



centre for
sustainable
energy

Tackling fuel poverty, reducing carbon emissions and keeping household bills down: tensions and synergies

Executive summary

Report to the Committee on Fuel Poverty

1 Executive Summary

1.1 Background

The government has three overarching strategic objectives with respect to household energy policy:

- Meeting its statutory fuel poverty obligations (as set out in the 2015 fuel poverty strategy¹).
- Meeting its statutory climate change targets.
- Keeping household bills affordable across the wider population.

One of the key roles of the Committee on Fuel Poverty (CFP) is to advise the Government on the effectiveness of policies aimed at reducing fuel poverty in England. This includes a specific remit to consider and report on the effectiveness and efficiency of policies and schemes which contribute to meeting the Fuel Poverty Strategy 2030 target. However, it also includes a responsibility to consider the impact of other policies and schemes on fuel poverty, possible modifications to existing policies and any additional programmes needed to meet the interim milestones and the final 2030 target.

1.2 Project Summary

The Centre for Sustainable Energy (CSE) was commissioned by the Department of Business, Energy and Industrial Strategy (BEIS) and the CFP to review a set of existing household energy policies that collectively aim to tackle fuel poverty, reduce carbon emissions and keep bills affordable. Following policy reviews, a total of seven different policies were modelled together to assess their combined impact on fuel poverty, energy bills and carbon emissions for households in England. Distributional impacts on different households were also assessed through the modelling, by segmenting the population into different fuel poverty groups. Adjustments were then made to each of the policies in an attempt to improve overall progress towards the Government's three strategic objectives. Finally, the findings from the study were used to derive a set of 'high-level principles' that could be applied to future policy design.

1.3 Methods of analysis

The policies that were a focus of this study were:

- Winter Fuel Payment (WFP)
- Warm Home Discount Scheme (WHD)
- Energy Company Obligation (ECO)
- Minimum Energy Efficiency Standard (MEES) for the private rental sector (PRS)
- PPM price cap and additional safeguarding tariff
- Domestic Feed in Tariff (FiT)
- Domestic Renewable Heat Incentive (RHI)

¹ Cutting the cost of keeping warm: a fuel poverty strategy for England, Department of Energy & Climate Change, March 2015 - www.gov.uk/government/publications/cutting-the-cost-of-keeping-warm

The initial policy assessment included a systematic desk review of all recent literature, impact assessments, consultation documents, published data and statistics, and policy reports for these policies. One-to-one interviews were also held with key policy leads for each of the policies. The fuel poverty segmentation was performed using the English Housing Survey (EHS) 2014 in conjunction with a Chi Squared Automatic Detection (CHAID) tree classification programme. The National Household Model (NHM) was used to perform policy modelling. The high level principles emerged from the policy reviews and modelling results, as well as discussions held within the project team at CSE and a stakeholder workshop attended by members of the CFP, the project steering group and other BEIS officials.

1.4 Findings

Segmentation analysis

The fuel poverty segmentation work resulted in the creation of 12 fuel poverty archetypes. Each archetype had distinct housing and household characteristics. The severity of fuel poverty for each archetype, as defined by the fuel poverty gap, also varied significantly. A key driver of a household's fuel poverty gap was found to be the energy efficiency rating of their dwelling. As such, these 12 archetypes were split into three separate groups based on the Energy Efficiency Performance (EPC) bands of their housing: those in dwellings in EPC bands F or G, those in EPC bands E and those in EPC bands D. The shorthand codes (e.g. F&G1) for each archetype are shown in Table 1, along with a selection of fuel poverty characteristics of each group. Further characterisation of these households was used to derive more detailed descriptions of each group, as follows:

- **F&G1** – Private rented low income tenants living in the least efficient solid walled and electrically heated dwellings
- **F&G2** – Wealthier middle aged or retired household living in remote rural locations in solid walled, oil heated detached houses with very high fuel costs
- **F&G3** – Off-gas empty nesters in low paid employment living in old solid wall dwellings
- **F&G4** – Off gas, retired households in more rural locations on very low incomes but who own their larger houses outright
- **E1** – Low income non-working or retired adult only households living in old solid wall, gas heated urban terraces
- **E2** – Average earning families with high housing costs, privately renting or owning older terraces or semi-detached houses
- **E3** – Older very low income households living in inefficient post war bungalows and semi-detached houses
- **E4** – Middle-aged working adults on reasonable incomes living in larger solid wall or uninsulated cavity wall houses
- **D1** – Younger non-working BAME households on low incomes living in urban locations, privately renting older solid wall terraces or converted flats
- **D2** – Average earning young families with high housing costs, privately renting or owning very old terraces or semi-detached houses
- **D3** – Middle aged renters in low income employment living in newer urban homes with poor levels of insulation

- **E4** –Older households on higher than average incomes but with long term health conditions living in old solid wall terraced housing.

Table 1: Summary of fuel poor archetypes (based on Table 4.1 in main report)

Archetype	Proportion in fuel poverty	Total number of households	Number of fuel poor households	Average FP gap of FP households only	Aggregate fuel poverty gap (total)
Group F&G1	84%	133,141	112,274	£998	£112m
Group F&G2	24%	193,163	47,288	£1,397	£66m
Group F&G3	39%	145,601	56,550	£767	£43m
Group F&G4	31%	148,421	46,092	£943	£43m
Group E1	56%	275,901	154,313	£485	£75m
Group E2	37%	719,393	268,148	£407	£109m
Group E3	46%	504,502	232,985	£260	£60m
Group E4	16%	414,213	66,104	£503	£33m
Group D1	44%	357,296	155,877	£218	£34m
Group D2	17%	501,935	84,332	£259	£22m
Group D3	23%	2,396,036	550,405	£163	£90m
Group D4	12%	279,173	33,111	£284	£9m

Policy tensions

There were three key policy tensions identified as part of the policy assessment, and these are summarised below. It is important to note that these are not isolated tensions and that there are overlaps and interactions between each one. For certain policies, several of these tensions occur together, compounding the effect.

- **Carbon emissions reduction versus fuel poverty (and warmth).** A direct financial benefit to households can help make bills more affordable for those struggling financially. However, some households might spend a proportion of the benefit to increase the level of warmth in their homes. If, as a result of receiving a benefit, people decide to heat for longer during the day or to higher temperatures, their energy consumption and CO₂ emissions will increase. In addition, each year these policies provide a single, one-off financial benefit for households each year. Policies which install energy efficiency measures reduce the energy required to maintain pre-improvement levels of warmth in homes targeted by such policies, and make lasting improvements for the inhabitants of improved homes. Any policies providing a financial benefit for households will need to be repeated each year to continue the benefit. Nevertheless, the WHD payment is taken into account when calculating fuel poverty status of households, so while it could result in increased carbon emissions it is also simultaneously helping to reduce fuel poverty.
- **Inappropriate targeting of measures.** It is recognised that accurately targeting assistance to fuel poor households in England is difficult; the number of households in fuel poverty is a statistically derived number. Nevertheless, several of the policies that were reviewed have inappropriate or inefficient targeting, resulting in policies failing to reach some of the most

vulnerable households and thus insufficiently working towards alleviating fuel poverty. Alongside this, the current design of policies – which largely depend on using the receipt of Government benefits as a proxy for fuel poverty – means that there is a ‘stacking’ of benefits on some households and a potential neglect of others.

- **Spending priorities: potential for better use of spending, particularly tax revenues.** The debate here is two-fold: is it better to fund direct but short-term financial help each year, or to finance the improvement of dwellings and make more lasting change? And, is it better to pay for these from general taxation revenues or through levies applied to fuel bills? In reality, a mixture of both approaches is preferable. However, for the former point, the current balance appears to be weighted too far towards tax funding of short term financial help, with less financing of programmes to make lasting changes to the housing stock and peoples’ long term warmth.

Policy adjustments

As a result of these identified tensions, a series of policy adjustments were proposed. These are summarised below:

Winter fuel payment (WFP): Currently this policy makes an annual payment each winter to all people in receipt of a state pension. Adjustments to the WFP were made by introducing means testing, so that households only qualified for a payment each year if they either received Pension Credit, or were in receipt of a state pension *and* had a limiting long term health condition or disability.

Warm home discount scheme (WHD): Currently this policy discounts £140 from the fuel bills of households where the bill payer is on Pension Credit (core group) or from households on a wider range of means test benefits, defined at the discretion of different energy companies, on a first come first served basis (broader group). Adjustments were made by removing the broader group and amending the core group eligibility criteria to include all those eligible for the Cold Weather Payment². It was assumed that the majority of eligible households qualified through an automated data matching process and payment.

Energy Company Obligation (ECO): The available funding for the ECO was increased by using some of the budget savings from reducing the scale of the WFP. This increased the total annual budget for the ECO from £670M per year to £1,473M per year. Following that, two options were explored for varying the eligibility criteria for the CERO and the HHCRO elements of the ECO. (All housing tenures were eligible in both instances.)

² Qualification criteria for Cold Weather Payment include: Pension Credit; Income Support and income-based Jobseeker’s Allowance and have any of the following: a disability or pensioner premium, a child who is disabled, Child Tax Credit that includes a disability or severe disability element, a child under 5; Income-related Employment and Support Allowance (ESA) and have any of the following: a severe or enhanced disability premium, a pensioner premium, a child who is disabled, Child Tax Credit that includes a disability or severe disability element, a child under 5; Universal Credit, and not employed or self-employed and one of the following apply: limited capability for work amount (with or without a work-related activity amount), the disabled child amount in the UC claim, a child under 5.

- **ECO version 1:** Align the eligibility criteria for both the CERO and HHCRO, so that all households living in homes rated in EPC bands E, F or G were eligible for either, in order to focus on the most inefficient dwellings in the stock.
- **ECO version 2 (targeted HHCRO):** Alter the eligibility of the CERO element so that only households living in homes rated in EPC bands E, F or G were eligible (as above), but target the eligibility of the HHCRO to households living in homes rated in EPC bands D or below on a means tested benefit³.

Minimum energy efficiency standards in the PRS: At the time of writing, a consultation was being conducted for this policy, with a proposal for Landlords to be obligated to spend a up to £2,500 towards improve homes rated in EPC bands F or G up to an EPC Band E rating – the original legislation did not require landlords to pay any upfront costs. For the modelling, adjustments were made so that landlords were required to spend a maximum of £5,000 per dwelling to bring a dwelling that is below the minimum standards up to or as close as possible to the minimum SAP rating.

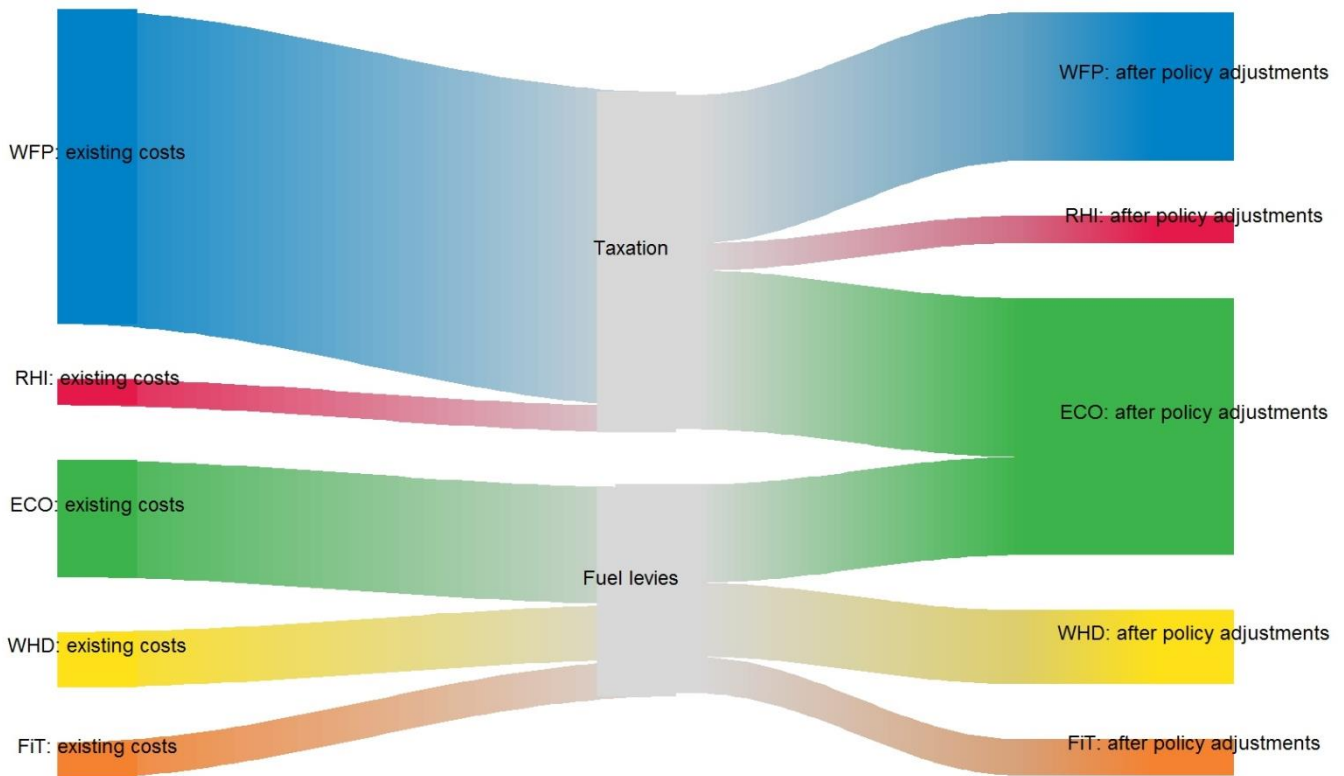
PPM price cap and additional safeguard tariff: At the time of modelling, a price cap was only in place for prepayment meters, but an additional safeguard tariff was introduced during the study for people in receipt of Pension Credit. However, when remodelling this policy, adjustments were made by adding an additional safeguard tariff extended to any household with someone on a means tested benefit *and* with someone who had a long term illness or disability, was in receipt of a state pension or with a child under the age of five years. The aim of this criteria was to ensure people who are both on low incomes and have an additional vulnerability (having a limiting long term health condition, being an older adult or with a young child) were by default on some of the lowest energy tariffs.

Renewable Heat Incentive: Currently this policy enables households who are able to afford the upfront costs to install low carbon heating technologies in their homes and receive annual payments over seven years to recuperate these costs. To a lesser extent, some social landlords have also used the RHI to help fund the installation of heating technologies on dwellings. Adjustments were made to the policy by assuming the successful implementation of a mechanism that allowed some lower income households in the private sector to benefit from the installation of low carbon heating systems through the RHI (an ‘assignment of rights’ amendment will become effective in the RHI from June 2018).

The resulting impact on budgets and financial sources of each policy as a result of these changes are shown in Figure 1. Overall, the new budgets maintained the existing total amount of levies applied to fuel bills and the total spending from general taxation. The increased funding for the WHD was paid for through a reduction in the fuel bill levy required to finance the ECO. The general taxation savings made from reducing the scale of the WFP were then allocated to the ECO to double the total financing of this energy efficiency programme, compared to the current levels of ECO funding.

³ Guaranteed element of Pension Credit, Income-based job seekers allowance, Income based Employment Support allowance, Income support, Child tax credits and/or working tax credits and/or Universal Credit with incomes below an equivalised threshold, dependent on household composition

Figure 1: Funding of policies and proposed changes to the funding amounts and sources (Figure 5.1 in main report)



Headline modelling results

A summary of the impacts of modelling the three policy scenarios are shown below in Table 2, reflecting overall impacts on fuel bills, fuel poverty and carbon emissions. When compared with current policies, an effect of the policy adjustments was to reduce the number of households being targeted by at least one of the policies, but to make a more substantial impact on reducing the bills of those who were targeted by the adjusted policies. The reduction in the number of households targeted by policies was predominantly the effect of significantly reducing the scale of the WFP, although more households received the WHD and ECO measures.

The estimated average net bill reduction for the 12.9 million households targeted by current policies was calculated to be £51 (after fuel bill levies were taken into account). After modelling the policy adjustments the number of households targeted by policies reduced from 12.9 million to 10.8 million but it was estimated that these households experienced an additional net bill reduction of £110 per year as a result of these adjustments. Partially, this was a result of focusing more energy efficiency improvements through the ECO at the least efficient dwellings (in EPC bands E, F or G). The low energy efficiency performance of these dwellings means that they have the largest potential capacity for improvements (both bill reductions and carbon savings).

For the policy change scenarios including a more targeted ECO, the energy efficiency eligibility criteria were widened to include dwellings in EPC band D, as well as those in EPC bands E, F or G. As a result, the additional average net bill savings across all households targeted by policies was slightly

lower at £102 per year (the inclusion of these dwellings reduced the average potential improvement capacity). In tackling the most inefficient dwellings, the less targeted ECO approach had a more significant impact on reducing the number of fuel poor households living in dwellings rated in EPC F or G and the total aggregate fuel poverty gap. It also had the biggest impact on carbon emission reductions for the reasons outlined above. However, the second set of policy adjustments – which includes a more targeted version of the ECO – had the biggest impact on reducing the total number of fuel poor households.

The current total annual spend of policies that install energy efficiency measures or low carbon technologies in dwellings was approximately £990M compared to a total annual spend of £1,825M on policies that provide a direct financial benefit. The policy adjustments reversed this balance: funding for policies installing energy efficiency measures increased to £1,758M while funding for fuel bill assistance policies reduced to £1,067M. This boosted the number of energy efficiency measures or low carbon technologies being installed from 3.2 million to 5.1 million, over five years.

Overall, both sets of adjustments to policies had a bigger impact on both reducing the level of fuel poverty in terms of numbers of households and the fuel poverty gap, compared to current policies. In addition, they had a more significant impact on reducing carbon emissions (i.e. a win/win can be found if policies are more closely aligned).

Table 2: Summary impacts of modelling current policies and policy change scenarios (Table 5.8 in main report)

Indicator	Current policies	Adjusted policies	Adjusted policies – targeted ECO
Number of households targeted by policies over five years	12.9M	10.8M	9.5M
Net bill reduction of households targeted by policies	–£51	–£161	–£153
Estimated total number of fuel poor households after five years of policies	1.93	1.91	1.84
Estimated number of fuel poor households in F and G after five years of policies	287,000	198,000	237,000
Overall aggregate FP gap after five years of policies	£1,127M	£1,009M	£1,049M
Net carbon emission changes - 2017 electricity carbon factors	-2.3%	-4.0%	-3.1%
Net carbon emission changes – decarbonising electricity carbon factors	-6.2%	-7.8%	-6.9%
Total annual policy spend on energy efficiency measures or low carbon technologies	£990M	£1,748M	£1,748M
Total annual policy spend on fuel bill assistance	£1,825M	£1,067M	£1,067M
Total number of energy efficiency measures or low carbon technologies installed over five years	3,240,000	5,060,000	4,750,000

1.5 Conclusions

Benefits of proposed changes

The study demonstrated that it is possible to make a series of changes to a set of existing policies to ensure that they make better progress towards the Government's combined aims, while not removing the existing benefits from the majority of vulnerable people and not increasing the total combined costs of these policies or the levies on fuel bills. It demonstrated that significantly boosting the scale and impact of the ECO programme – whilst simultaneously ensuring a more progressive funding system – can make more significant progress on reducing the numbers of fuel poor households living in dwellings in EPC bands E, F and G rated dwellings, as well as further headway towards reducing carbon emissions from the housing stock.

Barriers to implementing the changes proposed

However, as there are 'winners' and 'losers', there is likely to be significant lack of political will to implement many of the changes proposed in this study, particularly in reducing the scale of the WFP. In addition, both the policy change scenarios modelled in this study reduced the number of households benefiting from policies (albeit those who do benefit do so more and for much longer). Moreover, while attempts were made to ensure the policies were better targeted at more vulnerable households, there remained a number of vulnerable households who currently benefit from policies that would miss out as a result of some of the changes modelled in this study.

Fuel poverty targeting efficiency

Accurately targeting fuel poverty is difficult using eligibility criteria that typically require households to demonstrate their low income situation through being on means tested benefits. Systematic approaches to limit eligibility much more tightly on to the intended beneficiary households remain relatively inefficient at targeting fuel poor households. The modelling results suggest that targeting using just the energy efficiency rating of the dwellings would appear to have some benefits, but should be considered with caution. There is no guarantee that the most vulnerable or low income households living in these homes would proportionally benefit from such a scheme.

Risks to the implementation of the changes proposed

Funding policies through general taxation can be an insecure source of funding; changing political priorities or ideologies within government could shift spending priorities and leave the funds earmarked here for additional ECO spending being reduced or switched to another area altogether. Furthermore, the ECO is not without its critics and some may wish such additional government spending to be channelled through delivery routes other than the energy suppliers. Nevertheless, the scale of the task of reducing carbon emissions and alleviating fuel poverty mean that public funding of energy efficiency measures in the domestic sector, particularly for lower income households, could be an essential requirement to meet the respective targets.

1.6 Recommended high level principles

As part of this study, CSE were asked to develop a set of high level principles that could be applied to improve the alignment between fuel poverty and carbon abatement in future programmes. The high level principles which emerged from this process, for the consideration of the Committee on Fuel Poverty, the Committee on Climate Change and the Government, are:

1. Choose the sweet spot (and minimise tensions).
2. Prepare the ground for future action.
3. Be clear who foots the bill – and who gains the benefits – and why.
4. Look across the whole suite of relevant policies to reveal impacts and options.

With particular reference to the fourth principle, we recommend that studies such as this are repeated regularly in future to highlight where existing policy tensions remain or have reappeared and identify any new tensions. As policies continue to evolve, it is important that they are designed to work more effectively together towards the shared objectives of meeting fuel poverty obligations, meeting statutory climate change targets, and keeping household bills affordable across the wider population.