

# The future of energy efficiency obligation schemes in the EU

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## Abstract

EU Member States have been encouraged to introduce Energy Efficiency Obligation Schemes (EEOS) to help meet energy saving objectives. As a result, there are now sixteen EU EEOS in existence or planned, compared with just six prior to the introduction of the 2012 Energy Efficiency Directive. At the same time, the long-standing EEOS in Denmark and UK have faced challenges because of concerns over increasing costs. This paper considers the role of EEOS in current and future EU and national policy: can established EEOS continue to deliver significant savings; will new schemes meet their targets; and will EEOS have an important future role?

This analysis builds on research for the EU Commission, IEA and European Parliament and an EU project (ENSPOL). Firstly, this paper sets out in more detail the place of EEOS in EU energy policy. Then the future of longer-established EEOS is explored, with case studies presented for the UK and Denmark. Recent and planned re-designs in these two countries are detailed, with analysis of the factors which led to changes in policy ambition. For new EEOS, key risks to delivery of savings are an over-ambitious delivery target and time line in the absence of policy learning opportunities. These risks can be mitigated by either having a preliminary or voluntary phase, or by adopting policy design from another country. The policy risk for nine EEOS is assessed, and the conclusion is that savings are at most risk in Croatia, Latvia and Spain.

The paper concludes with an analysis of EEOS within the future policy mix. The discussion considers the place of EEOS in EU policy, future savings from EEOS, their relationship with energy companies and the possible influence of different framings of energy efficiency. Then thoughts about what it would take to not need EEOS as an option in the policy mix are presented, with concluding ideas about how to secure a strong and effective future for EEOS.

## Introduction

The EU and many of its member states have now ratified the UN Paris Agreement which sets an aspirational limit to global temperature rise at 1.5 C, rather than the 2 C which formed the basis for much of earlier policy making. It is not clear what effect a 1.5 C target would have on energy efficiency policy, or indeed if 1.5 C can be achieved without major negative carbon technologies. However, globally energy efficiency is increasingly understood as a key component of low carbon energy policy (IEA, 2016).

The European Union (EU) is committed to energy efficiency: this is exemplified by its aim of delivering 20 % improvement in energy efficiency by 2020. More specifically, it has a range of policies to require Member States (MS) to improve the efficiency with which energy is used. Policy has been implemented through three key Directives – Ecodesign (2009/125/EC), Energy Performance of Buildings (EPBD – 2009/125/EC) and the Energy Efficiency Directive (EED – 2012/27/EU). As their names suggest, the Ecodesign Directive covers the energy efficiency of products, EPBD covers aspects of energy use in buildings, and EED is an over-arching directive which sets binding national energy ef-

Table 1. EEOS in EU member states, current status.

EEOS status	Member States
Active	Austria, Bulgaria, Croatia, Denmark, France, Ireland, Italy, Latvia, Luxembourg, Malta, Slovenia, Spain, Poland, UK
Under consideration	Greece, The Netherlands
None planned	Belgium, Cyprus, Czech Republic, Estonia*, Finland, Germany, Hungary*, Lithuania*, Portugal, Romania, Slovakia, Sweden

\* EEOS were planned, but these plans have been withdrawn.

efficiency targets up to 2020, and includes additional policy requirements and tools which help MS to achieve their targets. This paper focuses on EED, and in particular on the Energy Efficiency Obligation Schemes which MS were encouraged to introduce. At the time of writing, European energy efficiency policy is being reviewed and the European Commission has presented their proposals for the period post-2020 in the so-called Winter Package in late 2016 (European Commission, 2016a).

Under the Energy Efficiency Directive, EU countries are required to use energy more efficiently at all stages of the energy chain from its production to its final consumption. Article 7 sets out how countries are to calculate their national energy savings targets and the policy means by which the targets may be achieved. National savings targets for 2014–2020 must be based on a nominal savings rate of 1.5 % per year compared to the average energy consumption in the period 2010–2012. However, due to exemptions and exclusions allowed within the legislation, the notified saving targets are only about half of this headline figure, i.e. the annual saving rate is about 0.75 % (Forster et al., 2016; Ricardo-AEA, 2015).

In theory, Article 7 targets can be met by delivering energy savings from all sectors of the economy. However, requirements within Article 7 mean that, in reality, savings are unevenly distributed between sectors. Importantly, savings delivered by Article 7 policies have to be additional to those which are expected from existing EU efficiency policies. In practice, this means that efficiency improvements to products are largely outside the scope of Article 7, as these are delivered via the Ecodesign Directive. Therefore, most savings must come from efficiency improvements to buildings (beyond those mandated in the Energy Performance of Buildings Directive<sup>1</sup>) or industrial processes and their management, with transport only playing a minor role. Article 7 differs from earlier legislation on energy efficiency in its complexity and flexibility (Rosenow et al. 2016). It is trying to influence the more difficult areas for policy to reach, without a clearly defined route to doing so.

Adoption of Energy Efficiency Obligation Schemes (EEOS) is specifically encouraged within the current version of Article 7, in addition to a full range of other policy options – known as ‘alternative measures’<sup>2</sup>. The basic concept of the EEOS is that the government imposes an energy savings target on energy companies that has to be achieved at the customer end. The

target does not usually require a reduction of final energy use. Rather, it is defined as the savings achieved by the measures, promoted via the obligation. EEOS were promoted at EU level primarily because there is good quality evidence, from the EU and beyond, that well-designed EEOS can deliver significant, cost-effective energy savings over many years (Bertoldi et al., 2010; ENSPOL, 2015b; RAP, 2012). The evidence base for the social and economic value of EEOS is strong and growing (e.g. Labanca and Bertoldi, 2016; Rosenow and Bayer, 2016).

However, not all countries have chosen to introduce EEOS. In 2015, 16 member states had implemented, planned or were actively considering the implementation of EEOS (ENSPOL, 2015c). Since then, Estonia and Lithuania have dropped their plans for EEOS, but Greece and the Netherlands are now actively considering EEOS – so that the number of member states engaged with the policy is still 16 (Table 1). In both the UK and Denmark, countries with long-established and successful EEOS, there has been concern about the rising cost of EEOS. This has influenced a reduction in energy savings targets in both schemes. So while EEOS have a good track record of success, this is a good point in time to consider their future role.

This paper considers whether established EEOS can continue to deliver significant savings; whether new schemes will meet their targets; and if EEOS have an important future role. Firstly, this paper sets out in more detail the place of EEOS in EU energy policy. Then the future of longer-established EEOS is explored, with case studies from the UK and Denmark. The new EEOS, their ambition levels and learning periods are described, and the risks of under-delivery of savings are assessed. The discussion focuses on the future prospects for EEOS. It considers the place of EEOS in EU policy, future savings from EEOS, their relationship with energy companies and the possible influence of different framings of energy efficiency. Then thoughts about what it would take to not need EEOS as an option in the policy mix are presented, with concluding ideas about how to secure a strong and effective future for EEOS.

## EU policy support for EEOS

On 30 November 2016 the European Commission published a comprehensive set of energy proposals called ‘Clean energy for all Europeans’, also known as the ‘Winter Package’ (European Commission, 2016a). The legislative proposals cover energy efficiency, renewable energy, the design of the electricity market, security of electricity supply and governance rules for the Energy Union. The package also includes actions to accelerate clean energy innovation and to renovate Europe’s buildings. The aim of the package of measures is “to keep the European

1. However, this may change in future under the proposed Winter Package.

2. Alternative measures are classified as: energy efficiency national fund; energy or CO<sub>2</sub> taxes; financing scheme or fiscal incentive; regulation or voluntary agreements; standards and norms; energy labelling schemes; training and education; other policy measures.

Union competitive as the clean energy transition is changing the global energy markets”.

Included in the proposals is an extension of the energy savings requirement of Article 7, EED to 2030. The proposal also suggests that Article 7 be amended to make it clear that Member States can achieve the required energy savings through an energy efficiency obligation scheme, alternative measures, or a combination of both approaches (European Commission, 2016b). In fact, this is not substantively different from the original Article 7. In addition, an overall target of 30 % energy saving for 2030 is proposed. The level of this target has been debated extensively in advance of the Commission's proposals, with the European Parliament calling for a target of 40 % (European Parliament, 2016). The Winter Package is yet to be debated by the Parliament and the European Council, and the final decision on targets and other legislative details is expected during 2017.

In theory, these revisions will give MS and investors a long-term perspective to plan their policies and investments and to adapt their strategies towards energy efficiency. It should strengthen the case for adopting or continuing to support EEOS, all other things being equal, as research has shown these policies take time to deliver significant savings (ENSPOL, 2015a).

### The role of EEOS in delivering Article 7 savings targets

EEOS are a key policy tool being used to deliver Article 7 savings. Analysis of Member State reports shows that the largest share of overall Article 7 savings is expected to be delivered by EEOS (34 %), followed by financing schemes or grants (19 %), and taxes (14 %) – all financial or fiscal measures (EEOS are essentially providing purchase subsidies (Rosenow et al., 2016b)). The remaining savings come from regulation/voluntary agreements (11 %), standards and norms (9 %) with smaller contributions from training, national energy efficiency funds, energy labels and any other policy measures. In terms of sectors, most savings are expected from multi-sector ‘cross cutting’ policies (44 %), followed by buildings (42 %), industry (8 %) and transport (6 %) (Forster et al., 2016). However, these figures should be viewed with some caution. They are ex ante estimations and not measured savings, and there are considerable uncertainties around their reliability (Rosenow et al. 2016b).

EU Member States take very different views of the importance of EEOS in their policy mix. Of the MS, 12 are not currently implementing or planning to implement EEOS. This may change over time, particularly in light of the expected extension of the Energy Efficiency Directive to 2030. However, at present many countries judge that they can deliver the required savings without this policy measure. For those MS having or planning EEOS, their contribution to energy savings targets can range from 14 % (Malta) to 100 % of the total (e.g. Poland, Luxembourg), or indeed in excess of 100 % of the target in Denmark's case.

### Future of long-established EEOS

EEOS have been in place in a number of MS prior to the introduction of the Energy Efficiency Directive. The longest-established have been those in the UK and Denmark, both in operation in some form for around 20 years. The other pre-EED national schemes are in France, Italy, Bulgaria and Poland. The schemes in the UK and Denmark are described in some detail below.

Briefly, in Denmark, France, Italy and the UK, up until 2013, each national scheme has been increasing the energy savings targets to be achieved, while also evaluating progress and amending scheme rules to meet changing objectives and circumstances. These schemes are generally considered to have been successful in delivering significant, cost-effective savings. The picture in Poland is more complex as the first phase of the scheme was not successful, and the EEOS has been comprehensively redesigned (ENSPOL, 2015a). In Bulgaria, an existing EEOS scheme is reported as having been adapted to fit with the requirements of EED (Republic of Bulgaria, 2016). The Bulgarian EEOS is less well documented (in English) than the other schemes. In addition to these national schemes, the Belgian region of Flanders also had a very successful EEOS (ENSPOL, 2015a).

The UK and Denmark have delivered higher savings from their EEOS than other EU countries, and so could be seen as front runners. However, in both countries the increasing ambition of savings targets, and the cost of the schemes to bill-payers has raised political and public concern. This has influenced reductions in their savings targets. Understanding how the EEOS have developed in recent years in these countries, what concerns were raised about their impact, and how the public debate evolved, should help other countries retain support for ambitious savings targets.

### UK redesign of EEO<sup>3</sup>

The EEOS began in 1994, when the UK was the first country in Europe to impose energy efficiency obligations on energy suppliers. Suppliers were allowed to raise money from a charge on residential and small and medium enterprise (SME) customer bills and had to use this to meet energy savings targets. SMEs were no longer included in the scheme from 2002 and subsequently it has covered the residential sector only. The UK is only EU country to restrict its EEOS to this single sector. The details of the scheme have been re-designed approximately every three years, some of these being major redesigns, others being less significant. Four different names have been employed since 1994. The current scheme, 2013–2017, is called ECO – the Energy Company Obligation. The UK objectives, measures, savings, costs and mechanisms have varied over time. These are described more fully elsewhere (ENSPOL, 2015a; Rosenow, 2012).

Re-designs prior to 2013 were primarily aimed at increasing the savings delivered. The success of early phases of the scheme led to confidence that suppliers could reach higher targets. The obligations started at a relatively low level but eventually became a major climate change mitigation policy for the domestic sector. In 2008–2012, the scheme was saving around 1 % of UK residential energy use annually. Until the sudden changes adopted in 2013, EEOs had developed incrementally and grown steadily in scale (Figure 1), resulting in general support as a policy mechanism across changes in political administration and market structure. Targets in Figure 1 are ‘estimated’ because UK targets are set in terms of lifetime carbon savings, and these have to be translated into annual energy savings. For more details see references.

3. Strictly speaking this section refers to Great Britain (the UK without Northern Ireland) – but we use UK, as it is more familiar.

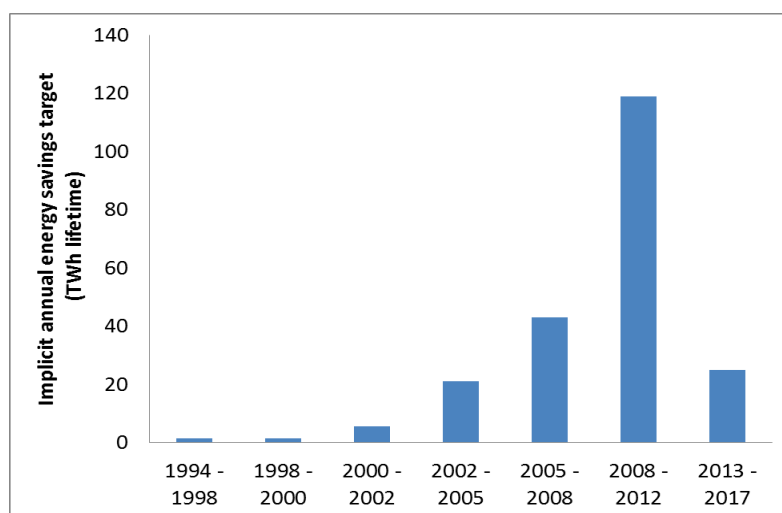


Figure 1. Estimated annual energy savings of the EEOS in the UK, 1994–2017. Source: Rosenow 2012, Rosenow et al 2013 1994–2012, author estimate 2013–2017.

The policy redesign of ECO (2013–2017) was to ensure it fit well with a significant new policy, the ‘Green Deal’ loan scheme. Green Deal was expected to establish a new market for energy efficiency measures for ‘able to pay’ customers, installing measures previously subsidised through the earlier EEOS phases. ECO was designed to:

1. support insulation measures in any household that were too expensive to meet the Green Deal funding rules, such as solid wall insulation, and
2. to provide support for a wider range of measures to vulnerable customers, largely people receiving social benefits who would be expected to be unable to take on Green Deal loans (DECC, 2011).

It was also designed, in part, to take account of the ending in 2011 of the government-funded programme designed to reduce fuel poverty. Thus the EEOS had changed from a scheme which supported large-scale installation of cheaper measures (particularly loft and cavity wall insulation) to a scheme primarily targeting expensive insulation measures – not because all the available cheaper measures had been installed, but because the government judged they should no longer be generally subsidised. Unfortunately, Green Deal was a very unsuccessful policy, with minimal take of up loans, and it was effectively withdrawn in July 2015 (Rosenow and Eyre, 2016).

In mid-2014, ECO was re-designed “to reduce pressures on consumer bills and ensure ECO provides value for money for energy consumers; whilst continuing to help tackle fuel poverty, support the development of a sustainable energy efficiency supply chain and improve the energy efficiency of our housing stock” (DECC, 2014). As well as reducing the savings target of the main strand of ECO by 33 %, some cheaper measures were reintroduced to the scheme from 2015.

A number of factors influenced this decision:

- Energy companies argued that targets could not be delivered at the costs suggested by government, and cheaper measures needed to be included in ECO.

- The markets for low cost insulation measures (loft and cavity wall insulation) originally excluded from ECO had been severely damaged due to the very low uptake under Green Deal. The job losses entailed, and concern about this business sector, put pressure on the government to make changes.
- Very high levels of public concern about energy prices led to pressure on government to reduce ‘levies’, which is how the cost of ECO was presented by its opponents (Rosenow and Eyre, 2016).

The savings target was reduced, despite the overwhelming contrary response to the government consultation (DECC, 2014) and government evidence that this would result in net higher energy bills overall (DECC, 2013). It is hard to interpret this decision other than as a politically expedient choice, as opposed to evidence-based policy making.

The government plans to keep ECO as part of its policy mix with plans for a supplier obligation to run for five years from April 2017 at an estimated level of £640 million (€732 m) per year. It is currently consulting on an interim scheme for a one year period from April 2017 to March 2018, which will act as a transition towards a longer term scheme from 2018–2022. Figure 2 shows the government’s intention in outline in terms of the content of the policy. The transitional extension for 2017–18 will be smaller in terms of expected energy company spend (26 % reduction), with more of a focus on the fuel poor – both moves which will further reduce the amount of energy savings delivered by this policy.

The recent and planned changes to the UK scheme were not inevitable. They were driven by a number of factors – with political concerns, within a programme of economic austerity, being key. The current plans mean that the UK will use its future EEOS to tackle fuel poverty. This raises questions as to whether this will retain public support, and if it is a sufficient or sensible way to address fuel poverty. Given that the future EEOS will not deliver significant energy savings, there will be a gap in the UK policy mix designed to meet Article 7 targets.

### Danish redesign of EEO

Denmark has had an EEOS for about 20 years where the obligated parties have been the distribution companies (DSO), which are regulated monopolies. There have been several phases of the EEOS in Denmark; the overall policy objective of delivering cost-effective savings has not changed significantly, but the means by which energy savings have been delivered has. The different phases have built on experience and adapted to external factors such as the development of the energy system, technological development, and the consequences of other policies. Over time the Danish scheme has included increasing numbers of energy distribution companies, supplying different fuels, including smaller companies. It has also increased the savings targets, moved towards supporting technological measures rather than education and advice, and has implemented more formal procedures to calculate and document savings and ensure additionality. The scheme is based on a voluntary agreement between the energy trade associations and the government (although as mentioned below, obligations can be imposed if actors refuse to take part voluntarily). This scheme is widely considered to be successful.

The Danish EEOS began with electricity companies in the 1990's. In the beginning, the focus was on awareness – information, education and campaigns. The scheme covered private households, industry, trade and services sector and the public sector. Around 2000, the gas distribution companies joined the scheme. From 2006, the scheme was changed radically, with savings targets being introduced which were two to three times higher than the savings delivered previously. The focus moved from awareness and information to implementation of energy savings. At this stage the oil companies joined the scheme, and district heating companies either joined voluntarily or were required to realise energy savings under the same conditions as the companies that joined the agreement. In 2009, more precise requirements for documentation of savings were introduced to ensure alignment between the DSOs and to increase additionality. As the size of the obligation grew, there was also an increased focus on costs and their documentation. In 2010, the EEOS target was doubled, and it has continued to increase over time (Figure 3). The 2015–2020 target is equivalent to saving 3 % of final energy in Denmark, excluding transport. A more detailed account of the development of the EEOS is available elsewhere (ENSPOL, 2015a).

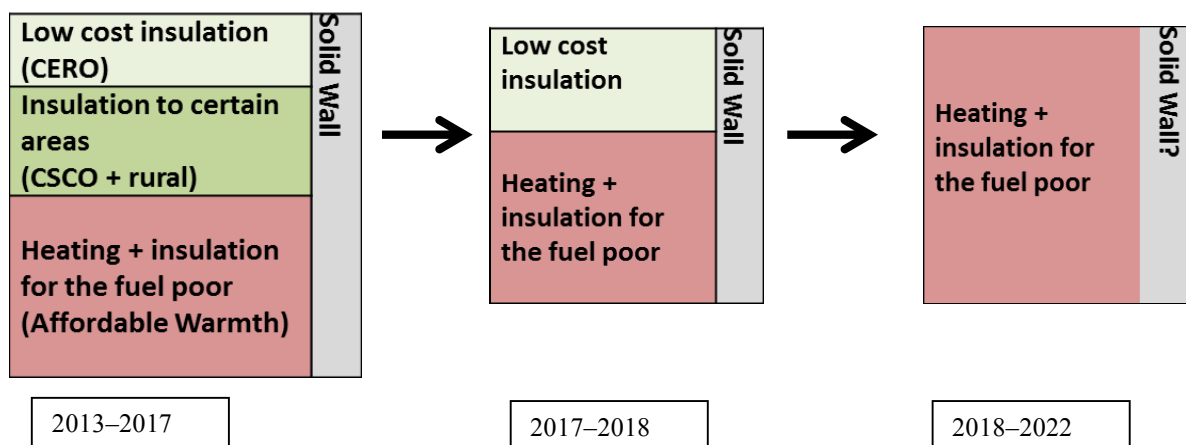


Figure 2. Change in design of UK EEOS, 2013–2022 (not to scale). Adapted from: (DECC, 2016).

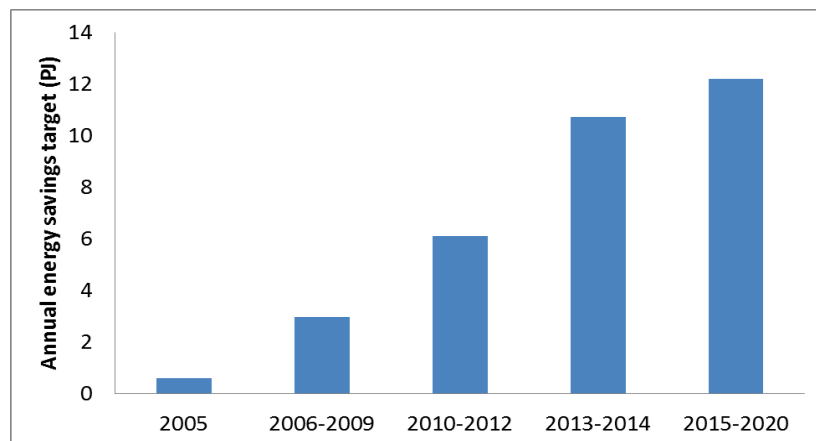


Figure 3. Danish EEOS – annual energy savings targets, 2005–2020. Source: Bach, 2016 – but see text below for subsequent changes to 2016–17 target.



Table 2. Risk of policy failure based on presence of voluntary phase and/or adoption of successful designs.

	Ambition level (share of EEOS of total Article 7 savings)	Voluntary phase	Adoption of successful design	Risk of savings shortfall
Austria	42 %	✓		Low
Croatia	41 %			High
Ireland	48 %	✓		Low
Latvia	65 %			High
Luxembourg	100 %		✓	Low
Malta	17 %			Moderate
Poland	100 %			Moderate
Slovenia	33 %	✓		Low
Spain	44 %			High

Source: authors' illustration; share of EEOS of total Article 7 savings taken from Fawcett and Rosenow (2016).

The current Danish EEO, known as “The Energy Savings Agreement”, runs from 2012–2020 and is renegotiated every three years. Evaluations of the scheme feed into the renegotiation process, and can be influential (Bundgaard et al., 2013). For the first time in the history of the scheme, savings target in 2013 and 2014 were not met. In 2015, obligated parties looked into the possibility of realizing more savings in the transport sector and energy production and from SMEs (ENSPOL, 2015a). The savings target in 2015 was met (Bach, 2016).

In the summer of 2016, politicians proposed that the obligation should be moved from distributors to retailers. This was in part due to their belief that this would deliver more competition and ultimately result in cheaper energy efficiency/energy savings, benefiting customers (Pers comm, Nikolaj Nørregård Rasmussen, 13 June 2016). Their views were influenced by two Danish studies about reforming the EEOS, one official and the other unofficial. This change would represent a major disruption to the Danish scheme. Discussions about future changes are continuing, but the DSOs are currently expected to remain the obligated parties until at least 2020. However, the latest agreement between the government and obligated parties (signed late December 2016) has reduced the savings target to 10.1 PJ per annum for 2016–17 (Pers comm, Mikael Tøgeby, 16 January 2017).

### Introduction of new EEOS

The following countries have new or planned EEOS: Austria, Bulgaria, Croatia, Ireland, Latvia, Luxembourg, Malta, Slovenia and Spain (for more details see Bertoldi et al., 2015; Fawcett and Rosenow, 2016; Commission Services, 2016). As already mentioned, the Polish scheme has been completely redesigned after failure to deliver significant savings in the first phase and can be treated as a new EEOS. There is a lot of high quality advice on how to design, implement, monitor and evaluate an EEOS (Lees and Bayer, 2016; RAP, 2012) in addition to EU-level initiatives to encourage mutual learning between Member States (e.g. the ENSPOL project, the bigEE project, Concerted Action programme).

A key question is whether the new EEOS are likely to emulate the success of schemes in Denmark, France, Italy and the

UK in delivering significant energy savings over a sustained period. Success is not determined by who the obligated party is, the way the targets are set, the sectors across which it operates, the degree of tradability of savings – which have varied between these countries. Factors that the successful schemes have in common are: (1) beginning with modest levels of savings; (2) increasing in ambition level over time; (3) learning from early phases and re-designing the EEOS to be more efficient and effective; and (4) consistently evaluating the performance of the EEOS and having an independent authority to check them and be ready to implement sanctions if savings are not delivered. The established schemes have proven that they can deliver high levels of savings, so there is evidence that EEOS of the right design and implementation can deliver all of a country's Article 7 savings.

Article 7 targets have to be met between 2014 and the end of 2020, giving a relatively short time for newly introduced EEOS to deliver significant savings. Successful schemes typically have limited savings targets on introduction. In France, the first three years of the EEOS (2006–2009) were treated as a trial period with low savings targets, so that obligated parties could acclimatise to the system and build relationships with the various stakeholders needed to deliver measures. The scheme was re-designed after experience in the first phase. There was a similar pattern of gradual introduction, learning and re-design in Italy and Denmark. In the UK, significant savings targets were only set after the first 8 years of the scheme<sup>4</sup>. However, the time scale it typically takes before EEOS can deliver significant savings can be cut short in the new EEOS schemes.

Two ways in which the initial learning period could be shortened are:

1. build on existing experience of a voluntary scheme for obligated parties;
2. adopt (and adapt) a successful EEOS design from another country.

4. This was a result of limited regulatory powers of the regulator and not driven by the need for learning. Without the limitations that were overcome in 2002 the targets most likely would have been increased earlier (Rosenow 2012).

Each of the new EEOS is assessed against those criteria to establish whether or not the schemes are likely to be at risk of delivering lower savings than anticipated<sup>5</sup> (Table 2).

The analysis shows that of these approaches, Austria, Ireland and Slovenia have taken the first approach, and Luxembourg has taken the second. (Luxembourg is unusual in this, as otherwise no two EEOS are the same, with each country or region adapting the central idea to its own circumstances and priorities). Having taken neither of these approaches, and having fairly ambitious targets, Croatia, Latvia and Spain are at high risk of savings shortfalls, although we are not saying that they won't be able to deliver savings through EEOS, just at a lower than anticipated rate. Given the problems with Phase 1 of its EEOS, and its high ambition level, that of Poland must also be at some risk.

## Discussion

This discussion focuses on the future prospects for EEOS, picking up on the evidence presented earlier and wider trends in energy and energy policy. It considers first the place of EEOS in EU policy, future savings from EEOS, their relationship with energy companies and the possible influence of different framings of energy efficiency. Then thoughts about what it would take to not need EEOS as an option in the policy mix are presented, with concluding ideas about how to secure a strong and effective future for EEOS.

### EEOS IN EU POLICY

The EU's Winter Package has reaffirmed that EEOS can have a future in meeting European and national energy saving goals, and has arguably strengthened the case for them by setting energy efficiency goals out to 2030 and beyond. However, EEOS are not seen as a necessary policy by all countries, with 12 member states choosing not to use an EEOS. Most of the longer established EEOS are continuing to deliver increasing levels of savings, and are expected to do so into the future. However, despite being paid for via energy bills rather than through taxation, EEOS can come under public and political pressure – as happened most notably in the UK. Without public and expert understanding of the benefits of this policy, it may be vulnerable to reduction in scope or ambition. The question arises as to whether there is a political limit to the scale of EEOS, or at least the scale of revenue that can be raised via these schemes on customer bills.

There are nine new EEOS (including Poland), either already in place or in the planning phase. Most of these are at low or moderate risk of not achieving their savings goals, as they have taken action to shorten the initial learning phase. However, for three schemes, because they have not had a voluntary phase, or copied a scheme design from elsewhere, the risk of under-delivery is judged as high. Overall there is considerable potential for successful member state EEOS – but failure is a real risk, as experienced in Poland in Phase 1 of its scheme. While failure, or only partial success, may not be fatal to an EEOS – in Poland a comprehensive re-design has been undertaken – clearly policy designers and implementers will want to avoid this by making best possible use of the available experience and evidence.

5. Risk of savings shortfall is only estimated against these criteria. We have not considered whether member states have sufficient low cost efficiency opportunities which can be delivered by their EEOS.

### WHAT SAVINGS DO EEOS DELIVER NOW, AND WHAT MIGHT BE THEIR ROLE IN FUTURE?

As reported elsewhere (ENSPOL, 2015a), EEOS have delivered savings from different sectors in different countries – primarily or solely from the residential sector in France and the UK, and predominantly from the industrial sector in Denmark or Italy<sup>6</sup> – although residential savings are becoming more important in both of these countries as well now. In the residential sector, EEOS have been used primarily to deliver relatively low cost energy efficiency measures. This clearly maximises benefit cost ratios, but does not support more comprehensive, whole-house retrofits. This may prove important in the context of the need to deliver substantial change in the built environment, as it is difficult to see how EEOS focused primarily on cost-effectiveness will support deep and complex refurbishment, one of the key challenges within energy efficiency policy.

If EEOS are to deliver deeper and more comprehensive energy efficiency improvements in residential (and other) buildings, in principle, this can be achieved by a) establishing incentives for deeper energy efficiency improvements and b) limiting the extent to which the most cost-effective measures can be utilised. Both of these moves have been incorporated in the UK scheme, with quotas for (relatively expensive) solid wall insulation, and limits on installation of cheaper measures – as described briefly earlier.

Including fewer, more expensive measures in EEOS has social equity implications. EEOS are funded through energy bills, which means that all customers pay for the programme. If the EEOS saving target is delivered via fewer projects, a smaller number of people and organisations benefit from the scheme. In other words, the benefits are concentrated and the costs are dispersed. This can become controversial. The same is true for other energy efficiency finance policies that rely largely on public subsidies and certainly not unique for EEOS.

However, there are ways to dampen the effect of concentrated energy saving benefits versus dispersed energy bill costs: in France, many energy efficiency measures are part-funded by EEOS and tax rebates which results in lower EEOS bill surcharges (Rohde et al., 2015). In principle, such an approach could be used to employ EEOS for the purpose of delivering technologies with higher costs and deeper energy efficiency improvements. The EEOS would be the primary delivery mechanism and the firm targets ensure that energy savings are being achieved. At the same time, funding for less cost-effective measures would be provided by a mechanism funded through general taxation in order to part-fund those measures together with the EEOS.

### EEOS AND ENERGY COMPANIES

The unique feature of EEOS is that they are an obligation on energy companies, whether retailers, distributors, or both. Because of this, the way in which energy company relationships with their customers are changing is likely to be relevant to the future of this policy. The energy landscape is changing. To give a couple of examples, more consumers are generating their own energy and selling as well as buying from their energy retailer, and are becoming 'prosumers'. The roll-out of smart meters and

6. Previously the residential sector dominated savings from the Italian EEOS but after a change in the calculation methodology in 2012 valuing the benefits of longer-lived measures there has been a shift to industrial measures.

feedback options, means that customers can be better informed than ever about their own energy use. The rising percentage of renewables in the electricity generation mix has increased interest in customers' capacity for 'demand response'. Whether these and other developments lead to more engaged, active customers with greater interest in the benefits of energy efficiency remains to be seen, but it certainly seems possible. If energy customers are more active, then it should be easier for energy companies to engage them in EEOS, and to deliver their savings targets. This would also apply more generally to energy policies promoting energy efficiency, demand response or uptake of renewable energy.

One of the hoped-for benefits of EEOS, is that they would themselves change the relationship between energy companies and their customers. Energy retailers might become more like energy service companies, ESCOs. The evidence for these changes is mixed (ENSPOL, 2015a). Energy distributors in Denmark are reported to have used EEOS to develop better customer relationships. In Italy the EEOS has supported a growing market for ESCOs, although not the transformation of energy companies into ESCOs. In France the source of EEOS programmes/funding is not understood by recipients, and in the UK the energy retailers have not notably changed their business model. While EEOS can be an important efficiency driver, this policy is not sufficient to fundamentally move energy retailers away from being kWh selling businesses.

#### EEOS IN DIFFERENT FRAMINGS OF ENERGY EFFICIENCY

The flexibility of EEOS also leads to their meaning and aims changing over time. For example, they can be designed to deliver reductions in fuel poverty, to generate job opportunities in chosen sectors, or to grow the market for particular technologies, as well as to deliver savings. As the policy objectives change, so the design of the policy is likely to change. This flexibility probably means that EEOS can be relevant, however energy efficiency is framed – whether as an aid to economic efficiency, as first fuel, or as a means to delivering multiple social, economic and environmental benefits (IEA, 2014). However, it is worth considering how well EEOS fit with two currently popular framings – 'energy efficiency first' or 'first fuel' and with energy efficiency as a means to achieve multiple benefits.

The policy approach proposed by the European Commission in its latest policy package is 'energy efficiency first'. Arguably, this framing implies a role for EEOS within the way the energy sector is regulated and structured – although how that plays out will depend on the national regulatory structures and the industry. EEOS have emerged out of a debate in the United States in the 1970s and 1980s around least-cost planning and later in the 1990s around integrated resource planning – an approach that requires systematic consideration of energy efficiency as a means for achieving outcomes more cheaply. 'Energy efficiency first' also builds on the principles of least-cost planning and integrated resource planning. EEOS naturally are a good fit with the new policy principle – although they were first implemented in vertically integrated markets, where requiring energy companies to provide energy efficiency in addition to energy is perhaps easier (Rosenow et al., 2016a).

The multiple benefits framing suggests that energy efficiency has many environmental, social and economic benefits, such as improved health, new job creation, and increased productivity,

and that these are not properly understood or taken account of in decision-making. These benefits may be quantifiable, with good quality data and agreed methodologies or intangible and hard to value – or somewhere in between. Studies using cost-benefit analysis show their value can be much higher than direct energy cost savings (IEA, 2014).

Article 7 has only been structured to deliver energy savings; it does not consider the multiple benefits of energy efficiency. The proposals for a revised Article 7 do include considerations of the social benefit of ensuring that households in energy or fuel poverty benefit from the scheme. However, this inclusion of more than one objective for a policy, is not the same as a multiple benefits framing. Including multiple benefits in policy design could affect targets set for EEOS, e.g. higher targets can be justified if a case has been made they will deliver societal benefits beyond energy saving. Given that it is government which has multiple social, environmental and economic objectives which can be delivered via energy efficiency – rather than the obligated parties – the interaction of multiple benefits framing with this policy needs some careful thought.

#### WHAT WOULD IT TAKE FOR EEOS NOT TO HAVE A FUTURE

One way of thinking about the future place of EEOS in EU policy, is to consider what it would take for them not to have a future. Assuming that there is a strong energy savings target still in place, the following conditions might mean EEOS are no longer part of the policy mix:

1. No significant energy efficiency potential available from standardized measures, or little available in the sectors which typically deliver most savings via EEOS.
2. EEOS policy is shown to fail in terms of efficacy/efficiency/cost-efficiency/equity.
3. Energy company resistance to delivering this aspect of government energy policy.
4. Public/political resistance to energy price rises.
5. A stronger focus on distributional issues of policy, so that regressive revenue raising via (residential) energy customers, or highly unequally distributed benefits were not acceptable.
6. Energy companies become more like ESCOs – so that they already deliver an (economically) optimum amount of energy efficiency.

Condition 1 does not apply, with plenty of energy efficiency potential identified within, for example, the buildings sector (Graham et al., 2013) and SMEs (IEA, 2015). Even in the long-term an argument can be made that innovation will lead to re-growth of 'low-hanging fruits' (Gilleo, 2014). Condition 2 would be unlikely based on evidence to date – but poorly designed and implemented schemes could fail to achieve the successes of the past, as discussed earlier. As we have shown, Condition 3 was a factor in the UK scheme being designed to be less ambitious, as was Condition 4. While in some countries it seems that EEOS have been influential in re-designing energy companies' relationships with their customers (e.g. Denmark), this is not universally true, and continued support of energy companies for this policy cannot be taken for granted. The Commission is



trying to address Condition 5 by its inclusion of a requirement to deliver some of the benefits of EEOS to those in energy/fuel poverty. However, there is also the issue of unequal distribution of benefits, which applies particularly in the residential sector for more expensive measures, or moves towards deep renovation, and could also be an issue in the industrial/commercial sector, if only a small number of firms benefit each year. The evidence shows we are a long way off Condition 6 becoming true.

#### SECURING A STRONG AND EFFECTIVE FUTURE FOR EEOS

On balance, there is still good policy space for EEOS. However, there are also risks, most notably a lack of energy company, public or political support for this policy. Energy companies can have internal reasons for opposing the policy (too burdensome, not their core business etc.), which they may present as protecting their customers from rising prices due to unnecessary government policy. In order to maintain public and political support, it is vital that the policy has support from trusted actors and interest groups (e.g. consumer groups, environmental and social NGOs), and that the evidence is available to show its benefits. This evidence must be communicated clearly and persuasively. EEOS cannot remain a policy only understood by a few experts.

An important conclusion from the experience over the past decade is that a rigorous and public process of review can drive innovation in delivery routes, can build greater public awareness of the services being offered, and is quite useful, perhaps essential, to ever-deeper savings levels over a period of years. EEOS are unlikely to meet deeper savings targets over multi-year periods without the discipline of programme reviews leading to innovations in implementation.

Finally, experience shows that relying on EEOS as the only instrument to deliver energy efficiency measures is risky – when political support for levy-funded energy efficiency policy drops this could have significant repercussions for the sustainability of the energy efficiency market. Using EEOS as a single instrument also does not exploit the potential synergies with other, complementary measures and a policy mix has been shown to be more effective than relying on single instruments (Rosenow et al. 2016b).

#### Conclusions

EEOS is a policy which has demonstrated that, correctly designed, it can successfully deliver sustained energy savings over multiple years. It is flexible, and can be designed in a variety of way to meet national needs, and to fit within very different policy mixes. At present EEOS are used to deliver savings primarily through upgrading the building stock, early replacement of inefficient appliances and equipment, and improving industrial processes – efficiency savings which are not covered by minimum standards or regulations. EEOS have delivered considerable energy savings, and are expected to do so into the future. In total, 16 EU countries now have, are planning or are giving serious consideration to introducing an EEOS. However, some member states have not adopted EEOS and are not planning to do so. In addition, as EEOS have delivered higher energy savings in Denmark and the UK, there has been public and political concern about the cost to bill payers, and this influenced the reduced ambition levels of the UK and Danish EEOS.

EEOS are likely to continue to evolve in objectives, design and delivery as the energy and policy landscape changes around them. The new European framework of ‘energy efficiency first’ supports EEOS, and the planned extension of the Energy Efficiency Directive to 2030 is also vital. EEOS have a very strong track record in securing savings from low cost measures and they are expected to continue to do so. However, their scope may need to widen as savings targets increase, and if (or when) low cost opportunities reduce over time. Delivering higher cost measures, particularly deep retrofit to buildings, is very challenging whatever policy instrument is used. EEOS may be able to make a contribution to this, but careful thought will be needed to ensure that the policy is seen as fair, and retains energy company, public and political support. The expertise and evidence which exists showing the benefits of EEOS needs to be shared with and understood by wider civil society, so that this is not a policy only understood by experts.

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