ENSMOV

TOWARDS BETTER ENERGY EFFICIENCY POLICIES

Snapshot of Energy Efficiency Obligation Schemes in Europe (as of end 2019)

Provisional version

ENSMOV Report

Project Coordinator: INSTITUTE FOR EUROPEAN ENERGY AND CLIMATE POLICY STICHTING - IEECP

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With thanks to all the interviewees (cf. Table of contents)

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Foreword

This snapshot presents an overview of the **Energy Efficiency Obligation Schemes** (EEOS) in Europe. All these schemes are reported to the Article 7 of the Energy Efficiency Directive (EED), for the obligation period 2014-2020.

EEOS are schemes setting an obligation on **energy companies** (energy distributors or suppliers/retailers) to achieve **energy savings targets**. As shown in this snapshot, **various ways** can be used to specify this obligation, its scope, how the targets can be achieved by the obligated parties, how energy savings can be monitored, how verification and controls are made.

By the time of preparing this snapshot (end of 2019), **16 EEOS** were in place in Europe, as shown in the map below.

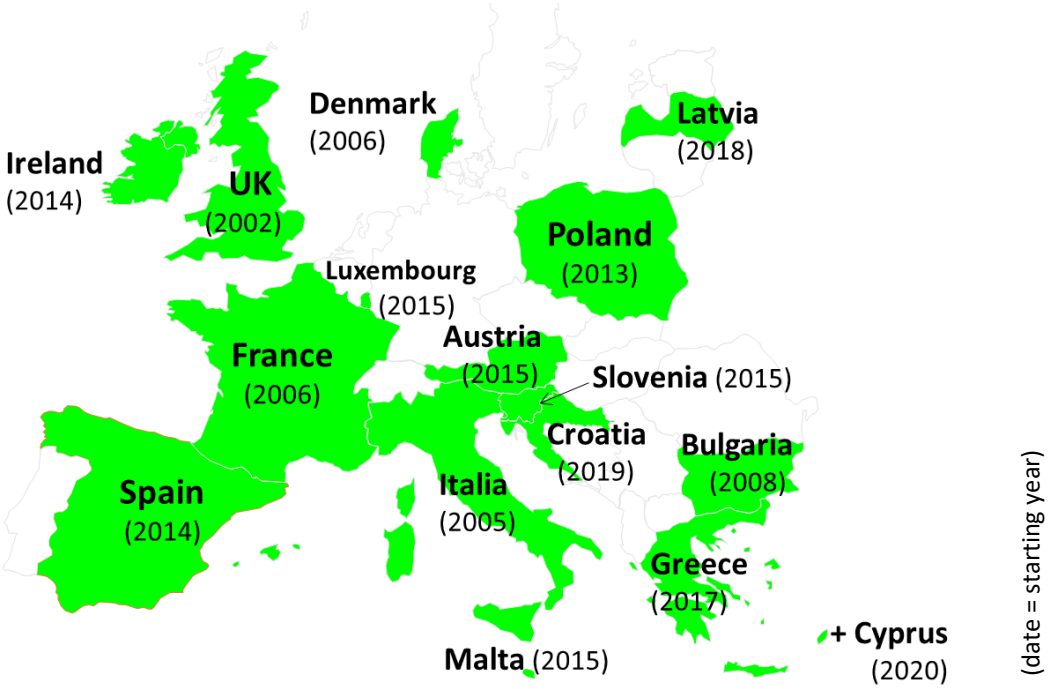

Figure 1. Map of the EEOS in Europe (as of end 2019).

As regards the choices of Member States to answer EED Article 7 for the obligation period 2014-2020, four Member States have chosen to use only an EEOS: Denmark, France, Luxembourg and Poland. The other 12 Member States implementing an EEOS have chosen to complement the EEOS with Alternative Measures to meet the national energy savings obligations.

This snapshot is an update of previous snapshots done by ATEE and the White Certificates Club.

It aims at providing a concise view of each scheme, highlighting the main features, results and data available. These fact-sheets are complemented by an interview with a national expert for 10 of the EEOS. These interviews offer a direct feedback about recent changes and lessons learned, in view of experience sharing among countries.

About more detailed analysis and the history of the EEOS, see (ENSPOL 2015 and 2016). And about guidelines to design EEOS, see (IEA 2017).

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Austria's EEOS

Responsible authority: Federal Ministry for Sustainability and Tourism

Managing authority: Austrian Energy Agency (AEA)

History, current targets and results

The EEO scheme **started in January 2015**, replacing voluntary agreements with energy suppliers set from 2009.

Obligated parties (OPs) must report every year by February 14th the amount of end-use energy delivered to final customers of the previous year. The **targets** for the OPs are set annually as **0.6% of this reported final energy consumption**. **40%** of the target has to be achieved **in the household sector** (housing or transport).

The energy savings reported **between 2014 and 2017** for Article 7 of the EED (from EEOs and alternative measures (AMs)) contribute **136 PJ** (cumulatively) to the savings target of 218 PJ for 2020. Assuming the already reported savings continue until 2020, the savings are expected to amount to 305.4 PJ (cumulatively) at the end of 2020. This puts Austria well above the target path and it can be assumed that **Austria will exceed the savings target** of 218 PJ by 2020.

37.3% of the achieved energy savings derive **from actions in households**.

The Energy Efficiency Act in Austria is currently being revised based on the experience with the EEOS so far and the feedback from involved parties.

Key actors, roles and options

The **Federal Ministry of Sustainability and Tourism** sets the rules for the Energy Efficiency Obligation Scheme (EEO scheme) in agreement with the Federal Ministry of Labour, Social Affairs, Health and Consumer Protection. The Federal Ministry of Sustainability and Tourism delegated the management of the EEO scheme (development of standardised evaluation methods, reporting and controlling tasks) to the **Austrian Energy Agency** (AEA).

The obligated parties (OPs) are all energy suppliers in Austria selling more than 25 GWh/a energy to end users. **About 450 energy suppliers** are obligated in total, covering about 80 % of the Austrian final energy consumption.

The OPs have to report the achieved energy savings by means of an IT-application called "*Anwendung zum EEffG"*. All public and private companies can get an energy savings account, and can transfer their energy savings to OPs through civil contracts (**no trading/market**). Companies with no obligation are allowed to bank implemented energy savings until the 14th of February of the subsequent year in order to be able to transfer them to OPs within the period from 2015 to 2020.

Instead of proving the implementation of energy efficiency actions, OPs may fulfil their obligation by carrying out energy efficiency actions for the respective year by a **tender** for the appropriate energy saving.

OPs can also use the "**pay to save**" option which means paying a compensation fee (0.2€/kWh of first-year energy savings).

If an OP does not comply with the regulations of the Austrian energy efficiency act the extent of the administrative **penalty** can be up to 100,000 €.

Scope and focus

All actions for which final energy savings can be demonstrated (except oil boilers in households) in **all end-use sectors** are eligible, if they exceed certain energy **performance requirements**, and if they are **not funded by national public subsidies**.

For actions carried out in households affected by **energy poverty**, the resulting end-use energy savings are multiplied by the **factor 1.5**.

The energy savings of energy efficiency actions can be calculated either with standardised or specific methods. 42 categories and **more than 250 standardised methods** (formula + deemed savings) are available. In addition a **guideline for the calculation of energy savings** for individual actions is available (for specific methods).

Between 2014 and 2017, **76%** of all reported measures were evaluated using **standardised methods**. 24% of the reported energy efficiency measures were documented by using specific methods.

Monitoring, Reporting and Verification

Energy savings are credited for the first year of the action. The *owner* of the energy savings is usually the final customer. The **OP has to document its role** in the context of the carried out energy efficiency action and has to provide in most cases a document signed by the final customer that transfers the ownership of the energy savings to the OP.

OPs can report the energy savings in the provided **online database** throughout the year in which the action was carried out and additionally until mid-February of the following year. The **detailed documentation** of the savings must be **kept for checks carried out by AEA**.

If the OPs over-achieve their obligation in one year, **banking is allowed** to transfer the excess savings to following years of the obligation period (2015-2020). In the case of not achieving the obligation of a given year, **borrowing is not allowed**. But OPs have the possibility to buy new energy efficiency actions from the same year on the market or they have to pay of the above mentioned **compensation fee** of 0.2 €/kWh.

There is **no ex-ante validation** of the energy efficiency actions. A statistically significant proportion and representative sample of the energy efficiency improvement measures are **verified ex-post** (automatized plausibility checks of all files + detailed review of samples). Selected implemented energy efficiency actions are also verified **on-site**.

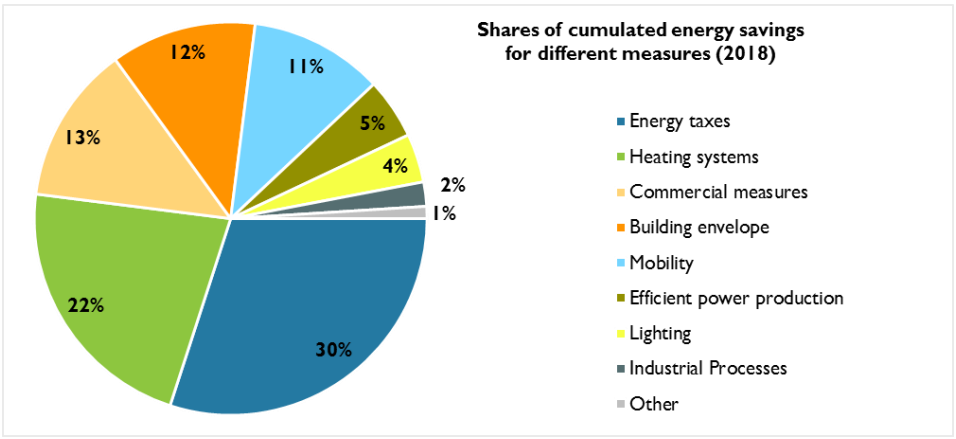
Under the Austrian EEOS, all four methods mentioned in Annex V of the EED 2012/27/EU are used for calculating savings, according to the action types: 'deemed saving', metered savings', 'scaled savings' and 'surveyed savings'.

Costs for obligated parties

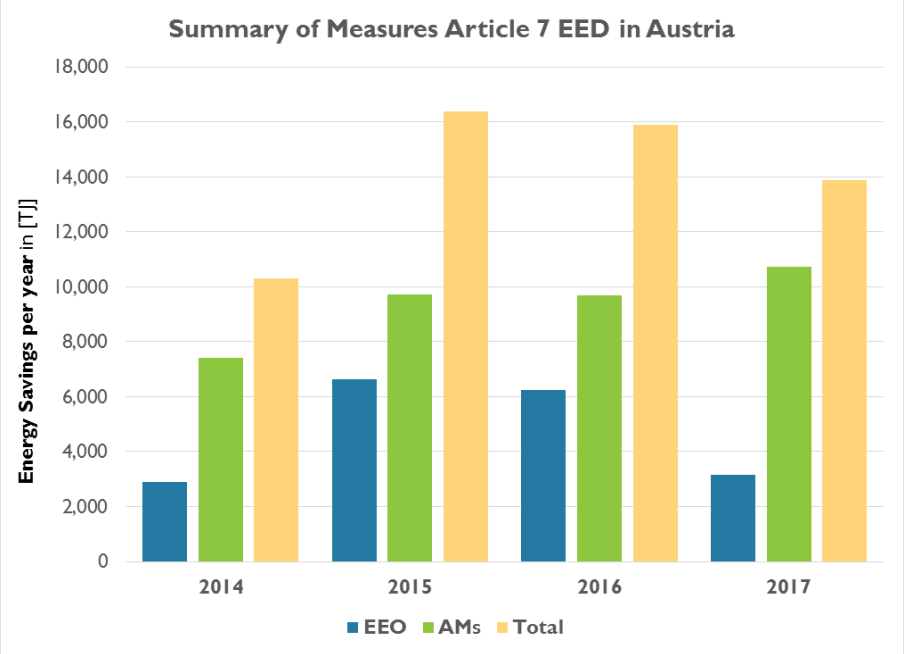
No data is available regarding the specific costs for OPs.

Other information about costs and benefits

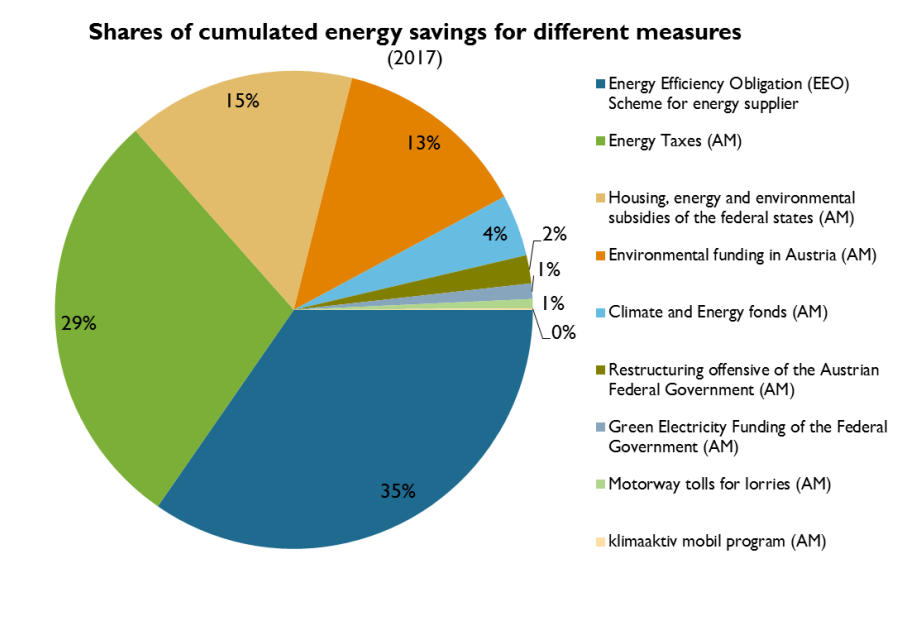
Public administration costs are about **€800,000/year** only for Art. 7 of the EED.



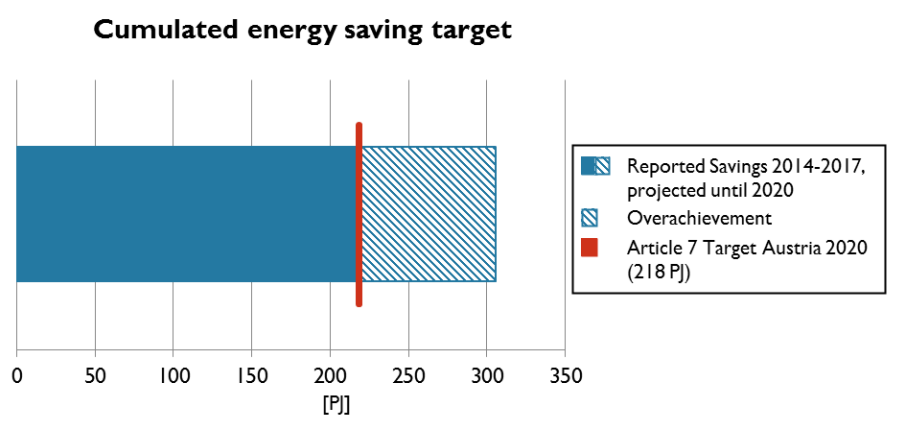
The figure shows the shares of reported annual energy savings in Austria from 2014 to 2018 distributed by energy saving action categories according to the national accounting scheme.



This table shows the first year energy savings from 2014 to 2017 from EEO; AMs and in total according to Article 7 of the EED.



This table shows the shares of cumulated energy savings from 2014 to 2017 from EEO and different AMs according to Article 7 of the EED.



This table shows the projected cumulated energy savings (measures from 2014 to 2017) until 2020 from EEO and different AMs according to Article 7 of the EED in comparison to the Austrian target of 218 PJ.

Source: Annual report 2019 according to Article 24 (1) EED 2012/27/EU

Interview with Heidi Adensam (Head of the Division Energy Efficiency and Buildings, Federal Ministry for Sustainability and Tourism)

1) What have been the main changes and lessons learnt since 2017?

There were no changes between 2017 and 2019.

Between 2017 and 2019 a broad evaluation process of the EEO was conducted, involving all relevant stakeholders.

2) And more specifically about monitoring, verification and controls?

The criteria of some generalized methods have been tightened because it has turned out that committed parties have exploited these methods in their favour.

The reporting platform (e-government) has been improved in terms of user-friendliness. This resulted in a significant reduction of incorrect entries and to an improvement in the documentation quality of the reported energy saving actions.

From year to year, the majority of the documentations reported via the platform got a better quality. A learning effect among the obligated parties could be observed, definitely.

3) What are the main interactions with other policies?

A process of reporting to the Austrian Parliament was introduced by law, which analyzed the progress and mutual effects of the Energy Efficiency Act with the Austrian implementation of other EU legislation (RES Directive, GHG effort sharing).

4) Are there challenges or changes foreseen for the coming years? (especially after 2020)

One big challenge of EEOs is and could be in the future the proof of additionality. The savings shall be shown to be additional to those that would have occurred in any event without the activity of the OP.

Another challenge is the treatment of measures implemented in the period 2020 and still alive in 2021. Considering this savings would mean higher targets. But not considering those savings would lead to a stop of investments in 2020.

Companies with no obligation are allowed to “bank” implemented energy saving actions until the 14th of February of the subsequent year in order to be able to transfer them to OPs within the period from 2015 to 2020. The predictability of the system is reduced due to those “banked” savings, they might be transferred to OPs or not. Al lot of those “banked” savings might be brought on the table in the next year.

5) If you could go back in time, what would you do differently?

For certain energy saving actions, higher requirements should have already been set at the beginning of the obligation period.

The "banking" of energy saving actions, which is allowed for companies with no obligation in the EEO of Austria, turned out to be very complex and time-consuming with regard to MRV.

There is a large number of obliged parties in the Austrian EEO because of the obligation of energy companies in transport. This entailed a high administrative or control effort at all levels. It is therefore advisable, if possible, to keep the circle of obligated parties as low as possible without jeopardizing the total energy saving target.

Bulgaria's EEOS

Responsible authority: Ministry of Energy

Managing authority: SEDA (Sustainable Energy Development Agency)

History, current targets and results

The scheme first **started in 2008** with a different approach until 2014. For 2014-2020, the total **cumulative savings target** for Bulgaria is **1 942.7 ktoe**. The overall target for the EEOS has been set as the difference between this target and the savings expected from alternative measures (AM). The EEOS target in 2019 thus represents **63% of the article 7 target**.

The total intermediate cumulative target for art. 7 over 2014-2018 was 1004 ktoe. The **progress** for the same period is **48%** (488 ktoe).

For the next period 2021-2030 the draft NECP foresees keeping the same model – EEOS and AM but the share of the AM is planned to be higher by using all available National and Operational programs.

Results for the EEOS are counted as first-year final energy savings.

Scope and focus

Energy efficiency actions are eligible in **all sectors** (incl. transport). The eligible measures are specified by a special ordinance to the EE Act. Actions can for example be delivered through **energy services** (e.g. energy audits, energy management, inspection of boilers) and **awareness raising** (for households).

Energy savings shall be proven either with an **energy audit** done after the actions are implemented, or by using one of the about **45 standard methods** adopted by the Ministry of Energy.

The EEOS does not include provisions specific to energy poverty.

Key actors, roles and options

The general rules set by the **Ministry of Energy** (in the Energy Efficiency Act and special by-laws), and the scheme is administered by **SEDA**.

Obligated Parties (OP) are all **companies selling energy to final customers** (**96 OPs** in 2019), including all types of energy sold (excluding fuels for transport), beyond a **threshold** depending on the energy type: 20 GWh/a for electricity and district heating; 1 million m3 natural gas; 6,500 tons of liquid fuels (excl. transport fuels); 13,000 tons of solid fuels. The individual targets (for OPs) are set annually, taking into account changes in energy sales per OP in the previous year.

OPs can achieve their target by themselves, contracting with **third parties** (e.g. ESCos), conclude **agreements** with other OPs (e.g. transfer of energy savings) or contribute to the **Energy Efficiency and Renewable Sources Fund**. Energy savings can also be transferred to other OP in case of overachievement of the individual target.

OPs should meet their obligations by the end of 2020. **Banking and borrowing are allowed** over the 2014-2020 period. An administrative **penalty** is applied in case of non-achievement of OP's annual target. The sanction does not revoke the obligation.

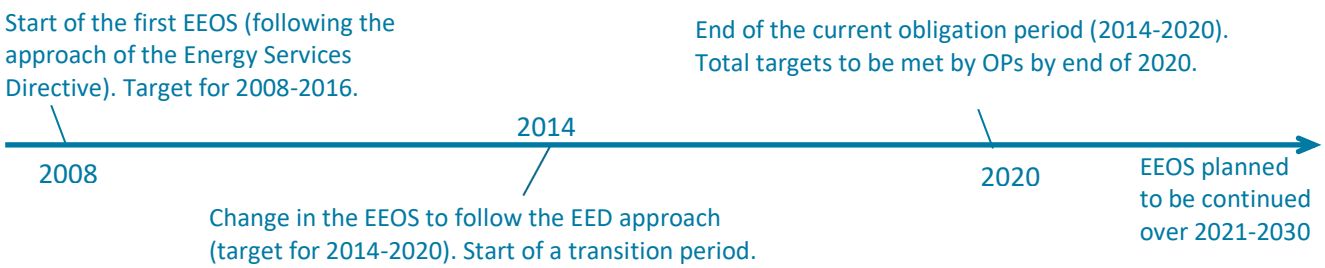
Monitoring, Reporting and Verification

SEDA is issuing energy savings certificates (ESC) to the project holder (OPs or third parties), under the responsibility of SEDA's Executive Director. SEDA systematically **verifies** the savings calculations **before issuing the ESC**.

OPs can **register** their ESC on an **on-going basis**. They then need to report annually to SEDA their achievements vs. their target. Based on this, SEDA reviews the progress of each OP.

The reported savings should be **validated by qualified energy auditors** registered with SEDA. They should be **independent** vis-à-vis the actions (i.e. not involved in ex-ante audit or any other service related to the action evaluated).

Training and/or qualifications are also required for **installers**.



Costs for obligated parties

Costs for the obligated parties are not subject of reporting and control. Therefore data on the actual cost of the measures implemented by the OPs are not systematically available. The only data available on the costs of the most common measures in industry and buildings are from the SEDA's energy audits database and the National Energy Efficiency and RES Fund database. According to these data, the investment needed for energy savings are (on average): 1016 BGN (519€)/MWh saved in Buildings, and 580 BGN (297€)/MWh saved in Industry.

Among the most expensive measures identified in Industry are measures for power transformers; fuel switch; and thermal insulation; replacement of process equipment.

The cost recovery is usually based on return of the investment costs (ESCo for example) or as part of the energy bill (only for the energy suppliers on the non-regulated market).

Other cost information

Administration cost of the EEOS is part of the SEDA's annual budget as a government institution. There is no special budget dedicated only for EEOS' management activities.

Alternative Measures (AM) already reported

AM1 – Individual energy savings targets for owners of government and municipal buildings, and industrial sites consuming more than 3 GWh/year (2014-2016): complementary obligations in the first period of the EEOS.

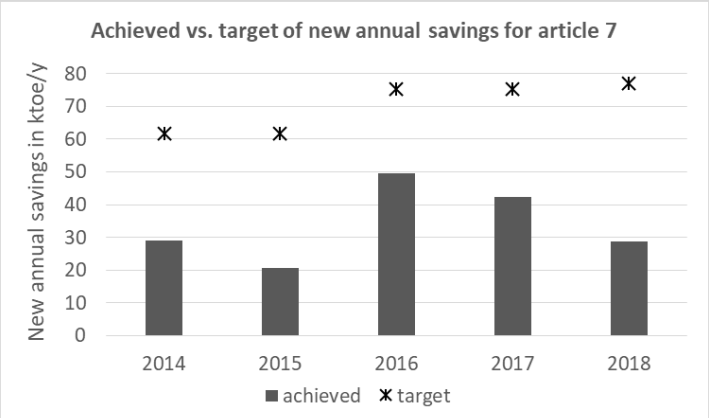
AM2 – National Program for the Energy Efficiency of Multi-Family Residential Buildings (2016-2020): the programme provides owners' associations (for co-owned buildings) with financial and organisational support. Initial budget for this programme was BGN 2 billion (about €1 billion).

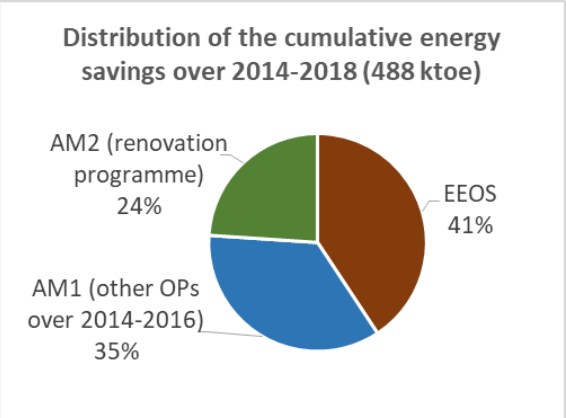
Alternative Measures newly reported in 2019

AM3 – Operational Programme "Innovation and Competitiveness" - Procedure **"Increasing energy efficiency in large enterprises"**

AM4 – European Economic Area Financial Mechanism 2014-2021 - programme area **"Renewable energy, energy efficiency, energy security"**

Overall energy savings results (for all policy measures reported for article 7: EEOS, AM1 and AM2)





Source: Bulgaria annual report 2019 for the EED

Interview with Tsvetomira Kulevska (Director "Coordination and Management of EE and RES" DG, SEDA)

1) What have been the main changes and lessons learnt since 2017?

Since 2017 there were no many changes in the EEOS in Bulgaria. The Bulgarian scheme has a history starting back in 2008. The main changes in it happened in 2014 when the EEOS was modified in accordance with the art. 7 EED requirements, and then again in 2016 with the introduction of alternative measures supplementing the EEOS. In 2019 were introduced two new alternative measures - Operational Program "Innovation and Competitiveness" - Procedure "Increasing energy efficiency in large enterprises" and European Economic Area Financial Mechanism 2014-2021 - program area "Renewable energy, energy efficiency, energy security". The expectations are that the two alternative measures will contribute significantly to the National cumulative target, and therefore to lower the burden on the energy suppliers for the two remaining years of the current obligation period. The main lesson learnt could be that introducing mixed approach to the art. 7 implementation is more motivational for the obligated energy suppliers by giving them a sense of sharing efforts with the state and reducing the burden.

2) And more specifically about monitoring, verification and controls?

Since 2017 OPs started using more actively the standard methods for energy savings evaluation (scaled savings). Moreover 5 new methods were adopted in 2019. In addition, currently 6 more are under discussion. In total there are already 35 scaled savings methods in use. Most of these methods are elaborated and submitted for adoption by the OPs. Using the scaled savings methods for evaluation of the energy savings significantly lowers the financial burden for the OPs. Scaled savings methods are standardized and are accompanied by a standard calculation sheet. That lowers the administrative burden and facilitates the control executed by SEDA.

3) What are the main interactions with other policies?

For the needs of art. 7 EED, the EEOS and alternative policy measures in Bulgaria are independent: the idea is not to interact in order to avoid double counting of the achieved energy savings and/or double financing of the same measures. Raising the general awareness of energy efficiency and highlighting the Energy Efficiency First principle on national level could be mentioned as an indirect effect of the EEOS.

4) Are there challenges or changes foreseen for the coming years? (especially after 2020)

The next period 2021-2030 is still under discussion. By now in the draft Bulgarian NCEP it is stated that the country will keep the same approach for art. 7 EED – combination EEOS and alternatives. The share of the alternative measures is foreseen to be higher than it is for the current period. Also we plan to introduce ex-ante approach as a method for calculating energy savings (deemed savings) as an additional opportunity to the currently existing methods.

5) If you could go back in time, what would you do differently?

Higher share for the alternative measures from the very beginning of the period. More efforts in raising awareness among OPs about the opportunities for and the benefits of the EEOS.

Croatia's EEOS

Responsible authority: Ministry of Environmental Protection and Energy

Managing authority: National Energy Efficiency Authority (within the Ministry)

History, current targets and results

Energy Efficiency Obligation Scheme (EEOS) was firstly introduced in Croatia in late 2014 with the adoption of the Energy Efficiency (EE) Act. The Act put the obligation to energy distributors / distribution system operators, while all implementing details related to the EEOS should have been regulated in a special by-law. However, the definition of 'distributor' was not clear enough, hence changes were initiated.

In late 2018, the amendments to the EE Act were adopted, obliging now energy suppliers to achieve energy savings in energy end-use. The Ordinance on EEOS was additionally adopted in April 2019, fully prescribing the functioning of the EEOS.

The target set in the 4th NEEAP for EEOS is cumulative savings of 27.07 PJ for the period 2014-2020. The first results of the scheme will be known in 2020, when obliged parties are due with the first reports on their achievements.

In period from 2021 until 2030, as envisaged in the draft National Energy and Climate Plan, the EEOS will continue its operation with the aim of delivering 50% of Article 7 target in Croatia.

Key actors, roles and options

Ministry of Environmental Protection and Energy is responsible for adopting regulatory framework related to the EEOS. Within the Ministry, the National Energy Efficiency Authority is responsible for the overall management of the EEOS, including operation of the monitoring and verification platform (SMiV).

Obliged Parties (OPs) are energy suppliers of electricity, natural gas, heat and oil products. They enter the EEOS gradually, depending on their annual sales volume: in 2019 OPs are only those suppliers with annual sales volume higher than 300 GWh. This will be extended in 2020 to suppliers with annual sales higher than 100 GWh, and from 2021 all suppliers with annual sales higher than 50 GWh will enter the EEOS. There will be approximately 40 OPs, with one main electricity supplier (HEP) and one main oil supplier (INA), whose obligations would represent about 70 to 75% of the overall EEOS target.

Apart from own actions, OPs may fulfil their obligation through purchase of energy savings from third parties. It is expected that this possibility will trigger the ESCo market.

A third possibility for OPs to fulfil their obligation is to pay a prescribed fee to the Environmental Protection and Energy Efficiency Fund. The payment is mandatory in case of non-compliance with the annual target. The Fund is obliged to use the gathered financial means to co-finance alternative measures. The fee is calculated annually, based on costs encountered by the Fund to achieve savings with alternative measures.

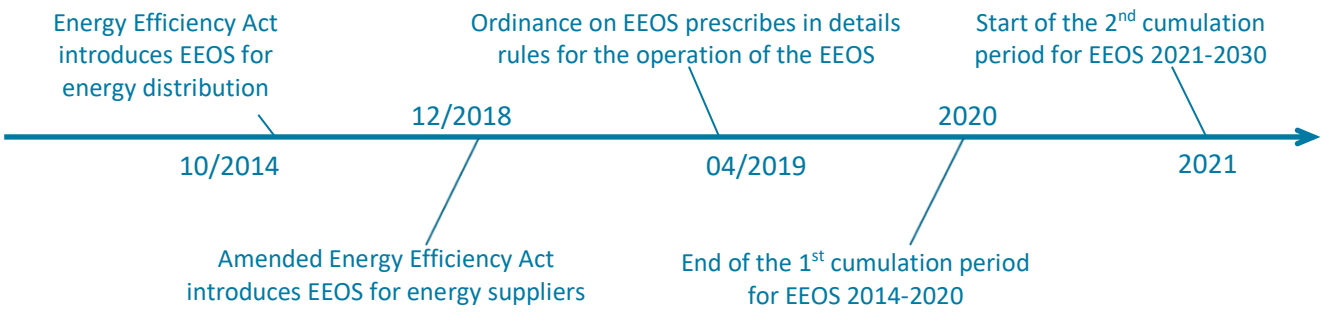
Scope and focus

OPs are free to chose EE measures they will use to fulfil their obligation. Apart from EE measures, it is also eligible to implement small-scale RES and CHP projects for self-supply, which are very important for Croatia, as well as smart metering. OPs are especially encouraged to tackle energy poverty. If EE measures are implemented in underdeveloped areas, energy savings achieved may be increased by 10%, while when implemented in vulnerable energy consumer's household, they may be increased by 20%.

Monitoring, Reporting and Verification

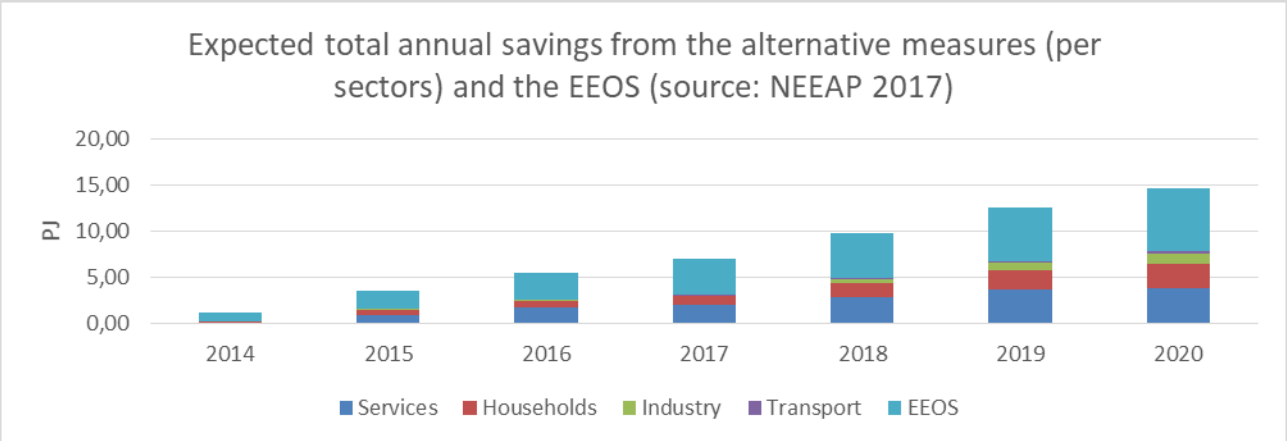
Banking/borrowing options are allowed: over-achievements can be transferred to next years in the current cumulation period or to the next cumulation period. Under-achievements in one year, if not higher than 10%, may be compensated in the next year.

All measures undertaken must be entered in the M&V platform (SMiV). The platform calculates energy savings, based on the Ordinance on monitoring, measurement and verification of energy savings, using dominantly deemed savings or engineering estimates. Documentation that proves the savings should also be uploaded in SMiV, for verification purposes performed by the National Energy Efficiency Authority.



Overview of the policy mix reported by Croatia for article 7

Croatia reported to fulfill its article 7 obligation by the mix of EEOS (49,9%) and alternative measures (50,1%). The figure below shows the planned contribution of EEOS and alternative measures as reported in the 4th National Energy Efficiency Action Plan. Since EEOS has only become operational in 2019, it is not possible to report on its achievements. Regarding the alternative measures, the first period of their implementation was 2014-2016, when co-financing from the Environmental Protection and Energy Efficiency Fund was ensured using national financial means gathered from various environmental fees, including incomes form EU ETS. In that respect, data shown in the figure below for this period represent actually achieved energy savings. Since 2017, Croatia is intensively using the European Structural and Investment (ESI) funds to implement alternative measures. In particular those for energy renovation of buildings. Since many of these projects are still under implementation, it is not possible to show the achieved results, hence planned savings are given in the figure below. Measures related to energy renovation of buildings contribute to 83% of target for alternative measures or 42% of overall article 7 target.



Services	Residential
Programme for energy renovation of public sector buildings (grant scheme, soft loan, ESCo model)	Programme for energy renovation of single-family houses (grant scheme)
Energy Management in public sector (regulation, training and education)	Programme for energy renovation of multi-apartment buildings (grant scheme)
Programme for energy renovation of commercial buildings, with emphasis on trade and tourism (grant scheme, soft loans)	Programme for tackling energy poverty (grant scheme)
Programme for energy renovation of public lighting (grant scheme, soft loans)	

Industry	Transport
Financing scheme for energy efficiency and renewable energy sources in manufacturing industry (grant scheme, soft loans)	Grant scheme for purchase of energy efficient vehicles
	Grant schemes for urban mobility solutions
	Eco driving trainings
	Special tax on motor vehicles based on CO_2 emissions

Interview with Kristina Čelić, Ph.D. (Head of Sector for Energy Market and Infrastructure, Energy Efficiency and Renewable Energy Sources, Ministry of Environmental Protection and Energy)

1) What would be the first lessons learnt from starting an EEOS?

Croatian EEOS has just started its operation in 2019. It is still too early to talk about lessons learnt. However, it may be said that the start of the scheme is promising as obliged parties are actively revising the activities they have implemented since 2014 in order to claim the energy savings and fulfil their obligation. Although the legal framework was thoroughly prepared based on the background studies and consultation process, there is still a need for continuous support to the obliged parties in terms of clarifications what can and what cannot be claimed as eligible energy savings. As some obliged parties are both suppliers and distributors, one of the most common questions is weather savings in distribution networks (natural gas and district heating) can be claimed under the EEOS. Also, the issue of overlapping with alternative measures and trading of energy savings is often raised. This all requires strong involvement of the Ministry in provision of information to obliged parties but also to third parties (e.g. ESCos), which are now starting to find their interest in the scheme. With limited capacities in the Ministry, this represent a significant challenge.

2) And more specifically about monitoring, verification and controls?

Monitoring and verification system is established in Croatia through regulation that defines the bottom-up methods for 19 typical energy efficiency measures. Obliged parties are required to use these methods when reporting the savings achieved and to provide prescribed proofs for data that are used in the calculations. The whole process is done through an on-line platform for M&V – SMiV – administered by the Ministry. Since obliged parties are allowed to implement other measures than those 19 covered by the regulation, in their annual report on fulfilment of the target, they should propose their own methodologies based on which they have calculated the savings. The Ministry will revise these methodologies and approve them. It is envisaged to amend the existing regulation with new measures and calculation methods based on the actual inputs from obliged parties. It is also envisaged to upgrade SMiV to better address the issues relevant to the EEOS, especially the trading of energy savings.

3) What are the main interactions with other policies?

Croatia reported a combination of EEOS and alternative measures to achieve its article 7 targets for period 2014-2020. Alternative measures are dominantly financing programmes from national or ESI funds. However, obliged parties may also participate with their funding in alternative measures, whereas the savings will be shared between the EEOS and alternative measures based on the shares of financing. We are also expecting that EEOS will boost the ESCo market due to the possibility to fulfil the obligation through purchase of energy savings from a third party.

4) Are there challenges or changes foreseen for the coming years? (especially after 2020)

According to the latest draft of the NECP (currently under the public discussion), we are planning to implement combination of EEOS and alternative measures also in the period 2021-2030, with 50-50% contribution. Further alignment of the legislation and regulation with the revised EED will be done in 2020, while possible changes in the EEOS will be considered in the next period based on the gained experience in the operation of the scheme.

5) If you could go back in time, what would you do differently?

Start with the operation of the EEOS earlier.

Cyprus's EEOS

Responsible and managing authority: Energy service of the Ministry of Energy, Commerce and Industry

History, current targets and results

The law for regulating the Energy Efficiency Obligation Scheme (EEOS) in Cyprus is under legal vetting by the Law Office of the Republic of Cyprus. The Bill is expected to be submitted to the House of Representatives for adoption by early 2020.

The overall target for cumulative end use energy savings over 2014-2020 equals to about 242 ktoe.

The total annual savings achieved from all alternative measures (EEOS not yet implemented) have been 0.9 ktoe/y in 2014; 2.3 ktoe/y in 2015; 6.3 ktoe/y in 2016 and about 69 ktoe/y in 2017. Most of the increase in the savings in 2017 came from the tax on transport fuels (newly reported from this year on).

Key actors, roles and options

Responsible authority for target setting, implementation and monitoring of the EEOS is the Energy Service of the Ministry of Energy, Commerce and Industry.

Obligated parties (OP) will be all energy suppliers (electricity and transport fuels) with annual energy sales exceeding a predetermined level.

OPs will be allowed to design and implement their own energy savings support schemes, and also to count certified savings that have been achieved by energy service companies or other third parties. Bilateral exchange of energy savings between OPs will also be allowed.

OPs can count the savings achieved within a year, as of it has been achieved in one of the last four years (banking) or in one on the following three years (borrowing), given that those years are within the period of the obligation scheme.

The law will provide for penalties, subject to the difference between OPs' target and savings achieved each year.

In case an OP does not meet its target, the responsible authority will have the possibility to mandate OPs to fulfil part or all of their obligation by contributing to the Fund for Renewable Energy Sources and Energy Efficiency.

Scope and focus

Specifications of actions eligible to the EEOS are under design. It is planned to use the types of calculation methods as defined in the EED (deemed savings, metered savings, scaled savings, or surveyed savings for the special case of behavioural actions). During the design of actions, the responsible authority considers the need for mitigating energy poverty and requires part of the actions to be implemented in vulnerable and energy poor households.

Monitoring, Reporting and Verification

The Energy Service of the Ministry will monitor the target achievement by the OPs, by implementing Monitoring, Reporting and Verification (MRV) systems in at least a statistical sample of the actions implemented by OPs. This will include randomly on-site inspections to check whether the implemented projects comply with the submitted projects.

The responsible authority will publish annually, energy savings achieved by each OP, as well as the cumulative savings under the obligation scheme. Energy poverty mitigation results are included.

The responsible authority will assess the costs entailing OPs for the achievement of their targets, and if necessary, will implement actions towards their minimization, with ultimate goal the preservation of OPs' worldwide competition.

Overview of the policy mix (alternative measures) reported by Cyprus for article 7

Transversal / cross-cutting

- Set of soft measures (information campaigns, trainings, workshops, etc).
- Special electricity tax (increase in the contribution to the Fund on Renewable Energy Sources and Energy Efficiency).
- Excise taxes on fuels for transports (tax level above the minimum EU taxation level).

Residential

- Financing scheme for photovoltaic systems with net-metering (including special grants for vulnerable households).
- "Save & Upgrade" grant scheme for improving the energy efficiency of dwellings (with special grants for vulnerable households).
- Grant Scheme for replacement of solar thermal collectors for domestic hot water.
- Urban incentive for increasing nearly zero energy buildings - nZEB (possibility for increase in building size in case nZEB energy criteria are met)

Public Sector

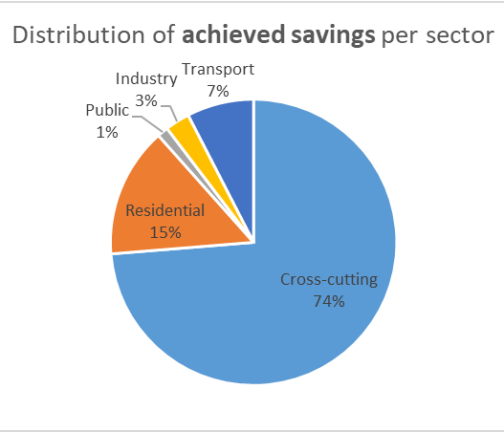
- Energy efficiency investments in public buildings (related to air conditioning systems: split units and heat pump chillers).
- Energy efficiency investments in street lighting (in motorways by the State + loans for municipalities).

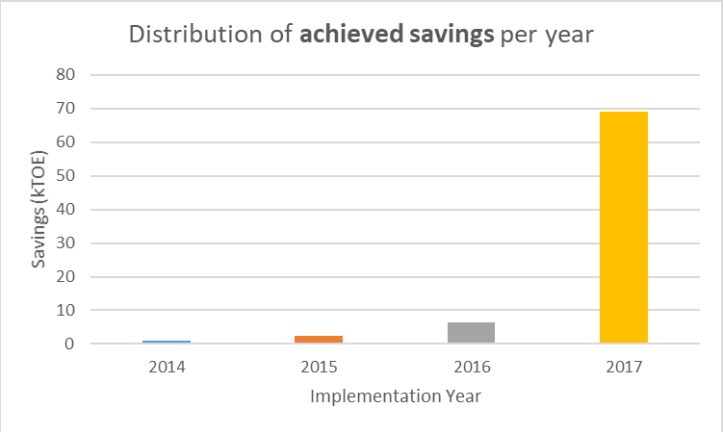
Services/Industry

- Photovoltaic systems for own consumption for commercial and industrial consumers.
- "Save & Upgrade" grant scheme for improving energy efficiency of commercial and industrial buildings.

Transports

- Integrated Fleet Management System (installed in vehicles of the Central Government).
- Vehicle taxes based on CO_2 emissions.
- Eco-driving training for new drivers.





The figures above present the contribution of sectoral policies towards the achievement of the Article 7 targets (left), as well as the total annual energy savings achieved in each year from 2014 to 2017 (right), according to the data of the annual reports for the EED. Most of the large increase in the total annual savings reported by Cyprus for year 2017 comes from the new annual savings reported for the taxes on fuels for transport (policy measure that was not reported for the previous years).

Interview with Mr. Christodoulos Ellinopoulos (Energy Service of the Ministry of Energy, Commerce and Industry)

1) What are the main expectations or objectives for the new EEOS?

The introduction of EEOs, is primarily intended for enabling competition to emerge among energy efficiency market actors for the benefit of final consumers.

In order for Obligated Parties to retain the achievement of their annual target in economic viable level, the Obligated Parties must choose to implement a group of energy saving measures, that lead to the expected result in a timely and cost-effective manner.

Through EEOs the energy performance contracts can also be promoted, as the Obligated Parties can meet their annual target by utilizing certified savings that have been achieved by energy service companies or other third parties.

EEOs can also play a strong role to tackle energy poverty, since it will include special counting of the savings derived from measures tacking energy poverty.

2) How have you prepared the design of the EEOS? (were the experiences of other countries useful for this preparation?)

The design of the Cypriot EEOs was based on the EEOs operating in Europe, adjusted to local specificities.

The general principle underlying the Cypriot EEOs, is that Obligated Parties are permitted to implement any individual action without any interference from the competent authority. However, the Obligated Party must obtain the approval of the competent authority for the methodology it intends to use for calculating the energy savings of an individual action and the data used.

3) What would be the lessons learnt from implementing alternative measures up to now?

Implementing alternative measures (acting as implementing public authority) requires good coordination and communication between government departments and other organizations that implement the measures. The bureaucratic process that has to be followed causes delays and an unclear picture on the actual progress towards target achievement.

4) And lessons learnt about MRV for these alternative measures?

The monitoring, reporting and verification system requires to process a large amount of information and therefore a good multiuser database is essential. Moreover, the acquired information needs to be of high quality, reliable and accurate.

Inadequate or incorrect information need more time to process and usually lead to wrong conclusions.

Implementing authorities should also consider developing "typical templates" which are used consistently throughout the government departments and other organizations.

5) If you could go back in time, what would you do differently?

The combination of alternative measures and energy efficiency obligation schemes appears to be necessary in order to achieve the national energy efficiency target on time and in the most cost-effective way.

Denmark's Energy Companies' Energy Saving Efforts

Responsible authority: Ministry of Climate, Energy and Utilities

Managing authority: Danish Energy Agency (DEA)

History, current targets and results

The obligation scheme has taken its current form (including an energy savings obligation) from 2006. The targets (expressed in new final first-year energy savings) for 2018 and 2019 were increased to 10.33 PJ (compared to 10.1 PJ/a in 2016), due to increases in energy consumption (overall goal calculated as a % of the consumption per energy type). The target for 2020 is set at 10.35 PJ.

Reported first-year energy savings:
11.6 PJ in 2015 (vs. target of 12.2 PJ)
11.0 PJ in 2016 (vs. target of 10.1 PJ)
9.8 PJ in 2017 (vs. target of 10.1 PJ)

7.9 PJ in 2018 (vs. target of 10.3 PJ)

According to the Danish Energy Agreement from 2018, the EEO scheme will be replaced after 2020 with a tender-based scheme for energy efficiency improvements in industry, service businesses and buildings. From 2021 to 2024, annually DKK 500 million (€67 million) will be allocated to the new scheme.

Key actors, roles and options

The overall target is set by the Ministry after a policy agreement (consensus-seeking process among all political parties). The implementing and supervision body is DEA. Rules and implementation issues are discussed within a technical working group chaired by DEA and including representatives of the obligated parties (OPs).

OPs are all the energy distributors (3 for natural gas, 55 for electricity, 405 for district heating and 6 for oil), covering all end-use sectors (except transport).

OPs may establish agreements with affiliated companies or other contractors (consultants, energy traders, installers, craftsmen, retailers, banks, etc.) that implement programmes towards end-users. Energy savings may also be traded between OPs before they are reported to DEA.

There is neither a financial penalty for OPs nor an opt-out fee available. However, a deficit in realising the target must be achieved in the following year.

Scope and focus

All actions saving final energy beyond minimum energy performance criteria (behavioural actions, CFLs and appliances excluded from 2010), reduction of losses in transmission and distribution networks, and savings from solar farms and heat pumps for district heating are eligible (in all sectors).

Fuel poverty is not explicitly addressed by the scheme.

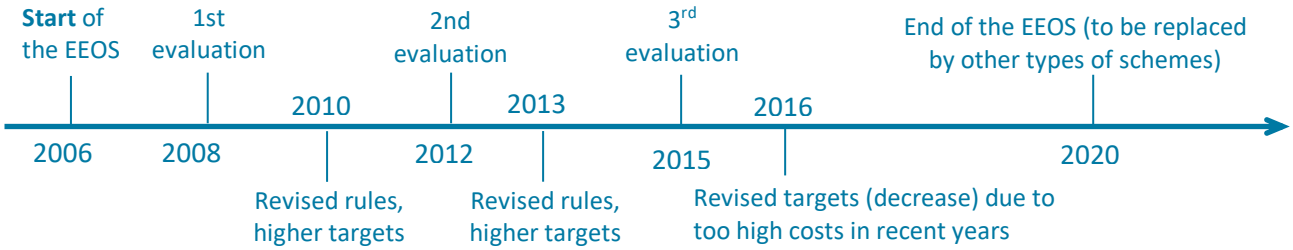
The scheme covers non-ETS sectors (households, public, commercial, industry).

Monitoring, Reporting and Verification

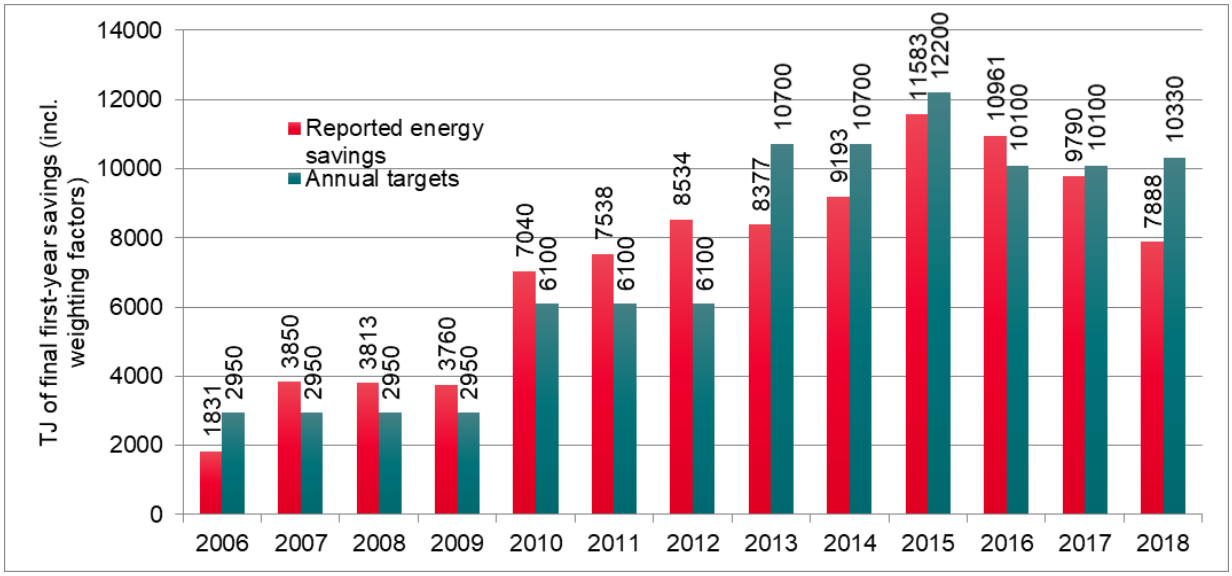
Energy savings are credited for the first year of the action, including a weighting factor to take into account the differences in action lifetimes, in impacts on primary energy consumption, and in terms of avoided CO_2 emissions (also distinguishing savings inside or outside the ETS scope). Banking and borrowing are allowed from year to year.

Measurement methods for energy savings incl. deemed savings for standard activities, which are developed by experts and approved by DEA (mostly applied in the residential sector) and specific calculations (scaled savings) for larger projects, especially in industry, public sector etc.

OPs report annually their energy savings achieved, and must keep a detailed documentation of the actions they supported in case of controls by DEA. Annual random checks (incl. on-site inspections and surveys of intermediaries and final consumers) are supervised by DEA and can lead to reductions in reported energy savings.

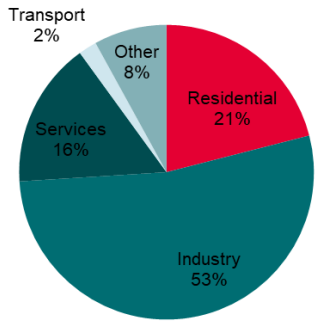


Reported energy savings (first-year, final energy) **and annual targets between 2006 and 2018** (DEA data):



Target overachievement until 2012, non-achievement 2013-2015 due to significant increases in targets, and stricter additionality criteria. Targets have then been reduced for 2016-2020. 2018 targets not achieved.

Distribution of the savings per sector



Source: based on (DEA 2019)

In 2018, the largest share (53%) of energy savings was realised in the industry sector, mainly calculated with scaled savings (specific calculations). 21% of the energy savings were achieved in households, mostly calculated with one of the 150 standardised actions (deemed savings). About 16% of the savings are achieved in the service sector and 2% in transport.

Relatively even distribution of savings from energy carriers in 2018: 19% from district heat, 23% from electricity, 22% from natural gas, 19% from biomass and 12% from oil heating (DEA 2018).

Top 5 technologies in 2018: 1) process equipment;
2) lighting; 3) heating; 4) boilers; 5) ventilation.

Costs for obligated parties

In 2016 and 2017 costs for OPs were around 6 to 7 cEUR/kWh first year savings (0.6 to 0.7 cEUR/kWh assuming an action lifetime of 10 years) (DEA 2019). Costs can fully be recovered by OPs within energy prices: via the distribution tariffs for electricity, natural gas and district heating; via the oil prices for oil companies (DEA 2019).

Other information about costs and benefits

The estimated surcharge by DEA on 2013-2015 energy prices due to cost recovery by OPs is 0.23 cEUR/kWh for electricity, 0.17 cEUR/kWh for gas, 0.2 cEUR/kWh for district heating and 0.04 cEUR/kWh for oil (ENSPOL, 2015).

Overall administration costs of the scheme (management and M&V) for DEA have been about 540,000 EUR in 2015 (Broc 2017).

DEA also monitors the average costs per kWh saved (first-year savings) according to the type of OPs. Data for 2017: 6.58 c€/kWh for electricity distributors; 6.13 c€/kWh for gas distributors; 6.20 c€/kWh for district heating companies; 5.67 c€/kWh for oil companies (overall average: 6.26 c€/kWh).

France's Energy Savings Certificates

Responsible authority: Ministry for the Ecological and Solidary Transition

Managing authority: National Pole for White Certificates (part of the Ministry)

History, current targets and results

The scheme started in July 2006, with targets usually set for 3-year periods expressed in kWh cumac (lifetime cumulated-discounted final energy savings). The current target is 1,600 TWh cumac for 2018-2020, of which 400 TWh cumac to be achieved for households at risk of fuel poverty.

Issued certificates from 01 January 2018 to 31 October 2019 amount to 569 TWh cumac (including 258 TWh cumac issued for the "fuel poverty" target).

The fourth period (2018-2020) is planned to be extended to 31 December 2021, with an overall obligation of 2,133 TWhc cumac for 2018-2021 (same annual target applied to 2021 as in 2018-2020).

Key actors, roles and options

The Ministry (DGEC, General Directorate for Energy and Climate) sets the rules, targets and penalties. A dedicated service of the Ministry (PNCEE, National Pole for White Certificates) administers the scheme. The French Energy Agency (ADEME) provides a technical support.

The obligated parties (OP) are the energy suppliers of electricity, natural gas, oil products, heat (district heating) in the residential and service sectors and in transports.

They can achieve their targets by directly gaining energy savings certificates (CEE) or by buying CEE on the market (OTC trading scheme – price mid-2019: 0.67 c€/kWh cumac or 0.80 c€/kWh cumac for "fuel poverty"). Overachievements in previous periods can count for the next period.

Local authorities, national agency for housing and social housing authorities are also eligible to get CEE.

An official registry monitors the certificates issued and traded. It is directly used to verify the target achievements at the end of the 3-year period. In case of non-achievements, OP must pay penalties in full discharge (1.5 c€/kWh cumac).

There are now around 120 obligated parties.

Scope and focus

Actions are eligible in all end-use sectors (recently including consumption covered by the EU ETS), under performance and/or quality requirements. More than 200 standardised operations are currently eligible (85% of CEE issued). Specific operations can be assessed according to an official methodology including an energy audit (mostly used for large actions in industry or services).

Specific programs selected by the Ministry (based on given policy objectives) are also eligible with a fix rate of kWh cumac per euro invested in these programs.

A bonus is granted for actions for "very low income" households to meet the "fuel poverty" target.

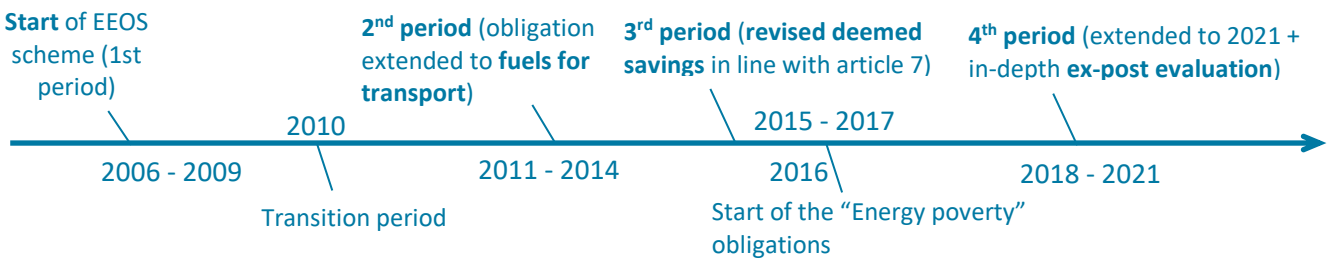
Monitoring, Reporting and Verification

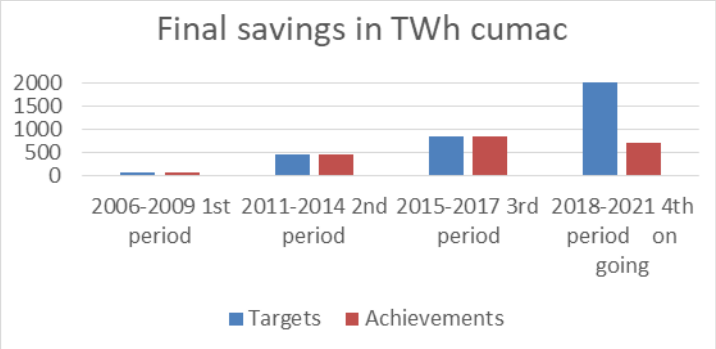
The justifying documents are kept (for 10 years) by the party applying for certificates, at disposal for control purposes. Obligated or eligible parties submit standard files to the PNCEE that issues the certificates once for the whole lifetime energy savings (hence the 4% discount rate).

For specific operations, the technical part of the file submitted is reviewed by ADEME experts.

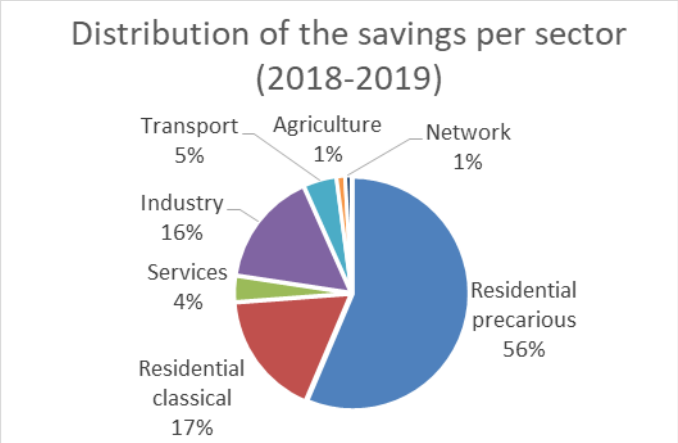
In addition to controls realized by OP and/or third parties, the PNCEE performs controls on sample of files. In case of non-compliance, the certificates are cancelled and sanctions may be applied (3 c€/kWh cumac).

In case of frauds related to CEE, the Ministry may forbid the sanctioned party to submit files for CEE for a given period (in addition to cancelling the CEE subject of the fraud and to financial sanctions). Other frauds or complaints (e.g. due to bad installers) are dealt with by DGCCRF (General Directorate for Competition Policy, Consumer Affairs and Fraud Control).



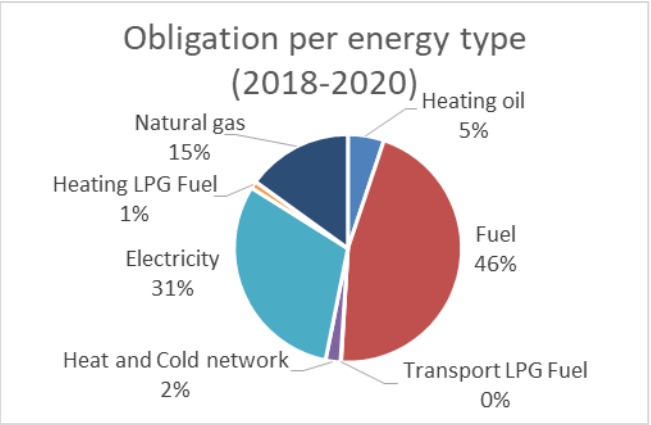


Since the beginning of the EEOS, starting with the 1st period to the current 4th period, the volume of obligations has been multiplied by 30. Today, the ecosystem around EEOS is mature and allows to consider ambitious objectives for the coming years.



These actions represents **75% of final energy savings** :

Attic of roof insulation
Floor insulation
Heat recovery system on a cold production group
LED Lamp (A+ or A++)
Insulation of a heating or domestic hot water network
Wall insulation
Individual boiler with high energy performance
Isolation of singular points



The actions with the largest energy savings are still insulation and heat recovery operations. They are concentrated in the residential and industrial sectors that represent 80% of the total number of EEO delivered.

NOTE: the data shown above are based on data in the unit used at the national level (TWh cumac, i.e. lifetime-cumulated and discounted savings). They also include savings that are not eligible to EED Article 7, but eligible to white certificates (due to national objectives or priorities). The data on savings eligible to EED Article 7 can be found in the annual reports to the European Commission (where 'non-Article 7' savings are removed).

Costs for obligated parties

Data of costs for obligated parties for recent years: around €3 billion per year. Recovered through energy pricing.

Other information about costs and benefits

About €2.5 million per year of administration costs for the public authorities (including controls).

Interview with Loïc Buffard (Deputy Head of the Energy Efficiency and Air Quality Division, DGEC, Ministry of Ecological and Fair Transition)

1) What have been the main changes and lessons learnt since 2017?

The "fuel poverty" target has been increased and now represents 400 TWh cumac for 2018-2020 (a quarter of the existing annual target). Consequently, some dedicated operations have been developed by obligated parties to tackle fuel poverty.

In addition, in order to improve household information a contribution framework is required since last year to demonstrate the incentive and active nature of the actions carried out.

At last, we made sharp progress on the issue of controls.

2) And more specifically about monitoring, verification and controls?

The obligated parties, third parties (accredited control offices) and the Administration carry out more and more controls.

The new climate and energy law introduces an obligation for EEO applicants to perform or have third party controls carried out for a given share of certain energy saving actions.

As a result of the continuous efforts that are being made on this subject, in last August, the Administration contracted an order to carry out on-site inspections of more than 3000 energy saving operations, the first results of which will be available by the end of 2019.

3) What are the main interactions with other policies?

In addition to being a tool as such, directly (through EEOS' operations) or indirectly (through EEOS' programmes), for the purpose of energy efficiency, EEOS can also support certain public policies.

Thus, within the framework of the energy renovation plan for buildings, the EEOS is involved and State aids are added to it to accelerate certain actions of energy renovation of buildings (tax credit for energy transition; reduced VAT rate of 5.5% for energy renovation works; eco-loan 0%-rate scheme; the ANAH subsidies).

Another example is that manufacturers subject to the European ETS system, as part of the fight against GHGs, will soon be able to use the EEOS to improve the energy efficiency of their processes.

4) Are there challenges or changes foreseen for the coming years? (especially after 2020)

The main stake is to further accelerate the energy savings pace in order to meet the ambitious targets for 2020 and 2030.

The scheme has proved to be well designed to deliver actions in the residential and service sectors. The energy savings potential in buildings and transport remains large.

A key challenge will be to trigger energy savings in a macroeconomic context where private actors are still relatively reluctant to invest, and with relatively low energy prices.

The new article 3 and article 7 objectives defined in the framework of the revised EED seem ambitious enough to keep a European leadership in energy efficiency.

5) If you could go back in time, what would you do differently?

The question is difficult because many improvements could have been implemented from the beginning (IT systems, more precise legal framework, third party controls, etc.) but the scheme was completely new, so it seems inevitable to make progress only with accumulating experience.

Regarding the obligation level, the 2015-2017 period could have been more ambitious. Indeed, the overperformance during that period led obligated parties to dramatically slow down their actions and created a "stop and go" with many negative effects.

Greece's EEOS

Responsible authority: Ministry of Environment and Energy

Managing authority: CRES (Centre for Renewable Energy Sources and Energy Savings)

History, current targets and results

The scheme started in 2017, with the publication of the bylaw about its regulation on 11th of April.

The first period will last until 2020, while an energy efficiency target has been appointed equal to 333 ktoe of cumulative final energy savings representing 10% of the total target for EED article 7, which has been undertaken by Greece.

The target has been expressed in cumulative energy savings taking into account the lifetime of the implemented measures within the duration of the scheme (2017-2020).

The annual targets have been specified with a minimum threshold to be achieved in the target year: 100 ktoe and 30% in 2017, 133 ktoe and 50% in 2018, 67 ktoe and 50% in 2019, 33 ktoe and 100% in 2020.

The continuation of the scheme was decided within the framework of NECP: the contribution of the scheme to the national target for the period 2021-2030 amounts to 20%.

Scope and focus

Actions and measures are eligible in all end-use sectors, taking into account the guidelines for the implementation of EED article 7.

Energy savings are evaluated utilizing either 26 predefined standard bottom-up methods or other methods for scaled or metered savings. The OPs can apply for using new methods, which are then controlled, edited, improved and then publicized by CRES.

Actions tackling fuel poverty are eligible getting a bonus factor of 40%.

Key actors, roles and options

The Ministry of Environment and Energy specifies and enforces the rules of the scheme including the determination of the targets.

CRES is the implementing body, in charge of measurement, monitoring, control and verification and submits proposals to the Ministry for scheme's improvement.

The obligated parties (OP) for the reference year 2017 consist of electricity (4 companies), gas (4 companies) and oil products (LPG, gasoline, diesel and heavy fuel oil; 24 companies) suppliers or retailers, whose market share is higher than 1% and representing in total at least the 95% of the sold energy for each fuel separately.

The number of the OPs in 2018 and 2019 was equal to 29 (4 electricity, 4 gas and 21 oil products companies) and 35 (6 electricity, 4 gas and 25 oil products companies) correspondingly.

OPs have the option either to implement measures themselves or to assign their obligation to third parties or to use the "buy out" option.

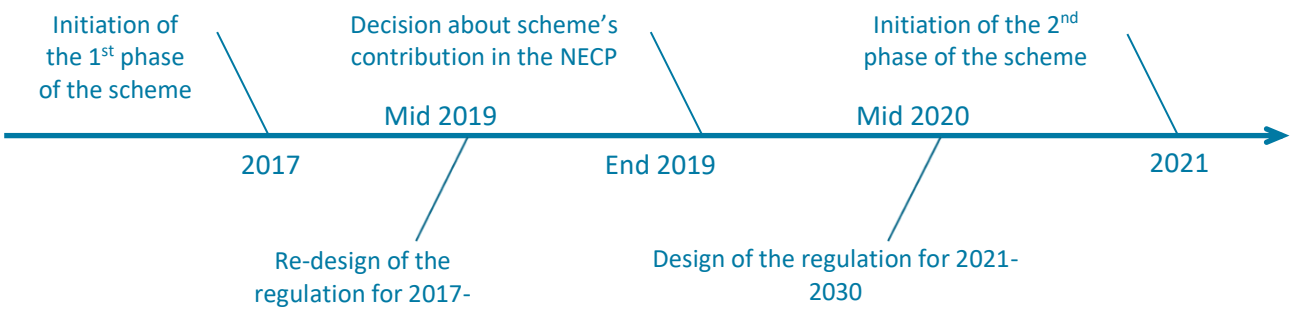
Exchange of energy savings among OPs is allowed under the prerequisite the units of energy savings have been verified.

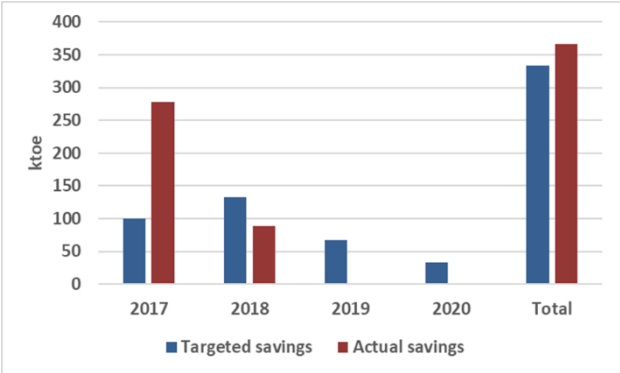
The OPs have the alternative option to contribute to a fund instead of achieving savings directly through energy efficiency measures, while penalties are foreseen in the case that an OP do not manage to fulfil its annual target.

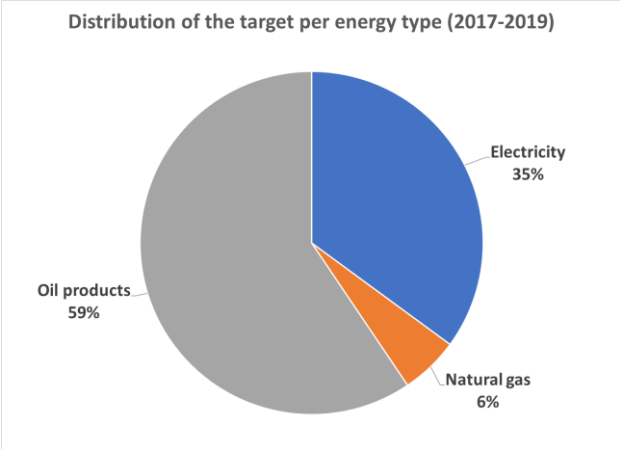
Monitoring, Reporting and Verification

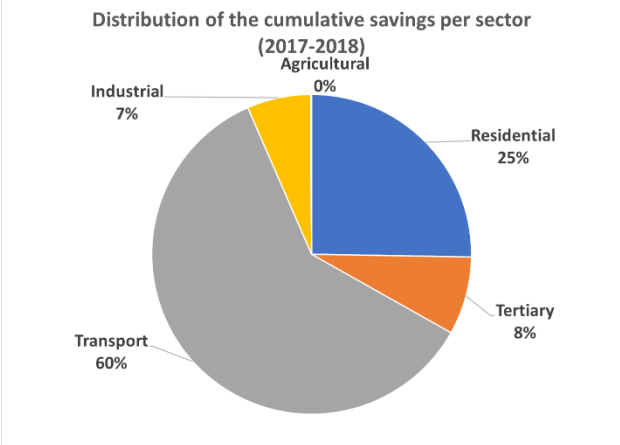
OPs must submit the Annual Compliance Plan to CRES by July each year, presenting how they plan to achieve their target. CRES reviews these action plans beforehand, in particular to agree on the documentation and prevent further issues. OPs report by the end of each year to CRES their achievements including the submission of the required evidence through a specialised submission tool. Finally, CRES verifies the submitted files and performs checks sampling on them, including on-site verification when it is required.

CRES completes the verification within the period of two months and then prepares an annual report indicating the outcome from the clearance of the OPs energy savings. Currently, 87% of the achieved savings has been verified through on-site verification of the respective control items regarding the realization of the energy efficiency measures.









The oil product companies have been undertaken the majority of the energy saving target for the period 2017-2019 (59% share), while the shares of electricity and natural gas companies are considerably lower (35% and 6% respectively).

The OPs for the reference years 2017 and 2018 managed to surpass the total energy saving target for the whole period. Specifically, they managed to deliver 366 ktoe of cumulative energy savings compared to 333 ktoe, which was the total appointed target for the corresponding period.

The cumulative energy savings have been resulted for the reference years 2017 mainly by information campaigns in residential, tertiary and transport sector (47% share).

30% of the energy savings have been derived by fuel additives, while the contribution of the promotion of high efficiency lubricants and the energy upgrade of heating systems in residential sector was lower (6% and 4% shares respectively).

Finally, 8% of the energy savings has been resulted by interventions in the industrial sector.

The highest portion of the achieved energy savings has been delivered in transport sector (60% share), while the shares of energy savings in residential, tertiary and industrial sector were lower and equal to 25%, 8% and 7% respectively.

Considering the measurement framework, 92% of the achieved energy savings were reported using the 26 predefined bottom-ups equations, while only 8% other ones.

Costs for obligated parties

No information about the cost for the fulfilment of the energy efficiency target has been collected.

No recovery mechanism is foreseen, while the OPs have the capability to pass the costs to their customers.

Other information about costs and benefits

No impacts on energy prices have been observed. Two man-years are required on annual basis in order to cover the administrative burden of the administrator.

Interview with Christos Tourkolias (Energy Expert, CRES)

1) What have been the main changes and lessons learnt since 2017?

The new regulation for the period 2017-2020 foresees specific changes in the timetable of the various steps in order to facilitate the conduction of the measurement, monitoring and verification procedures. Moreover, it has been decided for the case of the potential deviations from the annual energy efficiency target to set as a penalty the obligation to deliver additional energy savings.

Considering the main lessons learnt, it is important for a newly introduced scheme to handle the first period as a learning phase providing the required technical support to the OPs ensuring that the planned interventions will meet the technical requirements of the scheme and manage to achieve the imposed targets.

Practical challenges consist the active involvement of all the OPs and the application of common conditions to all OPs.

The completion and submission of the Annual Compliance Plan has contributed to the familiarization of the OPs with the technical requirements of the measurement, monitoring and verification (MRV) framework, while crucial was the role of the administrator in order to facilitate the smooth adaptation to the scheme.

The submission tool can be assessed as user-friendly and effective facilitating the implementation of a common framework of measurement of the achieved savings and fostering the uniform conduction of verification procedures.

2) And more specifically about monitoring, verification and controls?

Firstly, it is essential to standardize the control and verification procedures in order to reduce the administrative burden.

Moreover, additional studies are required in order to clarify crucial issues, such as the estimation of the affected population in the behavioural measures, the identification of the unique customers consuming oil products and the quantification of the impact of the free-riders, the autonomous actions and the rebound effect.

3) What are the main interactions with other policies?

The design of the compliance cost led the OPs to specific interventions, which were excluded from the scope of the other initiated policy measures. Moreover, the administrator gave specific attention to avoid the double counting of the implemented measures in relation with the other policy measures through a structured reporting procedure.

4) Are there challenges or changes foreseen for the coming years? (especially after 2020)

The most crucial challenge is to increase the implementation of the technical measures, which must be the most cost-effective, and to promote the development of ESCos.

Moreover, the MRV procedures should be conducted through an integrated online information system for reducing the triggered administrative burden.

Finally, it is important to provide access to both available information systems and existing administrative data sources facilitating the application of the MRV procedures.

5) If you could go back in time, what would you do differently?

Potentially, the determination of different energy efficiency targets for the various end-use sectors taking into account the available technical potential may have led to more targeted energy efficiency measures.

Ireland's EEOS

Responsible authority: Department of Communications, Climate Action & Environment

Managing authority: Sustainable Energy Authority of Ireland

History, current targets and results

The Irish obligation scheme started in January 2014, in continuation of a voluntary agreement (2011-2013). The current period is set for 2017-2020.

For 2017, the target was new annual primary energy equivalent (PEE) savings of 625 GWh/a with sub-targets of 20% for the residential sector and 5% for the "fuel poverty" scope. For 2018-2020, the target is 700 GWh/a, with the same relative sub-targets.

Looking just at the 2017 to 2018 period, non-residential savings account for 81% of total saving, residential 16% and energy poor at 3%. By the end of 2018, the Irish EEOS scheme had delivered a total of 3,293 GWh, delivering over the target by 10% with all three sub-targets exceeded.

Plans for post-2020 are being consulted upon until the end of November 2019, including whether or not to continue the programme and how to define the savings metric.

Scope and focus

Around 50 standardised actions for the residential sector. These must be implemented by qualified contractors. Actions in other sectors are considered on a case-by-case basis, using SEAI assessment tools or other methods.

Around 10% of savings in the non-residential sector, and approximately 60% of savings in the residential sector (including energy poor) were also supported with grants from SEAI programmes.

The energy savings are credited only for the year where the action is reported. A discounting factor is applied to energy savings from actions where the savings will not persist to 2020.

Key actors, roles and options

The Ministry (DCCAE) enforces the rules of the scheme, and SEAI is the implementing body. The obligated parties (OPs) are all energy suppliers (all energy types and sectors) selling more than 600 GWh/a (about ten electricity and/or gas suppliers and one entity representing the oil companies). Public authorities and OPs meet within the Quarterly Governance Forum to discuss implementation issues.

OPs can use partnerships with third parties (service providers, local authorities, etc.). Exchange of savings between OPs and internal transfer of savings between sub-targets are allowed under certain conditions (done for less than 10% of savings in 2018 for both options). It is possible to contribute to a fund instead of directly achieving savings, but this has not yet been used.

Targets accumulate over time. In any given year OPs must meet a minimum of 95% of their target in any given sector. If this is not achieved, OPs may buy out by contributing to the fund for up to 30% of their target or sub-target. For any remaining underperformance, penalties are then applied at a rate of 1.25 times the buy-out price, which is set at the cost to the State to achieve these savings; the buy-out price varies by sector (6cts/kWh in the non-residential sector, 20.4 cts in the residential sector and 88 cts in the energy poverty sector).

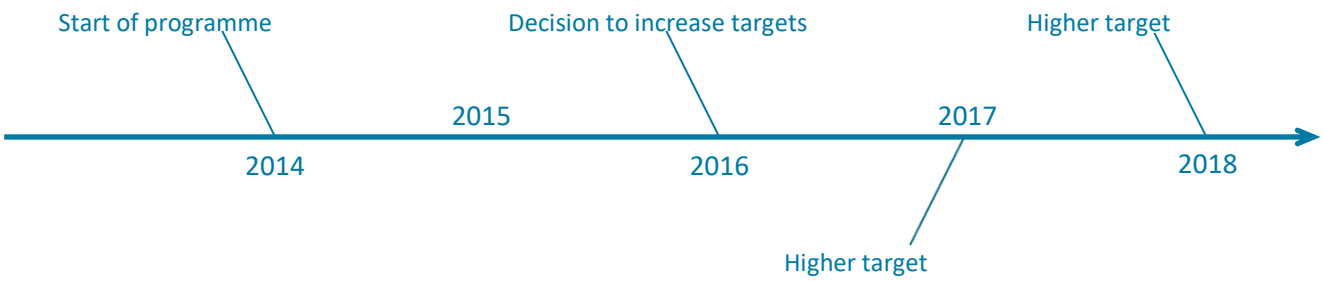
Banking and borrowing does not apply.

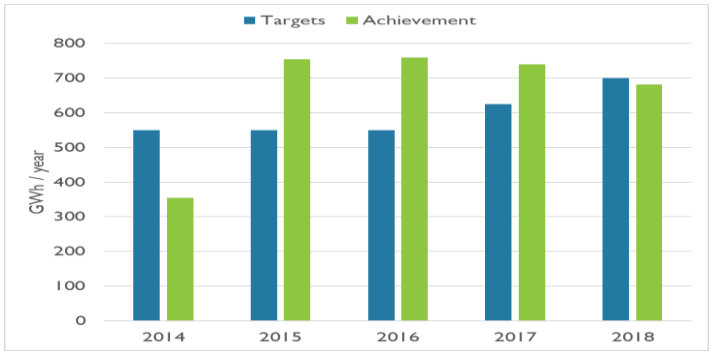
Monitoring, Reporting and Verification

OPs must have in place an agreement (for services in kind or monetary contributions) either directly or through a 3rd party with final customers prior to any energy savings being realised.

An online energy savings crediting system has been set for actions in the residential sector. OPs must implement an ISO 9001-aligned quality control process, use ISO 50015 or IPVMP for M&V, and perform audits of samples of non-residential projects representing at least 20% of the savings reported.

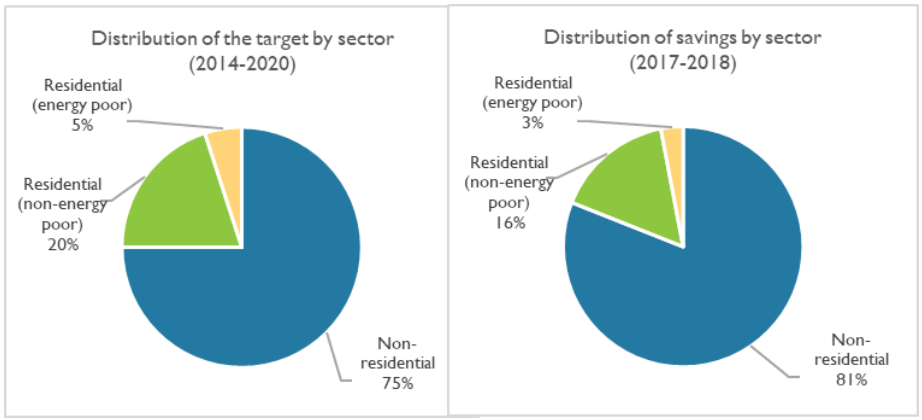
SEAI audit 5-10% of the projects, including on-site inspections (both in residential and non-residential sectors). Residential measures use deemed savings. Non-residential measures are verified using engineering calculations or using metering data. A simple boiler or lighting replacement would use an engineering calculation, scaled if appropriate; a more complex intervention would use metering data, potentially backed up by computer simulations. Guidance is provided to clarify when each method is appropriate.



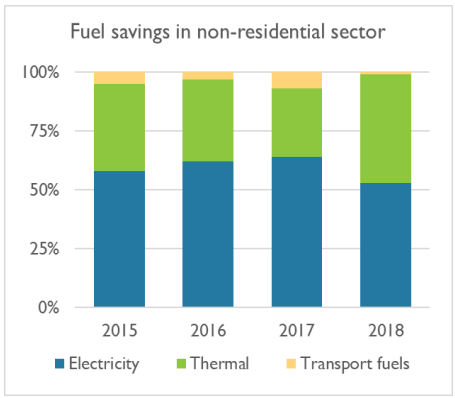


Targets were set low in the initial period to allow OPs to bed into the scheme.

Over-achievement by OPs may mean that effort is reduced in 2020. A mechanism for OPs to benefit from surpluses in any post-2020 programme are being consulted upon as part of the wider policy consultation in order to discourage the ramping down of effort in 2020.



A relatively high proportion of measures was delivered in the non-residential sector in 2017-2018, however, over the period since 2014, all the three sub-targets are being met. Annual targets are additive in that, in any given year, OPs must meet the sum of all annual targets from 2014 until the year in question.



The top non-residential measures by savings in (2014-15 and 2017):

- Processes (24% and 33%)
- Lighting (24% and 37%)
- Heating (24% and 22%)
- Ventilation/AC (5% and 2%)
- Transport (4% and 7%)

Thermal savings (see chart to left) are around 50:50 oil and gas.

The top residential measures in (2014-15; 2017 and 2018):

- Boilers (47%, 33% and 24%)
- Heating controls (10%, 25% and 43%)
- Wall insulation (22%, 12% and 10%)

Wall and attic insulation are the top energy poverty measures.

Costs for obligated parties

The average cost per kWh saved of the EEOS was €4.4cts per kWh in 2015 and €5.6cts per kWh in 2016. The costs per kWh saved over the lifetimes of the measures will be much lower, given that the targets are specified in terms of first year savings.

Other information about costs and benefits

OPs can choose to achieve some or all of their targets by working in partnership with existing government grant schemes, providing up to 30% of the funding towards residential measures and up to 95% for homes in energy poverty.

Interview with Joe Durkan (EEOS Programme Manager, SEAI – Sustainable Energy Authority of Ireland)

1) What have been the main changes and lessons learnt since 2017?

The targets have been increased in an orderly manner as OPs have become familiar with the scheme. The most important lesson is that it is really important to have a system of quality control in place (see next question below). It is very difficult to manage a voluntary scheme including small energy suppliers (e.g. solid fuel suppliers), without special legislation in place to allow access to their sales records. At the moment, if a company is obligated, the government has the right to obtain sales information, but this is not the case for smaller companies, meaning that it is sometimes impossible to ascertain whether or not their sales have met the obligation threshold. This is why a voluntary scheme for small suppliers under the mandatory threshold has been difficult to implement.

2) And more specifically about monitoring, verification and controls?

With the OPs having moved to ISO 9001-aligned systems, the MRV of the scheme has become a lot easier. Under ISO 9001, OPs must be externally accredited and audited. This allows independent audits to be targeted on specific areas. The ability to select makes the MRV process more cost-effective. OPs have companies that deliver work for them, and OPs are ensuring that those companies have quality assurance regimes in place and that the people doing the work are appropriately accredited.

3) What are the main interactions with other policies?

There are a number of alternative measures in Ireland. The Large Industry Energy Network and the SME network have a symbiotic relationship with the EEOS – these networks help to identify opportunities, connect with the energy efficiency industry and allow end-users to access OP funds. There is also a link to Article 8 audits, whereby auditors flag up opportunities under the EEOS to those being audited. Similarly, the OPs may drive the audit process in order to uncover opportunities to meet their obligations.

4) Are there challenges or changes foreseen for the coming years? (especially after 2020)

The post-2020 scheme is being consulted upon. If there is a scheme, the straightforward cumulative nature of the scheme will be a challenge because anything that is not delivered in 2021 will lead to a much bigger target in later years, given the nature of the Article 7 energy savings obligation.

The 2024-25 review by the European Commission is seen as a risk, particularly if targets are increased.

5) If you could go back in time, what would you do differently?

Ensure that the legislation would be robust enough to allow independent access to energy sales data of all companies, no matter how small.

Italy's White Certificates Scheme

Responsible authority: Ministry of Economic Development (MiSE)

Managing authority: GSE (Gestore dei servizi energetici)

History, current targets and results

The scheme started in 2005. Annual targets are defined within multi-year period (currently 2017-2020). The targets are expressed in both annual primary energy savings (in Mtoe/a) and in number of certificates (in Mcert/a), distinct unit due to the *tau* coefficient, adopted from 2011 to 2017. The target expressed in certificates is the one defining demand-supply for the market.

Annual targets for 2017-2020 (cumulative primary energy savings): 2017: 7.14 Mtoe/a; 5.34 Mcert/a

2018: 8.32 Mtoe/a; 5.57 Mcert/a

2019: 9.71 Mtoe/a; 6.20 Mcert/a

2020: 11.19 Mtoe/a; 7.09 Mcert/a

For 2005-2018 ≈59 million certificates were issued (against an overall target of ≈63 million certificates).

Key actors, roles and options

Ministry of Economic Development set the general rules of the scheme and the annual energy savings obligations. GSE (public body in charge of stimulating energy services) manages the scheme, and in particular the monitoring & verification tasks. ARERA (Regulator of the energy markets) sets the penalties and DSO tariff allowance. GME operates the WhC spot and bilateral markets.

The obligated parties are the distributors of electricity (12) and natural gas (44) with more than 50,000 customers. They can directly implement projects or buy certificates. Eligible (non-obligated) parties are non-obliged distributors, ESCOs, organizations with an energy management expert (UNI CEI 11339 certified) or with an ISO 50001 energy management system.

Many associations or federations of stakeholders are also active (e.g., FIRE for promoting the scheme and the development of energy services).

Penalties are provided in case a DSO does not meet its target. The amount depends on the severity of the default and on the effort to recover it.

Scope and focus

A large number of energy efficiency projects in almost all sectors is allowed, with particular emphasis on the industrial sector. A list of non-eligible interventions for lack of additionality has been published. 8 standardized actions with M&V on a sample are available (led for internal and public lighting, electric motors, compressed air generation, smart bill, naval propulsion systems, hybrid and electric vehicles fleets).

GSE monitors the achievement of targets annually. Flexibility is provided to DSOs, which every year have to obtain at least 60% of their target, compensating under-achievements in the next two years, to avoid fines.

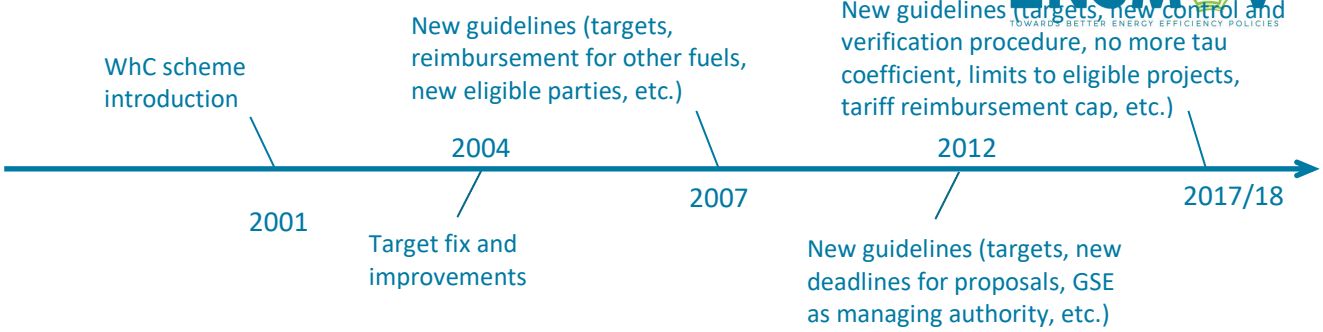
Monitoring, Reporting and Verification

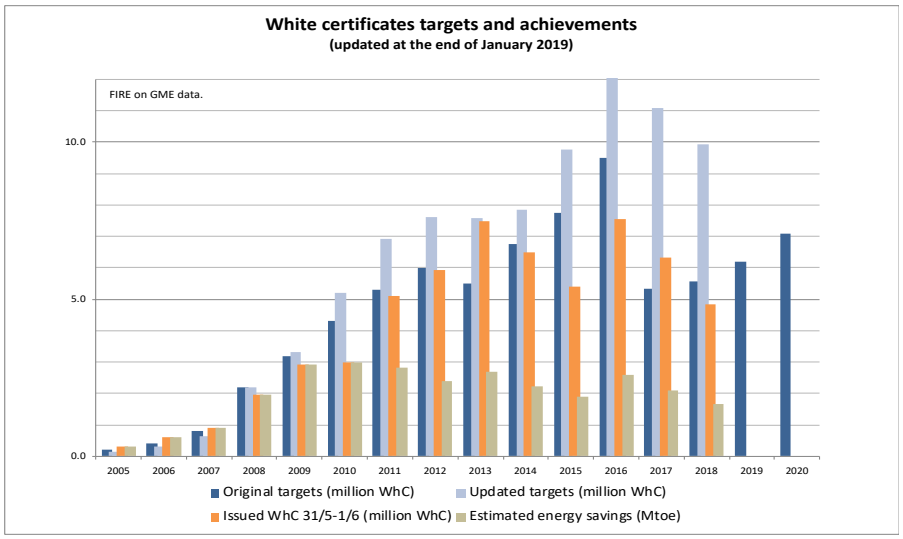
Obligated or eligible parties can submit **online application proposals**. **GSE** reviews their documentation and validates within 60 to 90 days, then **GME** issues the certificates.

Certificates are usually **credited on an annual basis for 5 years**. The period of time over which certificates are credited can anyway vary from 3 years, for behavioral change projects, to 10 years, for more complex projects.

With the new guidelines, published in 2017 and 2018, calculation of energy savings has to be done either through a **new type of standard projects** (with deemed savings plus mandatory measurement on a sample of similar projects) or through **monitoring plan projects** (subject to pre-validation of proposal by GSE, then certificates issued based on measured data). M&V in both cases is in line with IPMVP option B requirements, even if there is no mandatory use of IPMVP.

GSE randomly checks ex-post whether the implemented projects comply with the approved projects and conducts on-site inspections. Annual program of controls must include on-site inspections for projects with energy savings > 3,000 toe/a.

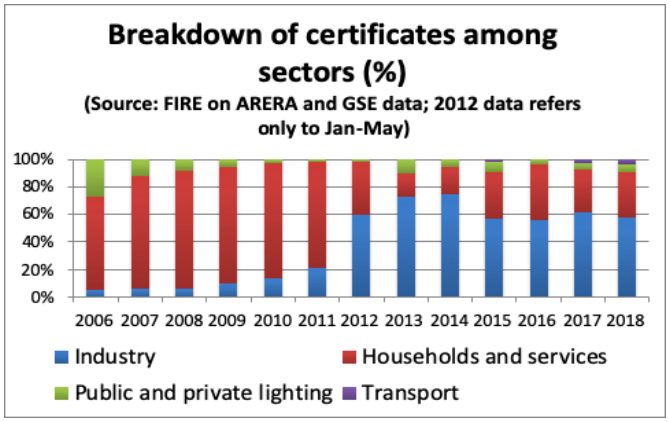




Four phases can be highlighted:

- first phase of oversupply (WhC price ≈30-80 euro);
- 2008-2014 slight undersupply phase (WhC price ≈90-110 euro);
- 2015-2016 insufficient supply due to restrictions of eligible projects and more stringent rules (WhC price ≈110-240 euro);
- 2017-2018 issues with frauds (WhC price ≈260-480 euro).

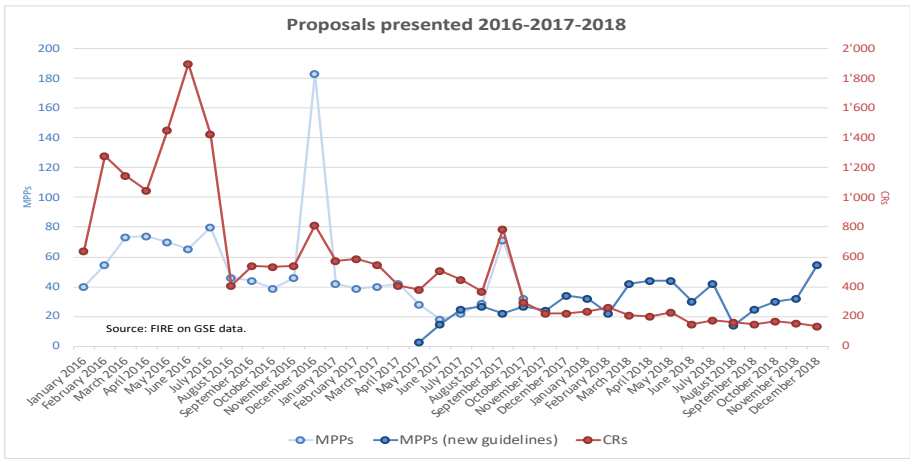
Price trend available on next page.



While some EEO and white certificate schemes deal mainly with the building sector; Italian WhC scheme has taken over time a different road.

The first one (2005-2011) was dominated by projects related to the building and service sectors (easiness to propose projects in those sectors thanks to the larger availability of standard projects files).

In the second phase (2012-2017) the **industrial sector took the leadership**, delivering most of the certificates. In industry, most of the savings comes from improvements in the manufacturing process.



Reduction of requests of certification in the last three years due to the evolution of the additionality requirements, the detection of large frauds and the increasing stringency of M&V rules.

Monitoring plan projects (MPPs) have a more stable trend, apart from the peak at the end of 2017 justified by the last opportunity to use the *tau* coefficient.

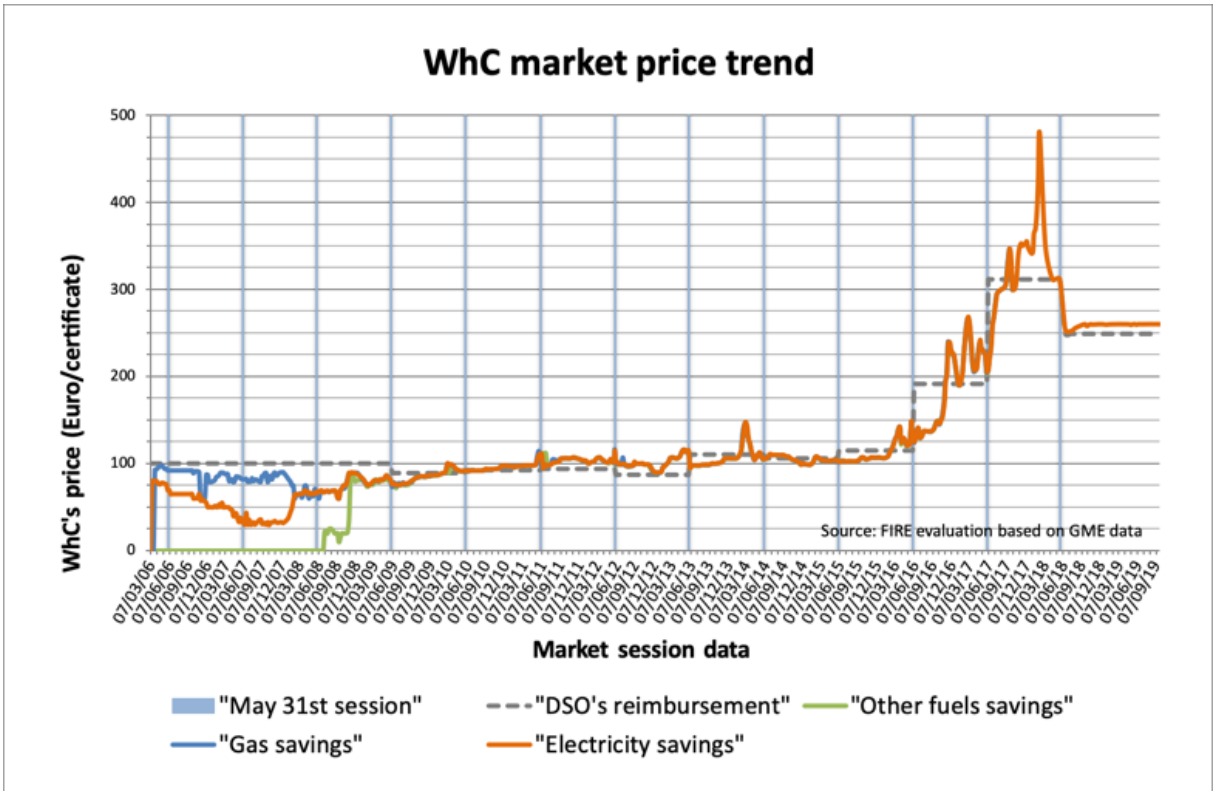
Costs for obligated parties

Most of the costs incurred by the obliged distributors are recovered through a reimbursement covered by tariff components on electricity and natural gas bills. Every end-user thus contributes to the cost-recovery mechanism. Obliged DSOs obtain the reimbursement when they present certificates to GSE according to their specific targets. The reimbursement is set by ARERA and is linked both to the WhC spot market price in the previous year and to the bilateral trading average price. In 2018 a cap has been posed on the value of this tariff reimbursement, equal to 250 euro/cert.

Other information about costs and benefits

The cost of the scheme can be calculated as the product of the cancelled certificates and the tariff reimbursement component. The costs incurred by GSE for information, evaluation, and control has been around 14 million euros in 2016, according to GSE' fiscal documents.

The Italian WhC scheme has a robust evaluation in place. Comprehensive figures are available on the dedicated resources.



Interview with Mauro Mallone (Energy efficiency division manager, Ministry of Economic Development)

1) What have been the main changes and lessons learnt since 2017?

In recent years the process of updating and strengthening the scheme has gone forward in order to increase the offer of certificates in the face of increasingly challenging objectives. To this end, for example, additionality topic has been revised, identifying baseline with ex-ante consumption for retrofit intervention.

A number of corrections were then introduced aimed at avoiding over-incentive of the interventions, rewarding projects exclusively based on the energy actually saved. Tau multiplier coefficient was abolished, the list of eligible projects revised, also introducing a list of non-eligible interventions.

In 2018 it was necessary to introduce a cap to the reimbursement price of the certificates issued by the obliged parties to safeguard the mechanism from undesirable speculation.

Thanks to the experience gained, the importance of standardizing the procedures for calculating savings for the most common technologies emerged, as well as the definition of criteria reducing uncertainty if the variables that affect consumption cannot be defined ex-ante (as in complex industrial processes). Moreover, the strong variability in terms of toe saved per euro invested in energy efficiency projects in different sectors should be considered, to make the scheme attractive not only to industry but also to non-residential buildings and transport sector.

2) And more specifically about monitoring, verification and controls?

In line with earlier remarks, verification action on the actual savings achieved by the eligible projects was strengthened. Unfortunately, as we feared, the percentage of poor-quality projects was not negligible. With regard to controls, it emerged that too simplified or too complex procedures can allow unlawful conduct by operators. Therefore, it should be paid more attention to the correct identification of critical aspects of the process and to standardize the documentation required during the project qualification and control phase.

3) What are the main interactions with other policies?

In energy efficiency sector, the White Certificates scheme has given the best results in terms of cost effectiveness, compared with other policy measures. Over time, however, other measures have been introduced with greater appeal (in terms of greater profitability, greater ease of access, or greater certainty of the expected economic benefit) that have moved several operators away from this mechanism.

4) Are there challenges or changes foreseen for the coming years? (especially after 2020)

The main challenge is to revive the mechanism and keep it "in shape" for the next decade. This will require to further simplify access criteria and optimize methods of quantification and recognition of energy savings, also by evaluating the possibility of implementing a radical reform of the scheme, In this context, particular attention will be addressed to the promotion of energy efficiency projects in buildings (non-residential) and transport sectors, also through the promotion of behavioural measures, as well as the widening of the audience of obliged parties.

5) If you could go back in time, what would you do differently?

The goal assigned to the mechanism for reaching the mandatory energy saving target set by article 7 of the EED was too ambitious. In 2014, when the objective was set, the WhCs production trend was in continuous growth, it was thought it could continue without taking sufficient account of the effects determined by the controls on the projects carried out (and the savings actually achieved) and by the displacement caused by other more attractive policies. Furthermore, a strategy that bases the achievement of the target on a more articulated mix of policy measures presents fewer risks of failure than the decision to focus on a few incentive mechanisms (and this is what we are implementing for the next decade).

Latvia's EEOS (Energoefektivitātes pienākuma shēma)

Responsible and managing authority: Ministry of Economics

History, current targets and results

Latvian EEOS was implemented in 2016 with the first commitment period starting from 2018 to 2020. The obligation is set for lifetime-cumulative final energy savings.

The target is set as 1,5% of electricity sold to customers for the first year (2018) and is increasing each year by adding additional 1,5% for the next year. It was estimated that the scheme could achieve around 234 GWh of energy savings in the first period.

329,5 GWh cumulative energy savings were reported so far from measures implemented in the starting period (2014-2017) (annual report 2019).The second period of the obligation is planned to last from 2021 to 2025 and the third from 2026 to 2030.

Scope and focus

OP may fulfil their obligation by:

1) providing end-users with information on energy efficiency improvement opportunities;

2) making contributions to the State Energy Efficiency Fund;

3) by implementing energy efficiency improvement measures at the end user.

For the calculation of energy savings Obligated Parties may use The Energy Savings Catalogue which includes individual energy efficiency improvement measures with default energy savings values. Its data can be used to calculate energy savings using the ex-ante method.

Additional conditions for dealing with energy poverty is not considered in the first commitment period of the scheme.

Key actors, roles and options

The EEOS so far was supervised by the Department of Energy Policy Administration of the Ministry of Economics. But starting from 2020, this task will be entrusted to the State Construction Inspection Bureau which will set up an energy department.

There are 15 obligated parties as of May 2019, which are retailers with the amount of electricity sold of at least 10 GWh per year. In case of the amount of electricity sold in next years is below that value the party is not excluded from the obligation (Ministry of Economy).

Trading of energy savings was not predicted for the EEOS in Latvia.

Obligated party may choose to make a contribution to the State Energy Efficiency Fund according to the amount of its obligation. The contribution is fixed at 70 EUR/MWh. For the OP not achieving at least 80% of their target the payment is mandatory and covers 1,5 times the amount of energy savings not achieved.

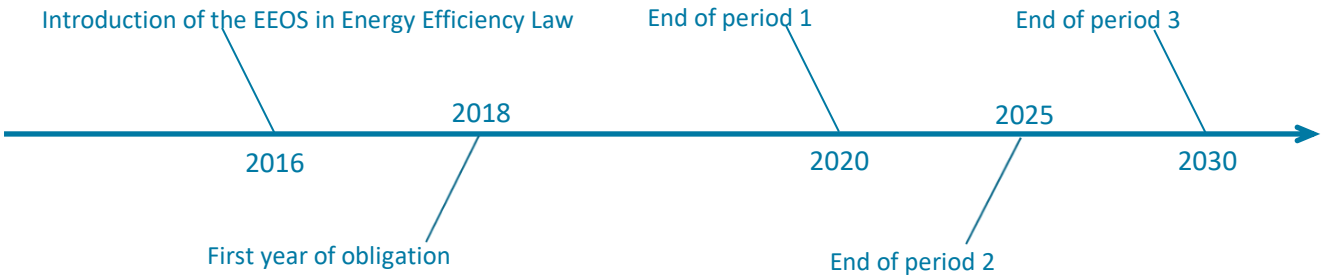
Monitoring, Reporting and Verification

Each obligated party draws an energy efficiency improvement action plan in order to reach the obligation target for each commitment period and submits to the responsible ministry. By 31 March each year, the obligated party shall submit to the responsible ministry amendments of the plan if necessary.

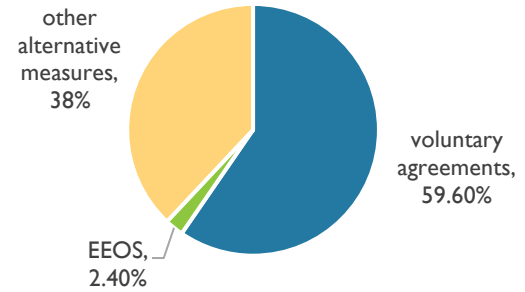
According to the Cabinet Regulations No.668 "Regulations on energy efficiency monitoring and the applicable energy management system standard" by 1 November each year, the obligated party shall submit to the responsible ministry an energy saving report for the previous calendar year. If the obligated party has complied with at least 80% of the obligation for the relevant year, the missing part shall be added to the amount of the obligation for the following year.

The responsible ministry invites merchants to submit their annual reports electronically to the Ministry of Economics electronic system for the energy sector https://ener.gov.lv.

The responsible ministry has the right to involve experts independent of the obligated parties in the inspection/assessment of the energy savings report of the previous year.

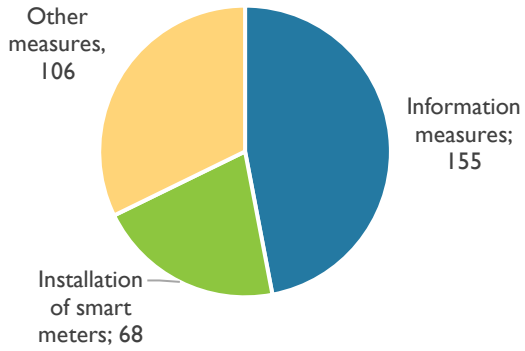


Planned share of savings from measures to reach Art. 7 target



The EEOS in Latvia is planned to deliver a very small share of the target set in Art. 7 of EED. The expected value was already achieved with a surplus in the starting period as 3,3 % of the total target were reported for EEOS. For the other measures most of the savings are planned to be achieved by voluntary agreements (almost 60%). Until 2017 53% of the target was achieved (annual report 2019).

Final energy savings from EEOS by 2017, per action [GWh]



The measures reported so far are related to the starting period (2014-2017). Those savings will be counted towards first commitment period in 2018. 47% savings were achieved through information measures, which lifespan is just one year. 21% was achieved through installation of smart meters for which the lifespan is two years. The rest was achieved through other measures with longer life spans as the yearly savings from those measures were less than 30 GWh.

Costs for obligated parties

The costs incurred by the responsible party for energy efficiency Improvement activities at the end user and contribution country the energy efficiency fund can be recovered by including it in the energy charge. In its turn, the costs of information measures are considered as the economic activity costs of the obliged party.

Costs of the start period (2014-2017) cannot be recovered.

Other information about costs and benefits

The obligated party shall indicate on its website the costs incurred by the obligated party in the previous calendar year for energy efficiency improvement measures at the end user, as well as how these costs have been recovered and shared between households and other end users.

Interview with Inguna Ozolina (Senior expert, Ministry of Economics, Department of Sustainable Energy Policy)

1) What would be the first lessons learnt from starting an EEOS?

In 2013 Latvia adopted the Concept and Government Order establishing the Energy Efficiency Obligation Scheme (EEOS) and according to them the implementation of the EEOS is set out in the Article 6 of the Energy Efficiency Act (2016). In 2017 the Cabinet Regulation No. 226 "Regulations on the Energy Efficiency Obligation Scheme" (hereinafter - Cabinet Regulation No. 226) was adopted, which provides for first EEOS period from 2018 and a start-up period before 2018 (2014- 2017), where responsible parties can report on the actions they have taken to end users. The EEOS is implemented by the Ministry of Economics. The sectors to be included in the EEOS, the criteria for the selection of obligated parties and the scope of the obligation of the responsible parties by year are specified in the Cabinet Regulation No. 226. According to these regulations at present EEOS includes electricity retail companies with annual sales of electricity of at least 10 GWh. The first results show that the obligated responsible have mainly implement information measures.

2) And more specifically about monitoring, verification and controls?

The energy savings achieved as the result of the implementation of the EEOS are accounted in accordance with Cabinet Regulation No.668 "Provisions for Energy Efficiency Monitoring and Applicable Standard of Energy Management System". The obligated parties are required to report by 1 November each year on the energy savings achieved during the previous year. The obligated parties are obliged to keep for a period of five years all relevant documentation on the calculation of energy savings, including readings of the energy meters and all energy bills (including transport fuel bills). The Ministry of Economics has the right to request, at least once a year, documentation on the methods used to determine savings and its end-users and energy consumption broken down by sectors, as well as planning regions of Latvia.

3) What are the main interactions with other policies?

The Energy Efficiency Act does not specify the sectors in which energy efficiency measures should be prioritized by obligated parties. Experience shows that the larges part of energy savings come from the introduction of information measures in households.

4) Are there challenges or changes foreseen for the coming years? (especially after 2020)

In view of the current situation with the fulfilment of the energy efficiency targets for the period until 31 December 2020, as well as the assessment of the effectiveness and contribution of the existing EPS to the fulfilment of the national targets, the EPS in Latvia should be extended, as required by the Energy Efficiency Act. Latvian National Energy and Climate Plan includes a proposal to include in the EEOS as obligated parties all energy traders whose energy sales represent 90% of the energy supplied to consumers in Latvia. The amount of energy sold by the party to the participant of the voluntary agreement must be excluded from the energy supplied to consumers. The amount of duty shall be calculated according to the amount of energy sold. Large electricity consumers and large enterprises are not excluded.

5) If you could go back in time, what would you do differently?

Currently, both the EEOS and the voluntary agreement scheme are implemented in Latvia. Experience has shown that the use of both instruments is not effective enough. When designing energy efficiency policies, only one of these instruments had to be chosen.

Luxembourg's EEOS

Responsible and managing authority: Ministry for the Economy

History, current targets and results

The scheme has started in **January 2015**, for a period up to the end of **2020**.

The overall target has been set to achieve 100% of the target for the EED article 7: **5 993 GWh** of final energy savings cumulated **over 2015-2020**.

The individual targets are set annually (level of about **285 GWh/a** of new final energy savings).

In 2015, 162 GWh has been reported by obligated parties and 102 GWh assumed by the ministry.

Key actors, roles and options

The **Ministry** has the responsibility of the scheme, including its administration and management. The **Energy Regulator** applies the sanctions after decisions by the Ministry. The agency **MyEnergy** provides a technical support.

The obligated parties are all the **electricity** (10) and **gas** (6) **suppliers**, based on their sales in the **residential**, **service** and **industry** sectors. Some suppliers are both electricity and gas suppliers. In this case, their market shares in electricity and gas are added for the purpose of the calculation of their annual target.

No trading is included, but **bilateral transfers** of energy savings certificates may be possible between obligated parties. Energy savings projects can be led by third parties (installers, energy advisors, etc.), but they have to be directly subcontracted by the obligated parties (through call for projects, bilateral contracts or simple negotiations).

Scope and focus

Actions are eligible in **all end-use sectors** to save **all types of energy**. A catalogue of **40 standardised actions** (including deemed savings) has been prepared. A calculation methodology is available for other types of actions. Behavioural actions may be eligible under conditions.

The results are counted in **1st-year final energy savings**, taking into account that the actions have to deliver savings in 2020. In 2015, in number of measures, most of them were realised in buildings. But in terms of energy savings, half were achieved in buildings and half in the industry sector.

Monitoring, Reporting and Verification

Obligated parties have to **report their energy savings each year** (before 31th March). Actions are reported according to a standard template defined by the Ministry of the Economy. **Complementary details** have to be documented and **kept** for 10 years **in case of contro**l (especially the documentation of the type of intervention with the final customer and the attestation of anteriority).

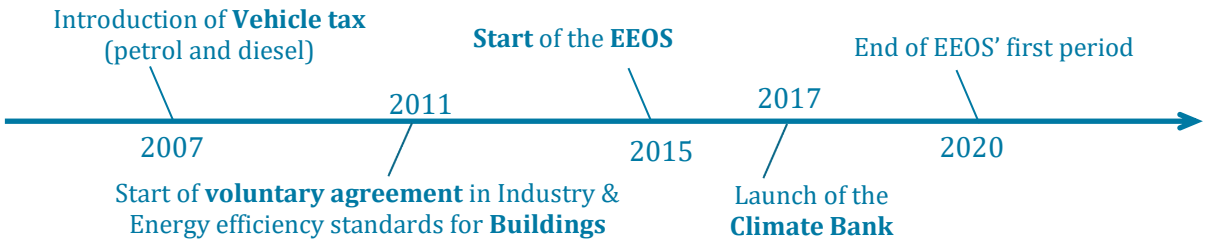
Independent consultancies perform **annual random controls** of a representative sample of actions, under the supervision of the Ministry of Economy. The control of 5% of the energy efficiency measures validated for 2015 is currently in progress.

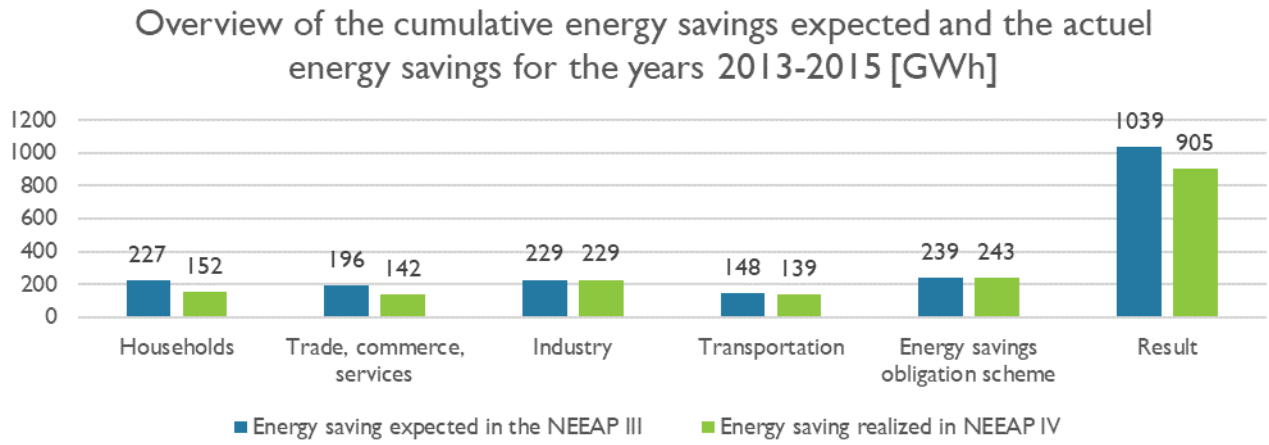
Penalties may be applied in case of non-achievement of the target, but the penalties are **not in full discharge** (the missing energy savings have to be achieved the next year).

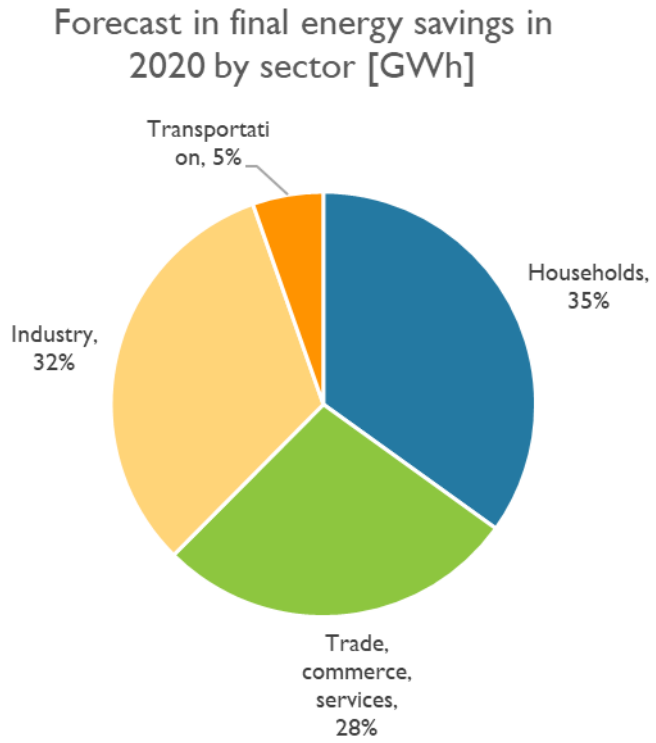
Specificities of the scheme or context

The obligation is defined as a mission of public service. This allows the scheme to be partly funded by the State budget.

The high share of savings in the residential sector in 2015 can be explained because specific measures are more complex and time-consuming to implement. So few of them could be completed at the start of the scheme. However, specific measures, despite their small number, account for half the total savings made.







The central energy efficiency measure in industry is **the voluntary agreement** between the Luxembourg Government and the Luxembourg Business Federation. It aims to improve energy efficiency by 7% for the period 2016-2020.

Two fiscal measures that will increase the cost of motorised transport are implemented to improve energy efficiency in **the transport sector**. Expanding public transport and soft mobility is used to encourage a shift to more sustainable forms of transport.

In January 2017, **the Climate Bank** entered into effect. It offers applicants financial support in the form of loans with reduced interest rates, or interest-free loans for low-income households.

Costs for obligated parties

The additional costs borne by obligated parties from making energy savings may be passed on to the final consumers, thus leading to an increase in electricity and gas prices. In order to avoid distortion of competition, a tax may be imposed on energy sources such as fuel oil, as the fuel oil suppliers are not included in the obligation scheme.

Other information about costs and benefits

The obligated parties may undertake measures in all sectors (including transport) and involving all types of energy in order to achieve energy savings with the best cost-benefit ratio.

Malta's Obligation on Enemalta corporation

Responsible authority: Ministry for Energy and Water Management

Managing authority: Energy and Water Agency

History, current targets and results

Malta is characterized by a small size of the energy market. This is fully recognized under article 7(1)(b) of the revised Energy Efficiency Directive, whereby Malta will be required to achieve new savings each year from 1 January 2021 to 31 December 2030 equivalent to 0.24% of annual final energy consumption averaged over the most recent three-year period prior to 1 January 2019.

For the period 2014-2020, the total Art.7 target of Malta is specified in NEEAP 2017: cumulative end use energy savings of 774 GWh over 2014-2020.

A first obligation was set on Enemalta to **roll out smart meters** between 2009 and 2015. Then Enemalta has been required to implement complementary measures for raising households' awareness about their electricity consumption and savings potentials. Since 2018, this obligation has been transformed in the **progressiveness of the residential electricity tariff** system and the incentive towards energy efficiency in the tariff structure (eco-reduction).

Key actors, roles and options

The **Energy and Water Agency** is responsible giving technical input to the drafting of EU and local regulations in the energy and water sectors.

The **Regulator for Energy and Water Resources** issues authorizations to operate in the energy market and has the legal power to enforce regulations and impose fines and take legal action as necessary.

Enemalta Corporation is the only distribution system operator and the only licensed **electricity** supply company in Malta. Malta opted to achieve the targets by establishing an obligation scheme on Enemalta for certain measures that have a bearing on its commercial interests and that are more appropriately carried out by it through its own infrastructure.

Scope and focus

Malta's energy market exhibits specific characteristics such as the **existence of a single electricity distributor**, the **absence of natural gas or district heating and cooling networks** as well as the small size of petroleum distribution companies which substantially limit the range of measures available to meet the energy savings obligations.

The scheme is focused on the **residential sector**. Savings resulting from measures are considered eligible in view that they incentivize and result in direct reduction of electricity consumption.

As a minimum, all individual measures will be required to comply with applicable European and/or International standards. Malta observes the rules and the regulations for quality standards for products, services and installation established in the Community.

Monitoring, Reporting and Verification

Derived from an **economic study** by external consultants, the Progressiveness of the Residential Household tariff System (including the effect of the eco-reduction) is based on consumption patterns in the domestic sector and applicable **elasticity** of demand. The consumption patterns are obtained from metered supplies and from 'number of persons in household', while elasticities are validated by figures in the literature.

The Regulator for Energy and Water Services will verify the savings resulting from the EEOS.

2011 — Smart meter obligation scheme

2018 — Progressiveness of the domestic residential electricity tariff system

The Energy Efficiency Obligation (EEO) has been re-dimensioned.

Malta was one of the first Member States in the EU to proceed with the implementation of **smart meter** installation, even before the Energy Efficiency Directive was drafted. Now this measure is slowly near completion. However, determining the resulting **behavioral changes** is proving to be rather difficult. Efforts are being made by the obligated party, through its billing partner ARMS Ltd, to provide information to the customer via a web interface. The portal shall be known as "My Consumption". For the revised target, no savings are being attributed to this measure until a more robust assessment is carried out. Instead, the impact of the progressive electricity tariff is evaluated by taking into account the elasticity between electricity demand and prices.

Overview of the policy mix (Alternative Measures) reported by Malta for article 7

In addition to the EEOS, Malta is using the following alternative measures to meet its Article 7 target.

Financing schemes and fiscal incentives

Schemes covering the residential, industrial, commercial and transport sectors. Such as:

- **on-site visits for vulnerable households** to raise energy awareness, provide energy saving tips and replace inefficient appliances (cumulative savings target: 973 MWh).
- support for implementing **RES technologies in residential buildings for own consumption** only (cumulative savings target: 401 GWh).

Regulation and voluntary agreements

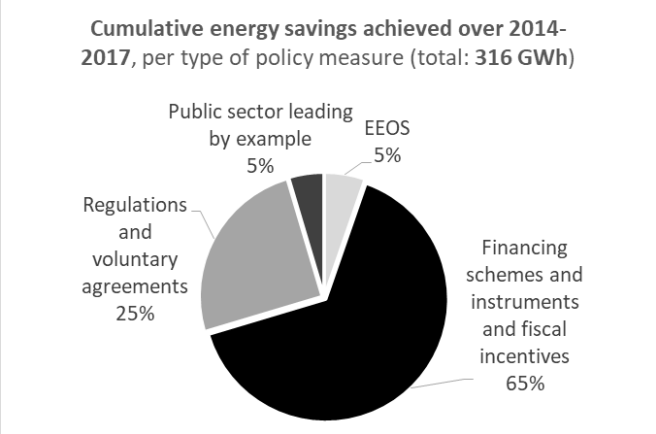
National voluntary agreement and the EE Partnership Initiative for large enterprises (cumulative savings target of 149 GWh).

Energy Efficiency scheme for industry: tax rebates to support energy efficiency actions in the service and industrial sectors. The scheme aims at rewarding the actions that achieve the most energy savings (target of achieving cumulative savings of 100 GWh).

Public sector leading by example

The government and public entities undertake measures to increase EE in their spheres of activity, particularly in industry, services and buildings. Among others:

- **the Government Desktops Power Management Initiative**: computer power settings optimization across all public sector, deployed so far on over eight thousand computers, with energy savings estimated in the range of 5-10%. Also desktop-based systems are replaced with laptops, with cumulative savings estimated to 970 MWh.
- **Energy efficiency measures at the National Pool Complex**: energy efficient actions partly funded by European Regional Development Funds (ERDF) (e.g. installation of new heat-pump technology in conjunction with solar collector panels and a VRF air-conditioning system, installation of a pool cover reducing evaporation and heat loss), with expected cumulative savings of 15 GWh.



The **cumulative savings achieved over 2014-2017** amount to about **316 GWh**, i.e. about 93% of the expected 341 GWh in the initial trajectory planned to meet the Article 7 target.

Sources: annual reports and NEEAP 2017

Poland's White Certificates scheme

Responsible authority: Ministry of Energy

Managing authority: URE (Energy Regulatory Office)

History, current targets and results

The scheme **started in 2013**, however it went through significant changes from auction-based to continuous applications in **2016** and continues in the **new form** since then.

The savings are reported both in primary and final energy, however the certificates are granted for average yearly final energy savings only.

There is a **final energy savings target of 2 645 ktoe** to be achieved by the end of 2020.

The scheme is planned to **continue beyond 2020**, however changes in the regulations are under preparation. Additionally, alternative measures are planned to be implemented to reach the Art. 7 target for 2021-2030.

Scope and focus

Only planned projects can now receive white certificates in the new system. Energy saving measures such as: industrial processes, buildings, lightning, household appliances, energy recovery, energy sources, losses in energy distribution and transformation are eligible to apply for the certificates.

Single projects or groups of projects that are precisely defined by the ministry and deliver more than 10 toe/a of final energy savings are eligible to apply for the certificates.

The energy audits, accompanying the application for granting the certificates, shall be performed accordingly to specified methodologies, and are checked by URE.

Energy poverty is not addressed in the scheme.

Key actors, roles and options

Rules of the scheme are set by the **Ministry of Energy**. **URE** is responsible for management and monitoring or the results.

The Obligated Parties (OPs) are the **energy suppliers and traders selling electricity, heat, or natural gas** to end users, except heating companies that supply less than 5 MW_t to final consumers.

OPs can perform the energy efficiency measures themselves, acquire **white certificates** on the market or pay a **substitution fee** to the **National Fund of Environment Protection and Water Management**. Only a part of the obligation could have been fulfilled with the substitution fee in 2016-2018, and from 2019 this option can only be used in case of a lack of certificates on the market. The substitution fee is predefined for each year. In 2017 it was set at 1,500 PLN/toe (350 EUR/toe) and is increasing 5% per year.

Any actor is eligible to submit energy savings projects to obtain white certificates. The certificates can be traded on the **Polish Power Exchange** or in OTC transactions.

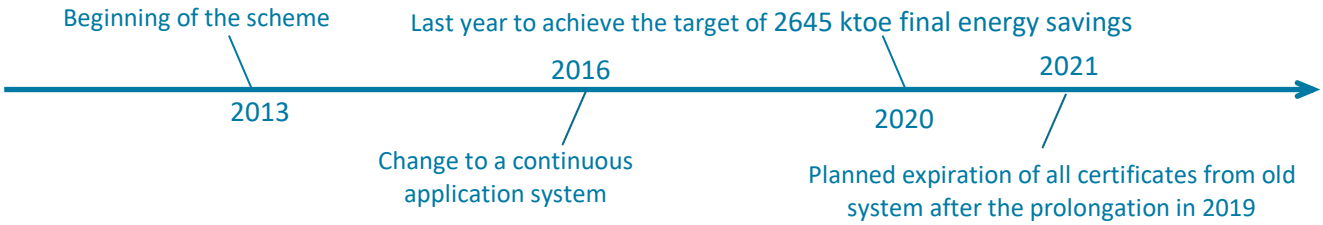
Monitoring, Reporting and Verification

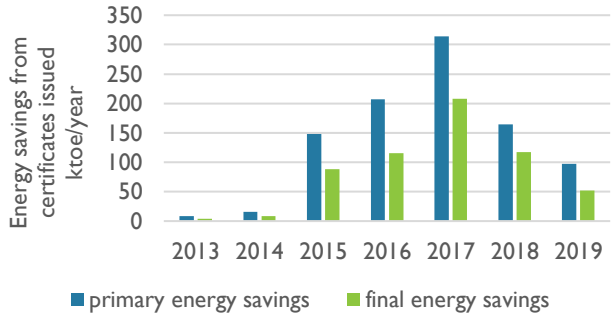
The obligation, which is equal to 1.5% of energy sold to the final customers in a calendar year, should be fulfilled by the end of June next year. The obligated parties can postpone (**borrowing**) the fulfilment of the obligation for one or two years. The obligation can be lowered through presenting measures implemented by a large consumer from specific industrial groups that consumes at least 100 GWh/a. Those measures follow similar requirements as others (at least 10 toe/a of savings confirmed with an audit), except they can be already implemented but not earlier than 2014.

Ex ante and ex post energy audits are required for all projects with energy savings **over 100 toe/year**. The certificates are issued after the completion of a project. URE has the right to organise **random controls** of the audits and to apply **penalties** in case of false information presented in the audit.

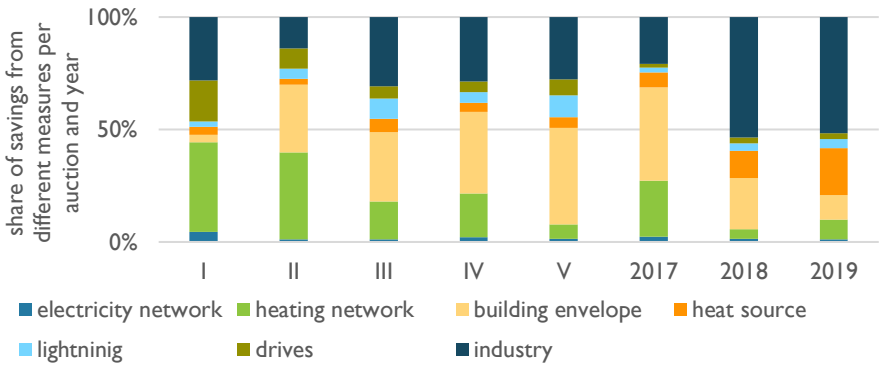
There are 8 types of measures that could use a simplified energy audit with predefined calculation methods.

The application for a certificate can be sent to URE online. The Polish Power Exchange organises the register and controls the owners of certificates.

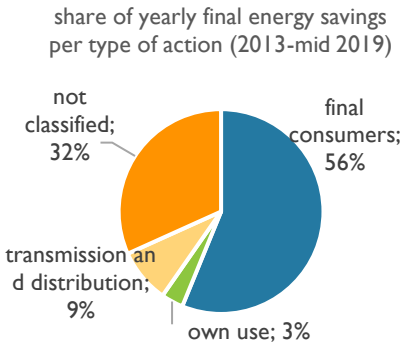




In the first years due to low supply of certificates most of the obligation was fulfilled with the substitution fee. The change proposed in 2016 resulted in the highest savings in 2017 when most of the certificates from last auction were issued. The certificates from the last auction and the transition period were still issued in 2018 and 2019 and less than 25% of savings were achieved from the new system. The data for this figure was gathered by the end of September 2019.

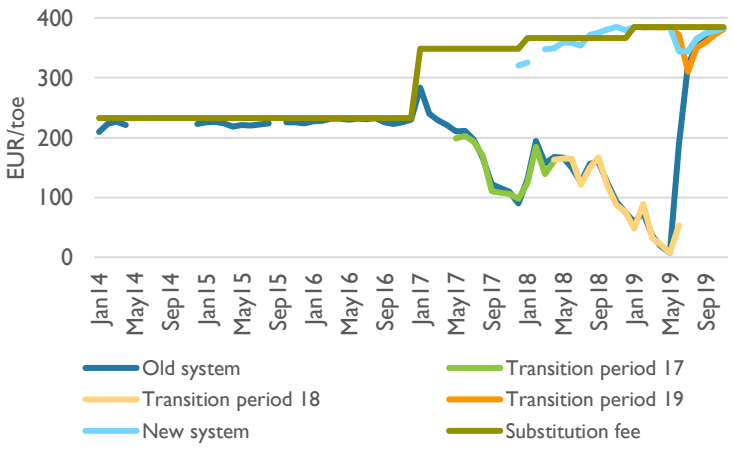


In the old system the certificates were granted through auctions held once a year. From 2017 the applications are submitted in a continuous manner. The classification of measures presented in the figure is not included in the official statistics. It comes from own analysis of short descriptions of all projects that are publicly presented.



To avoid unfair competition in the auctions in the old system the applications were classified into 3 groups. Most of the savings were achieved form projects addressing final consumers. The classification is not reported in the new system starting from 2017 as it was no longer needed for the auctioning process.

In general most final energy savings so far were achieved in industrial processes (34%) and thermal renovation of buildings (33%), followed by modernisation of heating networks (13%).



Information about costs and benefits

Price of the certificates on the market are different for each of three types. Those types are: certificates from old scheme (which are valid until 2021), certificates from the transition period (which are valid only for the year they were issued in) and certificates from the new scheme (which as for now do not have expiration date).

Interview with Tadeusz Skoczkowski, Professor and Head of the Chair of Rational Use of Energy at the Warsaw University of Technology

What have been the main changes and lessons learnt since 2017?

The scheme faces challenges resulting from a change of many key rules introduced in the Energy Efficiency Act in 2016. Those include but are not limited to:

- Change from yearly tenders to continuous application (with it abandoning the use of ω coefficient which influenced the value of certificates).
- Issuing certificates for final energy instead of primary energy.
- Limiting the possibility to fill the obligation with the substitution fee.
- Continuous increasing the value of the substitution fee.
- Allowing measures in industries covered by the EU ETS to apply for the certificates.
- Limiting the possibility to apply for the certificates only to planned projects.

And more specifically about monitoring, verification and controls?

The changes influenced the application process as the ex ante and ex post applications are now verified by the ERO. Additionally, the verification process is carried out continuously and not concentrated in a period related to auction.

The high number of applications for the last auction which results were announced in 2017 and the transition period caused many of those certificates still being processed and issued in 2019.

The monitoring of the results was limited because projects are no longer classified into three groups as it was in the previous scheme.

What are the main interactions with other policies?

The large scope of the scheme implicates many interactions with other policies. The projects that received financial support from thermal renovation programme or other public programmes when the support would exceed the amount set in state aid rules cannot apply for certificates. This rule does not apply to projects implemented with the support of municipal low emission programmes.

Furthermore, the projects from the EU ETS sectors are now eligible to apply for the certificates, which was one of the major changes introduced by the Energy Efficiency Act in 2016.

Are there challenges or changes foreseen for the coming years? (especially after 2020)

New legislation has not been introduced yet since the Energy Efficiency Act in 2016. However, prolonging the White Certificate Scheme and introduction of alternative measures is taken into consideration. Derisiking participation of the White Certificate Scheme will be the main challenge to attract new investments in coming years.

For the alternative measures allowed by art. 7, setting up a robust measurement, reporting and verification mechanisms to avoid double counting of energy savings and other negative influences of the introduction of such mechanism will be crucial.

If you could go back in time, what would you do differently?

The changes, however difficult, where necessary to fulfil the transposition of the EED. Better communication with the stakeholders and showing the benefits of the scheme to the end users during the first years could increase the results in that period and possibly avoid mistakes for the future. The major changes can have a very disruptive effect, so it is important to properly communicate them to lower the risk of participating especially in such a long-term mechanism.

Slovenia's EEOS

Responsible authority: Ministry of Infrastructure

Managing authority: Slovenian Energy Agency

History, current targets and results

The obligation scheme is built on a previous scheme started in 2010 collecting funds through fees on energy prices. The current rules of the scheme entered into force in 2015. All energy suppliers have now to achieve energy savings targets.

Targets are set annually from 2015 to 2020, as a % of the energy sales in the previous year:

- 0.25%/a for 2015,
- 0.5%/a for 2016-2017,
- and 0.75%/a for 2018-2020
- (0.75%/a represents about 260 GWh/a)

Energy savings achieved through EEOS are: 66 GWh in 2014, 502 GWh in 2015, 281 GWh in 2016, 252 GWh in 2017 and 284 GWh in 2018.

Key actors, roles and options

The government (Ministry of Infrastructure) sets the rules. The implementation of the scheme is supervised by the Slovenian Energy Agency (authority regulating the energy markets) with a team dedicated to monitoring and verification. The Centre for Energy Efficiency of the Jožef Stefan Institute provides a technical support (especially in the development of the calculation methods).

In 2018 there were 242 obligated parties (OPs) that are the suppliers of electricity, natural gas, heat (district heating), and liquid and solid fuels to final customers in all end-use sectors (with a lower target for transports: 0.25%/a for the whole period).

The scheme does not include a trading market. But OPs may fulfil their obligations by making a payment to the Eco Fund (fee equal to the average costs per kWh saved as observed for Eco Fund programmes). OPs may also have agreements to transfer projects between them or from ESCos, before reporting to the Energy Agency.

Scope and focus

About 30 standardised actions (with deemed savings) cover all end-use sectors. Other actions can be reported through energy audits. Actions improving the efficiency of district heating, cogeneration and cooling installations are also eligible.

About 57% of the savings achieved in 2018 came from 3 action types: cogeneration (23%), fuel additives (19%) and energy efficient lighting in residential sector (15%).

Monitoring, Reporting and Verification

Obligated parties have to report annually their achievements to the Energy Agency, according to a template. Surplus of energy savings can be transferred over the next three years.

The Energy Agency will verify 2.5 to 5.0% of the measures. These controls are mainly focused on the documentation of the energy savings. This may be complemented by on-site inspections.

Energy savings are accounted for the 1st year of the actions that are still delivering energy savings in 2020. The eligibility and specifications of the calculation methods are revised on a yearly basis.

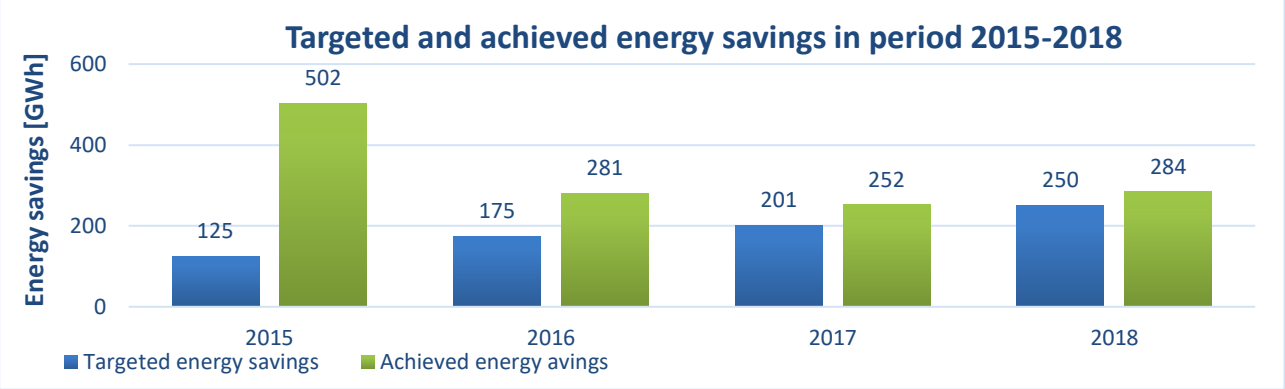
Costs for obligated parties

There are no publicly available data on costs incurred by the obliged parties.

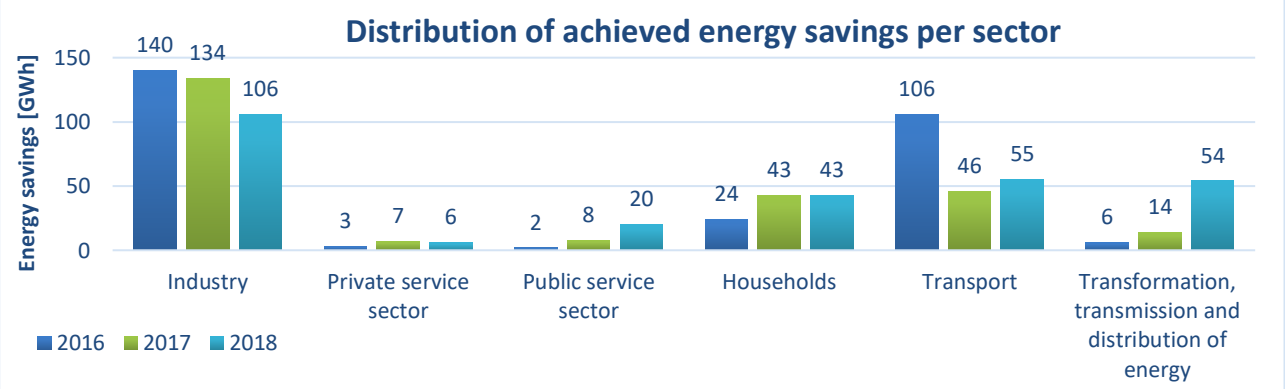
Other information about costs and benefits

There are no publicly available data about administration costs for operating the EEOS.

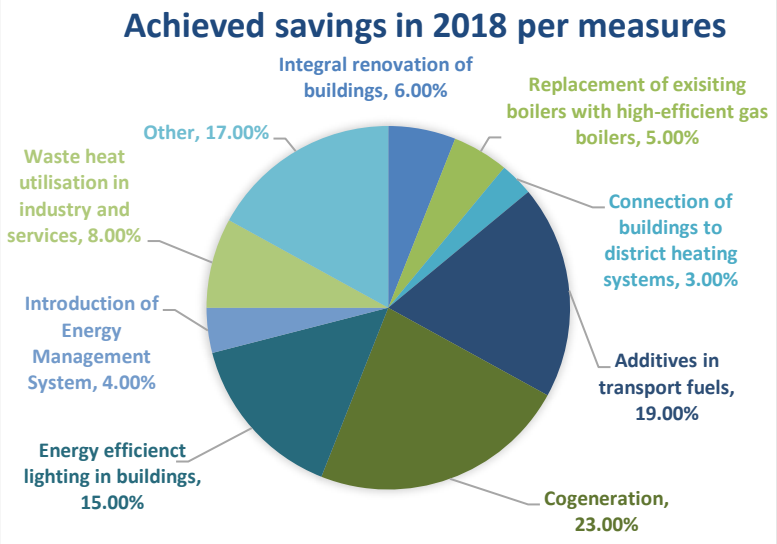
Source: All information and data shown hereafter are taken from the Report on the energy sector in Slovenia -2018, prepared by Slovenian Energy Agency in June 2019 (Agencija za energijo, 2019).



Targeted energy savings are increasing per year, which is a result of increasing the target share of mandatory energy savings. From 2018 onwards, however, the mandatory savings target is unchanged at 0.75% of energy sold in the previous year and 0.25% of gasoline and diesel sold last year (for transports). OPs have overachieved targets in each year, which is the result of both on-going activities and possibility to transfer surpluses from previous years to the next three years after implementation of a measure.



OPs made most of the savings in the industry. These savings are demonstrated by performing an energy audit. Lower savings were made in service sector, both private and public. However, in the public sector in 2018 significant progress in terms of savings has been made, mainly due to the involvement of OPs in public-private partnerships for the renovation of public buildings. Due to the implementation of many cogeneration projects in 2018, the savings in the energy transformation, transmission and distribution have also significantly increased.



In 2018, most energy savings were achieved with measures for the implementation of cogeneration, by adding an additive to the transport fuels and the implementation of energy-efficient lighting in buildings.

Implementation of these measures resulted in the emission reductions of 86,148 tonnes per year. CO_2 emissions have fallen the most in the industrial sector, with the largest contribution of cogeneration systems.

Spain's EEOS and Energy Efficiency National Fund

Responsible authority: MITECO (Ministry for the Ecological Transition)

Managing authority: IDAE (Institute for Diversification and Saving of Energy)

History, current targets and results

The energy efficiency obligation scheme (EEOS) has started in July 2014. The annual obligation is calculated considering the total Article 7 target for Spain, minus the savings achieved from the alternative measures that complemented the EEOS.

Annual targets have been set to 131 ktoe/year for 2014, and 262 ktoe/year for 2015-2019 (new final annual energy savings).

The total contribution to the EENF amounted to 103 M€ in 2014 and then 207 M€ each year over 2015-2019 (i.e. about 1100 M€ in total so far).

The draft NECP mentions that the EEOS and EENF are planned to be extended up to 2030.

Key actors, roles and options

The Ministry for the Ecological Transition set the general principles and targets of the scheme. The Ministry has also established the Energy Efficiency National Fund (EENF).

The IDAE manages the EENF, under the supervision and control of a Steering Committee (including different ministries) that approves the programmes prepared by IDAE.

The Obligated Parties (OPs) are the suppliers of electricity and natural gas, and wholesale retailers of oil products and LPG. They have to report each year about their energy sales to all their final customers the previous year, and then to pay in the year "n" in proportion to their energy sales in the year "n-2".

In 2019, 359 OPs had to pay a fee. The 3 largest OPs represent 40% of the fees paid in 2019.

The contribution fee has been set to 0.79 M€/ktoe (68€/MWh), taking into account the estimated average costs to achieve energy savings from the activities of the EENF.

Scope and focus

The EENF implements programmes in all sectors. About 48% of the funding has been dedicated to programmes in industry, 36% for buildings, 10% for street lighting, 2.7% for cities, 1.7% for information, 0.46% for desalination plants and 0.7% for transports (that receive more funding from alternative measures).

The EENF can receive contributions from other sources, from the General State Budgets, from the European structural and investment funds (ERDF) and from the return on the loans granted within the framework of call for projects already implemented since 2015.

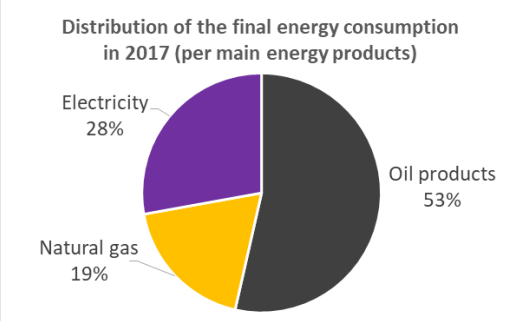
Energy poverty is tackled by other policy measures.

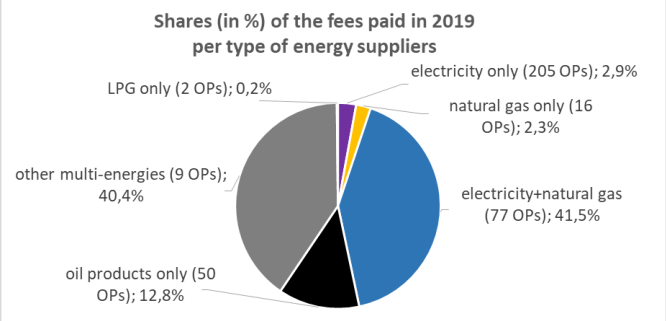
Monitoring, Reporting and Verification

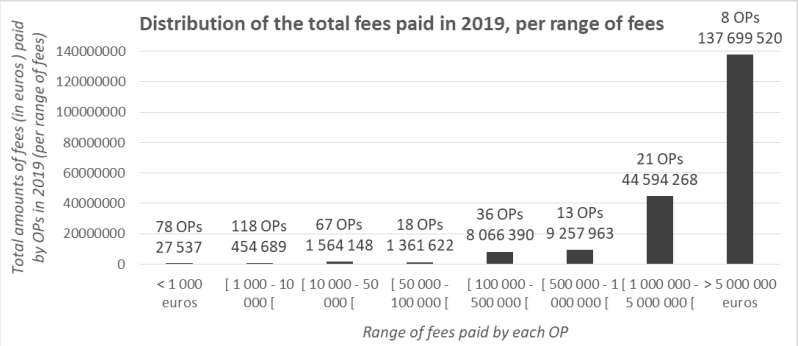
The implementing text (Ley 18/2014) has defined detailed rules about the types and levels of infringements, sanctions/penalties and related procedures. They cover the possible situations of false declarations, frauds, non-compliance and non-achievements of the targets.

IDAE is in charge of monitoring the EENF programmes, based on the reporting done by each project holder receiving funds from the EENF.

A dedicated Verification Unit has been set within IDAE to verify and control the programmes, through a combination of desk review and on-site inspections. The desk review verifies the documentation of all projects. Then on-site inspections are done on representative samples.



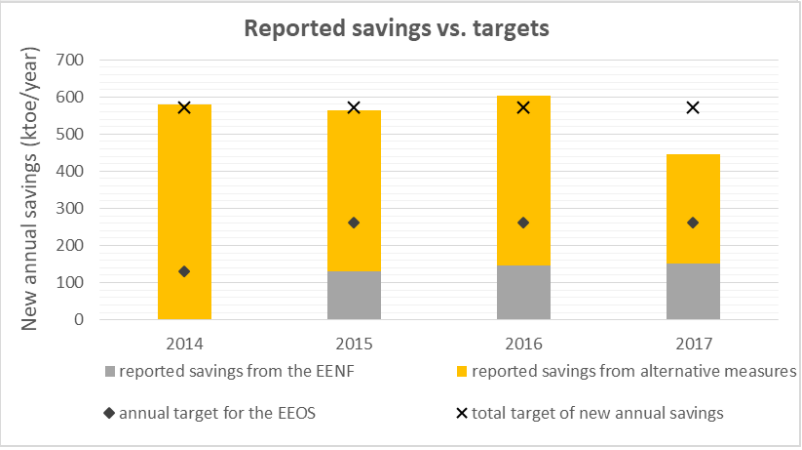




Fees are proportional to the energy sales (in energy unit). The largest OPs are multi-energies.

8 OPs paid an annual fee of more than 5 M€ in 2019, amounting to 137.7 M€ altogether (68% of the fees paid by all OPs in 2019).

Source: Ministerial Order for 2019

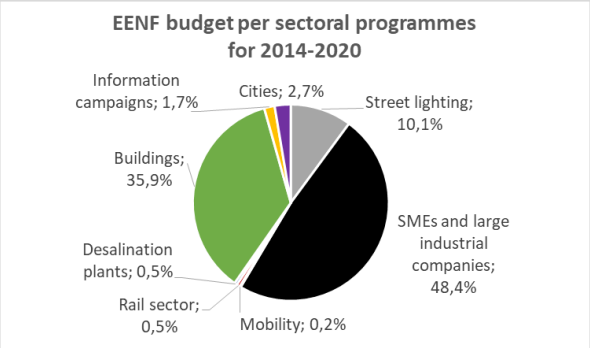


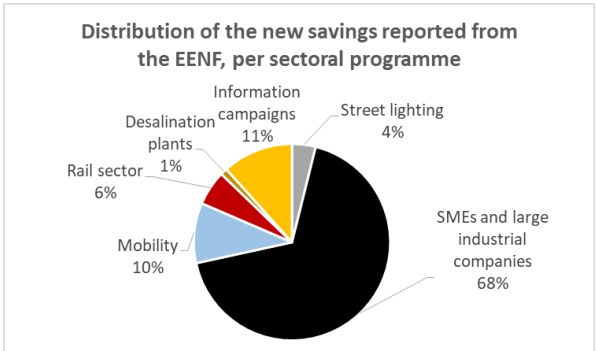
1-year time-lag in practice for the EEOS, as funding is collected in year "n" for actions that can be implemented in year "n+1".

The EEOS is expected to bring ≃40% of the savings to achieve the cumulative target for art.7.

So far, the reported new savings from the EEOS represented about half of its expected new savings.

Sources: IDAE data





Sources: IDAE data and annual reports

Overview of the complementary alternative measures

Cross-cutting: Taxation measures for energy sustainability; JESSICA/FIDAE fund for urban projects; CLIMA (Climate Carbon Project Fund for projects in non-ETS sectors); Programmes implemented by the Autonomous Communities (MENAE); voluntary agreements (CNAE, AEFGA)

Buildings: Incentive schemes for the energy renovation of existing buildings (PAREER and PAREER-CRECE and 3R plans); PIMA Sol (plan promoting improved energy efficiency in hotels)

Transport and mobility: MOVELE project for e-mobility; MOVEA Plan to promote mobility using alternative energy vehicles); incentives for replacing old vehicles and promote more efficient vehicles (PIVE, PIMA Aire, PIMA Tierra (for tractors), PIMA Transporte (for buses and trucks); Energy-efficient driving

Industry: Programme to promote industrial competitiveness

1) What have been the main changes and lessons learnt since 2017?

An important activity regarding the execution of the EENF (Energy Efficiency National Fund) programmes has occurred, amounting to more than 730 M€ for programmes related to the improvement of energy efficiency in industrial enterprises, municipal street lighting, mobility and in existing buildings; including awareness-raising communication campaigns.

Another important change was made in the management of the programmes as Spain has evolved from a centralised way to a regional management. Cooperation among public administrations (i.e. the central government and autonomous regions) is key in order to implement the policies in an efficient way.

2) And more specifically about monitoring, verification and controls?

IDAE, who is the manager of the programmes carried out under the EENF, has adapted its internal organisation creating a new department, the Verification Unit. The Verification Unit verifies and controls the programmes at a double level: through a documental revision of every project and through on-site inspections of a representative sample.

3) What are the main interactions with other policies?

The Fund can receive contributions from other sources such as the General State Budget, the European structural and investment funds (ERDF Funds) and the return on the loans granted within the framework of calls for projects already implemented since 2015.

The combination of EENF and ERDF Funds allows maximising the use of the resources under the Spain's Multi-regional Operational Programme, amounting to 2104 M€ for a low-carbon economy over 2014-2020. The projects can be executed for the different investment priorities identified up to 2023.

4) Are there challenges or changes foreseen for the coming years? (especially after 2020)

The Spanish National Energy and Climate Plan supports the continuation of the current system, meaning the combination of the EEOS linked to the EENF and alternative measures to achieve the energy savings objective for the new period 2021-2030.

The EENF provides budgetary stability to the achievement of the national energy savings obligation target. Besides, the management of programmes (evaluation, implementation and verification) is highly useful, enriching the technical knowledge as well as the insight of the final energy consumer sectors.

A revision of environmental tax policy is foreseen for the new period. There is a general consensus that it is an instrument with great potential to facilitate the transition to a low-carbon economy.

5) If you could go back in time, what would you do differently?

Generally speaking, Spain is satisfied with the implementation and results of the EENF Programmes. Nonetheless, we are working to improve the management to obtain the best results.

UK's Energy Company Obligation

Responsible authority: BEIS (Department for Business, Energy & Industrial Strategy)

Managing authority: Ofgem (Office of Gas and Electricity Markets)

History, current targets and results

The **first energy savings obligation** in Great Britain (England Scotland and Wales) **started in 1994**. The first phase of the **Energy Company Obligation** (ECO), **started in 2013** in England, Scotland and Wales. This was followed by a second phase, which ran from April 2015 and was extended until September 2018. In Northern Ireland, there is also an EEO – the Northern Ireland Sustainable Energy Programme (NISEP).

The UK is now in the **third phase** of ECO (ECO3) which will run until March 2022. ECO3 has a target of **£8.253 billion in lifetime energy cost savings** to be achieved by March 2022 (BEIS, 2018) (+ sub-targets for rural areas). The target is divided between the obligated parties, according to each supplier's relative share of the domestic energy market.

Key actors, roles and options

The **Ministry (BEIS)** sets the general rules and the overall targets. The scheme is administered by the **energy regulator, Ofgem**.

The Obligated Parties (OP) are the **electricity and/or gas suppliers** who are above specified **thresholds** of customers and energy sales in the residential sector. Until March 2020 energy companies with more than 200,000 domestic customers, will be OPs. The threshold will then decrease in subsequent phases of the scheme.

Trading obligations between obligated parties is possible, but a set of required criteria need to be met. The trading process is administered by the managing authority and decisions are made on a **case by case basis** (Ofgem, 2019a).

Scope and focus

The focus of ECO3 is on the promotion of measures to **low-income, energy poor and vulnerable consumers**. To support the reduction of heating cost in the residential sector, ECO3 will support **insulation and heating measures**. The managing authority has issued a list of qualifying measures (Ofgem, 2019b).

The Northern Ireland Sustainable Energy Programme also focusses very largely on energy poverty objectives.

Monitoring, Reporting and Verification

OPs are required to notify the managing authority of measures completed, on a monthly basis, using the '**notification template**'. The completed date is considered the date at which the measure starts to deliver the anticipated savings to the household.

If an OP achieved savings in the previous phase of the scheme (ECO2) that were above the obligation, they are able to '**carry over**' those savings into ECO3. OPs can also **transfer** qualifying actions to other suppliers. Savings are calculated with **deemed savings**. OPs notify the lifetime scores for the completed actions and the managing authority attribute savings to each eligible measure. To ensure quality, a **technical monitoring** verifies if the measure has been installed correctly. A **scoring monitoring** ensures the correct deemed score has been used. And **audits** of OPs are done to ensure that OPs have followed the **managing authority guidelines**.

Costs for obligated parties

The costs to OP is estimated to be **£640 million per year** on average (BEIS 2018). The actual costs to OP to meet the targets will also depend on other factors, such as the cost of identifying and targeting eligible households

Other information about costs and benefits

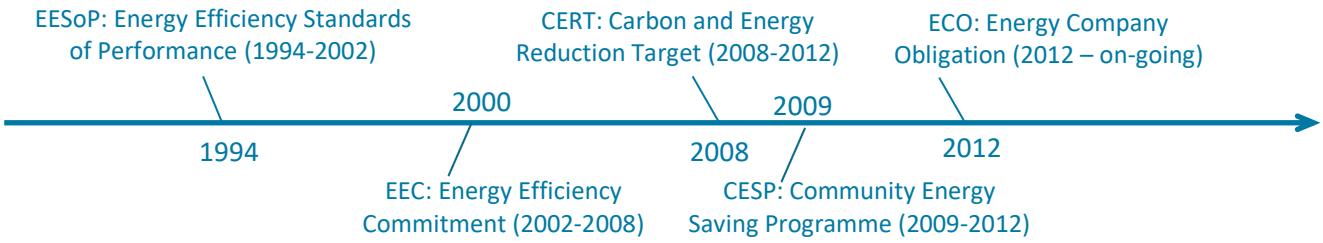
The Impact assessment carried out by BEIS, the responsible authority, estimated that ECO3 would have a **positive value to society of £722 million**. It is estimated that ECO will deliver 1.2 million measures, installed in approximately 1.2m households (BEIS, 2018).

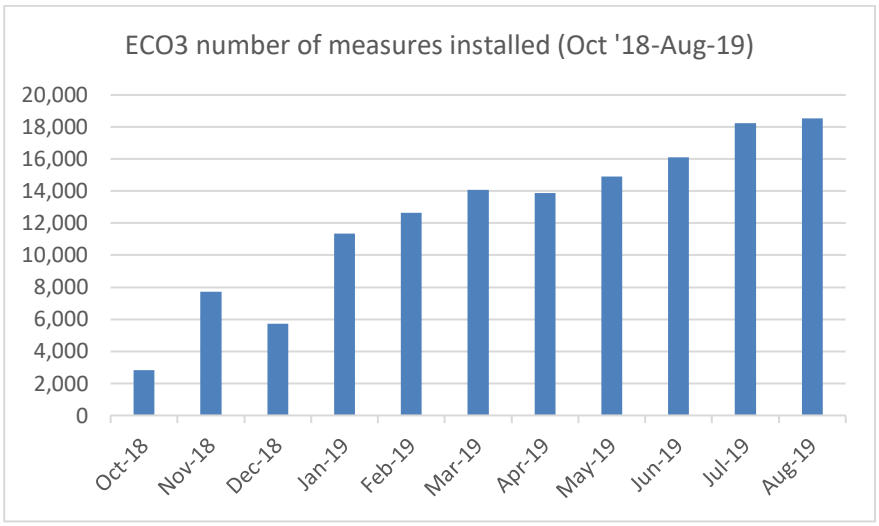
Sources:

BEIS (2018). The Electricity and Gas (Energy Company Obligation) Order 2018 No. 1183.

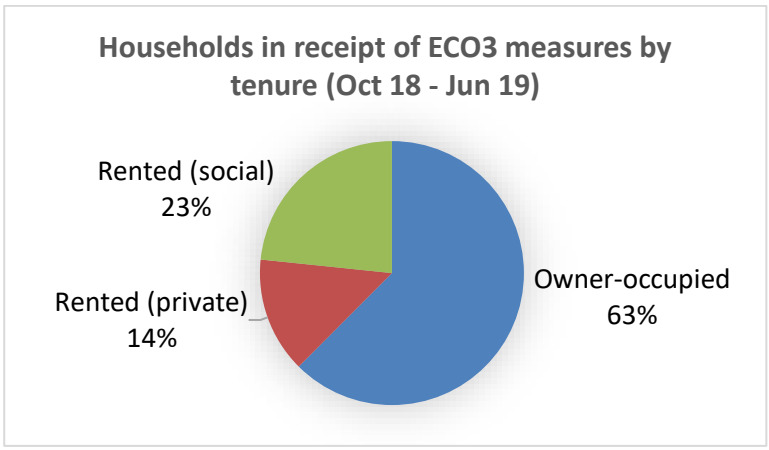
Ofgem (2019a). Energy Company Obligation (ECO3) Guidance: Supplier Administration v1.1.

Ofgem (2019b). Energy Company Obligation (ECO3) Guidance: Delivery Version 1.2.

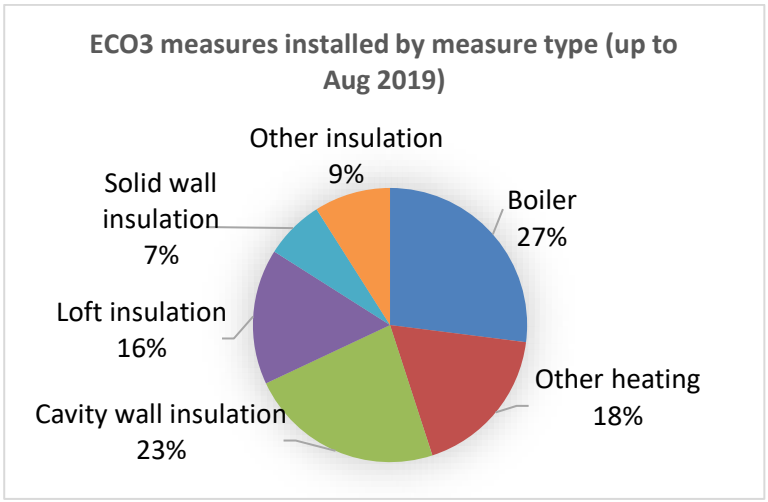




Since the start of ECO3 in October 2018, 136,000 measures have been installed.



Measures installed under ECO3 have been primarily in the private owner sector (63%), where the occupier has ownership of the property. 23% of measures have been installed in social rented properties and 14% in private rented properties. ECO3 has certain restrictions on which measures can be installed in the private rented sector, so that private landlords do not obtain measures that help them meet their statutory requirements.



Of the ECO3 measures installed up to the end of August 2019, 55% have been insulation measures, including cavity wall insulation (23%), loft insulation (16%) and solid wall insulation (7%). The remainder are heating measures, boiler measures (27%) and other heating measures (9%).

Sources and references

General sources used to prepare the country fact-sheets

Annual Reports of the Member States to the Energy Efficiency Directive (EED) and **NEEAP** (National Energy Efficiency Action Plans) 2017 (as required by EED Article 24 (1) and 24(2) respectively): https://ec.europa.eu/energy/topics/energy-efficiency/targets-directive-and-rules/national-energy-efficiency-action-plans_en

ENSPOL (2016). Report on existing and planned EEOs in the EU –Part II: Description of planned schemes. Report D2.1.1 of the ENSPOL project, updated version of October 2016.

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

IEA (2017). Market-based Instruments for Energy Efficiency – Policy Choice and Design. IEA Insights Series 2017 of the International Energy Agency.

Complementary references specific to countries

Denmark

Broc, J.S., 2017. Energy Companies' Energy-Saving Efforts in Denmark. Case study prepared by IEECP for the EPATEE project, funded by the European Union's Horizon 2020 programme.

DEA (2019). Status for energiselskabernes energispareindsats 2018 [*Status of energy companies' energy saving efforts 2018*]. Report of the Danish Energy Agency, 9 July 2019.

DEA webpage about the monitoring and evaluation of the Danish EEOS (in Danish): https://ens.dk/ansvarsomraader/energibesparelser/energiselskabernes-energispareindsats/kontrol-evalueringer-og

Italy

Di Santo, D., Biele, E., 2017. The Italian white certificates scheme. Case study prepared by FIRE for the EPATEE project, funded by the European Union's Horizon 2020 programme.

Latvia

Webpage of the Ministry of Economy about the EEOS: https://www.em.gov.lv/lv/nozares_politika/energoefektivitate_un_siltumapgade/energoefektivitate/energoefektivitates_pienakuma_shema/

Slovenia

Agencija za energijo (2019). Porocilo o stanju na podrocju Energetike v Sloveniji 2018 [*2018 Report on the situation in the field of Energy in Slovenia*]. Report of the Slovenian Energy Agency.

Spain

Ministerio par la Transicion Ecologica (2019). Orden TEC/332/2019, de 20 de marzo, por la que se establecen las obligaciones de aportación al Fondo Nacional de Eficiencia Energética en el año 2019 [*Ministerial Order TEC / 332/2019, of March 20, establishing the obligations of contribution to the National Energy Efficiency Fund in 2019*].

United Kingdom

BEIS (2018). The Electricity and Gas (Energy Company Obligation) Order 2018 No. 1183.

Ofgem (2019a). Energy Company Obligation (ECO3) Guidance: Supplier Administration v1.1.

Ofgem (2019b). Energy Company Obligation (ECO3) Guidance: Delivery Version 1.2.

Rosenow, J., 2017. Supplier Obligations in Great Britain. Case study prepared by IEECP for the EPATEE project, funded by the European Union's Horizon 2020 programme.