British experience with deemed savings in EEOS

Policy background: Supplier Obligations

In Great Britain (United Kingdom, excluding Northern Ireland), energy efficiency obligation schemes have been in place **since 1994 until March 2026**. The Energy Efficiency Standards of Performance (EESoP) obligation ran until 2002 over three phases. It was replaced by the Energy Efficiency Commitment (EEC), which ran over two phases until 2008. The Carbon Emissions Reduction Target (CERT) ran from 2008 to 2012 along with the Community Energy Saving Programme (CESP), from 2009 to 2012, which obligated both suppliers and electricity generators to deliver whole house retrofits in defined geographical areas. The Energy Company Obligation began in 2013 and, in 2025, is in its fourth phase, and will be scrapped at the end of March 2026. The obligations were on gas and electricity suppliers, based on their sales to residential customers. Actions were only allowed **in the residential sector** too.

Scaled methods (based on input fixed assumptions, which can be thought of as a form of deeming) were applied to measures that reduce the demand for heating and cooling, using models provided by the Building Research Establishment. From 2013, only actions that reduce the cost (and carbon emissions in early iterations of ECO) for heating have been allowable (building fabric improvements, heating systems and controls). Until end 2012, deemed methods were applied to energy savings from products and lighting.

There was no formal requirement in the EEOS legislation to update deemed savings, however **adaptations were often made between obligation phases**. The buildings models are usually updated following changes to the energy-related aspects of Buildings Regulations, given that they are used in relation to compliance to these regulations.

Process to specify and update deemed savings

Deemed scores were **updated between phases** in line with new evidence on technical performance or usage, data on market averages for sales across the distribution of products with different efficiencies and other changes, such as discount rates, comfort taking or lifetimes informed by **evaluations and other scientific evidence**. Fuel factors (costs and emissions factors) were also often changed between phases.

For example, the Technical Guidance manual for the 2005-2008 EEC updated the energy consumption assumptions for refrigerators and freezers compared with the 2002-2005 EEC Manual. The EEC 2005-2008 manual also amended the savings from

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these devices by applying a factor (of 0.71875) to savings to reflect evidence from the evaluation of the EESoP supplier obligation, carried out by the Energy Saving Trust and the regulator (Ofgem), which showed that eligible consumers used their refrigerators and freezers less than previously expected (in terms of opening and closing the appliance door).

The process for updating deemed scores evolved over the course of the obligation phases. Policy makers responded to calls from stakeholders for more **clarity** on the expected scores for actions, particularly when savings can be carried over (banked) from one phase to another, as was the case with the transition from EEC 2 and EEC 3 (subsequently CERT) in 2008. In 2006, the Government consulted on a new process by which the proposed scores in the phase beginning in 2008 would be **consulted upon in advance** (Jan 2007), before publishing a final approach later in 2007.

The **engineering models** used to estimate the impacts of energy efficiency actions on heating costs and emissions are updated on a periodic basis in line with updates to building regulations. The supplier obligations do not drive model updates. New evidence on energy efficiency would be incorporated at the same time. In between major updates, which historically happened every 3-4 years, all assumptions would remain fixed to **provide certainty for builders** needing to comply with the regulations. Updates would need to be completed around one year in advance of their use, to allow software developers using the model to adapt their products, which are used by the building industry. There have been no major updates to the RdSAP model since 2012. However, a new Home Energy Model (HEM) is expected to be introduced shortly.

Updates to the buildings model are reflected in the supplier obligation scores. Usually, switches to updated models would be done between EEOS phases.

Experience and feedback

Until end 2012, the Building Research Establishment Domestic Energy Model (BREDEM) was used to estimate scaled savings. This model was relatively flexible in that it allowed policy makers to tweak certain assumptions for the purposes of supplier obligation scoring, e.g., the carbon intensity of electricity over the lifetime of electricity using products and the time spent at home in priority group households.

From 2013, the switch to the Reduced data Standard Assessment Procedure (RdSAP), the successor to BREDEM, reduced the scope for making bespoke changes. SAP (used for new buildings and heat networks) and RdSAP (used for existing buildings) were tied to new legislation requiring Energy Performance Certificates (EPC). In the interests of consistency, the scope for using the models with non-standard assumptions was eliminated.

Even though RdSAP has been in place since 2012, there have been minor updates to the model to reflect new data on energy efficiency impacts. For example, in 2015, the model was revised to incorporate evidence on the thermal properties (u-values) of existing solid wall buildings – essentially, many old buildings had better thermal properties than previously thought, meaning that their EPC ratings improved and the savings from energy efficiency actions declined. These changes were reflected in the scores from actions in the second phase of ECO (ECO 2, 2015-2017).

Changes have been made to the ways in which the RdSAP model is used to calculate scores from combinations of actions in the same buildings. ECO 4 (2022-2026) took the RdSAP score before and after energy efficiency actions and works out the value of the energy savings, allowing for interaction effects between the actions. While increasing accuracy, this adds risk for scheme participants and is a relatively complicated scaled score compared with the previous regime. Under ECO 3 (2018-2022), scores for actions were calculated on a measure-by-measure basis, irrespective of the interaction effects.

The move from RdSAP to the Reduced data Home Energy Model (RdHEM), initially planned for 2026, would have incorporated changes in the way that the carbon intensity of the grid was calculated and incorporated the possibility of Time-of-Use tariffs and home batteries. This change will not be implemented, as the scheme is scrapped at the end of March 2026.

It is important to note that the **scaled energy savings** generated by the buildings models do not represent actual energy savings. They are **theoretical**, based on consistent assumptions across the building stock on the energy that would be required to achieve the same energy service level. This is important from the perspective of compliance with regulations, by commercial operators, that should not vary with end-user behaviour.

Empirical evidence shows that, for a variety of reasons, including behavioural factors (rebound effect, including comfort taking) and imperfect installation, leading to cold bridges, the **actual savings** from energy efficiency actions are **not as high as modelled *ex ante***. The **National Energy Efficiency Data-Framework (NEED)** is used as an evaluation tool to help understand the impact on energy use of energy efficiency actions[1]. NEED matches gas and electricity consumption data with information on energy efficiency measures installed in homes through policy measures and data on building and household characteristics. Differences-in-differences analysis enables the change in energy consumption before and after energy efficiency interventions to be compared with the change in energy consumption in non-treated homes with similar characteristics in other respects. The results of NEED analyses, which usually show lower energy savings than those predicted by the engineering

[1] About NEED, see also the UK ministry's presentation at the EPATEE workshop.

models, inform the UK government's supplier obligation impact assessments (e.g., ECO 4 Impact Assessment), which aim to estimate realistic carbon emission and energy bill savings (the units of policy interest).