></td>
<td>More positive. On the whole, less of the costs are met by low income/low consuming households. But there are exceptions</td>
</tr>
<tr>
<td>No. Does not encourage energy saving since reducing demand does not reduce the policy cost paid</td>
<td><em>Does it create an incentive to save energy?</em></td>
<td>Saving energy will save a portion of the policy costs.</td>
</tr>
</tbody>
</table>
**Gas vs Electric**

At present the CERT obligation is split between suppliers based on the total number of gas and electricity accounts that each supplier has. We expect that each household receiving both gas and electricity would pay the same amount. Those receiving electricity but not gas are likely to pay half as much at present.

Other policy costs fall solely upon the electricity bill (including the Renewables Obligation, Feed-in-Tariffs, EU ETS). The relative advantages and disadvantages of using the gas or electricity bill for the pass-through of ECO costs are set out in Table 2.

**Table 2 - Electricity vs Gas**

<table>
<thead>
<tr>
<th>Charge added to Electricity:</th>
<th>Issue</th>
<th>Charge added to Gas:</th>
</tr>
</thead>
<tbody>
<tr>
<td>All households: Practically every household has an electricity meter</td>
<td>Household coverage</td>
<td>18%(^{20}) of households do not use gas for heating; if costs were placed on the gas bill, these households could benefit from the ECO without contributing</td>
</tr>
<tr>
<td>Not congruent. Only a small portion of ECO funds will be used to reduce electricity consumption. This may change with migration to electric heating systems.</td>
<td>Congruency with benefits</td>
<td>Very. Likely that the majority of ECO funds will be spent on measures that reduce gas use.</td>
</tr>
<tr>
<td>Those heating with electricity will pay a disproportionately large share if charge is added to unit rate</td>
<td>Electric Heating</td>
<td>Those heating with electricity will not contribute</td>
</tr>
<tr>
<td>Will be mostly due to electric heating</td>
<td>Other LIHUs</td>
<td>Long heating periods: elderly, large families, unemployed households</td>
</tr>
</tbody>
</table>

Figure 9 presents the proportion of the ECO costs that are met by each income quintile under different mechanisms for passing-through the costs of the ECO. Should the cost fall upon the standing charge, the split is even across income quintiles (though placing the costs upon the gas standing charge would see the lowest incomes paying slightly less, since a greater proportion of these households do not use gas for heating).

By contrast, costs passed through on each gas or electricity unit consumed would see the poorest 20% of households contributing around 12% to the overall costs. It illustrates that, on average, placing the costs of the ECO on each kWh of gas or electricity sold has a very similar impact on the distributional burden.

Two factors interact to produce this similarity:

\(^{20}\)DECC (2011) Energy Consumption in the UK
Gas consumption is a function of both the size of a property and its efficiency. Whilst low-income households under-consume gas compared to standard occupancy, these households are more likely to live in inefficient homes.

Electricity consumption is more closely tied to the size of a property. Low-income households under-consume electricity to a lesser degree than they do gas, but they are more likely to live in smaller homes.

Hence based on property size and efficiency, we would expect low income households to consume proportionately less electricity than gas, but this effect is mitigated by our knowledge that low-income households under-consume gas to a greater degree. The result is a fairly even average gas and electricity consumption across income quintiles.

The relative contribution of households in different income quintiles to the costs of Warm Front, funded through income taxation, are also shown on Figure 9. It is clear that the ECO policy would be more regressive than Warm Front, if passed through on either the gas or electricity bill, and regardless of the method of pass-through.

Within each income quintile there will be inherent variations as to the extent of the ECO charge, relating to the type and size of the property, its efficiency, and the heating fuel used. Figure 10 presents the spread of costs across the low income households (income deciles 1-3) when the costs of the ECO are applied to the unit costs of gas, electricity, and power (i.e. electricity not used for heating) consumed. It shows that, on an assumption of typical consumption patterns, a per kWh charge for the ECO upon gas, all electricity, and power would benefit 85%, 90% and 97% of low income households respectively.

Figure 9 – Proportion of the ECO costs met by income quintile under different pass-through options

Throughout this report, 'low-income' will refer to households within income deciles 1-3.
Whilst benefiting the majority of low income households, moving to a kWh charge would leave some households worse off. Applying the charge to gas consumption or all electricity consumption would see 2% and 4% of low-income households paying at least 50% more towards ECO costs that the average household.

Figure 10 – Cumulative chart illustrating the proportion of low income households and the relative amount they would contribute to the ECO compared to the mean household if the costs were passed back in each unit of gas, electricity or power (i.e. excluding electricity for heating). If costs were passed through on each unit of gas consumed, 15% of low income consumers would be worse off. If passed through on electricity, 10% of consumers would be worse off.

2.4 Going further: customer credits and protected blocks

As Figure 9 illustrated, moving to per kWh charge for the ECO would reduce the scheme’s regressive nature, though not create a scheme as progressive as Warm Front. Studies have suggested that the supplier obligation could go further than the simple per kWh approach, and begin to reverse the regressive nature of the underlying energy tariffs themselves. Two mechanisms have been proposed to achieve this: a protected block and a customer credit.

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22 The EHS includes a very small number of households that consume far more units of energy than the average. Since this is based on very few data points (potentially anomalies), the highest consuming 0.5% of households have not been included.


24 Kirby (2010) Equilisation Principles
A protected block would prevent the costs of the ECO (and potentially other policies) from being levied upon a certain number of kWhs consumed. Households would receive a ‘protected block’ of units – the first that they consume – that would be free from policy costs, and therefore cheaper than the units that follow. Since suppliers still need to recoup these costs from customers, the result would be a higher rate per kWh beyond this threshold.

The customer credit would produce a similar outcome but work in a different way. Instead of a protected block where no policy costs are passed on, energy suppliers would give each customer a credit on their account. The cost of this credit is added to the cost of the policy, and recouped through a higher unit charge. Figure 11 presents a schematic illustrating these options alongside the typical approaches of a unit charge and per account charge.

![Figure 11](image-url)  
*Figure 11 – Example of the difference between a Protected Block and Customer Credit.*

There are differences between the customer credit and the protected block. Notably:

- The customer credit supports those with very low consumption, providing a net credit to offset energy costs.
- It is more costly for suppliers to apply a credit than to defer a cost. As such, the unit price would rise more sharply under a customer credit.
- Administratively, it would be easier for suppliers to apply a credit to each account, rather than create another ‘tier’ in the energy price. It would also be more transparent.

The inherent simplicity of the customer credit when compared to the protected block means that it is the option that this report assesses. However, in reality, both approaches could deliver similar outcomes.
Figure 12 presents the proportion of the ECO costs that are met by each income quintile, when the costs are passed-through onto the electricity or gas unit price, with or without a customer credit. The size of the credit provided was equivalent to the average policy cost for households upon which the costs would fall: higher for gas consumers since there are fewer accounts across which to spread the costs. The figure shows that with a consumer credit, the costs are more closely aligned to those of Warm Front.

![Graph showing the proportion of ECO costs met by different income quintiles](image)

Figure 12 – Proportion of the ECO costs met by different income quintiles if the costs are passed on per unit of electricity or gas consumed, with or without a customer credit added.

![Graph illustrating the relative amount that low-income households would contribute to the ECO compared to the mean household if the costs were passed back in each unit of gas or electricity, with or without a customer credit.](image)

Figure 13 - Cumulative chart illustrating the relative amount that low-income households would contribute to the ECO compared to the mean household if the costs were passed back in each unit of gas or electricity, with or without a customer credit.
Figure 13 illustrates the impact of this credit on the low income households. Around 45% of low income households are over 100% better off: that is they pay nothing for the ECO or receive a net credit from the policy. 10% of households would pay more than if the costs were passed on to all households in a standing charge. Under an electricity unit charge with credit, 6% of low income households would contribute 50% more to the ECO costs than if placed on the standing charge, and 4% of households under a gas unit charge with credit.

2.5 Protecting Low Income High Users

The analysis thus far has illustrated that, for the majority of low income households, a move to a per kWh charging for the ECO is more equitable, especially if a consumer credit is introduced. However, the results have also shown that there are households that would be worse off, a result of having large, inefficient houses, and using electricity for heating. In addition to this, households may consume more energy than our estimates (based on a known property type-income relationship) would suggest.

A recent study from CSE for Ofgem looked at the group of households that have low incomes, but are high users of energy\(^25\). They identified groups of households where particular circumstances led to an above average consumption of electricity and gas, either combined or separately.

Whilst many 'nodes'\(^26\) of households were identified, they can be classified as being caused by a combination of occupancy factors, property size, and use of electricity for heating:

- Occupancy factors covered those that result in a household having a longer heating regime and power consumption profile than is typical; a function of spending a greater amount of time in their home. This includes households that contain retired occupants, young families, and the unemployed.
- Those in large or under-occupied homes have a greater heating demand, and so typically consume more energy than average.
- Those who use electricity for heating, over-consume electricity compared to the average households.

Low income households with these characteristics will need protecting from price rises resulting from a change to the pass-through of ECO costs.

Figure 14 illustrates that the impact upon those low income households consuming large amounts of electricity or gas can be reduced by spreading the obligation across the amount consumed of both fuels. There are two ways in which this could be delivered: splitting the total ECO costs evenly between gas and electricity (shown in the figure as 50:50), or by treating each

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\(^{25}\) CSE (2010) Understanding ‘High Use Low Income’ Energy Consumers
http://www.cse.org.uk/downloads/file/understanding_high_use_low_income_energy_consumers.pdf

\(^{26}\) The CSE project used CHAID to identify ‘nodes’ of cases where a characteristic was associated with a level of household energy consumption. CHAID was performed on the (GB) EFS dataset enabling a detailed analysis of the socio-demographics of low-income, high-consumers.
kWh equally, with the same cost falling upon each unit (shown as Gas & Electric kWh). The latter would see 71% of the costs borne by the gas bill, and 29% by the electricity bill.

Both approaches give similar results: the greater number of gas kWhs sold is offset to some degree by the proportion of households that do not have a gas connection. As shown, both approaches would help protect the group of high consuming households, by reducing the exposure of any one fuel type: a standard levy on each kWh would see 8% of households worse off; an equal 50:50 split between gas and electricity would see 6% worse off.

![Chart](image-url)  

**Figure 14 -** Cumulative chart illustrating the relative amount that low-income households would contribute to the ECO compared to the mean households if the costs were passed back in each unit of gas or electricity, or split between both fuels equally (50:50), or spread across each kWh equally

Whilst such an approach would help reduce the impact on the minority of households that over-consume, support will still need to be given to those households disadvantaged, due to occupancy, house size, and heating factors.
Table 3 presents some potential options for supporting these households, and discusses the viability of the changes.
Table 3 – Factors behind high consumption in low income households, and potential solutions to offset the negative impacts of ECO being paid for through a per unit charge

<table>
<thead>
<tr>
<th>Factors</th>
<th>Potential Solutions</th>
<th>Viability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupancy factors</td>
<td>Pass ECO costs on in the standing charge</td>
<td>Detrimental to the majority of low income households</td>
</tr>
<tr>
<td></td>
<td>Address through benefits system</td>
<td>Arguably this already happens through the Winter Fuel Payment (elderly), Warm Homes Discount (low income) and Cold Weather Payments</td>
</tr>
<tr>
<td></td>
<td>Exempt certain households from costs</td>
<td>Myriad factors contributing to being within this group. Would require suppliers giving rebates/different tariffs to eligible households. Difficult to enforce.</td>
</tr>
<tr>
<td></td>
<td>Target ECO support on disadvantaged groups</td>
<td>Potential to prioritise high-consuming, low-income households under the ECO to help reduce demand</td>
</tr>
<tr>
<td></td>
<td>Protected block or consumer credit based on household size</td>
<td>Following a model used in Belgium as part of a rising block tariff(^27), a protect block could increase by the number of occupants in the property. Would appear complex administratively. Could be tied to benefits to equally support elderly and unemployed.</td>
</tr>
<tr>
<td></td>
<td>Max cost pass through</td>
<td></td>
</tr>
<tr>
<td>Large Homes</td>
<td>Pass ECO costs on in standing charge</td>
<td>Detrimental to the majority of low income households</td>
</tr>
<tr>
<td></td>
<td>Look at equity release</td>
<td>Low-income households in large homes are potentially asset-rich. Could the value of these assets be used to fund energy efficiency improvements?</td>
</tr>
<tr>
<td></td>
<td>Maximum cost pass through</td>
<td>Suppliers could set a maximum contribution from low income households. Would require energy companies to have income data on customers – perhaps through extending data sharing arrangements under Warm Homes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inefficient Homes</th>
<th>Pass ECO costs on in standing charge</th>
<th>Detrimental to the majority of low income households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prioritise through ECO</td>
<td>Potential to prioritise the ECO to support the most inefficient homes to help reduce demand</td>
<td></td>
</tr>
<tr>
<td>Maximum cost pass through</td>
<td>Suppliers could set a maximum contribution from low income households. Would require energy companies to have income data on customers – perhaps through extending data sharing arrangements under Warm Homes Discount.</td>
<td></td>
</tr>
<tr>
<td>Electric Heating</td>
<td>Costs only upon Gas</td>
<td>Would be congruent with the majority of measures cutting gas use. Would ease burden of policy costs on electricity bill. However, heating costs arguably less discretionary than power costs – more households struggling to heat homes. Costs on bills would be compounded, if RHI costs eventually passed on as a levy.</td>
</tr>
<tr>
<td>Electric charged per account</td>
<td>The electric share of the costs could be charged per account. This would protect those with electric heating but be less progressive of the majority of electricity consumers.</td>
<td></td>
</tr>
<tr>
<td>Exclude Economy Tariffs, or provide protected block</td>
<td>Those on tariffs designed to be used with electric heating could be spared the policy costs, or provided with a protected block. This could be tied together with income information to support only those on low incomes. Would require regulatory intervention. Unclear how to ensure the costs were excluded from certain tariffs.</td>
<td></td>
</tr>
<tr>
<td>Bigger credit for electric heating</td>
<td>Larger credit would have to be paid for. If cost reflective it would land back on eco-electric tariffs and therefore reduce effectiveness.</td>
<td></td>
</tr>
</tbody>
</table>
2.6 Recommendations

The modelling results suggest the following:

- Putting the costs of the ECO onto each kWh of electricity and/or gas would help reduce costs for the majority of low income households.
- On average, the impact of the costs placed on gas vs electricity is similar. However, this disguises some key differences:
  - If placed on gas, those households without a gas connection pay no charge. Those in large and inefficient homes, plus those who are required to heat their homes for long periods, will be worst affected.
  - If placed on electricity, households that use electricity for heating are badly affected.
- The excessive burden on certain households that comes with the costs being placed on only one fuel can be diluted by retaining a spread of the burden across both fuel types. This conclusion applies only if analysing the ECO in isolation.
- The conclusion differs if considering the ECO alongside other energy and climate change policies funded through levies on energy bills. The bias toward the electricity bill to recoup the costs of other policies makes a case for addressing this imbalance by placing the entire costs of ECO onto the gas bill. We argue against taking this approach for the following reasons:
  - The wider policy framework is still in flux, and always subject to change. There are many uncertainties at the moment regarding the Electricity Market Reform and the Feed-in-Tariff policy. In addition, it is not certain as yet how the Renewable Heat Incentive (RHI) will be funded once the current spending period ends after 2013/14. If the costs of the RHI were passed on in gas bills in future, then the difference in the extent of policy costs passed-through in electricity and gas bills would be reduced. Given this uncertainty it seems advisable to allocate the costs of the ECO in the most effective way for that policy, rather than attempting to address an imbalance with the costs of other policies.
  - Government’s long-term vision is for a greater proportion of homes to be heated by electricity through heat-pumps. This ties electricity consumption to the thermal performance of properties (the concern of the ECO), beyond those homes with conventional electric heating. Over the coming years, we may expect the ECO to increasingly deliver energy savings into electrically heated homes. It could be argued therefore that the electricity bill should bear some of the ECO costs.
  - Splitting the obligation between suppliers by the total units of gas and electricity sold should result in around 71% of the costs falling on the gas bills, since there are more units of gas sold than electricity. Should the migration towards electric heating gather pace, an increasing proportion of the ECO costs would be met through the electricity bill.
- Whilst the difference in distributional impact between splitting the total obligation in half and sharing it equally between gas and electricity consumption, or simply splitting it by the total kWh sold of both fuels is not significant, we recommend the latter approach since it apportions costs in a manner more congruent with the activity of the
ECO (weighted towards the gas bill), yet spreads the costs further, and importantly allows for electricity bills to account for an increasing share of the costs if the transition to electric heating takes place over the coming years.

- Customer credits can be used to further reduce the burden upon the lowest income deciles, though these can amplify the negative impact upon the low income high consuming households.

As such, from a consumers point of view, this report recommends the ECO fall upon each kWh of gas and electricity sold, with both consideration for a system of consumer credits, and, vitally, an additional policy mix designed to support those households disadvantaged by the amendments.
3 Delivering the recommendations

Achieving the recommendations potentially requires the use of two things: the optimal distribution of the obligation between suppliers, and the use of regulatory instruments to dictate the way costs are passed on to consumers.

3.1 Sharing the Obligation

In a competitive market, suppliers are expected to pass-through costs to consumers in the manner in which they themselves take them on. In order to best deliver upon the recommendations presented herein, the optimal combination of a progressive distribution without overly burdening low income high consuming households, would be for the ECO to be split between suppliers based on the kWhs of gas and electricity supplied by each obligated party.

This could be either split equally between gas and electricity consumption, or could be based on the total sum of both fuels. The latter would mean that the obligation would fall to a greater extent upon gas consumption (with a greater number of kWhs supplied), broadly congruent with the measures supported by the policy. It would also deliver a relative reduction in the costs placed on electricity.

3.2 Consumer Credit

Our modelling has illustrated that the use of a consumer credit could reduce the regressive nature of the ECO further, minimising the burden on the average low income household, though increasing it for a minority.

A key consideration would be how such a policy would be viewed by the Treasury. Given the recent introduction of the Levy Control Framework, which enables Treasury to cap the policy costs being passed on in energy bills, there would be considerable risk that such a mandatory credit would be deemed as induced tax and spend, and so fall under the cap.

3.3 Additional Policies

3.3.1 Targeting ECO support

Assessment of the delivery of the ECO has been outside the scope of this paper, being the focus of separate ACE research. However, the results here reinforce some of the conclusions from that paper, notably that:

- The ECO should focus support into low income households to help reduce the regressive nature
- Specific support should be targeted at the low income households living in inefficient properties, potentially with solid walls and/or electric heating, since these households will be disadvantaged by the ECO being passed-through in the unit charge.

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3.3.2 Look at large properties/under occupancy
Consideration needs to be given to those low incomes households that consume a large amount of energy due to the size of their home relative to the number of employed occupants. It is possible that some of these households are income poor, but asset rich, perhaps living off savings. More research is needed in this area to determine the optimal level of support or additional policy levers required to protect these households whilst making use of any assets they have.

3.3.3 Targeting the Warm Homes Discount
The Warm Homes Discount (WHD) has been introduced to provide a credit for certain electricity consumers based on their eligibility within a ‘core group’ (receiving only the Pension Credit Guarantee Credit in 2011/12, though expanding to include those receiving the Savings Credit by 2014/15) and a ‘broader group’ (where suppliers have more discretion, though still aiming to support households that are low income and vulnerable).

Further research is required, but it would seem appropriate for suppliers to target their broader WHD support at those low income households likely to be meeting a disproportionate share of policy costs. This might include energy inefficient homes, large properties, households using electricity for heating, and households that spend a large portion of their time at home (such as the elderly, young families, the unemployed).

It is beyond the scope of this paper, though worth acknowledging, that the benefits of the WHD could last longer if the monies were used to support energy efficiency measures – potentially through integration with the Green Deal mechanisms.

3.4 Ofgem’s Retail Market Review
In March, Ofgem published their initial proposals for regulating the energy market to ensure a better deal for consumers. As part of their work to improve the transparency of costs, the review included proposals to simplify tariffs: within each region, each energy supplier would set one per kWh cost per payment type for ‘evergreen’ products. For these products, a standardised charge (potentially either a standing charge or a unit charge) would be set by Ofgem regionally.

With particular relevance to this project, the proposals suggest that the standardised charge would be “designed to cover pass through costs, such as T&D charges and some environmental and social charges”. Whilst the simplification of tariffs would be helpful, it is vital that Ofgem’s proposals do not embed the costs of energy and climate change policies within a standing charge or tier 1 rate, since this would work against the recommendations within this report, creating higher costs for the majority of low income, low consumption households.

Instead, we recommend that Ofgem entrench our recommendations, by specifically including within the unit rates the costs of those policies split between suppliers based on the volume of energy sold. This would help remove the uncertainty that exists at present, over whether energy suppliers pass through their costs in the manner that would be expected.

30 Ofgem (2011) Retail Market Review
http://www.ofgem.gov.uk/Markets/RetMkts/rmr/Pages/rmr.aspx