Department for
Business, Energy
& Industrial Strategy

ENERGY COMPANY OBLIGATION

ECO3: 2018 - 2022

Consultation Stage Impact Assessment

March 2018

Title: Consultation Stage Impact Assessment: ECO 3 **IA No:** BEIS006(C)-18-HLE **RPC Reference No:** N/A **Lead department or agency:** Department for Business, Energy and Industrial Strategy **Other departments or agencies:** None	**Impact Assessment (IA)** **Date: March 2018** **Stage:** Consultation **Source of intervention:** Domestic **Type of measure:** Secondary legislation **Contact for enquiries:** *BeisECOteam@beis.gov.uk*

Summary: Intervention and Options

RPC Opinion: N/A

Cost of Preferred (or more likely) Option

Total Net Present Value	**Business Net Present Value**	**Net cost to business per year** (EANDCB in 2014 prices)	**In Scope of One-In, Three-Out?**	**Business Impact Target Status** Measure qualifies as
£722m	-£2,144m[1]	£554m[2]	Yes	Qualifying Provision

What is the problem under consideration? Why is government intervention necessary?

Upgrading the energy efficiency of homes addresses the root cause of fuel poverty, reduces greenhouse gas emissions, lowers energy bills, and improves security of energy supply. A number of market barriers and failures exist in the energy efficiency market, preventing the deployment of energy efficiency in the absence of Government intervention. These include externalities, imperfect information and information asymmetries, lack of access to capital, and misaligned incentives. Government intervention is required to overcome these barriers to deliver on its fuel poverty and climate change commitments.

What are the policy objectives and the intended effects?

The policy is intended to drive uptake of energy efficiency measures in the residential sector that would not have occurred in the absence of intervention, in particular among low income and vulnerable households in or at risk of fuel poverty. The intended effects are to: make progress against Government's statutory fuel poverty and climate change commitments; reduce energy demand in the residential sector, thereby lowering energy bills and improving energy security; improve thermal comfort and subsequent health outcomes; and support jobs and growth.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

Three options have been considered. Changes are described compared to the current scheme:

Policy Option 1 (preferred): Extend ECO for 3.5 years (to March 2022). End the carbon-focussed Carbon Emissions Reduction Obligation (30% of the current scheme) and increasing the Affordable Warmth (AW) part of the scheme (focussed on low income and vulnerable households) from 70% to 100%. The policy will also:

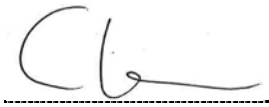
- Expand eligibility under AW to include disability-related benefits, and households in receipt of Child Benefit below an equivalised income threshold of £25,500 (for joint claimants with one child);
- Set a solid wall homes minimum, at the equivalent of treating 17,000 solid walls per year;
- Increase the maximum number of broken heating system replacements to the equivalent of 35,000 per year (and remove oil and coal boilers as eligible measures from the scheme);
- Increase the proportion of homes in rural areas that should be assisted to 15% of the whole scheme;
- Increase percentage of the scheme that suppliers can deliver with Local Authorities (Flexible Eligibility) to 25%;
- Allow 10-20% of the scheme to be delivered through the promotion of innovative measures; and
- Maintain the supplier threshold (at which suppliers become obligated under ECO) at 250,000 customer accounts, but change the current tapering approach when suppliers initially become obligated.

Policy Option 2: as Option 1 but maintain the AW eligibility criteria under the current scheme.
Policy Option 3: as Option 1 but remove the equivalised income thresholds from the AW eligible criteria.

[1] Provisional. The business net present value is larger than the costs to society, as the former includes transfers, mainly the economic rent (discussed in Annex D) and the full boiler replacement costs (see Annex D - natural boiler replacement cost savings)
[2] Provisional. Assumes a four year appraisal period – see Section 11 for more information

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 10/2022				
Does implementation go beyond minimum EU requirements?		N/A		
Are any of these organisations in scope?	**Micro** No	**Small** No	**Medium** Yes	**Large** Yes
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)		**Traded:** -1.7	**Non-traded:** -5.7	

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible minster:  Date: 29/03/18

Summary: Analysis & Evidence — Policy option 1

Description: Extend ECO for 3.5 years from October 2018 to March 2022. End the carbon-focussed Carbon Emissions Reduction Obligation (30% of the current scheme) and increase the Affordable Warmth (AW) part of the scheme (focussed on low income and vulnerable households) from 70% to 100%. The policy will also: expand eligibility under AW to include disability-related benefits, and households in receipt of Child Benefit below an equivalised income threshold of £25,500 (for joint claimants with one child); set a solid wall homes minimum at the equivalent of treating 17,000 solid wall homes per year; cap heating system replacements at the equivalent of 35,000 per year (and remove oil and coal boilers as eligible measures); allow 10-20% of the scheme to be delivered through the promotion of innovative measures; protect rural delivery by ensuring that at least 15% of delivery must go to rural locations; and increase the proportion of delivery that can be delivered through Flexible Eligibility to 25%.

FULL ECONOMIC ASSESSMENT

Price Base Year 2017	**PV Base Year** 2017	**Time Period Years** 46	**Net Benefit (Present Value (PV)) (£m)**		
			Low: Optional	**High: Optional**	**Best Estimate: 722**

COSTS (£m)	**Total Transition** (Constant Price) Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Cost** (Present Value)
Low	Optional	Optional	**Optional**
High	Optional	Optional	**Optional**
Best Estimate			**1,087**

Description and scale of key monetised costs by 'main affected groups'

The largest societal costs are the material and labour costs associated with installation of energy efficiency measures (PV, £1,011), costs of ECO scheme administration to suppliers (PV, £191m), the search costs in finding eligible households (PV, £127m). Other costs include the hidden costs associated with the installation of energy efficiency measures (PV, £92m), the avoided costs of replacement boilers (PV, -£412m), and the opex and boiler warranty costs (PV, £78m). The vast majority of these costs are expected to be incurred by energy suppliers, which suppliers then recoup through their consumer's energy bills.

Other key non-monetised costs by 'main affected groups'

There will be some small costs to BEIS and the administrator (Ofgem), which have not been monetised.

BENEFITS (£m)	**Total Transition** (Constant Price) Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Benefit** (Present Value)
Low	Optional	Optional	**Optional**
High	Optional	Optional	**Optional**
Best Estimate			**1,809**

Description and scale of key monetised benefits by 'main affected groups'

Households that have energy efficiency measures installed are the main affected group. They will benefit from energy savings (PV £1,007m), and increased comfort from warmer homes (PV, £280m). Society will also benefit from improved air quality (PV £125m), and reduced traded (PV £40m) and non-traded (PV £357m) greenhouse gas emissions.

Other key non-monetised benefits by 'main affected groups'

The UK is likely to benefit from lower energy imports, and lower costs of meeting peak energy demand, and health costs

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5 (years 1-30), 3.0 (>30 years)

The targets set in legislation will require suppliers to deliver a set volume of notional bill savings by installing energy efficiency and heating measures. The precise cost to suppliers, and therefore the pass through of these costs onto energy bills, is uncertain.

When partial estimates of the distributional benefits of the preferred option are included, the net present value increases to £2.8bn (an increase of 288% over the regular net present value, above).

BUSINESS ASSESSMENT (Policy Option 1)

Direct impact on business (Equivalent Annual) £m:			**Score for Business Impact Target (qualifying provisions only) £m:**
Costs:	**Benefits:**	**Net:**	
£554m	£0	**£554m**	TBC

Summary: Analysis & Evidence — Policy Option 2

Description: As with Policy Option 1 but retaining the current scheme eligibility criteria under Affordable Warmth. This reduces the pool of eligible households to an estimated 3.5m (compared to 6.5m under the preferred option), and is the mostly tightly focussed of the three options on low income and vulnerable households.

FULL ECONOMIC ASSESSMENT

Price Base Year 2017	PV Base Year 2017	Time Period Years 46	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	High: Optional	Best Estimate: 507

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Optional	Optional	**Optional**
High	Optional	Optional	**Optional**
Best Estimate			**983**

Description and scale of key monetised costs by 'main affected groups'

The largest societal costs are the material and labour costs associated with installation of energy efficiency measures (PV, £913m), costs of ECO scheme administration to suppliers (PV, £191m), the search costs in finding eligible households (PV, £98m). Other costs include the hidden costs associated with the installation of energy efficiency measures (PV, £67m), the avoided costs of replacement boilers (PV, -£365m), and the opex and boiler warranty costs (PV, £79m). The vast majority of these costs are expected to be incurred by energy suppliers, which suppliers then recoup through their consumer's energy bills.

Other key non-monetised costs by 'main affected groups'

There will be some small costs to BEIS and the administrator, which have not been monetised.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional	Optional	**Optional**
High	Optional	Optional	**Optional**
Best Estimate			**1,490**

Description and scale of key monetised benefits by 'main affected groups'

Households that have energy efficiency measures installed are the main affected group. They will benefit from energy savings (PV £862m), and increased comfort from warmer homes (PV, £214m). Society will also benefit from improved air quality (PV £111m), and reduced traded (PV £35m) and non-traded (PV £269m) greenhouse gas emissions.

Other key non-monetised benefits by 'main affected groups'

The UK is likely to benefit from lower energy imports, and lower costs of meeting peak energy demand, and health costs

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5 (years 1-30), 3.0 (>30 years)

The targets set in legislation will require suppliers to deliver a set volume of notional bill savings by installing energy efficiency and heating measures. The precise cost to suppliers, and therefore the pass through of these costs onto energy bills, is uncertain.

When partial estimates of the distributional benefits of the option 2 are included, the net present value increases to £3,185bn (an increase of 529% over the regular net present value, above).

BUSINESS ASSESSMENT (Policy Option 2)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs:	Benefits:	Net:	
£554m	£0	**£554m**	TBC

Summary: Analysis & Evidence — Policy Option 3

Description: As with Policy Option 2 but removing the equivalised income thresholds from eligible benefits from Affordable Warmth. This reduces the pool of eligible households to an estimated 4.5m (compared to 6.5m under the preferred option). This option is less tightly focussed than Option 2, but more tightly focussed than Option 1.

FULL ECONOMIC ASSESSMENT

Price Base Year 2017	PV Base Year 2017	Time Period Years 46	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	High: Optional	Best Estimate: 608

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Optional	Optional	Optional
High	Optional	Optional	Optional
Best Estimate			1,016

Description and scale of key monetised costs by 'main affected groups'

The largest societal costs are the material and labour costs associated with installation of energy efficiency measures (PV, £970m), costs of ECO scheme administration to suppliers (PV, £191m), the search costs in finding eligible households (PV, £110m). Other costs include the hidden costs associated with the installation of energy efficiency measures (PV, £79m), the avoided costs of replacement boilers (PV, -£416m), and the opex and boiler warranty costs (PV, £82m). The vast majority of these costs are expected to be incurred by energy suppliers, which suppliers then recoup through their consumer's energy bills.

Other key non-monetised costs by 'main affected groups'

There will be some small costs to BEIS and the administrator (Ofgem), which have not been monetised.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional	Optional	Optional
High	Optional	Optional	Optional
Best Estimate			1,624

Description and scale of key monetised benefits by 'main affected groups'

Households that have energy efficiency measures installed are the main affected group. They will benefit from energy savings (PV £928m), and increased comfort from warmer homes (PV, £253m). Society will also benefit from improved air quality (PV £108m), and reduced traded (PV £39m) and non-traded (PV £296m) greenhouse gas emissions.

Other key non-monetised benefits by 'main affected groups'

The UK is likely to benefit from lower energy imports, and lower costs of meeting peak energy demand, and health costs

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5 (years 1-30), 3.0 (>30 years)

The targets set in legislation will require suppliers to deliver a set volume of notional bill savings by installing energy efficiency and heating measures. The precise cost to suppliers, and therefore the pass through of these costs onto energy bills, is uncertain.

When partial estimates of the distributional benefits of the option 3 are included, the net present value increases to £3,009bn (an increase of 395% over the regular net present value, above).

BUSINESS ASSESSMENT (Policy Option 3)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs:	Benefits:	Net:	
£554m	£0	£554m	TBC

Contents

1. Introduction

1. This consultation stage Impact Assessment (IA) accompanies the consultation on extending the Energy Company Obligation for 3.5 years, to the end of March 2022, with a focus on supporting low income, vulnerable and fuel poor households. The current proposal is for it to apply across Great Britain.

2. The aim of this document is to provide the Government's assessment of the main impacts of the policy (hereafter referred to as ECO 3).

2. Problem under Consideration

3. Upgrading the energy efficiency of homes is the most effective way of tackling fuel poverty. In England there are over 2.5m fuel poor households[3]. These households are disproportionately concentrated in the least energy efficient homes, with more than 40% of fuel poor households living in homes rated Energy Performance Certificate (EPC) Band E or below, compared to just half that among the wider housing stock[4]. The Government has a statutory target to raise as many fuel poor homes in England as reasonably practicable to energy efficiency Band C by 2030[5], with interim milestones of as many fuel poor homes in England as reasonably practicable to Band E by 2020 and Band D by 2025[6].

4. Tackling the poor energy efficiency of the housing stock is also likely to lead to wider benefits, including:

- **Help lower household energy bills** - Households can save between £30 and £300 a year off their energy bills if they insulate their homes[7].
- **Reduce the costs of meeting energy demand** - International evidence suggests that energy efficiency can, in many cases, have a lower capital outlay and a lower levelised cost[8] than any form of fossil fuel or renewable generation[9].
- **Improve the security of energy supply** - The International Energy Agency (IEA) estimate that since 1990, energy efficiency improvements have reduced the UK's energy imports by around 25 million tonnes of oil equivalent, and reduced the UK's import bill by around $7 billion[10].
- **Improve health outcomes and reduce costs to the public of providing health care** - Living in accommodation that is not adequately heated can lead to a range of physical and mental health conditions, from cardiovascular disease in elderly householders to asthma in children[11].

[3] https://www.gov.uk/government/statistics/fuel-poverty-detailed-tables-2017
[4] Ibid
[5] More detail on measuring fuel poverty in England, the statutory target, and fuel poverty strategy for England see: https://www.gov.uk/government/publications/cutting-the-cost-of-keeping-warm
[6] It is important to note that in relation to the fuel poverty target for England, energy efficiency is defined by the Fuel Poverty Energy Efficiency Rating (FPEER), which is a variation on the EPC. More detail can be found here: https://www.gov.uk/government/publications/fuel-poverty-england-regulations-2014-and-methodology
[7] DECC Prices and Bills Report (2014), p. 7: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/384404/Prices__Bills_report_2014.pdf
[8] The levelised cost of energy is an attempt to measure different forms of generation on a comparable basis.
[9] International Energy Agency, Energy Efficiency Market Report (2015) http://www.iea.org/publications/freepublications/publication/MediumTermEnergyefficiencyMarketReport2015.pdf
[10] International Energy Agency, Energy Efficiency Market Report (2015) http://www.iea.org/publications/freepublications/publication/MediumTermEnergyefficiencyMarketReport2015.pdf
[11] For more detail see Chapter 3 of the Hills Fuel Poverty Review Interim Report: http://eprints.lse.ac.uk/39270/1/CASEreport69%28lsero%29.pdf

- **Support economic growth and jobs** - Reducing domestic energy bills will increase the disposable income of households, which could lead to higher economic growth by maintaining thermal comfort from energy while supporting increased spending on other goods and services[12].

3. Rationale for Government Intervention

3.1 Market Barriers and Failures

5. Market barriers and failures exist in the energy efficiency market, preventing the deployment of energy efficiency in the absence of government intervention. These have been extensively detailed in past ECO impact assessments and related documents[13]. To recap, the key market barriers and failures for intervention in the domestic energy efficiency market are:

- **Access to capital** - the upfront cost of energy efficiency measures means households must choose between investing in them or using the same money for other purposes (the 'opportunity cost').

- **Incomplete or asymmetric information** - the energy efficiency market is characterised by a lack of trusted information for consumers who are not well informed about the potential savings from the installation of energy efficiency measures.

- **Misaligned Incentives** for significant sections of the housing stock, the party responsible for the property (a landlord, for instance) may not be the same as those living in it (a tenant, for instance). This can lead to underinvestment in energy efficiency measures, because the former would be responsible for funding them while the latter would experience the benefits of lower bills and improved thermal comfort.

- **Externalities** - households generate carbon emissions through using energy in the home (e.g. heating). They experience the benefit of doing so (e.g. a warm home), but the climate change costs resulting from the emissions are under-priced[14]. This leads to overconsumption of energy and low demand for energy efficiency because the costs and benefits to society of energy use are not aligned.

3.2 Equity Considerations

6. Intervention is also justified on the grounds of equity by tackling fuel poverty, those that are on a low income or are vulnerable, and improving health.

- **Fuel poverty**[15] - Energy is a necessity and the fuel poor are among those with the highest needs (usually driven by poor energy efficiency) despite being on lower incomes. However, most of these households lack the means to fund energy efficiency improvements to tackle the underlying problem[16].

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[12] Particularly amongst households with lower household disposable income, as these households are likely to spend a greater proportion of their income on essentials (and therefore have a higher marginal propensity to spend any increases in their disposable income).

13 For example, see the 2014 ECO IA https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/373650/ECO_IA_with_SoS_e-sigf_v2.pdf and 2012 IA https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf

[14] The carbon content of fuels is not included in their price. The exception here would be electrically-heated homes, as electricity generation is subject to the EU Emissions Trading System which places a price on carbon emissions generated.

15 Households in England are considered to be in fuel poverty if they face above average energy costs and if they met those costs would be left with a residual income below the poverty line. In Scotland and Wales households are considered fuel poor if they need to spend more than 10% of their income on household energy. Scotland is due to change its definition of fuel poverty shortly, however.

[16] Fuel Poverty Statistics (2017), available at: https://www.gov.uk/government/collections/fuel-poverty-statistics

- **Health outcomes** - Living at low temperatures poses a risk to health, with a range of negative morbidity and mortality impacts associated with exposure to the cold. The Marmot Review Team report on cold homes and health[17], in addition to the Hills Fuel Poverty Review[18], set out the strong body of evidence linking low temperatures to these poor health outcomes.

4. Policy Objectives

4.1 Transitioning to a Fully Fuel Poverty Focussed Supplier Obligation

7. ECO places an obligation on larger energy suppliers[19] to achieve carbon and notional bill savings by promoting and installing energy efficiency measures into domestic homes. Since its introduction, ECO has delivered over 2.2m measures to over 1.7m homes[20].

8. The current phase of ECO (known as ECO2t) began in April 2017 and is due to end in September 2018. It was designed to act as a transition between ECO 2 (which ran between April 2015 and March 2017), and is comprised of a mix of carbon and notional bill savings targets, and ECO 3 (the subject of this IA), which is due to run between October 2018 and March 2022, and, as proposed below, is due to focus on helping low income, vulnerable and fuel-poor households.

9. The current phase of ECO (ECO2t) comprises 2 obligations:

- The **Carbon Emissions Reduction Obligation (CERO),** which seeks to reduce lifetime carbon emissions through the deployment of (primarily) insulation measures where they can be delivered most cost-effectively; and

- The **Affordable Warmth (AW) obligation**, which looks to reduce lifetime notional heating costs in low income and vulnerable households in or at risk of fuel poverty, through a mixture of insulation and efficient heating systems. Households can only receive measures under AW if they're in receipt of certain benefits.

10. Suppliers are also required to deliver a minimum share of their obligations through deploying Solid Wall Insulation (SWI), with the targets broadly the equivalent of around 21,000 homes per year. Further, they can only meet part of their Affordable Warmth obligation through the installation of replacement boilers, with a cap set at the equivalent of 25,000 per year.

4.2 Main Policy Objectives

11. As discussed above, the key outcomes are to put in place new regulations that focus the scheme on low income, vulnerable and fuel poor households, reducing the energy bills of these households, and ensuring that the Government makes greater progress towards its statutory fuel poverty commitments; other outcomes of the scheme are to:

- Control supplier costs and getting better value for money;
- Incentivise new, innovative measures;
- Give long-term certainty to support investment in the insulation and heating system supply chains;

[17] Marmot Review Team (2011). *The Health Impacts of Cold Homes and Fuel Poverty*. Available at: http://www.instituteofhealthequity.org/projects/the-health-impacts-of-cold-homes-and-fuel-poverty
[18] Hills (2011). *Fuel Poverty: The Problem and Its Measurement*. Available at: http://eprints.lse.ac.uk/39270/1/CASEreport69%28lsero%29.pdf
[19] Over 250,000 customer accounts and delivering over 2000GWh of gas or 400GWh of electricity per year. See Annex F for more information.
[20] Many of the costs and benefits from ECO can be found in the Household Energy Efficiency National Statistics https://www.gov.uk/government/statistics/household-energy-efficiency-national-statistics-headline-release-february-2018. These costs and benefits are largely in line with the department's past IA estimates.

- Promote collaboration with local actors[21]; and
- Align the policy approach with the long-term strategy around carbon budgets and tackling fuel poverty[22].

5. Policy Options

5.1 Policy Option 0 – the 'Do Nothing' Option

12. Under this Option, the current ECO scheme ends in September 2018 and obligated energy suppliers are no longer required to deliver heating and insulation measures to homes. Households targeted under ECO 3 have low income and tend to suffer from a lack of access to credit, meaning they would not generally be expected to install measures, other than replacing broken boilers, in the absence of Government intervention.

13. Some measures may also be installed under other government policies – principally, the Private Rented Sector (PRS) Regulations - in the absence of an ECO scheme. The measures that are forecast to be delivered to privately rented homes under the PRS Regulations, but supported by ECO funding, have been included in the IA counterfactual for the PRS Regulations (i.e. excluded from the headline impacts under the policy options), and therefore uptake to these homes has been included under the ECO policy options below[23].

14. This Option represents the counterfactual against which the costs and benefits of the consultation options are assessed (more details on the counterfactual can be found in Section 7).

5.2 Policy Option 1 (the Preferred Option)

15. The Government's preferred option involves continuing the Energy Company Obligation for an additional 3.5 years to March 2022, with a focus on low income, vulnerable and fuel poor households. This means that the carbon-focussed Carbon Emissions Reduction Obligation (CERO) would end in September 2018 (when the current scheme ends). All of the scheme (and thus supplier spending) from this point onwards would be focussed on meeting the targets set under Affordable Warmth.

16. The policy also involves:

    a. Extending eligibility to households on disability benefits, and households in receipt of Child Benefit below an equalised income threshold of £25,500[24]. This, along with removing the equivalised income thresholds for Working and Child Tax Credits, and Universal Credit, is estimated to increase the size of the eligible pool from around 4.7m households under the current scheme to an around 6.5m under ECO 3.

    b. Safeguarding rural delivery by requiring that a minimum of 15% of ECO 3 is delivered to rural areas.

[21] Organisations including Local Authorities, who have the data about their residences and housing stock condition.
[22] That is, continuing to deliver carbon savings by improving the energy efficiency of homes, while also tackling fuel poverty
[23] The PRS Regulations Consultation IA (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/669214/PRS_Consultation_stage_IA.pdf) assumes ECO delivery in its counterfactual because HMT has agreed to a supplier obligation to 2022, so some measures are not accounted for in the PRS Regulations impact assessment's policy options. Suspending ECO beyond September 2018 would change that counterfactual, resulting in a higher delivery of measures under the PRS Regulations coming into force in April 2018. For the purposes of modelling ECO's policy options, these additional measures are still captured under the ECO policy. For consistency, ECO's counterfactual excludes these measures in order to show their delivery under the different policy options.
[24] The equivalised income threshold is based on the equivalised income thresholds for the current scheme (£19,800) uprated with inflation.

c. Setting an obligation to treat a minimum number of solid walled homes to the same standard as installing solid wall insulation[25] (the solid wall homes minimum); the consultation proposes that this be set at the equivalent of treating 17,000 solid wall homes with solid wall insulation per year.

d. Including a cap on broken heating system replacements at the equivalent of 35,000 per year (replacing a cap on mains gas boiler replacements of 25,000 per year under current scheme), while removing oil and coal boilers as eligible measures, and allowing inefficient heating systems (whether broken or not) to be replaced outside this cap where they are installed alongside qualifying insulation measures.

e. Increasing the proportion of the scheme that can be delivered under Local Authority Flexible Eligibility to 25% (from 10% under the current scheme).

f. Permitting between 10-20% of ECO 3 to be met through innovative measures.

g. Maintaining the supplier threshold (at which suppliers become obligated under ECO at 250,000 customer accounts), but change the current tapering approach when suppliers initially become obligated.

17. More detail on the overarching vision for the policy can be found in the accompanying consultation document. Further rationale for the preferred option can also be found in Section 5.5 and Section 9.1.

5.3 Policy Option 2

18. Policy Option 2 is the same as Option 1, but involves maintaining the same eligibility criteria as the current ECO scheme (see the final stage IA for the current scheme – Annex A[26] - for more information on current scheme eligibility). This reduces the eligible pool to an estimated 3.5m households. See 'Rationale for the Preferred Option' (below) for more information on the decline in size of the eligible pool under the current scheme eligibility criteria.

5.4 Policy Option 3

19. Policy Option 3 is similar to Option 2, but involves removing the income thresholds for households in receipt of Tax Credits. This results in an increase in the eligible pool size from an estimated 3.5m households (under Option 2) to 4.5m households.

5.5 Rationale for the Preferred Option

Increasing the focus on those that are on a low income or are vulnerable

20. The Government is committed to upgrading all fuel poor homes to EPC Band C by 2030. It is unacceptable that low income, vulnerable and fuel poor households should live in properties that they cannot keep warm at a reasonable cost. Founded in the equity considerations outlined above, the Government proposes to focus ECO on Affordable Warmth. The impact of this is examined in Section 9, below.

The Rural Sub-obligation

21. The Government is also clear that households in rural locations should not miss out on ECO funding, particularly as rural homes tend to have a higher prevalence of fuel poverty[27] and a larger fuel poverty gap[28]. In order to ensure that rural households receive their fair share of ECO

[25] This may be achieved by installing solid wall insulation, or a combination of other insulation measures that lead to the same energy efficiency improvement as solid wall insulation.

[26] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/586266/ECO_Transition_Final_Stage_IA__For_Publication_.pdf

[27] The incidence of fuel poverty in rural locations is around 14%, compared to around 11% in semi-rural and urban locations. See table 5 of the 2017 fuel poverty statistics https://www.gov.uk/government/statistics/fuel-poverty-detailed-tables-2017

[28] The fuel poverty gap is a measure of the additional fuel costs (in pounds) a household would need to move out of fuel poverty. The fuel poverty gap is £726 in rural locations, £371 in semi-rural locations and £303 in urban locations. Source: Ibid.

3, the Government has proposed a rural sub-obligation, requiring that at least 15% of ECO 3 be delivered to rural households.

22. There will continue to be incentives for rural delivery under ECO 3. For example, the proposal to set a cap for the number of broken heating system replacements, a measure more prevalent in urban areas[29], is expected to incentivise the delivery of alternative measures in rural areas. Uplifts for non-gas fuelled homes[30] will be retained and will continue to act as an incentive for delivery in rural properties. The Government will also continue to gather address-level data in rural areas in order to monitor rural delivery.

23. As outlined in Annex G, around 20% of delivery under Affordable Warmth is expected to go to rural locations, meaning the safeguard is not expected to be binding; it is not therefore expected to increase the costs of delivering ECO 3.

Solid Wall Homes Minimum

24. Improving the energy efficiency of solid walled homes is a significant challenge for the nation's housing stock, but essential to meeting our statutory emissions reduction goals and to delivering the ambition of the Clean Growth Strategy. There are an estimated 8.5 million homes of solid wall construction in Great Britain but less than 10% currently have solid wall insulation[31]. Those living in fuel poverty are disproportionately affected - for example, while approximately 24% of non-fuel poor English households have uninsulated solid walls, 44% of homes occupied by fuel poor households have uninsulated solid walls[32]. Whilst these homes are considerably more expensive to insulate to a good standard, doing so will help us tackle fuel poverty and meet our longer-term carbon reduction targets. Ongoing support (through ECO) will help sustain the solid wall insulation supply chain[33], helping ensure we meet both of these longer term objectives. The current solid wall insulation minimum is set at the equivalent of around 21,000 installations per annum (and reflects expectations of co funding from third parties, including the Scottish Government)[34].

25. Solid walls cost an average of £8,000 per household to insulate. We need to bring down the cost of this potentially important technology. While the Government wants to continue to treat these homes, it recognises that ECO funds are finite and that there are other measures that it wishes to support. It also expects solid wall insulation to be more expensive for suppliers to deliver under a 100% Affordable Warmth scheme, as low income, vulnerable and fuel poor households may not be able to make a financial contribution towards the cost of the measure.

26. Furthermore, the Government is considering whether to offer flexibility in how solid walled homes can be treated to achieve a good standard of efficiency. It may be that in certain circumstances a combination of measures rather than solid wall insulation could be more appropriate and cost-effective to install whilst achieving the same level of bill savings.

27. The consultation is therefore seeking views on the proposal to change the minimum requirement from providing solid wall insulation to 21,000 homes per annum to treating 17,000 solid walled properties with either solid wall insulation, or a combination of measures that

[29] BEIS analysis of supplier delivery data, as reported within the Household Energy Efficiency National Statistics https://www.gov.uk/government/collections/household-energy-efficiency-national-statistics . The higher prevalence of heating system replacements (which has historically been gas boiler replacements) in urban areas is likely to reflect the fact that there are more homes in urban areas (around 19m homes are classified as 'Urban' in England, compared to 4m classified as 'Semi Rural' or 'Rural' (source: https://www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2017) and that urban areas are more likely to be connected to the gas grid.

[30] With the exception of oil and coal fuelled homes, which are proposed to be ineligible for support.

[31] https://www.gov.uk/government/statistics/household-energy-efficiency-national-statistics-headline-release-march-2017

[32] https://www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2017

[33] The solid wall insulation supply chain receives the majority of its work through supplier obligations, so (more than the supply chain for other ECO measures) is reliant on ECO activity to sustain their business. See, for example, the CERT Evaluation (page 60) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/350722/CERT_CESP_Evaluation_FINAL_Report.pdf.

[34] See Annex B for more information on assumed co funding under ECO.

achieve the same energy efficiency improvement as solid wall insulation. This would represent a provisional target of £0.713bn notional lifetime bill savings. The Government would expect that in most circumstances this will be achieved with solid wall insulation (this IA assumes that all homes are treated with solid wall insulation). However, BEIS welcomes evidence on whether there are alternative packages of measures that could be installed at the same or lower cost as solid wall insulation, while delivering same standard of energy efficiency improvement.

Increasing the Eligible Pool and Removing Equivalised Income Thresholds

28. Over the period 2017 to 2022, the total number of eligible households, using current scheme eligibility criteria, is expected to decline by around 25%, from 4.7m to 3.5m households, due to forecast changes in eligible benefit caseloads[35].

29. The reduction in the eligible pool is expected to increase the search costs associated with finding eligible homes, and thus reduce the number of properties that can be treated within the supplier spend envelope of £640m per annum. Increasing the size of the pool (to 6.5m households under the preferred option) by extending eligibility to disability benefit claimants and households in receipt of Child Benefit below an equivalised income of £25,500 (for joint claimants with one child) will help ensure that the scheme continues to target low income and vulnerable households, while ensuring search costs are manageable for suppliers.

30. By broadening the eligible pool of households and delivering more measures overall, the policy makes greater progress towards the Government's commitment, set out in the Clean Growth Strategy[36] and the Fuel Poverty Strategy[37], to bring as many fuel poor households as is reasonably practicable up to EPC[38] Band C by 2030.

31. Working and Child Tax Credit, and Universal Credit fall under the Government's benefits cap, which restricts the total amount of money a non-working household can receive to the level of the average earned income of working households after tax and national insurance contributions are deducted. The cap on benefits is also lower than the current Affordable Warmth equivalised income thresholds, and therefore acts as a natural cap on the equivalised income thresholds. As a result the equivalised income thresholds on these benefits have been removed. This will also enable easier and simplified data matching with DWP data for the scheme

A Cap for Broken Heating System Replacements

32. The level of the boiler cap of 25,000 under the current scheme partly reflects that only 70% of the overall ECO scheme is focussed on Affordable Warmth. Therefore, with the proposal that ECO 3 be focussed on low income and vulnerable households, the increase in the cap partly reflects a pro rata increase in Affordable Warmth spending.

33. BEIS considers that insulation tends to be the best long-term solution to reducing energy costs and fuel poverty[39]. The Government would like this to be reflected in scheme delivery by continuing to limit certain heating replacements and repairs under the scheme. However, low income, vulnerable and fuel poor households with broken heating systems may be unable to repair or replace them with a functioning system. It therefore wants to ensure that these households can replace their broken heating system, helping to prevent them from experiencing

[35] Source: DWP
[36] https://www.gov.uk/government/publications/clean-growth-strategy
[37] https://www.gov.uk/government/publications/cutting-the-cost-of-keeping-warm
[38] EPCs (or Energy Performance Certificates) provide an assessment on how energy efficient a property is, and ranges from A ratings (the most efficient) to G (the least); more information on EPCs can be found here http://www.energysavingtrust.org.uk/home-energy-efficiency/energy-performance-certificates
[39] See, for example, Chart 2 (page 10) of the consultation stage IA for the current scheme https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/534669/ECO_Transition_Consultation_IA.PDF . This Fuel Poverty Marginal Alleviation Cost Curve shows that insulation is the most socially cost effective way to make progress towards the 2020 interim milestone (to move as many fuel poverty households as reasonably practicable to Band E by 2020).

the negative health impacts associated with a cold home[40]. Therefore it is important to maintain support for homes with broken boilers.

34. There is evidence that there is additionality from installing boilers under Affordable Warmth (See Section 7.2, below), and that this has helped people who are often unable to replace their broken boilers for some considerable period of time. BEIS analysis of the English Housing Survey[41] and Fuel Poverty Statistics[42] suggests that low income, vulnerable and fuel poor households typically replace their boilers after around 15 years, which is 3 years beyond the typical lifetime of a boiler, and 5 years later than non-fuel poor households[43]. Intervening at the point of the boiler breaking can avoid these households resorting to coping mechanisms in the absence of a working heating system, while the householder gathers the means to replace the boiler themselves. The recent evaluation of the Warm Front scheme provides examples of the types of coping mechanisms low income households can resort to when their boiler breaks and they do not have the means to replace it – such as using expensive plug-in heaters for warmth and a kettle for hot water[44].

35. Further, the scale of boiler replacements under the scheme at present also means that significantly restricting volumes and altering the rules at the same time would risk making the scheme undeliverable. For these reasons, the cap will allow suppliers to continue to deliver boilers towards their Affordable Warmth targets, up to a limit.

36. Broken heating system replacements would continue to be limited to private tenures. The evidence on boiler lifecycles suggests that in the absence of subsidy support, boilers in social housing are replaced in line with the average boiler lifetime. This would imply limited or zero additionality from supporting replacement boilers in social housing.

Allowing Suppliers to Deliver Between 10-20% of Their Obligation through Innovation

37. Meeting both the country's fuel poverty commitments and abating its carbon emissions at the lowest possible cost will require new, lower cost products, as well as methods for installing them. Allowing innovation of between 10% and 20% of the obligation will allow the promotion and installation of innovative products and methods to help to achieve these aims, while continuing to ensure that homes benefit from the delivery of energy efficiency measures.

38. The proposal to include innovation uplifts for measures that have not previously been delivered under ECO, and therefore do not have a deemed score (see below), is based on the assumption that suppliers will need an incentive to deliver innovative products, as suppliers may not deliver these products in the absence of an incentive, due to the higher risks associated with bringing innovative products and methods to market.

39. Providing an innovation uplift for the measure will also reflect the benefits associated with these measures, which are expected to include (compared to their non-innovative counterparts): lower bills for households, or greater levels of thermal comfort, reduced costs of delivering the measures, spill over effects into the wider economy, improved appearance of energy efficiency measures, and longer useful lifetime for measures.

Increasing the Size of Flexible Eligibility

40. Under the current scheme, 10% of the ECO Affordable Warmth target could be met through Flexible Eligibility. Since its introduction, Statements of Intent[45], covering over 100 Local Authorities, have been issued, indicating strong interest amongst Local Authorities for Flexible Eligibility.

[40] Health Outcomes are discussed on page 3.
[41] https://www.gov.uk/government/collections/english-housing-survey
[42] https://www.gov.uk/government/collections/fuel-poverty-statistics
[43] Social housing tenants typically see their boilers replaced every 12 years, the average estimated lifetime of a typical boiler.
[44] Warm Front Process Evaluation, available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/322901/Warm_Front_Evaluation_Report.pdf
[45] A Statement of Intent states publicly the criteria that an LA, or a group of LAs, intends to use to identify households that meet the eligibility criteria under flexible eligibility.

41. The consultation proposes to increase the size of Flexible Eligibility to 25%. Increasing the size of Flexible Eligibility – meaning potentially more work is carried out by suppliers in collaboration with Local Authorities (who will be well placed to identify households in the most need) - may also reduce the search costs associated with delivering ECO, increasing the scheme's cost effectiveness.

42. More details on the impact of Flexible Eligibility can be found in Annex I.

Deemed Scores

43. In order for suppliers to meet their obligations, they must deliver measures to eligible homes. Each measure is awarded a 'deemed score' based on the anticipated notional bill saving that will be achieved over the measure's lifetime.

44. The deemed scores proposed for ECO 3 will be different to those used in the current scheme. Ofgem is adapting the current deemed scores to reflect changes in the Reduced Data Standard Assessment Procedure (rdSAP)[46], which the Building Research Establishment updated to 9.93 in November 2017. The Standard Assessment Procedure (SAP) will continue to be used to derive the bill savings for district heating. Ofgem are also using evidence from Boiler Plus Regulations[47] to revise the deemed scores for gas boiler upgrades to reflect increases in efficiency standards. Lifetime assumptions are expected to remain the same, with the exception of broken boiler lifetimes, which are now assumed to be 3 years which will consequently reduce the deemed lifetime bill saving. BEIS is therefore proposing an uplift to ensure suppliers are sufficiently incentivised to upgrade broken boilers.

45. There will continue to be an uplift to the score for insulation installed to off gas homes. All other uplifts used under the current scheme will cease to apply under ECO 3. Deemed scores under the current scheme also received an overarching uplift of 30% to bring them more in line with SAP-based scores used under the previous phase of the scheme; this uplift is not currently being proposed for ECO3. Ofgem is due to publish their ECO3 deemed scores consultation shortly.

Uplifts

46. BEIS analysis suggests an uplift is required to make broken boiler replacement measures more cost effective to deliver. Without this uplift, BEIS analysis suggests delivery will fall significantly short of this cap and homes with broken boilers will be left without ECO support. This uplift will take into account the Ofgem consultation on the revisions to the deemed scores for broken boilers. BEIS are also considering whether to uplift broken electric storage heating measures to ensure households with these measures are more likely to receive support.

Supplier Threshold

47. More information on supplier thresholds can be found in Annex F.

5.6 Targets for Obligated Suppliers

48. The provisional targets for ECO 3 (based on the preferred option) are:

[46] More information can be found here: https://www.gov.uk/guidance/standard-assessment-procedure

[47] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/651853/Boiler_Plus_final_policy_and_consultation_response.pdf

- The proposed Affordable Warmth[48] target is £7.735bn in notional lifetime bill savings to be achieved by March 2022 (15%, or £1.16bn, of which must be delivered to rural areas);

- Set a solid wall homes minimum: £0.713bn notional lifetime bill savings (broadly equivalent to the installation of 17,000 SWI per year – or 60,000 solid walls being insulated over the period October 2018 to March 2022); and

- Limit on the replacement of broken heating systems: £2.54bn notional lifetime bill savings (broadly equivalent to just over 35,000 heating systems per year – or around 120,000 over the lifetime of the policy)

6. Appraisal Period

49. The policy is appraised over the period 2018 to 2064, an appraisal period of 46 years. This reflects the lifetime of the energy efficiency measures that are expected to be installed during the extension, the longest-lived of which (cavity wall and loft insulation) are estimated to last for 42 years[49].

7. Counterfactual

7.1 Uptake in the Absence of Government Intervention

50. Low income and vulnerable households have (by definition) low incomes, and little access to cheap credit. This means that, with the exception of boilers (see below), they would not be expected to be able to finance measures in the absence of Government invention.

7.2 Measure Uptake as a Result of PRS Regulations

51. Some uptake of measures amongst households eligible under the scheme would be expected to occur as a result of the private rented sector (PRS) Regulations. These stipulate that from April 2018 privately rented homes with an Energy Performance Certificate rating of F or G cannot be let out until the landlord has attempted to improve the property's energy performance to at least an E. For properties with a long lease (or where there has been no change in occupancy) a regulatory backstop exists from March 2020, at which point these properties must comply with the Regulations[50].

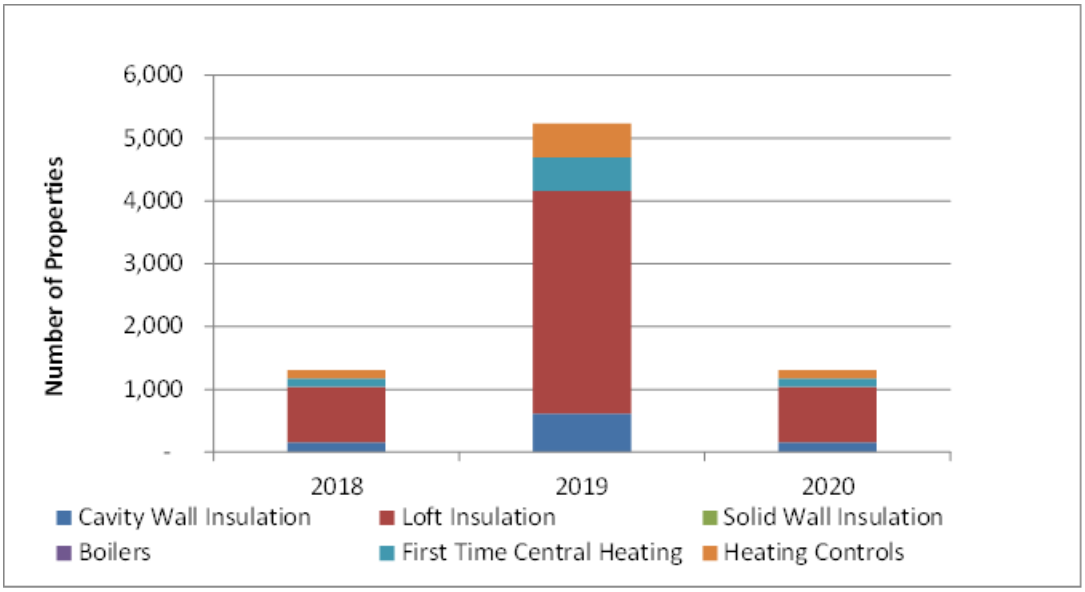
52. Figure 1, below, shows estimated deployment of ECO 3 to homes that would be expected to be treated under the PRS Regulations. In all, around 8,000 privately rented homes below EPC Band E are expected to be treated during the ECO 3, the majority of which would be expected to occur during 2019. This is due to ECO 3 beginning October 2018 (meaning only 3 months of deployment would be captured in 2018), and due to the regulatory backstop from March 2020 under the PRS Regulations. These deployment figures include that which would have otherwise occurred after 2020 under the ECO policy, but have been brought forward as a result of landlords looking to comply with the PRS Regulations before the regulatory backstop in March 2020.

[48] CERO seeks to reduce lifetime carbon emissions through the deployment of insulation measures where they can be delivered most cost-effectively;

[49] Given measures deployed until March 2022, the appraisal period would need to run to 2064 (42 years after the last year of the extension) in order to ensure that all of the energy saving-related benefits from these long lived measures are captured. This approach of ensuring that the benefits are captured over the full lifetime of the measures is in line with Green Book Guidance.

[50] The Government has recently consulted on amendments to the domestic PRS Regulations. Under the consultation's lead option, the required level of landlord spending in making the energy efficiency improvements would be capped at £2,500 per property. The proposed landlord contribution would only be required in the absence of Green Deal, ECO or third party grant funding. Uptake within PRS properties rated F or G (i.e. below the minimum standards) within this IA are based on this lead option. Uptake will be revised if any amendments to the cap are made in the forthcoming government response.

Figure 1: Deployment of ECO Measures to PRS F and G Rated Homes[51]



53. The overlap with the PRS Regulations has been accounted for in the counterfactual for the consultation stage IA for the PRS Regulations (that is, any measures installed in PRS F or G rated properties with ECO funding has been assumed under the counterfactual within the PRS IA, and therefore removed from the headline impacts of the policy). As a result, the deployment of measures shown above can be attributed to ECO 3, without double counting delivery. This IA therefore includes the uptake shown above in the net present values (NPVs) for the three policy options discussed in Section 9.

7.3 Boiler Counterfactual

54. Previous analysis undertaken by BEIS using the English Housing Survey[52] has shown that in private tenure fuel poor households, gas boilers are replaced on average every 15 years, compared to an average gas boiler lifetime of 12 years[53]. Current Affordable Warmth scoring rules mean that boilers are typically only replaced under the scheme if they are broken or not operating efficiently, and cannot be economically repaired. As a result, it is assumed that when replacement boilers are installed under ECO, they are replacing broken systems which in the absence of the policy would have been naturally replaced 3 years after the point at which it broke. This means that replacement boilers under ECO will have between 0 and 3 years of 'additionality' compared to the counterfactual.

8. Categories of Costs and Benefits

55. **Table 1**, below, summarises the key costs and benefits included in this IA. More details on each component used in the cost benefit and distributional analysis can be found in Annex D, while more details on the justice impact, and potential impacts of Flexible Eligibility and innovation can be found in Annexes K, I and J respectively.

[51] Source: Based on the counterfactual update within the 'Amending the Private rented sector energy efficiency regulations consultation stage IA (see https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/669214/PRS_Consultation_stage_IA.pdf). The counterfactual uptake was modelled using the Affordable Warmth Model underpinning this IA

[52] https://www.gov.uk/government/collections/english-housing-survey

[53] In contrast, the analysis suggests that social tenure households replace their gas boilers on average every 12 years (i.e. at the point when the boiler breaks on average), and private tenure non-fuel poor households replace on average every 10 years (before the boiler breaks completely).

Table 1: Summary of Key Costs and Benefits

Group	Costs	Benefits
Costs and Benefits included in the Cost – Benefit Analysis (monetised)	Energy efficiency and heating measure installation costs	Societal energy savings
	Hidden costs associated with installing measures	Carbon savings
	Heating measure ongoing operational costs	Air quality improvements
	Supplier administration costs	Comfort taking (the benefit of warmer home)[54]
	Additional supplier search costs under Affordable Warmth	
	Natural boiler replacement cost savings (negative costs)[55]	
Distributional costs and benefits (included in the distributional analysis)	Supplier delivery costs (including economic rent)	Value to society of lower energy bills in low income, vulnerable and fuel poor households
	Consumer bill impacts	
	Household contributions	
Non modelled/ non monetised impacts	Justice Impact (no significant impact on the justice system expected)	Flexible Eligibility[56]
		Increase in innovation for energy efficiency fabric and installation techniques
		Improvement in security of energy supply
		Wider economic benefits, for example supporting the energy efficiency supply chain, creating green jobs
		Community impacts
		Reduction in energy system costs
		Health impacts

9. Impact Analysis

9.1 Costs and Benefits

56. The overall monetised costs and benefits of the policy options to society, net of the counterfactual and discounted to 2017, are shown in Table 2

[54] Comfort taking is estimated to be 15 per cent of the energy savings from the installed measure. See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/43000/3603-green-deal-eco-ia.pdf p.132 for more details.
[55] Cost savings because of economies of scale when procuring boilers in bulk, compared to individual households' purchases
[56] More granular targeting of vulnerable homes in need of assistance even if they don't fall into the strict definitions for eligibility for fuel poverty. See Annex I for more information on Flexible Eligibility.

Table 2: Aggregate Costs and Benefits of ECO3, 2018 – 2064 (£m, 2017 prices)

Description of costs and benefits	Present Value Option 1 (Preferred Option)	Present Value Option 2	Present Value Option 3
Installation costs	1,011	913	970
Hidden costs	92	67	79
Supplier administration costs	191	191	191
Boiler warranties	15	15	15
Search costs (Affordable Warmth)	127	98	110
Operational costs	63	64	67
Natural boiler replacement costs[57]	*-412*	*-365*	*-416*
Total Costs	**1,087**	**983**	**1,016**
Value of energy saved	1,007	862	928
Value of air quality improvements	125	111	108
Value of change in traded carbon savings	40	35	39
Value of change in non-traded carbon savings	357	269	296
Value of comfort taking	280	214	253
Total Benefits	**1,809**	**1,490**	**1,624**
Overall Net Present Value	***722***	***507***	***608***

57. The installation costs of the energy efficiency measures, which do not include any 'excess subsidy' or economic rent (as this is a transfer), represent the largest societal cost from ECO 3 under all three options, ranging from a high of £1,011m under the preferred option to a low of £913m under Option 2. This reflects the larger number of households eligible for the scheme under the preferred option, which allows suppliers to target more cost effective properties and therefore increase the amount of homes that can be treated within the £640m supplier spend (see Section 9.2 below).

58. Fixed admin (supplier administration costs) represents the second largest component of the costs, at £191m across all options – these fixed costs incurred by suppliers do not vary across the three options.

59. Search costs are highest under the preferred option, and lowest under Option 2. This reflects that the same search costs per measure installed have been assumed across all three options[58] – so the search costs are highest where the most measures are installed (i.e. the preferred option). In reality, however, we would expect the search costs per measure installed to be much higher under Option 2, due to the pool size being almost half that of the preferred option. This means that the net present values (NPVs) of Option 2 may be smaller than those stated above.

60. There are large negative costs, meanwhile, as a result of natural boiler replacement costs. These are also fairly similar in size across all options, as roughly the same numbers of boilers are estimated to be installed under all options.

61. The largest component of the benefits is the societal energy savings. These are highest under the preferred option, and lowest under Option 2. Again, this reflects the ability of suppliers to

[57] Natural boiler replacement costs enter Table 4 as a negative cost. This reflects that as replacement boilers are deployed under Affordable Warmth (which are accounted for under the installation costs), an equivalent number of boilers no longer need to be replaced by the householders themselves (this leads to a net impact of reduced resource costs because of economies of scale achieved through the bulk buying of boilers under the ECO scheme. Under the counterfactual householders would have paid a higher price for a replacement boiler at a later date).

[58] See annex B for more information on the assumed search costs

target more cost effective homes under the preferred option. After the energy savings, the largest benefits are non-traded carbon savings (ranging from £357m to £269m), comfort taking (£280m –£214m) and air quality improvements (£125- £111m).

62. Table 3 shows the same costs and benefits as in Table 2, but after applying equity weights to the appropriate components. This reflects the distributional impacts of the scheme, consistent with the Green Book guidance[59] (see Annex C, pages 84-86, of the consultation stage IA for the current scheme for more information on the equity weights[60]).

Table 3: Equity-Weighted Costs and Benefits, 2018 - 2064 (2017 prices)

Description of costs and benefits	Present Value, £m Option 1 (Preferred Option)	Present Value, £m Option 2	Present Value, £m Option 3
Installation costs (*including cost of economic rents*)[61]	2,113	2,149	2,134
Hidden costs	92	67	79
Administration costs	236	236	236
Boiler warranties	18	18	19
Search costs (Affordable Warmth)	157	121	136
Operational costs	129	146	144
Natural boiler replacement costs	*-744*	*-799*	*-810*
Customer contributions towards installation costs	41	114	64
Total Costs	**2,042**	**2,053**	**2,000**
Value of energy saved	1,007	862	928
Value of air quality improvements	125	111	108
Value of change in traded carbon savings	40	35	39
Value of change in non-traded carbon savings	357	269	296
Value of comfort taking	526	468	515
Extra utility from lower bills in low income households	*1,505*	*1,710*	1,602
Value of economic rent to low income households	*1,284*	*1,785*	*1,521*
Total Benefits	**4,844**	**5,239**	**5,009**
Equity-weighted Net Present Value	***2,802***	***3,185***	***3,009***
Proportional change in NPV from equity weighting	*288%*	*529%*	*395%*

63. The equity weighting tends to increase both the costs and benefits of the policy outlined in Table 2, but with a more significant increase in benefits. This is because the majority of the costs are

[60] See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/534669/ECO_Transition_Consultation_IA.PDF

[61] As outlined in Section 11.1, in line with past impact assessments, we assume that economic rent accrues to the household or the supply chain, and not energy suppliers. The equity-weighted value of the economic rent paid for by suppliers (and ultimately bill payers because of the pass through onto their energy bills) under the costs will be lower than the equity weighted economic rent accruing to low income households receiving ECO measures (under the benefits), as the latter are estimated to have lower incomes than the former.

paid for by all energy consumers, who are relatively evenly distributed across income groups; but the benefits are focused on lower income households. For lower income households the value of each pound spent or saved is valued more highly from a social perspective, because £1 of cost or benefit is worth more to households on a lower income than to those on a higher income.

64. The increase in the benefits is highest under Option 2, and lowest under the preferred option. The increase in the NPVs relative to those shown in Table 2 reflects that the policy targets low income, vulnerable and fuel poor households. However, the narrower targeting under Option 2 (those benefitting from the measures installed are most likely to be towards the bottom of the income distribution) leads to the largest increase in the benefits.

65. While all options have a large positive equity weighted NPVs, equity weighting the options means that Option 2 has the largest NPV, while the preferred option has the smallest.

66. Policy Option 1 is the preferred option because:

    a. The analysis assumes the same search costs per measure under all three options (and that the search costs remain constant over time). In reality, the highest search costs per measure are likely to occur under Option 2 (which has the smallest pool of eligible households) and lowest under the preferred option (which has the largest pool of eligible households). The impact of varying the search costs and the 'findability' of eligible households is discussed further in Section 10, and shows that increasing the assumed search costs, or reducing the findability of eligible households, can substantially increase the costs of meeting the ECO obligations. Over the 3.5 years of the scheme search costs under Option 2 are also most likely to increase, given the more limited size of the pool.
    b. The equity weighting is based on the income distribution of the current occupants of the household. BEIS analysis of the English Housing Survey suggests there is considerable churn in the housing market (i.e. people moving house)[62] and movements in household income[63], meaning people may move in and out of fuel poverty over time[64]. This suggests that in the long run, Option 1 may have the highest NPV, as it improves the energy efficiency of the most households (which protects people who are not currently fuel poor, but may become fuel poor in the future).
    c. Widening the eligible pool leads to broadly similar levels of fuel poor households in England being treated, meaning that, in the short term, similar progress against the fuel poverty milestones would be expected.

9.2 Annual Costs to Suppliers

67. The social impacts of the policy shown above are not expected to be shared equally across society, with obligated suppliers expected to incur most of the costs presented in Table 2. As announced in the 2015 spending review, ECO has a spend envelope of £640 million per year, rising with inflation, until March 2022[65]. Suppliers are in turn assumed to recoup the costs they incur from meeting their obligation from their gas and electricity customers.

68. Table 4 below, shows suppliers' costs broken down by obligation during ECO 3, and how these compare to the annual supplier costs expected to be incurred under current scheme, running from April 2017 to September 2018.

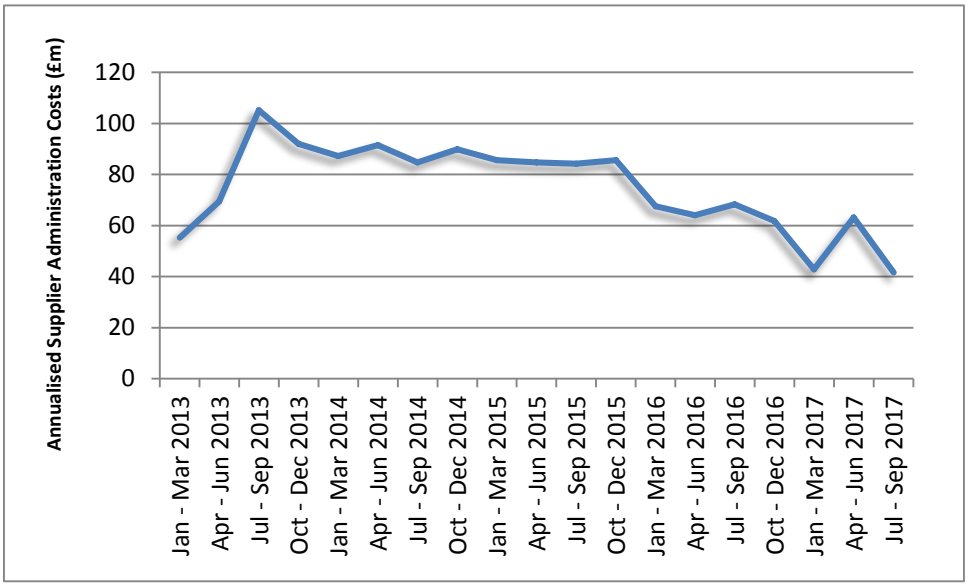
[62] Source: BEIS. Churn is also discussed in the 2016-17 English Housing Survey https://www.gov.uk/government/statistics/english-housing-survey-2016-to-2017-headline-report
[63] Source: DWP. https://www.gov.uk/government/statistics/income-dynamics-experimental
[64] The current definition of fuel poverty in England is based on a household having higher than average energy costs and, where they to adequately heat their home, their income would fall below the relative poverty line. Therefore, moving households (for example, to a more energy efficient property) or changes in income (which will affect how close they are relative to the relative poverty line) will affect whether a household is fuel poor.
[65] The £640m per year figure quoted above is in 2017 prices.

Table 4 Supplier Costs During the Current ECO Scheme and ECO 3 (Real 2017 Prices, Undiscounted)

Cost Component	Cost (£m) per annum under ECO 3 (all options)	*Costs (£m) per annum under Current scheme*
CERO Delivery Costs	£0m	£165m
AW Delivery Costs	£580m	£390m
Administration	£60m	£85m
Total Costs	**£640m**	**£640m**

69. The table above shows BEIS is assuming lower administration costs for suppliers during ECO 3. This reflects the fall in supplier administration costs in recent years, from the equivalent of around £85m per year to around £60m per year, as illustrated in Figure 2, below (which shows the reported quarterly administration costs by suppliers since the beginning of ECO in 2013).

Figure 2: Reported Supplier Administration Costs in Delivering ECO (Annualised)[66]



70. Following discussions with obligated energy suppliers, the main drivers of the decline in administration costs are:
    - the smaller size of the ECO (reducing the overall administration needed);
    - the administrative simplifications introduced under the current scheme (see Annex A of the current scheme final stage IA for more information);
    - the closure of suppliers' delivery arms; and
    - efficiency savings made by obligated energy suppliers in delivering ECO[67].

71. The majority of these reductions would be expected to continue during ECO3, so BEIS has reduced the assumed administration costs as a result.

9.3 Measure Uptake

72. Table 5, below, shows modelled gross measure uptake during ECO3. The most frequently installed measures under all options are low cost cavity wall insulation and loft insulation. The broken heating systems replacement limit of 35,000 per year is estimated to be reached, and

[66] Source: Household Energy Efficiency National Statistics (see https://www.gov.uk/government/statistics/household-energy-efficiency-national-statistics-headline-release-january-2018 Table 2.8)

[67] A larger share of the obligation being delivered by non-Big Six suppliers may also be partly driving this result (as they have lower admin costs per measure installed than the Big Six), although this appears to be a relatively small driver of the trend compared to the points raised above.

around 60-70,000 solid walls are insulated as a result of the solid wall homes minimum. The most measures are installed under the preferred option – reflecting the higher number of households eligible for the scheme and therefore the ability of energy suppliers to target more cost effective homes.

Table 5: Modelled Uptake of Energy Efficiency Measures Between October 2018 – March 2022[68]

	Option 1 – Preferred Option	Option 2	Option 3
Low Cost Cavity Wall Insulation	336,000	217,000	254,000
High Cost Cavity Wall Insulation	6,000	9,000	7,000
Loft insulation (including room in roof)	396,000	299,000	335,000
Solid wall insulation - external	63,000	73,000	67,000
Broken heating systems replacements	123,000	123,000	124,000
First time central heating	0	1,000	0
Storage heaters	27,000	27,000	28,000
Heat Pumps	0	0	1,000
Heating controls	12,000	8,000	11,000
Total measures	963,000	757,000	828,000

9.4 Homes Treated

73. The number of homes treated under ECO 3 under the three policy options is shown in the table below, and shows that the number of homes treated ranges from between 932,000 under the preferred option to 728,000 homes under Option 2. Considering only the homes that are insulated, the range is 801,000 (the preferred option) and 597,000 under Option 2.

74. The percentage of fuel poor households in England receiving a measure is highest under Option 3, at 39%, and lowest under the preferred option, at 30% (note the total number of households receiving a measure in the table below is for GB, so only a subset will be in England). However, the volume of fuel poor households in England receiving a measure is broadly consistent across all three options, ranging from 243,000 under Option 2 to 249,000 under Option 3.

75. Further, as discussed in Section 9.1, churn in the housing market may lead to the preferred option having the largest reduction in fuel poverty over the longer term.

Table 6: Estimated Number of Homes Treated and Insulated under ECO 3

Number of Homes Insulated / Treated	Option 1 – Preferred Option	Option 2	Option 3
Homes Insulated (GB)	801,000	597,000	663,000
Number of Homes Treated (GB)	932,000	728,000	799,000
Number of Fuel Poor Homes Receiving a Measure (England Only)	244,000	243,000	249,000

9.5 Fuel Poverty Impact

76. Table 7 shows progress towards the fuel poverty target and milestones, alongside the latest year covered by the fuel poverty statistics for England (2015), to demonstrate the cumulative progress since the start of the ECO until the end of ECO 3.

[68] Note that while the majority of the differences in the measure mix will be driven by the different input assumptions, a small amount of the variation between runs will be down to the stochastic nature of the Affordable Warmth modelling. See Annex C for more information on the Affordable Warmth Model.

77. The table shows that by the end of ECO 3, the proportion of fuel poor homes at Band E or above is estimated to be around 91% - up slightly from 90% in 2015. Larger increases are apparent for the other two milestones, however, with the percentage of fuel poor households at least a Band D and C increasing by 6 percentage points and 8 percentage points respectively.

78. Due to modelling and data limitations it has not been possible to undertake equivalent estimates for Scotland or Wales, although BEIS anticipates that the direction of travel to be similar to that in England (particularly given the availability of co funding in Scotland and Wales)[69].

Table 7: Estimated Progress Against Fuel Poverty Milestones (England Only), 2021

	Latest Fuel Poverty Statistics (2015)	Option 1 – Preferred Option (end 2021)
% of fuel poor households at Band E or above	90%	91%
% of fuel poor households at Band D or above	63%	69%
% of fuel poor households at Band C or above	8%	16%

9.6 Carbon Savings

79. Table 8 shows the traded and non-traded carbon savings[70] under the preferred option[71]. Savings are larger in the non-traded sector, reflecting that a majority of homes treated are heated by non-traded fuels (gas, solid fuels or oil). Insulation measures, which predominantly save non-traded fuels such as gas, are estimated to have lifetimes beyond 35 years and therefore continue to make savings beyond CB5[72].

Table 8: Estimated Greenhouse Gas Savings over Carbon Budget (CB) 5 and the lifetime of the policy (MtCO2e)

	CB5 (2028 – 2032)	Total
Traded	0.15	1.66
Non Traded	0.78	5.73
Total	0.93	7.39

9.7 Impact on Energy Bills

80. The costs incurred by energy suppliers in meeting their obligation are expected to be passed onto domestic customers through their gas and electricity prices. This means that suppliers

[69] The main source of co funding is Warm Homes Scotland, details of which can be found here: http://www.energysavingtrust.org.uk/scotland/grants-loans/heeps/heeps-warmer-homes-scotland-scheme . Further details on the assumed levels of co funding can be found in Annex B

[70] Savings presented do not adjust for counterfactual measure uptake, except where there are overlaps with other policies. This is to avoid double counting of carbon savings across policies (for example, savings from boilers are adjusted to avoid double counting of carbon savings with Building Regulations).

[71] An updated assessment of the impact of policies on carbon emissions will be published in the 2018 Energy and Emissions Projections (EEPs). The EEPs estimate impacts could differ from the ones presented here because of potential differences in final energy use and emissions factor assumptions underpinning the forthcoming projections.

[72] The removal of the Carbon Emission Reduction Obligation will lower the volume of carbon savings that are achieved by ECO. To illustrate this point, note the total (traded and non traded) lifetime carbon savings under the current scheme (between March 2017 and September 2018) are projected to be around 8.7 MtCO2e (i.e. greater than those achieved under the longer ECO 3 scheme), largely due to the presence of a CERO obligation (see the summary sheet of the final stage IA for the ECO Transition). However, as noted in Annexes I and J, we have not quantified the impact of ECO Flexible Eligibility (which could lead to more measures being installed for the same level of supplier spend) nor the innovation element (which could bring forward measures that deliver greater savings for the same level of spend) – both of which would be expected to increase the carbon savings compared to those presented in this IA. We will be looking to analyse these elements of the scheme in more detail within the final stage IA. zhttps://www.gov.uk/government/uploads/system/uploads/attachment_data/file/586266/ECO_Transition_Final_Stage_IA__For_Publication_.pdf). As discussed earlier in the IA, CERO has been ended on the grounds of equity (that is, focussing more supplier spend on offering assistance to low income and vulnerable households.

have an incentive to deliver their obligation as cost effectively as possible, and thus minimise the cost pass through.

81. While the scheme is in operation, the net impact of the policy on energy bills depends on whether a household has a measure installed under the scheme. The average cost of ECO on an annual household dual fuel bill is estimated to be the equivalent of around £27 per year during 2019. However, for those households treated under ECO, the policy could deliver a net saving on their annual dual fuel bill of up to £300[73].

82. After the ECO 3 ends (and assuming no continuation of the policy after that period), the bill savings for measures installed under the scheme continue to be realised, but the bill pass through falls to zero. This is because suppliers are no longer expected to incur costs from the scheme, while the bill savings from measures installed under ECO 3 will continue to be realised until the measures expire – often several decades after the scheme has ended.

9.8 Health Impacts

83. As outlined in Section 3, making energy efficiency improvements in homes can improve the health of the occupants, for example by reducing their risk of cardiovascular and respiratory diseases from warmer internal temperatures.

84. BEIS has monetised the health benefits associated with making these energy efficiency improvements under the transition using BEIS's Health Impacts of Domestic Energy Efficiency Measures (HIDEEM) model (more details on this model can be found in Annex G[74] of the consultation stage IA for the current scheme). HIDEEM simulates the change in relative risk of a range of cold-related morbidity and mortality risks for people living in homes receiving energy efficiency improvements. The changes in relative risk are then converted into Quality Adjusted Life Years (QALYs) and monetised in accordance with Department of Health guidance on health valuation.[75]

85. There are potential overlaps with the comfort taking benefits included in the net present values set out in Section 9.1; therefore we do not include the monetised health impacts in the cost-benefit analysis. At present we are not able to quantify the potential savings to health provision services (such as the NHS) from improving the energy efficiency of homes, although we expect these in reality to potentially be significant.

86. Table 9 presents the estimated impacts during the transition. Overall, the monetised health benefits are expected to be £223m, with installation of cavity and loft insulation making up the majority of these benefits.

Table 9: Health Benefits (October 2018 – March 2022)

Present Value, £m	Option 1 - Preferred Option
Cavity wall Insulation	126
Loft Insulation	81
Solid Wall Insulation	14
Boiler upgrades	2
Total	**223**

[73] For solid wall insulation

[74] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/534669/ECO_Transition_Consultation_IA.PDF

[75] See: https://www.gov.uk/government/publications/green-book-supplementary-guidance-health

10. Sensitivities

87. A full list of sensitivities included in this impact assessment is shown in Table 10. Each assumption is varied by the shown amount, holding all other assumptions constant, to determine the impact on the cost to suppliers of meeting their targets. The high and low measure cost sensitivities are informed by the high and low cost estimates for measure costs provided by Cambridge Architectural Research (for insulation measures)[76] and Delta EE (for heating measures)[77]. Further details on the other sensitivity assumptions can be found in Annex B, and Annex C the consultation stage IA for the current scheme[78].

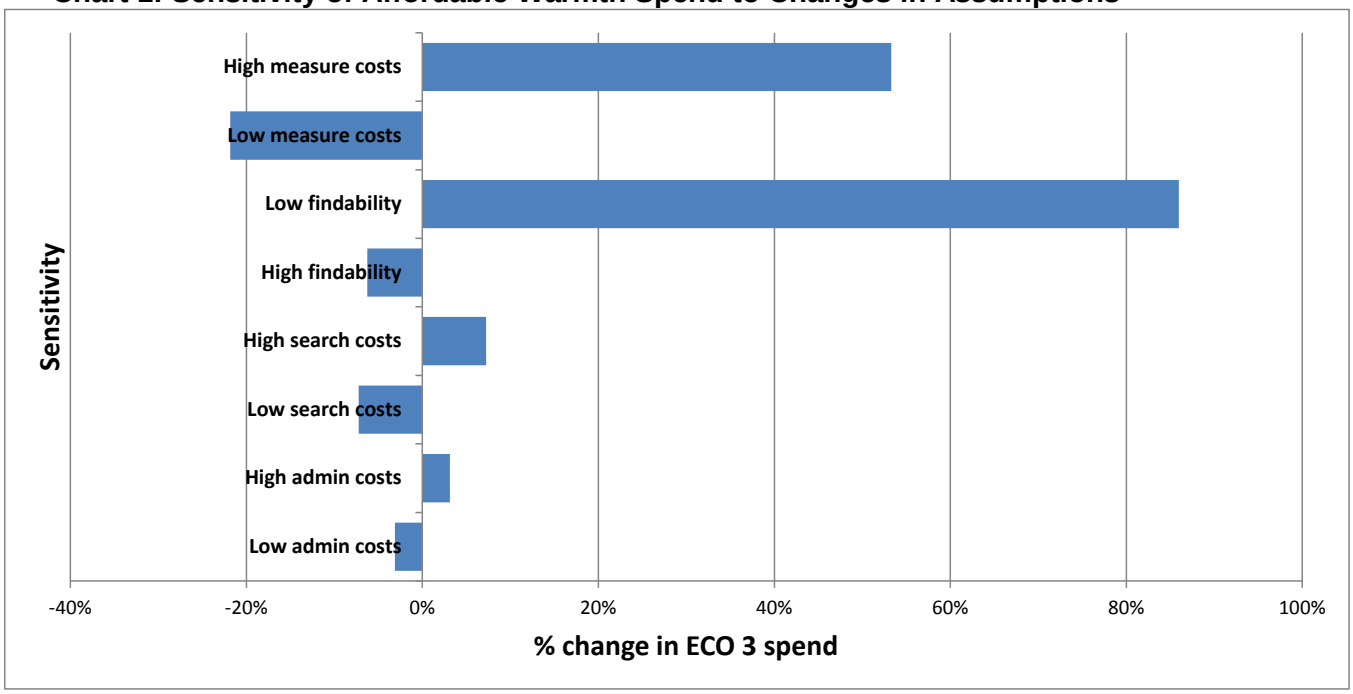
Table 10: Details on the Assumed Sensitivities

Sensitivity category	Sensitivity detail	Low	Central	High
Household findability (AW)[79] **–** percentage of the remaining technical potential that suppliers can identify each year	Cavity Wall Insulation	6%	9%	12%
	Solid Wall Insulation	9%	11%	13%
	Loft Insulation	3%	11%	19%
	First time central heating/ Heat Pumps[80]	100%	100%	100%
Measure costs	Solid Wall Insulation	10% lower	-	18% higher
	Loft Insulation	51% lower	-	146% higher
	Cavity Wall Insulation	18% lower		23% higher
	Replacement boilers	25% lower	-	25% higher
	First time central heating	43% lower	-	43% higher
Search costs (AW only)[81]	Replacement boilers	£50	£50	£140
	Qualifying boiler replacements – off gas grid	£300	£300	£300
	Other measures – on gas grid	£50	£125	£200
	Other measures – off gas grid	£300	£400	£500
Administration costs	Annual supplier administration incurred in meeting ECO 3	£52m	£60m	£85m

88. Chart 1 below shows the impact of varying each of the assumption categories above on the costs to suppliers of meeting their ECO 3 obligation (under the preferred option). Each sensitivity is discussed in turn.

[76] https://www.gov.uk/government/publications/domestic-cost-assumptions-what-does-it-cost-to-retrofit-homes
[77] Forthcoming
[78] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/534669/ECO_Transition_Consultation_IA.PDF
[79] For the purposes of this IA, we assume that suppliers cannot identify all of the technical potential, so this flexibility tests the impact of varying the 'findability' of eligible households.
[80] BEIS has limited evidence on the findability rate of first time central heating, and heat pumps, meaning our findability rates are currently set to 100%. Even with this high findability rate, very few first time central heating systems and heat pumps are expected to be installed. We will review (and, where appropriate, update) this assumption for the final stage IA.
[81] The search costs are closely rated the identification of technical potential. However, the search costs that suppliers pay for each 'lead' depends, in part, on the level of competition within the market for lead generation.

Chart 1: Sensitivity of Affordable Warmth Spend to Changes in Assumptions



Measure Costs

89. Chart 1 shows that increasing measure costs leads to a roughly 50% increase in supplier spend, while decreasing them reduces supplier spend by just over 20%. Most of the change reflects the assumed change in measure costs (with a greater increase in the measure costs assumed under the high scenario) and the change in the measure mix (particularly under the high measure cost scenario, where the increase in some measure costs leads to greater amount of high cost measures, such as solid wall insulation, being installed).

Household Findability

90. Varying the findability rate for eligible households has an asymmetric impact on suppliers' costs. Increasing the findability decreases the supplier spend by less (around 10%) than when findability is decreased (spend is over 80% higher). This is because suppliers find it more difficult to find cheaper measures (such as loft insulation and low cost cavity wall insulation), and therefore have to install more expensive measures such as solid wall insulation and high cost cavity wall insulation in order to meet their targets. As discussed in Section 9.1, the potentially large increase in supplier spend when eligible households are difficult to find is one of the justifications for the larger eligible pool size under the preferred option.

Other Sensitivities

91. Chart 1 also shows the impact of varying the search costs suppliers incur in finding Affordable Warmth households, and supplier administration costs. These sensitivities show a lower variance (generally less than 10% variance in supplier spend); these high and low administrative cost scenarios were based on the highest and lowest administration costs reported during any four quarter period since January 2015[82]. The high and low search costs, meanwhile, are informed by informal evidence provided by the ECO supply chain.

[82] https://www.gov.uk/government/statistics/household-energy-efficiency-national-statistics-headline-release-february-2018

11. Direct Impacts (including costs and benefits to business)

11.1 Businesses and Range of Impacts Considered in the Equivalent Annualised Net Direct Cost to Business (EANDCB)

92. Businesses that face a direct regulatory impact as a result of ECO 3 are large domestic energy suppliers with more than 250,000 customer accounts and that supply more than 400GWh of electricity or 2,000GWh of gas to domestic customers a year. The share of the overall obligation increases with the size of the supplier.

93. The supply chain will also be affected by the obligation, as energy suppliers will contract with third parties to deliver installation and heating measures to allow them to meet their ECO targets. However, in line with BRE guidance, these changes are indirect and so its impacts are not captured in the EANDCB.

Direct Costs and Benefits

Direct Costs

94. The costs suppliers incur are expected to be passed on from suppliers to customers through energy bills, so these costs are treated as direct for EANDCB purposes, consistent with their treatment in past ECO IAs[83].

95. All key direct costs for the purposes of calculating the EANDCB have been monetised. These broadly fall into two categories – supplier delivery costs and supplier administration costs; both of these cost components are outlined in more detail in Annex D.

96. Annex D also outlines that the level of the market clearing subsidy is assumed to be the last (or marginal) measure installed for suppliers to meet their obligation – a subsidy level which is then assumed to be paid to households. As some households would be willing to install measures for a lower level of subsidy than the one they receive, these households are assumed to receive economic rents. This increases the cost to suppliers of meeting their obligation.

97. Consistent with the 2012 and 2014 ECO IAs, it has been assumed (in the absence of evidence to the contrary) that households capture all of the economic rents. In practice it is possible that suppliers (and installers) may also capture some of the economic rents. This means our approach represents the most conservative projection of direct costs to suppliers.

Direct Benefits

98. No direct benefits to obligated parties in complying with the regulations have been identified, meaning there would be no direct benefits to businesses contained within the EANDCB.

EANDCB Position and Business Impact Target Status

99. The provisional EANDCB for the policy is estimated to be £554m, based on a four year appraisal period. This is a shorter than the one used to appraise the costs and benefits discussed in Section 9.1, as the costs faced by suppliers are incurred in the first 4 years of the scheme, whereas the benefits (mainly to households) are incurred (or accrue) over a longer time period. This means a longer appraisal period would be appropriate when considering the full costs and benefits to society (46 years), but a shorter one (4 years) when estimating the

[83] The 2012 ECO IA can be found here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf , while the 2014 ECO IA can be found here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/373650/ECO_IA_with_SoS_e-sigf_v2.pdf

costs to business. This approach is consistent with the approach taken in previous RPC-validated ECO IAs[84]

100. Scoring under the Business Impact Target is not calculated for the consultation stage IA. The change in the regulatory burden of the new ECO as well as the BIT scoring will be assessed in the IA at final stage.

11.2 Small and Micro Business Assessment

101. Businesses that are directly affected by the extension to ECO are large energy suppliers – those with over 250,000 customer accounts and supplying over 400GWh of electricity or 2,000GWh of gas per year. Some small and micro businesses in the supply chain may also be indirectly affected by the increased level of supplier demand for their services as a result of the extension to ECO. This is expected to have a positive impact on these companies' gross profits compared to a counterfactual of not having an ECO scheme in place. On the grounds of proportionality, however, no calculation has been made for these gross or net profits resulting from this 18 month extension.

102. Further detail on the small and micro business impact can be found in Annex F

[84] See for example the ECO Transition final stage IA https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/586266/ECO_Transition_Final_Stage_IA__For_Publication_.pdf, where an appraisal period of 44 years was used to calculate the societal costs and benefits, but one of two years was used to calculate the EANDCB.

Annexes

Annex A – Further Policy Details

Further Policy Details

103. The following relate to the main policy proposals contained within the preferred policy option (Option 1).

Eligibility

104. The Affordable Warmth eligibility under the current scheme covers[85]:

- private tenure households in receipt of certain means-tested benefits, or combination of benefits, sometimes needing to have a household income below a set threshold;
- private tenure households identified by a local authority as living on a low income and vulnerable to the cold or in fuel poverty; and
- households in social tenure households living in properties with an energy performance certificate rating of E, F or G, for certain measures.

105. For the future scheme, the consultation proposes:

106. To retain the current suite of means-tested benefits in use for determining eligibility of private tenure households. However, it proposes to enlarge the eligibility criteria by including other categories of non-means tested benefits, Child Benefit, disability and disability-related benefits, including Ministry of Defence related benefits.

107. Households in receipt of Child Benefit would only qualify if their (equivalised) income is below £25,500 per year. Meanwhile, the consultation proposes removing the equivalised income thresholds for households in receipt of Child or Working Tax Credit, and Universal Credit (due to the benefits cap discussed in Section 5.5).

Rural Safeguard

108. The consultation proposes to retain a rural delivery target within ECO3, increasing it to the equivalent of 15% of the total obligation, as the Government remains committed to ensuring that the scheme continues to deliver measures in rural areas. The rural safeguard is also expected to complement the proposals to encourage first time central heating (see below).

A Broken Heating System Replacement Cap

109. A cap on replacement gas boilers was introduced under the current scheme, at the equivalent of 25,000 boilers per year. The ECO 3 consultation proposes increasing the cap to the equivalent of around 35,000 heating systems per year, but widening the definition to encompass all broken heating system replacement measures, excluding renewable, district heating systems and heating controls.

110. Alongside this, the consultation proposes that where an inefficient heating system is replaced (or upgraded) alongside an insulation measure (such as loft and wall insulation[86]), it would fall outside the cap.

111. Finally, the consultation proposes removing oil and coal boilers as an eligible measure.

Solid Wall Homes Minimum

[85] See https://www.ofgem.gov.uk/system/files/docs/2017/03/eco2t_help_to_heat_group_guidance_note.pdf for further details.
[86] A full list of eligible Insulation measures is contained within the accompanying consultation document.

112. The consultation proposes setting a solid wall homes minimum of £0.713bn of notional lifetime bill savings; this is equivalent to 17,000 SWI installations per year. This is slightly lower than the solid wall minimum of around 21,000 solid walls per year under the current scheme.

Local Authority Flexible Eligibility

113. BEIS introduced local authority Flexible Eligibility in the Affordable Warmth part of the current ECO scheme. This voluntary element allows Local Authorities to publish a Statement of Intent setting out households that are eligible for ECO support in their area. Energy suppliers can then meet part of their targets by working with Local Authorities to deliver measures to eligible households.

114. Under the current scheme, Flexible Eligibility is capped at 10% of the Affordable Warmth targets. Under ECO 3, the proposal is to increase this cap to 25%.

Innovation

115. The Government proposes that ECO 3 should allow obligated suppliers to meet between 10-20% of their total obligation through innovation.

116. Innovation can take one of three forms:

- Demonstration actions – providing support for measures that have been tested in a laboratory and now require testing in a live environment;
- Innovation score uplifts – providing support for measures that have not previously been delivered under the obligation and have improved installation methods or material fabric that can drive down costs; and
- In-situ measurement of performance – to encourage a combination of measures to be installed in homes and monitoring the performance to assess whether this provides increased energy savings compared to the delivery of stand-alone measures.

117. Delivery under innovation would count towards scheme minima but not towards any scheme caps (other than the 10-20% innovation cap).

Annex B – Evidence Base

118. The section below outlines some of the key evidence and assumptions underpinning this IA. The Government welcomes feedback on these. All evidence and assumptions used will be reviewed and (where appropriate) updated for the final stage IA.

Insulation and Heating Costs

119. The insulation cost assumptions underpinning this IA are shown in the table below, these are based on the updated assumptions collected during late 2016, and presented in the final stage IA for current scheme[87].

87 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/586266/ECO_Transition_Final_Stage_IA__For_Publication_.pdf (page 28)

Table11: Capex Assumptions – Insulation Measures (£, real 2017 prices)[88]

Dwelling Type	Cavity Wall Insulation (Low Cost)	Cavity Wall Insulation (High Cost)	Loft Insulation	Solid Wall Insulation - External	Floor area (m^2)
Detached - Large	950	3,700	640	11,500	>117.03
Detached - Small	680	2,300	310	10,200	<117.03
Bungalow - Large	760	3,700	640	10,400	>117.03
Bungalow - Small	540	2,300	310	9,200	<117.03
Semi-detached/End of Terrace - Large	660	4,300	370	8,400	>80.45
Semi-detached/End of Terrace - Small	529	2,700	230	7,800	<80.45
Mid Terrace - Large	505	4,300	340	7,500	>75.5
Mid Terrace - Small	460	2,700	220	6,800	<75.5
Flat - Large	430	2,500	430	6,700	>54.29
Flat - Small	380	1,600	180	5,300	<54.29

120. Since the publication of the final stage impact assessment for the ECO transition, BEIS commissioned Delta EE to review and update its heating measure cost assumptions. The updated heating measure cost assumptions are presented in the tables below; these have been used in this IA.

Table 12 – Gas Boiler and First Time Central Heating installation costs by boiler capacity[89] (£,2017)

Heating Measure/ Capacity	Combination Gas Boiler	First Time Central Heating
24kW	£2,475	£5,746
30kW	£2,565	£5,866

Table 13 – Assumed Electric Storage Heater Costs by Number of Bedrooms (£, 2017)

Number of Bedrooms	Electric Storage Heater Costs
1	£2,580
2	£3,340
3	£4,120
4	£5,440
5	£6,220

121. Table 12 above shows just two boiler capacities – 24 and 30KW. This is informed by the work undertaken by Delta EE that suggested that the majority of measures installed into domestic homes are either 24kW or 30kW.

122. Consistent with past impact assessments, the boiler cost assumptions above have been reduced by 25% to account for the bulk discount associated with installing measures under ECO[90]. As part of the consultation, we will be exploring the extent to which the bulk boiler discount represents economies of scale (and therefore reduced resource costs) or reductions in supplier margins.

[88] These costs are based on research carried out by Cambridge Architectural Research https://www.gov.uk/government/publications/domestic-cost-assumptions-what-does-it-cost-to-retrofit-homes and the Energy Savings Trust https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/656865/160628_Non-standard_cavity_walls_and_lofts.pdf

[89] Research conducted by Delta EE suggested that the vast majority of new boiler installations are of either 24 or 30 kW capacity. We have therefore assumed these sizes of installations for the consultation stage IA.

[90] The bulk discount is the reduced resource costs because of economies of scale achieved through the bulk buying of boilers under the ECO scheme.

Technical Potential

123. The technical potential assumptions under the preferred option are shown in Table 14 below, which are based on the technical potential provided in the English Housing Survey, but adjusted downwards to account for estimated delivery to these homes to September 2018.

Table 14 – Remaining Technical Potential

Technology	Remaining Potential in Eligible Group (Millions)
Cavity Wall Insulation	1.1
Loft Insulation	1.4
Room In Roof Insulation	0.17
Solid Wall Insulation	2.1
First Time Central Heating	0.13

124. Loft insulation remaining potential figures exclude lofts defined in BEIS statistics as being hard to treat (these includes lofts which are unfillable - this can occur in properties with a flat roof or in properties where the roof has a very shallow pitch which makes the loft space inaccessible).

125. Cavity wall insulation remaining potential figures exclude cavities defined in BEIS statistics as having limited potential.

Search Costs

126. The lead generation costs assumed in the IA are shown in Table 15 below. These assumptions are applied consistently across all policy options. In reality, we would expect the search costs to be higher under Policy Option 2, reflecting the smaller pool size.

Table 15 – Assumed Search Costs[91]

Measure	Homes on the Gas Grid	Homes off the Gas Grid
Cavity Wall Insulation	£125	£400
Loft Insulation	£125	£400
Room in Roof	£125	£400
Solid Wall Insulation	£125	£400
Central Heating	£125	£400
Broken Replacement Boilers	£50	£300
Working Replacement Boilers	£125	£400
Ground Source Heat Pump	£125	£400
Air Source Heat Pump	£125	£400
Biomass Boiler	£125	£400
Storage Heater	£125	£400
Storage Heater upgrade	£125	£400
Heating Controls	£0	£0
Solar Thermal	£125	£400
Solar PV	£125	£400

127. We are looking to collect updated search costs as part of the supply chain survey mentioned above. We also welcome feedback on our assumed search costs as part of the consultation, which will be incorporated into the final stage IA.

[91] Informal evidence from ECO supply chain about the range of search costs.

Third Party Funding

128. In the final stage ECO transition IA, BEIS assumed around £100m of third party funding (funding from other regional or national government energy efficiency schemes, Local Authorities or housing associations) into its supplier delivery cost estimates. To recap, this was comprised of the following:

    a. householders' own contributions towards the cost measures (£25m); and
    b. contributions from local government and third parties (£75m)

129. The vast majority of this funding was expected to come from the £500m package announced by the Scottish Government to tackle energy efficiency and fuel poverty in Scotland, and which can be blended with ECO[92].

130. Given ECO 3's focus on low income, vulnerable and fuel poor households BEIS no longer assumes that householders' will continue to co- fund measures. As a result, for the purposes of this IA, the assumed level of co funding has reduced to £75m per year. We will review this assumption for the final stage IA.

Interest Rates on Private Funding ('Opportunity Cost of Capital')

131. Where private funding is used to finance measures, this is a means of using private capital to achieve social aims. In the absence of ECO, this capital could have been invested elsewhere and achieved returns. These returns have therefore been forgone as a result of the capital being used to contribute to measures under ECO – there is an opportunity cost of capital.

132. The Committee on Climate Change have previously undertaken research on the appropriate means of estimating the opportunity cost of capital where private funds are used to achieve social aims.[93] They found that the appropriate rate for individual financing of social aims was in the region of 3.5% to 7.5%. The mid-point of this range, 5.5%, is assumed to be the private interest rate.

Third Party Contributions

133. As outlined above, this IA assumes that around £75m of co-funding per year will be available from Local Authorities and from the Scottish and Welsh governments, to reduce the costs to suppliers of meeting their ECO obligations.

134. This assumption, however, is something BEIS wishes to periodically review. As a result, BEIS has commissioned the following surveys with which to provide further evidence for the final stage IA.

Supply Chain and Local Authority Survey

135. This quarterly survey is aimed at improving the department's understanding of:

    1. The source of measure funding – that is, how much suppliers, Local Authorities, households and the Scottish and Welsh governments are contributing towards the cost of measures installed under ECO;
    2. Search costs; and
    3. Supply chain and local authority administration costs

136. The survey looks to break down (1) and (2) by measure (e.g. cavity wall compared to loft) and obligation type (i.e. CERO compared to Affordable Warmth), and (3) by obligation type.

[92] See http://www.gov.scot/Publications/2017/01/2195/4
[93] See: http://archive.theccc.org.uk/aws/Time%20prefernce,%20costs%20of%20capital%20and%20hiddencosts.pdf

137. This survey also distinguishes between Affordable Warmth measures delivered under ECO Flexible Eligibility and those outside, helping to improve the department's evidence on the costs of using Flexible Eligibility.

138. To date, around 36 responses have been received, covering around £30m of ECO spend. By the time BEIS completes the ECO 3 final stage IA, BEIS anticipates that we should have at least three sets of returns, covering the first three quarters of the current scheme.

Technical Monitoring Survey

139. BEIS has also worked with Ofgem and suppliers to ask customers how much they are contributing towards different measures, as part of the ongoing ECO technical monitoring. Given that technical monitoring is conducted on 5% of all measures installed under ECO, this large scale survey should provide a large evidence base on which to test our assumptions around assumed customer contributions.

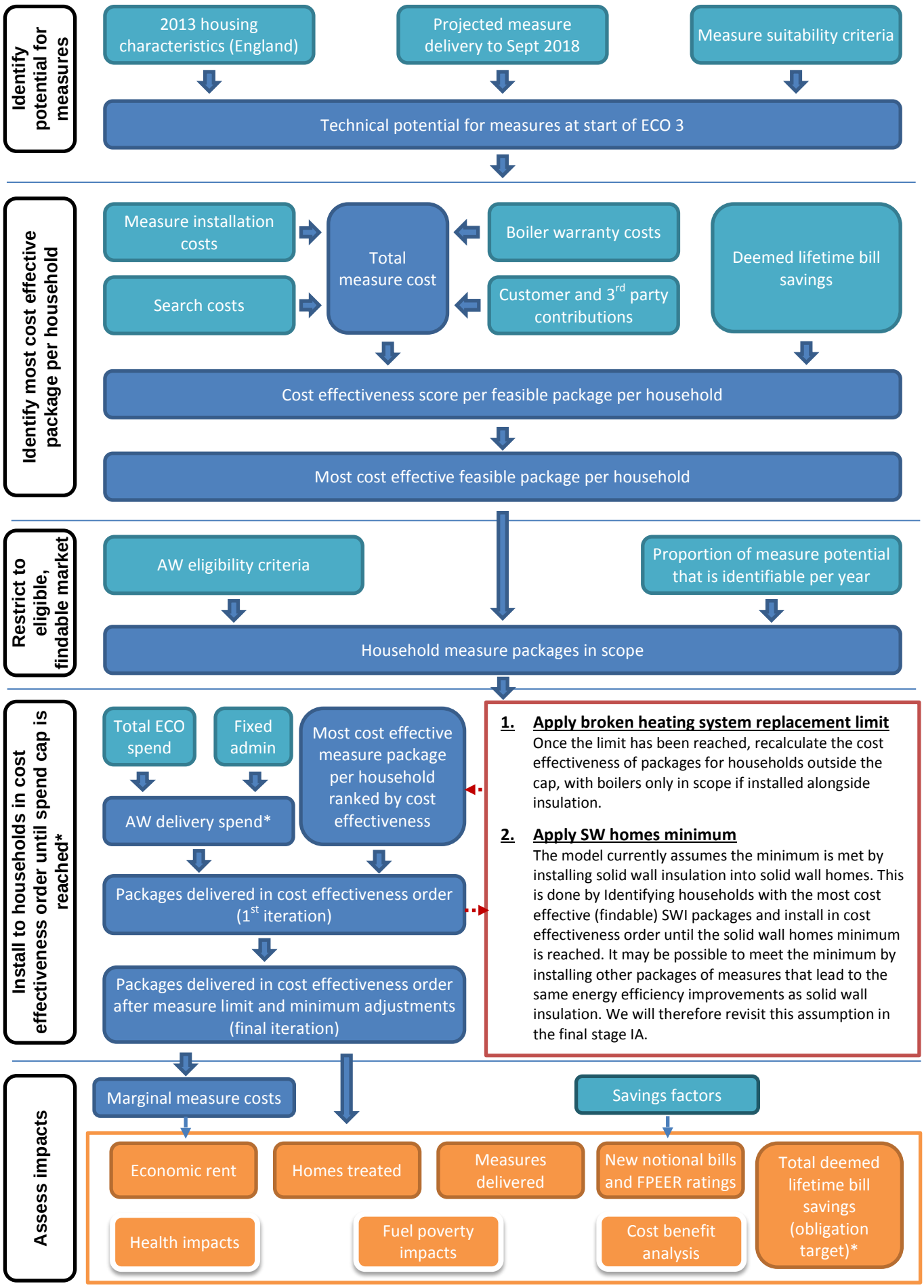
140. This evidence is intended to complement the evidence from the supply chain survey mentioned above, as well as inform the evaluation of the scheme.

Annex C – Affordable Warmth Model

Model Overview

141. The Affordable Warmth model simulates the delivery of measures that reduce the cost of heating homes for households that meet the Affordable Warmth eligibility criteria. The chart below provides a high level summary of the modelling methodology applied in this Impact Assessment (see Annex E – pages 90-97 of the current scheme consultation stage IA for more detailed information on the AW modelling approach[94]).

[94] See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/534669/ECO_Transition_Consultation_IA.PDF



* The model can be run in two ways:
1. To match a certain level of spend. This outputs an equivalent obligation target in terms of Lifetime Bill Savings
2. To match a certain obligation target (lifetime bill savings). This outputs the level of spend required to meet this target.

Modelling Improvements since the Final Stage IA for the Current Scheme

- The input and data assumptions have been updated to reflect improvements to the evidence base as described in Annex B, as well as changes in policy design (Annex A).
- Room in roof insulation and first time electric storage heaters are included as potential measures that could be delivered, to reflect the broader measure mix seen in recent delivery. Technical potential identification rates for these new measures have been included, as well as additional findability constraints for heat pumps.
- A solid wall homes minimum is now modelled. This reflects that for ECO 3 the solid wall homes minimum will need to be met through delivery to the Affordable Warmth eligible group whereas previously it was assumed to be delivered under CERO. Delivery of these measures are segmented from other measures, meaning solid wall insulation has a separate (higher) market price.
- The model now allows replacement boilers to be delivered in addition to those falling under the cap, if they are installed alongside insulation measures.
- The Affordable Warmth model uses updated cost assumptions for heating measures covering gas boiler upgrades and storage heater upgrades and first time central heating. Details are provided in Tables 12 and 13.
- The model has been updated to reflect 2017 prices, which includes the spend envelope, fixed admin cost assumptions, and cost assumptions.
- The model uses updated statistics[95] on measures delivered under the current scheme to reflect the remaining technical potential for heating and insulation measures.
- The lifetime deemed bill savings calculated by the AW model are based on Ofgem's provisional deemed scores provided to BEIS in December 17.

[95] https://www.gov.uk/government/collections/household-energy-efficiency-national-statistics

Annex D – More Details on the Categories of Costs and Benefits

Costs Included in the Cost-Benefit Analysis

142. **Installation Costs:** These cover the physical costs of the materials and labour required to install the energy efficiency measure in the home. No reductions are assumed in the real costs of installations over time. Over time, technological improvements and increased competition may lower the costs of installing energy efficiency measures and therefore lower the costs of the policy. Similarly no costs are assumed to increase over time, as it is assumed that the supply chain can meet the additional demand for energy efficiency measures without hitting supply chain constraints[96].

143. **Hidden Costs[97]:** These include the time taken by householders to liaise with the installer, prepare the property for installation and any oversight, as well as clean-up or redecoration costs associated with the installation. These costs are estimated to be small in the majority of cases.

144. **Operational Costs/Expenditure (Opex):** Covers the annual cost of running heating measures, and includes servicing and maintenance costs, but not the fuel costs.

145. **Administrative Costs:** In delivering their ECO 3 obligation, suppliers will incur administrative costs. These will vary by supplier, depending on their setup[98], but include items from lead generation[99] to maintaining and running IT databases, and reporting measures installed to the administrator (Ofgem). They will also include indirect costs, such as a share of the suppliers' accommodation costs, human resources and legal costs.

146. Administration costs, as reported by suppliers, are around £85m per annum under the present ECO scheme. These costs are estimated by BEIS to fall under ECO 3 to around £60m per year (according to a survey of obligated suppliers undertaken by the Department in early 2016), as outlined in Section 9.2, above.

147. **Additional Search Costs for Affordable Warmth:** Where suppliers are obligated to deliver measures to households eligible for AW support, they incur costs of not only identifying suitable properties but also in searching for eligible households and verifying they are indeed eligible. In many cases these costs will be first incurred by the installer who will pass on the costs to the supplier. This can entail paying third parties for referrals and additional specifically-targeted marketing, among other approaches.

148. **Natural Boiler Replacement Cost Savings (Negative Costs):** As outlined in Section 7, households are assumed to replace their boilers once they reach a certain age, with or without policy intervention. Boiler replacements made by households, rather than through policy intervention, is referred to as 'natural replacements'. These replacements will be sourced and funded by individual households, which are likely to be more costly than if the replacement were installed through the supplier obligation. This is because individual households are not able to benefit from bulk delivery discounts that are available to suppliers and installers that can deploy boilers at scale.

149. We count the avoided costs of households replacing boilers themselves as a negative cost (i.e. a saving), and the cost of replacing boilers through Affordable Warmth as a positive cost.

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[96] As all prices are in real 2017 prices, they are implicitly assumed to rise with inflation.

[97] See the ECOFYS (2009) "The hidden costs and benefits of domestic energy efficiency and carbon saving measures" report for further details http://webarchive.nationalarchives.gov.uk/20121217150421/http:/www.decc.gov.uk/assets/decc/what%20we%20do/supporting%20consumers/saving_energy/analysis/1_20100111103046_e_@@_ecofyshiddencostandbenefitsdefrafinaldec2009.pdf

[98] For example, some suppliers may have their own installation arms, which may reduce the administration costs the supplier directly incurs.

[99] Lead generation refers to the finding of ECO suitable households.

Costs Included in the Distributional Analysis

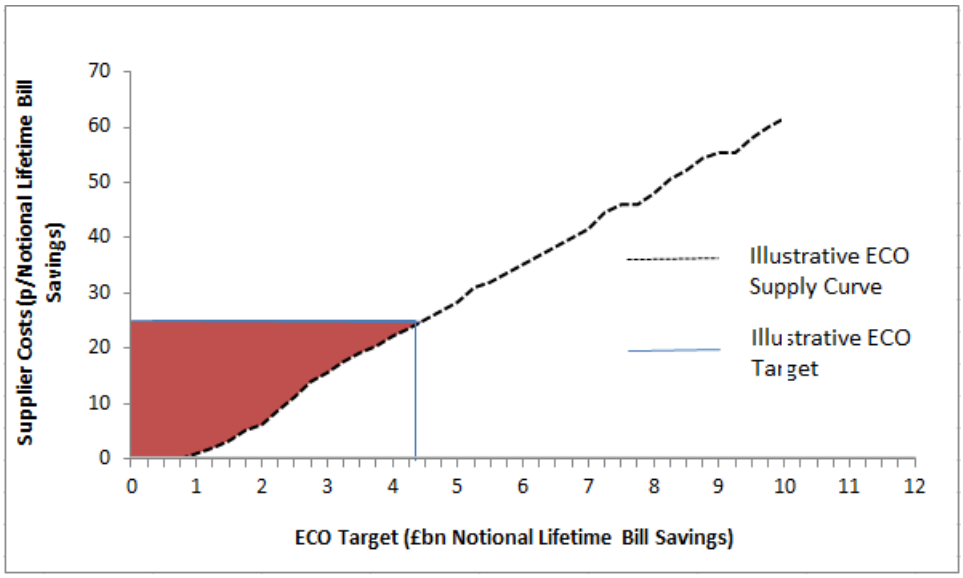
150. The following costs and benefits are treated as transfers between different groups in society, where the costs and benefits are equal to each other. They have therefore been excluded from the main cost benefit analysis in Section 9.

Supplier Delivery Costs ('Economic Rent')

151. The presence of the market barriers and failures (discussed in Section 3) mean that suppliers must subsidise the installation and hidden costs of energy efficiency measures in order to induce eligible households to install measures. The larger the size of their ECO targets, typically the higher the subsidy levels suppliers have to offer in order to make the offer attractive enough for households to take up the required level of measures. As a result, suppliers may need to offer some households subsidy levels above that which they would normally need in order to take up measures. This 'excess subsidy' is referred to as 'economic rent', and can potentially accrue to the household, the installer, or the energy supplier.[100]

152. The concept of economic rents is illustrated in Figure 3 below. The blue vertical line shows the demand (from suppliers) for bill savings in order to meet their obligation. The upward sloping dotted black line, meanwhile, shows the supply of savings, achieved by promoting and installing energy efficiency measures into ECO-eligible homes – the 'supply curve'. The supply curve is upward sloping because for low bill savings targets, suppliers can promote and install the most cost effective measures, and can target the most amenable households. As the level of the target increases, however, the more cost effective potential is exhausted, and suppliers have to pay larger subsidies to less amenable households; these act to increase the subsidy that suppliers have to pay.

Figure 3: Illustrative ECO Supply Curve



153. For the purposes of this IA it is assumed that suppliers cannot price discriminate between different households, in that they cannot infer the minimum subsidy level needed to induce each household to install energy efficiency measures. This means they are assumed to pay the same subsidy to all households in order to meet their obligation, implying that some households are

[100] If the householder demands or is offered a higher level of subsidy than they require, the rent will accrue to them. If an installer can persuade a household to accept a lower subsidy rate and sell the ECO compliance from the measures installed to the supplier at the higher subsidy rate, the rent will accrue to them. Alternatively, if a supplier funds the installation of measures at a level lower than they would ultimately be willing to offer, they could sell that compliance to another supplier and the rent would accrue to them.

paid a subsidy larger than they would have needed in order to induce them to take up the measure (this is also counted as a benefit when undertaking distributional analysis – see section 9.1). This is illustrated by the shaded area in Figure 3, and represents an additional cost to suppliers in meeting their obligation.

Consumer Bill Impacts

154. Suppliers are assumed to pass the costs of delivering their obligation on to all of their customers through the variable element of gas and electricity prices. This cost pass through means that suppliers have an incentive to minimise the cost of delivering their obligation, as the greater the costs a supplier passes onto their consumers, the stronger the incentive their customers will have to switch suppliers. This would lose customers and potentially have a detrimental impact on a supplier's market share.

Annex E - Benefits

Benefits Included in the Cost-Benefit Analysis

155. An overview of the monetised benefits included in the analysis is detailed below, all of which are valued in line with the Green Book and supplementary guidance on valuing changes in energy and greenhouse gas emissions[101].

156. **Energy Savings**: The installation of energy efficiency measures reduces the resources needed to meet the demand for energy services, such as heating. Energy savings mean fewer resources are required to meet energy demand for the lifetime of the measures installed. This is a benefit to society in the short run as it frees up energy to be used elsewhere immediately, but it also benefits society in the long run in that long term reductions in energy demand can bring down the long run variable costs of energy supply (for example, avoiding the need to build an extra power plant in order to provide electricity).

157. **Air Quality Improvements and Carbon Savings:** Similarly, lower energy use improves air quality and reduces carbon emissions[102]. Reductions in carbon emissions help meet the nation's Carbon Budgets, while improvements in air quality reduce adverse health impacts (including mortality and morbidity). Carbon savings are valued using the benchmark carbon values published in the Green Book supplementary guidance; while air quality improvements are valued using the relevant damage factors in the same publication.

158. **Comfort Taking**: Efficient heating and insulation measures reduce the amount of energy required to heat the home (or in the case of first time central heating, provide the means to fully heat the home for the first time). This means that following the installation, some households will choose to heat their homes to a higher temperature, for a longer period, or heat more rooms in the house. This can be measured in the form of a change in energy used to reach a higher temperature, and valued using the retail price of energy as this reflects a household's willingness to pay for the extra warmth.

Additional Benefits Assessed in Distributional Analysis

159. **Value to society of lower energy bills in low income households**: Energy bill savings are a private benefit – only the householder enjoys the direct benefits of paying less for energy. However, energy is a necessity and high energy costs faced by low income households can be regressive. When taking into account the distribution of energy bill savings, the benefit to low income households can be valued more highly than had the benefit flowed to those with higher

[101] See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/254083/2013_main_appraisal_guidance.pdf.
[102] Carbon savings are divided into those that are traded (i.e. emissions covered by the EU Emissions Trading System) and non-traded (i.e. emissions outside of the Emission Trading System). More details on the EU ETS can be found here: http://ec.europa.eu/clima/policies/ets/index_en.htm

incomes. This effect can be valued through the use of equity-weighting.[103] More detail is available in the ECO transition consultation stage IA[104].

160. **Household Contributions**: For some measures households are assumed to make contributions towards to the cost of their installation. Lower income households will place a higher value on their contributions than higher income households, due to their income constraints. This can also be monetised through the use of equity-weighting.

161. **Wider Benefits:** There are also likely to be a range of benefits associated with improved health outcomes[105], potentially savings for health service provision, and improvements in productivity that it has not been possible to monetise.

Annex F – Further Details on the Small and Micro Business Impact

Background

162. Energy suppliers are only obligated under ECO if they are over a certain size, meaning that many smaller, independent suppliers are exempt from ECO. This small supplier exemption recognises that ECO is likely to bear disproportionate costs of smaller suppliers of complying with ECO (due to the fixed costs of compliance), as they have a lower customer base to spread the costs of compliance. It is also consistent with Government regulatory guidance that small and micro businesses should be exempt from regulations unless the disproportionate burden these businesses face can be fully offset[106].

163. The minimum threshold for ECO meant that at the start of ECO in January 2013, only the Big Six[107] energy suppliers were obligated.

164. As ECO has progressed independent suppliers' domestic energy market share has grown significantly - from around 2% just prior to the launch of ECO in 2013 to almost 24% at present[108.] Growth in 2017 amongst the smaller suppliers has been supported by significant levels of switching, with 18% of customers reporting that they had changed suppliers in the 12 months to April 2017[109], continuing an upward trend in switching rates. Around 29% of switches between January and November 2017 were to independent suppliers[110].

165. The growth in independent suppliers meant that by the start of the second year of ECO 2 (April 2016 – March 2017, referred to as 'phase 2'), nine independent suppliers had become sufficiently large that they became obligated. Further energy suppliers are expected to become obligated during ECO 3.

[103] Equity-weighting is an approach outlined in the Green Book to monetising the distributional costs and benefits of policy options. It means that £1 of cost or benefit is worth more to those on lower disposable incomes than those in higher income groups.
[104] See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/534669/ECO_Transition_Consultation_IA.PDF.
[105] Estimates of the monetised health impact for households of energy efficiency measures are included in Section 9.6; however the overlaps with comfort taking are at present unclear, therefore these benefits are not included in the cost-benefit analysis, to avoid double-counting.
[106] Source: Better Regulation Executive Guidance https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/468831/bis-13-1038-Better-regulation-framework-manual.pdf (see page 27)
[107] The Big Six are British Gas, Scottish Power, SSE, E.ON, NPower, and EDF
[108] Cornwall Insight, correct as of February 2018
[109] https://www.ofgem.gov.uk/system/files/docs/2017/10/consumer_engagement_survey_2017_report.pdf
[110] https://www.ofgem.gov.uk/publications-and-updates/infographic-bills-prices-and-profits

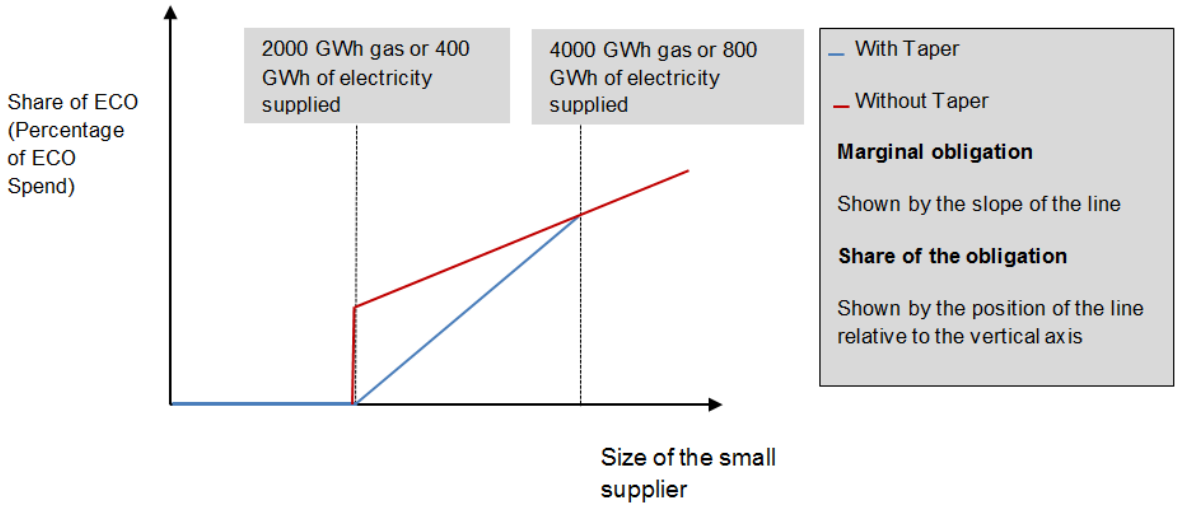
ECO Taper

166. The Government recognises that crossing the ECO threshold and becoming obligated can result in additional costs being borne by independent suppliers, and these costs will be passed onto their customers through their bills; it can also take time for suppliers to put the systems and expertise in place to deliver the obligation on a large scale[111].

167. In recognition of the additional challenges faced by newly-obligated suppliers, ECO operates with a taper, whereby newly obligated suppliers are only obligated on the parts of their size that exceeds the ECO threshold. For example, the tapering approach means that where a supplier reaches 401 GWh of electricity, the full amount will not count towards its obligation share, only the volume above 400 GWh multiplied by 2 will count (i.e. only 2 GWh will count in this case). The full volume of supply is counted when the supplier reaches 800 GWh of electricity or 4,000 GWh of gas.

168. The impact of the ECO Taper is illustrated in Figure 4, below. The red line shows how a newly obligated independent supplier's obligation share would grow assuming that ECO did not operate with a taper. Under this scenario, supplier's obligation share jumps upon crossing the threshold, and continues to grow in line with the growth in their market size. The blue line, meanwhile, shows how the obligation share changes with the taper. As can be seen, there is no sudden jump in their share of the obligation under this scenario – although newly-obligated suppliers see their obligation size grow more rapidly up until the upper 4000GWh limit as their market size grows.

Figure 4: Overview of the Current ECO Taper Mechanism

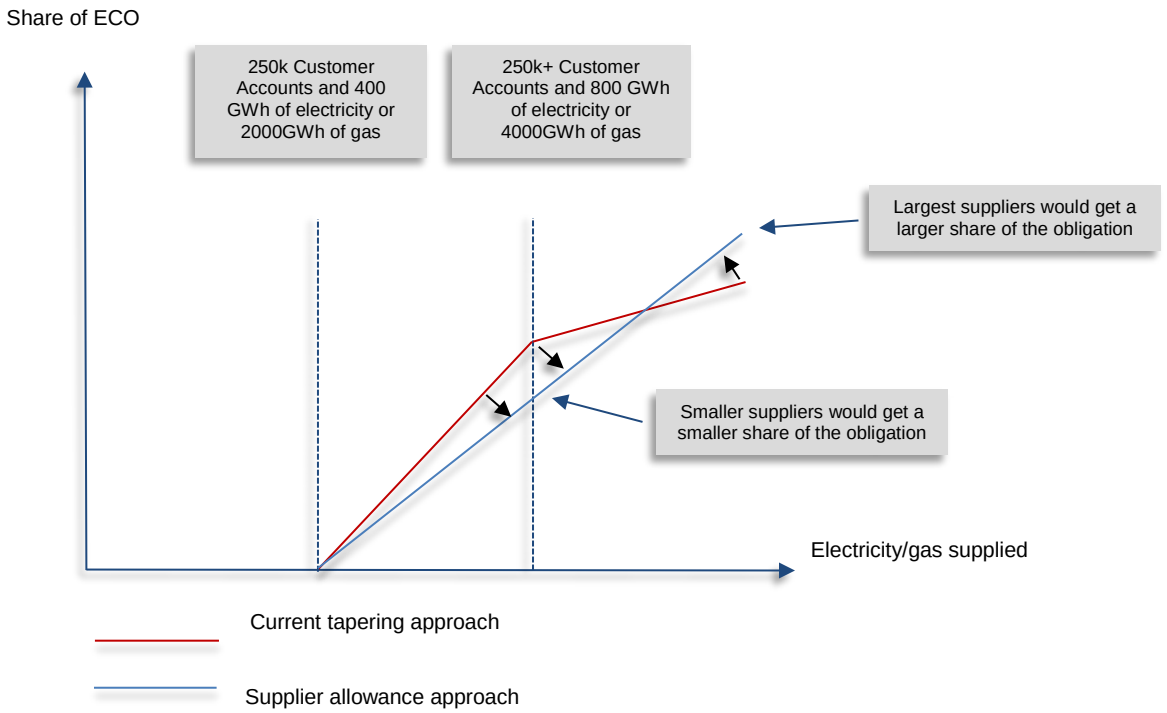


169. Some smaller suppliers have argued that the current level of the threshold and taper still represents a barrier to growth, and that in order for small suppliers to grow (and compete with the large, established suppliers) the threshold should be increased - or the taper extended. Conversely, the larger, established suppliers have argued that exempting small suppliers from the cost of delivering ECO gives them an unfair competitive advantage, arguing that the majority of ECO compliance costs are variable and that there is no evidence that the variable costs differ materially by size of supplier.

170. For the future scheme, we propose to introduce an alternative taper, the 'supplier allowance' approach. This would give all energy suppliers would be entitled to the same 'supplier allowance' (equal to the threshold), after which their obligations would be calculated on a per unit of supply basis. This approach would address the current problem of a steeper gradient for smaller suppliers subject to the taper, removing any disincentive to expansion.

[111] Independent suppliers have the option of outsourcing some elements of the admin costs. However, some costs will still be incurred.

Figure 5 Proposed New 'Supplier Allowance' Taper Mechanism



171. Provisional analysis undertaken by BEIS indicates that a move to this supplier allowance approach would increase the largest suppliers' share of the obligation by 0.2% - 1%, and reduce the medium sized suppliers share by 0.1% - 0.5%.

Annex G – Further Modelling outputs

172. This section summarises the projected delivery of measures during the extension across tenure, fuel type, dwelling type, rurality and whether the dwelling is on or off the gas grid under the preferred option. The mix of measures delivered and the estimated delivery of these across different household characteristics should be read as illustrative only, as ECO regulations neither control nor regulate for this.

173. There is considerable uncertainty about what the actual distribution of measures will be, in part because it is not known whether historic delivery will be illustrative of future delivery, particularly given changes to the policy design. In addition, our modelling assumes that suppliers will target the cost-effective opportunities, whereas the extent to which suppliers are able to do so in practice is uncertain.

Tenure

174. The majority (around 56%) of measure uptake is estimated to be in the owner occupied sector (which also represents the latest tenure group of the housing stock), with a further third of measures installed in the private rental sector.

175. Delivery to privately rented homes is disproportionately high given the sector makes up around 20% of the stock[112]. This is likely to be partly driven by private-rented homes being less energy efficient than other tenures, and therefore having disproportionately high cost-effective potential. In practice, delivery to this sector may be lower due to the known barrier of both landlord and

[112] https://www.gov.uk/government/statistics/english-housing-survey-2016-to-2017-headline-report

tenant needing to agree to work being carried out. On the other hand the PRS Regulations may act as an incentive to deliver to privately rented homes.

176. It also reflects the focus of Affordable Warmth, where social housing is restricted to only the least efficient properties, and therefore the bulk of delivery by definition has to occur in private tenure housing.

Table 16: Estimated Uptake of Measures by Housing Tenure (October 2018 – March 2022)

Housing Tenure	
Owner-occupied	56%
Rented (private)	36%
Rented (social)	8%

Fuel Type

177. Table 17 shows around a quarter of delivery is estimated to be to households heated by non-gas fuels, slightly higher than the GB average (around 23% of households are heated using non-gas fuels, including electricity[113]).

178. For Affordable Warmth suppliers have an additional incentive to deliver to non-gas fuelled households, due to uplifting the score achieved by delivering insulation measures and boiler replacements to non-gas fuelled households. These uplifts are in place because fuel poor households disproportionately use non-gas fuels to heat their homes. Tempering these incentives is the assumption that the cost of finding households with potential for delivery will be higher for those off the domestic gas grid.

Table 17: Estimated Uptake of Measures by Heating Fuel (October 2018 – March 2022)

Main Heating Fuel	
Gas	77%
electricity	19%
Oil	2%
Solid	2%

Domestic Gas Grid

179. The vast majority of delivery (80%) is estimated to be to households on the domestic gas grid, in line with the GB average. As above, the slight skew in delivery to off-gas grid properties under Affordable Warmth reflects our assumption there are stronger incentives to deliver to non-gas fuelled properties because of their greater cost-effectiveness.

Table 18: Estimated Uptake of Measures by Whether on the Gas Grid (October 2018 – March 2022)

Connected to gas grid	
Not connected to gas grid	80%
Connected to gas grid	20%

[113] See for example the Table 11B of the Fuel Poverty Statistics https://www.gov.uk/government/collections/fuel-poverty-statistics, which shows that 15% of homes in England are heated by fuels other than gas.

Dwelling Type

180. Almost 50% of measures are predicted to be delivered to larger properties (detached and semi-detached). Again, this reflects our assumption that suppliers target the most cost-effective homes in delivering their obligations.

Table 19: Estimated Uptake of Measures by Dwelling Type (October 2018 – March 2022)

Dwelling type	
Detached	23%
Semi Detached	24%
End Terrace	8%
Mid Terrace	22%
Bungalow	4%
Flat	19%

Rurality

181. Around 20% of delivery is projected to be to rural households, meaning the rural safeguard is not expected to be binding[114]. Off the gas grid homes tend to also be in rural locations. Therefore the incentives that drive delivery to non-gas heated propertied have a similar effect in driving delivery towards rural homes.

Table 20: Estimated Uptake of Measures by Rurality (October 2018 – March 2022)

Rural status	
Rural	20%
Urban	80%

Annex H – Non Monetised Impacts

182. There will be some small costs to BEIS and the administrator (Ofgem), which have not been monetised in this IA.

183. There are a significant number of benefits that have not been monetised, due to the limited scope in modelling the scheme, which focusses on setting the obligation size for energy suppliers. Also, the flexibility designed into the scheme, allowing suppliers to decide on the amount of Flexible Eligibility and innovative measures they deliver, will vary the range of benefits the policy delivers. These non-monetised benefits include:

- **Lower Energy Imports:** reducing the amount of energy inputs required from overseas, reducing the country's reliance on imports and improving security of supply.
- **Lower Costs of Meeting Peak Energy Demand**: increasing energy efficiency reduces the amount of peak energy demand, particularly from electrically heated homes. This reduces the amount of capacity that needs to be constructed in the grid.
- **Health Impacts**: although not included in the NPV score, there are likely to be additional health benefits associated with improving the energy efficiency (and warmth) of a home.

[114] Rural homes are defined as areas that are outside settlements of 10,000 or more. For more information see: https://www.gov.uk/government/collections/rural-urban-definition

- **Increase in Innovation (10-20% of the Obligation can be delivered through Innovation):** the scheme can support business activity, particularly in sectors with large potential for growth through innovation, delivering potential cost reductions in the future.

- **Wider Economic Benefits**: the scheme will continue to support the energy efficiency supply chain and, in tandem with its impact on innovation, promote growth in jobs in the sector.

- **Community Impacts and Flexible Eligibility**: improving the well-being of low income, vulnerable and fuel poor households will improve the communities of those amongst which they live. Also, measures such as solid wall insulation often helps to regenerate an area, increasing further the wellbeing of those living there. Local Authorities' ability to access ECO through Flexible Eligibility funds could better enable the scheme to be targeted at areas that benefit from these measures the most.

Annex I - Flexible Eligibility

184. Under the current scheme, suppliers are able to meet up to 10% of their obligations through Flexible Eligibility. The Flexible Eligibility element of Affordable Warmth was introduced in April 2017. This is a voluntary element that enables suppliers to work alongside participating Local Authorities. Under Flexible Eligibility, a participating local authority is able to: (a) determine its own locally specific criteria for identifying private tenure households that it considers to be living in fuel poverty or on a low income and vulnerable to the effects of living in a cold home (hence the term 'Flexible Eligibility') and (b) determine non-fuel poor households as eligible for solid wall insulation exclusively where this forms part of a project that delivers solid wall insulation to fuel poor or low income and vulnerable households. All other scheme requirements (e.g. measure type, maximums, administrative processes) apply in the same way as under the rest of the scheme.

185. Since its introduction, this delivery method has become increasingly popular. In November 2017, 2.4% of all ECO measures were delivered under this route. Total delivery to January 2018 is shown in Table 21 below.

Table 21: Measures Delivered Under Flexible Eligibility April 2017 to January 2018

Measure	Volume
Boilers	215
Cavity Wall Insulation	92
Loft Insulation	151
Electric Storage Heaters	42
Heating Controls	28
Flat Roof Insulation	1
Solid Wall Insulation	121
Total	**650**
Number of Properties Treated	**536**

Source: BEIS Household Energy Efficiency National Statistics[115]

186. While measures are being delivered under Flexible Eligibility, it is difficult to estimate how it would affect the costs to suppliers of meeting their obligation. However, since it is optional, and suppliers would only use it where it is cost effective to do so, Flexible Eligibility is expected to reduce the costs to suppliers of meeting their obligation.

[115] https://www.gov.uk/government/collections/household-energy-efficiency-national-statistics

187. The four main ways Flexible Eligibility might lower the costs to suppliers of meeting their obligation are by:

1. **Reducing Supplier Search Costs.** If Local Authorities identify low income, vulnerable and fuel poor households in fuel poverty and determine that they are eligible for Affordable Warmth, suppliers will have to spend less finding AW qualifying homes, reducing the costs to them of meeting their obligation targets.
2. **Increasing the Eligible Pool.** Related to the point above, flexible eligibility may increase the eligible pool offering suppliers more discretion in the homes they treat.
3. **Realising Economies of Scale.** Flexible eligibility will allow suppliers to treat multiple neighbouring homes with solid wall insulation, even if only some of them receive relevant benefits (for example, Universal Credit).
4. **Reducing Compliance Costs**. Suppliers won't need to check eligibility with the Department of Work and Pensions, helping to reduce bureaucracy.

188. In order to improve the department's understanding of the impacts of ECO Flexible Eligibility, BEIS has commissioned a survey, distributed to the ECO supply chain, managing agents and Local Authorities (see annex B for more information). It is anticipated that this information will be taken into account in the final stage IA.

Annex J - Innovation

Uptake of Innovation – Evidence from CERT

189. The Carbon Emission Reduction Target (CERT, a predecessor obligation to ECO, which ran between 2008 and 2012) allowed suppliers to deliver up to 10% of their obligation through innovation – namely market transformation and demonstration actions, and operated in a similar way to the proposed market transformation and demonstration actions under ECO 3, described above.

190. Suppliers met nearly 10% (9.6%) of their CERT obligation – almost exclusively through market transformation. Far less of the obligation was met through demonstration actions, with just 0.1% of the CERT targets delivered through this route. One reason offered for the lower uptake of demonstration actions, which was targeted at measures that didn't have pre-determined deemed score under CERT, was the higher risk associated with promoting and installing measures through this route.

Potential Impact of Innovation on the Market for Energy Efficiency

191. Promotion of measures through innovation is intended to have one or more of the following benefits:
    - the development and deployment of new measures that are not currently delivered under ECO and therefore do not have a deemed score;
    - reductions in the costs of improving solid walled homes, recognising there can be trade-offs between the costs of the works and the levels of carbon savings achieved;
    - devices and controls that improve consumers' ability to manage their energy use;
    - improvements in the processes of production and installation of measures that bring down costs and allow new ways of solving problems;
    - new ways of installing existing measures or combinations of measures which, for example, reduce cost, improve quality and enhance the overall experience for the consumer; and
    - better ways of identifying and targeting households for ECO support that result in an improved customer experience.

192. Innovation is also expected to generate wider benefits – such as knowledge spillovers, whereby innovation undertaken as part of ECO increases the amount of innovation being carried out elsewhere in the industry.

193. At present, we do not have sufficient evidence to carry out a detailed assessment of the impact of innovation or how much of the potential 10-20% cap they are likely to use. However, given that innovation is voluntary, we would only expect suppliers to use demonstration actions where it is cost effective to do so, and so would only be expected to reduce the costs to suppliers of delivering their obligation.

194. Over the course of the consultation, BEIS intends to collect further evidence on the attractiveness of the innovation proposals to suppliers. However, at this point, a conservative assumption has been made that suppliers do not use market transformation, and therefore do not receive the uplifts available under innovation. In reality, this is likely to understate the role of innovation in the scheme.

195. The department therefore welcomes evidence on the likelihood of suppliers using innovation to meet their ECO 3 targets, as well as the size of the proposed uplifts; BEIS will take this feedback into account when determining the final targets and uplifts outlined in the Government Response and final stage IA.

196. If BEIS determines that work will be undertaken large scale through innovation, as intended, it will amend the targets to reflect the impact of innovation.

Annex K – Equality Impact

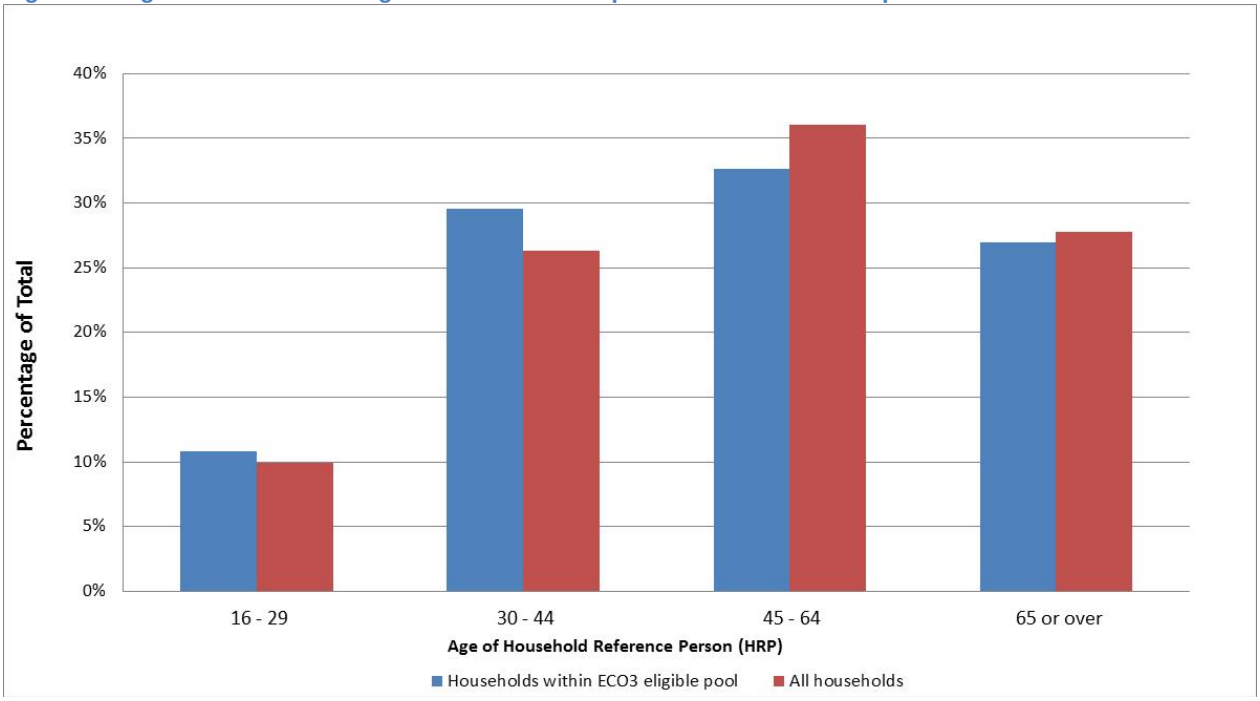
197. The impact of ECO 3 on the protected characteristics covered in the Equality Act 2010 are expected to be similar to those presented in the 2014 ECO IA[116], but are discussed briefly below. Where a particular protected characteristic is not listed, it is because there is no evidence that people with this protected characteristic are more or less likely to benefit from, or lose out because of, the policy.

Age

198. The age profile (based on the Household Reference Person[117]) of households eligible for ECO 3, compared to the general population, is shown below. It suggests households under 45 are slightly more likely to be eligible, while those over 45 are slightly less likely to be eligible for ECO 3, although the difference only varies by a few percentage points within each age group, suggesting no group is significantly under or over represented under ECO 3.

[116] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/373650/ECO_IA_with_SoS_e-sigf_v2.pdf (page 45)
[117] The Household Reference Person is the individual interviewed as part of the English Housing Survey.

Figure 6 – Age of Households Eligible for ECO 3 Compared to the General Population



Disability

199. Under the preferred option, ECO 3 extends eligible benefits to those in receipt of a wide range of disability benefits[118] so people with disabilities are expected to be more likely than the average household to benefit from ECO 3.

Race

200. In England, households where the Household Reference Person was from an ethnic minority were more likely to be in fuel poverty[119] during 2015. However, BEIS does not have any evidence on whether they are more or less likely to be eligible, or benefit, from ECO 3.

Pregnancy and Maternity

201. ECO 3 is expected to have a positive impact on recent mothers on low incomes. Households in receipt of Child Benefit (below an income threshold) or Child Tax Credit will be eligible for support under ECO 3.

Annex L - Justice Impact

202. There will not be a significant impact on the legal system or the volume of cases going through the courts, as BEIS is not making significant changes to the enforcement regime. The justice system would become involved were someone to seek to challenge an Ofgem enforcement action for a breach of the obligation or potentially where Ofgem sought a court order – although the latter has not occurred under supplier obligations since they began in the 1990s.

[118] Disability Living Allowance, Personal Independence Payment Attendance Allowance, Carer's Allowance, Severe Disablement Allowance, Industrial Injuries Disablement Benefits, War Pensions Mobility Supplement, Constant Attendance Allowance, Armed Forces Independence Payment

[119] https://www.gov.uk/government/statistics/fuel-poverty-detailed-tables-2017 (Table 22)