[UNITED KINGDOM] Supplier Obligations

(EESoP, EEC, CERT, CESP, ECO)

About the measure

Policy instrument	Sector	Starting date and status
Market-based (energy efficiency obligations)	**Residential**	**[1994] – [on-going]**

The objective of the scheme is to **help alleviate fuel poverty** and **reduce carbon emissions**. It is implemented through secondary legislation that provides the Department for Business, Energy and Industrial Strategy (**BEIS**, formerly DECC) with the **powers to set energy efficiency targets** for energy companies with more domestic customers than 250,000. The scheme is **administered by the energy regulator, Ofgem**. Energy companies are required to achieve **periodic energy savings targets**, and must **report monthly** to Ofgem which carries out audits of the claimed savings.

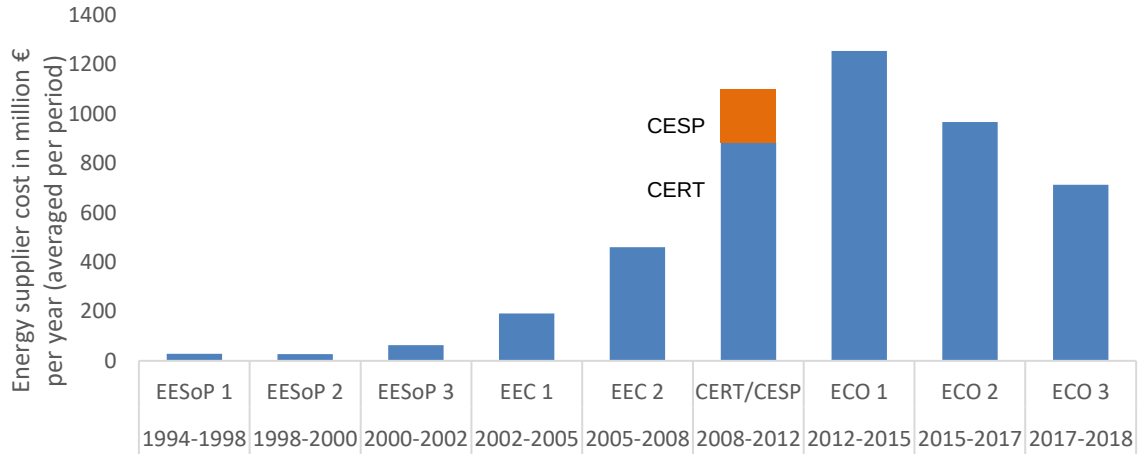
Energy companies can deliver their targets through a variety of means including direct engagement with customers (their own or any other), contracts with energy efficiency companies (managing agents) and installers and/or together with local authorities.

Actions saving final energy can only be delivered in the **residential sector**. Eligibility criteria include **minimum energy performance requirements** and **rules about additionality** (for ex., CFLs and household appliances were excluded from 2010 and 2013 respectively).

The scheme has known a number of changes from one period to the other. For more details about its history, see (ENSPOL, 2015; Rosenow, 2012).

Expected energy savings in 2020	Benchmark
4.4 TWh/y (15.8 PJ/y) in 2020 from actions over 2014-2020 (cumulated annual final energy savings) (source: UK 2017 NEEAP and Annual Report)	7% of the target for EED article 7 **annual target for 2016 = 0.2% of UK 2016 residential final energy consumption** (source: UK 2017 NEEAP and Annual Report and Energy Trends: total energy)

Means and outputs



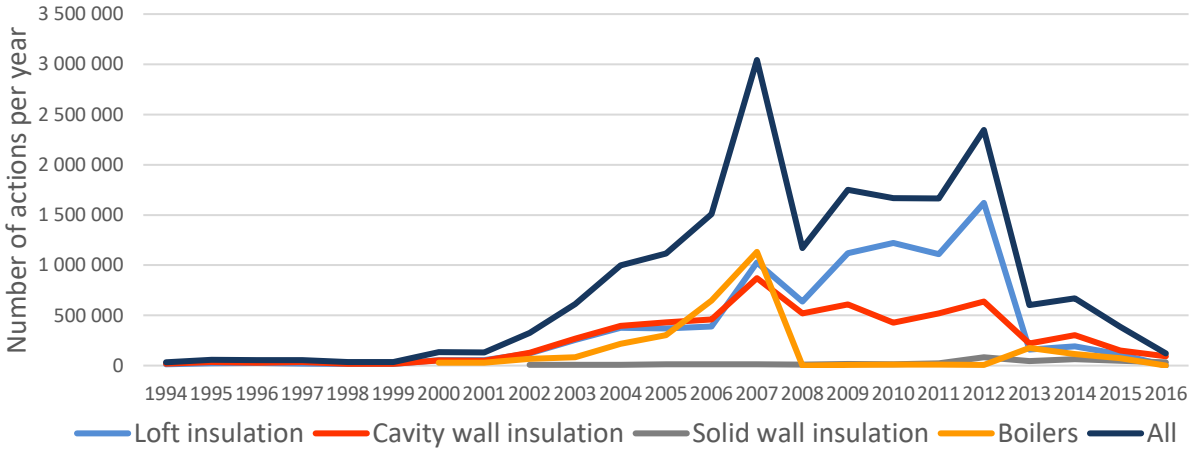
(exchange rate used: 1 GBP = 1.15 €) (sources: BEIS 2017a; NAO 2016; Rosenow and Eyre 2013)

Figure 1. Annualized energy supplier cost for each obligation period (in M€/year).

The EPATEE project has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 746265.

EESoP: Energy Efficiency Standards of Performance (obligation defined in spending per customer per year, see (Ofgem and Energy Saving Trust, 2003))
EEC: Energy Efficiency Commitment (first obligation defined in energy savings, see (Lees, 2006 and 2008))
CERT: Carbon Emission Reduction Target (obligation for 2008-2012 defined in carbon savings, see (Ipsos MORI et al., 2014))
CESP: Community Energy Saving Programme (complementary area-based scheme also defined in carbon savings, see (Ipsos MORI et al., 2014))
ECO: Energy Company Obligation (obligation defined in carbon savings and fuel bill savings including stronger focus on vulnerable households, see (NAO, 2016))

- **Costs estimated/ reported by the energy suppliers** = incentive costs (subsidies) and administration costs incurred by the energy suppliers (quality control system, documentation, reporting)
- **Administration costs for Ofgem** (management of the scheme + M&V): **about 2m €/a** for 2008-2012, **now closer to 6m €/a** (author's estimate)
- **Investment by participants** are assessed on a sample of projects (in the ex-post evaluations but high uncertainty around this data) (total investment by participants is unknown)
- **Costs per type of actions** is estimated through surveys and stakeholder interviews (ex-post evaluations report high uncertainties around this data)
- **Number of actions monitored by Ofgem and BEIS** (publicly available on their website)**:**

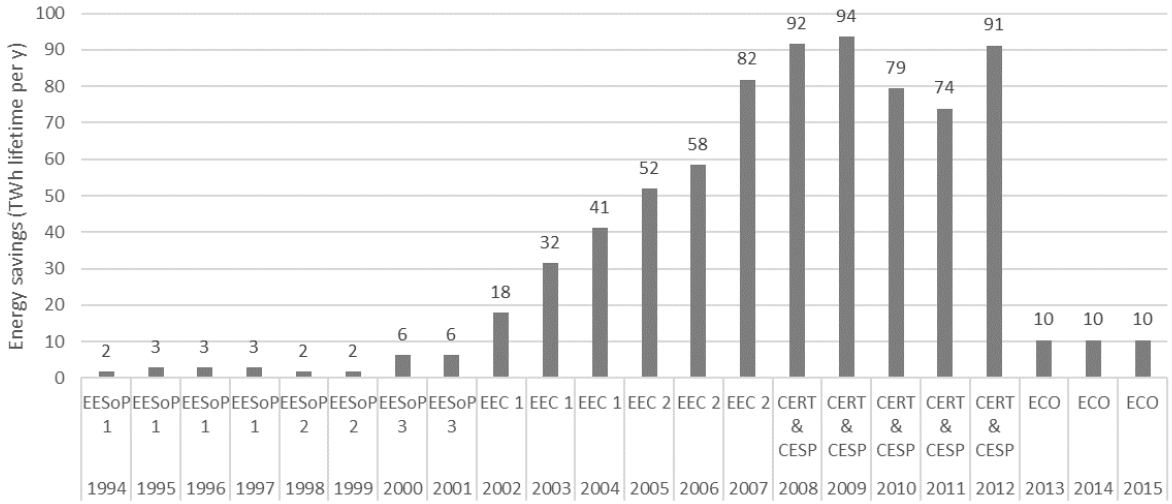


(data sources: BEIS 2017b; Committee on Climate Change 2013, 2017; Lees 2006, 2008; Ofgem 2003, 2005, 2008)

Figure 2. Annual number of actions per main action types (for 1994-2016).

Data about energy savings

Unit	Main source of data
final lifetime energy savings (in TWh/y)	Energy and carbon savings reported by NAO and Ofgem



Data sources: Lees (2006, 2008), NAO (2016) and Ofgem (2003, 2005, 2006, 2007, 2008, 2013)

Figure 3. Lifetime-cumulated energy savings from new actions implemented each year (in TWh).

- reported energy savings = lifetime energy savings including conversion factors to convert carbon savings to energy savings.

Sources of uncertainties about energy savings

- errors in the calculations and reporting of the energy savings (addressed by random checks);
- uncertainties related to the use of deemed savings (e.g., differences between estimated and observed energy consumption);
- uncertainties related to the in-use factors (see *Focus on evaluating the impact of energy efficiency actions*).

An evaluation by the National Audit Office (2016) refers to analysis by the Department of Energy & Climate Change (now Department for Business, Energy & Industrial Strategy) carried out in 2015, which evaluated ECO, CERT and CESP on the same basis. This analysis found that CO_2 savings attributable to CERT and CESP were 50% lower than it originally calculated, largely a result of using different (and more realistic) estimates for the energy savings from specific actions. However, similar analysis is not available for the years prior to 2008. Actual savings for the years 1994-2008 may therefore be lower than reported savings.

Evaluation of the energy savings

Calculation method(s) and key methodological choices

- **Final lifetime CO_2 savings (since 2008) and energy savings (before 2008)** are calculated with pre-defined carbon/ energy savings ratios according to standardised types of actions taking into account in-use factors which account for rebound effects and performance gaps (**deemed savings, method 3**). The UK government has commissioned multiple studies in order to derive and improve the deemed savings estimates. Those studies have been carried out by independent consultants, academics and the Energy Saving Trust.
- More recently, the **National Energy Efficiency Data-Framework (NEED)** was set up by BEIS to provide a better understanding of energy use and energy efficiency in domestic and non-

domestic buildings in Great Britain (see *Focus on evaluating the impact of energy efficiency actions*).

Reported carbon savings have included **in-use factors** since the inception of the Supplier Obligation in 1994 (expanding and refining the factors over time) to take into account the following points:

- **differences in performance** in-situ compared to laboratory testing and imperfect installation
- **natural variations** in the **thermal performance** of structural and fabric elements that cannot be fully determined by the assessment, e.g. the possibility that the un-insulated walls have different U-values than the standard assumptions and that U-value varies across different parts of the wall.
- **comfort taking** (rebound effect) by the household, where some households may choose to heat their homes to a higher temperature
- the household **failing to operate** the product/system **effectively**

Ex-post verifications and evaluations

In the UK every new public policy including a new phase of the Supplier Obligation is subject to an impact assessment prior to its implementation (usually compiled by the relevant government department). This can be classified as an ex-ante evaluation. Once implemented, the energy regulator Ofgem is responsible for monitoring and verifying the reported energy efficiency actions. In addition, BEIS carries out interim reviews of the Supplier Obligation based on Ofgem's and their own analysis of the scheme. Those reviews are then used to design the subsequent phase of the Supplier Obligation. In the past, BEIS and its preceding departments have commissioned independent ex-post evaluations of the Supplier Obligation. Through NEED, BEIS continually refines the energy saving estimates of specific interventions, which are used to calculate the overall impact of the Supplier Obligation. The National Audit Office, an independent public sector auditing body, has evaluated the value for money of a range of energy efficiency schemes including the Supplier Obligation. All this information is used to improve the Supplier Obligation over time.

Other indicators monitored and/or evaluated

Indicator	Explanations
Net Present Value = €734m	Ex-ante assessments made taking into account actions to be implemented from April 2017 to September 2018 and their impacts up to 2059 (according to the action lifetime) **Costs**: The largest societal costs are the material and labour costs associated with installation of energy efficiency actions (present value, €769m), costs of ECO scheme administration to suppliers (present value, €131m), the hidden costs associated with the installation of energy efficiency actions (e.g. time, disruption) (present value, €81m), the avoided costs of replacement boilers (present value, -€166m), and the search, finance and operational costs (present value, €91m). The vast majority of these costs are expected to be incurred by energy suppliers. **Benefits**: Households that have energy efficiency actions installed are the main affected group. They will benefit from energy savings (present value €840m), and increased comfort from warmer homes (present value, €209m). Society will also benefit from improved air quality (present value €71m), and reduced traded (present value €15m) and non-traded (present value €506m) greenhouse gas emissions. Discount rate used for the calculations: 3.5%/y (for years 1-30) and 3.0%/y (for years >30)
Value of energy savings = €840m	Calculated ex-ante based on energy price projections, taking into account energy savings cumulated over the lifetime of the actions expected to be implemented between April 2017 and September 2018.
CO_2 emissions savings benefits = €521m	$CO_{2\ equivalent}$ emission savings associated with electricity savings: 1.2 Mt $CO_{2\ equivalent}$ emission savings associated with non-electricity energy savings: 7.7 Mt (taking into account CO_{2e} savings cumulated over the lifetime of the actions expected to be implemented between April 2017 and September 2018) Carbon savings are valued using the benchmark carbon values published in the Green Book supplementary guidance.
Value of comfort taking = €209m	This is measured in the form of a change in energy used to reach a higher temperature, and valued using the retail price of energy as this reflects a household's willingness to pay for the extra warmth.
Health benefits = €182m (excluded from cost-benefit analysis)	Health benefits associated with making energy efficiency improvements have been calculated using BEIS's Health Impacts of Domestic Energy Efficiency Measures (HIDEEM) model. Note that overlaps with comfort taking are at present unclear, therefore BEIS do not include these benefits in the cost-benefit analysis to avoid double-counting.
Air quality benefits = €71m	Air quality improvements are valued using the relevant damage factors published in the Green Book supplementary guidance.
Value to society of lower energy bills in low income households = €665m	When taking into account the distribution of energy bill savings, the benefit to low income households can be valued more highly than had the benefit flowed to those with higher incomes. This effect can be valued through the use of equity-weighting. Equity-weighting is an approach outlined in the Green Book to monetise the distributional costs and benefits of policy options. It allows us to reflect that £1 of cost or benefit is worth more to those on lower disposable incomes than those in higher income groups.

(exchange rate used: 1 GBP = 1.15 €)
Data source: BEIS 2017a

Other aspects evaluated

The evaluation of CERT and CESP carried out by Ipsos Morri et al. in 2014 provides further insights. The analysis includes a range of aspects including the delivery routes chosen by the energy suppliers, the customer engagement methods, targeting of vulnerable customers and private renters, the impact on the energy efficiency industry and households, and the role of government and Ofgem.

Focus on evaluating the impact of energy efficiency actions

The National Energy Efficiency Data-Framework (NEED) project was set up by DECC (now BEIS) to assist in its plan to promote energy efficiency and support vulnerable consumers. It is the continuation of data collection work started in 2004 making more disaggregated data available for the analyses done by the Ministry (Gregory and Prime, 2012). It is a key element of the evidence base supporting BEIS to (BEIS 2016):

- Develop, monitor and evaluate key policies (including the Green Deal and ECO);
- Identify energy efficiency potential which sits outside the current policy framework;
- Develop a greater understanding of the drivers of energy consumption; and
- Gain a deeper understanding of the impacts of energy efficiency actions for households and businesses.

The data framework provides the largest source of data available in the UK for analysis of consumption and the impacts of installing energy efficiency actions. NEED is a framework for combining data from existing sources (administrative and commercial) to provide insights into how energy is used and what the impact of energy efficiency actions are on gas and electricity consumption, for different types of properties and households. The data framework matches gas and electricity consumption data, collected for BEIS sub-national energy consumption statistics, with information on energy efficiency actions installed in homes, from the Homes Energy Efficiency Database (HEED), Green Deal, the Energy Company Obligation (ECO) and the Feed-in Tariff scheme. It also includes data about property attributes and household characteristics, obtained from a range of sources. It has been used to understand the reduction in consumption for households installing specific energy efficiency actions using actual energy consumption data rather than modelled energy use. To date, NEED has looked at savings from a number of actions, including cavity wall insulation, loft insulation, installation of condensing boilers and solid wall insulation. The estimates from NEED were used to inform "in use factors" for the calculation of energy savings. Estimates are based on observed savings, so they are savings after comfort taking (direct rebound effect). To do this, intervention and comparator groups are created – with the intervention group containing properties which have received the energy efficiency action being considered (and no other action), and the comparator group containing similar properties that have not had a recorded energy efficiency action installed at any point.

NEED has supported a number of UK energy efficiency policies including the Supplier Obligation. Data on consumption has informed Fuel Poverty analysis so there is a better understanding of actual consumption for different types of properties and households and therefore a better understanding of how policy options will impact on different households. NEED data has also been used by researchers (e.g. Adan and Fuerst 2016).

Experience feedback from stakeholders

Interview with the public authorities (evaluation customers)

1. **What is the role of evaluation in the management of the scheme?**

The purpose of evaluation is to evaluate the scheme, consider learnings and implement changes in next phase. However, the Supplier Obligation is continuous and there is typically not enough time to carry out an evaluation at the end and apply the learnings in the next phase. We therefore conduct post

implementation reviews which happen mid-term during an ongoing phase of the Supplier Obligation. There is also continuous tracking of impacts of scheme in terms of actions and costs - this reduces the need for substantial evaluations at the end of the scheme.

2. **What were the main lessons learnt from the evaluations (about the impacts of the scheme and what could be improved)?**

We identified a number of lessons learnt:

a) We consider the work with trusted bodies such as local authorities as very important. We have introduced a new flexibility options for obligated parties to deliver a share of energy efficiency actions through local authorities.
b) There is a need for transition agreements between periods to phase-in any changes and ensure continuity.
c) Data sharing is important, particularly for targeting fuel poor households - BEIS is currently working towards sharing data from the Department for Work and Pensions with energy suppliers.
d) The quality of the installed actions is very important and not always considered. We commissioned the so-called Bonfield review looking into how to ensure highest quality standards. We also established the National Energy Efficiency Data-Framework (NEED) to check what actions are actually delivering. Ofgem also carries out technical monitoring and spot checks to ensure quality standard are met.
e) We learned that there is a need for a long-term framework including carry-over options (if savings targets are exceeded) and longer timeframes providing certainty for industry.
f) We recognised the need for a better understanding of the costs to obligated parties and implemented a data requirements for suppliers to report cost.
g) Data on consumer and third-party contributions to the cost is relatively scarce and further data will need to be collected.
h) There is a need for a better understanding of fuel poverty impacts of the Supplier Obligation and impact research is under way.

3. **What were the lessons learnt in terms of evaluation practices?**

Counterfactuals are always difficult to define as there are no areas in the UK that have not been treated under the Supplier Obligation.

You need to think about evaluation when you start the scheme, embed it in the design and make sure data is collected from the start. This can only happen if there is a legal framework for suppliers to actually provide the data.

4. **In parallel of the ex-post evaluations, are there other evaluations or studies that provided insights about the impacts of the scheme and/or possible interactions with other policies or drivers (or barriers) for energy efficiency?**

Evaluations only form subset of how BEIS reviews policies. The science team at BEIS commissions studies on new technologies, costs and barriers. We also talk to stakeholders involved in delivery to understand their perspective. For example, we returned to deemed savings as result of stakeholder feedback.

NEED is used as the main tool to assess the actual savings of actions, but there are significant lags between implementation and data availability.

5. **What would you like to highlight about your experience related to the evaluations of the scheme?**

It is difficult to say whether we should do an evaluation at a specific point as scheme keeps changing. Embedding an evaluation process that is continuous can accommodate for that. We also base our evaluation work on the so-called Magenta Book which contains broad guidelines for evaluation to be applied across all departments in the UK.

To go further

About the measure

- Ofgem webpage about the scheme:

https://www.ofgem.gov.uk/environmental-programmes/eco

- Ofgem guidance for the technical monitoring of the actions:

https://www.ofgem.gov.uk/publications-and-updates/eco2t-monitoring

- House of Commons Briefing paper about ECO (Energy Company Obligation):

http://researchbriefings.parliament.uk/ResearchBriefing/Summary/SN06814

- ENSPOL, 2015. Report on existing and planned EEOs in the EU – Part I: Evaluation of existing schemes. Deliverable D2.1.1 of the ENSPOL project, March 2015 (pp.181-199).

http://enspol.eu/results

- Description of the measure in the MURE database:

http://www.measures-odyssee-mure.eu/public/mure_pdf/general/UK33.PDF

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