



Department for  
Energy Security  
& Net Zero

# Energy Company Obligation 4 and the Great British Insulation Scheme

Consultation on mid-scheme changes

Closing date: 12 December 2024



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# Foreword

Improving the energy efficiency of our homes is one of the best long-term solutions for reducing energy bills and tackling fuel poverty.

Energy efficiency measures provide sustained support to consumers by reducing their energy bills over the long term and make our energy system more secure and resilient to price shocks. At the same time, they ensure our homes are kept warm while contributing to our net zero targets that will generate green growth and skilled jobs.

The Energy Company Obligation (ECO) is one of the most successful schemes for improving energy efficiency. ECO places a legal obligation on larger energy suppliers to deliver energy efficiency measures to eligible households. It aims to reduce fuel poverty, improve security of energy supply, and reduce household carbon emissions to support government's net zero ambitions. Since it began in 2013 it has delivered around 4.1 million measures in around 2.5 million households, representing just over 9% of homes in Great Britain. The current scheme, ECO4, is due to end on 31 March 2026 and is worth £4 billion.

The Great British Insulation Scheme (GBIS) was launched after energy prices spiked in 2023 to accelerate the installation of energy efficiency measures in a wider pool of households, reducing energy bills and tackling fuel poverty. GBIS is due to end on 31 March 2026 and is worth an additional £1 billion.

GBIS typically delivers one insulation measure to each supported household, a deliberate contrast to the multi-measure approach of ECO4. GBIS provides further support to households already eligible for ECO4, while expanding support to many of those not able to receive help under existing government energy efficiency schemes. ECO4 and GBIS cut heating bills for recipient households by an average of around £430 and £230 per year, respectively (based on the most recent energy prices associated with the October 2024 energy price cap set by Ofgem).

The changes we are proposing through this consultation would help to ensure ECO4 and GBIS support our statutory objectives of improving as many fuel poor homes to band C by 2030 as is reasonably practicable and reaching net zero by 2050.

# Executive Summary

This consultation contains proposed amendments, additions and updates to the fourth Energy Company Obligation scheme (ECO4) and Great British Insulation Scheme (GBIS). The use of the term 'ECO schemes' refers to both ECO4 and GBIS. The document is separated into two parts, with each summarised below. The parts are:

- Part 1: Mid-scheme changes to current requirements
- Part 2: Pay-For-Performance

## Part 1: Mid-scheme changes to current requirements

We propose to update GBIS to make it a more attractive scheme for the supply chain and help grow the volume of contracts available in the market. We are seeking views on allowing loft and cavity wall insulation (CWI) to be installed simultaneously as part of a GBIS project and allowing smart thermostats to be installed in the low-income group. Additionally, we propose that delivery achieved under ECO4 rules counts towards an obligated supplier's GBIS target.

To encourage increased delivery of loft insulation (LI), this consultation outlines our proposals to allow the option of an alternative installation standard to PAS (Publicly Available Specification) 2035/2030 for specific measures under GBIS. In the ECO+ (now named GBIS) government response, we committed to continuing to explore whether an alternative installation standard to PAS 2035/2030 could be a viable option for low-cost single measures installed under the scheme.<sup>1</sup> Industry representatives and TrustMark have considered how TrustMark Licence Plus (TMLP) could be adapted for LI under GBIS, when delivered as a single measure (and heating controls (HCs) when paired with LI), thereby lowering costs while mitigating risks and prioritising consumer protection. TrustMark is consulting on the details of this alternative standard.<sup>2</sup> Within this consultation we welcome views on whether this adapted version of TMLP, deemed suitable for GBIS, should be introduced.

The document also requests feedback in relation to the costs of compliance with PAS 2035/2030. It outlines proposals for minor legislative amendments to aid scheme administration, as well as options for strengthening financial protection which is key to government's commitment to protect all consumers undertaking home retrofits. We would continue to work alongside industry stakeholders such as TrustMark to enhance consumer protection. As part of this effort, TrustMark would consult on strengthening guarantees for LI and boilers delivered through ECO4 and GBIS.<sup>3</sup>

Finally, we propose a range of small changes to align the scheme with wider industry changes and address specific delivery issues. These changes aim to support increased uptake of measures in the current ECO schemes.

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<sup>1</sup> <https://www.gov.uk/government/consultations/design-of-the-energy-company-obligation-eco-2023-2026>

<sup>2</sup> <https://www.trustmark.org.uk/pages/licence-plus-consultation>

<sup>3</sup> <https://www.trustmark.org.uk/pages/licence-plus-consultation>

## Part 2: Pay-For-Performance

Part 2 proposes to introduce a voluntary Pay-For-Performance (PFP) mechanism to ECO4 and GBIS.

PFP could incentivise better quality retrofits and provide valuable data for PFP-style approaches in future iterations of ECO and other government energy efficiency schemes. PFP would measure and reward actual improvements to the energy efficiency of a treated home using Smart Meter Enabled Thermal Efficiency Ratings (SMETERs). SMETER technologies take direct measurements from a building to assess its performance. For PFP, SMETERs would calculate the average rate at which the home loses heat – measured in heat transfer coefficient. Measuring improvements in this way and rewarding industry parties accordingly is expected to drive industry to use better quality measures and work to even higher standards.

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# General information

## Why we are consulting

We are proposing changes because GBIS is proving more costly to deliver than we originally estimated. Other minor changes are proposed to align GBIS and ECO4 to wider industry changes. We are also proposing to pilot an innovative Pay-For-Performance mechanism in ECO4 and GBIS that could incentivise better quality retrofits.

An Options Assessment will be published alongside this consultation to support the policy proposals. This provides more specific detail on the impact of the proposed changes outlined in this consultation document.

We would like to hear from a wide range of stakeholders, including consumer representatives, energy suppliers and those with an interest in energy efficiency and fuel poverty policies.

## Consultation details

**Issued:** 14 November 2024

**Respond by:** 12 December 2024

**Enquiries to:**

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Department for Energy Security and Net Zero  
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London  
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Do not submit consultation responses to this email address. Any responses submitted via this email address will not be considered.

**Consultation reference:** Energy Company Obligation 4 and the Great British Insulation Scheme Consultation

**Audiences:**

Stakeholders with an interest in domestic energy efficiency and fuel poverty in Great Britain and domestic energy suppliers.

**Territorial extent:**

This consultation is for England, Scotland and Wales.

## How to respond

Please respond directly to the questions posed, though additional comments and evidence would also be welcome.

Your response should be submitted online using the dedicated online portal:

**Respond online at:** <https://energygovuk.citizenspace.com/energy-efficiency/eco4-gbis-consultation>

Please do not send responses to this consultation by post to the Department, as we may not have access to them.

When responding, please state whether you are responding as an individual or representing the views of an organisation.

Your response will be most useful if it is framed in direct response to the questions posed, though further comments and evidence are also welcome.

## Confidentiality and data protection

Information you provide in response to this consultation, including personal information, may be disclosed in accordance with UK legislation (the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004).

If you want the information that you provide to be treated as confidential please tell us, but be aware that we cannot guarantee confidentiality in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not be regarded by us as a confidentiality request.

We will process your personal data in accordance with all applicable data protection laws. See our [privacy policy](#).

We will summarise all responses and publish this summary on [GOV.UK](#). The summary will include a list of names or organisations that responded, but not people's personal names, addresses or other contact details.

## Quality assurance

This consultation has been carried out in accordance with the government's [consultation principles](#).

If you have any complaints about the way this consultation has been conducted, please email: [bru@energysecurity.gov.uk](mailto:bru@energysecurity.gov.uk).

# Part 1: Mid-scheme changes to current requirements

## Chapter 1.1: Deliverability

GBIS has a wide eligible pool and supports installing insulation for a group of people who are not covered by other government schemes. As such, it is important to improve delivery under GBIS to reach these homes. At the same time, we have a statutory duty to ensure that as many fuel poor homes as is reasonably practicable achieve a minimum energy efficiency rating of Band C by 2030. We must therefore enable more progress towards meeting the full GBIS target as well as maintaining support for the supply chain that delivers ECO4.

We recognise that GBIS is proving much more expensive and more challenging for obligated suppliers to deliver than we anticipated when it launched in 2022. The reasons for this include the constrained supply chain due to the limited number of installers; the competition from other more attractive schemes such as ECO4; the fixed scheme costs which obligated suppliers can recover under the energy price cap; difficulties contracting for projects in the general group which require customer contributions; inflation rising faster than expected at the time of scheme design; and the move to single measure projects with relatively higher fixed costs rather than whole house retrofits.

The proposals in this part aim to address some of these issues.

### Loft and cavity wall insulation in the same project

GBIS currently only allows one insulation measure to be installed per household, with an additional heating control being permitted for installations in low-income households. This rule was introduced to ensure as many households as possible could benefit from the scheme. However, high fixed costs associated with home surveys, compliance with standards, and searching for viable properties mean offering only one insulation measure is not as attractive as offering multiple measures where the fixed costs make up a lower proportion of the total costs. In addition, better value for money is provided when multiple cost-effective insulation measures such as loft and CWI can be installed at the same time.

Spreading high fixed costs over more insulation measures and the associated increase in attractiveness of GBIS for installers and householders could make the scheme more profitable, and therefore more attractive for the supply chain.

We propose that households in the general group or low-income group could receive both CWI and LI as part of the same GBIS project. These are the most popular and most cost-effective measures on GBIS and installing both, where possible, results in better outcomes for installers and householders. While this proposal theoretically reduces the number of homes able to be treated through GBIS compared to the original assumption, it should enable more delivery overall than would take place without changes. The noted delivery challenges and compliance costs, which make up a large proportion of scheme costs, would be significantly reduced, making GBIS more attractive to the supply chain.

We propose that this change would be made through an amendment to the GBIS legislation, allowing projects containing loft and CWI measures to be eligible. There are three options for when we could allow projects to be delivered in accordance with any new rules:

- 1) the commencement date of the legislation, or earlier,
- 2) at the time that we publish the consultation document, or
- 3) at the time that we publish the Government Response to this consultation.

Our preference is to allow changes to take effect from the date of consultation as this would allow suppliers and households to benefit from the changes as soon as possible.

#### **Consultation questions**

1. Do you agree that a household should be able to receive both loft and cavity wall insulation under GBIS?
2. Do you agree that we should allow this change to be effective from the date of consultation? If not, would you prefer the change to be effective from the date of Government Response, or the commencement date of the legislation?

## **Smart thermostats**

HCs can deliver significant savings to households at a small cost compared to insulation measures like loft or CWI. HCs improve energy efficiency by reducing heating hours when heat is not required. GBIS currently allows HCs in owner-occupied households in the low-income group only, as a secondary measure in addition to a primary insulation measure. Certain types of HCs are eligible measures, but smart thermostats have not previously been allowed. Smart thermostats offer several advantages to the household, such as remotely controlling their home temperature via a tablet, smartphone or desktop.

Including smart thermostats as an eligible secondary measure for owner-occupied households in the low-income group would broaden the variety of measures on offer. The addition of another high-scoring, low-cost secondary measure could help make GBIS more appealing to the supply chain and assist with increasing levels of delivery.

We propose that this addition would be made by amendment to the GBIS legislation, allowing smart thermostat measures to be eligible. There are three options for when we could allow projects to be delivered in accordance with any new rules:

- 1) the commencement date of the legislation, or earlier,
- 2) at the time that we publish the consultation document, or
- 3) at the time that we publish the Government Response to this consultation.

Our preference is to allow changes to take effect from the date of consultation as this would allow suppliers and households to benefit from the changes as soon as possible.

### Consultation questions

3. Do you agree that smart thermostats should be an eligible secondary measure for owner-occupied households in the low-income group?
4. Do you agree that we should allow this change to be effective from the date of consultation? If not, would you prefer the change to be effective from the date of Government Response, or the commencement date of the legislation?

## ECO4 counting towards GBIS

The changes proposed above would likely increase levels of delivery, but contracted delivery costs would likely remain relatively high compared to other schemes, particularly ECO4, meaning it would continue to be less attractive to the supply chain. Our fuel poverty target is to ensure that as many fuel-poor homes as reasonably practicable achieve a minimum energy efficiency rating of Band C by 2030. We therefore want to enable more progress towards meeting the full GBIS phase A, B, and C obligations. One approach to help achieve this could be to increase the estimated cost of GBIS with the subsequent rise in the price cap. This would incur additional costs for bill-payers and would not fix the underlying issue with GBIS: that it is not competitive with other schemes. We have listened to representations from stakeholders and to enable the delivery of GBIS to better suit the needs of the market, we propose expanding the criteria, making part of the GBIS home heating cost reduction target deliverable through actions that currently only qualify under ECO4 criteria. This would assist obligated suppliers to achieve their GBIS obligations while also continuing to prioritise support to fuel poor homes.

Although we are consulting on this proposal in response to stakeholder feedback, we invite views on the counterfactual option. This would involve not introducing this proposal and instead only allowing the GBIS target to be met through delivery of measures conforming to GBIS rules. Delivery to date suggests that this would mean the GBIS target would be missed, and we therefore wish to provide alternative options for obligated suppliers to meet that target.

Obligated suppliers are reporting high volumes of ECO4 capacity in the market and that scheme has been delivering well, with many suppliers now ahead of where they would need to be at this stage of the scheme. Maximising use of this ECO4 capacity would expand support for fuel poor homes. We therefore propose allowing annual bill savings (ABS) an obligated supplier achieves under ECO4 rules to be able to count towards their GBIS obligations.

We invite views on three options for which period this change would cover.

The first, and our preferred, option is to enable delivery over Phases A, B and C, so the full lifetime of the scheme. We would do this through a transitional arrangement, which would enable projects that qualify as a result of this change, and have been completed during the relevant GBIS phase, to be counted towards a participant's overall GBIS obligation (and be assigned to the obligation set for the GBIS phase in which it was completed). Under this preferred approach, we would allow all actions completed within the lifetime of GBIS as specified in in current Article 11(1)(d) that meet the expanded criteria, to count towards GBIS.<sup>4</sup>

<sup>4</sup> <https://www.legislation.gov.uk/ukxi/2023/873/made>

This would allow projects completed under ECO4 criteria to be counted towards each Participant's obligation for all three phases of GBIS.

For GBIS phases B and C this approach would give obligated suppliers as much certainty as possible in immediately increasing ECO4 delivery that could count towards GBIS. However, there would be some, very low, risk to obligated suppliers in doing this since the updated legislation is subject to approval by Parliament. To minimise this risk, and pending the scheme administrator, Ofgem, consulting on the issue, obligated suppliers delivering projects that they intend to count towards GBIS phase B or C, before the legislation is made, should notify these projects against their ECO4 obligation.

The second option is for the transitional arrangements to bring projects completed from the date of publication of the consultation within the scope of GBIS. This means projects meeting the expanded requirements that are completed prior to the consultation would not be eligible in relation to GBIS obligations. We believe this option is less desirable since it gives obligated suppliers less opportunity to realise additional delivery.

The third option is to omit transitional arrangements so that qualifying actions falling under the expanded criteria can only count towards GBIS if completed after the changes come into force. We currently expect the Order to be made after GBIS phase B has ended, so only projects completed in Phase C would qualify. We do not favour this option since it affords less opportunity to respond to stakeholder feedback and incentivise additional delivery of projects currently only eligible for ECO4 immediately after this consultation is published.

Ofgem would consult on and determine the mechanism for how this proposal is administered. We want to support obligated suppliers in achieving their full GBIS phase A, B, and C obligations. Since achieving each phase of GBIS requires promoting qualifying actions that are completed within the timeframe of that phase, our preferred option of a transitional arrangement proposes that obligated suppliers could count past projects meeting the new criteria to meet their GBIS obligations. If an obligated supplier were to count projects conforming to what are currently ECO4 criteria, against their GBIS obligation, then these projects would count towards their GBIS low-income minimum requirement. The same would apply for projects meeting the ECO4 Flex criteria; these would count towards GBIS Flex.

An ECO4 project could count towards either the ECO4 or the GBIS target, at the supplier's discretion. It would not be possible to count the same project, or measures delivered within a project, against both schemes.

We propose that the proportion of the GBIS home heating cost reduction target that can be achieved via ECO4 delivery should be capped so that obligated suppliers must still make all efforts to achieve their GBIS obligations via delivery of GBIS projects within the lifetime of the scheme. A limit on the quantity of projects that can count towards GBIS by meeting the new criteria is, we believe, necessary to continue to allow support for the wider group of households that GBIS delivers to.

Meeting the current GBIS overall home-heating cost reduction target through this joint delivery approach, without a conversion factor between the two schemes, would risk the cost of compliance exceeding the £1 billion spend envelope presented in the original Impact Assessment. Depending on the amount of the GBIS obligation delivered through ECO4 compliance, a different conversion factor will be required to equalise the costs of delivering within the spend envelope.

We have produced conversion factors by modelling the delivery costs of GBIS, with the reforms proposed in this consultation having been implemented, and compared these to the

modelled ECO4 costs with the sub-obligations removed. This results in the cost of achieving an ABS under GBIS to be £24.84/ABS and ECO4 to be £17.87/ABS.

We present a scenario where the amount of the GBIS HHCR target that could be delivered via ECO4 projects is 50% i.e. £27,999,000 ABS. Under this scenario, the conversion factor would be 1.3, meaning to achieve £1.30 ABS that counts towards an obligated supplier's GBIS obligation, £1 ABS must be delivered to ECO4 rules.

Depending on responses to this consultation regarding the most appropriate cap on ECO4 delivery that can count towards GBIS, the conversion factor would scale relative to this cap. For example, were the cap set at a level such that 25% of the GBIS target could be delivered via ECO4 projects, the conversion factor would be 6.83. At a 75% cap the conversion factor would be 1.03.

These figures serve to illustrate the implications of different cap levels and conversion factors and as such have not been subject to final analytical assurance. Please refer to the Options Assessment that accompanies this consultation for finalised figures and updated scheme costs.

Capping the amount of ECO4 delivery that can count towards GBIS should ensure that ECO4 projects are additional, and do not replace GBIS projects entirely. We are particularly interested in the views of stakeholders and their assessment of how much of their GBIS obligation they are likely to achieve via delivery of GBIS projects alone. We are also seeking information on the amount of additional delivery via ECO4 rules that obligated suppliers expect to be achievable.

If these proposals are implemented, and additional ECO4 delivery is realised, more projects conforming to ECO4 rules would likely be completed. If this increases the overall deliverability of the scheme, more fuel poor homes could be brought out of fuel poverty, since there is greater focus on low-income homes with deeper interventions within ECO4. More heat pumps and gas boilers would likely be installed since these are popular measures under ECO4. If this proposal were introduced, an obligated supplier's ECO4 target would not be affected and still must be delivered in full according to the ECO4 legislation.

We do not propose any restrictions on the types of ECO4 projects that could be counted towards GBIS, if they met the ECO4 rules. We do not propose that the ECO4 sub-obligations would need to be adhered to for those projects counting towards GBIS. For example, it would not be required that a certain proportion of ECO4 projects counting towards GBIS would be private tenure band E, F and G homes, or that a minimum number of solid wall insulation measures would need to be delivered. Projects conforming to ECO4 rules that an obligated supplier counts towards GBIS would not be able to contribute to their ECO4 sub-obligations. This is because obligated suppliers must still achieve their ECO4 obligation, including sub-obligations, through notification against those obligations, not the GBIS target. Those ECO4-rule projects that are counted towards the GBIS target would count towards the GBIS caps and minima.

### Consultation questions

5. Do you agree with allowing projects meeting the ECO4 rules to count towards an obligated supplier's GBIS obligation?
6. Do you agree with our preferred option of a transitional arrangement that enables projects that have met the ECO4 rules during all phases of GBIS to be capable of counting towards GBIS obligations in phase A, B, or C?
7. Assuming the changes proposed in this consultation take effect, what proportion of your GBIS obligation is achievable?
8. Do you agree that the proportion of GBIS obligations that can be achieved via delivery under ECO4 rules should be limited? What should the limit be? Please provide as much detail as possible.
9. Do you agree that a conversion factor should be applied to projects meeting the ECO4 rules that count towards GBIS?
10. Do you agree with our estimate that the cost of achieving an ABS under GBIS would be £24.84/ABS with the proposed scheme changes? Do you agree that the cost of achieving an ABS under ECO4 (excluding EFG and SWI minimums) would be £17.87/ABS?
11. Based on your interpretation of the costs per ABS for GBIS and ECO4, what conversion factor do you think 1 ECO4 ABS should be subject to in order to help keep total costs within £1 billion. Please provide answers based on:
  - A maximum of 25% of GBIS ABS being achievable through ECO4.
  - A maximum of 50% of GBIS ABS being achievable through ECO4.
  - A maximum of 75% of GBIS ABS being achievable through ECO4.

## TrustMark Licence Plus for GBIS

To make delivery of LI more attractive in GBIS it is proposed to allow an alternative installation standard for LI when installed as a standalone measure or when paired with HCs.

TrustMark are consulting on the details of the proposed version of TrustMark Licence Plus (TMLP) which is discussed below, as well as the related proposals for guarantees.<sup>5</sup> We are consulting on whether that version of TMLP (TMLP for GBIS) should be permitted for LI when delivered as a single measure (and HCs when paired with LI only) under GBIS. TrustMark's consultation should be considered as a separate process, but responses may influence the overall outcome of this consultation.

### Context

Currently energy efficiency measures delivered under existing government schemes, including ECO4 and GBIS, must be installed in accordance with PAS 2035/2030 installation standards,

<sup>5</sup> <https://www.trustmark.org.uk/pages/licence-plus-consultation>



except for those measures covered by the Microgeneration Certification Scheme (MCS) and the Heat Trust Scheme. PAS 2035/2030 has a role in protecting consumers by increasing the quality of retrofits, reducing the risk of unintended consequences through provision of effective communication and advice via retrofit professionals. In addition, to demonstrate compliance with PAS 2035/2030, Retrofit Installers, Retrofit Coordinators and Retrofit Assessors must be registered with a TrustMark Scheme Provider and therefore operate in accordance with TrustMark Framework Operating Requirements (FOR).<sup>6</sup>

Government remains committed to the Each Home Counts Review and its recommendations.<sup>7</sup> However, we understand that costs of compliance with PAS 2035/2030 can be viewed as disproportionate for single lower-cost measures.

In the ECO+ (now named GBIS) design consultation we sought views on whether the original TrustMark Licence Plus (TMLP) standard could be used for LI in low-risk scenarios (and HCs when paired with LI) whilst PAS 2035/2030 standards would continue to be used for all other measures.<sup>8</sup> After consideration of responses to the GBIS design consultation and feedback from a working group, composed of representatives from across industry, a decision was made that all measures under the scheme should be delivered in accordance with PAS 2035/2030. A number of factors led to this decision, including:

- the challenge of defining low risk vs high risk LI scenarios without incorporating elements of PAS 2035/2030 which would drive the cost of compliance up;
- concerns raised by some industry respondents that, in their opinion, the original TMLP was not sufficiently robust to mitigate risks for LI under GBIS.

As GBIS was set up at pace, there was insufficient time to develop a version of TMLP that could be used for GBIS that fully addressed the concerns identified, for example, around unintended consequences including the risk around mould, damp and potential health consequences for occupants.

In the GBIS consultation we also sought views on whether the original TMLP standard could be used for CWI in low-risk scenarios. Responses noted that CWI was complex and that there were technical issues around pre-filled cavities and correct removal of material, in addition to concerns around fraud and interactions with other measures. Government noted these concerns and following consideration by the working group there is no proposal to explore alternative installation standards for CWI via GBIS or ECO4.

Modelling for the GBIS Final Impact Assessment showed that the number of LI measures forecast to be delivered through GBIS reduced significantly when delivered under PAS. As a result, in the GBIS Government Response we committed to continuing to look at whether TMLP could be a viable option for low-cost single measures.<sup>9</sup>

TrustMark offers the opportunity for TMLP to be adapted to suit specific needs, therefore the working group, facilitated by Government, and consisting of representatives from across industry and TrustMark, used the baseline of the original TMLP, and sought to explore whether a version could be used for LI (and HCs when paired with LI) in GBIS.

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<sup>6</sup> <https://www.trustmark.org.uk/business/documents>

<sup>7</sup> <https://www.gov.uk/government/publications/each-home-counts-review-of-consumer-advice-protection-standards-and-enforcement-for-energy-efficiency-and-renewable-energy>

<sup>8</sup> <https://www.gov.uk/government/consultations/design-of-the-energy-company-obligation-eco-2023-2026>

<sup>9</sup> <https://www.gov.uk/government/consultations/design-of-the-energy-company-obligation-eco-2023-2026>

The principal aim in exploring this with the working group was to reduce costs, whilst ensuring any alternative installation standard remains sufficiently robust to mitigate risks. A lower-cost alternative to PAS could reduce delivery costs for LI when delivered in isolation (or with HCs) and may therefore result in a greater number of households receiving support, than is the case currently.

Although we are consulting on allowing LI and CWI being delivered together in GBIS, we continue to see value in consulting on this standard for single measure LI to ensure those homes who are able to have LI but cannot have CWI are more able to receive support through the scheme.

## Considering TMLP for ECO4

We considered if any version of TMLP, if deemed potentially suitable for GBIS, should be applicable in ECO4.

ECO4 is designed as a multi-measure scheme, whereas GBIS was developed to deliver single measures to as many households as possible. Therefore, in ECO4, PAS compliance costs are spread across multiple measures, making them more cost-effective. The risks of unintended consequences are also higher in multi-measure delivery, providing greater justification for those costs.

In addition, demonstrating that a property meets the ECO4 Minimum Requirement (MR) is done currently utilising retrofit assessments. To facilitate those assessments through a version of TMLP for GBIS, additional requirements would be needed to the current proposal, potentially increasing compliance costs. Furthermore, the likelihood of LI (paired with HCs only) meeting the ECO4 MR is low.

We therefore do not propose that any measures delivered via ECO4 including LI should be permitted to use any version of TMLP.

### Consultation question

12. We are not considering utilising TMLP for ECO4 at this time. Do you agree with our approach?

## Developing TMLP for GBIS

We have worked closely with TrustMark and the industry-led working group who have developed a proposal for a version of TMLP that could represent a cost-effective alternative installation standard for LI when delivered as a single measure (and HCs where eligible and when paired with LI), whilst continuing to mitigate risks and putting consumer protection at the fore.

The proposed version of TMLP developed by the working group would require installers to be PAS 2030 certified, registered with TrustMark through an appropriate TrustMark Scheme Provider and be bound by the TrustMark Framework Operating Requirements.

There would be the option for installations to be completed in accordance with the new TMLP assurance requirements set by TrustMark as well as the option to continue to use PAS 2035. Delivery of assurance would continue to focus on quality, robust and proportionate oversight,

and consumer protection. There are specific circumstances whereby it is proposed that loft installations (where delivered as a single measure and HCs when paired with LI) would be required to proceed through the existing PAS 2035/2030 route. These include high-rise properties (as defined in PAS 2035 as a building over 11 metres in height, or over four storeys in height above the ground), heritage properties, those with non-typical access or design, and those where existing mould, condensation and/or damp issues are identified. Further detail can be found in TrustMark's consultation.<sup>10</sup>

To address concerns raised in response to the GBIS design consultation, in respect of the original TMLP, the following key proposals were recommended by the working group and incorporated into the proposed TMLP for GBIS:

- Checks required during the Retrofit Assessment stage to ensure the building is within scope of the version of TMLP for GBIS assurance requirements, thus eligible to be installed under TMLP for GBIS option, rather than the full PAS 2035 process.
- Retrofit Assessment would be required to be undertaken by a TrustMark registered Retrofit Assessor. This would incorporate the Reduced Data Assessment Procedure (RdSAP) process to produce an Energy Performance Report (EPR).
- In addition to circumstances listed above, an obligation for the work to be completed under PAS 2035 if the assessment identifies any complications or construction details that means a qualified Retrofit Coordinator should be appointed.
- An expanded Independent Surveillance requirement of the Pre-Installation Building Inspection (PIBI), and audit of alignment of Energy Performance Report Recommendations by Retrofit Assessors. An assessment of physical feasibility, along with a requirement to provide post-installation evidence so that potential installation defects can be identified and addressed immediately before lodgement.
- Where an installer completes the installation design the personnel involved must be different from those undertaking the installation itself.
- New obligations, specific to TMLP for GBIS, on the installer to direct consumers to a satisfaction survey and for the results to inform a process of continuous improvement. This survey would be facilitated by TrustMark.
- A provision to allow PAS 2030 certification, or evidence that an installer is working towards PAS 2030 certification, to be taken into account as part of the initial audit by any Scheme Provider validating compliance with the version of TMLP assurance requirements.
- Lodgement with TrustMark would be modelled on existing processes via a registered TrustMark business and within TrustMark Framework Operating Requirements.
- The requirement for a guarantee of a duration of six years for LI which offers rectification of failed measures and consequential damage arising directly from the failed measure to address consumer protection.

The main concerns previously raised by stakeholders with using the original TMLP for LI are detailed below, along with how the adapted version of TMLP proposes to seek to address those concerns:

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<sup>10</sup> <https://www.trustmark.org.uk/pages/licence-plus-consultation>

**Table 1: Concerns raised by stakeholders with original TMLP and proposed mitigations**

Concern	Proposed Mitigation
How the risk profile of LI could be assessed	<p>Retrofit Assessment and Pre-Installation Building Inspection (PIBI) outcomes (supported by independent validations) would determine which path a measure would have the option to follow: Version of TMLP for GBIS or PAS.</p> <p>The consumer would be free to seek additional independent advice or engage a Retrofit Coordinator to carry out a full options evaluation and create a medium-term improvement plan.</p> <p>Those properties not in scope of this version of TMLP would continue to proceed through the existing PAS framework. These properties would include (but may not be limited to) high-rise properties, heritage properties, those with non-typical access or design, and those where existing mould, condensation and/or damp issues are identified.</p>
Concerns around unintended consequences including the risk around mould and damp and potential health consequences for occupants	For those proceeding along the proposed GBIS for TMLP route the requirements such as independent design and surveillance, in addition to strengthened guarantee requirements, would aim to mitigate risks around mould and damp. Ventilation assessments would be required.
Installer competency, independent surveillance and quality assurance of installers	The proposed version of TMLP standard structure includes the requirement for Retrofit Assessors to undertake Retrofit Assessments. Also, the introduction of independent surveillance of Pre-Installation Building Inspections by TrustMark registered independent parties.
No requirement for a medium-term improvement plan. Carries a varying number of risks depending on dwelling and measures	An Energy Performance Report (EPR) would set out basic recommendations for households and/or property owners, which they are free to investigate further.

To demonstrate compliance with TMLP for GBIS, installers would need to be registered with a TrustMark Scheme Provider and follow the necessary requirements set out in the TrustMark Framework Operating Requirements, Code of Conduct and Consumer Charter.<sup>11</sup>

Further details on the construct of the proposed version of TMLP for GBIS and specific requirements, including financial protection, is being consulted on separately and independently by TrustMark and can be found on their website:

<https://www.trustmark.org.uk/pages/licence-plus-consultation>. We are referring to the adapted version of TMLP developed for GBIS here for completeness, however the details will be determined through TrustMark's consultation. This consultation only decides whether the adapted version of TMLP should be utilised as an option for installs under GBIS. For information about the details of the proposed version of TMLP for use in GBIS please see TrustMark's consultation.<sup>12</sup> Whilst we have been working closely with TrustMark, we do not control their consultation timelines or processes.

## Conclusion

In conclusion, government is content that the proposed version of TMLP for GBIS, developed by the working group and set out in further detail by TrustMark, minimises previously identified risks while reducing compliance costs and therefore could help to remove barriers to the delivery of LI when delivered as a single measure (and HCs when paired with LI) through the scheme. Subject to the outcome of this and TrustMark's consultation, and that the proposals to introduce TMLP for GBIS are taken forward, the alternative standard is currently expected to launch in time for the final year of GBIS.

### Consultation questions

13. Considering the details set out in this consultation and by TrustMark, do you agree with the proposal to introduce the version of TMLP for use in GBIS for loft insulation when delivered as a single measure (and heating controls when paired with loft insulation)?

14. For the adapted version of TMLP, have sufficient risks been identified and addressed in Table 1?

If there are other stakeholder concerns that have not been identified in Table 1, please provide details of such concerns and proposed mitigations.

## Costs of complying with GBIS TMLP and delivery impacts

In the ECO4 and GBIS Final Impact Assessments, the processes involved in conducting a PAS 2035/2030 retrofit project, such as the retrofit assessment and coordination, were estimated to add £1,030 (in 2023 prices) on average to the overall project cost.<sup>13</sup> This average cost was included for every property treated through ECO4 and GBIS, on top of the costs of installing energy efficiency measures (labour and material costs), heating measures and any

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<sup>11</sup> <https://www.trustmark.org.uk/business/documents>

<sup>12</sup> <https://www.trustmark.org.uk/pages/licence-plus-consultation>

<sup>13</sup> Note that this cost assumption is expressed in 2023 prices and costs were assumed to vary by year in line with general inflation.

required ventilation measures.<sup>14</sup> Whilst it was recognised that the costs of complying with PAS processes can vary depending on measure type and the risk pathway (as used within PAS 2035/2030 at the time), the same average cost was used across all properties modelled to be treated. This was done due to challenges in robustly modelling project-specific PAS costs.

The costs of complying with the proposed version of TMLP for GBIS for the installation of LI on its own are forecast to be around £400 to £500.<sup>15</sup> This is a significant cost saving compared to modelled costs for PAS, and potentially an even greater cost saving as compared to the costs under the new version of PAS 2035/2030 published in September 2023 (PAS 2035/2030:2023). The £400 to £500 cost figure covers the estimated average costs of the processes involved in the version of TMLP for GBIS as set out by TrustMark.<sup>16</sup>

Industry engagement suggests that a more cost-effective installation standard could attract additional installers who are not currently delivering under PAS. As a result of the lower cost of compliance and the potential for a greater supply of labour, we expect to see an increase in LI measures delivered and therefore more homes treated than would otherwise have been the case.

If the version of TMLP for GBIS were introduced, we expect to retain current targets to aid the deliverability of the scheme.

We welcome views through this consultation on the difference in compliance costs between the proposed version of TMLP for GBIS and PAS 2035/2030:2019, and on the potential impact on GBIS delivery.

### Consultation questions

15a. Given the structure of the version of TMLP suitable for GBIS, what are your views on the average cost assumptions for compliance with its processes (forecast at approximately £400 to £500)?

- Yes, £400 to £500 is about right
- No, cost would be significantly higher (£601 or more)
- No, cost would be slightly higher (£501 to £600)
- No, cost would be slightly lower (£300 to £399)
- No, cost would be significantly lower (under £300)
- Don't know / Prefer not to say

15b. What do you think could be the main drivers for any potential savings between the costs of compliance with PAS 2035/2030 and the costs of compliance with TMLP for GBIS?

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<sup>14</sup> The costs of ventilation measures were not explicitly modelled, though assumed to be incorporated into the cost assumptions for insulation measures.

<sup>15</sup> Note this refers to the estimated compliance costs for single measure loft insulation only.

<sup>16</sup> <https://www.trustmark.org.uk/pages/licence-plus-consultation>

16. Given the forecast costs of the version of TMLP suitable for GBIS, and the potential impact on GBIS delivery, do you agree its introduction in the final year of the scheme would have a sufficient impact to make it worthwhile implementing?

If there is any additional information you would like to add, please provide details.

## Deliverability considerations

The proposals in this chapter aim to increase levels of delivery under GBIS. Stakeholders, including energy suppliers, have made a range of suggestions, but we are proposing only those changes that we think constitute the most effective means of improving delivery. We believe these proposals represent the best available changes given the time available and complexity associated with the changes.

### **Consultation question**

17. Are there any other changes, not proposed in this consultation, that you believe would increase levels of delivery under GBIS?

If yes, please provide details.

## Chapter 1.2: Installation Standards

This chapter of the consultation considers the impact of the 2023 update to PAS 2035/2030 on both ECO schemes (ECO4 and GBIS), including changes required to references to PAS 2035/2030 in legislation and the associated compliance costs. In addition, it sets out considerations to changes in ECO legislation regarding TrustMark certificates of lodgement and low carbon heating and microgeneration installations certification requirements, and options for strengthening guarantees for both ECO4 and GBIS.

TrustMark are consulting on details of the proposed changes to guarantees for ECO4 and GBIS. Government is consulting on whether those changes to guarantees should be implemented. TrustMark's consultation should be considered as a separate process, but responses may influence the overall outcome of this consultation.

### Costs of compliance with PAS 2035/2030

In the ECO+ (now named GBIS) design consultation, we asked for further information on expected PAS costs by measure type or risk pathway and responses varied. While roughly half of respondents agreed with our assumptions, others felt that costs were probably higher. Overall, there was insufficient evidence to change this cost assumption in the GBIS Final Impact Assessment, which was £1,030 per property retrofit in 2023 prices.<sup>17</sup>

The 2023 version of the standard (PAS 2035/2030:2023) which is subject to an 18-month transition process until 30 March 2025, may change compliance costs.<sup>18</sup> The change in costs will likely differ across measure and property type, as well as scheme (i.e., ECO4 or GBIS). As such we would like to test again whether the current cost assumption is accurate for both schemes, to help better inform what the true impact of moving to PAS 2035/2030:2023 will be, and to ensure costs are modelled as accurately as possible.

Compliance costs consist of the costs of complying with PAS 2035/2030 processes, including (as relevant) retrofit assessment, measure design, coordination and lodgement of data with TrustMark. For these purposes, compliance costs do not include the costs of installing ventilation requirements such as mechanical extraction or trickle vents where these are required under Building Regulations.

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<sup>17</sup> <https://www.gov.uk/government/consultations/design-of-the-energy-company-obligation-eco-2023-2026>

<sup>18</sup> <https://knowledge.bsigroup.com/products/retrofitting-dwellings-for-improved-energy-efficiency-specification-and-guidance-2?version=standard>



## Consultation questions

18a. DESNZ's cost assumption for compliance with PAS 2035/2030:2019 processes is £1,030 per property retrofit (in 2023 prices) for both ECO4 and GBIS. The assumed cost does not vary according to how many measures are installed.

Roughly what is the average cost you have experienced complying with the current PAS 2035/2030:2019 processes per property retrofitted? Please answer for both multi-measure and single-measure projects that have upgraded the fabric of a building, as relevant.

### Multi measure

- Less than £900
- £900 to £1,100
- £1,100 to £1,300
- £1,300 or more
- I don't know/ Prefer not to say

### Single Measure

- Less than £900
- £900 to £1,100
- £1,100 to £1,300
- £1,300 or more
- I don't know/ Prefer not to say

18b. If you believe that the average cost does not fall between £900 to £1,100, please provide us with any information on ECO4 or GBIS PAS 2035/2030:2019 compliance costs per project to evidence lower or higher costs.

19a. In September 2023 a new version of PAS 2035/2030 was published.

Roughly what is the average cost you would expect for complying with the PAS 2035/2030:2023 processes per property retrofitted? Please answer for both multi-measure and single-measure projects involving an upgrade to the fabric of a building, as relevant.

### Multi measure

- Less than £900
- £900 to £1,100
- £1,100 to £1,300
- £1,300 or more

- I don't know/ Prefer not to say

#### **Single Measure**

- Less than £900
- £900 to £1,100
- £1,100 to £1,300
- £1,300 or more
- I don't know/ Prefer not to say

19b. Please provide us with any information to evidence why you believe the compliance costs to be within the range you chose.

19c. What, if any differences, between PAS 2035/2030:2019 and PAS 2035/2030:2023 processes are driving any changes in costs?

20. We would like to understand more about the compliance costs of PAS 2035/2030. Please provide details on what you feel are the key cost drivers. For example, the PAS process, the need to use qualified professionals, the need to complete paperwork to demonstrate compliance with the PAS etc.

## References to PAS 2035/2030:2019 in legislation

The transition period between PAS 2035/2030:2019 and PAS 2035/2030:2023, as consulted on by BSI, ends on 30 March 2025. Current legislation contains references to the 2019 iteration of PAS.<sup>19</sup> In order for those references to remain valid beyond the transition we propose making relevant amendments to legislation to replace the references to PAS 2035/2030:2019 references with PAS 2035/2030:2023. If legislation would not be laid until after the PAS transition period, government would take steps to ensure continuity and mitigate any risks of negative impacts on scheme delivery.

## Low carbon heating and microgeneration installations certification requirements

Currently ECO legislation requires low carbon heat installations and microgeneration installations to be certified by the Microgeneration Certification Scheme (MCS) or under an equivalent scheme which is operated by a person accredited to ISO/IEC 17065:2012 and which certifies microgeneration products to consistent standards.

We are looking to align our approach to certification requirements with that of other government schemes offering or incentivising low carbon heat and microgeneration installations. This could include an assessment of the certification requirements by the Secretary of State.

<sup>19</sup> <https://www.legislation.gov.uk/ukxi/2022/875/contents/made>,

**Consultation question**

21. What do you think the minimum certification requirements for low carbon heating and microgeneration installations should be under ECO4?

## TrustMark Certificates of Lodgement

The ECO4 and GBIS legislation currently require projects and measures to meet TrustMark requirements related to guarantees, consumer protection, and installation standards, such as PAS 2035/2030.

Upon lodgement of a project within TrustMark's Data Warehouse which can consist of a single measure or a group of measures, depending on the scheme (i.e., GBIS or ECO4) TrustMark issues a certificate of lodgement. A certificate of lodgement indicates that a project has been installed by or under a TrustMark registered installer, but it does not confirm compliance with all TrustMark requirements.

If measures within a project fail to meet the required standards, a TrustMark Quality Assurance Non-Compliance Report would be generated. These measures are typically remediated to bring them into compliance.

If TrustMark deems measures and/or projects to have failed to meet those requirements and they remain un-remediated, the policy intent is that Ofgem is expected to reject those measures as part of its role as the scheme administrator.

We propose to update the wording in the ECO order to clarify the position and ensure consistency with policy intent. We are not proposing to change the definition of compliance or the process for ensuring compliance. This update facilitates Ofgem's ability to reject those measures more easily.

**Consultation question**

22. Do you agree that the policy intent could be made clearer to facilitate Ofgem's ability to reject measures which have been identified as non-compliant by TrustMark?

## Guarantees

In the ECO4 consultation we set out our intention to ensure that guarantee requirements were strengthened where possible and that we understood there were a number of providers already offering LI guarantees of six to ten years.<sup>20</sup> We gathered views on whether guarantee durations for LI and boilers should be increased and to what duration. In the ECO4 Government Response we set out that we would work closely with Ofgem and TrustMark to consider strengthening guarantee requirements and that any ECO guarantee requirements should be consulted on by TrustMark, allowing government, Ofgem and wider industry the opportunity to respond to any changes, ahead of them being implemented.<sup>21</sup>

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<sup>20</sup> <https://www.gov.uk/government/consultations/design-of-the-energy-company-obligation-eco4-2022-2026>

<sup>21</sup> <https://www.gov.uk/government/consultations/design-of-the-energy-company-obligation-eco4-2022-2026>

Given the proposal to require guarantees with a duration of at least six years for LI through TrustMark's Framework Operating Requirements and/or associated documents, in the version of TMLP for GBIS, we are supportive of any move to align guarantees for measures that are delivered outside of TMLP with these strengthened requirements. It is proposed that the two-year guarantee requirement for HCs would be retained.

These changes would be implemented through TrustMark's Framework Operating Requirements and associated documents, and we will continue to work closely with Ofgem, TrustMark and other stakeholders on any such proposals. TrustMark is consulting on proposals to strengthen guarantees and amendments to the TrustMark Framework Operating Requirements. Further details on the proposed changes to TrustMark's Operating Requirements can be found on their website: <https://www.trustmark.org.uk/pages/licence-plus-consultation>.

## Building Fabric Repair

The ECO4 government response set out requirements for the Building Fabric Repair (BFR) uplift and how that should be evidenced, including whether the extraction of defective LI and/or CWI should be in scope.

Respondents to the ECO4 consultation felt that Chartered Surveyors were equipped to undertake an assessment of a domestic premises to substantiate the need for the extraction of CWI or LI. We set evidencing requirements accordingly.

To reflect developments within the sector, we propose amending legislation (The Electricity and Gas (Energy Company Obligation) Order 2022 62 (2) (d) (i)) to allow for a report recommending extraction, to be completed by individuals appropriately qualified for conducting this assessment, to at least a Level 2 Technical and Vocational qualification, or equivalent.<sup>22</sup> This change would deem those undertaking that report with an appropriate Level 2 Technical and Vocational qualification, or equivalent, to have the relevant skill set.

In light of these industry developments, we also welcome views on whether a Chartered Surveyor continues to be suitably equipped to conduct this assessment. The purpose of these assessments is to verify and evidence the need for an extraction of the relevant measure. The legislation currently describes the purpose as "identifying potential efficiency measures for improving the energy efficiency of the premises". We propose refining this purpose to, "assessing the condition of the insulation and related building fabric", to more accurately reflect the assessment's purpose. As a result, this change would align more closely with relevant industry skillsets and contribute to effective monitoring of extractions.

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<sup>22</sup> <https://www.legislation.gov.uk/ukxi/2022/875/article/62/made>

### **Consultation questions**

23. Do you agree with our proposal to allow individuals with at least a Level 2 Technical and Vocational Qualification, or equivalent, to undertake a report substantiating the need for extraction of cavity wall or loft insulation for the purposes of determining building fabric repair expenditure?
24. Are there any specific Level 2 Technical and Vocational Qualification qualifications, or equivalent, which would be most appropriate for those conducting this report?
25. Do you think a Chartered Surveyor continues to be suitably equipped to conduct this assessment?
26. Do you agree with amending the purpose of the assessment under article 62(2)(d)(i) of the ECO4 Order from; “identifying potential efficiency measures for improving the energy efficiency of the premises”, to; “assessing the condition of the insulation and related building fabric”, to more accurately reflect the role undertaken by the assessor?

## Chapter 1.3: Minor ECO4 and GBIS policy amendments

This chapter of the consultation gathers views on several smaller amendments to ECO4 and GBIS:

### Shared Ground Loops

Currently in ECO4, Shared Ground Loops (SGLs) are treated separately to other District Heating Connections (DHCs). This means that they are required to be evidenced via RdSAP assessments. Businesses working on SGL projects have provided evidence that some of the assumed values in an RdSAP assessment undervalue the improvements offered by installing a SGL.

To ensure that SGLs are appropriately accounted for, we propose the ECO4 order is updated such that SGLs are treated similarly to other DHCs. Doing so would permit SGLs to be evidenced by SAP assessments where installed alone, or alongside Data Light Measures. We propose that in those circumstances SGL projects would have the option to use either SAP or RdSAP for evidencing for the remainder of ECO4.

The scope of this change may be widened subject to changes arising noted in the ECO SAP and RdSAP amendments consultation and government response.<sup>23</sup> We are exploring options for retrofits that include both insulation and a DHC to be evidenced by SAP assessments. Potential changes from this, alongside changing the definition of DHCs to remove the restriction for SGLs should increase the deliverability of SGLs.

#### Consultation questions

27. Do you agree with our proposal to update legislation so that SGLs can be evidenced by SAP assessments where they are installed alone, or alongside Data Light Measures?
28. Are there any other barriers to delivering SGL projects under ECO4 we should be aware of?

### Smart meter requirements

Smart meters are replacing traditional gas and electricity meters across Great Britain as part of an essential infrastructure upgrade to make the energy system more efficient and flexible, helping to deliver net zero emissions cost-effectively. As of June 2024, there were over 36.2 million smart and advanced meters in homes and small businesses in Great Britain.<sup>24</sup> All domestic consumers are offered In-Home Displays as part of their smart meter installation,

<sup>23</sup> <https://www.gov.uk/government/consultations/energy-company-obligation-schemes-standard-assessment-procedure-sap-and-reduced-data-sap-rdsap-amendments>

<sup>24</sup> See: DESNZ (2023) Smart Metering in Great Britain Quarterly Update

<https://www.gov.uk/government/collections/smart-meters-statistics#2023-quarterly-updates>

which give accurate, accessible and near real-time consumption and price information. This helps consumers make changes to their energy use and save money on bills.

Millions of households are already benefiting from smart meters, including ECO4 and GBIS consumers who can benefit from:

- Energy consumption information which helps consumers understand the impact of any insulation or new heating equipment and encourages further energy saving behaviours post-installation that helps them save money.
- The In-Home Display, which allows near real time monitoring of energy use, whilst budget controls allow consumers to receive warnings when spending on energy may breach custom-set levels.

Homes made 'flexibility ready', with access to smart energy tariffs which reward households for shifting their energy use away from peak periods.

It is currently a requirement for both ECO4 and GBIS that advice on the benefits of using a smart meter must be provided to the household before completion of the first measure.<sup>25</sup>

Due to the benefits noted above, there has been strong support from energy suppliers to make the installation of a smart meter a prerequisite for participating in these schemes. We have concluded that it is not practicable within the design of the schemes to require that a smart meter installation has already been completed before consumers can benefit from the retrofit measures. This is due to a number of factors such as data privacy and not wishing to unduly delay ECO4 and the GBIS retrofits due to a smart meter being fitted.

Nonetheless, we are proposing the following options to build on the current requirements and increase take-up of smart meters by participants of the schemes. Both options strongly encourage the consumer to agree to a smart meter installation:

- Under Option 1, the consumer is encouraged to agree to ask their energy supplier(s) for a smart meter. The onus is on the consumer to contact their energy supplier(s) to request a smart meter installation.
- Under Option 2, the customer agrees (either voluntarily or as a requirement to gain access to the scheme) to be contacted by their energy supplier to arrange a smart meter installation. The onus is on the energy supplier to contact the consumer to arrange the installation.

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<sup>25</sup> See: The Electricity and Gas (Energy Company Obligation) Order 2022 at <https://www.legislation.gov.uk/ukdsi/2022/9780348236606/article/31>; The Electricity and Gas (Energy Company Obligation) Order 2023 at <https://www.legislation.gov.uk/uksi/2023/873/article/22/made>

**Table 2: Summary of options. Under Option 2, two scenarios are detailed, with the key difference highlighted.**

	<b>Option 1</b>	<b>Option 2a</b>	<b>Option 2b</b>
	<b>Voluntary consumer pledge</b>	<b>Voluntary agreement for a smart meter installation</b>	<b>Mandatory agreement for a smart meter installation<sup>26</sup></b>
<b>STEP 1</b>	<p>Smart metering advice is provided by retrofit assessor and discussed (similarly to present requirements).</p> <p>The consumer is asked whether they would like to opt in to sign a pledge that they will arrange a smart meter installation with their supplier(s).</p>	<p>Smart metering advice is provided by retrofit assessor and discussed (similarly to present requirements).</p> <p>The consumer is asked whether they would be happy to have a smart meter installed by their electricity and gas supplier(s). The consumer can refuse this against the advice of the scheme.</p>	<p>Smart metering advice is provided by retrofit assessor and discussed (similarly to present requirements).</p> <p>The consumer is told they need to agree to have a smart meter installed by their electricity and gas supplier(s) to receive the retrofit measures. The consumer cannot refuse this.</p>
<b>STEP 2</b>	<p>The consumer contacts supplier(s) following instructions on the pledge. The responsibility for arranging the installation lies with the consumer.</p> <p>This process would then continue in line with a standard smart meter installation.</p>	<p><b>If the consumer agrees to a smart meter installation:</b></p> <p>No more action is required by the consumer. The supplier(s) would reach out to the consumer to arrange the smart meter installation (ECO retrofit work can be done prior to this).</p> <p>The responsibility for arranging the installation lies with the supplier.</p>	<p><b>In all cases:</b></p> <p>No more action is required by the consumer. The supplier(s) would reach out to the consumer to arrange the smart meter installation (ECO retrofit work can be done prior to this).</p> <p>The responsibility for arranging the installation lies with the supplier.</p>

We are also open to hearing alternatives that would increase the uptake of smart meters whilst also being practicable from the point of view of scheme deliverability and data privacy.

### Option 1: Consumer pledges

Under Option 1, we propose an optional and light touch process where the consumer is encouraged by the assessor to sign a voluntary pledge to seek a smart meter installation from their Energy Supplier(s) at the pre-retrofit assessment stage. That Energy Supplier would then organise an appointment with the consumer, and this process would continue in line with a standard smart meter installation.

<sup>26</sup> Where technically possible: the Data and Communications Company (DCC) has contracted with its Communications Service Providers (CSPs) requiring that they reach at least 99.25% of properties across Great Britain.



It would be up to the consumer to follow through with their pledge by contacting their energy supplier. As this is voluntary, we do not propose any penalties should households not opt into this process or not follow through with the pledge.

To monitor the effectiveness of this approach, consumers would be asked by researchers during the wider ECO evaluations if they have followed through on their pledge and arranged an appointment to install a smart meter. This would be done through interviews with ECO4 recipients in 2024 and through a survey with GBIS recipients in 2025.

#### Benefits of this approach

Behavioural studies in multiple contexts suggest that voluntary pledges like this would be effective in encouraging people to follow through on an action, even when a penalty is absent.<sup>27</sup> We therefore believe that pledges could be an effective way of providing a small boost in the number of consumers who would get a smart meter installed following an ECO4 or GBIS retrofit. The same research also suggests that the context and method for introducing a pledge is crucial for its effectiveness. To increase the chances of success, we can maximise the likelihood of installation through:

- Ensuring that the process is as easy as possible for the consumer by:
- Acting as part of the pre-retrofit assessment.
- Providing a simple route to opt-in (e.g. tick box).
- Providing clear actions on how to request a smart meter.
- Increasing the attractiveness of the process to the consumer, by providing clear information on the benefits of smart metering.
- Ensuring the pledge is provided at the most effective time, leveraging the increased level of consumer interest in energy costs during the retrofit process.
- Utilising social drivers, including providing information on the progression of the smart metering rollout.

#### Option 2: Consumers agree to a smart meter installation (to be arranged by their Energy Suppliers)

We are open to considering stronger measures should industry feel this may be appropriate to drive smart meter uptake, and a suitable methodology can be found which causes no ethical or data concerns, or detrimental impacts on the deliverability of schemes.

In this scenario, the onus would be placed on energy suppliers to share information about which consumers have opted in to be contacted to get a smart meter installed following an ECO4 or GBIS retrofit. This would involve the secure transfer of information from the supplier promoting the project measures to the suppliers from whom the consumer receives their

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<sup>27</sup> Example contexts include the environment, health, education, personal finance and professional development. For an example, see this review and meta-analysis of 19 studies in the environmental context: Lokhorst, A. M, et al. (2013). 'Commitment and Behavior Change: A Meta-Analysis and Critical Review of Commitment-Making Strategies in Environmental Research'. *Environment and Behavior*, 45(1), 3–34.  
<https://doi.org/10.1177/0013916511411477>.

For a specific example of a personal commitment contract without a penalty leading to greater completion of a task, see: Savani, M. M. (2019). Can commitment contracts boost participation in public health programmes?. *Journal of Behavioral and Experimental Economics*, 82.

electricity and gas supply. Once suppliers have been informed which of their consumers have agreed to these measures, they would reach out to the consumer to book an appointment.

### Benefits of this approach

Sharing information on which consumers have agreed to an installation would be mutually beneficial for all suppliers, giving them further opportunities to install smart meters. From a behavioural insight perspective, this eases the consumer journey (as the supplier would reach out to them), and therefore would likely lead to greater smart metering installations than Option 1.

### Considerations

We are keen to hear from industry whether there is a practical way of implementing this approach across the schemes while avoiding any significant impacts on scheme deliverability, including the most appropriate routes for data sharing. We have detailed two sub-options – a voluntary agreement for a smart meter installation (option 2a) and a mandatory agreement for a smart meter installation (option 2b) in table 2 above.

If this agreement is voluntary (i.e. a consumer could receive retrofit measures without agreeing to have a smart meter installed), we understand it may be difficult for suppliers to identify which consumers have agreed to have a smart meter installation, given the challenges associated with information transfer between the ECO4 or GBIS assessor and the supplier paying for the retrofits, and the supplier(s) of energy to the household. If this agreement is mandatory, the consumer would not be able to receive retrofit measures unless they agree to a smart meter installation. This installation could occur after the retrofit measures are installed.

Any data transfer would need to comply with UK General Data Protection Regulation under the Data Protection Act (2018).

As this option could involve requiring consumers to accept being contacted to arrange a smart meter installation appointment, we recognise that there is the potential for a negative impact on ECO4 and GBIS uptake. We therefore are also keen to hear from industry whether this approach would be useful or counterproductive in helping energy suppliers achieve their targets under both the Smart Metering Targets Framework and the ECO4 and GBIS obligations.

### **Consultation questions**

29. Our objective is to ensure consumers receive the maximum benefit from their retrofit measures by encouraging smart metering uptake. Which is your preferred method for achieving this aim and why?
- Option 1 – Voluntary consumer pledge
  - Option 2 – Consumers agree smart meter installation (to be arranged by their energy suppliers)
  - Neither – the current process of providing smart meter advice to ECO4 and GBIS consumers should remain as it is now
  - An alternative approach – please provide details of how your preferred approach is practicable for scheme deliverability and data privacy

- No view

30. If Option 1 is your preferred option:

Were Option 1 to be implemented, how would you refine the approach to maximise its effectiveness? For example, what is the correct point to contact consumers?

31. If Option 2 is your preferred option:

Please provide descriptions of how this methodology could operate in practice for a) voluntary and b) mandatory agreement to a smart meter installation to receive retrofit funding. Please include information on data sharing routes, and how adverse impacts on deliverability can be minimised.

32. Do you think that Option 1 would impact scheme delivery for ECO4, GBIS and/or smart meter targets?

If yes, please provide evidence to support your response.

33. Do you think that Option 2 would impact scheme delivery for ECO4, GBIS and/or smart meter targets if it involved either:

- Option 2a) voluntary agreement for a smart meter installation; or
- Option 2b) mandatory agreement for a smart meter installation?

If yes, provide evidence to support your response.

## Solar PV batteries

Currently in ECO4, households can benefit from solar PV as a measure where their home already has a hydronic heat pump, electric storage heater or an electric heating system with a manufacturer responsiveness rating of 0.8 or above when assessed against SAP, or has one installed as part of the same ECO4 project.

A solar photovoltaic (PV) battery is not recognised within RdSAP2012. However, it was included within the RdSAP10 specification<sup>28</sup>. We are aware that, because there is no differentiation between electricity import and export tariffs in RdSAP10, any solar PV battery installation will not lead to an increase in a home's overall SAP score and therefore the measure would not generate an ECO4 score. Consequently, when RdSAP10 goes live it may not be cost effective to install solar PV batteries in ECO4. However, households could still benefit from a reduction in heating costs by installing them as part of an ECO4 project. The benefits to the household could be realised, for example, where a household chooses to cover the cost or contribute to the cost of installing a solar PV battery to their new or pre-existing solar PV system during an ECO4 retrofit.

<sup>28</sup> <https://files.bregroup.com/SAP/RdSAP10-dt13.02.2024.pdf>

## Rural area definition

Some ECO4 and GBIS rules apply differently to projects in 'rural areas'. The ECO4 Order interprets rural areas using classification datasets published in 2013 by the Office for National Statistics (ONS)<sup>29</sup> for England and Wales and in 2018 by the Scottish Government for Scotland.<sup>30</sup> The GBIS Order uses the interpretation found in the ECO4 Order. In practice, the ONS Postcode Directory look-up is used to check the classification for any specific household in England, Wales or Scotland.<sup>31</sup>

Both datasets are expected to be updated later this year to reflect the most recent census data available. No significant methodological changes are expected, although there may be small changes to the rural-urban classification of output areas. To ensure ECO4 and GBIS use the most up-to-date datasets, we plan to update the “rural area” interpretation the ECO4 legislation to reflect the updated datasets accordingly.

There is likely to be a gap between the publication of the ONS and Scottish Government’s next datasets which are expected later this year and the update to the “rural area” definition in ECO legislation which is expected to come into effect in 2025. Consequently, there is likely to also be a period where scheme participants are unable to use the updated datasets and ONS Postcode Directory look-up to determine eligible rural properties. To address this, access to a “frozen” version of the datasets currently referred to in legislation will remain available via the ONS website with an accompanying user guide.

If a gap between the dataset update and legislation coming into force materialises, it would be necessary to consider transitional arrangements for any ECO4 and GBIS projects that straddle the definition update in legislation. There are a couple of options for the transitional arrangements:

- A) The transition could be based on the date of the project pre-retrofit assessment. Under this option, legislation would allow any ECO4 and GBIS projects with a pre-retrofit assessment completed before the date when legislation is updated to use the older rural datasets.
- B) Alternatively, the transition could be based on whether a project has been completed and notified to Ofgem before the legislation comes into force. Under this option, any ECO4 and GBIS projects that have been started before, but completed and notified after the legislation comes into force, would be required to refer to the new rural datasets.

Regardless of the transition option, all ECO4 and GBIS projects started after the legislation comes into force would be required to refer to the new rural datasets.

### Consultation questions

34. Do you agree with our proposal to update the “rural area” definition in line with the planned ONS and Scottish Government updates?
35. If transitional arrangements are required, which transition option would you prefer?

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<sup>29</sup> The 2011 rural/urban classification - Office for National Statistics <https://www.ons.gov.uk>

<sup>30</sup> The Scottish Government Urban Rural Classification 2016 ([www.gov.scot](http://www.gov.scot))

<sup>31</sup> <https://onsdigital.github.io/postcode-lookup/>

- Transition option A
- Transition option B
- An alternative approach
- No view

Please provide evidence to support your response.

## Buy-Out

The 2020 Energy White Paper set out the intention to consult on how supplier thresholds can be removed from ECO while enabling small suppliers to participate in ECO without incurring disproportionate costs. In the 2021 ECO4 consultation, we introduced the Buy-Out mechanism as our approach to achieve this, and its requirement for new primary powers.<sup>32</sup> These primary powers were then enacted in section 214 of the Energy Act 2023.<sup>33</sup> However, we are not proposing to reduce the supplier volume thresholds in ECO4 and GBIS, nor introduce a buy-out mechanism to these schemes. The strategic case for Buy-Out has changed since the 2021 ECO4 consultation, with many suppliers below the threshold leaving the market. We may further consult on options where there is a strategic case to introduce a Buy-Out mechanism in a future ECO scheme.

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<sup>32</sup> <https://www.gov.uk/government/consultations/design-of-the-energy-company-obligation-eco4-2022-2026>.

<sup>33</sup> <https://www.legislation.gov.uk/ukpga/2023/52/part/7/crossheading/reduction-targets-carbon-emissions-and-homeheating-costs>.

## Part 2: Pay-For-Performance

### Chapter 2.1: PFP introduction

PFP approaches, also known as ‘in-use performance’, use advanced measurement methods to better assess the performance delivered by energy efficiency measures. These are informed by monitoring hardware, e.g. smart meters and in-home temperature sensors, and move beyond assumed improvement in energy efficiency under more generic approaches such as SAP and RdSAP.

Internationally, an increasing number of jurisdictions are utilising performance data from smart meters and other technological developments to drive better quality and more cost-effective energy efficiency retrofits.<sup>34,35,36</sup> In GB, this market could be transformed by an ECO PFP programme.

In ECO, PFP also has the potential to transform delivery of energy efficiency retrofit by rewarding participating suppliers for monitored improvement in home energy efficiency rather than based on only estimated improvement. This would, in theory, incentivise industry to deliver higher quality retrofits.

Government is committed to ensuring low-income households have access to sustainable, low carbon warmth as part of a fair transition to net zero. The ECO schemes (ECO4 and the GBIS) support this aim by reducing heating costs via energy efficiency improvement, reducing fuel poverty. A PFP approach can support these objectives by increasing the quality of energy efficiency measures delivered through the schemes.

PFP in ECO4 and GBIS offers an opportunity to further test the Smart Meter Enabled Thermal Efficiency Ratings (SMETER)<sup>37</sup> method and the use of heat transfer coefficient (HTC)<sup>38</sup> as an in-use performance metric in an existing government energy efficiency scheme.

Beyond SAP, retrofit improvement can be assessed through a variety of advanced methods, e.g. via co-heating testing,<sup>39</sup> air tightness testing, and change in household energy consumption. In ECO PFP, we have opted to use the SMETER method due to the combination of its low-cost, resilience to ‘comfort taking’, and that it has been tried and tested via the Department for Energy Security and Net Zero’s (DESNZ, or ‘the Department’) Technical

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<sup>34</sup> For California, see Marin Clean Energy’s Market Access Program Implementation Plan at <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/energy-efficiency/market-access-program/implementation-plan/mce-implementation-plan.pdf>.

<sup>35</sup> For Belgium, see <https://www.knaufinsulation.com/184-home-retrofit-makes-history>.

<sup>36</sup> See Green Finance Institute’s Metered Energy Savings report (page10) for a list of international examples <https://www.greenfinanceinstitute.com/programmes/ceeb/metered-energy-savings>

<sup>37</sup> SMETER refers to a methodology for calculating thermal performance in a property using input data from e.g. smart meters, property surveys, external weather data and in-home temperature sensors.

<sup>38</sup> Heat Transfer Coefficient (HTC) measures heat loss from a property through the walls, roof, floor, and windows in watts per degree temperature difference between inside and outside temperatures.

<sup>39</sup> A co-heating test takes place in an unoccupied dwelling and measures property HTC. To do this, a constant, raised and recorded, indoor temperature is maintained for a period of time (typically two weeks), with the average heat flow measured (typically using electrical heaters). See also: [https://www.leedsbeckett.ac.uk/-/media/files/research/leeds-sustainability-institute/coheating-method-for-whole-house-heat-loss/lsci\\_cebe\\_coheating\\_test\\_method\\_june2013.pdf](https://www.leedsbeckett.ac.uk/-/media/files/research/leeds-sustainability-institute/coheating-method-for-whole-house-heat-loss/lsci_cebe_coheating_test_method_june2013.pdf)

Evaluation of SMETER Technologies (TEST) project.<sup>40</sup> Learning from this pilot will inform the future direction of this work.

PFP approaches can provide actual data on home energy efficiency improvement. Where this shows no or very little improvement, this can help inform compliance activity, e.g. where audits take place, which could then increase compliance process reliability. PFP approaches could therefore reduce scheme administrative costs and result in more scheme spending on energy efficiency measures. Rewarding based on monitored improvement, i.e. determined by an in-use performance approach, recognises and so incentivises better quality installation and materials. Retrofits with issues, e.g. gaps in insulation, may then be easier to identify thanks to the availability of detailed performance data for each retrofit.

Over the longer term, PFP approaches, both more generally and in the context of ECO, can result in a range of benefits, including but not limited to:

- incentivising and rewarding higher performing products and installation standard practices beyond the high bar mandated by e.g. PAS 2035;
- better addressing solutions for housing defects, including hidden defects e.g. gaps in insulation, that might reduce the monitored score if left untreated;
- incentivising development of innovative and more effective measures;
- reducing the cost and increasing the reliability of compliance processes because of the availability of more detailed data specific to each retrofit;
- raising quality across the supply chain as manufacturers and installers compete in a race to the top to earn the biggest rewards;
- delivering low-cost interventions that were not previously well-incentivised;
- incentivising the development of new and improved in-use performance methodologies; and
- providing policy data and learning so an improved PFP mechanism could be included in future ECO schemes, where this aligns with scheme objectives.

## Introducing a new PFP programme

In 2018, we introduced In-Situ Performance (ISP) to ECO3. ISP was a monitoring mechanism that allowed suppliers to apply to Ofgem if they wanted to deliver monitored measures in ECO3. Suppliers delivering these measures received a score based on the deemed score for the measure or the actual performance, whichever was higher. However, no suppliers participated in this mechanism.

Based on engagement with suppliers, perceived barriers to participation included:

- An expectation that measures or retrofits in a significant share of households would underperform against SAP/RdSAP, indicating a potentially low rate of return;

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<sup>40</sup> For more information, see Annex B and <https://www.gov.uk/government/publications/smart-meter-enabled-thermal-efficiency-ratings-smeter-technologies-project-technical-evaluation>

- Comfort taking<sup>41</sup> by fuel poor households could mask the increased ‘performance’ delivered by installers. This would only occur if performance was measured in the change in the household’s actual pre and post-retrofit energy bills (as distinct from ECO score).<sup>42</sup> The comfort taking would then undercut the installer’s financial return;
- The upfront costs of investing in new IT systems for such a mechanism; and
- Much of ISP was left to suppliers to determine, e.g. selecting a methodology to be used in the mechanism, which many suppliers considered risky and subject to a requirement for specialist knowledge.

The proposals set out in this consultation comprise a heavily reformed approach that aims to remove those barriers to supplier participation listed above.

Our aim is to test how a reformed mechanism could achieve maximum value via the PFP programme, demonstrating the benefits of PFP and providing evidence to inform how it can be improved and deployed in any future ECO schemes and potentially other government-led energy efficiency schemes.

We would aim to use data from PFP, including delivery data, household and industry evaluation data, and feedback from participating stakeholders, to answer many research questions. This includes but is not limited to understanding: how best to drive industry participation in such mechanisms, the effectiveness of SMETERs in supplier obligations, the extent to which the expected benefits of PFP were realised, household experiences of PFP, and how best to minimise PFP-specific compliance issues and risks in future schemes.

Ultimately, we want to use this pilot to explore whether we could move away from scores and schemes that incentivise installers to demonstrate the minimum standard at minimum cost. We want every retrofit to deliver the highest feasible energy bill and carbon savings alongside a good consumer experience.

## ECO4 and GBIS PFP process

In the subsequent chapters of this consultation, we set out in detail our proposals for ECO4 and GBIS PFP. For ease, a high-level overview of Part 2 follows:

Through PFP, obligated suppliers would be able to get a score uplift for retrofits where, among other things, pre and post-retrofit monitoring has taken place in the property by an eligible SMETER provider. To be eligible, SMETER providers must submit an application to DESNZ, sponsored by an ECO-obligated supplier, which meets the criteria set out in chapter 2.2. Applications would be assessed by a PFP Panel that makes a recommendation on whether to accept or reject applications to DESNZ.

PFP involves additional parties and datapoints compared to standard ECO4 and GBIS retrofits. The data journey for PFP retrofits are therefore somewhat more complex than main scheme ECO4 and GBIS retrofits. For example, we propose that SMETER providers would directly lodge several datapoints with TrustMark associated with specific PFP retrofits. This is set out in greater detail in chapter 2.3. In particular, we also detail in this chapter our proposal to contract

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<sup>41</sup> Whereby a newly more efficient home’s occupants ‘spend’ their savings on higher energy consumption. This is a good outcome, particularly for those previously rationing consumption. This is sometimes also referred to as the ‘rebound effect’.

<sup>42</sup> ECO4 and GBIS PFP do not use this approach.



a third-party auditor to help ensure PFP monitoring and submitted HTC values are sufficiently robust, alongside PFP audit and compliance considerations more generally.

Any home that is already eligible for ECO4 or GBIS would be eligible for PFP, with some exclusions owing to a lack of data on how well SMETERs perform in these scenarios through previous trials. For this reason, homes with any of the following attributes are not eligible for PFP: are under 50 square metres, do not have relevant smart meters, use solid fuel heating, were built after 2006 in England and Wales or after 2007 in Scotland, are flats or are park homes.

PFP retrofits would be largely the same as any other ECO4 or GBIS retrofit, except that they must include delivery of either a wall or roof insulation measure as a minimum. Other measures are allowable in PFP retrofits in ECO4 and GBIS, subject to relevant scheme rules. PFP measure rules are set out in detail in chapter 2.4, alongside eligibility requirements.

PFP would be voluntary for obligated suppliers, however we propose an annual bill savings uplift for all PFP retrofits to drive participation. Bigger PFP uplifts are possible where SMETER monitoring shows that HTC improvement – relative to HTC improvement from RdSAP – crosses relevant thresholds. We also propose to offer a ‘hardware cost allowance’ to cover part of the costs of SMETER hardware (e.g. in home sensors). Overall PFP would be capped at 10% of each supplier’s obligation. More detail on PFP scoring is set out in chapter 2.5.

## PFP timings

Amendments to ECO legislation would introduce PFP, however, obligated suppliers would be able to partner with and sponsor SMETER applications after the response to this consultation is published and before the legislation is in force.

Beyond ECO4 and GBIS, we expect to continue the PFP mechanism into any successor ECO schemes with as few changes as possible to minimise complexity and cost to industry.

Industry parties interested in participating in PFP would need some time after we issue government’s response to this consultation to, at least, partner with SMETER providers, put relevant contracts in place, develop and submit SMETER applications and set up any necessary IT systems. This would need to be done before the 2025/2026 heating season so participating suppliers have enough time to deliver PFP retrofits in that period. We had aimed to issue this consultation earlier this year, however this was delayed by the timing of the 2024 UK General Election. As a result, the period in which industry parties can take these steps is shorter.

There is further some risk that our consultation, government response and regulatory timelines reduce this timeframe further, particularly where any of these are delayed due to factors outside of the Department’s control. Depending on the time likely to be available to industry post-government response, we may have to consider introducing PFP – based on those PFP proposals in this consultation – to any successor ECO scheme, rather than to ECO4 and GBIS. However, our preference is to introduce PFP to ECO4 and GBIS, as well as include PFP in any successor ECO scheme.

**Consultation questions**

36. Do you plan to participate in PFP in ECO4 and/or GBIS?

37. Where development time available to industry for PFP appears limited, would you favour government introducing PFP to ECO4 and GBIS or introducing PFP into any successor ECO scheme?

## Chapter 2.2: The SMETER method

This chapter covers our proposals for using the SMETER method in ECO PFP, the application process by which different SMETER providers can participate in PFP, and the criteria against which they would be assessed.<sup>43</sup>

Government uses the Reduced Data Standard Assessment Procedure (RdSAP) to estimate the energy performance of homes.<sup>44</sup> However, there is evidence that bill savings, as an RdSAP output, following retrofits are highly variable due to e.g. retrofit and measure quality, and assumptions used to assess the pre and post-retrofit performance differing from reality, e.g. variances in actual U-values from Standard Assessment Procedure (SAP) assumptions.<sup>45</sup>

Government sought views on a new Home Energy Model (HEM) to replace the current model, SAP, used to estimate the energy performance of homes.<sup>46</sup> While the introduction of HEM would not affect PFP in ECO4 and GBIS, opportunities offered by both in-use performance and HEM could enable any future ECO schemes to more reliably assess home energy performance.

### The SMETER methodology

SMETER refers to a methodology for calculating thermal performance in an occupied property using input data, e.g. smart meter data, property surveys, external weather data and in-home temperature sensors. This is fed into a SMETER algorithm to calculate HTC. SMETERs can use different combinations of input data and varying algorithms to calculate the HTC.

The lower the HTC, the better a building is at retaining heat. Using HTC has two benefits from the perspective of ECO:

- HTC measures how well a home retains heat and so aligns well with the objective of ECO: to deliver space heating savings to supported homes.
- It should correct for behavioural changes in energy consumption so household comfort taking poses minimal risk to industry's financial returns in PFP, noting industry concerns under ECO3 ISP.

The metered energy savings approach was considered; however this approach would be affected by household comfort taking, reducing the likelihood of industry participation.<sup>47</sup> DESNZ's SMETER trials also favour use of HTC and SMETERs as they provide a proof of concept that these approaches can accurately measure the HTC value in occupied homes.

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<sup>43</sup> By SMETER providers, we mean the party that owns and operates the SMETER algorithm. In some cases, SMETER providers may sub-contract agents to conduct certain activities, e.g. deploying and collecting monitoring devices, or they may conduct these activities in-house.

<sup>44</sup> SAP is also used by government to estimate home energy performance. RdSAP was developed for use in existing dwellings when the complete dataset for a SAP calculation is unavailable.

<sup>45</sup> U-value is the rate of heat transfer through a particular section of construction, e.g. a wall or window, in watts per square meter per kelvin. A lower U-value denotes better thermal efficiency.

<sup>46</sup> <https://www.gov.uk/government/consultations/home-energy-model-replacement-for-the-standard-assessment-procedure-sap>

<sup>47</sup> <https://es.catapult.org.uk/report/metered-energy-savings/>

Use of the SMETER method also addresses most of the barriers identified earlier with the ECO3 ISP approach: SMETERs account for household comfort taking, while SMETER methods have already been established and are commercially available, including potentially new SMETER-related products beyond those tested in the trials. This means products are available to suppliers interested in ECO4 and GBIS PFP, increasing competition and potentially leading to lower scheme costs and better outcomes for households. It would also be administratively simpler to apply PFP to a single family of methods, i.e. SMETERs, for measuring improved performance.

A SMETER-based PFP approach can improve outcomes by incentivising industry to target those homes with the greatest potential for thermal performance improvement; correct those defects hampering or at risk of hampering thermal performance; and focus on the combinations of measures that result in the most cost-effective overall improvement in thermal performance (and therefore space heating bill savings).

One drawback of SMETERs is that the monitoring of HTC cannot take place year-round but only when the home is being heated. As such, we expect most PFP retrofits to take place across the heating season: typically October to March, with pre and post-retrofit monitoring (which typically takes four weeks each) occurring in the same heating season. Parties could stretch this window by delivering more PFP retrofits in Scotland and the North of England, where heating periods are typically longer, or by installing measures outside the heating season, with pre and post-retrofit monitoring occurring in the heating seasons either side of retrofitting.

SMETER methods only work when the heating system is warming up the home. The indoor air temperature of the dwelling must be at least 7°C above its outdoor air temperature, on average, during the test period. This is to allow the SMETER method to accurately determine the heat loss from the home. For those periods where this temperature difference is not possible, SMETER providers would have to continue monitoring until their minimum monitoring period – as set out in their application – is met.

In designing a PFP programme for any future schemes we would consider the SMETER approach as well as others in light of the outcome of this consultation and pilot. The design of future PFP mechanisms would depend on a variety of factors, including scheme objectives, further technical developments and, crucially, insights from ECO4 and GBIS PFP.

#### **Consultation question**

38. Do you agree with our proposal to limit ECO4 & GBIS PFP to SMETER methods? If not, what approaches do you think we should allow and why?

## **The PFP application and approval process**

Any SMETER provider wishing to participate in ECO PFP can only do so via an application to DESNZ, which must be sponsored by an ECO-obligated supplier. The objective of the application process is to ensure SMETERs used in PFP are sufficiently accurate and to provide DESNZ and Ofgem with information to support compliance activity in PFP.

Applications would be assessed by a Pay-For-Performance Panel ('the Panel'), comprising DESNZ and Ofgem staff, and external experts. The Panel would recommend to DESNZ whether to accept or reject applications. Before recommending to reject any applications, the

Panel would provide feedback to applicants on areas where more information and/or improvement is needed.

A single PFP application process would cover both ECO4 and GBIS. An obligated supplier could sponsor multiple applications, while any obligated supplier could use any approved SMETER. A successful application would not commit sponsoring suppliers to deliver any number of PFP retrofits. PFP would remain voluntary, even for successful applicants.

Unsuccessful applicants could reapply to participate, using much of their original evidence where relevant, however they would need to demonstrate where their application had changed to meet the requirements for participation.

## Application scope

The core aim of the Panel would be to decide whether the application a) includes all information on the SMETER needed for quality assurance and compliance, and b) demonstrates the SMETER is sufficiently accurate at monitoring HTC.

Applications would therefore need to include at least the following information to satisfy criterion a):

- Information on the SMETER itself, including but not limited to the SMETER name and sponsoring supplier; length of monitoring periods pre and post-retrofit,<sup>48</sup> hardware and sensors used, sensor accuracy and their calibration and positioning; standard parties (not individuals) involved in the placement of hardware and their necessary training and qualification; input data used, its format, and how input data is sourced; and
- Information on (but not limited to) the steps and processes in place and parties involved in quality assuring reported HTC reads and input data, any way in which input data is filtered or removed from feeding into the output HTC and the rules associated with this, as well as the process for identifying anomalous HTC reads, and timelines for quality assurance processes.

Where a SMETER method is approved, it must use only the input data stated in its application and collect data for at least the minimum monitoring periods stated in its application when calculating HTC values in PFP retrofits.<sup>49</sup> Where a PFP retrofit was not monitored in line with that SMETER's (approved) application, the retrofit would not qualify for the PFP uplift (see scoring chapter).

Some SMETERs collect and use information about the property from the RdSAP assessment to calculate the HTC, e.g. the type and efficiency of the property's heating system and the floor area. Some SMETERs may also collect information from the occupants. This is known as survey data and is also considered part of the input data and must be set out in the application if used.

If an approved SMETER method is modified or updated (e.g. the SMETER algorithm itself is updated), there would need to be a further assessment by the Panel. We therefore propose

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<sup>48</sup> This must be linked to the SMETER's validation timeline, i.e. if validation is based on four weeks of data (as set by the SMETER), then monitoring should use at least four weeks of data.

<sup>49</sup> Each SMETER would 'monitor' a home before and after the retrofit takes place, building up several weeks (typically around four) of input data, that is then used to generate pre and post-retrofit HTC values, which would show the improvement delivered by the retrofit as monitored by the SMETER.

that any updates or modifications to SMETER algorithms should be notified to the Panel. The actions resulting from this assessment would depend on whether the change could impact on the accuracy or the quality assurance procedures of the approach. If the changes are minor and do not impact substantively on the approach, e.g. a software update which does not affect the HTC calculation or the reported information, the SMETER provider must still notify the Panel of changes. The Panel would then recommend to DESNZ whether the changes necessitated further assessment. If the changes could impact on the accuracy or the quality assurance of the approach, the SMETER provider would need to effectively re-apply to the Panel<sup>50</sup> before those changes could take effect, undergoing another accuracy assessment. To this end, SMETER providers would need to maintain a change history and version number for their algorithm, to track such changes.

One approach to manage this risk is for our third-party auditor (see chapter 2.3) to supply the same e.g. synthetic and/or real input data to the SMETER provider at intervals and ensure that the HTC outputs are the same in each case. This could be carried out through a meeting with the SMETER provider.

We propose to permit obligated suppliers to sponsor SMETER applications (and SMETER providers to submit them) after Government's response to this consultation is published but before the legislation is in force. Government would seek to provide a response to applications as quickly as possible. This would allow SMETER providers to submit well-informed applications while reducing the overall timeline ahead of PFP monitoring and retrofit taking place.

Further information on the application process would be set out in Government's Response to this consultation and in scheme guidance where relevant.

### **Consultation questions**

39. Do you agree with the PFP application scope we have proposed?
40. Do you agree with the proposed role of the PFP Panel?
41. What additional information should SMETER applicants be required to provide if anything, and why?
42. Do you agree with us that updates or modifications to SMETER algorithms should be notified to the PFP Panel?

In relation to criterion b), above, we propose that only sufficiently accurate SMETER approaches should participate in ECO and GBIS PFP. The application process would include an assessment of the accuracy of the relevant SMETER algorithm. For accuracy validation, SMETER technologies can be divided into two types:

- Type 1: These use some or all the following input data: Smart meter consumption data, weather data, in-home temperature data, property survey details and occupancy numbers.
- Type 2: Those methods requiring further data to Type 1, e.g. heat meter data.

See Annex C for diagrams of the Type 1 and Type 2 application processes.

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<sup>50</sup> Where relevant, information from that SMETER's previous application could be reused.

## Type 1 SMETER technologies

We propose to validate the accuracy of Type 1 SMETERs by using either synthetic datasets, real datasets from past field trials or a mixture thereof. DESNZ would administer this process, including procuring data, where relevant. Whether we use a synthetic or real dataset or both, input data would be fed into the applying SMETER algorithm to generate an HTC value. This value would then be compared to the known HTC value for either the home or the synthetic dataset. A comparison against multiple synthetic datasets or homes would be carried out to allow a robust evaluation.

The following process is proposed for approaches to test SMETER accuracy:

- i. Before submitting their application, the SMETER provider would specify to the Panel what input data is needed e.g. the type of monitored data, and the frequency and period of any monitored data.
- ii. Datasets would then be provided to the SMETER provider for different test cases, which match the input data used by that SMETER provider. The SMETER provider would then pass this data through their SMETER algorithm and provide the HTC value for each test case.
- iii. DESNZ or a DESNZ contractor would then compare the submitted HTC values against the actual HTC values for the test cases and assess the accuracy of the SMETER method (see 'Accuracy criteria' below), which would inform the Panel's wider decision on the application.

Using a real dataset would be limited by the number of homes in the relevant field trial/s, while a synthetic dataset would be near limitless in this regard. Real datasets could also involve data or even homes known to applicants or other commercial parties, allowing them to work out some or all the HTCs without calculation, particularly where the real dataset is related to published materials. However, field trial data could be accompanied by real survey data, which some SMETER providers use in their HTC calculations, noted above. While helpful, this could also raise the risk that HTC is unpicked rather than calculated.

If we were to take a synthetic data-based approach to testing SMETER accuracy, we would opt not to supplement this with survey data. While a method for creating synthetic input data (excluding survey data) that could be used to test SMETER accuracy exists, a bespoke and robust method to match the synthetic data with associated survey data does not exist. Creating such a method would be a significant exercise that may itself introduce inaccuracy into the accuracy assessment. The synthetic data would therefore only include gas and electricity consumption, internal temperature, external temperature and solar irradiance.

Our preference is to use a combination of both real and synthetic datasets to test applicants. This has the advantage of being compatible with survey data, for those approaches using it, while also including a test using data parties have no possibility of unpicking. Further, we would take steps to 'mask' any real datasets used so they appear unknown to all parties tested, including any SMETER providers or their partners that could be familiar with the dataset(s). Both accuracy criteria described below would be used to assess the HTCs predicted by SMETER providers against both datasets (i.e. real and synthetic), with relevant survey data accompanying the real (but masked) dataset where relevant.

## Type 2 SMETER technologies

Some SMETER methods (Type 2 SMETERs) may use additional input data to that available from the datasets identified above. Hence, the Type 1 approach may not be suitable by itself for the validation of Type 2 SMETERs. We may still require Type 2 approaches to undergo the above accuracy test but recognise that the results for Type 2 SMETERs may be an underestimate of their accuracy.

In this case, the following process is proposed:

- The Type 2 SMETER undergoes the accuracy test set out above.
- The Type 2 SMETER provider has an initial meeting with the Panel to understand its technology and discuss potential approaches to validation. An approach and key evidence are agreed.
- The Type 2 SMETER provider obtains from a third party - that is demonstrated to be expert, reputable and independent of the SMETER provider - an assessment measuring the accuracy of its approach, captured in evidence. The evidence and assessment would reflect that agreed between the Type 2 SMETER and the Panel in step ii) and would be submitted to the Panel alongside other necessary information (listed under 'Application scope' section above).

The Panel would evaluate the accuracy of the SMETER method based on the evidence provided. Type 2 SMETERs would have to meet the same level of accuracy to that required of Type 1s to the extent possible.

We considered an alternative process for Type 1 and Type 2 SMETERs whereby they might solely demonstrate the accuracy of their methodology through predicting the energy consumption in monitored homes. We opted against such an approach at this time on the basis that:

- We would need a reliable way of benchmarking the homes besides the SMETER's predicted HTC, which would generate cost;
- We would expect there to be significant time and cost involved if we recruited homes and carried out testing for this purpose;
- If the SMETER provider (or an organisation on their behalf) had recruited the homes and carried out the testing, a new system would need to be set up to assure that the SMETER made those predictions 'blind', i.e. the SMETER provider did not know the home's true energy consumption; and
- ECO PFP is proposed to operate based on HTC improvement, not actual energy consumption savings; accuracy based on the latter metric would not assure us that the SMETER was sufficiently accurate in predicting home HTC.

## Accuracy Criteria

We want to encourage the development of PFP methodologies that are sufficiently accurate, hence our preference to set accuracy minima for prospective SMETER applicants in ECO4 and GBIS PFP. Given our use of RdSAP assessments in the schemes already, and their role



in setting the score baseline in PFP (see chapter 2.5), our accuracy minima would be of similar accuracy to RdSAP assessments, as measured during the TEST project.

Two commonly used metrics to assess accuracy are below. These could apply to both Type 1 and Type 2 approaches.

- Normalised mean bias error (NMBE) quantifies the magnitude and direction of the average bias in the calculated HTC across a sample. This is a measure of trueness, or systematic agreement, of a measurement and is ideally zero; and
- Coefficient of variation of the root mean square error (CVRMSE) is a comparative measure of the precision of the calculated HTC across a sample. A lower CVRMSE is better.

Based on data from the TEST project, we have opted to require that Type 1 and Type 2 SMETER providers meet or surpass the following: (i) an NMBE of between -5% to +5%, and (ii) a CVRMSE of 0 to 20%. These accuracy minima are broadly in line with that set by a commercial RdSAP assessment. For Type 1s, this would be tested via results against the dataset noted above. For Type 2 SMETERs, this would be demonstrated in an assessment from an independent, expert and reputable third party, though as noted above, we would still ask Type 2 SMETERs to provide HTC predictions against the same dataset as Type 1s.

We consider that the above metrics for measuring accuracy would also capture, to some extent, the repeatability of each methodology. An alternative, administration-lite approach for protecting repeatability, compared to e.g. setting repeatability minima, is to set a minimum length period for pre and post-retrofit monitoring of e.g. 28 days. We propose to require that SMETER monitoring takes place for a minimum of 28 days pre-retrofit and a minimum of 28 days post-retrofit. This 28-day minimum period would not have to be consecutive, given some days may need to be omitted due to poor data quality, nor would this period count those omitted days. However, the wider monitoring period would have to be consecutive to minimise risk of 'cherry picking' of data, for example, for pre-retrofit monitoring, two weeks from September, then two more weeks from December would not be acceptable. Pre-retrofit monitoring then post-retrofit monitoring would not be consecutive as installation has to occur between them. SMETER providers should be ready to justify any gaps in monitoring data for a given property. To ensure they have sufficient monitored data, SMETER provider may wish to monitor a given property for e.g. five or six weeks pre and post-retrofit to account for any necessary omitted days.

## Quality assurance

Audit and monitoring would take place on ECO PFP retrofits and associated data fields (see chapter 2.3) by TrustMark, Ofgem, DESNZ contractors and other parties. Alongside this, SMETER providers would conduct ongoing quality assurance on the monitored HTC reads they produce for ECO PFP retrofits, as set out in applications. The application must include, at the least, information on how SMETER providers would detect anomalous HTC reads.<sup>51</sup>

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<sup>51</sup> Where anomalous reads are found, SMETER providers should make the supplier sponsoring the retrofit aware, as well as the relevant Retrofit Coordinator.

### **Consultation questions**

43. Do you agree with our approach for validating the accuracy of Type 1 SMETERs? If not, what alternative do you suggest?

44. Do you agree with our approach for validating the accuracy of Type 2 SMETERs? If not, what alternative do you suggest?

45. Should we use a synthetic dataset, a real dataset or both when assessing SMETER accuracy, or another approach entirely? Please explain your answer.

46. If we were to rely on synthetic datasets for assessing SMETER accuracy, do you agree with our preference to exclude survey data? If not, why not?

47. Do you agree with our proposal to set an NMBE accuracy minima of between -5% to +5% and set a CVRMSE accuracy minima of 0 to 20%? If not, what alternative rate or metric do you suggest?

48. Do you agree with our proposal to set accuracy minima using both NMBE and CVRMSE to assess the accuracy of Type 1 and 2 SMETER approaches? If not, what alternate do you suggest for either or both of Type 1 & 2 methods?

49. Do you agree with our preference to capture methodology repeatability via NMBE and CVRMSE? If not, how else should this be tested at application?

50. Do you agree with our proposal to require SMETER monitoring to take place for a minimum of 28 days pre-retrofit and 28 days post-retrofit?

51. Do you agree that SMETER providers (or their sub-contractors) should conduct the ongoing quality assurance we have stated? Besides anomaly detection, what else do you think this should comprise?

52. What other aspects, if any, of the ECO PFP application process, as proposed, do you disagree with or wish to provide further thoughts on?

## Chapter 2.3: Data journey and audit

This chapter outlines our proposals for the PFP data journey, use of data within the PFP programme, and how it would be audited. A diagram of the data journey is available in Annex D.

### The installation and data journey

Each ECO4 and GBIS retrofit involves at the least an obligated supplier, installer (sometimes more than one for a given retrofit), a Retrofit Assessor (RA) and a Retrofit Coordinator (RC), as well as the household. Sometimes the RA and RC are the same individual and may or may not be employed by the installer. Ofgem, TrustMark and TrustMark-licensed scheme providers are associated with all retrofits.<sup>52</sup> PFP retrofits would involve all these parties, as well as SMETER providers and potentially a third-party auditor appointed by DESNZ to ensure lodged HTC values are robust.

Alongside most data already used for main scheme retrofits, e.g. that associated with PAS 2035 or to prove eligibility, the following additional data types would be processed by some or all the above parties: SMETER input data (see chapter 2.2); SMETER-derived HTC values (see chapters 2.2 and 2.5), and RdSAP-derived HTC values (see chapter 2.5).

The following table sets out which parties are likely to process this data. The number in the columns with the above data headings signifies the order in which these parties are likely to process this data. In some cases, the order in which these parties process the data may differ to the below, reflecting differing industry processes and contractual arrangements. Asterisks (\*) below signify where parties may access information in some circumstances, e.g. as part of a contract. As data subjects, households are not included in table 3 below, however they may access information in some circumstances, e.g. according to contract.

**Table 3: Potential data processors**

Processor	SMETER input data	SMETER-derived HTC	RdSAP-derived HTC
RA/RC			1
SMETER provider	1	1	*
TrustMark		2	2
TrustMark scheme providers			3
Ofgem		3	4

<sup>52</sup> A very small number of ECO4 retrofits are out of scope of PAS 2035 and therefore TrustMark, however this does not apply to PFP retrofits, which by necessity are in scope of PAS 2035.

Processor	SMETER input data	SMETER-derived HTC	RdSAP-derived HTC
DESNZ PFP auditor	2 <sup>53</sup>	4	5
Supplier	*	*	*
Installer		*	*

In each retrofit, SMETER providers and installers - the latter often including RAs and RCs - would need to work together to coordinate the following: the collection of input data in the pre and post-retrofit monitoring periods, the Retrofit Assessment (including pre-retrofit RdSAP assessment), the installation itself, post-retrofit RdSAP assessment, collection of any equipment, and the transfer of input data to the SMETER provider. The relevant obligated supplier may need to facilitate this through their contracts with SMETER providers and supply chain parties.

Our expectation is that the RA, alongside their duties under PAS 2035, would collect property details for the SMETER provider alongside the pre-retrofit survey. Most of the property details needed by SMETER providers would already be collected as part of the RA’s standard survey. The RA (or another relevant agent) may then need to upload the property details and any other relevant building data to the SMETER provider’s system. The order in which PFP data is collected and the party that collects that data is up to industry to determine, provided this is otherwise in line with scheme requirements.

Monitoring equipment may be deployed at the property, in line with the approach set out at application, as the pre-retrofit survey takes place, e.g. by the RA to reduce the number of visits needed. We assume that monitoring equipment would either include its own data storage, with the data collected in person, or be able to transmit data via e.g. mobile signal, in line with the protocol submitted as part of the SMETER application.

SMETER data in conjunction with PAS 2035 lodgement data would be used by TrustMark and DESNZ to verify and provide supporting evidence for the effectiveness of in-use performance measurement.

## Data collection requirements

As part of the PFP application process, SMETER providers must state the input data, type, duration and granularity needed for their algorithm to generate the HTC. This data must be collected in each PFP retrofit thereafter where that SMETER is used, including from any relevant sensors installed in homes, and all stated input data fed into the SMETER software, so that the monitoring activity is in line with the application.

<sup>53</sup> As discussed later in this chapter, the auditor may only require this information for a sample of retrofits across each SMETER. SMETER providers and their agents must ensure households provide consent for their data to be passed to the third-party auditor for audit purposes, otherwise the PFP uplift would not be granted for those retrofits without this permission.

The SMETER method would have been validated during the application process based on details of the number and type of each sensor, the rooms that the sensors are placed in, the frequency of data collection (e.g. every 30 mins) and the data period (e.g. a month). All subsequent uses need to comply with this as a minimum standard e.g. at least as many temperature sensors must be installed in the dwelling as were used for the validation to assure the accuracy of the results.

Different SMETER methods may require different numbers of sensors, of different types, installed in different locations and recording data at different frequencies. The number, type and placement of sensors may also depend on the type of dwelling and additional sensors may be required in some circumstances. This would only be permitted where differences are 'above and beyond' those stipulated in the application, e.g. more sensors are used per room.

After pre-retrofit monitoring ends, monitoring equipment may be redeployed at another dwelling, or industry parties may prefer to leave these in-situ until post-retrofit monitoring is completed. However, monitoring equipment must be placed in the same location pre and post-retrofit in each home unless this is impossible, e.g. as measures installed in the retrofit prevent this. Some parties may prefer to leave equipment in place during the retrofit, so equipment is disturbed as little as possible.

SMETER providers must retain input data for all PFP retrofits so this can be called upon for auditing up to 12 months after the end of the schemes. SMETER providers may be required by contract to provide input data to the relevant supplier, allowing the supplier to carry out their own due diligence, e.g. audit.

We assume that SMETER providers access smart meter data via DCC Other Users or via hardware connected to the smart meter. The SMETER provider or its agent would need to provide proof to the DCC Other User that the resident consents to access of their smart meter data.

Energy and heat metering requirements are set out in chapter 2.4.

## Monitoring and equipment requirements

Where an appropriate in-use performance accreditation scheme is available, it may be the case that the requirements set out immediately below are subsumed by that scheme. For more information, see "Accreditation scheme(s) for SMETERs", later in this chapter.

In the absence of such a scheme, and in addition to requirements proposed elsewhere in this document, SMETER providers would:

- Provide Installation manuals/guides to the householder on how to interact with the sensors, avoid issues, e.g. opening windows when the heating is on, and troubleshooting assistance;
- Inform occupants about the type of data being collected, e.g. temperature, and energy, and the duration of the data collection period;
- Arrange with the occupant for decommissioning and removal of stand-alone sensors shortly after the data collection period and no more than three months after data collection;

- Make sure there is no pipe work/electrical circuits in the wall behind the sensor where sensors are fixed;
- Exercise care when installing sensors to ensure, where they are fixed to surfaces, that they are attached using non-permanent, readily removable adhesive material. Mechanical fixings should be avoided, unless e.g. nylon straps are used, while any marks or paintwork should be repaired, repainted or otherwise remedied immediately after sensors are removed;
- Agree with the occupant placement and fixing of sensors to confirm their acceptance of the selected locations and method of attachment;
- Calibrate sensors in line with SMETER application information and calibrate prior to pre and again prior to post-retrofit monitoring, and test their connection with smart meters, thermostats or other in-home devices prior to monitoring where such connections are used;
- Where standalone equipment is battery powered, check to ensure both adequate battery life and data capacity for the selected recording period and intervals;
- Calibrate standalone sensors that measure temperature in accordance with the manufacturers' recommended intervals and have minimum 0.1°C resolution and +/- 0.5°C accuracy;
- Calibrate standalone sensors that measure relative humidity in accordance with the manufacturers' recommended intervals and have minimum 0.5% resolution and +/- 3% accuracy;
- Where standalone sensors are used, discount the data collected for the first six hours of recording (post installation) whilst the sensors acclimatise;
- Avoid placing temperature sensors adjacent to other devices, particular any that have even a low heat output; near appliances that consume a significant amount of power or output heat such as ovens, fridges, dishwashers, boilers; near radiators and cooling systems of any kind; or in exposed sunlight via e.g. windows, skylights, or conservatories;
- Avoid installing sensors in rooms outside of the thermal envelope or inside bathrooms (due to steam from showers and baths or increased window opening);
- Monitoring devices should be placed in the same locations pre and post-retrofit to the extent possible;
- Install temperature sensors away from windows, ventilation units or any excess air movement; and
- Ensure sensors have free flow of air to sense temperature, so are not installed where potentially blocked by furniture, curtains, or other furnishings.

As discussed in the “Third party auditor” section later in this chapter, DESNZ may procure a third party to conduct compliance assessment and audit to mitigate any associated risks. This party could also be made responsible for assessing whether the above requirements are met in ECO PFP retrofits.

## HTC lodgement deadline for SMETER providers

We already set a retrofit time-limit for ECO4 main scheme retrofits, as well as set notification deadlines in ECO4 and GBIS. We plan to conduct auditing in PFP, for which the availability of HTC reads for PFP retrofits would be essential.

We therefore propose to require that HTC reads would need to be lodged by SMETER providers with TrustMark within two months of the retrofit completion date<sup>54</sup> for pre-retrofit HTC reads and 12 months of the retrofit completion date for post-retrofit HTC reads. However, SMETER-derived HTC values must be submitted by 30 June 2026 at the latest. The PFP uplift would only be awarded where these deadlines are met.

As the PFP uplift cannot be awarded before HTC reads are uploaded, we expect SMETER providers to upload them long before this deadline, however we recognise that in some cases post-retrofit monitoring could occur in the following heating season.

### Consultation questions

53. Do you agree with the likely data journey we have set out? If not, how do you expect this to differ?
54. Do you agree with the data collection proposals? If not, please explain your reason and proposed alternative(s).
55. Do you agree with the proposed deadlines of two and 12 months of the retrofit completion date for lodging pre and post-retrofit SMETER HTC reads, respectively? If not, please explain your reasoning and proposed alternative(s).
56. Do you agree with those stipulations set out under “Monitoring and equipment requirements” for SMETER providers that would apply in the absence of an appropriate accreditation scheme for SMETERs and in-use performance? What should be added or removed from this list if anything?
57. How might those stipulations set out under “Monitoring and equipment requirements” best be evidenced and compliance assessed?

## Data Storage

The RC and/or RA would also need to lodge all RdSAP assessments for PFP retrofits in TrustMark’s Data Warehouse as standard, alongside other information stored with TrustMark for PAS 2035 compliance.

Once SMETER providers have performed necessary checks and quality assurance, they would lodge the SMETER-based HTC reads – pre- and post-retrofit – in TrustMark’s Data Warehouse. SMETER providers would also need to state the retrofit ID, created by the RA when the pre-retrofit assessment was completed, so the SMETER-derived HTC reads can be

<sup>54</sup> This is the ‘date of completed installation’, i.e. the date on which the installation of the final measure in the retrofit was ‘complete’

associated with the correct retrofit. The same SMETER method must be used both before and after the retrofit. No PFP uplift could be granted where this was not the case.

We may also require SMETER providers to lodge SMETER version numbers and confidence ranges, also known as confidence intervals, for each HTC value with TrustMark. A confidence interval refers to the probability that a parameter will fall between a set of values. This would not inform scoring, as only one score for a retrofit is possible. If we excluded HTCs beneath a certain confidence range, industry parties could game confidence ranges to submit a value. Therefore, these values may only be useful for statistics purposes and to inform compliance activity. To allow SMETER providers to lodge necessary data, TrustMark would provide a portal to its Data Warehouse that SMETER providers could register to use.

TrustMark may use pre and post-retrofit HTC values from SMETER providers, in conjunction with pre and post-retrofit RdSAP assessments, to inform its own compliance processes. TrustMark would pass HTC reads for each retrofit (both SMETER-derived and RdSAP-derived) to Ofgem to calculate retrofit scores, as well as all other retrofit information Ofgem would normally access via TrustMark for ECO4 and GBIS.

To access RdSAP-derived HTCs, our preference is for TrustMark to obtain these directly from scheme providers, after RdSAP XMLs have been submitted for PFP retrofits. Direct access would also permit TrustMark to conduct broader compliance checks. One alternative approach is for industry parties to manually submit these values; however this is open to human error and fraudulent manipulation. Another approach is to require industry parties to lodge SAP worksheets,<sup>55</sup> however this would add burden to industry, Ofgem and TrustMark, requiring more intensive IT changes to facilitate it.

### Consultation questions

58. Should we require SMETER providers to lodge confidence ranges for each HTC value with TrustMark? As this would not inform scoring, what value do you think capturing this data would provide?
59. Do you agree with our preference for SMETER providers to upload HTC reads to TrustMark's Data Warehouse? If not, what alternate is preferable?
60. What other information should SMETER providers upload to TrustMark's Data Warehouse besides that stated?
61. Do you agree with our preference for TrustMark to access RdSAP-derived HTC values directly from scheme providers?

## Permissions and consents

Household participation in PFP would be voluntary. If households do not wish to share their data to facilitate PFP, they are not required to. In this scenario, a household could still benefit from a main scheme ECO4 or GBIS retrofit, if offered, though information sharing is also necessary for these. The information collected and processed for PFP retrofits would only be used by those parties that need it to facilitate the PFP process. In line with data minimisation

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<sup>55</sup> A SAP worksheet is provided by approved RdSAP software platforms when RdSAP XMLs are created. The worksheet contains a detailed breakdown of the calculations of the related RdSAP XML.



principles, parties should only collect information that is necessary for the task, including where required by Ofgem, TrustMark and Government.

Privacy notices should be shared by data collectors, which may be SMETER providers and/or installers, with households ahead of the PFP retrofit. These should be extended to cover all relevant PFP considerations, e.g. in terms of data collection; data processors; and allow for the necessary uses of that data. As above, the household would also need to consent to their smart meter data being accessed, where necessary.

The household must give informed consent for the data to be collected, prior to the commencement of the data collection. The SMETER provider, and potentially other agents involved in the retrofit, would be placed in the role of data controller as defined under GDPR and thus the responsibilities under these regulations would apply when collecting, processing, and retaining data from individuals. Data sharing agreements and privacy notices may be audited to check GDPR compliance. This helps to create the right sector conditions to ensure data is used by the supply chain only for agreed purposes.

A household withdrawing consent after a contract has been signed with the installer, agent, or SMETER provider could prevent the PFP retrofit going ahead after relevant parties have incurred costs, e.g. deploying hardware and monitoring. This could attract a contract cancellation fee to cover costs. This should be clearly flagged to households up front and before any works begin.

Government may use an aggregated and anonymised version of the data for a range of statistical and research purposes. This would include policy evaluation, improvement, research, and innovation along with a provision to enable cleansed and anonymised data to be shared to support policy and performance improvements. This would not include any personal data. Households would therefore not be identifiable from the dataset.

## Auditing and risk

Existing protections mitigate some of the risk introduced via PFP. However, as a new mechanism involving additional data, we expect to introduce further compliance assessment and audit to help us realise the benefits of PFP and reduce PFP-specific risks, in particular risk of intentionally gamed results.

The following activities would help to ensure the robustness of PFP:

- The application process set out in chapter 2.2;
- Accreditation (including auditing) of those collecting input data for the SMETER software, including deploying monitoring devices;
- Auditing of SMETER providers against their commitments in their PFP applications, e.g. monitoring periods and quality assurance activities; and
- Auditing of input data, SMETER-derived HTC values, and PFP retrofits under monitoring.
- Assessment, e.g. via but not limited to auditing, to ensure requirements proposed in this consultation are met.

We are consulting on the necessity of bullet two, noting no accreditation scheme is currently available. For bullets three, four and five, we expect to contract a third party to carry out these and potentially other activities, discussed below.

## Ofgem and TrustMark

Beyond risks specific to PFP, main scheme fraud and compliance risks in ECO4 and GBIS retrofits are mitigated largely through existing activity by Ofgem and TrustMark. Relevant data from PFP may supplement this activity. For example, TrustMark may use SMETER-reported HTC's to inform its compliance and audit activity, and that of TrustMark-licensed scheme providers.

Where the third party PFP auditor (see "Third party auditor" section, later in this chapter) finds issues, these would be escalated to Ofgem and TrustMark, to inform their own activity. For example, Ofgem's existing counter-fraud function may need to investigate outcomes in some PFP retrofits where fraud or gaming is suspected, or Ofgem could simply not award the PFP uplift where the SMETER provider has clearly not followed the necessary process in line with the information in their application or any other PFP mechanism requirements.

TrustMark and TrustMark-licensed scheme providers, on receiving lodgements and processing data, conduct fraud and gaming checks, including audit, to assess compliance with PAS 2035. This existing activity mitigates fraud and gaming risk across the main scheme and PFP. In particular, pre and post-retrofit RdSAP assessments are compliance assessed by TrustMark and TrustMark scheme providers, mitigating one of the likelier sources of fraud risk.

## Accreditation scheme(s) for SMETER providers

Ideally, one or more accreditation schemes for SMETER providers would be present in the market that would be appropriate for PFP and to which we could require adherence. An accreditation scheme would ensure that their members are competent to carry out SMETER testing and that they carry out tests to a good standard. This would help to mitigate risk associated with PFP. There are already accreditation schemes for other building performance evaluation, such as for EPCs and air permeability testing, that could provide a model for their application to SMETERs.

Where an appropriate accreditation scheme is not available in time for use in PFP, we would expand the activities undertaken by the third-party auditor, described below, to sufficiently mitigate risk. See also the "Monitoring and equipment requirements" section, above.

Where an accreditation scheme exists that is appropriate for ECO PFP, we could require adherence to it. However, where we require adherence to any accreditation scheme or schemes for PFP-participating SMETER providers and their agents, those accreditation schemes would be expected to meet the following criteria:

- Accreditation schemes would operate under a set of Scheme Operating Rules.
- Schemes set their own prices for members, but the support activities (technical bulletins, telephone and email support, auditing and complaints management etc) are funded from these revenue streams.

- Scheme Operation Rules would be developed by a committee that comprises relevant stakeholders to define and document the requirements, rules and procedures to be followed. This could build from the approach adopted by existing accreditation schemes.
- Accreditation schemes would themselves have UKAS-accreditation or formal recognition by an equivalent independent entity.
- The Scheme Operating Rules would contain the competence and knowledge to be assessed and monitored relating to SMETER testing. An accreditation service provider, or providers, would also play a key role in training, surveillance and sanction.

In addition, all accreditation schemes would need to maintain a suitable quality management scheme to ensure that all assessors:

- hold minimum qualifications;
- ensure test equipment has been calibrated, set out in an approved procedure;
- adhere to a code of conduct;
- publicly declare any relevant commercial relationship. The inference is that users of the SMETER test result might have more confidence when the assessments are done independently;
- be insured;
- undergo a minimum amount of continuing professional development.

Accreditation schemes would also need to:

- keep a public register of accredited assessors;
- provide a technical support service to members;
- manage complaints that cannot be resolved by the assessor;
- undertake random audits of an assessor's work to ensure standards are followed.

Audits are a mandatory requirement and are used to ensure members are complying with scheme requirements and identify areas for personal development and continuing professional development.

The SMETER provider associated with the retrofit would need to lodge with TrustMark the accreditation scheme membership number for the agent associated with the retrofit.

## Auditing of SMETER software providers

### Third party auditor

SMETER-derived HTC's lodged with TrustMark by SMETER providers do not fall into scope of PAS 2035. These values also determine the size of the PFP uplift; therefore some parties may be incentivised to artificially inflate them to obtain more score. As such, we consider it necessary to contract a third party to audit PFP retrofits. This auditing could involve many different activities, including:

- Ongoing audit on each SMETER provider, where they are associated with completed PFP retrofits, to verify that quality assurance processes are being correctly followed in practice (as set out at application stage) e.g. how anomalous HTC reads are identified.<sup>56</sup> This audit could be either face-to-face or remote to assure relevant processes are followed. For example, input data of different quality could be provided to the SMETER with the auditor present and able to confirm if anomalous HTCs are identified.
- Other application stage information could be verified via audit to confirm that the approach conforms with that set out at application e.g. input data used.
- Input data from a sample of retrofits from each SMETER provider could be put through a third party SMETER to check the reliability and accuracy of results. Input data could also be scrutinised to check it conforms with e.g. the DCC's records or Met Office records.
- On-site visits could be conducted to mitigate specific risks, e.g. installers carrying out activities like closing ventilation devices to reduce the overall ventilation rate and improve the HTC value.
- Assessment that PFP requirements, as proposed in this consultation and which are confirmed as adopted via the government response to this consultation, are complied with.
- Using a batch of synthetic input data – different to that used at the application stage – to validate a SMETER mid-scheme. This could be conducted either by the auditor or by an alternative third party (where the latter is the same as the party carrying out SMETER accuracy assessment at application stage).

Where a SMETER provider is found to have fraudulently manipulated scores in PFP, they could be reported to the Police and Action Fraud, while any suppliers partnering with the SMETER provider may be prevented from delivering further PFP retrofits in ECO4 and GBIS involving the relevant SMETER provider. The PFP uplift would not apply to affected retrofits.

### Consultation questions

62. If an accreditation scheme relevant to SMETERs and in-use performance is available, do you think we should require adherence to it in PFP?
63. If an accreditation scheme relevant to SMETERs and PFP is not available, do you think this is sufficiently mitigated by the activities of Ofgem, TrustMark, TrustMark-licensed scheme providers and the proposed activities of a third-party auditor in PFP? If not, what further activities are necessary to assure PFP in the absence of an accreditation scheme?
64. Do you agree that any accreditation scheme to which we stipulate adherence in PFP should meet the criteria set out under the "Accreditation scheme(s) for SMETER

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<sup>56</sup> We assume that where anomalous HTC reads are found pre-retrofit, the monitoring could continue or the retrofit could be delivered as a main scheme retrofit; where anomalous HTC reads are found post-retrofit, both pre and post reads are lodged with TrustMark, with the latter flagged as anomalous.

providers” section? If not, what do you think we should add and/or remove from the criteria?

65. Do you agree with the process we have proposed for updates to SMETER providers’ software and algorithms? What else should be required of them in these instances, if anything?
66. Do you agree with the validation process? If not, please explain your reasons and proposed alternative(s).
67. Do you agree with the auditing and risk management process? If not, please explain your reasons and proposed alternative(s).
68. How can the risk that an installer reduces intended ventilation (as a means of artificially improving the HTC value) best be mitigated?

## Chapter 2.4: Measures and eligibility

This chapter sets out our PFP proposals on household and measure eligibility, and measure-specific installation rules. The main proposals in this chapter are:

PFP would only be available to households already eligible for ECO4 and GBIS, excluding park homes, flats, homes without smart meters, solid-fuel heated homes, homes under 50 square metres and homes built after 2006 in England and Wales, and after 2007 in Scotland.

The same measures are eligible in ECO4 and GBIS PFP as ECO4 and GBIS main schemes; heating and fabric measures are therefore permitted in PFP. ECO4 and GBIS PFP retrofits must include at least one of the following measures: solid wall insulation (SWI); cavity wall insulation (CWI); flat roof insulation (FRI); pitched roof insulation (PRI); room in roof insulation (RIRI).<sup>57</sup>

The ECO4 MR applies in ECO4 PFP and is needed to get full project score (FPS) and the PFP uplift.<sup>58</sup>

### Eligible measures

All eligible measures<sup>59</sup> in the ECO4 main scheme can be delivered in ECO4 PFP except park home insulation. GBIS PFP is limited to only one wall or roof insulation measure per retrofit given GBIS is currently a single insulation measure scheme. Under Chapter 1.1: Deliverability of this consultation, we are seeking views on allowing retrofits comprising both CWI and LI in GBIS. GBIS PFP would also permit these measures in line with the main GBIS scheme if this proposal is adopted. HCs are allowed in GBIS main scheme and GBIS PFP retrofits in low-income, owner-occupier homes only. Where changes proposed in this consultation concerning smart HCs in GBIS are adopted, GBIS PFP would also align with this. PFP eligible measures for both schemes are shown in table 4 below.

Only roofs without any pre-existing insulation can be insulated in GBIS PFP. Roofs with pre-existing insulation can be insulated in ECO4 PFP however this would not count towards the insulation minimum.

The measure range in GBIS PFP is limited to protect the accuracy of SMETER readings. SWI, CWI, FRI, PRI, and RIRI all tend to deliver greater annual bill savings than other insulation measures, even at the low end of the partial project score (PPS) matrix. Retrofits including or consisting of only one of these measures are therefore easier for the SMETER to detect via the home's HTC improvement than a single retrofit consisting of only e.g. LI.

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<sup>57</sup> Where CWI and SWI are concerned all uninsulated walls must be insulated; we understand this may mean a mix of party wall and/or hybrid wall insulation in some retrofits.

<sup>58</sup> The ECO4 MR states that SAP band F and Gs must be improved to at least band D, with E and Ds improved to at least C.

<sup>59</sup> [https://www.ofgem.gov.uk/sites/default/files/2023-08/ECO4%20Measures%20Table\\_0.xlsx](https://www.ofgem.gov.uk/sites/default/files/2023-08/ECO4%20Measures%20Table_0.xlsx)

**Table 4: PFP eligible measures**

Rule/measure type	ECO4	GBIS
PFP retrofit must contain one of the following to qualify for PFP uplift:	SWI, internal and/or external; CWI <sup>58</sup> FRI; PRI; or RIRI	
In addition, the retrofit can contain these other fabric measures, which should improve the property's HTC	LI Floor insulation (solid and/or suspended) Draught proofing High performance external doors Improved window glazing <sup>60</sup>	No other measures (though joint LI and CWI retrofits permitted in GBIS PFP if this proposal is taken forward in GBIS main scheme).
In addition, the retrofit can contain these heating measures, which would not improve the property's HTC but would generate a greater retrofit score overall	Boiler upgrades Boiler repairs Boiler replacement (like-for-like) First time central heating Heat pump (air or ground source) Electric storage heater (ESH) ESH repair ESH replacement (like-for-like) Renewable heating system District heating connection (DHC) HCs Solar PV	HCs in low-income group owner-occupied homes
Data Light Measures (DLM) or Alternative Methodology (AM) measures	Not permitted in PFP in either scheme	

<sup>60</sup> Improved window glazing is permitted only in circumstances where this is already permitted in the ECO4 main scheme. See Ofgem ECO4 delivery guidance, chapter 5.

We propose not to permit DLM or SAM measures in ECO4 PFP to reduce complexity. These measures are not permitted in GBIS main scheme or PFP.

## Boiler and ESH repairs and like-for-like replacements

ECO4 permits the repair or like-for-like replacement of broken efficient boilers and ESHs, which attract fixed rate uplifts of 140 and 40 annual bill savings (ABS), respectively. We propose to permit these in ECO4 PFP, though they would not improve HTC. Delivery of these measures is capped in ECO4. Where these measures are delivered in ECO4 PFP, they would contribute to the same cap. All other ECO4 eligible heating measures are permitted in ECO4 PFP.

We recognise that some broken heating systems (boiler, ESH, or otherwise) may prevent pre-retrofit SMETER monitoring from occurring. We could allow industry to deliver repair or like-for-like replacement of broken, efficient heating systems before 'pre-retrofit monitoring' begins. Industry would need to do the following here: a) ensure works are in line with PAS 2035; b) consider whether there is a risk the household might end the project early and therefore before the minimum insulation requirement and MR are met, impacting the retrofit score; and c) consider how long it would take to replace/repair the heating system, for pre-retrofit monitoring and the main installation to take place, and if this can be done inside the ECO4 retrofit time-limit, which applies in ECO4 PFP in the same way as in the ECO4 main scheme, and in accordance with scheme notification rules.

If we allowed industry to repair or replace efficient broken heating systems in PFP only before pre-retrofit monitoring and therefore before any insulation measures are installed, this would differ to the ECO4 main scheme insulation pre-condition requirement.

### Consultation questions

69. Do you agree with our preference to require GBIS retrofits to include only one of CWI, SWI, RIRI, FRI or PRI? If not, why not?
70. Do you agree with our preference to require ECO4 retrofits to include at least one of CWI, SWI, RIRI, FRI and PRI? If not, why not?
71. Do you think we should allow eligible heating measures to be delivered in ECO4 and GBIS PFP? If not, why not?
72. Do you agree with our proposal to allow repair and like-for-like replacement of efficient, broken boilers and ESHs in ECO4 PFP? If not, why not?

## ECO4 Minimum Requirement

ECO4 PFP would use the same MR as the ECO4 main scheme. Where the MR is not met, only deflated PPS can be awarded for the retrofit. The ECO4 PFP uplift would only be granted where the MR is met (according to the pre and post-retrofit RdSAP assessments); this is necessary to avoid the risk that the ECO4 PPS deflator cancels out the ECO4 PFP uplift. There is no MR in GBIS.



Our preference is not to permit consumer circumstances in ECO4 PFP on the basis the gaming/fraud risk (of parties looking to avoid meeting the original MR while still getting a sizeable PFP uplift) is higher. As exemptions to the MR can be more formally evidenced, we are still minded to permit these in ECO4 PFP. This means that an ECO4 PFP retrofit with a valid exemption to the MR could still receive the PFP uplift provided the retrofit a) included delivery of all possible, appropriate ECO-eligible measures and b) one of those measures was wall or roof insulation.

## Sub-obligations

PFP projects would contribute to sub-obligations, e.g. Low-Income Minimum in GBIS, and SWI and EFG minima in ECO4, in the same way projects do in the main schemes. This consistent approach reduces complexity and administrative burden and makes PFP more commercially attractive.

## Household eligibility

ECO4 and GBIS PFP would use the same household eligibility requirements, in terms of eligible benefits,<sup>61</sup> tenure and Council Tax bands (GBIS only), as the GBIS and ECO4 main schemes. Flex also applies to PFP in both schemes in the same way as in the main schemes.

A measure in an ECO4 or GBIS PFP retrofit could be used as a primary measure for in-fill, however in-fill homes themselves cannot get the PFP uplift. In-fill associated with a PFP retrofit would not contribute to the supplier's PFP cap.

## Consumer experience

The main difference between a PFP and ECO main scheme retrofit from the consumer's perspective would be a) the discussion between the installer or SMETER agent and the household on the implications of PFP for the household and b) the presence of monitoring devices and/or sensors in the property for the pre and post-retrofit monitoring periods. However, not all SMETER methods use in-home devices. There may also be more visits from retrofit professionals in PFP retrofits than ECO4 and GBIS main scheme retrofits. In PFP, these additional visits may be necessary to deploy and subsequently remove monitoring devices.

Households would also need to give informed consent for smart meter and monitoring data to be collected, as well as be handed a PFP-specific privacy notice before the data is collected. Some SMETER methods may also require occupants to complete an occupant survey. Consumers not wanting to take part in PFP could still be eligible for one or both main schemes. Given consumers have to take additional steps to participate in PFP, industry parties would have to persuade households that their participation in PFP was worthwhile.

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<sup>61</sup> These are: Income based Jobseekers Allowance, Income related Employment and Support Allowance, Income Support, Pension Credit Guarantee Credit, Working Tax Credit, Child Tax Credit, Universal Credit, Housing Benefit, Pension Credit Savings Credit, and Child Benefit.

## Smart meters

Restricting PFP to households with functioning smart meters reduces fraud and gaming risk associated with manipulation of input data, the risk that inaccurate approaches to reading traditional meters creates inaccurate or anomalous HTC reads, mechanism complexity and administrative burden for Ofgem and industry.

Permitting households with traditional meters to participate would expand the PFP eligible pool. However, with the smart meter rollout ongoing and 64% of households having a smart meter already, the share of homes with smart meters is large and will only rise over the course of ECO4 and GBIS.

Most smart meters (known as 'SMETS2')<sup>62</sup> communicate data to energy suppliers via a bespoke network provided by the Data Communications Company (DCC).<sup>63</sup> Some older smart meters ('SMETS1') were initially connected directly to the energy supplier and are being remotely moved onto the DCC network. As both provide smart meter consumption data, we intend to permit either in ECO4 and GBIS PFP. This also avoids constraining the PFP eligible pool further.

As mentioned above we are minded to require that all homes must have a functioning smart meter to be eligible for ECO4 and GBIS PFP. Gas-heated homes would need both gas and electricity smart meters, while electrically heated homes would need only an electricity smart meter.

### Consultation questions

73. Do you agree with our preference to apply the same minimum requirement in ECO4 PFP as in the ECO4 main scheme? If not, why not?
74. Do you agree with our preference to allow exemptions to the minimum requirement while excluding 'consumer circumstances' as valid reasons for not meeting the minimum requirement in ECO4 PFP retrofits?
75. Do you agree with our proposal to only include homes with a relevant smart meter in the eligible pool for ECO PFP?

## Housing stock

Learnings from the SMETER TEST project can be applied to the vast majority of the ECO-eligible housing stock in Great Britain. We are not currently able to conclude whether HTC in home types outside of that covered in the TEST project can be accurately measured without further research. It is imperative to the efficacy and objective of the PFP programme that HTC reads are as accurate as possible, therefore some building types must be excluded from PFP support. These homes would still be able to receive support under the ECO4 and GBIS main

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<sup>62</sup> Smart Metering Equipment Technical Specification. For more information on SMETS1 and SMETS2 meters, see <https://www.smartenergygb.org/about-smart-meters/do-i-already-have-one>

<sup>63</sup> The DCC manages the communication architecture that allows information to be sent and received from smart meters to energy suppliers, energy network operators and energy service companies.

schemes where scheme eligibility criteria are met. The following property types are not eligible for ECO4 and GBIS PFP:

- Flats;
- Park homes;
- Homes built after 2006 in England and Wales, and after 2007 in Scotland; and
- Homes with floor areas less than 50 m<sup>2</sup>.

Over the longer term, as more building types are tested and more data becomes available outside of ECO4 and GBIS PFP, we expect to permit their inclusion in future PFP schemes where these building types are proven to work effectively with the relevant methodology. We would not be testing these building types as part of ECO4 and GBIS PFP as this would add risk and complexity.

We recognise concerns that the above requirements may result in a reduced eligibility pool for ECO4 PFP. Our analysis suggests that around 2.23m households would be eligible for ECO4 PFP. We expect this to be sufficient on the basis that PFP would be limited to a maximum of 10% of each supplier's obligation, would only be deliverable in ECO4 Phase 4, and that some suppliers would choose not to participate.

The eligible pool for GBIS is very large: over 13 million homes. The risk the GBIS PFP eligible pool is too small is therefore very low.

## Heating systems and other technologies in the home

The primary method of heating the home must be listed in the SAP Product Characteristic Database<sup>64</sup> so that the correct efficiency value can be used. Homes with any of the below items must have heat metering, with the associated data from the heat meter(s) forming part of the input data for the property, which is then fed into the SMETER as part of pre and post-retrofit monitoring:

- Homes with heat pumps;
- Unmetered LPG or oil-based primary heating;
- Homes where the primary heating system supplies outbuildings; and
- Households using secondary gas heating in preference to central heating.

Solid fuel-heated homes are not PFP-eligible as these are not usually metered.

Homes with the following technologies require electricity sub-metering<sup>65</sup> for SMETERs to determine the in-use HTC:

- Heat pumps;
- Solar PV systems; and

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<sup>64</sup> <https://www.ncm-pcdb.org.uk/sap/pcdbsearch.jsp?pid=26>

<sup>65</sup> Sub-meters are separate to mains electricity meters. The former are installed downstream of the latter and are often used to measure individual consumption or generation for certain equipment.

- EV charging or other significant electricity use outside of the home (but still part of that household's overall electricity demand), e.g. an electrically heated outbuilding.

### Consultation questions

76. Do you agree with our preference to limit PFP to properties with those characteristics set out above? If not, why not, and what characteristics should be omitted or included and why?
77. Do you agree with our preference to require heat metering and electricity sub-metering in those circumstances outlined above?

## Complementary insulation work

Installers may carry out further insulation work that addresses defects or otherwise improves the thermal performance of homes, e.g. rectifying LI gaps and service openings, and fixing defects like holes in walls from poor quality boiler installs, provided these actions do not raise the property SAP rating. Raising the overall improvement in HTC would increase both the incentive on the supplier and benefit delivered to households.

These works would not include the partial or full installation of another insulation measure (defined as a measure deliverable under ECO4 and GBIS). Any ECO-eligible insulation measures installed at a property between pre and post-retrofit monitoring must be properly notified to Ofgem and lodged with TrustMark. If they are not funded via ECO4 or GBIS, they must not be installed between the PFP monitoring periods. If these steps are not followed the retrofit could be invalidated and receive no score as this poses risk of fraud.

In some cases, rectifying thermal performance defects may be required under PAS 2035. Where this meets the definition of 'Building Fabric Repair' (BFR), some or all this work's cost may be covered under the BFR allowance.<sup>66</sup> This allowance is only available in ECO4 and ECO4 PFP, not GBIS or GBIS PFP. This could result in some works being covered by the BFR allowance and improving the monitored HTC of the property. We propose retaining the BFR uplift in ECO4 PFP to ensure that BFR issues are rectified to avoid them growing worse over time.

### Consultation question

78. Do you agree with our proposed approach to 'complementary insulation work'?

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<sup>66</sup> BFR homes are those which require remedial work to rectify faults or otherwise require spending to treat issues in the property before the installation of energy efficiency measures can take place.

## Chapter 2.5: Scoring and incentives

This chapter outlines the scoring methods for ECO4 and GBIS PFP and the incentives associated with the mechanisms.

To avoid adding undue complexity, government proposes using the same scoring system in ECO4 PFP as in the wider ECO4 scheme.<sup>67</sup> Likewise, government proposes using the same scoring system in GBIS PFP as in the GBIS main scheme.<sup>68</sup> This means that FPS and PPS would apply in ECO4 PFP, according to when these apply in the main scheme, while PPS would apply in GBIS PFP where these apply in the wider GBIS scheme.

### Consultation question

79. Do you agree with our preference to align scoring in both ECO4 and GBIS PFP with the wider ECO4 and GBIS scoring systems, respectively? What changes do you think we should make to this, if any, and why?

## Evidencing and standards

All PFP retrofits would fall in scope of TrustMark and PAS 2035 as they must include at least one insulation measure. ECO4 and GBIS currently require pre and post-retrofit RdSAP assessments for FPS to be awarded. PFP would mirror these requirements: the PFP uplift can only be awarded for PFP retrofits where both pre and post-RdSAP assessments are lodged.

We would use the following outputs from RdSAP assessments lodged for PFP retrofits:

- Pre- and post-retrofit intermediate SAP band (both schemes) pre-retrofit intermediate SAP band (GBIS only): This determines the score for the retrofit, which uplifts are then applied to. These are usually generated by Retrofit Assessors (RA) and/or Retrofit Coordinators (RC).
- Pre- and post-RdSAP assessment-derived HTC (both schemes): This sets the 'baseline HTC change', i.e. how much the retrofit has improved the home's HTC. This is the baseline against which SMETER-derived HTC change is compared.

### Consultation question

80. Do you agree with our proposals to align ECO4 and GBIS PFP evidencing with the approaches in the respective main schemes? If not, why and what alternative do you suggest?

<sup>67</sup> <https://www.ofgem.gov.uk/publications/eco4-scores>

<sup>68</sup> <https://www.ofgem.gov.uk/publications/great-british-insulation-scheme-scoring-methodology>

## Minimum score

In some cases, installed measures may be compliant and all PFP rules followed but monitoring reveals improvement is at or even significantly below the baseline (i.e. expected change in HTC in RdSAP). In this scenario, RdSAP is assuming a greater level of improvement than SMETER monitoring indicates. To avoid this disincentivising supplier participation in PFP, we propose to still award the PFP uplift for all successfully monitored PFP retrofits, provided all relevant conditions are met. This acts as a minimum score. Nevertheless, and as noted in chapter 2.3, retrofits where SMETER monitoring indicates minimal HTC improvement or even worsened HTC may undergo further assessment by a third-party auditor.

As well as increasing the likelihood of supplier participation, this approach rewards all accurate HTC reads, even where the submitted read suggests little improvement. Some good quality retrofits could deliver only moderate or minor improvement due to, for example, the property's physical circumstances.

Where a reliable HTC read is not possible pre- or post-retrofit, but all other relevant criteria are met, e.g. an accurate pre-retrofit read is provided, the MR is met, necessary insulation measures are installed and other evidence provided, the standard score should be provided for the retrofit, with no PFP uplift. This applies to both ECO4 and GBIS PFP. This scenario would include where an anomalous HTC read is found. These should be identified by SMETER providers, with the HTC read lodged with TrustMark and flagged as anomalous. This would evidence anomaly detection practices and could be used by government for statistical and policy making purposes. The retrofit would not be eligible for the PFP uplift or hardware cost allowance.

PFP retrofits must be monitored individually to receive the PFP uplift.

**Table 5: PFP scores in various scenarios**

Scheme	Scenario	Score	PFP uplift applies?
ECO4 PFP	Monitored HTC below baseline HTC	FPS	Yes
GBIS PFP	Monitored HTC below baseline HTC	PPS	Yes
ECO4 PFP	MR not met	Deflated PPS	No
GBIS PFP	Retrofit does not include any wall or roof insulation	PPS	No
ECO4 PFP	Retrofit does not include any wall or roof insulation	FPS if main scheme requirements met <sup>69</sup>	No

<sup>69</sup> For example, ECO4 MR and minimum insulation pre-conditions.

Scheme	Scenario	Score	PFP uplift applies?
GBIS PFP	Pre or post-retrofit monitoring fails e.g. auditing finds issue	PPS	No
ECO4 PFP	Pre or post-retrofit monitoring fails e.g. auditing finds issue or anomalous read	FPS if main scheme requirements met	No
PFP (both)	Insulation measure not notified or captured in the RdSAP assessments is installed between monitoring periods	Zero – This could be considered fraudulent activity	No

### Consultation questions

81. Do you agree with our proposal to provide a PFP minimum score via the uplift? If not, please explain why?
82. Do you agree with the score outcomes we have set out in those scenarios in table 5? If not, why? In what other scenarios should we clarify PFP score outcomes?
83. Do you agree that anomalous HTC reads should still be lodged by SMETER providers with TrustMark? If not, please explain why.

## PFP uplift

No suppliers participated in ECO3 ISP because of the expectation that the additional costs of monitoring would not be covered by the score from better performing monitored measures alone. We therefore propose to provide an uplift for ECO4 and GBIS PFP retrofits. For the uplift to apply to a GBIS or ECO4 PFP retrofit, the MR (ECO4 only) and any other relevant conditions must be met (e.g. the retrofit includes one of the five required insulation measures).

An uplift in both ECO4 and GBIS PFP is necessary to raise the likelihood of supplier participation in PFP given the extra costs of participating, e.g. new IT system costs, creating new contracts with installers, partnering with SMETER providers and the additional time needed to complete PFP retrofits (primarily due to HTC monitoring).

We considered a range of uplift structures, including a single multiplication factor and a single fixed ABS value. Both approaches are simple and would make PFP participation more likely however neither drive greater improvement against the baseline, i.e. the improvement in dwelling HTC according to RdSAP.

A tiered uplift however, where one of several rates could apply dependent on improvement relative to the baseline, would put a much stronger incentive on industry to use the best materials and techniques. This would be similar to the Innovation Measure uplift.<sup>70</sup>

We propose to apply one of the uplift rates (see table 6 below) to each PFP retrofit in ECO4 and GBIS, noting that the rates differ by scheme. The applicable rate is determined by the ratio of the SMETER HTC improvement against the baseline HTC improvement determined by RdSAP. For example, if SMETER HTC improvement is 45%, and RdSAP HTC improvement is 50%, the improvement against the baseline is  $45/50 = 0.9$ . If SMETER HTC improvement is 60% and SAP HTC improvement is 40%, the improvement against the baseline is 1.5.

The baseline HTC difference must be expressed as a percentage and compared to SMETER-derived HTC improvement represented as a percentage. The alternative is to compare the two differences in absolute values (in W/K).<sup>71</sup> However this would create unintended consequences because the same values of HTC improvement, as reported by the SMETER and derived from RdSAP would have a different percentage when compared to the starting HTC. For example, a 50 W/K improvement in HTC for an RdSAP-derived initial reading of 200 W/K is 25%. While a 50 W/K improvement on a SMETER HTC of 100 W/K would be 50%. In this example the SMETER-derived HTC improvement outperforms SAP's expectation when compared in percentage terms, but not in absolute terms.

As shown in table 6 below, we are proposing to apply fixed rate uplifts (in annual bill savings (ABS)). These function in the same way as the boiler/electric storage heater repair/replacement uplifts in ECO4. We opted for a fixed rate rather than a percentage rate uplift as the latter would unnecessarily uplift score from heating measures, as well as (necessarily) fabric measures. PFP drives delivery of better-quality fabric measures, not heating measures, as the latter do not change property HTC. Fixed uplifts also, beneficially, make homes with smaller floor areas more attractive to installers and suppliers. Smaller homes have tended to receive less treatment in ECO, relative to their share of the population, than larger ones.

**Table 6: PFP uplift rates and associated baseline ranges**

SMETER HTC improvement divided by RdSAP HTC improvement	ECO4 PFP uplift	GBIS PFP uplift
<0.1	50 ABS	25 ABS
0.11-0.5	100 ABS	50 ABS
0.51-0.8	150 ABS	75 ABS
0.81-1.1	200 ABS	100 ABS
1.11+	300 ABS	150 ABS

<sup>70</sup> Where Innovation Measures receive either a 25% or 45% uplift, according to the benefit delivered against standard counterparts for that measure.

<sup>71</sup> W/K stands for Watts per Kelvin. This is a description of heat loss.



We have opted for lower uplift values for GBIS PFP given GBIS retrofits tend to involve fewer measures on average than ECO4. A 300 ABS uplift rate equates to over 30% of the raw FPS for typical ECO4 retrofits. We consider this to be generous at the higher end. At the lower other end, an uplift rate is always achievable, even where the HTC of the property worsens. We expect this to be very rare, given PFP requires installation of at least one fabric measure, however, household behaviour or SMETER calculation errors or anomalies could result in negative HTC reads even where the measure is adequately delivered. Offering rates in this rare scenario reduces risk to industry, drives participation in PFP, and helps to contribute to the Department's research aims. Where this scenario does occur, further audit and compliance activity may be necessary.

The uplift ranges in the far-left column of table 6 were selected based on DESNZ data from several trials, as well as some industry data. The trend from these datasets shows that the SAP framework tends to overestimate how much insulation measures improve dwelling HTC. Nevertheless, industry parties may focus PFP retrofits on those properties where SAP underestimates potential for HTC improvement, as well as where HTC improvement is most easily improved.

The SMETER-based HTC change is used only for calculating the PFP uplift. The uplift applies to the score. For ECO4 PFP, this would be in FPS, for GBIS PFP this would be in PPS.

A worked example of how the uplift applies in GBIS follows:

- CWI is installed in an off-gas rural, Low-Income Group PFP retrofit. The pre-retrofit RdSAP assessment shows the property has a Low F SAP rating. The PPS for CWI in this property is £228 ABS.
- The standard pre-retrofit RdSAP assessment has the property's starting HTC at 310 W/K. The post-retrofit RdSAP assessment shows an HTC of 180 W/K, an improvement of 130 W/K, or 42%. The baseline is therefore 42%.
- The SMETER-derived pre-retrofit HTC is 240 W/K, while the post-retrofit SMETER-derived HTC is 140 W/K, an improvement of 100 W/K or 42%. The improvement against the baseline is therefore 42/42, equating to a ratio of 1.0, corresponding to a PFP uplift of £100 ABS.
- The PFP uplift of £100 ABS is added to the raw score (£228 ABS). The Off-gas Rural uplift (20%) also applies to the raw score, adding another 45.6 ABS. The final score for the retrofit is therefore £373.6 ABS.

As in the rest of ECO4, no uplifts interact.

Chapter 1.1. of this consultation includes proposals to allow some ECO4 retrofits to count towards GBIS targets. This could include an ECO4 PFP retrofit counting towards the GBIS target. Where this occurs, the 'ECO4' PFP retrofit would still be able to receive the ECO4 PFP uplift and would, in all other respects, have to meet ECO4 PFP requirements rather than GBIS.

## Innovation Measure uplift

The Innovation Measure (IM) uplift has been designed to support the delivery of innovative measures that can provide further energy efficiency improvements or that offer additional

benefits.<sup>72</sup> IMs are available in both ECO4 and GBIS main schemes. We are minded to permit IM uplifts in ECO4 and GBIS PFP. We expect this to reduce complexity and make PFP retrofits more commercially attractive.

We recognise that the IM uplift for some IMs captures additional benefit that could also be captured by the PFP uplift, via improved HTC. This in effect double counts part or all of the benefit for these IMs. However, we expect this double counting to be very small, and preferable to allowing the IM uplift for some measures but not others, which would add complexity and administrative burden.

The alternative would be to disallow IM uplifts in PFP, making PFP less commercially attractive, and resulting in fewer IMs delivered.

### Consultation questions

84. Do you agree with the overall uplift approach we have proposed for PFP? If not, why not and what alternative do you suggest?
85. Do you agree with the uplift rates we have suggested for both ECO4 and GBIS PFP? If not, please provide data to e.g. justify any costs not covered.
86. Do you agree with our proposal to allow the IM uplift for all eligible IMs where these are delivered in PFP? If not, why not?

## Hardware cost allowance

As set out in the ECO4 Design consultation, we propose to cover part of the costs suppliers incur when procuring and deploying SMETER monitoring hardware under a 'hardware cost allowance' in ECO4 and GBIS PFP. Typically, the more accurate SMETER methods use physical monitoring devices, e.g. in-home sensors, to calculate HTC. This allowance reduces the risk that more accurate SMETER approaches are less favourable due to their hardware costs.

We collected data on these costs from several sources, including the TEST project. We used this evidence to assume an average cost for hardware-based methods, defined as those using any physical monitoring device<sup>73</sup> deployed in-home to calculate a property's HTC. This excludes hardware costs associated with monitoring smart meter consumption data, given some approaches only use software for accessing this data. Therefore, costs for accessing smart meter data for all SMETER methods, whether via hardware or software, are covered by the PFP uplift, as we consider this to be fairer and to incentivise more cost-effective behaviour.

The proposed rate for the expenses allowance is set below market prices for purchasing equipment because some parties rent monitoring hardware, while others purchasing the hardware can reuse it in other PFP retrofits. A below-market rate incentivises this cost-effective behaviour and means more ECO support is likely to be delivered to households overall.

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<sup>72</sup> <https://www.ofgem.gov.uk/publications/energy-company-obligation-2022-26-eco4-guidance-new-measures-and-products>

<sup>73</sup> Excluding smart meters, which are necessary at every property.

This allowance is set at £20 ABS per PFP retrofit, but only for those PFP retrofits that both a) are monitored by a SMETER that requires monitoring hardware and b) have valid pre and post-retrofit monitored-HTC values for the retrofit in question.

## Maximum PFP delivery cap

In our ECO4 consultation we proposed capping PFP at no more than 10% of a supplier's obligation given PFP is a pilot and could therefore be subject to unforeseeable teething issues. We propose to apply this 10% cap in GBIS PFP too. All scores associated with a PFP retrofit would contribute to the cap: uplifts (PFP and others), hardware cost allowance, and raw score.

Where a supplier exceeds its PFP cap, it cannot receive the PFP uplift or hardware cost allowance for PFP retrofits delivered beyond the cap. The supplier would still receive the applicable main scheme score for the retrofit. In the unlikely event a supplier delivers PFP projects or retrofits beyond its PFP cap, they may also transfer the project to another obligated supplier.

### **Consultation questions**

87. Do you agree with our proposal to provide a hardware cost allowance for SMETER approaches that use physical monitoring devices? If not, why not?
88. Do you agree with the expenses allowance rate we have proposed?
89. Do you agree with our proposal for a 10% cap on GBIS and ECO4 PFP with all retrofit score contributing to this? If not, what do you propose and why?

## Chapter 2.6: Cross policy linkages

This chapter outlines where PFP interacts with other features in ECO4 and GBIS.

**Table 7: PFP interactions with other ECO4 and GBIS policy areas**

Policy area	Changes, if any
Caps	No change – PFP retrofits in either scheme would contribute to relevant caps in the same way as any main scheme retrofit.
Consumer circumstances	Change – Not permitted in ECO4 PFP owing to high gaming/fraud risk, see chapter 2.4, “ECO4 Minimum Requirement”.
Exemptions	No change – Exemptions apply in ECO4 PFP as in the main scheme. Retrofits must still include either a wall or roof insulation measure as well as delivery of all possible, appropriate ECO-eligible measures to receive the PFP uplift.
Notification deadlines	No change.
Retrofit time limits	No change – the three-month retrofit time limit does not include pre or post-retrofit monitoring. The time limit starts from the installation of the first measures and stops as the last is installed. No time limit applies to GBIS PFP or GBIS main scheme retrofits, however these must be completed and notified before scheme end, in line with legislation.

### Uplifts

As highlighted within this consultation there would be a PFP uplift for qualifying PFP projects as well as a hardware allowance where relevant. PFP projects would also be eligible for other uplifts offered as part of ECO4 and GBIS.

All uplifts permitted in PFP use the same rate and conditions as they do in the main scheme in which they are delivered, e.g. the Off-gas Rural uplift applies only to Scotland and Wales in the main schemes and in PFP. The rate for this uplift is 35% in the ECO4 main scheme, so 35% in ECO4 PFP.

**Table 8: Uplifts in ECO4 and GBIS**

Uplift/allowance	Origin scheme	Permitted in ECO4 or GBIS PFP?
PFP	Permitted in both schemes, only in PFP	
PFP hardware allowance	Permitted in both schemes, only in PFP	
Off-gas Rural	Used in both schemes	Permitted in both
IM	Used in both schemes	Permitted in both
IM sponsoring supplier	ECO4	ECO4 PFP only
BFR	ECO4	ECO4 PFP only
ECO4 Flex route 4	ECO4	ECO4 PFP only
Broken efficient boiler replacement	ECO4	ECO4 PFP only
Broken efficient boiler repair	ECO4	ECO4 PFP only
Broken efficient ESH replacement	ECO4	ECO4 PFP only
Broken efficient ESH repair	ECO4	ECO4 PFP only

**Consultation question**

90. Do you agree with the policy linkages positions we set out between the PFP mechanism and main schemes? If not, please state which you disagree with and why. What other policy linkages should we provide information on?

## Annex A: Consultation questions

1. Do you agree that a household should be able to receive both loft and cavity wall insulation under GBIS?
2. Do you agree that we should allow this change to be effective from the date of consultation? If not, would you prefer the change to be effective from the date of Government Response, or the commencement date of the legislation?
3. Do you agree that smart thermostats should be an eligible secondary measure for owner-occupied households in the low-income group?
4. Do you agree that we should allow this change to be effective from the date of consultation? If not, would you prefer the change to be effective from the date of Government Response, or the commencement date of the legislation?
5. Do you agree with allowing projects meeting the ECO4 rules to count towards an obligated supplier's GBIS obligation?
6. Do you agree with our preferred option of a transitional arrangement that enables projects that have met the ECO4 rules during all phases of GBIS to be capable of notification and therefore count towards GBIS obligations in phase A, B, or C?
7. Assuming the changes proposed in this consultation take effect, what proportion of your GBIS obligation is achievable?
8. Do you agree that the proportion of GBIS obligations that can be achieved via delivery under ECO4 rules should be limited? What should the limit be? Please provide as much detail as possible.
9. Do you agree that a conversion factor should be applied to projects meeting the ECO4 rules that count towards GBIS?
10. Do you agree with our estimate that the cost of achieving an ABS under GBIS would be £X/ABS with the proposed scheme changes? Do you agree that the cost of achieving an ABS under ECO4 (excluding EFG and SWI minimums) would be £Y/ABS?
11. Based on your interpretation of the costs per ABS for GBIS and ECO4, what conversion factor do you think 1 ECO4 ABS should be subject to in order to help keep total costs within £1 billion. Please provide answers based on:
  - A maximum of 25% of GBIS ABS being achievable through ECO4.
  - A maximum of 50% of GBIS ABS being achievable through ECO4.
  - A maximum of 75% of GBIS ABS being achievable through ECO4.

12. We are not considering utilising TMLP for ECO4 at this time. Do you agree with our approach?
13. Considering the details set out in this consultation and by TrustMark, do you agree with the proposal to introduce the version of TMLP for use in GBIS for loft insulation when delivered as a single measure (and heating controls when paired with loft insulation)?
14. For the adapted version of TMLP, have sufficient risks been identified and addressed in Table 1?

If there are other stakeholder concerns that have not been identified in Table 1 please provide details of such concerns and proposed mitigations.

- 15a. Given the structure of the version of TMLP suitable for GBIS, what are your views on the average cost assumptions for compliance with its processes (forecast at approximately £400 to £500)?
  - Yes, £400-to £500 is about right
  - No, cost would be significantly higher (£601 or more)
  - No, cost would be slightly higher (£501 to £600)
  - No, cost would be slightly lower (£300 to £399)
  - No, cost would be significantly lower (under £300)
  - Don't know / Prefer not to say
- 15b. What do you think could be the main drivers for any potential savings between the costs of compliance with PAS 2035/2030 and the costs of compliance with TMLP for GBIS?
16. Given the forecast costs of the version of TMLP suitable for GBIS, and the potential impact on GBIS delivery, do you agree its introduction in the final year of the scheme would have a sufficient impact to make it worthwhile implementing?

If there is any additional information you would like to add, please provide details.

17. Are there any other changes, not proposed in this consultation, that you believe would increase levels of delivery under GBIS?

If yes, please provide details.

- 18a. DESNZ's cost assumption for compliance with PAS 2035/2030:2019 processes is £1,030 per property retrofit (in 2023 prices) for both ECO4 and GBIS. The assumed cost does not vary according to how many measures are installed.

Roughly what is the average cost you have experienced complying with the current PAS 2035/2030:2019 processes per property retrofitted? Please answer for both multi-measure and single-measure projects that have upgraded the fabric of a building, as relevant.

	<b>Less than £900</b>	<b>£900 to £1,100</b>	<b>£1,100 to £1,300</b>	<b>£1,300 or more</b>	<b>I don't know/ Prefer not to say</b>
<b>Multi measure</b>					
<b>Single Measure</b>					

18b. If you believe that the average cost does not fall between £900 to £1,100, please provide us with any information on ECO4 or GBIS PAS 2035/2030:2019 compliance costs per project to evidence lower or higher costs.

19a. In September 2023 a new version of PAS 2035/2030 was published.

Roughly what is the average cost you would expect for complying with the PAS 2035/2030:2023 processes per property retrofitted? Please answer for both multi-measure and single-measure projects involving an upgrade to the fabric of a building, as relevant.

	<b>Less than £900</b>	<b>£900 to £1,100</b>	<b>£1,100 to £1,300</b>	<b>£1,300 or more</b>	<b>I don't know/ Prefer not to say</b>
<b>Multi measure</b>					
<b>Single Measure</b>					

19b. Please provide us with any information to evidence why you believe the compliance costs to be within the range you chose.

19c. What, if any differences, between PAS 2035/2030:2019 and PAS 2035/2030:2023 processes are driving any changes in cost?

20. We would like to understand more about the compliance costs of PAS 2035/2030. Please provide details on what you feel are the key cost drivers. For example, the PAS process, the need to use qualified professionals, the need to complete paperwork to demonstrate compliance with the PAS etc.

21. What do you think the minimum certification requirements for low carbon heating and microgeneration installations should be under ECO4?

22. Do you agree that the policy intent could be made clearer to facilitate Ofgem's ability to reject measures which have been identified as non-compliant by TrustMark?

23. Do you agree with our proposal to allow individuals with at least a Level 2 Technical and Vocational Qualification, or equivalent, to undertake a report substantiating the need for extraction of cavity wall or loft insulation for the purposes of determining building fabric repair expenditure?



24. Are there any specific Level 2 Technical and Vocational Qualification qualifications, or equivalent, which would be most appropriate for those conducting this report?
25. Do you think a Chartered Surveyor continues to be suitably equipped to conduct this assessment?
26. Do you agree with amending the purpose of the assessment under article 62(2)(d)(i) of the ECO4 Order from; “identifying potential efficiency measures for improving the energy efficiency of the premises”, to; “assessing the condition of the insulation and related building fabric”, to more accurately reflect the role undertaken by the assessor?
27. Do you agree with our proposal to update legislation so that Shared Ground Loops can be evidenced by SAP assessments where they are installed alone, or alongside Data Light Measures?
28. Are there any other barriers to delivering SGL projects under ECO4 we should be aware of?
29. Our objective is to ensure consumers receive the maximum benefit from their retrofit measures by encouraging smart metering uptake. Which is your preferred method for achieving this aim and why?
- Option 1 – Voluntary consumer pledge
  - Option 2 – Consumers agree smart meter installation (to be arranged by their energy suppliers)
  - Neither – the current process of providing smart meter advice to ECO4 and GBIS consumers should remain as it is now
  - An alternative approach – please provide details of how your preferred approach is practicable for scheme delivery and data privacy
  - No view
30. If Option 1 is your preferred option:
- Were Option 1 to be implemented, how would you refine the approach to maximise its effectiveness? For example, what is the correct point to contact consumers?
31. If Option 2 is your preferred option:
- Please provide descriptions of how this methodology could operate in practice for a) voluntary and b) mandatory agreement to a smart meter installation to receive retrofit funding. Please include information on data sharing routes, and how adverse impacts on deliverability can be minimised.
32. Do you think that Option 1 would impact scheme delivery for ECO4, GBIS and/or smart meter targets?
- If yes, please provide evidence to support your response.

33. Do you think that Option 2 would impact scheme delivery for ECO4, GBIS and/or smart meter targets if it involved either:  
Option 2a) a voluntary agreement for a smart meter installation; or  
Option 2b) a mandatory agreement for a smart meter installation?

If yes, please provide evidence to support your response.

34. Do you agree with our proposal to update the “rural area” definition in line with the planned ONS and Scottish Government updates?
35. If transitional arrangements are required, which transition option would you prefer?
- Transition option A
  - Transition option B
  - An alternative approach
  - No view

Please provide evidence to support your response.

36. Do you plan to participate in ECO4 and/or GBIS PFP?
37. Where development time available to industry for PFP appears limited, would you favour government introducing PFP to ECO4 and GBIS or introducing PFP into any successor ECO scheme?
38. Do you agree with our proposal to limit ECO4 & GBIS PFP to SMETER methods? If not, what approaches do you think we should allow and why?
39. Do you agree with the PFP application scope we have proposed?
40. Do you agree with the proposed role of the PFP Panel?
41. What additional information should SMETER applicants be required to provide if anything, and why?
42. Do you agree with us that updates or modifications to SMETER algorithms should be notified to the PFP Panel?
43. Do you agree with our approach for validating the accuracy of Type 1 SMETERs? If not, what alternative do you suggest?
44. Do you agree with our approach for validating the accuracy of Type 2 SMETERs? If not, what alternative do you suggest?
45. Should we use a synthetic dataset, a real dataset or both when assessing SMETER accuracy, or another approach entirely? Please explain your answer.

46. If we were to rely on synthetic datasets for assessing SMETER accuracy, do you agree with our preference to exclude survey data? If not, why not?
47. Do you agree with our proposal to set an NMBE accuracy minima of between -5% to +5% and set a CVRMSE accuracy minima of 0 to 20%? If not, what alternative rate or metric do you suggest?
48. Do you agree with our proposal to set accuracy minima using both NMBE and CVRMSE to assess the accuracy of Type 1 and 2 SMETER approaches? If not, what alternate do you suggest for either or both of Type 1 & 2 methods?
49. Do you agree with our preference to capture methodology repeatability via NMBE and CVRMSE? If not, how else should this be tested at application?
50. Do you agree with our proposal to require SMETER monitoring to take place for a minimum of 28 days pre-retrofit and 28 days post-retrofit?
51. Do you agree that SMETER providers (or their sub-contractors) should conduct the ongoing quality assurance we have stated? Besides anomaly detection, what else do you think this should comprise?
52. What other aspects, if any, of the ECO PFP application process, as proposed, do you disagree with or wish to provide further thoughts on?
53. Do you agree with the likely data journey we have set out? If not, how do you expect this to differ?
54. Do you agree with the data collection proposals? If not, please explain your reason and proposed alternative(s).
55. Do you agree with the proposed deadlines of two and 12 months of the retrofit completion date for lodging pre and post-retrofit SMETER HTC reads, respectively? If not, please explain your reasoning and proposed alternative(s).
56. Do you agree with those stipulations set out under “Monitoring and equipment requirements” for SMETER providers that would apply in the absence of an appropriate accreditation scheme for SMETERs and in-use performance? What should be added or removed from this list if anything?
57. How might those stipulations set out under “Monitoring and equipment requirements” best be evidenced and compliance assessed?
58. Should we require SMETER providers to lodge confidence ranges for each HTC value with TrustMark? As this would not inform scoring, what value do you think capturing this data would provide?
59. Do you agree with our preference for SMETER providers to upload HTC reads to TrustMark’s Data Warehouse? If not, what alternate is preferable?

60. What other information should SMETER providers upload to TrustMark's Data Warehouse besides that stated?
61. Do you agree with our preference for TrustMark to access RdSAP-derived HTC values directly from scheme providers?
62. If an accreditation scheme relevant to SMETERs and in-use performance is available, do you think we should require adherence to it in PFP?
63. If an accreditation scheme relevant to SMETERs and PFP is not available, do you think this is sufficiently mitigated by the activities of Ofgem, TrustMark, TrustMark-licensed scheme providers and the proposed activities of a third-party auditor in PFP? If not, what further activities are necessary to assure PFP in the absence of an accreditation scheme?
64. Do you agree that any accreditation scheme to which we stipulate adherence in PFP should meet the criteria set out under the "Accreditation scheme(s) for SMETER providers" section? If not, what do you think we should add and/or remove from the criteria?
65. Do you agree with the process we have proposed for updates to SMETER providers' software and algorithms? What else should be required of them in these instances, if anything?
66. Do you agree with the validation process? If not, please explain your reasons and proposed alternative(s).
67. Do you agree with the auditing and risk management process? If not, please explain your reasons and proposed alternative(s).
68. How can the risk that an installer reduces intended ventilation (as a means of artificially improving the HTC value) best be mitigated?
69. Do you agree with our preference to require GBIS retrofits to include only one of CWI, SWI, RIRI, FRI or PRI? If not, why not?
70. Do you agree with our preference to require ECO4 retrofits to include at least one of CWI, SWI, RIRI, FRI and PRI? If not, why not?
71. Do you think we should allow eligible heating measures to be delivered in ECO4 and GBIS PFP? If not, why not?
72. Do you agree with our proposal to allow repair and like-for-like replacement of efficient, broken boilers and ESHs in ECO4 PFP? If not, why not?
73. Do you agree with our preference to apply the same minimum requirement in ECO4 PFP as in the ECO4 main scheme? If not, why not?

74. Do you agree with our preference to allow exemptions to the minimum requirement while excluding 'consumer circumstances' as valid reasons for not meeting the minimum requirement in ECO4 PFP retrofits?
75. Do you agree with our proposal to only include homes with a relevant smart meter in the eligible pool for ECO PFP?
76. Do you agree with our preference to limit PFP to properties with those characteristics set out above? If not, why not, and what characteristics should be omitted or included and why?
77. Do you agree with our preference to require heat metering and electricity sub-metering in those circumstances outlined above?
78. Do you agree with our proposed approach to complementary insulation work?
79. Do you agree with our preference to align scoring in both ECO4 and GBIS PFP with the wider ECO4 and GBIS scoring systems, respectively? What changes do you think we should make to this, if any and why?
80. Do you agree with our proposals to align ECO4 and GBIS PFP evidencing with the approaches in the respective main schemes? If not, why and what alternative do you suggest?
81. Do you agree with our proposal to provide a PFP minimum score via the uplift? If not, please explain why?
82. Do you agree with the score outcomes we have set out in those scenarios in table 5? If not, why? In what other scenarios should we clarify PFP score outcomes?
83. Do you agree that anomalous HTC reads should still be lodged by SMETER providers with TrustMark? If not, please explain why.
84. Do you agree with the overall uplift approach we have proposed for PFP? If not, why not and what alternative do you suggest?
85. Do you agree with the uplift rates we have suggested for both ECO4 and GBIS PFP? If not, please provide data to e.g. justify any costs not covered.
86. Do you agree with our proposal to allow the IM uplift for all eligible IMs where these are delivered in PFP? If not, why not?
87. Do you agree with our proposal to provide a hardware cost allowance for SMETER approaches that use physical monitoring devices? If not, why not?
88. Do you agree with the expenses allowance rate we have proposed?

89. Do you agree with our proposal for a 10% cap on GBIS and ECO4 PFP with all retrofit score contributing to this? If not, what do you propose and why?
90. Do you agree with the policy linkages positions we set out between the PFP mechanism and main schemes? If not, please state which you disagree with and why. What other policy linkages should we provide information on?

## Annex B: DESNZ's SMETER trials

The Department funded a series of SMETER trials, formally the SMETER Innovation Competition and the TEST project from 2020 to 2021.<sup>74</sup> The SMETER Innovation Competition worked with nine competition partners to develop and test their own methods for measuring the thermal performance of homes using smart meter and other data. The trials took place in 30 occupied and typical UK homes.

The TEST project sought to test if SMETER methods could calculate HTC more accurately than RdSAP and more practically and cost-effectively than co-heating tests. RdSAP assessments, including by an expert RdSAP assessor (assumed to provide greater accuracy than a commercial assessment), and modified co-heating tests took place at all homes for comparison.

Co-heating tests, while accurate, are prohibitively expensive and require the home to be unoccupied for around three weeks. They are therefore not feasible for use in ECO PFP. The HTC baseline from co-heating tests was used to assess the accuracy of each SMETER method when implemented in occupied homes.

Two of the eight SMETER methods were found to be more accurate than the expert RdSAP assessor, in line with the project hypothesis, both of which utilised in-home temperature sensors as one of their data collecting methods. A further three demonstrated high levels of accuracy, with all five providing HTC results more than 90% successful overall.

SMETER methods are also used in a small number of projects under Wave 2.1 of the Social Housing Decarbonisation Fund (SHDF) to digitalise retrofit in the social housing sector.<sup>75</sup> Independently of this, social housing providers across the SHDF Demonstrator pilot,<sup>76</sup> Wave 1 and Wave 2.1 have also chosen to deploy SMETERs alongside retrofit installations to monitor the effectiveness of retrofits for social housing residents.

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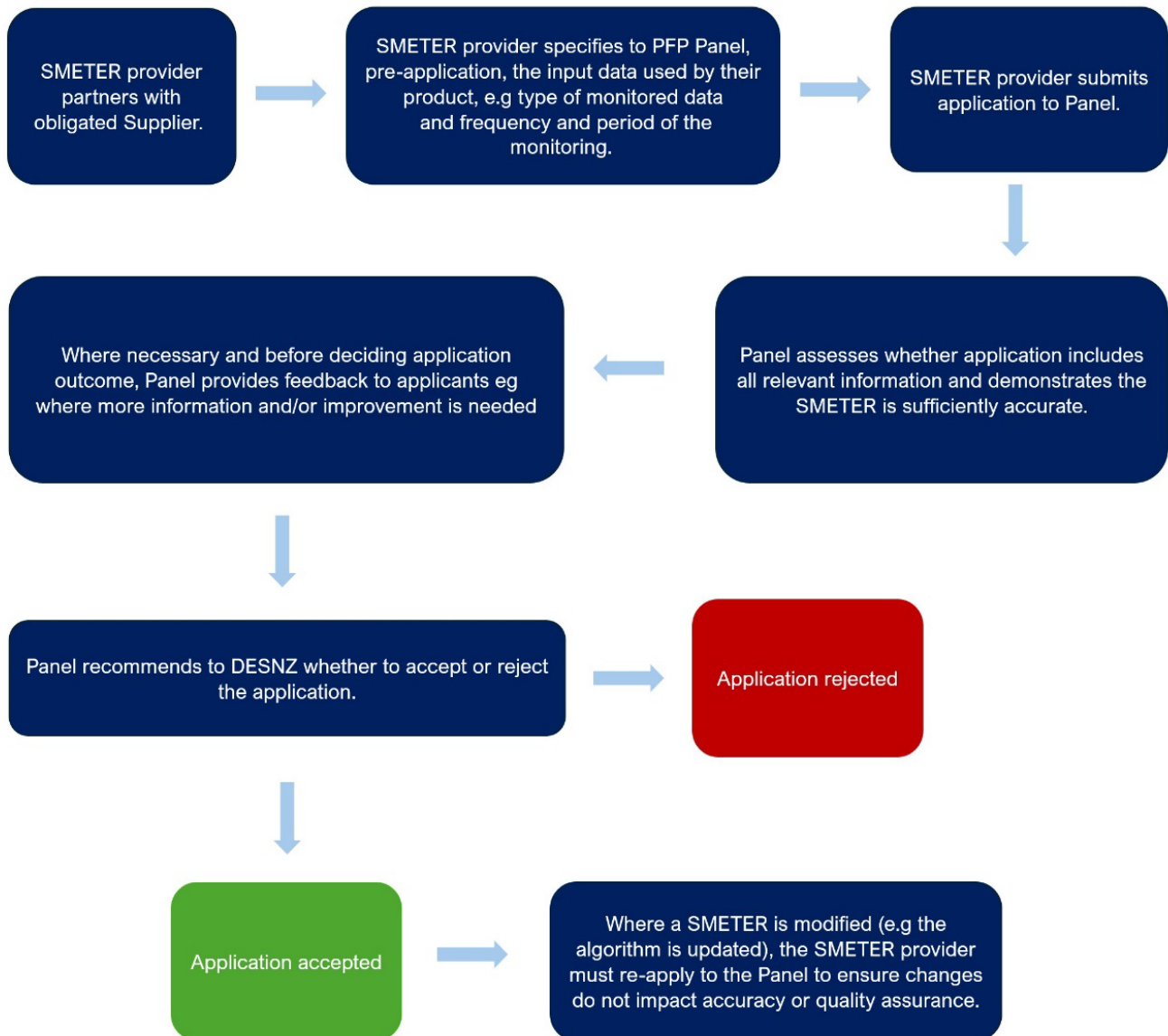
<sup>74</sup> <https://www.gov.uk/government/publications/smart-meter-enabled-thermal-efficiency-ratings-smeter-technologies-project-technical-evaluation>

<sup>75</sup> Successful bidders for digitalisation funding are highlighted in the digitalisation section here: <https://www.gov.uk/government/publications/social-housing-decarbonisation-fund-wave-21-successful-bids/social-housing-decarbonisation-fund-wave-21-successful-bids>

<sup>76</sup> The SHDF Demonstrator pilot programme preceded Wave 1 & Wave 2.1 of SHDF.

# Annex C: PFP process maps

## Type 1 SMETER Application Process



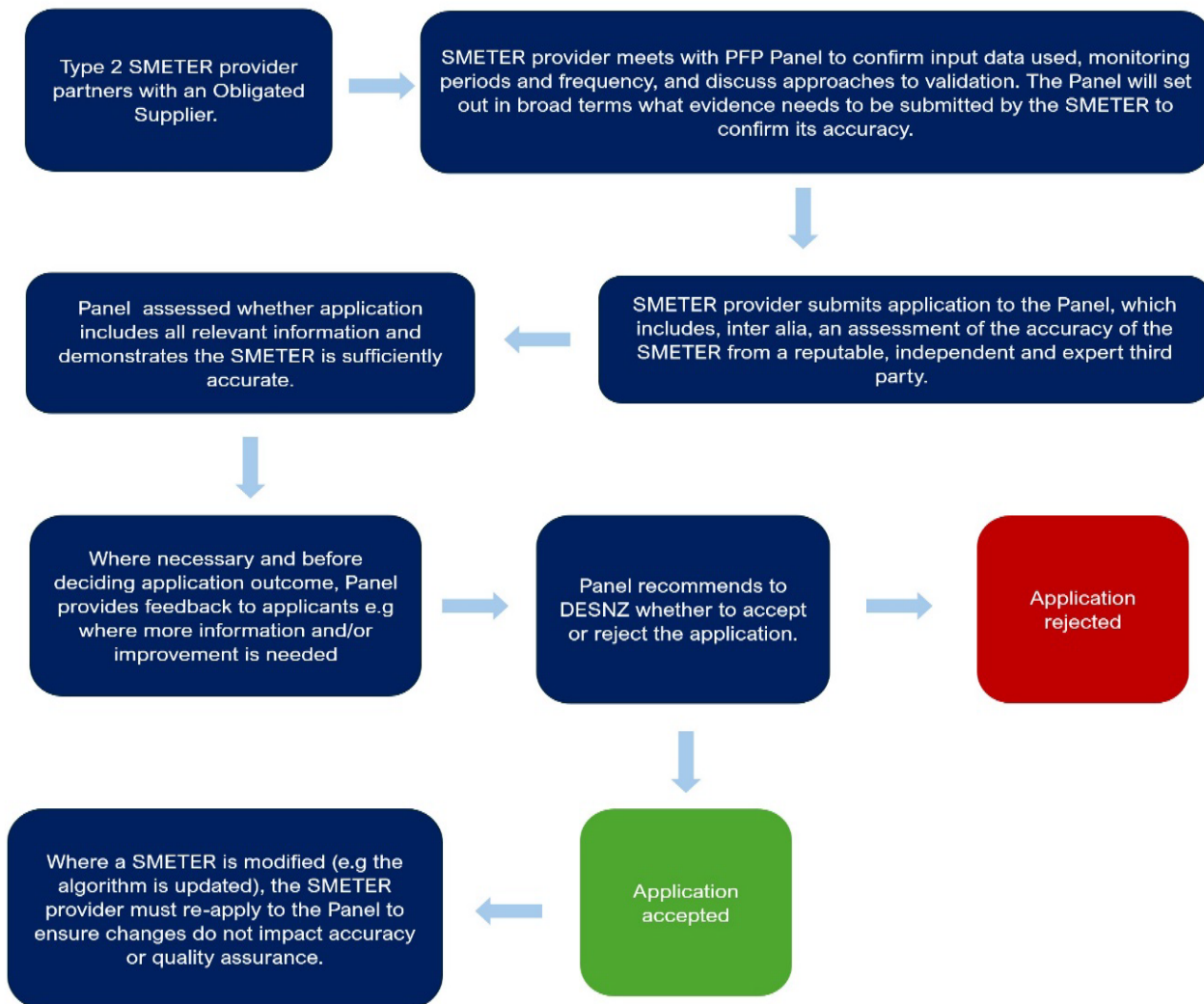
## Type 1 SMETER application process (alternate text)

1. SMETER provider partners with obligated Supplier.
2. SMETER provider specifies to PFP Panel, pre-application, the input data used by their product, e.g. type of monitored data and frequency and period of the monitoring.
3. SMETER provider submits application to Panel.
4. Panel assesses whether application includes all relevant information and demonstrates the SMETER is sufficiently accurate.
5. Where necessary and before deciding application outcome, Panel provides feedback to applicants e.g. where more information and/or improvement is needed.



6. Panel recommends to DESNZ whether to accept or reject the application.
7. Application is either accepted or rejected.
8. If the application is accepted the following will apply: where a SMETER is modified (e.g. the algorithm is updated), the SMETER provider must re-apply to the Panel to ensure changes do not impact accuracy or quality assurance.

## Type 2 SMETER Application Process



### Type 2 SMETER application process (alternate text)

1. Type 2 SMETER provider partners with an Obligated Supplier.
2. SMETER provider meets with PFP Panel to confirm input data used, monitoring periods and frequency, and discuss approaches to validation. The Panel will set out in broad terms what evidence needs to be submitted by the SMETER to confirm its accuracy.
3. SMETER provider submits application to the Panel, which includes, inter alia, an assessment of the accuracy of the SMETER from a reputable, independent and expert third party.
4. Panel assesses whether application includes all relevant information and demonstrates the SMETER is sufficiently accurate.
5. Where necessary and before deciding application outcome, Panel provides feedback to applicants e.g. where more information and/or improvement is needed.
6. Panel recommends to DESNZ whether to accept or reject the application.
7. Application is accepted or rejected.
8. If the application is accepted the following will apply: Where a SMETER is modified (e.g. the algorithm is updated), the SMETER provider must re-apply to the Panel to ensure changes do not impact accuracy or quality assurance.

# Annex D: PFP and standard retrofit journeys in ECO4



## **Annex D: The standard retrofit journey in ECO4 compared to a PFP retrofit (alternate text)**

### **Additional PFP steps in the retrofit journey are:**

Step 1: For a standard ECO retrofit, the eligible and commercially suitable property is found. No additional PFP elements needed. However, additional PFP compliance steps will include the following: where applicable, in-use performance accreditation scheme(s) conducts checks at any point in the process

Step 2: For a standard ECO retrofit, the customer agrees to ECO PFP retrofit and consents to sharing data. The additional PFP step includes extra data sharing (e.g. smart meter data) that households must consent to if participating in PFP.

Step 3: For a standard ECO retrofit, the Retrofit Assessor (RA) completes pre-retrofit assessment, including RdSAP assessment, and lodges with TrustMark. In addition for PFP the Retrofit Assessor collects relevant property details and passes these to the SMETER provider.

Step 4: For a PFP retrofit where relevant, SMETER monitoring devices are deployed in the property.

Step 5: For a PFP retrofit, pre-retrofit monitoring period occurs, generating input data.

Step 6: For a PFP retrofit, the input data is automatically sent to SMETER provider or uploaded manually, e.g. by Retrofit Assessor alongside building survey info.

Step 7: For a PFP retrofit, pre-retrofit monitoring period occurs, generating input data.

Step 8: For a standard ECO retrofit, measures are installed and retrofit is completed in line with PAS 2035. The additional PFP steps include the SMETER provider quality assuring data then uploading pre-retrofit HTC read to TrustMark Data warehouse. In addition, the PFP compliance steps include the DESNZ third party PFP auditor conducting several different checks at various points in the process.

STEP 9: For a standard ECO retrofit, the supplier notifies retrofit information with Ofgem. The additional PFP steps include post-retrofit monitoring period occurring, generating input data. Property details are needed but likely the same as those collected pre-retrofit

Step 10: For a PFP retrofit, TrustMark obtains stock HTCs from RdSAP assessments via scheme providers.

Step 11: For a PFP retrofit, the SMETER provider quality assures data then uploads HTC read to TrustMark Data warehouse. In addition to this there is an additional PFP compliance step in which TrustMark uses HTC reads in conjunction with PAS2035 lodgment data in its compliance and auditing processes to detect issues.

Step 12: For a standard ECO retrofit, Ofgem calculates retrofit score using SMETER HTCs and stock HTCs from pre- and post-RdSAP assessments via TrustMark. The additional PFP step means that Ofgem calculates PFP uplift score, using lodged HTCs and the additional PFP compliance step means that Ofgem conducts further checks to ensure all PFP requirements met, e.g. deadlines & qualifying measures.

## Annex E: Glossary

**Annual Bills Savings (ABS):** Each measure or project completed under ECO4 receives a score which determines the contribution made towards a supplier's obligation. Scores are based on the annual bill saving achieved by a measure or package of measures when installed in an eligible domestic premises.

**Building fabric repair (BFR):** homes are those which require remedial work to rectify faults or otherwise require spending to treat issues in the property before the installation of energy efficiency measures can take place.

**British Standards Institution (BSI):** The British Standards Institution is the national standards body of the United Kingdom. BSI produces technical standards on a wide range of products and services and also supplies certification and standards-related services to businesses. <https://www.trustmark.org.uk/business/documents>.

**Data Communications Company (DCC):** The DCC manages the communication architecture that allows information to be sent and received from smart meters to energy suppliers, energy network operators and energy service companies.

**Framework Operating Requirements (FOR):** TrustMark's Framework Operating Requirements defines the relationship between TrustMark and the TrustMark Scheme Providers. It sets out obligations, responsibilities and activities, in addition to requirements for energy efficiency measures delivered through ECO.

**Full project scores (FPS):** are awarded to projects which meet the minimum requirement (or where a relevant exemption applies) and are based on the annual energy bill savings produced by the improvement in a premises' SAP rating.

**Heat Transfer Coefficient (HTC):** measures heat loss from a property through the walls, roof, floor, and windows. It is in watts per degree temperature difference in inside and outside temperatures.

**Innovation Measures (IM):** This uplift supports the delivery of innovative measures where their benefits and improvements may not otherwise be captured through current PPS or FPS. Following a successful application to Ofgem, a description of the innovation measure will be published, a standard (25%) or substantial (45%) score uplift is awarded to products meeting that description.

**In-Situ Performance (ISP):** In 2018, ISP was introduced to ECO3. ISP was a monitoring mechanism that allowed suppliers to apply to Ofgem if they wanted to deliver monitored measures in ECO3.

**Microgeneration Certification Scheme (MCS):** MCS is a product and installation standards quality assurance scheme, and an installer certification scheme covering microgeneration technologies (solar PV and thermal panels, batteries, ground and air source heat pumps, biomass, and onshore wind etc.). MCS product and installation standards are designed to meet EU standards, and MCS's installer certification scheme has UKAS accreditation (to ISO 17067). For an installer to become MCS certified s/he must also join a UKAS approved certification body (usually a competent person's scheme) and a Chartered Trading Standards Institute approved consumer code which offers Alternative Dispute Resolution (ADR).

**Minimum Requirement (MR):** The ECO4A Order article 50 set out the MR: all homes starting at SAP bands F and G must be improved to band D, and those starting at D and E must be improved to band C. Where this is not met, suppliers receive deflated scores.

**Publicly Available Specification 2035 and 2030 (PAS 2035/2030):** Published by the BSI, PAS 2035 is a specification, with guidance, covering all the elements involved in the energy retrofitting of existing homes and PAS 2030 specifies requirements for installing energy efficiency measures in existing homes. PAS 2035/2030:2023 was published in September 2023 and the transition from PAS 2035/2030:2019 + A1:2022 will end on 30 March 2025.

**Partial Project Score (PPS):** PPS are awarded as each measure within a project is notified and approved. They are interim scores which represent a proportion of the full expected annual bill saving of the measure. PPS are also based on the starting SAP rating of a property but not the finishing SAP rating. Once a project is complete, partial project scores may be superseded by full project scores if the project meets the minimum requirement.

**Retrofit Assessor (RA):** In accordance with PAS 2035/2030 a Retrofit Assessor is responsible for undertaking a Retrofit Assessment, a survey, inspection and assessment of a building to collate information for a retrofit design with a view to the installation of energy efficiency measures

**Retrofit Coordinator (RC):** In accordance with PAS 2035/2030 a Retrofit Coordinator manages the entirety of a retrofit project taking overall responsibility for overseeing assessment, identification, specification and evaluation of energy efficiency measures and subsequent monitoring and evaluation.

**Social Housing Decarbonisation Fund (SHDF):** now Warm Homes: Social Housing Fund. Warm Homes: SHF provides funding to local authorities, combined authorities, registered providers of social housing, and registered charities that own social housing in England. It supports the installation of energy performance and low carbon heating measures – such as external wall insulation, CWI, LI, double glazing, and heat pumps – in social homes below band C in order to make socially rented homes warmer and cheaper to heat and to reduce carbon emissions.

**Smart Meter Enabled Thermal Efficiency Rating (SMETER):** SMETER refers to a methodology for calculating thermal performance in an occupied property using input data from e.g. smart meters, property surveys, external weather data and in-home temperature sensors.

**TrustMark (TM):** the only UK government endorsed quality mark for home improvement, a key recommendation of the [Each Home Counts review](#) which was an independent review of standards and consumer protection in the retrofit market. TrustMark licences and audits over 35 Scheme Providers. Scheme Providers don't just cover installers of energy efficiency measures but also trades such as plumbers, electricians and builders and others. Scheme Providers are responsible for and provide oversight of the conduct of their members and must do their best to help resolve disputes between businesses and their customers.

**TrustMark Licence Plus (TMLP):** The Licence Plus Scheme was developed by TrustMark to provide a key route in supporting TrustMark Registered Businesses to engage in an adoption of fabric-first, whole house retrofit outside of government energy efficiency schemes. Originally created for the able to pay market (outside of government energy efficiency schemes) it sought to support the achievement of the UK's Net Zero targets and aid homes in reducing their household energy bills.

This consultation is available from: [www.gov.uk/government/consultations/energy-company-obligation-4-and-the-great-british-insulation-scheme-mid-scheme-changes](https://www.gov.uk/government/consultations/energy-company-obligation-4-and-the-great-british-insulation-scheme-mid-scheme-changes)

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