Title: ECO+ Consultation Stage Impact Asssessment **IA No:** BEIS074(C)-22-NZBI **Lead department or agency:** Department for Business, Energy and Industrial Strategy **Other departments or agencies:** None	**Impact Assessment (IA)** **Date:** 14 December 2022 **Stage:** Consultation **Type of measure:** Secondary legislation **Contact for enquiries:** beisecoplusteam@beis.gov.uk

Summary: Intervention and Options

RPC Opinion: N/A

Total Net Present Social Value (2021 prices, 2022 PV base year)	**Business outcomes** (2019 prices, 2020 PV base year)		
	Business Net Present Value	**Net cost to business per year**	**Business Impact Target Status**
£732m	-£397m	£272m	Qualifying Provision

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

The existing levels of government support for energy efficiency were set when energy prices were less than half their current level. Given the increase in energy prices and the Government's statutory fuel poverty and net zero targets there is reason to provide further energy efficiency measures for households on the lowest income as well as households who previously received no support at all. Several market barriers and failures exist in the energy efficiency market, preventing the deployment of energy efficiency in the absence of government intervention. Without intervention, many households will struggle to pay their bills not just this winter but over the next few years.

What are the policy objectives and the intended effects?

The primary objective of the scheme is to provide rapid installation of energy efficiency measures to a wider pool of households, including those on the lowest income and those in the least energy efficient homes in the lower council tax bands, reducing energy bills and tackling fuel poverty in the face of significant energy price rises. The intended effects are to: lower energy bills, make progress against the Government's statutory fuel poverty and climate change commitments; reduce energy demand in the residential sector (contributing to the national ambition of a 15% reduction in energy consumption by 2030), improve energy security and support jobs and growth.

What policy options have been considered, including any alternatives to regulation?

An additional Energy Company Obligation (ECO), ECO+, offers the timeliest intervention to help the greatest number of households reduce their energy consumption and bills. Given a £1bn ECO+ scheme, running from Spring 2023 to March 2026, this IA provides a detailed appraisal of three options concerning which households to support under the scheme:

Option 1: Target support exclusively towards low income and vulnerable households (the low-income group) and retain broadly the same eligibility requirements as used for ECO4.

Option 2: Target support more broadly to homes in Council Tax bands A-D in England, A-E in Scotland and A-C in Wales with an EPC of D or below (the general group).

Option 3: Target support to both the low-income and general groups, with the requirement that energy suppliers deliver at least 20% of their annual ECO+ obligations to the low-income group.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 2026

Is this measure likely to impact on international trade and investment?		No		
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 over Carbon Budget 5?		**Traded:** -0.02 MtCO2e	**Non-traded:** -0.69 MtCO2e	

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 minister: Matthew Pennycook Date: 14/12/22

Summary: Analysis & Evidence — Policy Option 1

Description: A £1bn ECO+ obligation to improve EPC D and below homes occupied by low-income and vulnerable households who are eligible for ECO4 (eligibility is largely defined by benefit recipience). Homes treated can receive one primary insulation measure, plus heating controls as a secondary measure. EPC E/F/G rated homes that could meet the ECO4 minimum EPC requirements, and so could receive more substantial improvements under that scheme, are not eligible.

FULL ECONOMIC ASSESSMENT

Price Base Year 2021	PV Base Year 2022	Time Period Years: 45	Net Benefit (Present Value (PV)) (£m)
			Best Estimate: 544

COSTS (£m)	Total Transition (Constant Price)	Average Annual (excl. transition) (Constant Price)	Total Cost (Present Value)
Best Estimate	937	N/A	834

Description and scale of key monetised costs by 'main affected groups' (figures in present value)

Most costs will be incurred by energy suppliers. Energy suppliers cover measure installation costs, including both capex (£334m) and retrofit standards compliance (£282m). Energy suppliers also incur search costs in finding eligible households willing to have measures (£91m), administration costs (£52m) and pay the 'economic rent' that arises in the marketplace for ECO points which is assumed to go to installers (£123m). Energy suppliers' costs in 2023/24 are included in the Energy Price Guarantee (EPG) and paid by government, with the arrangements from April 2024 onwards to be confirmed at a later stage. Costs faced by households include the hidden/hassle costs associated with installations (£45m) and reinstallations costs for measures (£24m).

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

Key costs have been monetised.

BENEFITS (£m)	Total Transition (Constant Price)	Average Annual (excl. transition) (Constant Price)	Total Benefit (Present Value)
Best Estimate	2,882	N/A	1,378

Description and scale of key monetised benefits by 'main affected groups' (figures in present value)

Societal benefits from a reduction in GHG emissions account for 57% of the total benefit (£791m), whilst improved air quality accounts for a further 3% (£38m). Total fuel bill savings for households living in improved homes are estimated to be £834m (of which £401m are societal benefits once energy firms' profits are netted off). In addition, £147m of comfort benefits are expected for households receiving measures. Installers of measures are assumed to acquire £123m of 'economic rent' (a transfer) in the marketplace for ECO points.

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

Until March 2024, the Government will be compensating energy suppliers for supplying electricity and gas to households in Great Britain at reduced rates under the EPG. By lowering energy use, ECO+ will marginally reduce the cost of the EPG in 2023/24. This benefit has not been monetised. Other non-monetised benefits include improved security of energy supply, lower energy imports and the health benefits gained by households receiving measures who will live in warmer homes.

Key assumptions/sensitivities/risks — **Discount rate: 3.5% (⩽30 years), 3% (>30 years)**

ECO+ modelling was carried out using the BEIS National Household Model (NHM) and relies on various assumptions. ECO4 assumptions on the capital costs of energy efficiency measures were used, though a 60% uplift was applied to the costs of loft and cavity wall insulation, based on evidence from the 2020/21 Green Homes Grant Vouchers scheme. All cost assumptions are being tested as part of the consultation.

BUSINESS ASSESSMENT (2019 prices, 2020 present value)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs:	**Benefits:**	**Net:**	
272	0	272	816

Summary: Analysis & Evidence — Policy Option 2

Description: A £1bn ECO+ obligation to improve EPC D and below homes in Council Tax bands A-D in England, A-E in Scotland and A-C in Wales. Homes treated can receive one primary insulation measure with no secondary measures. The ECO+ targets are set on the basis of £1.1bn of spend, comprising a £1bn direct cost to energy suppliers and £100m (10%) household contributions to measures installed.

FULL ECONOMIC ASSESSMENT

Price Base Year 2021	**PV Base Year** 2022	**Time Period Years:** 45	**Net Benefit (Present Value (PV)) (£m)**
			Best Estimate: 830

COSTS (£m)	**Total Transition** (Constant Price)	**Average Annual** (excl. transition) (Constant Price)	**Total Cost** (Present Value)
Best Estimate	923	N/A	849

Description and scale of key monetised costs by 'main affected groups' (figures in present value)

Energy suppliers cover the majority of measure installation costs, including both capex (£366m) and retrofit standards compliance (£310m). Energy suppliers also incur search costs (£105m), administration costs (£58m) and pay the 'economic rent' that arises in the marketplace for ECO points (£46m). Energy suppliers' costs in 2023/24 are included in the EPG and paid by government, with the arrangements from April 2024 onwards to be confirmed at a later stage. Household contributions towards measures installed according to the appropriate standards total £88m, though overall households make a saving of £29m on measures as some households are assumed to pay the full cost of measures in the counterfactual. Additional hidden/hassle costs incurred by households total £30m and households pay £2m re-installing measures at the end of their lives.

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

Key costs have been monetised.

BENEFITS (£m)	**Total Transition** (Constant Price)	**Average Annual** (excl. transition) (Constant Price)	**Total Benefit** (Present Value)
Best Estimate	3,523	N/A	1,679

Description and scale of key monetised benefits by 'main affected groups' (figures in present value)

Societal benefits from a reduction in GHG emissions account for 60% of the total benefit (£999m), whilst improved air quality accounts for a further 2% (£37m). Total fuel bill savings for households living in improved homes are estimated to be £974m (of which £471m are societal benefits once energy firms' profits are netted off). In addition, £172m of comfort benefits are expected for households receiving measures. Installers of measures are assumed to acquire £46m of 'economic rent' (a transfer) in the marketplace for ECO points.

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

As with Policy Option 1, a marginal reduction in government expenditure on the EPG in 2023/24 has not been monetised. Other non-monetised benefits include improved security of energy supply, lower energy imports and the health benefits gained by households receiving measures who will live in warmer homes.

Key assumptions/sensitivities/risks **Discount rate: 3.5% (⩽30 years), 3% (>30 years)**

As with Option 1, ECO4 assumptions on the capital costs of energy efficiency measures were used, though a 60% uplift was applied to the costs of loft and cavity wall insulation.

This policy option includes £100m of expected household contributions to measures, equivalent to 10% of energy supplier / government spend. It is expected that energy suppliers will be able to leverage household contributions from the broader/general eligibility group. The 10% assumption is being tested as part of the consultation and BEIS is currently conducting research into consumers' willingness to pay for measures.

A conservative assumption (in terms of the NPV) is made that 20% of households in the general group would have installed measures at some point anyway.

BUSINESS ASSESSMENT (2019 prices, 2020 present value)

Direct impact on business (Equivalent Annual) £m:			**Score for Business Impact Target (qualifying provisions only) £m:**
Costs: 272	**Benefits:** 0	**Net:** 272	816

Summary: Analysis & Evidence — Policy Option 3

Description: A £1bn ECO+ obligation to improve EPC D and below homes which are either eligible for ECO4 (low-income group) or in Council Tax bands A-D in England, A-E in Scotland and A-C in Wales (general group). The ECO+ targets are set on the basis of £200m of spend on the low-income group and £880m of spend on either the low-income group or general group (including £80m of household contributions to measures).

FULL ECONOMIC ASSESSMENT

Price Base Year 2021	**PV Base Year** 2022	**Time Period Years:** 45	**Net Benefit (Present Value (PV)) (£m)**
			Best Estimate: 732

COSTS (£m)	**Total Transition** (Constant Price)	**Average Annual** (excl. transition) (Constant Price)	**Total Cost** (Present Value)
Best Estimate	986	N/A	890

Description and scale of key monetised costs by 'main affected groups' (figures in present value)
Energy suppliers cover the majority of measure installation costs, including both capex (£371m) and retrofit standards compliance (£306m). Energy suppliers also incur search costs (£102m), administration costs (£57m) and pay the 'economic rent' that arises in the marketplace for ECO points (£49m). Energy suppliers' costs in 2023/24 are included in the EPG and paid by government, with the arrangements from April 2024 onwards to be confirmed at a later stage. Household contributions towards measures installed according to the appropriate standards total £70m, though overall households make a saving of £8m on measures as some households are assumed to pay the full cost of measures in the counterfactual. Additional hidden/hassle costs incurred by households total £42m and households pay £15m re-installing measures at the end of their lives.

Other key non-monetised costs by 'main affected groups'
Key costs have been monetised.

BENEFITS (£m)	**Total Transition** (Constant Price)	**Average Annual** (excl. transition) (Constant Price)	**Total Benefit** (Present Value)
Best Estimate	3,403	N/A	1,622

Description and scale of key monetised benefits by 'main affected groups' (figures in present value)
Societal benefits from a reduction in GHG emissions account for 60% of the total benefit (£975m), whilst improved air quality accounts for a further 2% (£31m). Total fuel bill savings for households living in improved homes are estimated to be £949m (of which £448m are societal benefits once energy firms' profits are netted off). In addition, £167m of comfort benefits are expected for households receiving measures. Installers of measures are assumed to acquire £49m of 'economic rent' (a transfer) in the marketplace for ECO points.

Other key non-monetised benefits by 'main affected groups'
As with Policy Option 1, a marginal reduction in government expenditure on the EPG in 2023/24 has not been monetised. Other non-monetised benefits include improved security of energy supply, lower energy imports and the health benefits gained by households receiving measures who will live in warmer homes.

Key assumptions/sensitivities/risks — **Discount rate: 3.5% (⩽30 years), 3% (>30 years)**

As with Option 1, ECO4 assumptions on the capital costs of energy efficiency measures were used, though a 60% uplift was applied to the costs of loft and cavity wall insulation.

This policy option includes £80m of expected household contributions to measures, representing a 10% uplift on the ECO+ spend that can be used to treat homes in the general group. The 10% assumption is being tested as part of the consultation and BEIS is currently conducting research into consumers' willingness to pay for measures.

A conservative assumption (in terms of the NPV) is made that 20% of households in the general group would have installed measures at some point anyway.

BUSINESS ASSESSMENT (2019 prices, 2020 present value)

Direct impact on business (Equivalent Annual) £m:			**Score for Business Impact Target (qualifying provisions only) £m:**
Costs:	**Benefits:**	**Net:**	
272	0	272	816

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1. Problem under consideration and rationale for government intervention

1. This consultation stage Impact Assessment (IA) accompanies the consultation on the Government's proposals for a three-year additional Energy Company Obligation (ECO), ECO+, from Spring 2023 to March 2026. ECO+ requires energy suppliers to meet a target of notional annual bill savings by installing energy efficiency measures to homes in Great Britain. These measures help households to keep their homes warmer, reduce their energy bills and carbon emissions.

2. Upgrading the energy efficiency of homes addresses several Government objectives by:

    - **Tackling the root cause of fuel poverty** and making progress towards the Government's statutory fuel poverty target for England (to ensure that as many fuel poor homes as is reasonably practicable achieve a minimum energy efficiency rating of band C, by 2030).
    - **Reducing greenhouse gas emissions in the domestic sector**, contributing to the Government's legally binding carbon reduction targets. The residential sector is responsible for a significant share of the UK's greenhouse gas emissions (around 16%)[1], and final energy consumption (around 31%)[2].
    - **Lowering energy bills**, helping keep bills as low as possible for households. Given the current cost of living crisis and associated spike in energy prices, more households today are struggling to afford to heat their homes. In the 2022 Autumn Statement[3], the government announced the Energy Price Guarantee (EPG) will be maintained through winter 2022/23, limiting typical energy bills to £2,500 per year. From April 2023 the EPG will rise to £3,000. Whilst this equates to an average of £500 of support for households in 2023/24, complementary support to reduce households' energy consumption is required to make heating homes in Britain as affordable as possible.

      Such support is not only needed for those towards the bottom of the income distribution. To protect the most vulnerable, in 2023/24 the Government will be providing an additional Cost of Living Payment of £900 to households on means-tested benefits, of £300 to pensioner households, and of £150 to individuals on disability benefits. The government will also raise benefits, including working age benefits and the State Pension, in line with inflation from April 2023, ensuring they increase by over 10%. For middle-income households without such support, it is appropriate for the government to extend the coverage of its energy efficiency schemes to cover them.
    - **Reducing energy demand, contributing to a secure and resilient energy system**. The International Energy Agency estimates 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.[4]
    - **Improving health outcomes, leading to savings for the NHS** - living at low temperatures poses a risk to health, with a range of negative morbidity and mortality

[1] BEIS Final UK greenhouse gas emissions national statistics, 2020: https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2020. See Table 1.2.
[2] BEIS Energy Consumption in the UK, 2021 https://www.gov.uk/government/statistics/energy-consumption-in-the-uk-2021. See Table C1.
[3] https://www.gov.uk/government/publications/autumn-statement-2022-documents/autumn-statement-2022-html
[4] International Energy Agency Energy Efficiency Report (2015): http://www.iea.org/publications/freepublications/publication/MediumTermEnergyefficiencyMarketReport2015.pdf

impacts associated with exposure to the cold. The Marmot Review on cold homes and health[5], in addition to the Hills Fuel Poverty Review[6], set out the strong body of evidence linking low temperatures to these poor health outcomes.

3. Market failures and barriers exist in the domestic energy efficiency market, slowing and preventing take-up of socially cost-effective energy efficiency measures. Key market failures and barriers that would be addressed by ECO+ 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'). Whilst this lack of access to capital will be particularly acute for the lowest income, vulnerable and fuel poor households who are the target of existing government schemes including ECO4, Green Homes Grant Local Authority Delivery, the Home Upgrade Grant and the Social Housing Decarbonisation Fund, many more households today will not be able to afford energy efficiency measures. The OBR forecasts that over the next two years average living standards in the UK – as measured by after-tax real incomes per person – will fall by 7%.[7]
    - **Incomplete or asymmetric information** - households may have limited knowledge on how best to improve their property and lack of awareness on where trusted installers of measures can be found. As such, consumers may not feel confident in assessing the risk of buying a poor-quality service and may prefer to withdraw from the market or heavily discount the claimed savings from energy efficiency measures. Under ECO, measure installers and energy suppliers identify homes which can be improved and, for the most part, are incentivised to treat those which generate the greatest energy bill savings per pound invested in measures. Installers treating homes under ECO must follow industry standards to make sure the most suitable measures are selected and are installed correctly. Hence, by making use of established ECO supply chains, ECO+ reduces the burden on households to research how best to improve their home or find reputable installers.
    - **Externalities** - By subsidising the cost of energy efficiency measures, the government will also help internalise into household decision making the external benefits associated with reducing energy consumption, including reducing greenhouse gas emissions and improving UK energy security (reducing energy consumption lowers the risk that UK energy demand will exceed UK energy supply).

2. Policy objectives

4. Various schemes could be developed and implemented, or expanded, by the government to support households to upgrade the energy efficiency of their homes. ECO+ was established as the preferred way forward to meet the leading aim of delivering cost-effective energy efficiency measures at pace and in high volumes from spring 2023 (with the potential for even earlier delivery). ECO has existed since 2013 and has a proven track record of success in delivering measures. Between January 2013 and September 2022, 3.5 million measures were installed under ECO in around 2.4 million properties (this means that close to 1 in 10

[5] Marmot Review Team (2020). *Health equity in England: The marmot Review 10 years on*. Available at: https://www.health.org.uk/publications/reports/the-marmot-review-10-years-on
[6] Hills (2012). *Getting the measure of fuel poverty*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48297/4662-getting-measure-fuel-pov-final-hills-rpt.pdf
[7] https://obr.uk/efo/economic-and-fiscal-outlook-november-2022/

households in Great Britain have benefitted from ECO to date).[8] In the most recent iteration of the scheme to have completed, ECO3 (October 2018 – March 2022), energy suppliers successfully met their overall obligation within the scheme's spending envelope – to March 2022, energy suppliers' total delivery and administration costs from ECO3 were £1.95bn[9], which compared to a £2.24bn spending envelope for the scheme.

5. The ECO model encourages efficient delivery of energy efficiency measures as energy suppliers have an incentive to meet their obligations as cost-effectively as possible. In addition, every iteration of ECO builds on previous versions of the scheme, making use of established supply chains and learning amongst suppliers.

6. If the government were to pursue an alternative public vouchers or rebate scheme along the lines of the Green Homes Grant (GHG) Voucher Scheme or Boiler Upgrade Scheme, it would be very unlikely to support households in 2023 – the 2020/21 GHG Vouchers scheme underperformed due in part to its rushed delivery and implementation, highlighting the risk of trying to establish a new scheme quickly.

7. For ECO+ the following objectives have been set (the modelled outcomes for the preferred policy option have informed the targets[10]):

    1) **Over 400,000 households supported with energy efficiency measures** between 2023 and 2026.
    2) ECO+ recipients have energy bills lower than they otherwise would have been, with an **average bill saving of £310 per year** (this figure is the average bill saving consistent with a £3,000 EPG and the target will change in proportion to energy prices).
    3) **Over 160,000 homes upgraded to at least an energy efficiency rating of Band C**, helping the government meet its statutory fuel poverty target.
    4) **Carbon savings of 0.14 MtCO2e per year** delivered from 2026 onwards (equating to 0.69 MtCO2e savings for Carbon Budget 5 (2028 – 2032)).

    See Section 10 for a broad plan of how the policy will be monitored and achievement of these objectives assessed. In addition to these specific objectives, ECO+ is also intended to lead to supply-side growth in the markets for energy efficiency measures, with more jobs and better local capability to service demand.

3. Policy options

8. For ECO+, the Government has considered different options around:

    - Household eligibility, including the income level of eligible households, their tenure, their home's current energy efficiency level and their coverage under other

[8] See Tables 1.1 and 1.2 of the Household Energy Efficiency Statistics (November 2022): https://www.gov.uk/government/statistics/household-energy-efficiency-statistics-headline-release-november-2022
[9] See Table 6.6 of the Household Energy Efficiency Statistics (November 2022): https://www.gov.uk/government/statistics/household-energy-efficiency-statistics-headline-release-november-2022
[10] The accuracy of key modelling assumptions will be considered as part of the monitoring and evaluation of ECO+. A successful ECO+ scheme in terms of delivering measures to households may fail to achieve one of the set objectives if an inaccurate assumption is used, e.g., if the assumed level of energy savings from installing a measure is inaccurate.

Government schemes (particularly ECO4). Energy suppliers' use of ECO Flexible Eligibility[11] was also considered.

- Eligible measures and whether to have minimum energy performance improvement requirements.
- The retrofit standards to use to ensure households get the best measures for their home and that they are installed to a decent, industry standard.
- How to score installations, including uplifts.

9. The consultation on ECO+ which this IA accompanies, sets out and explains the government's proposals on these elements. This IA sets out the estimated outcomes and impacts of the preferred policy being consulted on (Option 3 below), as well as two alternative policies where ECO+ is made exclusively a scheme to support households in a low-income group (Option 1) and where ECO+ is fully targeted at homes in a general group, defined as homes in Council Tax bands A-D in England, A-E in Scotland and A-C in Wales (Option 2). The assessed options are as follows:

Option 0 – ECO+ is not implemented (do nothing)

10. Under this option, energy suppliers will not be required to go further than fulfil their obligations under the ECO4 scheme. Those households who would benefit from ECO+ would not be financially supported to install energy efficiency measures and therefore a low volume of installations would be expected - it is assumed that no low-income households would install measures without ECO+, whilst 20% of households that would be supported as part of the general group (that are also not low-income) would install measures in the counterfactual (this assumption is deliberately optimistic to avoid overstating the additional impacts of ECO+).[12] There would be no cost to the government from this option.

Option 1 – ECO+ is fully targeted at low-income households

11. Under this option, a new obligation covering the period 2023/24 to 2025/26 and costing £1bn (in 2022 prices) would be set on energy suppliers to improve the energy efficiency of EPC D and below homes occupied by low-income and vulnerable households who are eligible for ECO4 (this is the ECO+ low-income group and excludes households in EPC E/F/G rated homes that could meet the ECO4 minimum EPC requirements[13]). This includes households receiving means-tested benefits, households living in the least efficient social housing and households referred through the Local Authority or Supplier Flex mechanisms as being low-income, fuel poor and/or vulnerable. Homes treated under the obligation can receive one primary insulation measure, plus heating controls as a secondary measure if an owner-occupier property.

[11] Under LA and Supplier Flex, a local authority or participating supplier can refer 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.
[12] The assumption that 20% of households in the general group would install measures at some point without ECO+ support is based on survey work conducted by BEIS with households who installed measures under the Green Homes Grant Vouchers scheme. Amongst the households who had cavity wall insulation installed under the scheme, 29% said they were likely to have installed the measure anyway. There are reasons to believe that a significantly lower proportion of households in the ECO+ general group would install measures in the absence of support. Statements made in surveys on the likelihood of acting are only weakly correlated with actual action and there is no evidence of such significant take up of measures outside of government schemes.
[13] The ECO4 minimum EPC requirements necessitate that EPC F and G homes reach EPC D and EPC D and E homes reach EPC C. The rationale for excluding households in EPC E/F/G rated homes that could meet the minimum requirements is that they should be treated under ECO4 where it is cost-effective to do so.

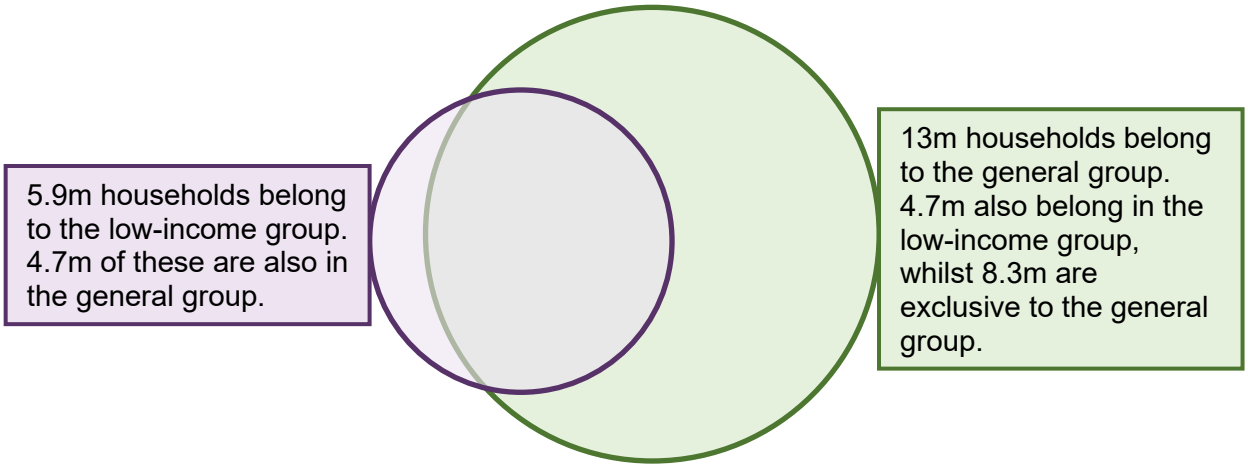
12. In Great Britain, 5.9 million households are estimated to fall into the low-income group, of which 3.3 million are estimated to be eligible through Local Authority or Supplier Flex[14].

Option 2 – ECO+ is fully targeted at homes in the general group

13. Under this option, a new obligation covering the period 2023/24 to 2025/26 and costing £1bn (in 2022 prices) would be set on energy suppliers to improve the energy efficiency of EPC D and below homes in Council Tax bands A-D in England, A-E in Scotland and A-C in Wales (the general group). Homes treated under the obligation can receive one primary insulation measure with no secondary measures. In expectation that energy suppliers will be able to leverage household contributions from the general group, the ECO+ targets are set on the basis of £1.1bn of spend, comprising a £1bn direct cost to energy suppliers and £100m household contributions to measures installed.[15]

14. In total, around 13 million households in Great Britain are estimated to fall into the general group. Of this 13 million, 4.7 million also belong to the low-income group[16], whilst the other 8.3 million are exclusive to the general group – see Figure 1 for a diagrammatic illustration of how the low-income and general groups overlap. As low-income households make up just over a third of the general group, even when support is fully targeted at homes in the general group, it is likely that some low-income households will benefit. However, under Option 2, there is no requirement for energy suppliers to support low-income households.

Figure 1: Relationship between the low-income group and general group



Option 3 – ECO+ can be used to support both households in the low-income and general groups, with a low-income minimum requirement (20% of the annual ECO+ targets)

15. Under this option, a new obligation covering the period 2023/24 to 2025/26 and costing £1bn (in 2022 prices) would be set on energy suppliers to improve the energy efficiency of EPC D and below homes which are either in the low-income group (see Option 1 description) or in

[14] As done in ECO4 modelling, the pool of LA/Supplier Flex homes that can be found in the ECO+ modelling is reduced by 50% (of 3.3 million) to proxy for local authority engagement in the scheme.
[15] The 10% uplift on total ECO+ spend to account for household contributions is being tested as part of the ECO+ consultation and BEIS is also currently conducting research into consumers' willingness to pay for measures.
[16] Not all of these 4.7 million low-income households are modelled as belonging to the low-income group in this impact assessment. 50% of those homes that would belong to the low-income group through LA/Supplier Flex are modelled as belonging to the general group only. This means that the true proportions of low-income homes treated when ECO+ support is given to the general group could be slightly higher than presented in Tables 6 and 7 of this IA.

the general group (see Option 2 description). Households in both groups can receive one primary insulation measure, with low-income households also eligible for heating controls as secondary measures (owner-occupier households only). Energy suppliers will need to meet at least 20% of their annual ECO+ targets by treating homes in the low-income group. The ECO+ targets are set on the basis of £200m of spend on the low-income group and £880m of spend on either the low-income group or general group (including £80m of household contributions) – note that whilst £200m of spend on the low-income group represents 18.5% of total spend (including household contributions), it is modelled to account for 20% of the overall ECO+ score target. This is because the initial £200m of spend on the low-income group is modelled to generate 58 score points per £1,000 of spend, whereas the remaining £880m of spend on either household group generates 52 score points per £1,000 of spend.

16. Further/specific eligibility requirements for households in the low-income and general groups which are consistent across the options are summarised in Table 1.

Table 1: ECO+ household eligibility (see Table 2 for ECO+ measures)

Households in the low-income group	Households in the general group
• Must be either receiving means-tested benefits, living in the least efficient social housing or referred through the Local Authority or Supplier Flex mechanisms as being low-income, fuel poor and/or vulnerable, and then for: • **Owner-occupiers:** If the household owns the home and the home is EPC D or below, then the household can receive any ECO+ insulation measure, plus heating controls. • **Social renters:** If the household lives in EPC E or below social housing, then the household can receive any ECO+ insulation measure. If the home is EPC D, then only a qualifying innovation measure is allowed. Heating controls cannot be provided under ECO+ to social renters. • **Private renters:** If the household lives in an EPC D or E home, then the household can receive any ECO+ insulation measure.[17] Heating controls cannot be provided under ECO+ to private renters. • In all cases, if the household lives in an EPC E/F/G rated home that could meet the ECO4 minimum EPC requirements, then the household will not be eligible for support under ECO+.	• Must be living in a Council Tax band A-D home in England[18], A-E in Scotland or A-C in Wales, and then for: • **Owner-occupiers:** If the household owns the home and the home is EPC D or below, then the household can receive any ECO+ insulation measure. • **Social renters:** If the household lives in EPC E or below social housing, then the household can receive any ECO+ insulation measure. If the home is EPC D, then only a qualifying innovation measure is allowed. • **Private renters:** If the household lives in an EPC D or E home, then the household can receive any ECO+ insulation measure other than cavity wall insulation and loft insulation.[13]

[17] EPC F and G PRS homes will also be eligible for ECO+ support if either of the following two conditions apply: (i) if the property has registered a valid exemption in relation to the PRS EPC E Regulations, or (ii) if the property is not in scope of the PRS EPC E Regulations because it is not legally required to have an EPC or it is not let on one of the relevant tenancy types.
[18] Official statistics from the Valuation Office Agency show that 81% of properties in England are in Council Tax band A-D: https://www.gov.uk/government/statistics/council-tax-stock-of-properties-2022

17. Table 2 lists the energy efficiency measures that will count towards an energy supplier's obligation under ECO+.

Table 2: ECO+ energy efficiency measures

ECO+ energy efficiency measures
• Cavity wall insulation • Solid wall insulation (both external and internal) • Loft insulation • Pitched roof insulation • Flat roof insulation • Under floor insulation • Solid floor insulation • Park home insulation • Room-in-roof insulation • Heating controls (room thermostat, boiler programmer and/or thermostatic radiator valves) – only allowed as a secondary measure for low-income, owner-occupier households • Innovation measures of any of the above measure types, that are approved under ECO4 (see Chapter 3 of the accompanying consultation)

18. With respect to the retrofit standards used to ensure households are protected and get the best measure for their property, installed to a decent standard, it is proposed that all ECO+ measures are delivered in accordance with PAS (Publicly Available Specification) standards (PAS 2035), other than loft insulation in low-risk situations and heating controls. For loft-insulation in low-risk situations and heating controls, either ECO+ Trustmark Licence Plus (TMLP) standards or PAS 2035 can be used (see Chapter 6 of the accompanying consultation).

19. Under all options, the £1bn obligation (in 2022 prices) on energy suppliers is split across the three years of the scheme as follows[19]:

    - April 2023 – March 2024: £130m
    - April 2024 – March 2025: £435m
    - April 2025 – March 2026: £435m

    These sums are used to set mandatory annual ECO+ targets for energy suppliers, based on the notional annual bill savings (ECO score points) associated with qualifying energy efficiency measures. As with ECO4, BEIS's National Household Model (NHM), based on 2013/14 dwelling stock data from the English Housing Survey (EHS), is used to determine the ECO+ score targets. This is done by selecting eligible properties and installing measures in descending order of cost-effectiveness (based on ECO score points per £ spent) until the scheme budget for each year has been reached. The modelling also reflects the assumption

[19] These annual budgets are increased in line with inflation so that total scheme spend over the three years equates to £1 billion in today's prices. The inflation adjustment has used the HM Treasury's GDP deflator series: https://www.gov.uk/government/collections/gdp-deflators-at-market-prices-and-money-gdp

that installers / energy suppliers will be able to leverage contributions from households in the general group, equivalent to 10% of the ECO+ budget available to that group. See Section 4 for further details on the modelling approach.

20. The proposal for ECO+ is that measures are scored using the ECO4 partial project scores without the 20% deflator (this deflator is used in ECO4 to help maintain an incentive to meet the minimum EPC requirements and obtain a full project score). The ECO4 partial project scores for qualifying measures can be found at https://www.ofgem.gov.uk/publications/eco4-scoring-methodology.

21. Energy suppliers' costs meeting their 2023/24 ECO+ target will be included in the Energy Price Guarantee (EPG) and paid by government. Arrangements for covering energy suppliers' costs in meeting their 2024/25 and 2025/26 ECO+ targets will be confirmed at a later stage. In this impact assessment it is assumed that the government will cover energy suppliers' costs in these years, rather than the costs being passed onto energy suppliers' domestic customers.

4. Analytical approach

4.1 Modelling measures installations and determining the ECO+ targets

22. The National Household Model (NHM), based on dwelling stock data from the 2013/14 English Housing Survey (EHS)[20], has been used to model which homes are treated under ECO+ and which energy efficiency measures are installed.[21,22] The NHM allows the user to model the costs of installing measures into properties and compare these with the ECO score points that would be acquired. In this way, the model can be used to rank properties in terms of how cost-effective they are to treat under ECO+.

23. As observed with previous ECO schemes, under ECO+, installers of energy efficiency measures and ECO managing agents are expected to sell notional annual bill savings (ECO score points) to energy suppliers. It is assumed these installers seek out the most cost-effective properties (based on ECO score points per £ spent) to deliver the annual bill savings at least cost. Given this assumption, and to incentivise this optimal behaviour, the mandatory annual ECO+ targets are modelled based on measures being installed in the NHM in descending order of cost-effectiveness.

24. The market for ECO score points between installers as the providers/sellers and energy suppliers as the consumers is assumed, for simplicity, to be perfectly competitive with a single market price (£/point). This market price is determined by the cost of the last home treated in terms of cost-effectiveness (the marginal home). Figure 2 illustrates how for a given level of demand amongst energy suppliers for ECO score points (the blue vertical line) how the marginal home on the supply curve for ECO score points sets the market price.

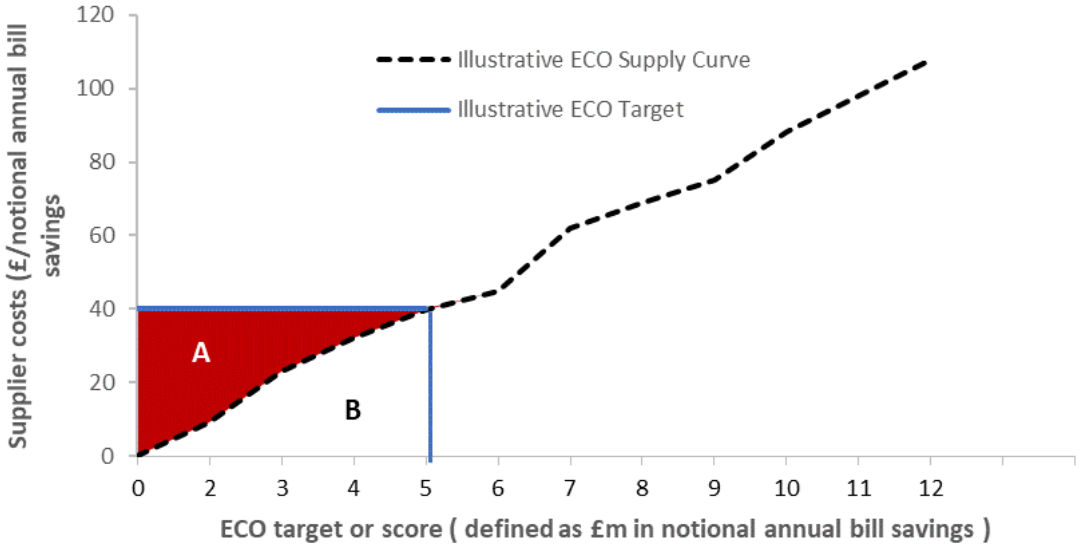
[20] The NHM is adjusted to try and reflect the latest position we have data for by accounting for measures installed in line with National Statistics since 2013/14: https://www.gov.uk/government/collections/household-energy-efficiency-national-statistics

[21] As the NHM is based on homes in England, an 'England-only' ECO+ scheme equivalent to £857m of spend by energy suppliers was modelled. The results for this England-only ECO+ scheme were then scaled up to the GB-wide £1bn ECO+ scheme. The size of the England-only ECO+ scheme was based on the ratio of households in England to Great Britain (https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/householdprojectionsforengland).

[22] Before the ECO+ policy scenario starts in the model, stock updates and other policies which pre-date ECO+ are modelled, e.g., ECO3 and the PRS EPC E Regulations. ECO4 installations are modelled before ECO+ installations, which reduces the pool of ECO+ eligible households slightly.

25. The 'artificial' market created by ECO for these scores points enables installers to acquire economic rent - they are paid more for treating properties than their opportunity cost, which is what it actually costs to treat the property or the amount they would be paid to treat the property outside of ECO.[23] In Figure 2, the total opportunity cost (a social cost) of servicing energy suppliers' demand for ECO score points is represented by area B, whilst area A is economic rent assumed to go to installers. The total cost faced by energy suppliers to meet their ECO target is area A + B.

Figure 2: Illustrative market for ECO score points



26. For the ECO+ social cost-benefit analysis, all economic rent is assumed to go to installers based on anecdotal evidence from stakeholders. However, there may be instances where households acquire the economic rent if, for example, an installer or energy supplier gives money to a household in order to treat their property. Should the actual market clearing prices for ECO score points be below what BEIS models, then energy suppliers will acquire some of the economic rent as they are compensated on the basis of modelled market prices.

27. Based on stakeholder feedback during the ECO4 consultation that most pricing contracts for ECO score points last around six months, the market for ECO points is run every six months in the modelling. There are different market prices in each six-month period due to changes in supply (more homes to treat are found over time and previously treated homes drop out of the market) and changes in demand (the amount to be spent by energy suppliers changes).

28. In addition, there is evidence from previous ECO schemes of multiple markets for different sub-obligations. It is likely that under policy option 3 for ECO+, a separate market for ECO score points that count towards the low-income group minimum requirement will emerge with a separate market price. This is because a single market price may fail to bring into equilibrium both overall demand and supply of ECO points, and the subsets of demand and supply that relate to ECO points from low-income households. For instance, if there was a single price for ECO points, an energy supplier could achieve their overall ECO+ target, but fall short on their low-income minimum requirement. That supplier would then have an incentive to pay above the single market price to secure ECO points from a low-income home.

[23] Note the economic rent acquired by ECO installers is different to the producer surplus they would get in existing markets for energy efficiency measures.

29. Differences in the costs of finding low-income households and treating their homes, compared to other households in the general group, could also lead to a different market price for ECO points associated with the low-income minimum requirement. Whilst not assumed in the modelling for this consultation stage IA, the costs of finding households that satisfy the low-income group requirements are likely to be greater than for the general group. In addition, installers are expected to able to secure contributions from households in the general group, which could lower the costs of ECO points arising from this group.[24]

30. The consequence of having two separate markets – one for ECO points from treating low-income households to meet the 20% minimum requirement and one for ECO points from treating either low-income or general group households to meet the other 80% of ECO+ targets – is generally that one set of households are treated at a lower price (£/point) compared to if all households were supplied in a single market. This generally means less ECO+ funding is lost to economic rent and therefore more homes can be treated.

31. On the interaction between the markets for ECO points for the 20% low-income minimum requirement and the 80% remainder, note that low-income households feature in both markets (energy suppliers have a choice to treat either households from the low-income group or general group to meet the 80% remainder of their ECO+ targets). It is expected that energy suppliers will seek to meet their low-income minimum requirements at least cost, so that the most cost-effective low-income homes get supplied in the market associated with the minimum requirement. The low-income homes not supplied in this market are then mixed with other homes from the general group in the market associated with the other 80% of ECO score points.

32. In line with ECO4[25], it is assumed that installers and energy suppliers do not have perfect information on all the homes that require measures, and which also have ECO+ eligible households willing to take those measures. With respect to the low-income group, the ECO4 modelling assumed that 20% of the eligible pool of households were found in 2022/23 and then a further 20% of the unfound pool is discovered every year thereafter. This results in about 60% of the eligible pool being identified by the end of ECO4 in 2025/26. The same 'found' pool of low-income households is used in the ECO+ modelling. That is, in the first year of ECO+ (2023/24), about 36% of the eligible pool is found[26], rising by a further 20% of the unfound pool every year thereafter. Note that the total ECO+ low-income eligible pool is slightly lower than for ECO4 because homes that receive measures under ECO4 are excluded.

33. In the absence of strong evidence to support a specific higher findability rate for the general group, the same 20% findability rate per year is used for the general group (excluding the low-income households already found). In 2023/24, the first 20% of general group homes is found and a further 20% of the unfound pool is discovered every year thereafter. Using a higher findability rate for the general group is being considered for the final ECO+ modelling, pending consultation feedback on BEIS's view that households in this group who are willing to have measures will be easier to find.

[24] The 20% low-income minimum requirement has been introduced to mitigate the risk of under delivery of ECO+ support to low-income households. This could occur if treating homes in the general group is much cheaper relative to homes in the low-income group.

[25] The ECO4 final stage impact assessment can be accessed here: https://www.gov.uk/government/consultations/design-of-the-energy-company-obligation-eco4-2022-2026

[26] As 20% of the pool of low-income households was assumed to be found through ECO4 in 2022/23, when energy suppliers find a further 20% of the unfound pool in 2023/24 (20% of 80%), this means 36% of the eligible pool is known to suppliers in 2023/24.

34. Installers / energy suppliers incur costs in identifying homes suitable for measures, which also have eligible households willing to take those measures. These costs can include paying third parties for referrals and targeted marketing campaigns, amongst other approaches. In the ECO+ modelling, the search costs assumptions which were used in the ECO4 modelling have been used for the low-income group. Again, in the absence of evidence on specific search costs for households in the general group, these search costs assumptions are used for the general group, too. The accompanying consultation asks stakeholders for views on whether lower search costs should be used for the general group.

35. Note that the homes which are found each year in the model is random. For this consultation stage IA, the model is run four times and the average results from those runs taken.

36. Accounting for the proportion of eligible homes that can be found and the existence of economic rent, the NHM model is used to spend the ECO+ budget each year on the most cost-effective measures and properties. The sum of score points across all measures installed in a year is then taken as the mandatory annual ECO+ target.

4.2 Quantifying the costs and benefits of ECO+

37. The impacts of ECO+ have been appraised according to HM Treasury Green Book[27] and supplementary guidance[28] and are presented in discounted real 2021 prices, against a counterfactual where ECO+ is not implemented (see Section 3 for the counterfactual assumptions on measure installations). As the cost of energy has changed significantly since the Green Book supplementary guidance on energy use and emissions was published, adjustments have been made to the costs of supplying energy to domestic consumers and the retail prices paid by these consumers.

38. As impacts are usually appraised in government using calendar years, the costs and benefits of ECO+ each financial year are assigned to the calendar year with the biggest overlap. For example, the costs in 2023/24 are assigned to the calendar year 2023.

39. The appraisal period starts in 2022 and ends in 2066. The year 2066 is the point at which all measures installed in the last year of the policy, 2025/26, will have reached the end of their estimated lifetimes (loft and cavity wall insulation are both assumed to last for 42 years before needing to be replaced).

40. Table 3 summarises the societal costs, societal benefits and transfers of wealth (transfer payments) associated with the ECO+ policy. Those impacts that have been quantified in the cost-benefit analysis are highlighted. Annex A sets out the input assumptions for the costs and benefits.

[27] HM Treasury (2022) The Green Book: https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent

[28] BEIS (2021) Valuation of energy use and greenhouse gas (GHG) emissions: https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal

Table 3: Costs, benefits and transfers associated with the ECO+ policy

Type	Impact (those highlighted green are quantified)
Societal cost	Installation capital costs of energy efficiency measures (this includes the costs of labour, materials and equipment to install measures)
	Installation retrofit standards compliance costs (PAS 2035 / Trustmark Licence Plus)
	Re-installation costs of energy efficiency measures once they reach the end of their life
	Hidden/hassle costs associated with measure installations - these include the time taken by householders to liaise with an installer, prepare the property for installation and any oversight.
	'Search' costs of finding ECO-eligible households who are willing to have measures. The costs of Local Authorities in referring households are included in this.
	Energy suppliers' administration costs
	Scheme administrator (Ofgem) administration costs
	BEIS staff (including policy, analysis and legal) costs and policy monitoring and evaluation costs
Transfer	Economic rent on energy efficiency measure installations
	Compensation of energy suppliers' costs meeting their ECO+ obligations – the government pays these costs in 2023/24 and decisions on arrangements in 2024/25 and 2025/26 will be confirmed at a later stage.
	Increases in property values from measures installed (increase in property value and rental value) – this is treated as a transfer of the long-term benefits of an energy efficient home from a property buyer/renter to the property seller/landlord.
	Profits forgone by energy suppliers due to domestic energy consumption falling. This is a transfer of wealth mostly to households but also the government in 2023/24 due to the EPG.
Societal benefit	Avoided costs of energy supply (UK production/opportunity costs) – note that the 2021 Green Book central long-run variable cost series has been used with a short-term adjustment for recent movements in the market.
	Improved thermal comfort for households
	Reduced greenhouse gas emissions
	Improved air quality
	Improved health outcomes for households
	Wider economic benefits – supporting and creating jobs in the energy efficiency sector. Growing capacity in the sector will help to improve UK homes in the long run.
	Lower energy imports - reducing the amount of energy inputs required from overseas, reducing the country's reliance on imports and improving security of supply.
Householder benefit	Reduction in spend on energy bills (presented average bill saving estimates are consistent with the £3,000 EPG which will apply from April 2023).
Exchequer benefit	Reduction in expenditure on the Energy Price Guarantee scheme.

5. Policy options' outcomes and impacts

5.1 Measures installed and homes treated

41. Table 4 shows modelled gross energy efficiency measure installations in ECO+ under the three policy options.

42. Table 5 shows the net/additional measure installations once installations that would occur in the counterfactual are deducted (20% of non-low income households in the general group are assumed to install measures in the counterfactual).

43. Where a measure from the list of qualifying measures under ECO+ (see Table 2) is not shown in these tables, this is either because the modelling did not install the measure in any home, or the measure is not built into the NHM (this includes pitched roof insulation, room-in-roof insulation, flat roof insulation and park home insulation).[29] The only insulation measures chosen in the modelling were cavity wall insulation and loft insulation. This is because these measures typically offer much higher annual bill savings (ECO score points) per £ spent. For example, whilst the score points available from solid wall insulation can be just over two times greater than cavity wall insulation for a similar property, the cost of solid wall insulation is of the order of ten-times greater. Compared to underfloor and solid floor insulation, cavity wall insulation offers greater score points and is generally cheaper, hence these floor insulation measures are not modelled to be installed.

44. In reality, there could be uptake of the higher-cost measures that are not installed in the ECO+ modelling. Households and landlords may make sizeable contributions to these measures, thereby making them more cost-effective for installers / energy suppliers to install. However, the likelihood and level of customer contributions at the dwelling level in the NHM is unknown and therefore this cannot be modelled. The most stretching but defensible ECO+ targets are set with installations of cavity wall insulation and loft insulation.

Table 4: Modelled gross ECO+ measure installations (nearest '000)

Energy efficiency measure	Option 1	Option 2	Option 3
Cavity wall insulation	299,000	398,000	365,000
Loft insulation	56,000	6,000	49,000
Heating controls (room thermostat & thermostatic radiator valves (TRVs))[30]	108,000	0	82,000
Total measures	**463,000**	**404,000**	**496,000**

[29] In ECO3, these unmodelled measures accounted for a very small proportion of all measures installed. Room-in-roof insulation accounted for 1.2% of all measures installed, flat roof insulation accounted for 0.1% and park home insulation accounted for 0%. Pitched roof insulation was not recorded in the national statistics for ECO3, though has accounted for only 0.2% of ECO4 measures as of September 2022. Data taken from Household Energy Efficiency Statistics (November 2022): https://www.gov.uk/government/statistics/household-energy-efficiency-statistics-headline-release-november-2022. Note that in the NHM, loft insulation installations will proxy for some pitched roof and room-in-roof insulation installations.

[30] Room thermostats are counted separately from TRVs. That is, a household getting a thermostat and a set of TRVs is classified as having received two heating controls.

Table 5: Modelled additional ECO+ measure installations (nearest '000)

Energy efficiency measure	Option 1	Option 2	Option 3
Cavity wall insulation	299,000	337,000	322,000
Loft insulation	56,000	5,000	48,000
Heating controls (room thermostat & thermostatic radiator valves (TRVs))	108,000	0	82,000
Total measures	**463,000**	**342,000**	**452,000**

45. The volumes of installations in Table 4 are believed to be deliverable. BEIS's Household Energy Efficiency Statistics show there is still a significant minority of homes without cavity wall insulation or adequate loft insulation. At the end of December 2021, it is estimated that there were around 5.2 million homes without cavity wall insulation in Great Britain, of which 3.8 million are easy to treat standard cavities and 1.3 million are hard to treat.[31] There were around 7.9 million uninsulated lofts, which includes any loft with no insulation or less than 125mm of insulation (these lofts would benefit from top-up insulation). Of these, around 5.7 million homes require easy to treat loft insulation, whilst 2.3 million are considered to be hard to treat or unfillable.

46. The modelled gross numbers of homes treated under ECO+ across the three policy options are shown in Table 6, and Table 7 shows the net/additional homes treated. In the tables, the proportions of homes treated that belong to the low-income group are shown, as well as the proportions of homes treated that are exclusive to the general group, i.e., they do not also belong to the low-income group (see Figure 1 for an illustration of the overlap between the groups).

Table 6: Modelled gross numbers of homes treated under ECO+ (nearest '000)

Homes treated in Great Britain	Option 1		Option 2		Option 3	
Total	**355,000**		**404,000**		**414,000**	
Low-income group	355,000	100%	96,000	24%	196,000	47%
General group (not low-income)	0	0%	308,000	76%	219,000	53%
EPC D homes	332,000	93%	351,000	87%	378,000	91%
EPC E/F/G homes	22,000	6%	53,000	13%	36,000	9%
Owner-occupier homes	203,000	57%	402,000	>99%	351,000	85%
Privately rented homes	148,000	42%	0	0%	61,000	15%
Socially rented homes	4,000	1%	2,000	<1%	2,000	1%
Fuel poor homes (England only)	107,000	30%	37,000	9%	75,000	18%

Table 7: Modelled additional numbers of homes treated under ECO+ (nearest '000)

Homes treated in Great Britain	Option 1		Option 2		Option 3	
Total	**355,000**		**342,000**		**370,000**	
Low-income group	355,000	100%	96,000	28%	196,000	53%
General group (not low-income)	0	0%	247,000	72%	175,000	47%

[31] Data taken from the BEIS 2021 Household Energy Efficiency Statistics: https://www.gov.uk/government/statistics/household-energy-efficiency-statistics-detailed-report-2021

EPC D homes	332,000	93%	299,000	87%	340,000	92%
EPC E/F/G homes	22,000	6%	44,000	13%	31,000	8%
Owner-occupier homes	203,000	57%	341,000	>99%	308,000	83%
Privately rented homes	148,000	42%	0	0%	61,000	16%
Socially rented homes	4,000	1%	1,000	0%	2,000	<1%
Fuel poor homes (England only)	107,000	30%	34,000	10%	72,000	20%

47. Policy Option 3 is modelled to treat the greatest number of homes, both on a gross and net-of-counterfactual basis. This is partly due to modelled household contributions in Option 3 which means that the overall level of spend is £80m greater in Option 3 compared to Option 1. However, Option 2 has a level of spend £20m greater than for Option 3, though is modelled to treat fewer homes on a gross basis. This is due to greater numbers of cavity walls being insulated in Option 2 relative to Option 3, which is more expensive than insulating lofts.

48. Under Option 3, whilst the low-income minimum requirement only requires a minimum 20% of the obligation to be met through the treatment of low-income homes, the modelling selects 47% of these homes for treatment. One factor behind this is the share of low-income households in the overall general group (just over a third of households in the general group are low-income). Another driver of the result is homes in the private rented sector. Only low-income private tenants can receive cavity wall insulation or loft insulation. Some of these PRS homes with low-income tenants are more cost-effective to treat compared to owner-occupier homes with higher-income tenants.

49. Based on the modelling, 24% of households receiving support in Option 2 (ECO+ fully targeted at the general group) are part of the low-income group. This is a consequence of the sizeable share of low-income households in the overall general group (just over a third). However, unlike in Option 3, the provision of support to low-income households is not guaranteed under Option 2.

50. It is recognised that the modelling may overstate how many low-income households benefit from ECO+ under both Options 2 and 3. This is because household contributions are not modelled at the dwelling level. Instead, the overall spend available to the general group is increased by 10% to account for contributions. As richer households are more able and likely to contribute towards measures, they may be more highly sought after by installers / energy suppliers compared to what the modelling shows.

51. Policy Option 2 almost exclusively targets owner-occupier households (99% of homes treated), whilst they are also the primary target in Option 3 (85%). For comparison, only 65% of households in England own and occupy their homes.[32] Policy Option 1 treats a disproportionately high volume of PRS homes.

52. In terms of the ratio of EPC D homes treated to EPC E/F/G homes treated, all policy options deliver a disproportionate amount of support to EPC D homes. In England, there are around four EPC D homes for every one EPC E/F/G home.[33] In comparison, under Policy Option 1, fifteen EPC D homes are treated for every one EPC E/F/G home, whilst the ratios for Options 2 and 3 are 7:1 and 10:1, respectively. The higher ratios for Options 1 and 3 are partly a

[32] https://www.gov.uk/government/statistics/english-housing-survey-2020-to-2021-headline-report. Annex Table 1.2, data for 2020/21.
[33] https://www.gov.uk/government/statistics/english-housing-survey-2020-to-2021-headline-report. Annex Table 2.8, data for 2020 and all tenures.

consequence of low-income E/F/G homes not being eligible for ECO+ if they can meet the ECO4 minimum EPC requirements.

53. The fuel poor 'hit-rates' for Options 1 and 3 are higher than the proportion of all households in England that are fuel poor (13%).[34] Policy Option 2 performs less well at supporting fuel poor households.

5.2 Carbon savings

54. Table 8 shows that Policy Options 2 and 3 deliver similar levels of carbon savings over the Carbon Budget 5 period. Policy Option 1 has the worst performance in terms of delivering carbon savings.

Table 8: Carbon savings from additional measures installed under ECO+ (MtCO2e)

	Option 1	Option 2	Option 3
Carbon Budget 5 (2028 – 2032)			
Traded emissions savings	0.02	0.02	0.02
Non-traded emissions savings	0.55	0.70	0.69
Lifetime of policy (2022 – 2066)			
Traded emissions savings	0.07	0.05	0.05
Non-traded emissions savings	4.71	5.99	5.85

5.3 Social NPVs and equity-weighted NPVs

55. Table 9 sets out the estimated costs and benefits to society of the three ECO+ policy options. Note that these are additional costs and benefits, against a counterfactual where 20% of households in the general group (that are not low-income) would install measures anyway.

Table 9: Social costs and benefits of ECO+, 2022 – 2066 (£m, 2022 present-values and 2021 prices)

Type of cost or benefit	Option 1	Option 2	Option 3
Installation capex costs	334	351	366
Installation retrofit standards compliance costs	282	297	302
Reinstallation costs	23	2	14
Hassle/hidden costs	45	30	42
Search costs	91	105	102
Energy suppliers' administration costs	52	58	57
BEIS and Ofgem admin costs	7	7	7
Economic rent (transfer payment)	123	46	49
Total Costs (excluding rent)	**834**	**849**	**890**
Avoided costs of energy supply	401	471	448

[34] https://www.gov.uk/government/statistics/fuel-poverty-detailed-tables-2022. Table 1 fuel poverty rate for England in 2020.

Value of comfort taking	147	172	167
Value of reduced GHG emissions (traded)	15	11	10
Value of reduced GHG emissions (non-traded)	777	988	965
Value of air quality improvements	38	37	31
Total Benefits	**1,378**	**1,679**	**1,622**
Overall Net Present Value (NPV)	**544**	**830**	**732**
Benefit:Cost Ratio	**1.65**	**1.98**	**1.82**

56. In terms of the costs of ECO+, the major costs are the installation costs and retrofit standards compliance costs (mostly PAS 2035 compliance). Together these costs account for between 64% - 72% of all costs, including economic rent, across the options. By far the biggest benefit of ECO+ relates to reduced greenhouse gas emissions, followed by the avoided costs of energy supply.

57. Policy Options 2 and 3 have higher total search costs compared to Option 1 and this is because these options find and treat more homes. As explained in Section 4, the same search costs assumptions were used for both households in the low-income group and general group. For the final IA, the search cost assumptions for the general group could be revised downward, reducing the total search costs of Options 2 and 3.

58. All policy options have a highly positive NPV with Option 2 having the highest. Whilst the NPV of Option 2 is the most sensitive to the assumption that 20% of non-low income general group households install measures in the counterfactual, this assumption would have to be increased to 47% (almost one-half of these households install measures without ECO+ support) in order for the NPV of Option 2 to fall below that of Option 3 (both would stay above Option 1's NPV).

59. Table 10 gives the modelled distributions of households receiving ECO+ measures by income and provides the average income of ECO+ recipients across the different options. As expected, Policy Option 1 leads to a greater proportion of low-income households being supported. Support under Policy Option 2 is modelled to disproportionately benefit higher-income households, which is partly the consequence of the option almost exclusively targeting owner-occupiers who tend to be older and richer than average.[35] Policy Option 3 gives slightly more support to those in the top half of the income distribution, again due to the prevalence of owner-occupier households receiving measures.

60. It may be that the average incomes for households treated under Options 2 and 3 are understated. This is because household contributions are not modelled at the dwelling level. As richer households are more able and likely to contribute towards measures, they may be more highly sought after by installers / energy suppliers compared to what the modelling shows.

[35] Note that the average income of all households in lower Council Tax bands (which is the main factor determining eligibility in the general group) is below the population average. However, in Options 2 and 3, ECO+ support is modelled to disproportionately go to the owner-occupiers within this group, who have an average income above the population average.

Table 10: Modelled distributions of households receiving ECO+ measures by income decile and average incomes of ECO+ recipients

Income decile	Option 1	Option 2	Option 3	Overall population
1st (lowest)	17%	3%	7%	10%
2nd	13%	6%	9%	10%
3rd	13%	5%	11%	10%
4th	16%	8%	9%	10%
5th	12%	10%	9%	10%
6th	14%	10%	13%	10%
7th	7%	15%	11%	10%
8th	5%	19%	13%	10%
9th	2%	15%	11%	10%
10th (highest)	1%	10%	8%	10%
Average income (2013/14)[36]	**£16,500**	**£27,000**	**£22,300**	**£20,700**

61. Table 11 compares the NPVs of the policy options with equity-weighted NPVs where the costs and benefits experienced by ECO+ recipient households are equity-weighted in line with Green Book guidance (see Annex B for the calculations of the equity-weighted NPVs). Equity-weights are a function of the ratio of policy recipients' average income compared to the average income of the general population. Where the average income of recipients is lower than the average, the costs and benefits experienced by the recipients are scaled up, and vice versa.

Table 11: NPVs and equity-weighted NPVs (£m, 2022 present-values and 2021 prices)

Type of cost or benefit	Option 1	Option 2	Option 3
Net Present Value (NPV)	544	830	732
Equity-weighted NPV	858	496	633

62. On an equity-weighted basis, Policy Option 1 is estimated to have the highest NPV, followed by Option 3.

5.4 Average energy bill savings and cost per home treated

63. Table 12 shows how the policy options compare in terms of the estimated average yearly energy bill saving provided to ECO+ households once all measures are installed. These estimated bill savings are consistent with a £3,000 EPG. The table also shows the average spend per home (the £1bn obligation on energy suppliers divided by the number of homes treated).

[36] Average incomes from the 2013/14 English Housing Survey are used as the National Household Model is based on dwelling and household data from that year of the survey. The average incomes shown are after housing costs and equivalised.

Table 12: Average energy bill savings and energy suppliers' spend per home treated

	Option 1	Option 2	Option 3
Average annual energy bill saving (consistent with a £3,000 EPG, 2022 prices)	£280	£340	£310
Energy suppliers' spend per home (2022 prices)	£2,800	£2,500	£2,400
Energy suppliers' spend per additional home (2022 prices)	£2,800	£2,900	£2,700

5.5 Summary of impacts and preferred option

64. Table 13 summarises the key outcomes and impacts of the three policy options. Based on the modelling undertaken, Policy Option 3 is judged to have the strongest overall performance with both a high and competitive NPV and equity-weighted NPV. The option is modelled to treat the most homes and delivers a relatively high level of additional carbon savings (the difference between Options 2 and 3 is marginal). By offering support to a broader range of households compared to existing energy efficiency schemes, Option 3 helps to fill a gap in BEIS's portfolio of energy efficiency policies, whilst also guaranteeing further support for low-income households with the 20% low-income minimum requirement (this guarantee does not exist under Option 2). For these reasons, Option 3 is the Government's preferred option.

Table 13: Summary of outcomes and impacts

	Option 1	Option 2	Option 3
Policy NPV (2021 prices)	£544m	£830m	£732m
Policy BCR	1.65	1.98	1.82
Equity-weighted NPV (2021 prices)	£858m	£496m	£633m
Gross homes treated	355,000	404,000	414,000
Percentage of homes treated in fuel poverty	30%	9%	18%
Non-traded GHG savings for CB5 (MtCO2e)	0.55	0.70	0.69
Average annual energy bill saving (2022 prices)	£280	£340	£310
Suppliers' spend per home (2022 prices)	£2,800	£2,500	£2,400

6. Targets for obligated suppliers

65. Based on the preferred policy option, the proposed overall ECO+ target for obligated energy suppliers is £57,120,000 in notional annual bill savings, to be achieved by March 2026. This will divide between the 3 years of the scheme as follows:

- April 2023 – March 2024: £9,598,000
- April 2024 – March 2025: £25,722,000
- April 2025 – March 2026: £21,800,000

66. Energy suppliers will need to meet at least 20% of their annual ECO+ targets by treating homes in the low-income group.

67. Ofgem will set individual supplier targets each year based on market share, using the same approach and data points as for ECO4. The estimated overall market share of ECO obligated suppliers is 99.76% as of 31 December 2021, based on their share of domestic customers.[37]

7. Equality and distributional impacts

68. This section provides an analysis of how different groups of people will be affected by ECO+ in line with the government's Public Sector Equality Duty (PSED). The PSED ensures that government (and other public sector bodies) evaluate and consider the distributional impact of policies on people who share protected characteristics including age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, and sex.

69. Equality analysis of ECO+ by protected characteristic is presented below along with additional distributional analysis about households receiving support under each option. The results should be read as illustrative only, as ECO regulations neither control nor regulate for these.

70. Estimates for the overall population of households used in tables below are taken from the English Housing Survey (EHS) 2013-14[38] to align with the dataset underpinning the NHM and ensure appropriate comparison. Given the age of the data used, all results should be treated with caution. The EHS survey is filled out by the household reference person (HRP), who is the designated head of the household. The presented results refer to the answer that person gave.

71. Due to data limitations, it has not been possible to build up a robust picture of ECO+ recipients on the protected characteristics of gender reassignment, pregnancy and maternity, religion or belief, and sex.

7.1 Age

72. Likely driven by ECO+ focusing support towards owner-occupiers in Options 2 and 3, Table 14 shows that older, working age households (HRP is 35-64 years old) receive a disproportionate amount of support in these options. The distribution of households supported in Option 1 by age is similar to that of the overall population, except that those where the HRP is aged 35-44 receive a relatively high amount of support, and those with a HRP aged 65 or over receive a relatively low amount.

Table 14: Distribution of ECO+ recipients by age (England only)

Income decile	Option 1	Option 2	Option 3	Overall population
16-24	4%	0%	1%	4%
25-34	16%	9%	13%	15%

[37] Source: Ofgem
[38] https://www.gov.uk/government/statistics/english-housing-survey-2013-to-2014-headline-report

35-44	25%	23%	24%	18%
45-54	19%	27%	24%	20%
55-64	16%	17%	18%	16%
65 or over	21%	24%	20%	28%

7.2 Disability

73. Table 15 shows that the share of ECO+ support that goes to households with a long-term ill or disabled member is dependent on the share of low-income households supported. ECO+ recipients are more likely to be long-term ill or disabled than the general population under Option 1 (wholly targeting low-income households) but less likely to be disabled compared to the general population under Option 2 (targeting the general group). There is a slightly lower likelihood that an ECO+ recipient household contains someone with a long-term illness or disability compared to the general population under Option 3.

Table 15: Distribution of ECO+ recipients by whether a member of the household has a long-term illness or disability (England only)

Member of the household has a long-term illness or disability?	Option 1	Option 2	Option 3	Overall population
No	58%	73%	68%	67%
Yes	42%	27%	32%	33%

7.3 Race

74. As seen in Table 16, the race profile related to a given option depends on the level of support provided to low-income households compared to the general group. The race profile for Option 1 (targeting low-income households only) is modelled to closely match that of the overall population. The modelling suggests, however, that the HRPs of ECO+ recipient households are less likely to come from an ethnic minority background under Option 2 and Option 3 (solely and partially targeting the general group, respectively) compared to the general population. This may be explained by the lower proportion of ethnic minorities who are owner occupiers compared to the general population.

75. **Table 16: Distribution of ECO+ recipients by ethnicity (England only)**

Ethnicity	Option 1	Option 2	Option 3	Overall population
White	88%	94%	93%	89%
Black	4%	1%	1%	3%
Indian	2%	2%	2%	2%
Pakistani or Bangladeshi	2%	2%	2%	2%
Other	4%	1%	2%	4%
All ethnic minority	12%	6%	7%	11%

7.4 Marriage and civil partnership

76. Due to data limitations, it is not possible to determine directly from the English Housing Survey whether ECO+ recipients are married or in civil partnerships. Instead, information gathered on relationship status is used as a proxy which may not accurately represent these groups.

77. Table 17 indicates that the likelihood of ECO+ recipients' HRP being in a couple, single or a member of a non-couple multi-person household is dependent on whether support is targeted at low-income households or the general group. Option 1, which only targets low-income households, is less likely to support HRPs with a partner compared to the overall population. ECO+ recipients' HRPs under Option 2 and Option 3, which provide more support to the general group, are more likely to be in a couple than households in the wider population. This pattern may be driven by a higher proportion of couples amongst owner-occupiers.

Table 17: Distribution of ECO+ recipients by relationship status (England Only)

Relationship Status	Option 1	Option 2	Option 3	Overall population
Couple	49%	73%	67%	56%
Single	45%	20%	25%	35%
Other multi-person households	6%	7%	8%	8%

7.5 Regional distribution and rurality

78. Table 18 gives the regional breakdown of homes modelled to be treated under ECO+, while Table 19 presents the estimated proportion of rural homes treated. These estimates should be seen as indicative only, as modelling does not capture all factors that influence where delivery happens, such as regional differences in measure costs or regional supply chain coverage. Note that ECO modelling is based on English housing data only and overall delivery figures are pro-rated to account for Scottish and Welsh households (using the ratios of homes in Scotland and Wales, compared to England). As such, the figures for Scotland and Wales should be treated with caution.

79. Across the three options, Table 18 shows that London receives a lower amount of support under ECO+, in terms of homes treated. This is particularly true for Option 2 and Option 3. One reason for this is the relatively low proportion of owner-occupiers in London. 50.7% of households are owner-occupiers in London, compared to 67.3% for the rest of England. London has both more private renters and social renters.[39] Conversely, areas like the South East and North West receive larger amounts of support than might otherwise be expected.

[39] https://www.gov.uk/government/statistics/english-housing-survey-2020-to-2021-headline-report. Annex Table 1.2, data for 2020/21.

Table 18: Distribution of ECO+ treated homes by region[40]

Region	Option 1	Option 2	Option 3	Overall population
East of England	8%	6%	7%	9%
London	10%	5%	6%	13%
South East	18%	17%	17%	14%
North East	7%	4%	5%	4%
North West	13%	17%	17%	12%
Yorkshire and the Humber	8%	7%	8%	9%
East Midlands	7%	12%	8%	7%
West Midlands	7%	7%	6%	9%
South West	8%	10%	11%	9%
Scotland[41]	9%	9%	9%	9%
Wales[42]	5%	5%	5%	5%

80. Table 19 indicates that, across all three options, slightly more homes treated by ECO+ are likely to be non-rural than would be expected given the proportion of non-rural homes in the overall population.

Table 19: Percentage of ECO+ treated homes by rurality (England only)

Household Structure	Option 1	Option 2	Option 3	Overall population
Rural	17%	16%	15%	18%
Not rural	83%	84%	85%	82%

8. Business impact

8.1 Equivalent Annual Net Direct Cost to Business (EANDCB) & Business Impact Target

81. The costs incurred by energy suppliers fulfilling their obligations under ECO+ are treated as direct costs, consistent with their treatment in past ECO IAs. These direct costs total £1bn (2022 prices) and include:

- Funding of measure installation costs (capex and retrofit standards)
- Search costs
- Administration costs
- Paying the economic rent associated with ECO score points

[40] Data for the overall population taken from the 2013 estimates given in the ONS '2018-based: Principal projection edition of this dataset'. The dataset contains projections of households for all GB regions by region and year: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/householdprojectionsforengland

[41] Ibid. Scaled using ratio of Scottish household to English household estimates for 2013.

[42] Ibid. Scaled using ratio of Welsh household to English household estimates for 2013.

82. There are assumed to be no direct benefits to business from the ECO+ scheme. Whilst installers are assumed to benefit from excess profit achieved through installing measures in ECO+, these benefits are the result of 'resource used to comply with regulation' and are therefore not classified as direct benefits for the purpose of the EANDCB, in line with RPC guidance.[43]

83. Using BEIS's Impact Assessment Calculator[44], the EANDCB of the preferred policy (Option 3) is set out in Table 20 below, alongside the business net-present value and Business Impact Target score.[45] Note that the business NPV has been calculated over the 2022 – 2066 appraisal period, whilst the EANDCB has been calculated over the 3-year lifetime of the scheme as this is the period over which all of the direct costs to business are incurred.

Table 20: Impact of ECO+ on business (2019 prices, 2020 present value base year)

Impact metric	Value (£m)
Business Net Present Value	-397
Estimated annual net direct cost to business (EANDCB)	272
Score against the Business Impact Test	816

8.2 Small and Micro Business Assessment

84. Businesses that will face a direct regulatory impact because of ECO+ are large domestic energy suppliers with more than 150,000 customer accounts and that supply more than 300GWh of electricity or 700GWh of gas per year.

85. Based on Ofgem data, an estimated 99.76% of domestic energy customers are with obligated suppliers as of 31 December 2021.[46] Analysis done for a previous BEIS IA[47] suggests that the average headcount (in March 2017) for suppliers with 150,000 – 200,000 customer accounts (in December 2017) for which data was available was roughly 120. This is expected to still hold given the recent changes in the market, and available information online on the size of suppliers' workforces suggests it is still reasonable to assume no small or micro businesses will be obligated under ECO+.

86. Some small and micro businesses in energy efficiency supply chains may also be indirectly affected by the increased level of supplier demand for their services because of the ECO+ scheme. The scheme is expected to have a positive impact on these companies' gross profits, though on the grounds of proportionality, these impacts have not been quantified.

9. Risks and uncertainties

87. The outcomes and impacts of ECO+ are uncertain due to a range of factors. How sensitive the policy NPV and energy suppliers' cost per ECO score point are to the following assumptions, holding all other factors and the ECO+ score targets constant, has been tested for the preferred option.

[43] https://www.gov.uk/government/publications/rpc-case-histories-other-bit-methodology-issues-march-2019
[44] Available at: https://www.gov.uk/government/publications/impact-assessment-calculator--3
[45] The Business Impact Target is a cross-government target for the reduction of regulation on business.
[46] Source: Ofgem
[47] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/716463/Warm_Home_Discount_FS_IA_Signed.pdf

- **The assumed capital costs of loft insulation and cavity wall insulation** – in the central modelling undertaken for ECO+, the costs (in 2021 real terms) of both loft and cavity wall insulation were increased by 60% compared to the costs assumed in ECO4 modelling[48]. This adjustment was based on evidence from the 2020/21 Green Homes Grant Vouchers Scheme (60% represented the average difference between predicted costs for cavity wall insulation from a BEIS cost/regression model built on GHG Vouchers data and the previous ECO4 cost assumptions). Two alternative scenarios have been modelled: a low measure capital costs scenario where the ECO4 cost assumptions are used without the 60% uplift, and a high measure capital costs scenario where a 120% uplift is applied.
- **The rate at which eligible households willing to have measures are found** – in the central ECO+ modelling, it is assumed that every year of the scheme, installers / energy suppliers find 20% of the eligible households who had not been identified prior to the year. Two alternative scenarios have been modelled: installers / energy suppliers finding households at a rate of 10% per year (low findability) and at a rate of 30% per year (high findability).
- **The assumed search costs for households in the general group** - in the central ECO+ modelling, the search costs assumptions which were used in the ECO4 modelling have been used for both households in the low-income group and general group. In reality, the costs of finding eligible households willing to have measures in the general group are likely to be lower. This is because there are more households in the general group compared to the low-income group and because the eligibility requirements for the general group, based on Council Tax bands, are simpler. Given this, an alternative scenario has been modelled where the search costs for households in the general group (excluding the low-income households) have been halved.

88. Figures 3 and 4 show, respectively, the proportional differences between the policy NPV and energy suppliers' cost per ECO score point in the alternative scenarios described above with the results in the central scenario. Note that in all scenarios the annual ECO+ score targets that energy suppliers have to achieve is the same, with the alternative scenarios showing how the NPV and cost per ECO point associated with meeting those targets change under different assumptions. Small differences should be treated with caution due to random variation in which households are found when ECO+ is run in the NHM model. For this consultation stage IA, the model was run four times for each scenario and the average results from those runs taken.

[48] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065825/eco4-final-ia.pdf

Figure 3: NPVs in alternative scenarios compared to central NPV for the preferred option

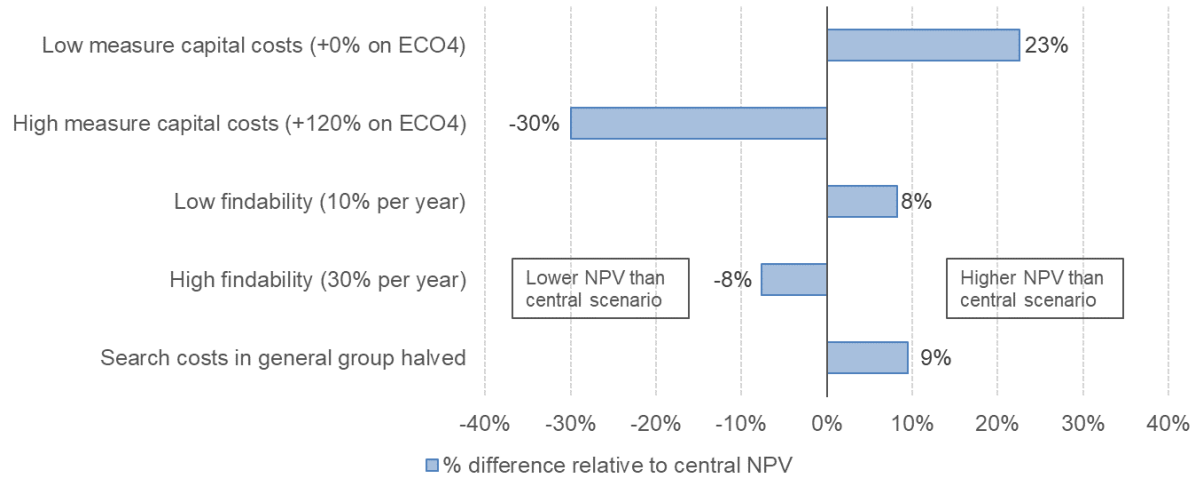
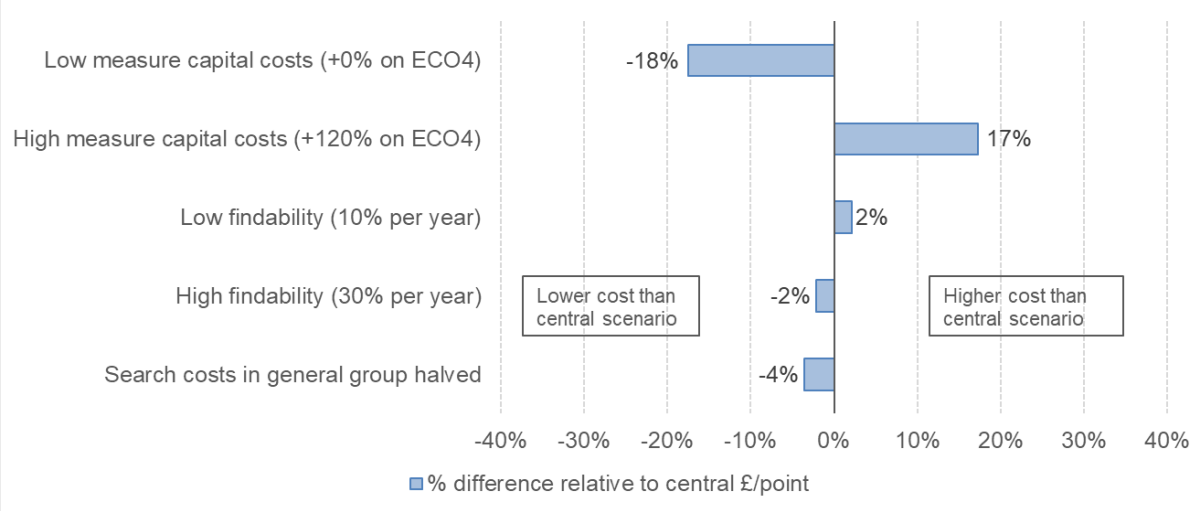


Figure 4: Cost per ECO point in alternative scenarios compared to central scenario for the preferred option



89. The results in Figure 3 demonstrate that the positive NPV of the preferred policy option (+£732m) is robust to the alternative assumptions on measure capital costs, findability rates and search costs in the general group. That is, none of the alternative assumptions causes the NPV to fall by 100% or more. The biggest reduction in the NPV is associated with assuming higher measure capital costs (+120% on ECO4 cost assumptions), though this would still leave a highly positive NPV of +512m. Based on the figures in Table 9 (Social costs and benefits of ECO+), energy suppliers' capital expenditure on measures is equivalent to 50% of the policy NPV. Therefore, overall capital expenditure would have to double to cause the NPV to turn negative.

90. Counterintuitively, improving the assumed findability of all households is modelled to slightly worsen the NPV of the policy. In the alternative scenario with a 30% findability rate, the total number of homes treated is only 1% lower than the number treated in the central scenario. However, in the case of a higher findability rate, the model selects many more mid-terrace homes for treatment (+36% compared to the central scenario) and fewer end-terrace homes (-24%), semi-detached homes (-11%) and detached homes (-16%). As insulating the two walls of a mid-terrace home is typically less impactful in terms of reducing energy consumption compared to insulating end-terrace, semi-detached and detached homes, the

scenario with a higher findability rate yields lower energy savings overall and hence a lower NPV.

91. Note that there does appear to be a more general, positive relationship between the percentage of homes found and the percentage of all homes treated that are mid-terrace. In the case of a lower findability rate (10%), the model selects proportionately fewer mid-terrace homes for treatment compared to the central scenario (-4%). This positive relationship between the findability rate and the proportion of homes treated that are mid-terrace is likely a consequence of using the ECO4 partial project scores for ECO+. Treating a home with cavity wall insulation is scored more highly the greater the floor area of the property and the lower the starting EPC band. The scoring system does not account for the number of exposed walls that would be treated. Therefore, for energy suppliers it will likely be more cost-effective to treat a mid-terrace home than an equivalent end-terrace, semi-detached or detached home with the same floor area and starting EPC band. The same number of ECO score points would be collected for each but treating the mid-terrace home will likely be cheaper.

92. Halving the search costs in the general group (excluding the low-income households) is modelled to reduce overall search costs by 29% and improve the NPV of the policy by 9%. Compared to the central scenario, this alternative scenario sees the same number of homes treated (to the nearest 1,000), but a greater proportion of these (+23%) are from the general group (there is a 19% decrease in the number of low-income homes treated). With the lower search costs, the overall costs to energy suppliers of meeting their ECO+ targets are estimated to fall by 4% (see Figure 4).

93. On energy suppliers' cost per ECO score point, removing the 60% cost uplift for loft and cavity wall insulation results in an 18% reduction in energy suppliers' costs, whilst increasing the cost uplift to 120% results in an 17% increase. The reason energy suppliers' overall costs do not increase by -60/+60% is because measure capital costs only account for 42% of total energy supplier costs.

94. Other factors, which have not been tested through modelling, that could affect the outcomes and impacts of ECO+ include:

    - **Household contributions driving a different measure mix** – the only insulation measures chosen in the modelling were cavity wall insulation and loft insulation. This is because these measures typically offer much higher annual bill savings (ECO score points) per £ spent. Household contributions are factored into the modelling by increasing the portion of ECO+ spend that can be allocated to the low-income or general groups by 10%. Implicit in this assumption is that households are willing to contribute to all energy efficiency measures equally, and this means energy suppliers' modelled preference for delivering loft and cavity wall insulation is unchanged compared to a scenario without household contributions. In reality, there could be uptake of higher-cost measures (e.g., solid wall insulation) that are not installed in the ECO+ modelling. Households and landlords may make sizeable contributions to these measures, thereby making them more cost-effective for installers / energy suppliers to install. BEIS is currently undertaking research into consumers' willingness to contribute towards the costs of different energy efficiency measures, and the likelihood of higher-cost measures being delivered under ECO+ will be further explored ahead of the final IA.

- **In-fill** – modelling does not cover homes permitted under 'in-fill'[49], for example where a block of flats or street includes mixed tenure occupants, as the modelling is unable to account for location of properties (needed for in-fill modelling). This means the eligible pool may be slightly larger than modelled and the costs for energy suppliers of meeting their ECO+ targets could be slightly lower. However, the impacts are not expected to be large.
- **Changes to SAP[50]** – in the ECO+ modelling, the starting SAP ratings (and therefore EPC Bands) of homes are determined according to SAP/RdSaP 2012[51]. This determines which homes in the housing stock meet the ECO+ EPC-eligibility requirements and affects the ECO+ score points available from treating homes (the ECO+ score points are based on the starting EPC Band of a home). As described in the consultation which this IA accompanies, the Government is considering updating how the starting SAP ratings for homes are determined for ECO4 and ECO+. The proposal is to use SAP/RdSAP 10[52]. Modelling undertaken for ECO4 indicated that the switch to SAP/RdSAP 10 would increase the number of electrically heated homes that get treated under the scheme, though overall costs for suppliers would only marginally change (within 1%).[53] Such modelling has not been undertaken for ECO+. For the final IA, the possibility of updating the modelling to proxy for the changes to SAP will be explored.
- **Supply chain risks** – ECO+ will run alongside several other Government energy efficiency schemes and there may be risks associated with local supply chains being overstretched. However, ECO is an established policy with a strong supply chain in place, therefore this risk is expected to be smaller for ECO4 and ECO+. The government also has taken steps to support growth in the installer supply chain, including investing in skills and training with the 2021 Skills Training Competition[54] worth £6 million and the Home Decarbonisation Skills Training Competition[55] worth £9.2 million.
- **Imperfect competition in the markets for ECO points** – as explained in Section 4, the market for ECO score points between installers as the providers/sellers and energy suppliers as the consumers is assumed, for simplicity, to be perfectly competitive.[56] This means that no participant in the market is individually able to influence the market price and there is perfect information on how much installers are charging and energy suppliers paying. The more the real-life market for ECO points diverges from the perfect competition assumption, the more the costs to energy suppliers of meeting their ECO+ targets will differ from what has been modelled. For example, if an installer has a significant market share in terms of cavity wall insulation delivery, they may be able to command a higher price per ECO point where an energy supplier would struggle to find an alternative provider. Conversely, if an installer does

[49] In-fill is a mechanism which allows homes to be treated under ECO, even if their households do not meet the eligibility criteria. In-fill flats must be located within the same block as the flat occupied by ECO eligible households, whilst in-fill houses must be located on the same street as the house occupied by ECO eligible households. For ECO+, it is proposed that in-fill can be used when treating a block of flats with either solid wall insulation or cavity wall insulation, whilst for houses in-fill would be restricted to solid wall insulation only.
[50] The Standard Assessment Procedure (SAP) is the methodology used to determine and rate the energy performance of properties for EPCs.
[51] https://www.bregroup.com/sap/standard-assessment-procedure-sap-2012/
[52] https://www.bregroup.com/sap/sap10/
[53] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065825/eco4-final-ia.pdf
[54] https://www.gov.uk/guidance/apply-for-free-or-subsidised-training-under-the-green-homes-grant-skills-training-competition-scheme
[55] https://www.gov.uk/government/publications/home-decarbonisation-skills-training-competition
[56] Assuming something other than perfect competition is not practical in terms of modelling ECO, nor is there a robust evidence base for an alternative assumption.

not have visibility on what all energy suppliers are paying for ECO points, they may be undercharging a particular energy supplier who could, in turn, meet their ECO+ targets at a lower cost than modelled.

Note that in the most recent iteration of the ECO scheme to have completed, ECO3 (October 2018 – March 2022), energy suppliers successfully met their overall obligation at a cost (£1.95bn[57]) close to the scheme's spending envelope (£2.24bn). Therefore, overall, the ECO modelling approach appears to be sufficiently reliable.

10. Monitoring and evaluation

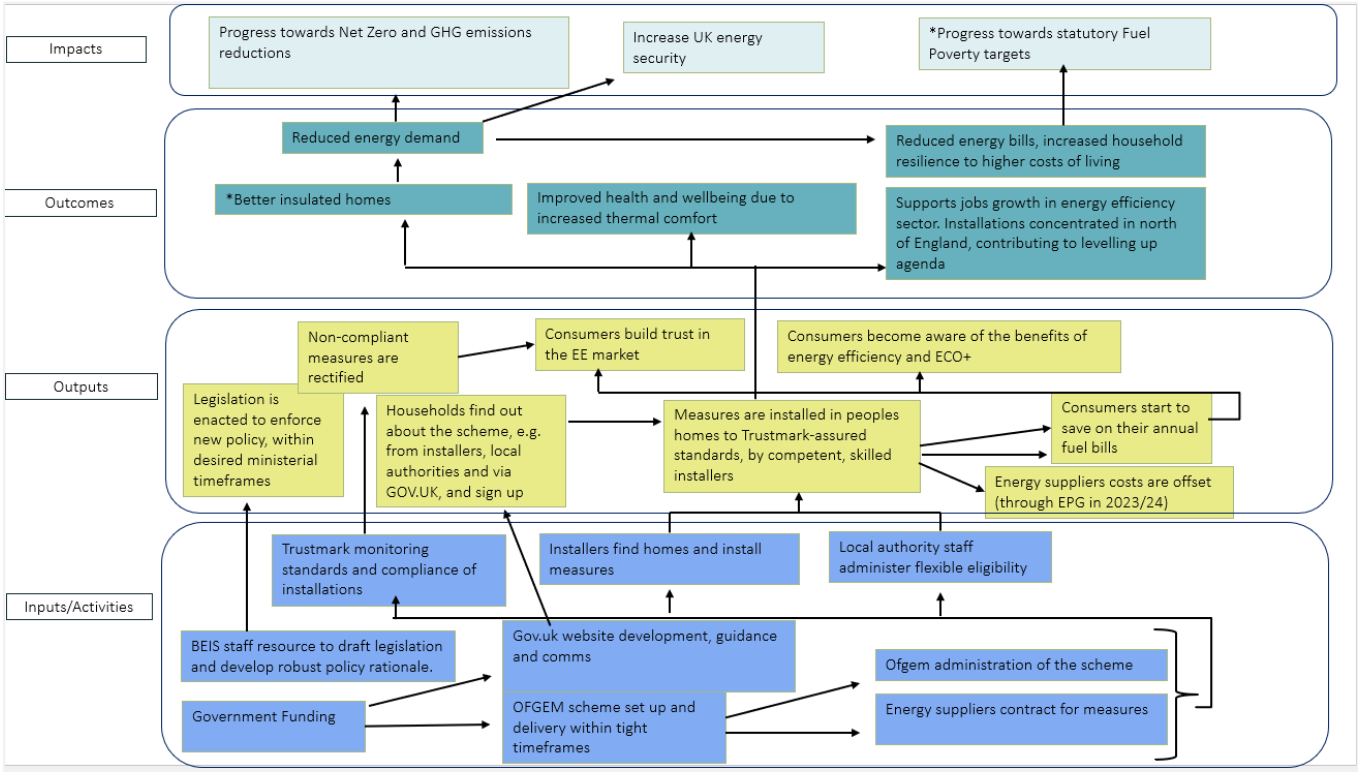
95. The strategic aims of ECO+ align with the intended outcomes and impacts, as shown in the Theory of Change in Figure 5. These are to: better insulate homes, reduce energy bills, and contribute towards the UK's fuel poverty and net zero targets. The monitoring and evaluation approach will assess the extent to which ECO+ has been successful in achieving these aims. Specifically, it will examine whether ECO+:

    - Successfully reached intended households and delivered energy saving measures
    - Reduced energy bills for eligible households
    - Improved energy efficiency for eligible households
    - Contributed towards net zero and fuel poverty targets

96. The provisional Theory of Change set out in Figure 5 shows how we expect ECO+ to achieve these high-level aims. It sets out the pathways to impact which result from the scheme activities, outputs and outcomes. This Theory of Change has been developed in consultation with those involved in policy design and steered by a monitoring and evaluation (M&E) adviser in BEIS.

[57] See Table 6.6 of the Household Energy Efficiency Statistics (November 2022): https://www.gov.uk/government/statistics/household-energy-efficiency-statistics-headline-release-november-2022

Figure 5: Provisional Theory of Change for ECO+



97. A full list of evaluation questions will be developed during the planning phase. However, some potential high-level questions, derived from the Theory of Change, and discussions with policy and analytical stakeholders, include:

    - Has ECO+ delivered its predicted bills savings and reached its intended target population?
    - Has ECO+ contributed towards net zero and fuel poverty targets?
    - Have households who would have received a deeper retrofit under ECO4 been given a lighter touch retrofit under ECO+?
    - What is the consumer journey of ECO+?
    - What were the experiences of consumers where ECO+ measures were installed and were they satisfied?
    - Have suppliers delivered measures in the most cost-effective way?
    - Did ECO+ provide non-financial benefits to eligible households, such as increased thermal comfort and improved health and wellbeing?

98. The ECO+ evaluation will supplement evidence collected through the ECO4 evaluation, as both schemes will run in parallel. The proposed approach to the ECO4 evaluation is set out in the ECO4 Final Stage Impact Assessment[58]. While the exact approach to evaluation design is still being finalised, we expect it to use a theory-based impact evaluation approach to examine the causal pathways and contribution of ECO4 to its intended outcomes and impacts. The research will entail interviews, surveys and quasi-ethnographic fieldwork with household and non-household stakeholders (including managing agents, Ofgem, energy company representatives and local authorities).

[58] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065825/eco4-final-ia.pdf

99. A detailed M&E plan for ECO+ is set out in Annex B. This includes consideration of previous research and relevant learning, a high-level outline of the proposed approach, and some initial estimates of resource requirements. The proposed M&E plan involves a process and quasi-experimental impact evaluation. As a new scheme announced in the Growth Plan, we expect ECO+ to be subject to a high degree of public scrutiny. We therefore consider this M&E plan to be proportionate to both the scale and the profile of ECO+.

100. The M&E will be used by policy leads and analysts to explore whether the assumptions and modelled impacts of the scheme, as set out in this Impact Assessment, have been met. The process evaluation will assess whether costs were as expected and what impact issues such as inflation have had on delivery. The impact evaluation will be used to check whether the modelled impacts on key variables such as energy bills, energy demand and GHG emissions, have been met.

Annex A. Input assumptions for costs and benefits

1. This annex sets out the input assumptions used for quantified costs and benefits in the ECO+ modelling.

A.1 Installation capital costs of energy efficiency measures

2. Table 21 sets out the assumed capital costs of the energy efficiency measures which are incorporated into the ECO+ modelling and primarily derived from a published study[59]. These are the same assumptions as used for ECO4, though with a 60% cost uplift applied to loft insulation and cavity wall insulation. This adjustment was based on evidence from the 2020/21 Green Homes Grant Vouchers Scheme (60% represented the average difference between predicted costs for cavity wall insulation from a BEIS cost/regression model built on GHG Vouchers data and the previous ECO4 cost assumptions).

3. Note that "m2 treated" in Table 21 does not represent the amount of insulation material installed. Instead, this represents the total loft or floor space of a property, or in the case of wall insulation, the total external surface area across all sides of a property.

4. To account for inflation, all measure costs (in nominal terms) were increased by 10% for 2022 and then a by further 5% per annum for 2023-2025.[60] The 10% adjustment for 2022 was based on the general level of inflation (CPI) observed in the economy. The 5% adjustment from 2023 was based on the average level of inflation observed for 'insulating materials (thermal or acoustic)' between 2016-2021, derived from BEIS statistics[61].

Table 21: Measure capital cost assumptions used in the ECO+ modelling (2021 prices)

Measure description	Fixed cost (£)	Unit cost (£)	Units for unit cost
Loft insulation[62]	256	8.3	£ / m^2 treated
Low-cost cavity wall insulation	432	5.1	£ / m^2 treated
High-cost cavity wall insulation	2720	48	£ / m^2 treated
Solid wall insulation (external)	4200	124	£ / m^2 treated
Floor insulation	0	37	£ / m^2 treated
Room thermostat	90	-	N/A
Boiler programmer	73	-	N/A
Thermostatic radiator valves	200	26	Rooms treated

A.2 Hidden/hassle costs associated with measure installations

5. Hidden/hassle costs include the cost of time taken by householders to liaise with an installer, prepare the property for measure installation and any oversight, as well as clean-up or

[59] https://www.gov.uk/government/publications/domestic-cost-assumptions-what-does-it-cost-to-retrofit-homes. Note that the cost assumptions for solid wall insulation were updated based on evidence from a survey with ECO suppliers.
[60] The increases in measure costs in real terms will be less than these increases in nominal terms. The real term increases will account for increases in the general level of prices across all goods and services in the economy, for which HM Treasury's GDP deflator series is used: https://www.gov.uk/government/collections/gdp-deflators-at-market-prices-and-money-gdp
[61] https://www.data.gov.uk/dataset/75ee36ed-21f7-4d7b-9e7c-f5bf4546145d/monthly-statistics-of-building-materials-and-components
[62] The study from which the costs of loft insulation were derived did not specify the types of insulation used. It is assumed that using spray foam to insulate lofts was not captured in the study and therefore the costs presented for loft insulation are excluding spray foam.

redecoration costs associated with the installation. Assumed hidden/hassle costs are shown in Table 22 and are drawn from an ECOFYS report[63].

Table 22: Hidden/hassle cost assumptions used in ECO+ modelling (2021 prices)

Measure description	Estimated hidden cost to household (£)
Loft insulation	135
Cavity wall insulation	95
Solid wall insulation (external)	220
Floor insulation	165
Heating controls (any of room thermostat, boiler programmer and thermostatic radiator valves)	50

A.3 'Search' costs of finding ECO-eligible households who are willing to have measures

6. In the ECO+ modelling, the search costs assumptions which were used in the ECO4 modelling have been used for the low-income group. In the absence of evidence on specific search costs for households in the general group, these search costs assumptions were also used for the general group, though this is being tested as part of the consultation. The assumed search costs are shown in Table 23. These assumptions were derived from a supply chain survey and stakeholder feedback during the ECO4 policy development process. All search costs are per successful install (for example, if two eligible households needed to be found per successful installation then the costs of finding both households is presented below).

Table 23: Search cost assumptions used in the ECO+ modelling (2021 prices)

Measure description	Homes on the gas grid (£)	Homes off the gas grid (£)
Loft insulation	190	430
Cavity wall insulation	260	430
Solid wall insulation (external)	290	430
Floor insulation	290	430
Heating controls (any of room thermostat, boiler programmer and thermostatic radiator valves)[64]	0	0

A.4 Energy suppliers' administration costs

7. In delivering their ECO+ obligation, suppliers will incur administrative costs. These will vary by supplier, depending on their setup, but include items such as the cost of running IT databases, staff time 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.

[63] ECOFYS (2009) "The hidden costs and benefits of domestic energy efficiency and carbon saving measures"
[64] Search costs for heating controls are assumed to be zero as they are an optional secondary measure for households in the low-income group.

8. In the ECO+ modelling, 5.9% of annual ECO+ spend is assumed to go towards energy suppliers' administration costs, which is in line with the administration costs reported by energy suppliers under ECO3[65] (statistics are not available for ECO4).

A.5 BEIS and Ofgem administration costs

9. Estimates of BEIS administration costs in relation to ECO+ were internally estimated and include all aspects of policy design and implementation, stakeholder engagement (including formal consultation), the development of Regulations, wider administration, and monitoring and evaluation activities required to deliver the scheme. Estimates of Ofgem administration costs were provided by Ofgem.

A.6 Avoided costs of energy supply

10. Reductions in energy consumption reduce the use of resources in the production, transportation, and final supply and use of energy. The reductions in energy consumption brought about by ECO+ were valued using the long-run variable cost (LRVC) of energy supply estimates in Green Book supplementary guidance[66], with a short-term adjustment for recent movements in the market – compared to the 2021 Green Book central long-run variable costs of gas supply in 2023, the cost used in the ECO+ modelling was about four-times higher.

A.7 Improved thermal comfort for households

11. Proposals that improve homes' energy efficiency have the effect of reducing households' energy bills. This frees up funds which can be spent on energy or other goods and services. Any resulting increase in energy use is known as the "rebound effect". The existing, standard assumption in BEIS modelling of energy efficiency policies is a 15% direct rebound effect[67] - this means that of the energy savings delivered by a measure, 15% of those savings do not materialise in practice because the household uses their bill savings to increase their energy consumption by this amount. The household does so to live in a warmer, more comfortable home.

12. The benefits to households of a warmer home are monetised by multiplying the rebound in energy consumption savings (the 15%) by the retail prices of energy in the Green Book supplementary guidance[68] (the retail price acts as a proxy for the consumer's willingness-to pay). As with the LRVCs, a short-term adjustment was made for recent movements in the market - compared to the 2021 Green Book retail prices of gas in 2023, the cost used in the ECO+ modelling was about three-times higher.

A.8 Reduced greenhouse gas emissions

13. Savings of greenhouse gas emissions (in MtCO2e) as a result of reduced energy consumption due to ECO+ were quantified using the fuel emissions factors in Green Book

[65] Household Energy Efficiency Statistics (November 2022), Table 6.6: https://www.gov.uk/government/statistics/household-energy-efficiency-statistics-headline-release-november-2022
[66] Tables 9-12: https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal
[67] See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/43000/3603-green-deal-eco-ia.pdf p.132 for more details on the sources of this 15% assumption.
[68] Tables 4-7: https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal

supplementary guidance.[69] The emissions savings were then monetised using the carbon values from Table 3 of that guidance.

A.9 Improved air quality

14. Air quality damage costs from Green Book supplementary guidance[70] were used to monetised the benefits associated with improvements in air quality resulting from reduced energy consumption.

[69] Tables 1 and 2a: https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal
[70] Table 15: https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal

Annex B. Equity-weighted NPV calculations

1. To calculate the social net-present value (NPV) of a policy where the costs and benefits for affected households are equity weighted, the first step is to identify the impacts for these households. Table 24 lists the monetised impacts of the ECO+ policy by affected group. Note that the 'energy bill savings' benefit for households is not completely accounted for in the calculation of the standard NPV. This is because some of this benefit is a transfer of wealth from energy suppliers who forgo profit when households reduce their energy consumption.

Table 24: Monetised impacts of ECO+ by affected group

Affected group	Costs	Benefits
Energy suppliers	• Funding of measure installation costs (capex and retrofit standards) • Search costs • Administration costs • Paying the economic rent associated with ECO score points • Profit losses associated with reduced energy consumption	• Compensation of costs incurred meeting ECO+ targets (assumed to be paid by government for the entire scheme)
ECO+ recipient households	• Contributions to measure installation costs (capex and retrofit standards) • Measure re-installation costs, including VAT. • Hidden/hassle costs	• Energy bill savings (post-comfort taking). • Comfort benefits.
Government	• Compensating energy suppliers' costs meeting ECO+ targets (confirmed with the EPG in 2023/24 and assumed for the last two years of the scheme) • Covering BEIS and Ofgem scheme administration costs.	• VAT collected when households re-install measures.
Energy efficiency measure installers	• No costs assumed – energy suppliers and households cover the costs of measures.	• Economic rent collected in the markets for ECO score points.
Society	• No costs outside of the groups listed above assumed.	• Reduced greenhouse gas emissions. • Improved air quality.

2. The next step is to assign equity-weights to the affected households. This is done using the average incomes of affected households and these are set out in Table 25 for each policy option. As only non-low income households in the general group are assumed to contribute

towards measure installations costs, these households are treated separately from low-income households for Policy Options 2 and 3.

Table 25: Median incomes of households receiving ECO+ measures (2013/14 data)

	Option 1	Option 2	Option 3
All households receiving measures	£16,500	£27,000	£22,300
Low-income households receiving measures	£16,500	£17,800	£16,400
General group households receiving measures (not low-income)	N/A	£30,200	£29,200

3. HM Treasury's Green Book guidance recommends that equity-weights are calculated by dividing the median equivalised income of all households in the population (estimated at £20,700 using 2013/14 data) by the median equivalised income of households affected by the policy, and then raising this number to the power of 1.3 (an estimate of the elasticity of the marginal utility of income). Following this approach, the equity weights for households receiving ECO+ measure are as set out in Table 26. These equity weights were used to calculate the equity-weighted NPVs in Table 11.

Table 26: Equity-weights assigned to households receiving ECO+ measures

	Option 1	Option 2	Option 3
All households receiving measures	1.34	0.71	0.91
Low-income households receiving measures	1.34	1.22	1.36
General group households receiving measures (not low-income)	N/A	0.61	0.64

Annex C. Further detail on monitoring and evaluation

1. This annex provides more detail about the proposed M&E approach, expanding on the high-level plan set out in Chapter 10.

Summary of existing evaluation and evidence gaps

2. The most recent available evaluation evidence from ECO is from the ECO2t and ECO3 phases of the scheme. This evaluation involved a three-wave household survey and follow-on interviews with households who received measures under these two phases of the scheme. There has so far been one published report from this evaluation (Wave 1)[71], with a final report due to be published in spring 2023. The Wave 1 report used quantitative and qualitative approaches to explore the characteristics of properties and households reached by the scheme, whether and how households benefitted from the scheme and their experiences of installation. Some key findings were that i) households who benefited tended to be lower income[72] ii) 4 in 10 households perceived that ECO had led to decreases in their energy bills compared with before the measures were installed and iii) most households were satisfied with the process of having a measure installed, due to fulfilled expectations and trust in installers.

3. As well as finding high overall levels of satisfaction with installation, the ECO evaluation found that households experienced a range of wider benefits including increased thermal comfort, lower energy bills and improved health and wellbeing. These positive experiences demonstrate the varied household-level benefits of energy efficiency installations under ECO, thus supporting the case for expanding support under ECO+. This is especially the case as ECO+ will support households to reduce their bills in the context of unprecedented energy price rises.

4. While the ECO2t/3 evaluation has provided new insights into the experience of households, it has several limitations. First, it has not involved research with non-household stakeholders such as suppliers, installers or retrofit coordinators. This has led to a significant gap in knowledge around how these groups engage with the scheme, their views on its effectiveness, and the value-for-money of the ECO delivery mechanism. Second, this evaluation was a process evaluation and, as such, the reported changes in beneficiary outcomes and impacts cannot be unequivocally linked to the scheme, due to the lack of a counterfactual population. The ECO+ evaluation will prioritise addressing these evidence gaps by i) conducting research with non-household stakeholders and ii) adopting a robust impact evaluation design to provide rigorous evidence of outcomes and impacts.

Proposed M&E Approach

5. Under ECO4, monitoring of participation and work covered by the scheme is undertaken by the scheme administrator (Ofgem). Energy suppliers provide Ofgem with data on the number of installations completed. Ofgem then provide monthly data to BEIS on measures installed which BEIS publishes as Official Statistics (more detail below). This will continue under the ECO+ scheme.

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[71] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1003872/eco-wave-1-summary-report.pdf

[72] 40% of beneficiary households had a pre-tax income of less than £16,000, compared with the national median income of £29,600 in the FY ending 2019.

6. The monitoring framework will be complemented by a commissioned evaluation to gather in-depth insights into the delivery and impacts of the scheme. We plan to conduct both an impact and process evaluation of ECO+. Taken as a whole, this approach will address the research questions set out in the main body of this IA.

7. The exact approach to the impact evaluation will be determined during the ITT drafting stage. However, we expect to employ a robust methodology to measure the impacts of ECO+. One option may be a quasi-experimental approach, which would likely involve the following broad steps:

    a) Identifying a treatment group: This would represent the ECO+ beneficiaries for whom we want to identify changes in outcomes of interest (e.g. energy savings, energy bills, thermal comfort). For this, we would obtain a representative sample of those who received at least one measure under ECO+ using the ECO database. Pending final decisions around ECO4/ECO+ eligibility, we may wish to have two treatment groups – one of whom received only measures under ECO+ and one who received measures under both ECO4 and ECO+. This would allow us to differentiate between the impacts of each scheme.

    b) Identifying a counterfactual group: Given that there are likely to be non-random reasons why certain households receive ECO+, while others do not, we will need to compare beneficiary households with an appropriate control group. To select the control group, we could use data supplied by Ofgem to identify those households who are eligible for ECO+, but do not take up the offer. We could also use NEED to identify suitable households.

    c) Determining the most suitable characteristics for matching: Having identified possible populations for treatment and control groups we may want to 'match' households to ensure we are comparing those most similar to each other, to better understand the causal impacts of the scheme. We would most likely use socio-demographic and household characteristics (e.g., dwelling type, household income, EPC band) as matching variables, as predictors of treatment under ECO+. Once matched, outcomes of interest (e.g., energy bills) would be measured at baseline and tracked over time. The difference between treatment and control groups would then constitute an estimate of the impacts of the scheme.

8. After scoping options for the impact evaluation, we may alternatively opt for a theory-based evaluation design. This will largely be determined by the research questions of interest and any data limitations. In this case, we will assess the impacts of the scheme without a counterfactual. Such an approach would provide an equally robust assessment of the scheme impacts, but would provide different insights into causality. Such approaches tend to answer questions such as how, why and in which circumstances a scheme delivered impacts, rather than providing quantitative estimates of what impacts a scheme delivered. Theory-based evaluations are also often more resource intensive and could increase the costs significantly.

9. The impact evaluation will be supplemented by a process evaluation which will involve research with a range of household and non-household stakeholders and will explore issues with delivery of the scheme, including the success of the delivery model and value-for-money. The process evaluation will be used to check the assumptions about delivery set out in the theory of change and will help identify in-flight changes to scheme delivery, if required.

10. For both household and non-household elements of the evaluation, we will consider the scale of resource which should be dedicated, and the volumes of surveys/interviews required, in the planning stage. We will review this alongside the planned approach to the ECO4 evaluation. To avoid replication and minimise respondent burden, we will ensure these elements focus on the distinctive elements of ECO+, over ECO4, and will determine a proportionate data collection strategy on this basis.