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Study evaluating the national policy measures and methodologies to implement Article 7 of the Energy Efficiency Directive

Final Report

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Abstract

This report provides the final results from a study that has assessed the implementation of Article 7 (and the related Annex V) of the Energy Efficiency Directive by Member States. Member States had to submit their national notifications setting out how they intend to transpose Article 7 of the Directive by 5th December 2013. Member States submitted further information in April 2014 as part of their National Energy Efficiency Action Plans (NEEAPs) and in updated Article 7 notifications. The project team reviewed the notifications and NEEAPs using a robust framework consistent with the Directive and checked how Member States have responded to the requirements in Article 7. This included an analysis of the policy measures proposed and their suitability, the calculation of the energy savings targets and an in-depth assessment of the monitoring, measurement and verification approaches. The report provides an overview of the proposed policy measures and their contribution to energy savings by 2020. It also identifies key issues around the methodologies used to calculate the energy saving targets, the proposed policy instruments, and the monitoring, reporting, verification and compliance regime.

Ce rapport présente les résultats finaux d'une étude d'évaluation de la mise en œuvre par les États membres de l'article 7 (et l'annexe V correspondante) de la directive sur l'efficacité énergétique. Les États membres ont soumis leurs notifications nationales, expliquant comment ils entendent transposer l'article 7 de la directive, le 5 décembre 2013. Les États membres ont ensuite présenté en avril 2014 plus de détails dans le cadre de leurs plans nationaux d'action en matière d'efficacité énergétique (PNAEE) et dans leurs notifications de mises à jour. L'équipe projet a examiné les notifications et les PNAEEs en utilisant un cadre solide et conforme à la directive, et en vérifiant comment les États membres ont répondu aux exigences de l'article 7. Ceci a inclus des analyses des mesures politiques proposées et de leur pertinence, un calcul des objectifs des économies d'énergie, et une évaluation en profondeur des approches de contrôle, de mesure et de vérification. Le rapport donne un aperçu des mesures politiques proposées et de leurs contributions aux économies d'énergie d'ici 2020. Le rapport identifie également les points clés concernant les méthodes utilisées pour calculer les objectifs d'économie d'énergie, les instruments proposés, ainsi que le régime de suivi, de communication, de vérification et de conformité.

Executive summary

Directive 2012/27/EU (EED, Energy Efficiency Directive) addresses one of the three key pillars identified in the EU 20-20-20 Strategy - a 20% reduction of energy consumption by 2020. Article 7 of the Directive is expected to deliver more than half of the required energy savings. Therefore, it is a key Article in terms of its contribution to the 20% reduction target.

This report provides the final results from a study that has assessed the implementation of Article 7 (and the related Annex V) of the EED by Member States (MS). The analysis is based on the notifications that MS were required to submit under the Directive by 5 December 2013, the National Energy Efficiency Action Plans (NEEAPs) by 30 April 2014, and the updated 5 December 2013 notifications, whenever relevant. Analysis has been performed of the available documents up to 20 November 2014, which covers notifications from all 28 MS, most of the NEEAPs (23), and 7 updated 5 December 2013 notifications.

Energy efficiency obligation schemes deliver most of the savings

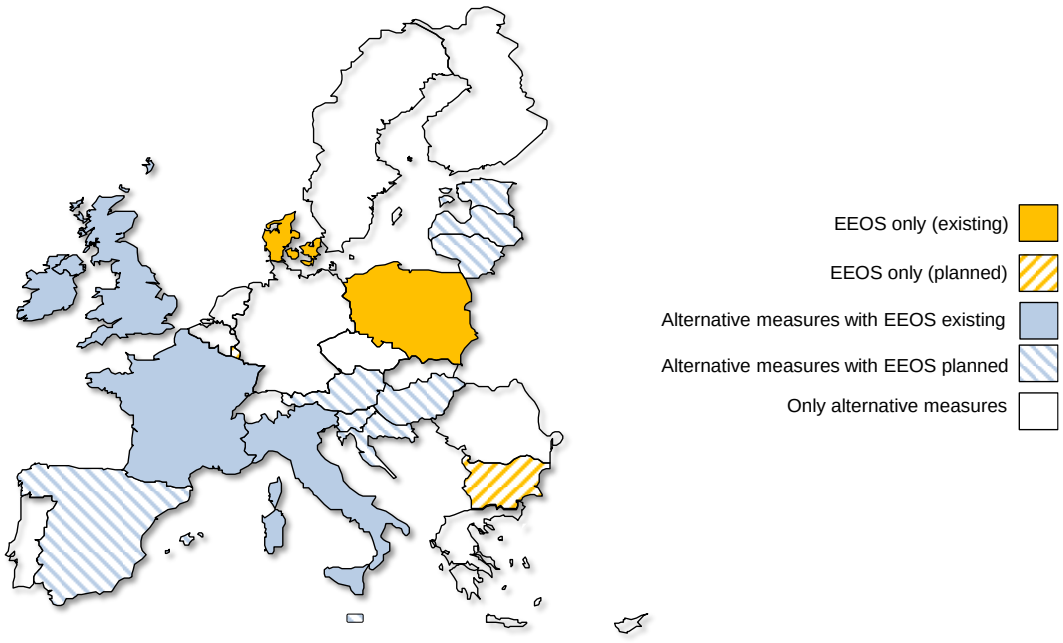
Energy Efficiency Obligation Schemes (EEOS) are a key feature of the EED given the impressive results this instrument has achieved in the EU and overseas.

Our findings clearly indicate that the EED has led to an increased uptake of EEOS across MS – 17 MS plan to implement or have already implemented an obligation scheme[1] and 40% of the proposed savings from Article 7 will be generated by EEOS, making EEOS by far the most important policy instrument in terms of energy savings.

Four MS have notified EEOS as the only policy instrument for Article 7 (two MS have notified existing schemes: Denmark and Poland, and two MS have notified planned schemes: Bulgaria, Luxembourg).

The map below illustrates the current status of implementation of EEOS across the EU. For some MS the details of the planned EEOS are still being developed.

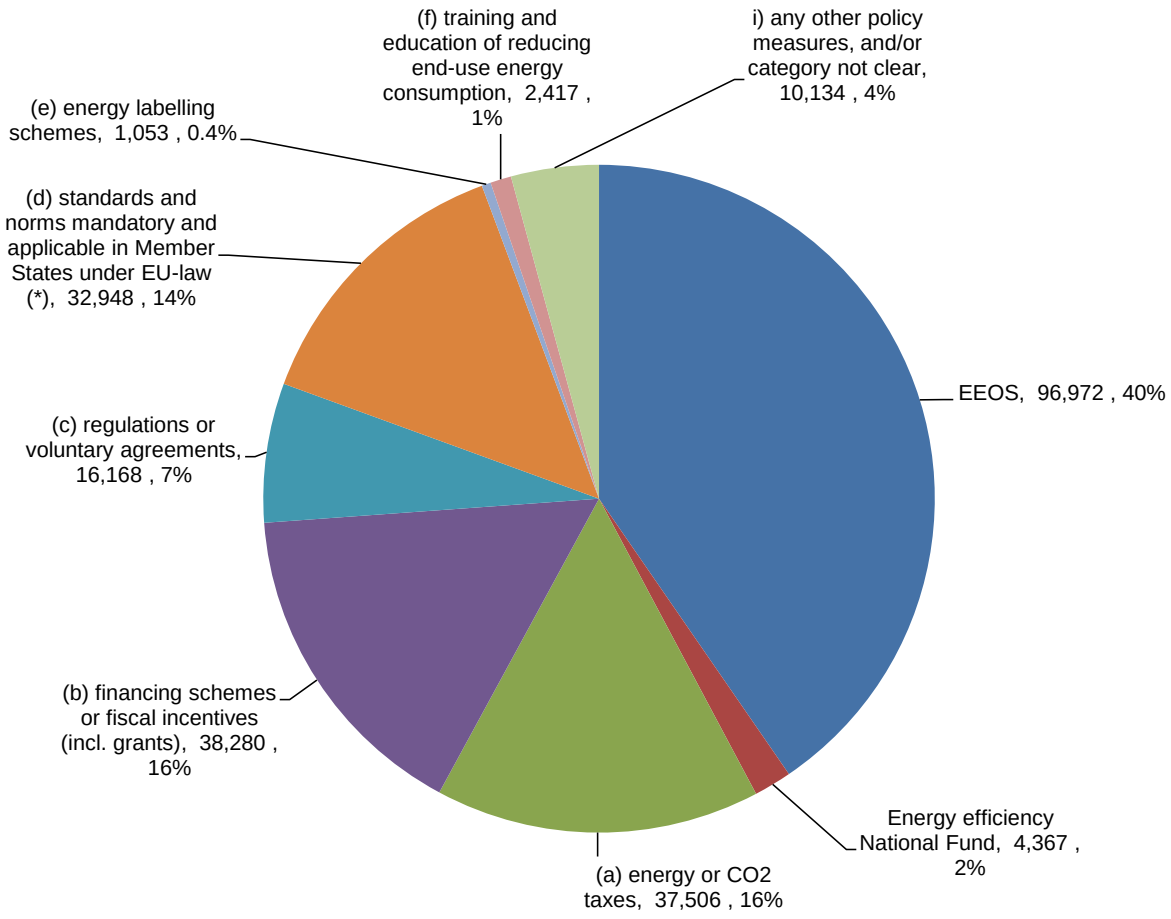
Figure 1: Map of MS with existing and planned EEOS (only those notified)



[1] Some MS have an existing scheme in place but did not notify EEOS as a measure to transpose Article 7 (Portugal).

With regards to the contribution of EEOS to the total energy savings expected from Article 7, the figure below shows a breakdown of the proposed savings (ktoe) by policy measure type.

Figure 2: Breakdown of energy savings by type of policy measure

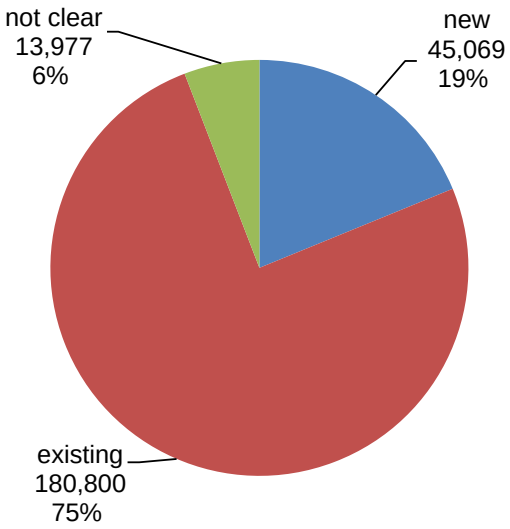


Existing policy measures prevail

We also analysed whether or not the notified policy measures were new (i.e. did not exist prior to the Directive coming into force[2]), already existed prior to the transposition by the MS, had a status that was unclear from the notification, or comprised a mix of policies of different status (policy packages with new and existing policy measures). Our findings are that 75% of the savings proposed are based on existing policy measures (see figure below) (that is three quarters of all energy savings will be delivered by policy measures that already existed before the Directive came into force).

[2] This does not include modifications of existing policy measures.

Figure 3: Breakdown of savings by existing and new policy measures



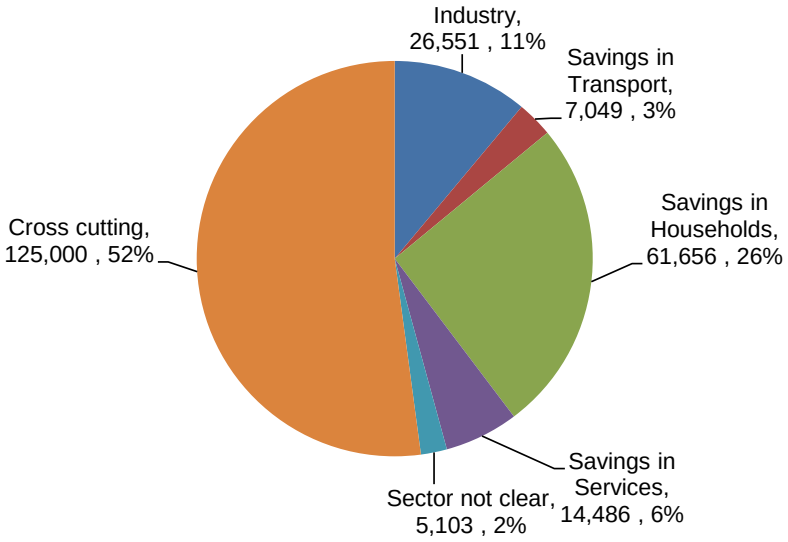
Household and buildings sector deliver most of the savings

An analysis of the sectoral split of the energy savings has been carried out, which provides an indication of which sectors the savings are likely to come from. It should be noted that MS do not provide a sectoral split of the expected savings in the documentation they have submitted and the sectors had to be inferred by checking each of the 360 policy measures.

The figure below shows that most of the savings come from measures that are cross cutting across more than one sector (such as taxes, building regulations applying to domestic and non-domestic buildings, financial incentives applying to multiple sectors). In relation to the savings from measures targeting a single sector, the residential sector is responsible for the largest share of the savings.

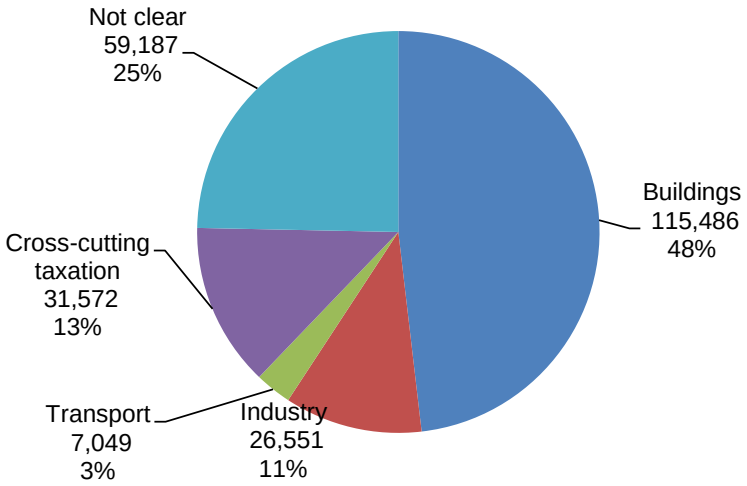
Only 3% of all savings resulting from the transport sector. However, this does include energy savings from cross-cutting measures, of which a proportion is likely to include transport energy consumption.

Figure 4: Breakdown of savings by target sector



An alternative classification of the measures is shown in the figure below where, for example, the cross-cutting measures targeting both households and services have been reclassified as measures targeting buildings. This classification shows that measure targeting buildings generate almost half of the projected savings. This is in line with the large potential for energy efficiency improvements in buildings. The contribution from industry is much smaller, and transport smaller still.

Figure 5: Breakdown of savings by sector



Credibility of the proposed policy packages

We made an assessment as to whether the MS are likely to realise their cumulative energy savings target as obliged by Article 7 of the EED. The methodology that we used to assess the credibility of the proposed policy packages, and therefore the likelihood of the savings target being delivered, was based on an analysis of the following elements:

a) **notified baselines**: We checked whether or not the adjusted baseline that was notified by the Member State was equal to or higher than an adjusted baseline calculated using Eurostat data. In making this comparison account was taken as to whether the Member State excludes final energy use for transport and/or energy production for own use (using Chapter 2).

b) **notified cumulative energy savings target:** We checked whether or not the notified cumulative energy savings target is equal to or higher than the target as calculated using Eurostat data. This took into account any exemptions notified by the Member State (using Chapter 2).

c) **notified expected cumulative energy savings**: We checked whether or not the notified expected cumulative energy savings of the notified policy measures are equal to or higher than the required target based on Eurostat data (using Chapter 3).

d) **quality of the notified policy measures**: We reviewed the quality of the information that was notified on policy measures, as a proxy for the likelihood of the policies delivering the expected savings (team analysis, also taking into account the results as presented in Table 9 and Chapters 4 and 5).

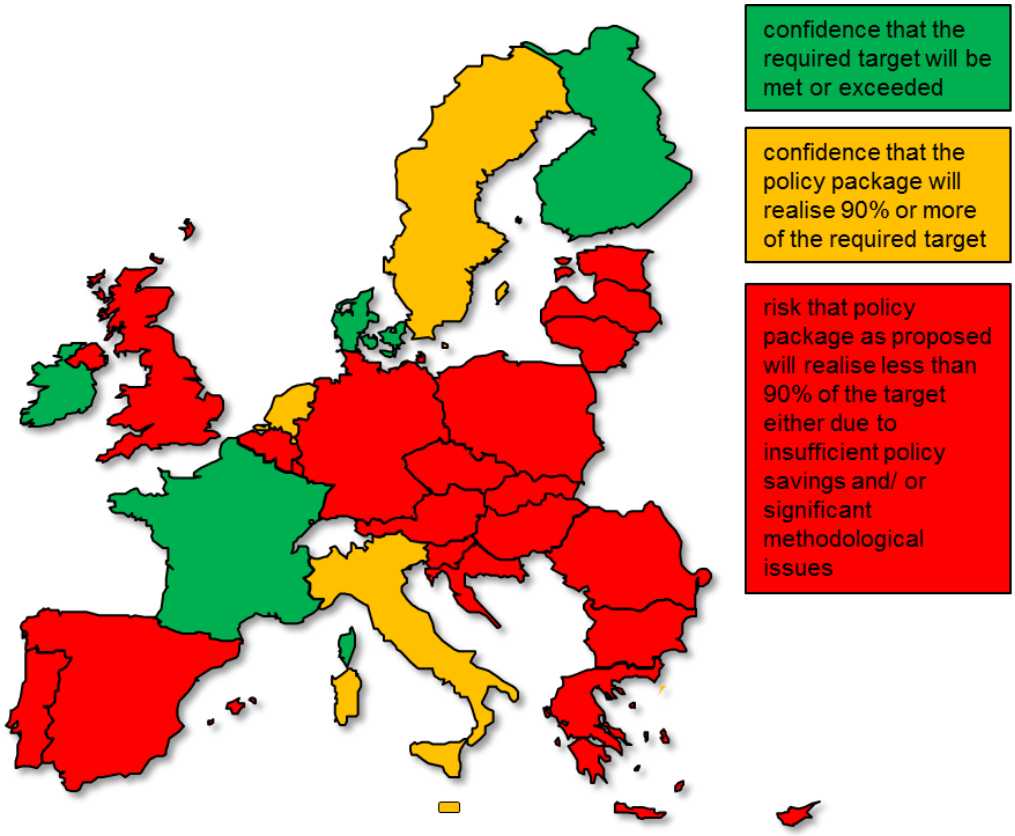
We used a colour code to present the outcome of this assessment:

- Green: good confidence that the policy package as notified by the Member State will meet or exceed the required target;
- Amber: minor issues, confidence that the policy package as notified by the Member State will realise 90% or more of the required target;

- Red: major issues, risk that the policy package as notified by the Member State will realise less than 90% of the required target either due to insufficient policy savings and/ or significant methodological issues.

The outcome of this assessment is presented in Figure 6.

Figure 6: Overall credibility rating of the notified policy packages



Note that for example a Member State that notified a well-designed and well-described policy package with notified savings that match the notified savings target may be assessed as 'red' in case the notified baseline or notified target is at least 10% lower than the required target based on Eurostat data and without providing sufficient evidence for deductions made. On the other hand a MS that notified a policy package with some methodological issues but expected savings that by far exceed the required target, may be assessed as green here. In this latter case the green rating does not signify good practice in all aspects of implementation, since the MS may still have some methodological issues. However, it does suggest a higher confidence that the required target will be met, taking into account the full range of evidence available.

Calculation of whether or not baselines and targets are in line with expectations

Our analysis found that the calculation of the baseline and energy savings targets are largely accurate and in line with expectations. There are some issues around how exemptions have been used by MS and the adjustments made to the baseline. However, overall, the proposed savings targets exceed the total of all targets calculated using Eurostat data (excluding transport, excluding energy production for own use (where notified) and including the notified percentage of exemptions)[3].

[3] Note that Sweden did not exclude transport. In the case of Denmark, the deducted energy consumption figure for transport is lower than the 2010/12 average in Eurostat data, which means the energy savings target is slightly larger than required by Article 7 if transport was fully excluded.

Across all MS, the total of the energy savings targets is equivalent to almost 34% of the total of the notified adjusted baselines. If all MS use the maximum 25% exemptions, the value would be 31.5% (42% with no exemptions). This means that the proposed targets are in line with expectations. More detailed explanations of the figures are provided in section 2.2.

Comparison of proposed targets and policy measures to impact assessment

The European Commission has estimated, on the basis of the EED final text, that Article 7 of the EED would deliver annual savings in 2020 of 84.8 Mtoe (primary energy)[4]. This estimate allowed for a reduction of the initial ambition level by 25% – assuming the take up of all exemptions under Article 7(2), but does account for the possible overlaps with other measures.

The energy saving targets and expected policy savings notified by Member States under Article 7 are in final energy terms. After converting into primary energy terms, our analysis shows that the targets and the projected savings from policy measures are slightly lower than the Commission's estimate of the impact of the final EED text[5].

The total annual savings in 2020 required by the energy saving targets is equivalent to 77.8 Mtoe (primary energy) for the EU28 (a detailed description of how this has been calculated is provided in the main body of the report – see section 3.10). In our analysis, we have assumed a linear delivery of savings to 2020. The total projected savings in 2020 from notified policy measures are 82.6 Mtoe (primary energy savings).

Comparison to energy saving target

Compared to the figure estimated by the Commission, based on the negotiated EED text, the notified targets are 8% lower[6]. Our estimate does not account for MS using the slow-start option which, in theory, increases savings in later years. However, using this exemption (Article 7(2)(a)) has no impact on the actual phasing off when the savings will be delivered, and most MS have not provided annual figures that would allow for this to be checked.

Comparison to policy measures

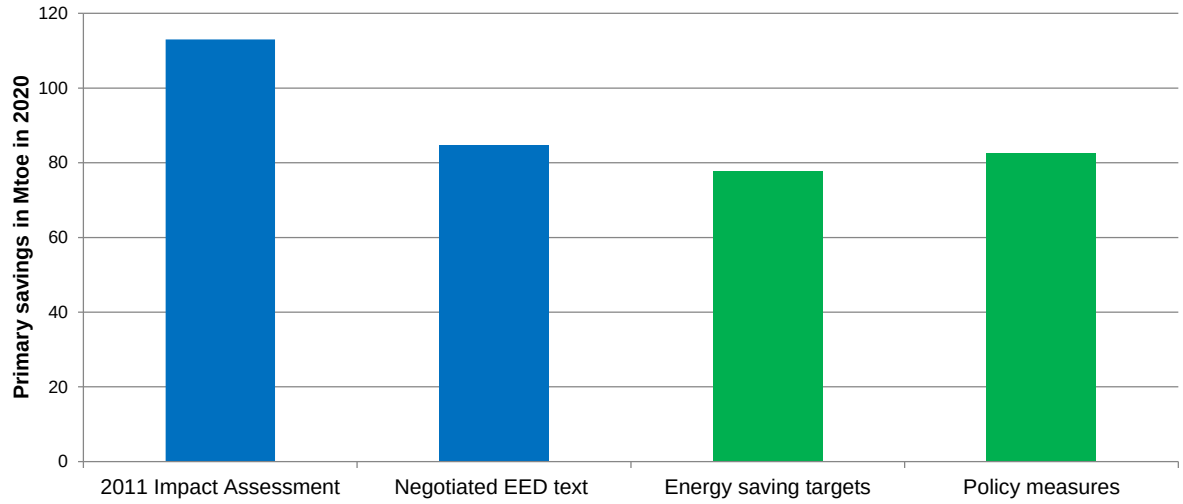
Similarly, the savings resulting from the policies notified by MS are 3% lower than estimated during the negotiations of the EED proposal.[7] Again, the effect of slow start has not been quantified, but our previous analysis suggests that it is likely to be small.

The figure below shows a comparison of the energy saving targets and the expected savings from policy measures to the estimate in the 2011 Impact Assessment and figure estimated during the negotiations of the EED proposal.

It should be noted that a number of calculations and assumptions have had to be made to convert the figures provided by MS (cumulative savings in final energy) to annual energy savings in primary energy. The detailed calculations and assumptions are provided in section 3.10.

[4] The likely savings generated by Article 7 have been estimated in the impact assessment SEC(2011) 779 produced in 2011 based on the PRIMES model run using 2009 data and the E3ME model. The Impact Assessment assumed that, by 2020, annual savings in primary energy of between 108Mtoe and 1Mtoe per year will be delivered by Article 7. This figure was based on the Commission's proposal and does not include exemptions and policy overlaps. See Impact Assessment accompanying the document Directive of the European Parliament and of the Council on energy efficiency and amending and subsequently repealing Directives 2004/8/EC and 2006/32/EC {COM(2011) 370 final} {SEC(2011) 780 final}. Online: http://ec.europa.eu/energy/efficiency/eed/doc/2011_directive/sec_2011_0779_impact_assessment.pdf page 32
[5] The savings and targets are significantly lower than the 2011 Impact Assessment estimate, but this estimate did not include exemptions.
[6] A comparison to the 2011 Impact Assessment shows that the targets are 31% lower than the expected savings.
[7] A comparison to the 2011 Impact Assessment shows that the savings from policy measures are 27% lower than the expected savings.

Figure 7: Comparison of energy saving targets and policy measures to 2011 Impact Assessment and Commission estimate based on final EED text



Methodological issues

All MS made proposals with minor issue in at least one area, which is often due to insufficient or no information provided on the required elements of the Article 7 notification. The quality of notifications and the detail provided on methodological aspects varies widely with some MS providing little information (Bulgaria, Hungary, Lithuania, Romania and Slovakia) and others (Denmark and Sweden) disclosing close to sufficient detail.

We found several issues regarding:

- lack of completeness of information on the methodological aspects;
- insufficient accounting for additionality, particularly with regard to EU minimum standards such as the Energy Performance of Buildings Directive;
- no or very limited information on materiality;
- the robustness of the proposed method;
- using categories of actions that are not eligible within the scope of Article 7 requirements (for example, renewable energy technologies);
- reduction factors (such as rebound effects[8], performance gaps and prebound effects[9]) not addressed when using deemed or scaled savings;
- unrealistic lifetimes used;
- for taxation measures use of inappropriate elasticities and inclusion of non-energy taxes; and
- lack of evidence on how double counting of energy savings is avoided.

Monitoring, verification, control and compliance regimes

The analysis of the methodologies used to calculate the savings and the monitoring, verification, control and compliance regimes has been restricted due to a lack of information provided in the notifications. We expected that the NEEAPs and the updated 5 December 2013 notifications would provide further detail as indicated by some MS in their 5 December

[8] Rebound effects can result in energy savings falling short of expectations. An example of a rebound effect would be the driver who replaces a car with a fuel-efficient model, only to take advantage of its cheaper running costs to drive further and more often. Or a family that insulates their loft and puts the money saved on their heating bill towards an overseas holiday.
[9] The prebound effect describes the phenomenon that modelled energy consumption of a building is usually about 30% higher than actual consumption. When calculating the impact of energy savings, using the modelled energy consumption thus can lead to an overestimation.

2013 notifications. However, only a limited amount of additional information has been provided by MS in the NEEAPs and the updated 5 December 2013 notifications.

Hence our findings so far indicate that most MS need to strengthen their monitoring, verification, control and compliance regimes to follow the requirements of the Directive.

Further guidance

We identified some areas where the guidance could have been more detailed and where we made suggestions for further guidance:

- **inclusion of renewable energy technologies** – these can only be counted as part of excluding energy generated by households for their own use and, under very limited circumstances, contribute to savings (for example, when energy efficiency improvements are required alongside the installation of the technology);
- **additionality to mandatory EU legislation** – energy savings from technologies and techniques mandatory under European legislation can only be counted if they are additional to the minimum requirements;
- **energy for own use** – while some energy for own use, such as energy consumption from own production (that is energy not sold to the final energy consumer by a company), may be excluded from the baseline, there needs to be clearer boundaries on what types of energy can and cannot be excluded and especially what specific evidence should be provided by MS; and
- **exemption of the EU ETS sector** – only final energy consumption from relevant sectors can be deducted from the baseline. Some further clarification on these requirements would be worthwhile.

We have provided detailed draft guidance on these issues in section 7.

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1 Introduction

The Energy Efficiency Directive (EED) (2012/27/EC) addresses energy efficiency as one of the three key pillars identified in the Europe 2020 Strategy with a 20% reduction in projected primary energy consumption by 2020. It is the most ambitious European energy efficiency policy ever put forward and will result in significant economic, social and environmental benefits, while stimulating innovation across the policy landscape, industry and other stakeholders.

The EED was designed to bring the European Union back on track to achieve the 20% target and is one of key steps identified by the Communication on the Energy Efficiency Plan 2011 and the Roadmap to 2025. Previous analysis by the European Commission has shown that existing energy efficiency policy measures would not deliver the 20% target by 2020 and leave a significant gap of more than half of the required reduction.

The EED puts in place a number of important provisions to be implemented by Member States (MS) including the requirement to establish binding national energy efficiency targets (Article 3), national building energy efficiency strategies (Article 4), a requirement to renovate 3% of public sector buildings each year (Articles 5 and 6), the need to establish energy efficiency obligation schemes or alternative measures (Article 7) and provisions for auditing and metering (Articles 8 to 12).

This project focuses on the transposition of Article 7 (and the related Annex V) and supports the Commission in evaluating notifications from MS. Article 7 is expected to deliver an impact of around 10.5% by 2020. This equals more than half of the 20% target set by the EED, which should reduce energy bills at EU level by EUR200 billion per year from 2020. Therefore, it is the most important Article of the Directive in terms of its estimated impact.

1.1 Article 7

Article 7 requires all MS to introduce energy efficiency obligation schemes (EEOS). MS must have a target that is at least equivalent to achieving new savings each year of 1.5% of the annual energy sales by volume. MS are allowed to meet this requirement by using alternative policy measures if they provide verification of equivalent savings resulting from those alternative instruments. This section briefly describes how we understand the provisions made in Article 7.

1.1.1 Energy efficiency obligation schemes

EEOS already feature in the EU Energy End-Use Efficiency and Energy Services Directive of 2006 (2006/32/EC) as a possible market-based instrument for realising energy savings. However, the Directive only recommended EEOS and there was no requirement for MS to implement the instrument.

This has now changed with the implementation of the EED. The requirement in Article 7 to implement EEOS is the result of largely positive experience with EEOS across Europe where there are now several decades of combined experience with the instrument. So far, the UK, Italy, France, Denmark, the Flanders region and Poland have introduced EEOS, although in very different forms. In those countries, EEOS have delivered large energy savings at a relatively low cost, leveraging additional capital from recipients and third parties.

MS have a lot of flexibility in how they design their obligation schemes and the EED gives them a wide range of options as long as some basic principles are followed.

1.1.2 Alternative policy measures

Article 7 offers MS a high degree of flexibility to account for national circumstances, including the option of implementing alternative policy measures instead of, or in combination with, EEOS.

Article 7(9) provides for alternatives to the setup of EEOS. MS may opt to achieve the same level of energy savings by directly targeting final users or targeting distributors and consumers. Final users' consumption can be targeted by a national energy efficiency programme, which includes measures to support the uptake of energy efficient technologies and/or practices.

These include:

- energy or CO_2 taxes;
- finance and fiscal incentives schemes;
- regulations or voluntary agreements;
- minimum standards for products (including buildings) and services;
- energy labelling schemes; and
- training, education and advisory schemes to encourage the use of more efficient technologies and practices.

Article 20(6) provides a further option in case MS choose to implement a national obligation scheme. Obligated parties could contribute to an Energy Efficiency National Fund to fulfil their obligation for an amount equal to investments required to achieve those obligations.

According to the principle of additionality (laid down in Annex V, part 2), only savings that are above the EU minimum level can be counted towards the target (e.g. Energy Performance Certificates and the minimum levels of energy taxes as required by the Energy Taxation Directive).

1.2 Focus of this project

This project focuses on the implementation of Article 7 of the EED. It assesses how MS are transposing the EED and the key learning points to date. The outputs of this project will inform the Commission on progress and assist MS in transposing the EED effectively.

1.2.1 Objectives of this study

In this context, the aims of the study are threefold:

- to support the Commission with the analysis and evaluation of the national notifications that were due for 5 December 2013, 30 April 2014 and 5 June 2014, in compliance with the requirements in Article 7 and Annex V;
- to provide an initial assessment of the impact of Article 7 in triggering additional energy savings and their contribution towards the 20% EU energy efficiency target; and
- to provide an overview and analysis of key methodological and policy design features essential for the implementation of this article. In particular:
  - energy savings calculation methodologies;
  - treatment of lifetimes of savings; and
  - calculation of savings from the EEOS and other policy measures including taxation; and
  - approaches to monitoring, verification, control, audit and compliance.

1.2.2 Outputs and final outcomes

The outputs and final outcomes of this project include:

- evidence to support our suggestions for further improvement;
- analysis of impact on overall energy savings target; and
- overall evaluation findings and best practice.

1.3 Criteria used to assess the notifications

We have used three criteria to assess the 5 December 2013 notifications and updated notifications, also further information on Article 7 provided in the NEEAPs:

- **Completeness**: This check involved assessing the level of detail provided by the Member States to determine whether all the requirements were covered in the notification.
- **Consistency with the EED**: Where sufficient detail was provided, we assessed the extent to which the plans are in line with the requirements of the Directive.
- **Credibility**: Where sufficient detail was provided, we assessed the extent to which the plans were credible in relation to the energy savings notified, and the overall energy savings target.

For completeness and consistency the assessment involved a straightforward assessment as to whether the requirements were met (i.e. whether the MS provided a complete response and the notification was consistent with the requirements of the EED). However, assessing the credibility of the notified information was more complex, and required the development of more detailed criterion.

1.3.1 Assessment of credibility

The credibility assessment was made on the basis of the information notified by the Member States to the Commission. The central aim of the assessment was to determine whether a Member State would likely realise its notified cumulative energy savings target as required by Article 7 of the EED. When determining the credibility the following aspects were taken into account:

- If a MS did not provide the required detail of information in its notification, it was not possible to assess the credibility of the respective element with any certainty.
- Just because a MS did not notify certain information (e.g. on a specific policy instrument) does not necessarily lead to the conclusion that the notified energy savings are not credible.
- At the same time, taking a conservative approach, it is reasonable to suggest that where there is missing or incomplete information less confidence was given to the notified energy savings.

The methodology we used to assess the credibility of the energy savings in the notifications was based on an analysis of the following elements:

a) **notified baselines**: We checked whether the adjusted baseline was notified by the Member State was equal to or higher than an adjusted baseline calculated using Eurostat data. In making this comparison account was taken as to whether and how the Member State excludes final energy use for transport and/or energy production for own use.

b) **notified cumulative energy savings target:** We checked whether the notified cumulative energy savings target was equal to or higher than the target as calculated using Eurostat data. This took into account the use of exemptions notified by the Member State.

c) **notified expected cumulative energy savings**: We checked whether or not the expected cumulative energy savings of the notified policy measures were equal to or higher than the required target based on Eurostat data.

d) **quality of the notified policy measures**: We reviewed the quality of the information that was notified on policy measures, as a proxy for the likelihood of the policies delivering the expected savings. The review assessed if the MS had demonstrated in their notifications that they had correctly taken into account the requirements from specific provisions in Article 7 and Annex V which are intended to ensure the credibility of the savings notified under the Article. The specific aspects that we assessed were: eligible measure categories and/or individual actions; measurement methods; distribution of savings over the obligation period; additionality; materiality; lifetimes; climatic variations, and double counting. Where the requirements were correctly implemented the savings estimates were considered to have higher credibility, and vice versa.

Following the analysis of the above elements we then classified each of the MS into one of the following categories:

- Green: good confidence that the policy package[10] as notified by the Member State will meet or exceed the required target;
- Amber: minor issues, confidence that the policy package as notified by the Member State will realise 90% or more of the required target;
- Red: major issues, risk that the policy package as notified by the Member State will realise less than 90% of the required target either due to insufficient policy savings and/ or significant methodological issues.

This classification was based on expert judgement of the project team flowing the assessment of the all criteria listed above.

[10] Where MS notified that they would use more than one policy measure to deliver their energy saving target we assessed the overall credibility of the policy package as a whole.

2 Calculation of the energy savings target

2.1 Calculation of the baseline

The energy savings targets adopted by MS are calculated using a baseline for final energy consumption. Hence, the accuracy of the baseline directly impacts on the appropriateness of the energy savings target. For example, a baseline that is too low will result in a lower energy savings target than that required by the EED.

Recognising the importance of a robust baseline calculation, the EED defines the baseline very clearly: Article 7(1) of the EED specifies that MS need to define an energy savings target based on "annual energy sales to final customers of all energy distributors or all retail energy sales companies by volume, averaged over the most recent three-year period prior to 1 January 2013. The sales of energy, by volume, used in transport may be partially or fully excluded from this calculation".

It follows that the baseline has to be calculated from the **sales** of **final** energy. According to the Guidance Note B1 para 7 "energy volumes transformed on site and used for own-use, and those that are used for the production of other energy forms for non-energy use, are excluded" from the baseline. Thus, sales of electricity used for electric cars and energy generated by energy end-users for their own use can be excluded from the calculation of the baseline. However, according to Annex V, MS should develop a methodology to justify this.

It is recommended that MS use Eurostat data to calculate the baseline final energy use and the savings target. The Eurostat final energy use data are already corrected for non-energy use of fuels. MS may choose to use alternative statistical sources and/or make further adjustments to the data to reflect the definition of final energy sold.

2.1.1 Best practice

Best practice regarding the calculation of the baseline is:

- using the recommended Eurostat data (or national source compliant with Eurostat); and
- providing values and proper sources for all data used in the baseline calculation.

MS with best practice in the baseline calculation are **Croatia, Denmark, Ireland, Italy, Latvia, Lithuania, Poland** and **Slovenia**.

2.1.2 Main issues

The main issues observed regarding the calculation of the baseline include:

Table 1: Baseline calculation – main issues

Issue	MS where issue has been found
Use of non-Eurostat data sources, with data different from Eurostat Certain MS chose to use data from their own national statistical bureau when calculating the baseline. These values may differ from those reported to Eurostat, even though the Eurostat data are supplied by these national statistical bureaus. However, some of these differences may relate to process delays between new national statistics becoming available and the Eurostat data being updated, rather than differences in the statistics themselves.	Austria, Belgium[11], Cyprus, Czech Republic, Estonia, Finland, France, Slovakia, Spain, Sweden and United Kingdom.
Final energy use in the transport was excluded but no value was provided MS stated that final energy use by transport is excluded from the baseline, but did not provide the value of the final energy excluded.	Bulgaria, Luxembourg, Netherlands and Portugal
Use of non-verifiable corrections for energy production for own use Several MS made adjustments to their baselines to exclude any consumption related to energy produced for own use, which is, therefore, not associated with a sale to final customers. This included own firewood production by households, production of solar heat and electricity for own use and use of own coal mines by industry[12]. The data used in the notification for these adjustments were generally based on national surveys. It was not possible to check the accuracy of these data, so it had to be taken as a given that the data source was robust (for example, the national bureau of statistics). Moreover, it is important to verify whether the reported national data on energy production for own use is indeed part of the data on final energy use, otherwise there would be a double correction.	Austria, Belgium, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Netherlands, Portugal
Baseline not provided: Only one Member State did not provide a baseline at all.	Romania

See also Table 2 for an overview of figures for the baseline, the exclusion of transport and the exclusion of energy production for own use for each Member State. The table also includes an assessment of the credibility rating of the baseline calculation for each Member State.

[11] The baseline calculation of Belgium is a special case, since Belgium used data for the three regions separately, which cannot be verified by Eurostat data which is only available on the level of the Member State. The sum of the notified baselines of the three regions is 22% lower than the baseline we derived from Eurostat-data for Belgium as a whole.
[12] NB: Finland also excludes electricity purchased by end users directly from the Nord Pool Spot AS from the baseline. This is a different issue, and is not allowed, see Guidance Note B1 para 7.

2.1.3 Transport

Only Sweden stated it does not exclude final energy use for transport from the baseline. Hungary had not decided whether or not to include energy use in transport when calculating its baseline. Romania did not provide information on whether or not to exclude final energy use for transport from the baseline. All other MS stated that they fully exclude final energy use for transport from the baseline. Of these, Bulgaria, Luxembourg, The Netherlands and Portugal did not specify the figure.

2.1.4 Energy production for own use

Of the 28 MS, 13 stated they had excluded energy production for their own use when calculating the baseline, causing deviations from baselines calculated using Eurostat data only. However, the values for the deducted quantities of energy are not always provided (see Table 2). Romania did not provide information on this aspect of the baseline calculation. As can be seen in Table 2, the quantity of energy production for own use as a percentage of the total final energy consumption is very high for the Czech Republic and Finland.

Table 2: Baseline calculations and credibility rating for each MS

Key for credibility rating of the adjusted baseline

Figure in line with Eurostat data (discrepancies of less than 1%)
When national data used: any discrepancy clearly explained
Corrections clear and in line with guidance
Calculations correct
Figure not in line with Eurostat data (discrepancies of 1-10%)
When national data used: discrepancy not clearly explained
Corrections clear but not sure whether in line with guidance
Calculations correct
Figure not in line with Eurostat data (discrepancies of more than 10%)
Not clear on data source
Corrections not clear
Calculations not correct
Not provided

Member State	Adjusted baseline (ktoe)*	Transport excluded (ktoe)	Energy production for own use, if excluded (ktoe)	Adjusted baseline: credibility rating
Austria	16,508	8,565	1,497	
Belgium	21,940	8,231	Yes, but not specified	
Bulgaria	6,167	Yes, but not specified	–	
Croatia	4,112	2,036	–	
Cyprus	767	1,023	160	
Czech Republic	14,539	6,082	3,219	
Denmark	10,113	4,973	–	
Estonia	1,938	787	146	
Finland	13,306	4,939	7,289	
France	97,060	49,380	9,393	
Germany	133,324	61,192	21,329	

Member State	Adjusted baseline (ktoe)*	Transport excluded (ktoe)	Energy production for own use, if excluded (ktoe)	Adjusted baseline: credibility rating
Greece	10,483	7,215	427	
Hungary	11,473	Not yet decided	–	
Ireland	6,873	4,422	–	
Italy	80,961	41,001	–	
Latvia	2,702	1,109	159	
Lithuania	3,188	1,556	–	
Luxembourg	1,688	Yes, but not specified	–	
Malta	184	264	–	
Netherlands	36,591	Yes, but not specified	453	
Poland	47,040	17,310	–	
Portugal	8,038	Yes, but not specified	Yes, but not specified	
Romania	Not provided	Not provided	Not provided	
Slovakia	7,252	2,214	–	
Slovenia	2,999	1,911	-	
Spain	50,727	35,239	–	
Sweden	19,553	No	–	
UK	88,392	53,740	–	
Total	**697,918****	**313,231****	**44,072****	

* Adjusted means: energy use by transport and production for own use are already subtracted where relevant.

** Not specified by all MS

Using Eurostat data for 2010/12, we find that the final energy use by transport is 32% of the total final energy use in the EU-28 over this period. The fact that almost all MS use the option to fully exclude the transport sector from the calculated baseline, results in an energy savings target, for the EU as a whole, that is approximately 32% lower than that compared with the situation when transport would have been included. The exclusion of energy production for own use reduces the calculated baseline further.

2.2 Calculation of the energy saving targets

MS have to provide the calculation used to derive their cumulative energy savings target for the period 2014/20. This calculation is based on a savings rate of 1.5% per year. However, the total energy savings target may be lower than this savings rate if exemptions under Article 7(2) are used by the MS.

Four different exemptions may be used (Article 7(2)) with the possibility of using a combination of all four exemptions subject to the provision of Article 7(3), whereby the maximum threshold of the exemptions should not exceed 25% of the target, based on the 1.5% per year saving rate. These exemptions are:

- (a) phasing in of the energy savings (1% for 2014 and 2015; 1.25% for 2016 and 2017; and 1.5% for 2018, 2019 and 2020);
- (b) exclude final energy use in the ETS industry;
- (c) supply-side energy savings (efficient energy production and distribution); and
- (d) early actions (since 31 December 2008).

If no exemptions are used, the cumulative energy savings over the period 2014-2020 should amount to 42% of the adjusted final energy sales as calculated in the baseline, as shown in Table 3.

Table 3: Cumulative energy savings from targets in the period 2014-2020, expressed as a percentage of the baseline energy sales

Year	2014	2015	2016	2017	2018	2019	2020	Sum
2014	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	10.5%
2015		1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	9.0%
2016			1.5%	1.5%	1.5%	1.5%	1.5%	7.5%
2017				1.5%	1.5%	1.5%	1.5%	6.0%
2018					1.5%	1.5%	1.5%	4.5%
2019						1.5%	1.5%	3.0%
2020							1.5%	1.5%
TOTAL								**42.0%**

If the 25% exemptions are fully used, the cumulative energy saving drops to **31.5%** of the adjusted baseline energy sales.

Please note, the exemption option Article 7(2)(a) alone (the slower phasing off the savings percentage), can be responsible for a reduction of the cumulative energy savings target from 42% to 33.25% of the baseline energy sales, leaving little potential for the other exemptions to be used. The use of exemption option 7(2)(a) for the energy savings target has no relation with the planned *actual* phasing of the energy savings by the MS.

19 MS stated that they use exemption option a, 14 MS use option b, 4 MS use option c and 12 MS use option d, see also Table 5. Since the total amount of exemptions is capped to 25%, MS in general use option a for the main part of the exemptions, and subsequently use the other options to add up to 25%. Three MS notified a lower percentage of exemptions than the maximum of 25%: Denmark (3%), Portugal (0%) and Sweden (21%). Bulgaria, Hungary and Romania have not decided which exemptions they will use.

2.2.1 Best practice

Best practice regarding the calculation of the cumulative savings target is:

- providing a clear calculation that is in accordance with the provided baseline (that is 42% x adjusted baseline); and
- all exemptions are clearly notified and not exceeding 25% in total.

MS with best practice in the calculation of the cumulative savings target were **Croatia, Denmark, France, Ireland, Italy, Latvia, Netherlands, Portugal, Spain** and the **UK**.

2.2.2 Main issues

The main issues observed regarding the calculation of the cumulative energy savings targets are shown below.

Table 4: Target calculations – main issues found

Issue	MS where issue has been found
25% exemptions not clearly specified MS have to specify the exemptions that have been used in the calculation of their energy savings target. However, the use of exemptions was not clearly specified in all cases.	Exemptions not clearly specified – Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Finland, Germany, Greece, Hungary, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia (some issues regarding the amount of supply side actions), and Sweden.
Target too low (deviation more than 5%) compared to Eurostat calculation In some notifications, MS have proposed a cumulative savings target that is lower than if the target were derived using Eurostat data (taking into account the notified exclusions and exemptions). In most cases, this is caused by discrepancies between the baseline used by the MS in their notifications and the Eurostat data. It can also be caused by internal inconsistencies in the calculation approach.	Discrepancies between notified target and Eurostat – Austria, Belgium, Czech Republic, Slovakia, and Sweden[13]

See Table 5 for further details of which exemptions are used by each MS (noted with 'x' and '?' (if it was not clearly indicated in the notification) in the table).

Denmark and Sweden have set higher cumulative savings targets of +34% and +21% respectively, if/ than compared to a reference calculation based on Eurostat data 2010/12 data, excluding transport, and using 25% exemptions. Denmark uses 3% exemptions, Sweden uses 21% exemptions and does not exclude transport.

Romania also has a higher cumulative savings target of +83% compared to a reference calculation based on Eurostat data 2010-2012 excluding transport and using 25% exemptions. Nevertheless, Romania did not provide information on the baseline and the calculation of the target and the use of exemptions.

Hungary was the only Member State that did not formally notify a cumulative savings target, since it has not yet decided whether or not it will exclude final energy from transport from the baseline or if it will use exemptions. Belgium and Bulgaria did not provide enough information to be able to check the target calculation.

Use of exemptions

Of the 28 MS, 23 use the maximum 25% of target exemption. The only exceptions are Portugal (no exemptions used), Denmark which uses a much lower percentage of target exemption (equivalent to 3%), Sweden which uses 21% of exemptions, Hungary which has not yet decided and Romania which did not provide information on the use of the exemptions. See Table 5 for more details.

[13] Sweden notified that it will *not* exclude the energy use of the transport sector for the target calculation, but the notified target is too low compared to the Eurostat benchmark calculation while not excluding transport energy use.

Table 5: Cumulative savings target, exemptions used and credibility rating

Key for credibility check target

	Exemptions used are clear, in accordance with EED and are no more than 25%. Target in line with EED (discrepancies less than 1%)
	Minor issues, discrepancies less than 5%
	Major issues, discrepancies more than 5%
	No information provided to be able to check the data

Member State	Cumulative energy savings target (ktoe)	% exemptions used	Exemptions used (Article 7.2)				Credibility rating of target calculation
Austria	5,200	25%				x	
Belgium	6,911	25%	x	x		x	
Bulgaria	1,943	25%					
Croatia	1,295	25%	x	x			
Cyprus	242	25%	x	x			
Czech Republic	4,581	25%	x			x	
Denmark	4,130	3%			x		
Estonia	611	25%	x	x	x	x	
Finland	4,192	25%	x	x		x	
France	30,570	25%		x		x	
Germany	41,989	25%				x	
Greece	3,301	25%	x	x			
Hungary	Not provided 3,614 *	Not yet decided	?	?			
Ireland	2,164	25%	x	x			
Italy	25,502	25%	x		x	x	
Latvia	851	25%	x	x			
Lithuania	1,004	25%	x		x	x	
Luxembourg	532	25%	x	x			
Malta	56	25%	x			x	
Netherlands	11,512	25%	x	x			
Poland	14,818	25%		x			
Portugal	3,376	0%					
Romania**	10,000	Not clear					
Slovakia	2,284	25%	x			x	
Slovenia	945	25%	x		x		
Spain	15,979	25%	x	x			
Sweden	9,114	21%	x				
UK	27,859	25%	x	x		x	
Total	**234,575**						

*: Calculated with transport excluded and with 25% exemptions

**: Target expressed in primary energy consumption, converted to final energy

The total amount of the proposed cumulative savings targets is 234,575 ktoe. This amounts almost 34% of the sum of the adjusted baselines[14] and is slightly more than the minimum value of 31.5% in case all MS had used the full 25% exemptions.

2.3 Conclusions

The findings are that 25 out of 28 MS fully excluded the final energy use of the transport sector from the baseline. The exceptions being Sweden (transport fully ***in***cluded, Hungary (not formally decided yet) and Romania (information not provided). According to Eurostat data for 2010-2012, the percentage of final energy used for transport is 32% of total final energy consumption. Regarding the use of the exemptions, most MS (except for Denmark, Portugal and Sweden) use the full 25% exemptions, resulting in a sum of the cumulative energy savings targets that amounts to almost 34% of the sum of the adjusted baselines.

[14] NB: Romania did not provide a baseline, but did provide a savings target.

3 Overview of main policy measures and savings proposed

MS can either implement an EEOS (Article 7(1)) and/ or propose alternative policy measures (Article 7(9)) that should generate at least the same amount of cumulative savings. EEOS and alternative policy measures are discussed separately below.

In this chapter, we first describe the types of policy measures as notified by the MS, with e.g. information on the distribution over new and already existing policy measures, and on the sectoral split of the savings. Then the sum of the cumulative energy savings per Member State is discussed and related to the target for each Member State.

In Appendix 1, an overview is provided of all of 360 policy measures notified by MS as contributing towards their savings target under Article 7. The expected cumulative energy savings per policy measure (or group of policy measures) are also provided in Appendix 1, where this information has been notified by the MS.

3.1 Types of policy measures chosen

Table 6 provides an overview of MS that have opted for an EEOS and/or for alternative policy measures, of which taxation is shown as a specific category. The numbers in the table reflect the number of notified policy measures per category.

Table 6: Overview of MS that opt for an EEOS and/or for alternative policy measures

	EEOS	Energy Efficiency National Fund	(a) Energy or CO_2 taxes	(b) Financing schemes or fiscal incentives (including grants)	(c) Regulations or voluntary agreements	(d) Standards and norms mandatory and applicable in MS under EU law[15]	(e) Energy labelling schemes	(f) Training and education in reducing end-use energy consumption	i) Any other policy measures, and/or category not clear	Total number of policy measures
Austria	1	0	2	3	1	1	0	0	1	**9**
Belgium	0	1	0	14	4	3	0	0	0	**22**
Bulgaria	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Croatia	1	0	1	8	0	0	0	1	0	**11**
Cyprus	0	0	0	3	0	0	0	0	2	**5**
Czech Republic	0	0	0	11	0	0	0	0	0	**11**
Denmark	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Estonia	1	1	1	1	0	0	0	0	0	**4**
Finland	0	0	1	2	2	3	0	0	0	**8**
France	1	1	0	0	0	0	0	1	0	**3**

[15] NB: only savings above minimum EU-levels may be counted towards the target.

	EEOS	Energy Efficiency National Fund	(a) Energy or CO_2 taxes	(b) Financing schemes or fiscal incentives (including grants)	(c) Regulations or voluntary agreements	(d) Standards and norms mandatory and applicable in MS under EU law[15]	(e) Energy labelling schemes	(f) Training and education in reducing end-use energy consumption	i) Any other policy measures, and/or category not clear	Total number of policy measures
Germany	0	0	4	7	0	3	0	3	1	**18**
Greece	0	0	1	7	0	0	0	4	5	**17**
Hungary	1	?	?	?	?	?	?	?	?	**1**
Ireland	1	0	1	5	0	5	0	1	0	**13**
Italy	1	0	0	2	0	0	0	0	0	**3**
Latvia	1	1	0	4	1	0	0	0	1	**8**
Lithuania	1	0	0	1	0	7	1	3	1	**14**
Luxembourg	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Malta	1	0	0	14	19	0	0	0	0	**34**
Netherlands	0	0	10	10	19	5	0	0	0	**44**
Poland	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Portugal	0	0	2	3	4	3	4	2	6	**24**
Romania	0	1	0	0	2	0	1	2	0	**6**
Slovakia[16]	0	0	0	21	0	0	0	0	44	**65**
Slovenia	1	1	0	0	0	0	0	0	0	**2**
Spain	1	1	1	8	0	1	0	1	0	**13**
Sweden	0	0	1	0	0	0	0	0	0	**1**
UK	3*	0	1	6	6	3	0	0	1	**20**
Total [number of measures]	**19**	**7**	**26**	**130**	**58**	**34**	**6**	**18**	**62**	**353**
Total [number of MS]	17	7	12	19	9	10	3	9	9	

* Includes two EEOS notified as early actions (the Carbon Emissions Reduction Target and the Community Energy Savings Target) and a new obligation scheme in place from 2013 (Energy Company Obligation).

3.2 Energy efficiency obligation schemes

Energy Efficiency Obligation Schemes (EEOS) are the most important type of policy measure adopted by MS in terms of energy savings – 40% of the expected cumulative energy savings across all MS are expected to be generated from the implementation of EEOS, far more than any other type of policy measure (see Figure 9). This shows that the intention of Article 7 to encourage MS to adopt EEOS has been quite effective. The EEOS of Denmark and the UK have a high credibility and can be seen as examples of best practice.

EEOS are planned by 11 MS and have already been implemented by 6 MS (see Table 7). Of these 17 MS, the 11 MS that do not yet have implemented EEOS are Austria, Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Spain. Note

[16] Slovakia provided savings per group of policy measures, targeted to a specific sector; not savings per individual policy measure.

that Hungary is still considering an obligation scheme but has not yet decided. The six MS that already have EEOS in place and notified those are Denmark, France, Ireland, Italy, Poland and the UK. Austria implemented a voluntary scheme in 2009 which will be replaced with mandatory scheme, also Ireland has changed its voluntary agreement to a mandatory obligation scheme.

Romania states in its notification that it may consider an obligation scheme in the future but currently does not plan to implement one.[17]

EEOS notified	**Bulgaria, Denmark, Poland, Luxembourg** (notified as the only measure to reach the target under Article 7 of the Energy Efficiency Directive); **France, Italy, UK, Austria, Croatia, Estonia, Hungary, Ireland, Latvia, Lithuania, Malta, Slovenia, Spain** (in combination with alternative measures to reach the target). **Hungary** has not yet decided on the approach.

EEOS already in place:	Denmark, France, Ireland, Italy, Poland, UK Of these MS, France, Ireland, Italy and the UK will combine the EEO scheme with the alternative measures.
EEOS planned:	Austria[18], Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Luxembourg, Malta, Slovenia, Spain

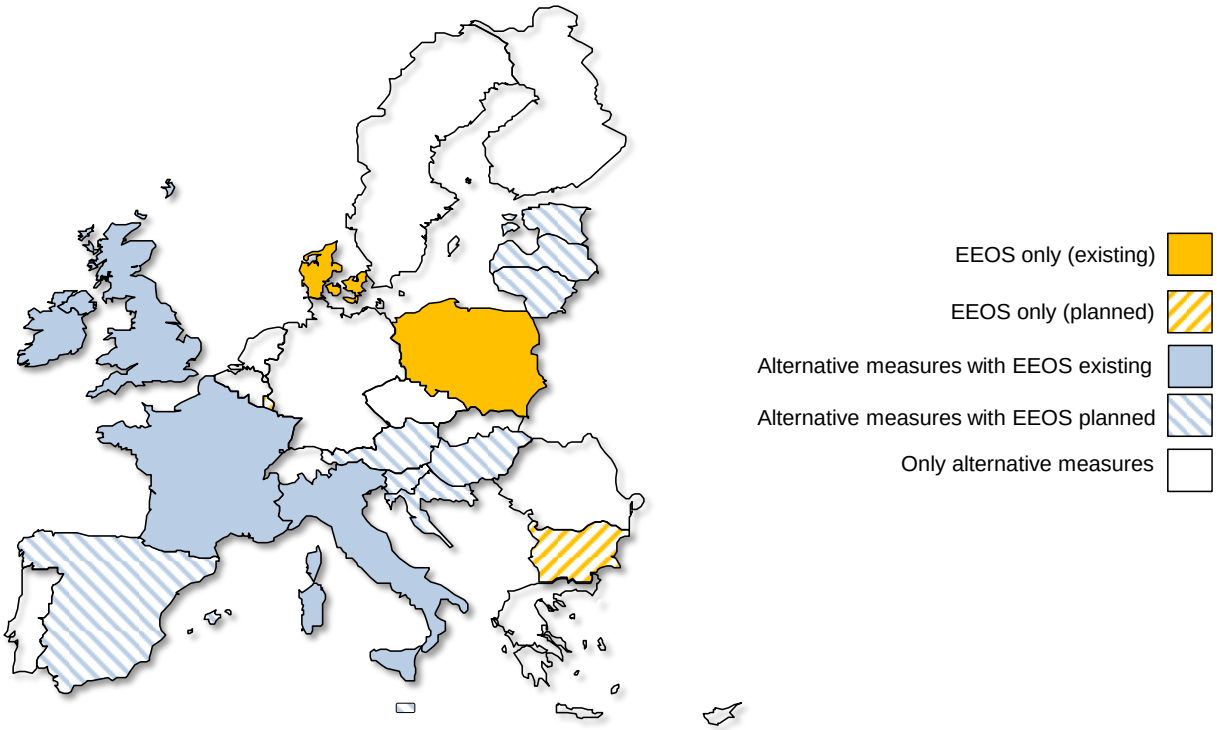
Of the MS with planned EEOS, Bulgaria and Luxembourg do not propose alternative policy measures to reach the target in combination with the obligation scheme. Hungary has not decided yet.

Figure 8 also presents the current status of EEOS in all MS in form of a colour-coded map.

[17] The notification states 'An obligation scheme might be considered on the basis of an analysis of the annual results following implementation of alternative policy measures, by the end of the initial period proposed (1 January 2014-31 December 2016).'

[18] From the Austrian NEEAP: "*At the end of 2012, a government bill was submitted for an Austrian Energy Efficiency Act; this was adopted in spring 2013 by the outgoing government. A parliamentary decision was not taken, on account of the new elections in the last legislative period. A new bill is currently being drafted and will be submitted for consideration in the near future.*" In the NEEAP, Austria did not provide a savings target for the EEOS (i.e. set to zero in the analyses for this study).

Figure 8: Map of planned or existing EEOS and alternative measures under the EED [19]



Of the MS with planned EEOS, Austria, Bulgaria, Croatia, Estonia, Latvia, Lithuania, Luxembourg and Poland are assessed as having major credibility issues associated with their schemes, based on the information provided in their notifications and NEEAPs. With regards to the obligation scheme of Hungary, there was not enough information on which to base an assessment with major information gaps regarding the policy design, the calculation methodology, the eligible actions, and the monitoring, verification, reporting and compliance regime. Only minor credibility issues were identified for the other EEOS mentioned (see Table 8).

3.2.1 Summary of key features of planned and existing EEOS

Annex V Part 4 of the EED requires MS to notify to the Commission their detailed methodology for the operation of the energy efficiency obligation scheme. Table 7 presents an overview of the key features of the notified planned and existing EEOS. For each of the main features we provide a short summary in the following sub-sections.

3.2.2 Starting date

Six EEOSs were notified by MS as having already started. In addition, Austria introduced a voluntary obligation scheme in 2009 (replaced with an obligatory scheme in 2014).The oldest obligation scheme in Europe started in 1994 in the UK. This was followed by Denmark in 1995 (although at that stage it was more a demand side management scheme), Italy in 2005 and France in 2006. The last two countries to introduce the EEOS were Ireland and Poland in 2012 (Ireland also initially implemented a voluntary scheme now replaced with an obligatory scheme).

The other 11 EEOS have not started yet. Only Estonia clearly defines the starting date (2016) whereas the other MS state or imply that they will define the starting date in the future.

[19] The map only includes EEOS notified by MS.

3.2.3 Duration of obligation period

Where the timeframe of the obligation period is specified this is mostly 2-3 years with some MS using longer obligation periods (e.g. Estonia: 5 years).

In some instances the obligation periods have already started in January 2014 but the EEOS are not in place yet (Bulgaria, Hungary, Lithuania, and Luxembourg). Presumably the obligated parties would need to achieve the savings retrospectively (for example, if the scheme started in 2015 and the obligation period lasted from January 2014 to December 2016 the obligated parties would still need to prove that they generated savings meeting the target for the whole period 2014-2016 rather than just post the starting date).

3.2.4 Obligated parties

14 out of 17 MS specify the obligated parties with 3 MS not providing this information (Austria only states that its scheme will cover 'all energy sources and […] all energy utility companies'[20], Croatia, Hungary does not provide any information).

8 MS put the obligation on energy suppliers (Bulgaria, Ireland, France, Luxembourg, Poland, Slovenia, Spain, UK), 3 MS on distribution companies (Denmark, Italy, Lithuania) and 2 MS (Estonia, Malta) on both distribution companies and suppliers (in case of Malta this is the main energy company that covers both distribution and retail of energy).

3.2.5 Sectoral coverage

All but two MS (Croatia, Hungary) specified the sectoral coverage. Most MS (Austria, Bulgaria, Estonia, Italy, Latvia, Lithuania, Poland, Slovenia, and Spain) allow obligated parties to generate savings in all sectors. One MS (France) includes all sectors but does not allow savings from activities covered by the ETS.

One Member State does not allow any savings from transport to be counted (Austria) and 1 MS covers all sectors but limits the amount of savings from transport (Luxembourg).

One Member State (UK) covers only the residential sector.

One Member State (Ireland) put in place a mandatory split across non-residential and residential sectors (Ireland).

Most MS do not state the anticipated split of the expected savings across different sectors. Most of the activity is likely to be in the buildings sector. Large countries such as France, Italy and the UK historically delivered a large share of their EEOS in the building sector. Ireland targets domestic and commercial buildings. The Danish scheme focuses mainly on industry which is an exception compared to other existing EEOS.

3.2.6 Requirements with a social aim

The Directive (Article 7(7)(a)) states that MS may include requirements with social aims in their EEOS (for example to target households in fuel poverty). Most MS have not included requirements with a social aim in their schemes. Only 4 MS (Austria, France, Ireland, UK) have made such provisions.

Austria includes an uplift factor of 1.5 for savings achieved in fuel-poor households. This means that for each unit of energy saved in households living in fuel poverty the energy supplier receives 50% more savings compared to a household not in fuel poverty.

France introduced a 'programme option' as part of their scheme starting in the 2nd period in 2011. Obligated parties can realise up to 25 TWh cumac, or 7.2 % of the national obligation by financing specific programmes on information, training or innovation. This option also

[20] Personal communication with Dr Simon Moser, Energieinstitut an der Johannes Kepler Universität Linz Department of Energy Economics revealed that Austria will include all retailers of energy including motor fuels and biomass but excluding small retailers (threshold not clear).

includes four programmes targeting fuel poverty but in case of those programmes there is no limit to the amount of savings that can be generated. Obligated parties can provide funds to organisation working on reducing fuel poverty through retrofits and the obligated parties receive certificates for the savings in return.

Ireland prescribes that 5% of the total savings need to be achieved in fuel-poor households defined as receiving certain welfare transfers or located in areas classified as RAPID (Revitalising Areas by Planning, Investment and Development) or Clár areas (rural locations) and designated areas specified by the regulator.

The **UK** has always included provisions for low-income customers (voluntary in the beginning but obligatory since 2002). Historically, a specified share of the savings had to be generated in households that receive certain benefits (called the 'Priority Group'). Those benefits were mainly income-related. In addition, people over 70 qualified for support from energy suppliers under the rules of the Carbon Emissions Reduction Target (2008-2012). With the CERT extension from April 2011 to December 2012 a Super Priority Group (SPG) was introduced, requiring suppliers to meet 15% of their total CERT target (37.5% of their PG target) from a subset of low-income households that were considered to be at high risk of fuel poverty. They differed from the PG because of stricter eligibility requirements regarding recipients' household income and the benefits they receive.

The EEO Community Energy Savings Programme (CESP) which ran in parallel with CERT (2009-2012) only allowed projects to be carried out in the lowest 10–15% of areas ranked in Income Domain of the Indices of Multiple Deprivation.

Under the current rules of the Energy Company Obligation (ECO) there are two targets with social aims:

1) The Carbon Saving Community Obligation needs to be achieved in 25% of the lowest areas on the Index of Multiple Deprivation. This target has a sub-target, which states that at least 15% of each supplier's Carbon Saving Community Obligation must be achieved by promoting measures to low income and vulnerable households living in rural areas.
2) Under the Home Heating Cost Reduction Obligation (HHCRO), energy suppliers are required to provide measures to a group of customers receiving certain income-related benefits similar to the SPG under CERT.

The literature on EEOS and social aims such as reducing fuel poverty is thin and there are limited analyses on this topic.

3.2.7 Trading provisions

8 MS currently allow trading. Three MS made provisions for bilateral trading only (Austria, Denmark, UK), 4 MS allow bilateral and vertical trading (France, Ireland, Italy, Poland), and for one MS it is not clear whether trading is allowed both bilaterally and vertically (Spain).

3.2.8 Banking and borrowing

Banking of energy savings (overachieving the target and using the excess savings in subsequent periods) is allowed in 5 MS (Denmark, France, Ireland, Italy, UK).

Borrowing is currently only allowed in Italy but at least 60% of the target has to be achieved (otherwise the obligated parties is subject to penalties).

3.2.9 Penalty regime

With regards to the EEOS, 5 MS defined the level of penalties (Austria, France, Ireland, and UK). 1 MS defines penalties on a case-by-case basis (Italy) and for Poland it is not clear whether the penalties relate to obligated parties or to entities that generate certificates.

4 MS (Denmark, Hungary, Latvia, and Spain) have penalties in place or planned, but no information on the level of penalties is available.

6 MS (Bulgaria, Estonia, Lithuania, Luxembourg, Malta, and Slovenia) do not mention penalties at all in their notifications or NEEAPs.

The penalty regimes are also discussed in section 5.5.

*Table 7: Overview of key features of EEOS in Member States (information refers to EEOS as notified)**

Member State	Date started	Share (%) of target	Target	Timeframe of obligation period	Obligated parties	Sectoral coverage	Provisions for vulnerable customers	Trading provisions	Banking and borrowing	Penalty regime
Austria**	2009 (voluntary) 2014 (mandatory)	no savings for scheme provided by MS	no savings provided in the NEEAP	2014-2020	all retailers of energy - including motor fuels and biomass - excluding small retailers	all sectors	uplift by factor of 1.5 for savings achieved in fuel poor households	bilateral trading between obligated parties	not proposed at this stage	20 Eurocent per kWh not delivered in one year
Bulgaria	not clear whether started already	100%	not specified yet	2014-2016	electricity, heat, natural gas, liquid and solid fuel traders selling an amount greater than the equivalent of 75 GWh annually, or employing more than 10 people, or having a turnover or end-of-year balance for the previous year of more than BGN 3.9 million; transport fuel retailers are not obliged to participate in the scheme	all sectors	not proposed at this stage	no trading proposed at this stage	not proposed at this stage	not proposed at this stage
Croatia	expected to start in 2015	41%	not specified yet	not specified yet	not specified yet	not specified yet	not proposed at this stage	no trading proposed at this stage	not proposed at this stage	not proposed at this stage
Denmark	1995	100%	2013-2014: 10.7 PJ (final energy) / year after 2015: 12.2 PJ (final energy) / year	Jan 2013 to 31 Dec 2015	all companies in sectors covered by Electricity Supply, Natural Gas Supply and Heating Supply Acts	all sectors except transport	none	none	only Banking and with limitations	yes, but not clear how high
Estonia	expected to start in 2016	17%	no targets set yet but up to 1200 GWh (over the entire period 2014-2020)	2016-2020	energy network operators and retail energy sales companies whose annual amount of energy supplied or sold exceeds 100 GWh/yr	all sectors	not proposed at this stage	no trading proposed at this stage	not proposed at this stage	not proposed at this stage

Member State	Date started	Share (%) of target	Target	Timeframe of obligation period	Obligated parties	Sectoral coverage	Provisions for vulnerable customers	Trading provisions	Banking and borrowing	Penalty regime
France	2006	89%	01 Jan 2011- 31 Dec 2013: 345 Twh cumac 01 Jan - 31 Dec 2014: 115 Twh cumac	01 Jan 2011 - 31 Dec 2014	all household oil suppliers, LPG suppliers with a turnover >100 GWh, suppliers of electricity, gas and district heating with a turnover >400 GWh in 2015: individual suppliers of domestic fuel oil no longer belong to obligated parties	all sectors except for actions in facilities subject to the ETS	option for obligated parties to contribute to 4 programs on fuel poverty (no mandatory requirement)	vertical trading via trading platform and bilateral trading	yes, savings can be banked for up to 9 years	yes, buy-out of 0.02 €/kWh
Hungary	unclear	no savings for scheme provided by MS	not specified yet	2014-2020	not specified yet	not specified yet	not specified yet	no trading proposed at this stage	not proposed at this stage	yes, level to be specified in future
Ireland	2012	50%	550 GWh per annum	01 Jan 2014 - 31 Dec 2016	energy suppliers that sell more than 600 GWh per year; importers of road transport fuel	mandatory split: non-residential (75%), residential (20%) and energy poverty (5%)	5% of savings need to be achieved in energy poor households defined as receiving certain welfare transfers or located in RAPID (Revitalising Areas by Planning, Investment and Development) or Clár area (rural location) and designated areas specified by regulator	bilateral trading between obligated parties and vertical trading via trading platform put in place in Nov 2014	unrestricted banking of savings possible no borrowing	yes, penalty set at multiple of 1.25 of the buyout price across all sub-sectors

Member State	Date started	Share (%) of target	Target	Timeframe of obligation period	Obligated parties	Sectoral coverage	Provisions for vulnerable customers	Trading provisions	Banking and borrowing	Penalty regime
Italy	2005	63%	2013: 4.60 Mtoe 2014: 6.20 Mtoe 2015: 6.60 Mtoe 2016: 7.60 Mtoe	01 Jan 2013 - 31 Dec 2016	electricity and gas distributors having more than 50,000 end users	all sectors	none	vertical trading via spot market and bilateral trading; initial generation of WCs is 2/3rd by bilateral contracts with EE providers of all WCs	Banking and borrowing are allowed. A compliance ratio of at least 60% has to be achieved	Penalty is due if compliance is less than 60% of the obligation. It is set depending on the market price of certificates which is multiplied by a number greater than 1.
Latvia	Unclear	65%[21]	not specified yet	not specified yet	electricity, district heating and gas suppliers	all sectors	not proposed at this stage	no trading proposed at this stage	not proposed at this stage	yes, level to be specified in future
Lithuania	unclear	no savings for scheme provided by MS	not specified yet	1 Jan 2014 - 31 Dec 2016	electricity distribution network operator AB Lesto, the natural gas distribution network operators AB Lietuvos dujos and heating companies whose heat sales exceed 90 GWh	all sectors	not proposed at this stage	not proposed at this stage	not proposed at this stage	not proposed at this stage
Luxembourg	unclear	100%	not specified yet	1 January 2014 to 31 December 2020	all suppliers of electricity and natural gas serving residential, service sector and industrial customers	all sectors but transport sector can only be taken in to account to a limited extent	not proposed at this stage	not proposed at this stage	not proposed at this stage	not proposed at this stage
Malta	2009 smart meter roll out + behavioural change from 2016; 2014 for progressive tariffs	18%	10.5 GWh annual saving by 2020	2014-2020	Enemalta Corporation (monopoly distributor)	electricity consumers	not proposed at this stage	not relevant as only one obligated party	not proposed at this stage	not proposed at this stage

[21] Though target for the EEOS not yet formally notified by Latvia

Member State	Date started	Share (%) of target	Target	Timeframe of obligation period	Obligated parties	Sectoral coverage	Provisions for vulnerable customers	Trading provisions	Banking and borrowing	Penalty regime
Poland	2012	100%	1.1 Mtoe (expected); estimated to be 25.6 TWh by 2016 80% of target to be met by end use energy savings	3 years in the period Jan 2013– Dec 2016	electricity, natural gas and district heating companies selling to final consumers; members of a commodities exchange and commodity brokerage houses	residential, commercial and industrial end users; also energy efficiency improvements in their T&D business or own energy use	not proposed at this stage; being discussed as part of the reforms of the WC system	tender procedure certificates can be traded via Polish Power Exchange	not proposed at this stage	financial penalties of up to 2 million if verification indicates lower savings than those specified in tender declarations
Slovenia	unclear	33%	not specified yet	unclear	suppliers of electricity, heat, gas and liquid and solid fuels to final customers	all sectors	not proposed at this stage	not proposed at this stage	not proposed at this stage	unclear
Spain	expected to start in 2015	71%	not specified yet	not specified yet	all electricity, gas and oil product retailers, including transport, that sell to final customers obligation will not be imposed on small energy distributors, small retail energy sales companies and small energy sectors	all sectors	not proposed at this stage	certificates will be tradable but unclear whether only bilaterally or also vertically	not proposed at this stage	yes, level to be specified in future
UK	1994	15%	Three subtargets: CERO: 14.0 m CO2 (cummulative lifetime) emissions CSCO: 6.8 (cummulative lifetime) emissions HHCRO: £4.2 billion lifetime savings	01 Jan 2013 - 31 Mar 2015 (will be extended pro-rata to Mar 2017)	energy suppliers that have more than 250,000 domestic customer accounts and supply more than 400 GWh of electricity or 2,000 GWh of gas to domestic customers a year	residential	part of the target (CSCO) needs to be achieved in 25% lowest areas on the Index of Multiple Deprivation part of the target (HHRCO) needs to be achieved in households receiving certain welfare transfers	bilateral trading between obligated parties	unrestricted banking of savings possible no borrowing	penalties can be as high as 10% of global turnover

* reviewed and supplemented by Dr Eoin Lees

** information based on personal communication with Dr Simon Moser, Energieinstitut an der Johannes Kepler Universität Linz Department of Energy Economics

3.3 Alternative policy measures

Alternative policy measures under Article 7(9) contribute more than half of the total savings proposed (see Figure 9). Bulgaria, Denmark, Poland and Luxembourg are the only countries that notify only EEOS to reach the target. Hungary has not decided yet. All other MS propose the use of alternative policy measures.

The four most dominant alternative policy measures (in terms of cumulative energy savings) are

- taxation measures (16%);
- financial instruments (16%);
- standards and norms (14%);
- regulations or voluntary agreements (7%).

Table 6 also gives an overview of which MS use which categories of policy measures and how many MS use each category in the notifications.

3.4 Energy Efficiency National Funds

Energy Efficiency National Funds (Article 20(6)) is a policy measure category that in general has risk of overlap with alternative policies category Article 7(9)(b) (financing schemes or fiscal incentives (incl. grants)), since MS use the term 'National Funds' in many different ways. However, Article 20(6) describes a special case of such a National Fund: 'MS may provide that obligated parties can fulfil their obligations set out in Article 7(1) by contributing annually to the Energy Efficiency National Fund an amount equal to the investments required to achieve those obligations.'

We indicated in the overview in Table 6 how many MS opted in their notification and/or NEEAP for this specific policy measure. These are:

- Belgium – obligation for fuel oil suppliers ("mazout");
- Estonia – it is not clear if Estonia notifies this Article 20(6) policy;
- France – France will create a guarantee fund for energy efficiency renovations of buildings to lower the costs of borrowing for households. The structure of the fund is still under consideration in France and may be categorised as a financial instrument and not a special case of fund as specified in this paragraph;
- Latvia – Latvia plans to use Article 20(6) alongside an EEOS without providing more information.
- Romania – it is not clear what the exact nature of the 'National Efficiency Fund' is;
- Slovenia – it is not clear what the exact nature of the 'ECO fund' is; and
- Spain – Spain has an Energy Efficiency National Fund in accordance with Article 20(6).

3.5 Overview of the proposed savings by type of policy measure

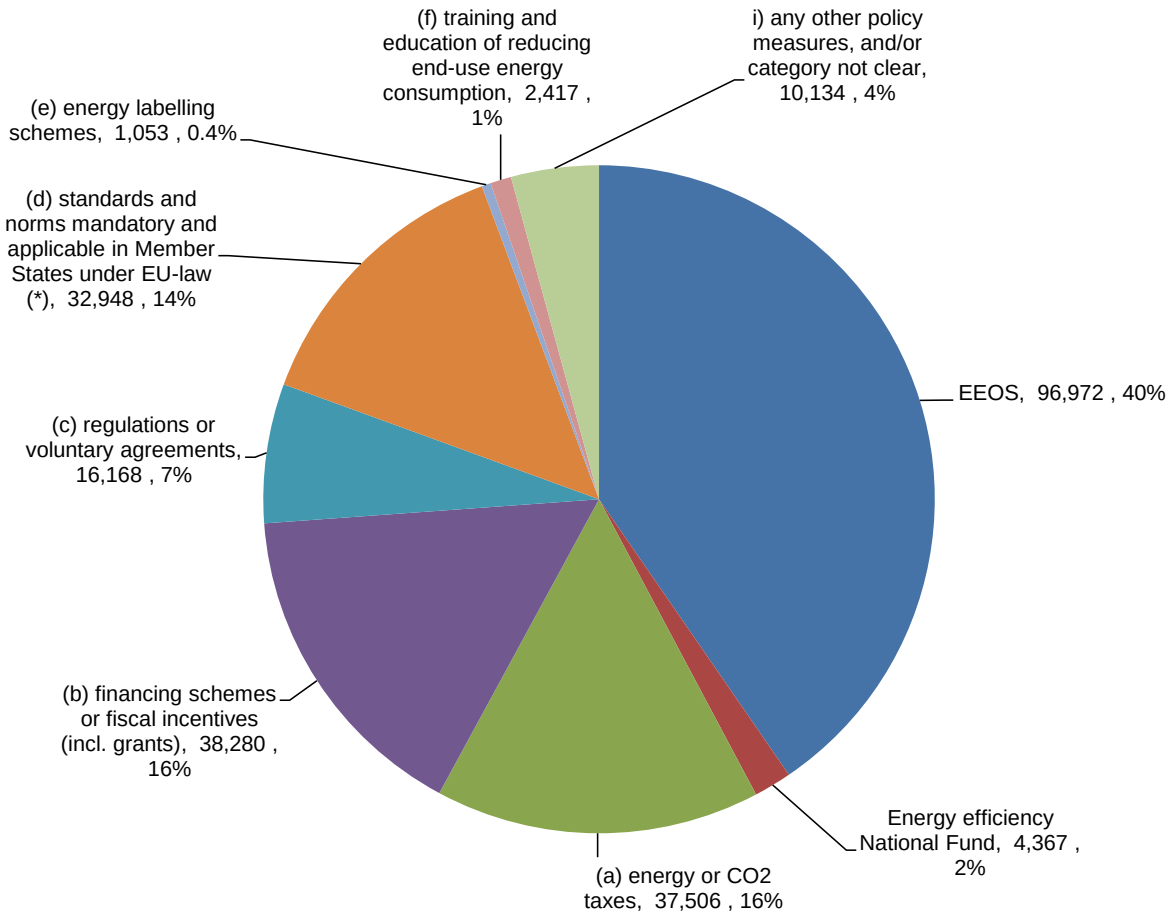
To get a comprehensive overview of how MS intend to generate the required savings, we added up the expected cumulative energy savings per policy measure type. This is presented in Appendix 1.

It was not possible to assess all of the expected savings per policy measure yet, due to no or insufficient information on the breakdown of expected savings by measure type (Hungary, Lithuania, Romania and Slovakia). Also, for three MS, the expected savings from the policy measures do not add up to the savings target as notified by the MS (Germany, Greece and

Slovakia), with a deviation of more than 5%. Hungary, Lithuania, and Romania did not notify the expected cumulative energy savings for the policy measures.

The largest share (about **40%**) of the savings come from the EEOS, **16%** from financing schemes or grants, **1%** from standards and norms (above minimum EU-levels, where applicable), **16%** from taxes (above minimum EU-levels, where applicable) and the rest from the other policy measure categories.

Figure 9: Breakdown of energy savings, based on notified savings by type of policy measure (figures in ktoe)

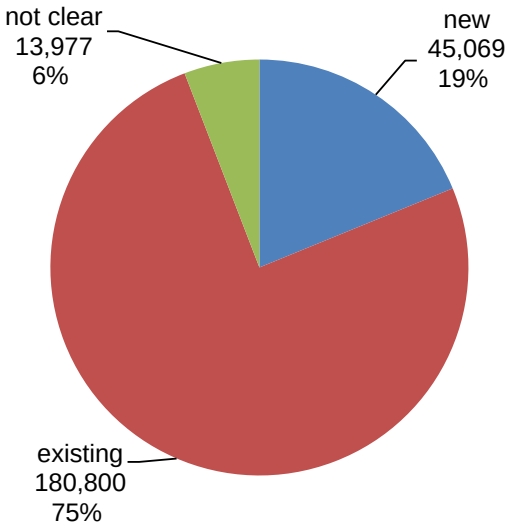


3.6 Breakdown to new and existing policy measures

In the table in Appendix 1, we indicate if a policy measure is a new measure (i.e. did not exist prior to the Directive coming into force[22]), an existing policy measure that will be prolonged into the period 2014-2020, or that it is not yet clear from the notification or NEEAP whether the policy measure is already existing or new. **19% of the cumulative energy savings** comes from new policy measures.

[22] This does not include modifications of existing policy measures.

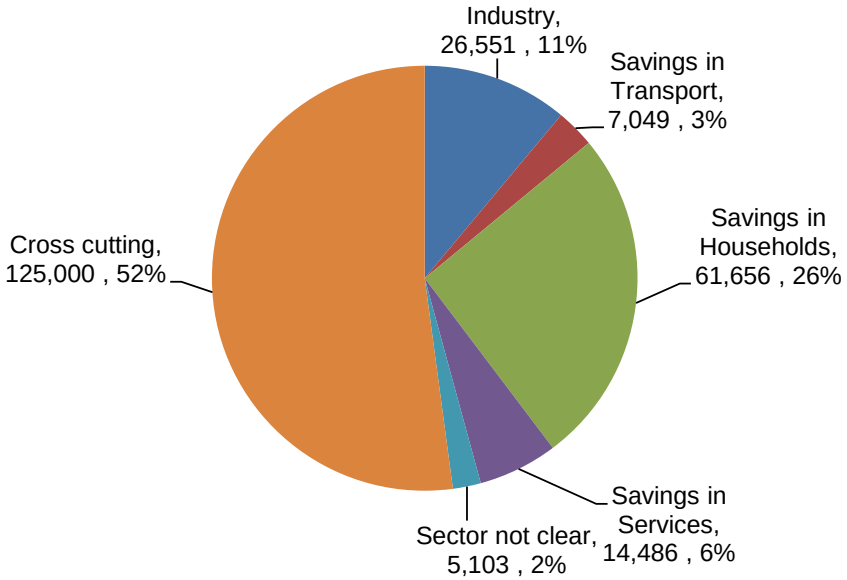
Figure 10: Breakdown of energy savings, based on notified cumulative savings by new and existing policy measures (figures in ktoe)



3.7 Sectoral split of savings

A first analysis of the sectoral split of the savings has been carried out. This provides an indication of which sectors the savings are likely to come. It should be noted that MS do not have to provide a sectoral split of the expected savings in the documentation they provide and sectors had to be inferred by checking each of the 360 notified policy measures. Figure 11 shows that most of the savings come from measures that are cross cutting across more than one sector (such as taxes, building regulations applying to domestic and non-domestic buildings, financial incentives applying to multiple sectors). In relation to the savings from measures targeting a single sector, the residential sector is responsible for the largest share of the savings.

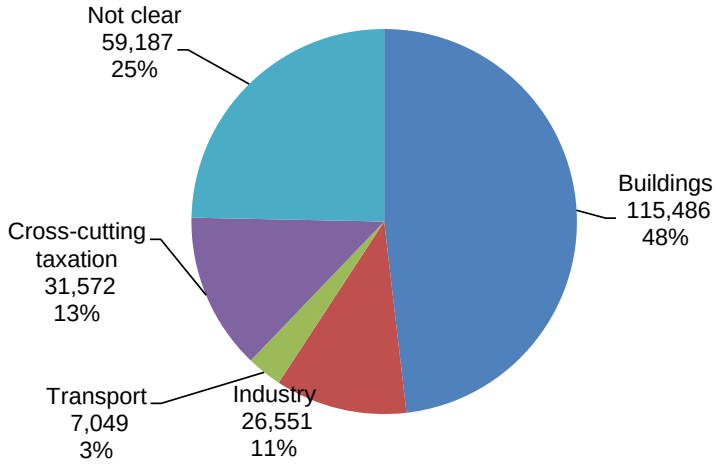
Figure 11: Breakdown of savings by target sector



An alternative classification of the measures is shown in the figure below where, for example, the cross-cutting measures targeting both households and services have been reclassified as measures targeting buildings. This classification shows that measure targeting buildings

generate almost half of the projected savings. This is in line with the large potential for energy efficiency improvements in buildings. The contribution from industry is much smaller, and transport smaller still.

Figure 12: Breakdown of savings by sector



3.8 Credibility assessment of proposed policy measures and their savings

The figures provided above are based on **notified cumulative** savings per policy measure. However, whether these policies will result in **real** savings depends largely on how credible the estimations by MS are.

The methodologies that have been used by MS to estimate the savings from their policies are often highly complex and, in many cases, are based on hundreds of pages of evaluations and research studies. An assessment of credibility, based on a comprehensive review of all these materials, was not possible as part of the project. However, we were able to develop a simplified credibility check based on key criteria that have been derived from the EED Article 7 and Annex V of the EED.

The main criteria we used to assess the credibility of policy measures and the proposed savings include:

- whether eligible measure categories and/or individual actions have been specified clearly;
- whether the calculation methods are transparent and in line with Article 7 and Annex V;
- whether intermediate periods have been provided for policy measures;
- how the issue of additionality has been addressed;
- how the issue of materiality has been addressed;
- whether double counting is avoided;
- whether the lifetimes of measures have been specified and are not too long; and
- whether the monitoring, verification, control and compliance regime is robust.

Please see sections 4 and 5 for further details and examples of issues. An overview of the types of policy measure that MS did notify and the credibility rating of the policy measures as described in the notifications are given in Table 8. Note that none of the MS provided alternative policy measures without issues. For nine MS, we identified major issues with alternative policy measures (Czech Republic, Germany, Ireland, Lithuania, Portugal, Romania, Slovakia, Slovenia and the UK). Where minor issues were encountered, these often simply relate to insufficient detail and missing information.

Of the notified EEOS, **Austria, Bulgaria, Croatia, Estonia, Latvia, Lithuania, Luxembourg** and **Poland** are assessed as having major credibility problems. **Hungary** did not provide enough information on which to base a credibility assessment of its obligation scheme. The EEOS of Denmark and the UK have a high credibility. The other EEOS notified have minor credibility issues.

It is not yet feasible to give a thorough credibility rating for all expected savings of all policy measure packages. If we give an overall credibility rating on the proposed policy measure package of an MS, we conclude that only the policy measure packages of **Denmark**, **Finland** and **Ireland** can be regarded as having minor or no credibility issues at this stage.

Table 8: Overview of EEOS and alternative policy measures

Key for check of credibility of proposed policy measures

	No issues
	Minor issues
	Major issues
	Not enough information provided

	EEOS	Alternative policy measures (excluding energy or CO_2 taxes)	Energy or CO_2 taxes
Austria			
Belgium	N/A		N/A
Bulgaria		N/A	N/A
Croatia			
Cyprus	N/A		N/A
Czech Republic	N/A		N/A
Denmark		N/A	N/A
Estonia			
Finland	N/A		
France			N/A
Germany	N/A		
Greece	N/A		
Hungary			N/A
Ireland			
Italy			N/A
Latvia			N/A
Lithuania			N/A
Luxembourg		N/A	N/A
Malta			N/A
Netherlands	N/A		
Poland		N/A	N/A
Portugal	N/A		
Romania	N/A		N/A
Slovakia	N/A		N/A
Slovenia			N/A
Spain			
Sweden	N/A	N/A	
United Kingdom			

3.9 Savings as a result of proposed policy measures

Based on the more detailed table in Appendix 1, Table 9 provides a high-level overview of the scale of proposed savings and if these match, exceed or miss the energy saving targets as proposed by the MS and as required. The latter is calculated using Eurostat 2010-2012 data, and taking into account the notified exclusions on the baseline (i.e. percentage of exclusion of final energy use for transport, and energy production for own use), and the notified percentage of exemptions to the target calculation.

Table 9: Notified savings as a result of policy measures by MS compared to target required based on Eurostat data

Key for check of sufficiency of proposed savings

	Notified savings match (difference less than 1%) or exceed required target
	Shortfall between notified savings and required target less than 5%
	Shortfall between notified savings and required target more than 5%

Member State	Cumulative target notified by MS (ktoe)	Cumulative target calculated with Eurostat (ktoe)	Sum of notified savings (ktoe)	Notified expected savings / required target (%)
Austria	5,200	5,567	5,348	96%
Belgium	6,911	not possible as no data for energy production for own use provided	7,140	N/A
Bulgaria	1,943	1,940	1,944	100%
Croatia	1,295	1,295	1,294	100%
Cyprus	242	214	244	114%
Czech Republic	4,581	4,813	4,620	96%
Denmark	4,130	4,028	7,908	196%
Estonia	611	611	662	108%
Finland	4,192	4,228	8,819	210%
France	30,570	29,175	31,131	107%
Germany	41,989	41,456	35,052	85%
Greece	3,301	3,290	928*	28%
Hungary	3,614	3,685	No information yet provided	N/A
Ireland	2,164	2,139	3,328	156%
Italy	25,502	25,503	25,830	101%
Latvia	851	876	851	97%
Lithuania	1,004	1,012	No savings per policy measure provided)	N/A
Luxembourg	532	515	532	103%
Malta	56	56	66	118%
Netherlands	11,512	11,471	11,349	99%
Poland	14,818	14,817	14,818	100%

Member State	Cumulative target notified by MS (ktoe)	Cumulative target calculated with Eurostat (ktoe)	Sum of notified savings (ktoe)	Notified expected savings / required target (%)
Portugal	3,376	not possible as no data for own energy use provided	4,289	N/A
Romania	10,000	not possible as no data for exemptions provided	No information yet provided	N/A
Slovakia	2,284	2,631	2,086	79%
Slovenia	945	959	945	99%
Spain	15,979	16,006	15,991	100%
Sweden	9,114	10,961	11,505	105%
UK	27,859	26,682	43,166	162%

* For Greece it is unclear whether the notified savings are cumulative or annual for 2020 (if annual for 2020 then there would be no gap).

The total cumulative energy savings, across all policy measures notified by MS as contributing towards their energy savings target, amount to 239,846 ktoe. This is equivalent to 102% of the total of notified energy savings targets and 99.6% of the required savings targets based on Eurostat data.

In Table 9, it is that notable that, for some MS, the sum of the expected cumulative savings is substantially larger (more than 10%) than the required savings targets based on Eurostat data (Cyprus, Denmark, Finland, Ireland, Malta, and the UK).

3.10 Estimated impact compared with the proposed energy savings targets

Analysis by the European Commission, based on the final EED text, provides an estimate for annual savings in 2020 of **84.8Mtoe** (primary energy)[23]. It should be noted that the units previously used in this report are *cumulative* savings rather than *annual* savings, but the Commission's estimate provides the expected savings in annual savings in 2020. The figure provided by the Commission reduces the initial ambition level by 25% – excluding all exemptions under Article 7(2), but it does not count in the overlaps of other measures.

Those projections can be compared with the individual energy saving targets and policy savings calculated by MS, and set out in their notifications. A number of adjustments are necessary to do this.

1) **Convert to annual savings.** The figures provided by MS are cumulative savings by 2020 and need to be converted to annual savings. We have assumed linear delivery of savings from 2014 to 2020 (that is, the same additional savings are generated) every year) which is a simplification and a conservative estimate as some MS have used the slow start option.

2) **Convert final to primary energy savings**. The figures in the Impact Assessment SEC(2011) 779 are presented in primary energy savings. The energy savings provided by

[23] The likely savings generated by Article 7 have been estimated in the impact assessment SEC(2011) 779 produced in 2011 and are based on the PRIMES model run using 2009 data and the E3ME model. The Impact Assessment assumed that, by 2020, annual savings in primary energy of 108-118Mtoe per year will be delivered by Article 7. This figure was based on the Commission's proposal and does not include exemptions and policy overlaps. See Impact Assessment accompanying the document Directive of the European Parliament and of the Council on energy efficiency and amending and subsequently repealing Directives 2004/8/EC and 2006/32/EC {COM(2011) 370 final} {SEC(2011) 780 final}. Online: http://ec.europa.eu/energy/efficiency/eed/doc/2011_directive/sec_2011_0779_impact_assessment.pdf page 32

MS are calculated in final energy consumption. We have converted the energy savings from final energy to primary energy. To do this we have:

- calculated the share of electricity of the total final energy consumption, which is 21.8% based on Eurostat[24] data (the other fuels used are already included as primary energy in the final energy consumption figures);
- assumed that the savings would be proportionate according to the share of fuels of final energy consumption (there may be a discrepancy as MS do not provide a breakdown of the savings according to fuel); and
- applied a conversion factor of 2.5 to convert electricity to primary energy (this is a factor in line with Annex IV of the Energy Efficiency Directive which states on converting primary to final energy 'For savings in kWh electricity Member States may apply a default coefficient of 2,5.').

3) **Prorate savings to account for missing data**. Data for the energy savings from notified policy measures from only 25 of the MS were available and exclude Hungary, Lithuania and Romania which has not yet notified the projected savings of their policy measures. We have adjusted the total savings from policy measures by a factor equal to the proportion of the final energy consumption of Hungary, Lithuania and Romania compared with the whole of the EU (assuming a similar energy saving effort in those countries as the average of the 25 countries analysed). This adjustment increases the savings from policy measures by 4%.

It should be noted that our estimate does not account for MS using the slow start option which, in theory, increases savings in later years. However, using this exemption (Article 7(2)(a)) has no impact on the actual phasing off when the savings will be delivered over the period 2014/20 and most MS have not provided annual figures that would allow for this to be checked.

3.10.1 Comparison of energy savings targets to the EED impact assessment

Following the three steps above, the savings targets have been converted to annual primary energy savings to be projected for 2020.

Step 1: Convert to annual savings

Assuming linear delivery, we have calculated the annual savings in final energy terms in 2020 by distributing the additional savings equally across the years 2014-2020 (Table 10).

Table 10: Savings delivered as result of targets assuming a linear delivery of the savings from 2014 to 2020

2014	8.4							8.4
2015	8.4	8.4						16.8
2016	8.4	8.4	8.4					25.1
2017	8.4	8.4	8.4	8.4				33.5
2018	8.4	8.4	8.4	8.4	8.4			41.9
2019	8.4	8.4	8.4	8.4	8.4	8.4		50.3
2020	8.4	8.4	8.4	8.4	8.4	8.4	8.4	58.6
Total								**234.6**

[24] Eurostat 2010-2012: 21.8% of the final energy consumption in the EU28 is electricity. The conversion factor for electricity is 2.5 to convert from final to primary energy consumption.

Based on the analysis above, annual energy savings of **58.6 Mtoe** (final energy) will be required in 2020 to meet the notified energy savings targets.

Step 2: Convert final to primary energy savings

Following the procedure outlined above, we derived the primary energy savings for 2020 based on the targets notified by MS, which are **77.8 Mtoe**.

Table 11: Convert final to primary energy savings

Final energy consumption (Mtoe)	1,103.4
Final energy consumption of electricity (Mtoe)	240.6
Proportion of electricity	22%
Conversion factor for electricity to primary energy	2.5
Annual savings in 2020 in final energy consumption (Mtoe)	58.6
Annual savings in 2020 excluding electricity in primary energy (Mtoe)	45.9
Annual savings in 2020 electricity in primary energy (Mtoe)	32.0
Annual savings in 2020 in primary energy (Mtoe)	77.8

Result

A comparison with the initial 2011 Impact Assessment shows that the targets are 31% lower than the expected savings. Compared with the Commission's internal calculations based on the final EED text, the targets are 8% lower.

3.10.2 Comparison of energy savings from policy measures to the EED impact assessment

A similar comparison has been made with the energy savings from policy measures, as described in the steps below.

Step 1: Convert to annual savings

Based on data from 25 MS (excluding Hungary, Lithuania and Romania) and assuming a linear delivery of the savings from 2014 to 2020, the energy savings delivered by the notified policy measures in 2020 will be **60.0 Mtoe** in final energy terms.

Table 12: Savings delivered as result of targets assuming a linear delivery of the savings from 2014 to 2020

2014	8.6							8.6
2015	8.6	8.6						17.2
2016	8.6	8.6	8.6					25.8
2017	8.6	8.6	8.6	8.6				34.4
2018	8.6	8.6	8.6	8.6	8.6			43.0
2019	8.6	8.6	8.6	8.6	8.6	8.6		51.6
2020	8.6	8.6	8.6	8.6	8.6	8.6	8.6	60.2
Total								**239,9**

Step 2: Convert final to primary energy savings

To convert final to primary energy savings, the same calculations have been made as for the energy savings targets.

Table 13: Convert final to primary energy savings

Annual savings in 2020 in final energy consumption (Mtoe)	60.0
Annual savings in 2020 excluding electricity in primary energy (Mtoe)	46.9
Annual savings in 2020 electricity in primary energy (Mtoe)	32.7
Annual savings in 2020 in primary energy (Mtoe)	79.6

Step 3: Prorate savings to account for missing data

Applying the 4% uplift factor to account for the missing data from Hungary, Lithuania and Romania (see point 3 at the beginning of this section how this adjustment was made), the total annual savings in 2020 as a result of proposed policy measures will be **82.6 Mtoe** in primary energy terms.

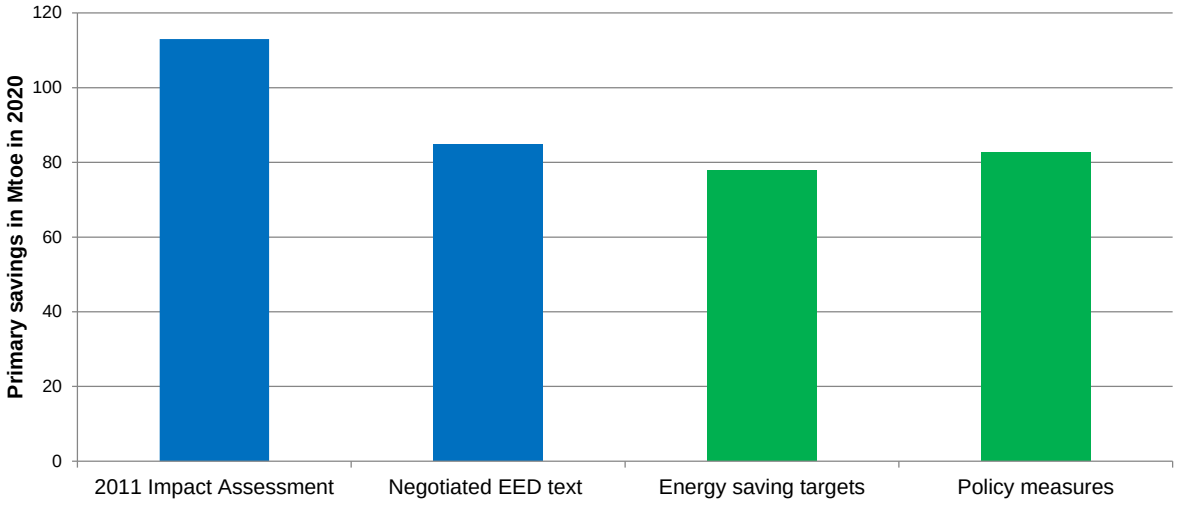
Results

The calculated energy savings from notified policy measures are 3% lower than the Commission's estimate derived during the negotiations of the EED text. There is a shortfall of 27% when comparing the policy savings with those in the 2011 Impact Assessment.

3.10.3 Summary of comparison of proposed energy savings targets and policy measures to the impact assessment

Our analysis of the data from MS notifications shows that the energy savings targets and the savings from policy measures are 8% and 3% lower respectively than the estimate provided by the Commission, based on the final EED text (see Figure 13). Given that the estimate based on the final EED text does not account for overlaps with other measures, the shortfall is likely to be lower. However, without further analysis of policy overlaps (notably of the extent to which MS have included actions required under other articles of the Directive in their Article 7 plans), which is outside of the scope of this study, it is not possible to provide a more precise estimate.

Figure 13: Comparison of proposed energy savings targets and policy measures to the Impact Assessment and Commission estimate based on final EED text



4 Overview of methodologies

The previous chapter provided a high-level assessment of the credibility of the savings estimates for policy measures set out in MS notifications. This chapter provides an in-depth analysis of the approaches notified by Member States, identifying examples of best practice along with any methodological issues encountered.

Annex V of the EED and the Guidance Note lay down important provisions to ensure the energy savings are calculated using credible and robust methodologies. Key aspects to consider relate to:

- eligible measure categories and/or individual actions;
- measurement methods;
- distribution of savings over the obligation period;
- additionality;
- materiality;
- lifetimes;
- climatic variations;
- double counting.

For each of these aspects we have provided a review of how MS have taken the requirements into account when calculating the energy savings from their notified policy measures. Failure to account for these methodological aspects correctly may suggest that the notified savings from the respective policy measures are less credible.

It is important to note that the credibility assessment was based on notified information by Member States, therefore:

- If a Member State did not provide the required information in its notification, it was not possible to assess the credibility of the respective element with any certainty.
- Just because a Member State did not notify certain information (e.g. for a specific policy instrument) does not necessarily mean that the notified energy savings are not credible.
- At the same time, taking a conservative approach, it is reasonable to suggest that where there is missing or incomplete information less confidence should be given to the notified energy savings.

The first step in the assessment was therefore to determine if the Member State had notified sufficient information on the respective methodological aspect. Where relevant the assessment was made for each of the policies notified by the MS. In some cases this meant that a Member State provided sufficient information for some policy measures but not for others. The output from this step was an assessment of the *completeness* of information notified by the MS on each of the methodological aspect. MS providing insufficient information on the methodological aspects were identified, but could not be assessed further.

For those MS that provided sufficient information, the second step in the credibility assessment involved reviewing if the MS had demonstrated in their notifications that the relevant methodological aspects (as described above) had been taken into account correctly. This considered if the MS had implemented the requirements of Article 7 and Annex V correctly, as well the Guidance note[25].

[25] This also took into account certain other methodological aspects that are not mention in the EED, but are important to take into account when calculating energy savings. This include factoring in performance gaps and prebound effects when using deemed or scaled savings.

Table 14 summarises the results of the assessment, taking into account both availability of information, and the rating of the information provided. A more detailed discussion of each of the methodological aspects is provided in the sections that follow.

Table 14: Availability of information, and credibility of information notified

No issues
Minor issues
Major issues
Not enough information provided

	Double counting	Calculation methodology	Savings in intermediate periods	Additionality	Materiality	Categories of actions	Lifetimes
Austria							
Belgium							
Bulgaria			N/A				
Croatia							
Cyprus							
Czech Republic							
Denmark			N/A				
Estonia							
Finland							
France							
Germany							
Greece							
Hungary							
Ireland							
Italy							
Latvia							
Lithuania							
Luxembourg			N/A				
Malta							
Netherlands							
Poland			N/A				
Portugal							
Romania							
Slovakia							
Slovenia							
Spain							
Sweden		N/A				N/A	
United Kingdom							

Table 14 shows that all MS show at least one minor issue, which is often due to insufficient or no information. The quality of notifications and the detail provided on methodological aspects varies widely with some MS not providing any information (Hungary, Lithuania, Romania) and others (Denmark and Sweden) disclosing close to sufficient detail.

We now discuss each issue area in turn. In addition, an assessment is provided of approaches used by MS to calculate the energy savings from energy and CO_2 taxes as these are a special kind of measure, with some unique features.

4.1 Eligible measure categories and/or individual actions

A policy measure can only lead to real energy savings if the actions promoted as a result of the policy measure are credible. Following this logic, the EED makes a number of important provisions: MS have to provide the list of eligible individual actions under each policy measure they plan to use for the implementation of Article 7. According to the EED definition, 'individual action' means 'an action that leads to verifiable, and measurable or estimable, energy efficiency improvements and is undertaken as a result of a policy measure' (see Article 2 (19)). The estimates of energy savings of individual actions allow for the quantification of the savings of policy measures proposed by the MS (see Guidance Note, D2, 32). Therefore, the definition of eligible actions (Annex V Part 4(e)) is essential for checking the suitability of proposed actions, the appropriateness of the chosen measurement method and the lifetime for each action. To be eligible under Article 7, policy measures need to fulfil several conditions, including:

- their primary aim is to reduce the energy consumption of end users (definition of policy measures in Article 2(18)) ('eligibility');
- they are material to achieved savings (Annex V, Part 2(c)) ('materiality'); and
- they should go beyond the minimum level of mandatory and applicable EU requirements (Annex V, Part 2(a) and Part 3(a)) ('additionality').

The same criteria apply to the individual actions promoted by a policy measure (that is, if the policy measure aims to reduce end-use energy consumption, so must the actions promoted to achieve that).

4.1.1 Best practice

The best practices on eligible individual actions can be found in countries already operating energy efficiency obligation schemes. In the UK, energy regulator, Ofgem, provides a very detailed catalogue of actions eligible under the various energy efficiency schemes, even though they are only referred to in the UK notification. A similarly detailed catalogue is available – for each target sector – for the obligated parties in France (again only referred to in the French notification).

4.1.2 Main issues

The main issues we found are questionable eligibility of actions proposed and insufficient detail of information provided. Table 15 lists all MS where, following detailed analysis, we found these two issues.

Table 15: Eligible categories of actions – main issues

Issue	Sub-aspect	MS where issue has been found
Insufficient detail of information	Not defined at all	Belgium (Wallonia), Netherlands, , Estonia, Lithuania, Slovakia, Austria, France, Latvia, Luxembourg, SIovenia, Spain, Hungary, Romania and Bulgaria
	Defined in too broad	Austria, Belgium (Wallonia),

	terms	Cyprus, Estonia, Finland, Germany, Ireland and Portugal
	List is not exhaustive	Ireland, Latvia, Croatia and SIovenia
List is not included in the notification	Reference made to external documents only	United Kingdom, France (for its obligation scheme)
	Actions are not predefined, but will be decided in future energy audits	Belgium (Brussels region)
Questionable eligibility of actions	Not targeting end-use energy savings	Greece, Italy, Germany, Ireland, Finland, Portugal, Spain, Austria, Cyprus, Czech Republic and Estonia
	Reduce energy consumption at generation[26]	Cyprus, Malta
	Reduce energy consumption at transmission and distribution[27]	Estonia, Germany, Poland,

Article 7 states that MS have to implement policy measures that are primarily designed to trigger end-use savings. According to Guidance Note B1 para 10 'energy generated by households for their own use' (such as solar thermal) can be excluded from the baseline. However, in general renewable energy measures do not qualify as eligible under Article 7 of the EED since they do not aim at reducing the final energy consumption.

Even if a policy measure is designed to trigger end-use savings, in some instances (Italy and the UK) also non-energy efficiency actions are promoted by the same policy instrument (for example, renewable energy technologies such as solar thermal heat generation). In this case, the energy efficiency actions triggered by the policy measure can be counted against the Article 7 target whereas the renewable energy technologies cannot. This split should be communicated in the notifications clearly.

The updated 5 December 2013 notifications show that the problem of including primarily non-energy efficiency policies (mainly renewables) and those saving energy at generation and distribution of energy (cogeneration and district heating) remains. The majority of MS still fail to provide comprehensive information on the eligible actions under each measure. However, the degree of incompleteness varies across the MS.

4.2 Measurement methods

Annex V Part 1 of the EED stipulates that one or more of the following methods will be used for calculating energy savings for the purposes of Article 7(1) and (2) and points (b), (c), (d)

[26] Energy savings as part of generation can only be used under option 7(2)(c) capped at 25% which allows to use of actions in the energy transformation and transmissions sectors.
[27] See previous footnote.

and (f) of the second subparagraph of Article 7(9) – deemed, metered, scaled and surveyed. Therefore, the requirement does not apply to the alternative policy measures introducing energy or CO_2 taxes.

The calculation methodologies for the EEOS and alternative policy measures have to be notified to the European Commission.

4.2.1 Best practice

Best practice regarding the measurement methods is defined as:

- indicating measurement methods used to calculate the savings for all policy measures in accordance with Annex V Part 1 of the EED;
- providing evidence that the deemed and scaled energy savings are independently verified; and
- describing methodologies and benchmarks used for estimates.

None of the MS consistently showed best practice; however, the UK's approach for EEOS as outlined in the guidance provided by the regulator (which is referred to in the notification) could be considered as best practice. This is because: a) deemed savings are established and regularly reviewed independently by researchers and consultants based on field trials and, b) effects that reduce the actual savings such as rebound effects and performance gaps are taken into account.

4.2.2 Main issues

Often references to measurement methods were made within notifications (**Error! Reference source not found.**see Table 17). Main issues however related to measurement methodologies, which are listed in Table 16**Error! Reference source not found.**.

Table 16: Measurement methodologies – main issues

Issue	MS where issue has been found
No information provided Often, references to the specific measurement methods are made, but no further information at all is given on methodology for estimating the savings, benchmarks used and independent verification of the savings.	Bulgaria, Germany, Hungary, Latvia, Lithuania, Luxembourg, Portugal, Romania, Slovakia and Siovenia.
Not enough information provided Some MS mention their approach to calculating the savings, but fail to provide sufficient information on methodologies and benchmarks used for savings estimates and how methodologies are developed independently.	Austria, Belgium (all regions), Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Ireland, Italy, Malta, Netherlands, Poland, Spain and UK (other policy measures than EEOS). Austria describes the methodologies comprehensively, but fails to mention eligible actions that makes the interrogation of methodologies impossible.
Measurements methods of the Energy Service Directive (ESD) used: MS make reference to the measurement and verification methods using ESD	Austria, Belgium (Flanders and Wallonia regions), Cyprus, Estonia and Spain.

methodologies, but no information is provided on the compliance of the measurement methods with the EED requirements.	

All MS have issues with the calculation methodology, many MS provide almost no information on the matter. As Sweden is using only taxation measures, Annex V Part 1 requirements are not applicable. The MS with major issues on the measurement methods are Austria, Belgium (Flanders and Wallonia regions), Cyprus, Estonia and Spain.

Sometimes, although there is no explicit reference to the ESD, the language or the calculation methods used in the notification suggest that ESD methods might have been used (Cyprus, Spain, Ireland and Bulgaria ('methodologies take "bottom-up" approach'), and Portugal is using ESD methods for monitoring purposes).

Table 17: Measurement methods adopted by MS

	Deemed savings	Metered savings	Scaled savings	Surveyed savings	Not clearly defined	ESD
Austria	x		x			x
Belgium	x	x			x	x
Bulgaria					x	?
Croatia	x	x				
Cyprus	x					x
Czech Republic	x	x	x	x		
Denmark	x		x	?		
Estonia	x		x			x
Finland			x	x	x	
France	x	x			x	
Germany					x	
Greece			x		x	
Hungary	x	x				
Ireland	x		x		x	?
Italy	x	x	x			
Latvia	x	x				
Lithuania					x	
Luxembourg	x	x				
Malta			x		x	
Netherlands	x					
Poland	x	x				
Portugal					x	
Romania					x	
Slovakia					x	
Slovenia					x	
Spain	x		x	x	x	x
Sweden	N/A – tax measures only					
UK	x				x	

4.3 Distribution of savings over obligation period

The EED stipulates that alternative policy measures should provide for at least two intermediate periods by 31 December 2020 (Article 7(10)(a)). MS were required to report to the Commission the duration of intermediate periods and the level of expected savings to be achieved over the intermediate periods. The requirement of having intermediate periods does not apply to EEOS as it is for MS to decide how the calculated quantity of the savings is to be phased over the period (Article 7(1)). In case of EEOS the Member States were required to report to the Commission the duration of obligation period and the expected savings to be achieved over the whole obligation period.

4.3.1 Best practice

Best practice regarding intermediate periods as defined by Article 7(10)(a) is:

- providing at least two **intermediate periods** by 31 December 2020;
- identifying the duration of intermediate periods; and
- quantifying the level of expected savings over the intermediate periods.

Our assessment of intermediate periods showed that only 14 out of 24 MS (Bulgaria, Denmark, Poland and Luxembourg excluded as they only use EEOS) have fully followed the EED requirements and notified the intermediate periods and savings over the periods (Austria, Belgium, Croatia, Cyprus, Czech Republic, Estonia, Finland, Greece, Ireland, Germany, Malta, Sweden, Portugal and the UK).

Best practice regarding **obligation period** for EEOS is defined as:

- identifying the duration of obligation period; and
- quantifying the level of expected savings to be achieved over the whole obligation period.

Our assessment of obligation periods showed that 9 out of 17 MS that use EEOS have fully followed the EED requirements and notified the European Commission of the obligation period and savings over the period (Bulgaria, Ireland, Lithuania, Luxembourg, UK, Slovenia, France and Italy. Poland has only defined the first obligation period until 2016 and quantified the savings during the period).

4.3.2 Main issues

The main issues relating to intermediate periods of alternative policy measures are listed in Table 18**Error! Reference source not found.**.

Table 18: Intermediate periods – main issues

Issue	MS where issue has been found
Intermediate periods not defined 7 MS have not defined intermediate periods even though they are using alternative policy measures. However, three of these have provided expected savings on an annual basis, allowing the intermediate periods to be established more easily.	France, Latvia, Slovakia, Spain, Italy, Netherlands and Slovenia (the latter three quantifying the annual savings).
The level of expected savings to be achieved over intermediate periods are not provided. Some MS have defined intermediate periods, but have not quantified the savings to be	Lithuania, Hungary and Romania.

Issue	MS where issue has been found
achieved over the periods.	

The table below provides a full overview of how intermediate periods are dealt with by MS for alternative policy measures.

Table 19: Inclusion of intermediate periods in notifications

	No intermediate periods defined	No intermediate periods defined, but savings defined per year	Intermediate periods defined, but no savings allocated	Intermediate periods defined with savings allocated
Austria				x
Belgium				x
Bulgaria	N/A – EEOS only			
Croatia				x
Cyprus				x
Czech Republic				x
Denmark	N/A – EEOS only			
Estonia				x
Finland				x
France	x			
Germany				x
Greece				x
Hungary			x	
Ireland				x
Italy		x		
Latvia	x			
Lithuania			x	
Luxembourg	N/A – EEOS only			
Malta				x
Netherlands		x		
Poland	N/A – EEOS only			
Portugal				x
Romania			x	
Slovakia	x			
Slovenia		x		
Spain	x			
Sweden				x
United Kingdom				x

Annex V part 4 requires MS to notify the duration of the obligation periods and intermediate periods and the level of expected savings to be achieved over the whole or intermediate periods. The main issues relating to obligation periods of EEOS, are listed in Table 20.

Table 20: Duration of the Obligation periods – main issues

Issue	MS where issue has been found
Obligation period not defined 4 MS have not explicitly defined obligation period even though they are using EEOS.	Austria, Croatia, Estonia, Malta Malta states that obligation for some eligible actions is past 2020 and for some to be determined. Austria and Estonia however define savings by 2020, which might imply that their obligation period runs until 2020.
The level of expected savings to be achieved over the obligation period is not provided. Some MS have defined the obligation period, but have not quantified the savings to be achieved over the period.	Hungary, Latvia and Spain.

The table below provides an overview of how obligation periods are dealt with by MS that are using EEOS.

Table 21: Indication of obligation periods in the notifications

	Obligation period not defined	Obligation period defined, but savings not quantified for obligation period	No savings quantified for obligation period, but quantified until 2020	Obligation period defined with savings quantified
Austria	x		x	
Bulgaria				x
Croatia	x			
Denmark				x
Estonia	x		x	
France				x
Hungary		x		
Ireland				x
Italy				x
Latvia		x		
Lithuania				x
Luxembourg				x
Malta	x		x	
Poland				x*
Slovenia				x
Spain		x	x	
United Kingdom				x

* Poland only states first obligation period and quantifies the savings.

4.4 Additionality

Annex V, part 4(f) of the EED requires that energy savings should be additional to the required minimum EU levels. This is an important aspect in the EED. Only savings that are above levels that are 'mandatory and applicable in MS under the Union Law' may be counted towards the target. This means that when, for example, energy performance levels or labelling schemes are laid down in EU legislation, then the energy savings stemming from individual actions that result from the automatic transposition of these levels cannot be counted. Only if the nationally established levels are more ambitious than those required at EU level can the savings above the minimum level be counted. The MS should describe how additionality is provided in the calculation of the cumulative energy savings, in accordance with Annex V, part 2(a) and part 3(a).

4.4.1 Best practice

Sweden is assessed as having no or only minor issues regarding additionality and is considered as best practice. Sweden uses only taxation as a policy measure and the savings are calculated using tax levels above minimum required levels.

Belgium (Brussels region – policy measure 'Call for project building practices 2') can be regarded as best practice on additionality to the minimum required level for refurbishments of existing buildings. In the Brussels "Call for project building practices 2", the paragraph on additionality states explicitly that only savings that go beyond the savings obtained by the cost optimum methodology are counted; these cost optimum methodologies are described in a so-called Cost Optimum study.

4.4.2 Main issues

As can be seen in Table 14, most MS did not provide (enough) information in relation to the additionality of the notified savings. The main issues on additionality are listed in Table 22.

Table 22: Additionality – main issues

Issue	MS where issue has been found
No information provided MS do not provide any information at all on additionality.	Bulgaria, Germany, Greece, Hungary, Lithuania, Malta, Poland, Romania, Slovakia and Spain
Not enough information provided Most MS that provided limited information on additionality state that savings will be counted only when they are additional to required minimum efficiency levels, but do not provide any further information about how additionality will be assessed and how corrections will be carried out. Most of these missing information issues are related to the Energy Performance of Buildings Directive (EPBD). The recast EPBD requires MS to establish a cost optimal methodology for new buildings and for refurbishments of existing buildings. Improving the energy efficiency of existing buildings is an important part of the expected energy savings of the MS. Therefore, providing a description of how MS	Austria, Estonia, Luxembourg, Netherlands, Portugal and Slovenia

take the cost optimal methodology into account, as the minimum required efficiency level, is important.	

When we look at the credibility assessments of the notifications of the MS, we see that a lot of MS have a poor credibility and/or lack of information on more than one quality aspect. Cyprus, Czech Republic and the UK are assessed as the only countries having major issues regarding additionality[28]. All other countries (i.e. Belgium, Croatia, Denmark, Finland, France, Ireland, Italy, and Latvia) have minor issues on this aspect in one or more of their notified policy measures. In these cases, the notifications provide information on how additionality is dealt with, however there are minor questions on the robustness of the approach. For example in case of France, it is unclear how the approach taken, using market averages, compares to the methodology to identify cost-optimal energy performance requirements for buildings and building elements as laid down in the EPBD. For Germany, there is serious doubt whether the policy measure targeted on the ETS industry complies with the additionality requirements. However, Germany did not provide the information required to be able to carry out this assessment[29].

4.5 Materiality

EED Annex V, part 2(c), states that 'the activities of the obligated, participating or entrusted party must be demonstrably material to the achievement of the claimed savings'.

From this, it follows that MS may not count individual actions that would have happened anyway. The automatic rolling out of EU legislation, or autonomous improvements because of market forces or technological developments, cannot be taken into account. This bottom-up approach, with emphasis on materiality of actions, is an important change to the earlier NEEAPs, where a top-down approach of calculating the energy savings could be followed. The term 'material' means that:

- the party in question must have contributed to the realisation of the specific individual action in question, and
- the subsidy or involvement of the obligated, participating or entrusted party must not have had what is clearly only a minimal effect in the end user's decision to undertake the energy efficiency investment.

The term 'demonstrably' means that MS must be able to show that this is the case.

4.5.1 Best practice

Best practice regarding materiality is defined as:

- providing explicit information for each policy measure that proves that the expected energy savings attached to the policy measures are the direct result of the policy measure (in accordance with the Guidance on Article 7, paragraph 33).

Belgium, Cyprus, France and Sweden are assessed as having no or only very minor issues on materiality, and are regarded as best practice countries on this issue.

[28] CY: While the Member State has made efforts to address additionality by making references to Directive 2009/15/EC, it however sets standards for ship inspection and does not relate to the EED. CZ: additionality is addressed in the NEEAP, but the provided information is not convincing that the energy savings are additional to minimum EU standards. UK: The updated notification states that because the UK Building Regulations predates the EPBD all the savings in their analysis are therefore additional for the purposes of the EED.
[29] Note also that the policy measures as notified by Germany do not add up to the German target, i.e. more policy measures might be needed.

Sweden uses only taxation as a policy measure and the savings are calculated using tax levels and elasticities. Therefore, it has no issues on materiality. As can be seen in Table 14, most MS did not provide (enough) information on the aspect of additionality.

4.5.2 Main issues

The main issues relating to materiality are listed in Table 23. The main issues concern a lack of information, and more information on the approach taken by the MS is needed to be able to assess the aspect of materiality.

Table 23: Materiality – main issues

Issue	MS where issue has been found
No information provided MS do not provide any information at all on materiality.	Bulgaria, Croatia, Greece, Hungary, Lithuania, Malta, Poland, and Romania
Not enough information provided MS address materiality in a way that does not make it clear how materiality is ensured.	Estonia, Finland, Germany, Luxembourg, Netherlands and Portugal

Note that those MS that are categorized as 'no information provided' or 'not enough information provided', *might* have major issues on materiality – however, there was insufficient information available to determine this. For those MS that did provide information on materiality, Austria, Czech Republic, Denmark, Ireland, Italy, Latvia, Slovenia, Slovakia, Spain and the UK have minor issues on this aspect.

4.6 Lifetimes

The assumed lifetimes of actions have a direct impact on the calculated savings. If the assumed lifetimes are too high, then this will lead to an inflation of the savings. However, if lifetimes are lower than in reality, then this may be a disincentive to the deployment of such actions. Therefore, it is crucial to understand which lifetimes MS have used to calculate the savings.

As lifetime savings are derived from an annual energy saving multiplied by the lifetime of the measure, it is straightforward to establish the annual energy savings in the period to meet the energy end-use savings target. Experience shows that such an approach works well. Most MS (with the exception of Denmark and France) use the 'straightforward approach' which is an approach that can be chosen by the MSs (Guidance Note E2/47, p19). Alternative approaches are used by Denmark and France:

- Denmark applies prioritisation factors that are different weights assigned to the first-year saving according to the lifetime of the measure; and
- France expresses savings in 'kWh cumac', which are the discounted total savings generated over the lifetime of the project.

These methods are legitimate, but may not necessarily guarantee that only savings achieved between 2014 and 2020 are accounted for as required by Annex V part 2(e). However, applying a lower than 1 factor to actions with shorter lifetime counterbalances this effect and, hence, does not result in higher claimed savings. However, we recommend that any savings achieved by measures installed in 2020 may only be accounted for multiplied by a prioritisation factor of 1 or lower in order to be counted against Article 7.

4.6.1 Best practice

Best practice regarding lifetimes includes the provision of a comprehensive list of eligible actions and the assumed lifetimes for each measure.

France has established a detailed and comprehensive list of eligible actions (grouped according to target sectors). Each action has an assigned lifetime, even though it is only referred to in the notification. The list of standard energy saving actions is made public at the website of the responsible ministry (visit http://www.developpement-durable.gouv.fr/-Operations-standardisees-.html).

4.6.2 Main issues

The most common problems relating to missing information regarding the calculation of lifetimes includes:

- lifetimes not specified;
- vague definition;
- white certificates potentially issued for post 2020 savings;
- unjustifiably long lifetimes; and
- questionable allocation of savings over the lifetime of the measure.

Table 24 gives an overview of where we encountered these issues.

Table 24: Lifetimes – main issues

Issue	Sub-aspect	MS where issue has been found
Lifetimes not specified.	Insufficient information.	Belgium (Wallonia), Estonia, Ireland, Poland, Czech Republic, Portugal, Hungary, Spain, Lithuania, Luxembourg, Slovenia, Romania
	Only reference to EU recommended values.	Latvia, Bulgaria, Belgium (Wallonia and Flanders), Ireland
	Lifetimes are taken into account but no information on values.	Austria, Ireland, Belgium (Flanders), Cyprus, Malta and the UK
Vague definition.		Estonia, Netherlands, Greece, Germany
White certificates issued for post 2020 savings.[30]		Denmark, France, United Kingdom, Italy, Belgium (Flanders), Poland
Unjustifiably long lifetimes.		Greece, Germany, Ireland, Belgium (Brussels region)
Questionable allocation of saving over the lifetime.		Finland

[30] This means that if White Certificates are issued for the whole lifetime of the project (and not annually) then saving realised after 2020 can be potentially counted against the EED target, which is not legitimate, see analysis below in this section.

No issues were identified for Sweden, Slovakia and for Croatia.

With regards to lifetimes not specified, several MS:

- Failed to provide sufficient information (Estonia on fiscal incentives; Ireland on smart meters, Accelerated Capital Allowance scheme and Large Industrial Energy Networks; Poland, the Czech Republic, Portugal, Hungary, Romania and Spain claim that they exceed the 2020 horizon, but actual values will be published late; and Lithuania, BE/Wallonia Region for New Voluntary Agreements). Luxembourg has not decided on its approach to cluster all individual actions into two or three lifetime value categories and Slovenia has not decided on this issue yet.
- Gave only a general reference to EU recommendations without specifying the lifetimes (Ireland in its building renovation programmes; Latvia to Annex IV of ESD; Bulgaria and Belgium: Wallonia and Flanders).
- Mentioned that lifetimes are taken into account without defining them. Ireland stated that "the lifetime length of savings is taken into account when calculating deemed savings" in its obligation scheme, but the actual lifetimes are not provided in the notification. Flanders/Belgium claimed that account is taken of the period the measure delivers net energy savings, but lifetimes are not provided. Lifetime is assigned only to some of the measures (Cyprus and Malta in their EEOS) and Austria refers to the straightforward approach, but without defining the lifetime of each action.
- Used vague and general definitions. Estonia uses lifetimes for the actions carried out under its obligation scheme that are "mostly over seven years". The Netherlands claims that "in (nearly) all cases, the lifetime of the savings achieved by means of Dutch policy is more than 7 years; therefore it is not necessary to take account of shorter lifetimes". Germany plans to use 10 to 30 year lifetimes, but fails to provide a lifetime for each eligible action. Greece defines a general lifetime for all measures (more than 10 years). For Slovakia, the legitimacy of stated lifetimes cannot be verified due to the vague definition of eligible actions.

Problems can arise when the total amount of savings generated over the lifetime of a project is embodied in white certificates that are issued at the onset of the project to the obligated party and the **redeemed white certificates are used as proof of compliance**. This issue may pertain to countries that operate white certificate schemes such as Italy, France, the UK, Denmark, BE (Flanders) and Poland. The obligated party receive the white certificates for the whole lifetime savings after an action has been implemented. This can include savings materialising beyond 2020 (for measures with lifetimes going beyond 2020). In some cases it is not clear how it is ensured that those savings post 2020 are excluded from the 2020 targets.

For example:

- Italy – it is not clear from the Italy's notification of whether the white certificates are issued for the whole lifetime of the project once it is implemented or annually. In the former case, if actions with a lifetime stretching beyond 2020 are promoted, the savings embodied in the certificates cannot fully be accounted to implementing Article 7.
- France – expresses savings in 'kWh cumac', which is the discounted total savings generated over the lifetime of the project. This creates the problem that savings generated after 2020 are embodied in the certificate and if the redeemed certificates are fully accounted for under Article 7, then the rule that only savings until 2020 can be considered is violated.

The possible solutions that can be considered by these MS are:

- issuing white certificates covering only the savings generated until 2020 and issuing the

rest then (in 2020?); or

- creating EED compatible white certificates (based on 2014/20 savings) and a non-compatible one that embodies saving that occur post 2020 and hence cannot be counted against the EED target.

The latter option would reduce liquidity on white certificate markets as it would create two products on the market with different prices. However, this is not without precedent (for example, in Italy, several types of white certificate (electricity, gas and transport) are traded).

The use of unjustifiably long lifetimes for certain measures (within the 2020 horizon) was not a common problem in the notifications analysed. However, there are some examples for this issue as well:

- **Unjustifiably long lifetime**. Greece uses a 10-year lifetime for awareness raising and training actions, and Ireland has a 12-year lifetime for actions targeting behavioural change. In addition, the 'Energy House' programme of the BE (Brussels region) notification assumed a 10-year lifetime for measures such as seals on doors and windows. Germany indicated 10-30 years of lifetime in its Federal Advisory Programs for energy auditing, checks and consultation that is too long for education/training actions.
- **Questionable allocation of savings over the lifetime of the action**. Finland assumes that half of the savings of technical measures occurs in the first year.

We do not see a major improvement regarding the quality of information on the lifetimes of individual actions when comparing the updated 5 December 2013 notifications and NEEAPs to the 5 December 2013 notification. Except for Croatia, all other MS failed to provide the missing information.

4.7 Climatic variations

Climatic conditions have a direct impact on the energy savings generated. This is particularly the case when promoting building insulation measures because of the different degrees of heat loss (gain) depending on outside temperatures.

To allow for a better representation of energy savings for heating/cooling and insulation measures in countries encompassing various climatic zones, the EED allows 'adjusting of the savings to a standard value or to accord the different energy savings in accordance with the temperature variation between regions' (Annex V Part 4(h)). The use of climatic adjustment is optional, it is not a requirement. However, once a Member State plans to use it, then that Member State has to provide further information on how the defined climatic zones are translated into the energy savings calculations. Generally, where the climate of a Member State is fairly homogenous across its regions, climatic adjustment is not necessary. Where the climate is more variable, an adjustment is sensible and an average figure based on monitored savings is appropriate as well.

Based on the latest information on the 28 MS, we have found that, compared with the 5 December 2013 notifications, an increasing number of MS have reported that they to plan to use climatic corrections in their energy savings calculations. Altogether 9 countries reported that they do not intend to use this option, while 8 countries failed to provide any information on this aspect. We have found no issues in case of Croatia, Finland and France."

Use of climatic variations	Member States
Yes	Bulgaria, United Kingdom, Greece, France, Cyprus, Spain, Lithuania, Croatia, Czech Republic, Finland, Italy
No	Netherlands, Sweden, Denmark, Estonia, Ireland, Malta, Belgium,

	Luxembourg, Slovenia
No information provided	Slovakia, Poland, Latvia, Germany, Austria, Portugal, Hungary, Romania

4.7.1 Best practice

France defined three climatic zones and uses them consistently in all policy measures related to heat energy savings.

4.7.2 Main issues

Potential problems relating to the use of climatic corrections in the notifications include:

- no information provided apart from the fact that climatic variation is to be used;
- climatic zones are defined, but not translated into savings calculations; and
- non-harmonised use of climatic correction across similar measures.

Table 25 lists MS that did not provide any information at all on the approach taken to address climatic variations or where issues with the approach notified by MS were identified. The table excludes MS that plan not to use climatic corrections. More detailed analysis follows after the table.

Table 25: Climatic zones – main issues

Issue	MS where issue has been found
No information provided	Slovakia, Poland, Latvia, Germany, Austria, Portugal, Hungary, Romania
No information is provided apart from the fact that climatic variation is to be used: The notification refers to the fact that temperature variation will be taken into account, but no further information is given (that is number of zones, basis of zoning and how corrections are made to savings values).	United Kingdom, Cyprus, Czech Republic, Italy, Lithuania, Spain
Climatic zones are defined, but not translated into savings calculations.	Bulgaria
Non-harmonised use of climatic correction across similar measures.	Greece

The UK notification states that 'this impact will form part of their estimation of savings' (SALIX: loans for the refurbishment of public buildings) or 'measurement and verification plan which takes account of climatic variation in calculating the technological saving to be achieved' (RE:FIT: procurement framework for ESCOs). Cyprus claims that 'For any investment made, temperature variations will be taken into account'. Lithuania claims in its 5 December 2013 notification and reiterated in the NEEAP that climate variation 'must be taken into account when calculating the amount of heat energy saved, and the energy savings should be recalculated on the basis of degree days'. In case of Italy, no adjustments for climatic variation are reported in the notification. In the Czech Republic climatic variations are taken into account in the framework of technical standards when calculating the energy performance of a building without further explanation.

Bulgaria defined nine climatic zones, but this information is not translated into the energy savings calculations.

The notification of Greece provides no information on climatic correction for some policy measures where climatic correction would be appropriate and it uses climatic correction for other (similar) policy measures. Greece plans to use climatic correction in building refurbishment programmes in the residential sector (for example, 'Save Energy at Home'), but provides no such information for similar building renovation programmes (for example, 'Save and Save II').

4.8 Double counting

Several policy measures may act upon the same individual action, with the risk of double counting the savings from that action. For example, a house owner may decide to install double glazing, triggered by a higher energy tax, a subsidy and an information campaign. This may lead to double counting in the expected savings of the policy measures and in the actual counting of realised savings.

Article 7(12) is explicit in that no double counting of energy savings from individual actions is allowed: 'MS shall ensure that when the impact of policy measures or individual actions overlaps, no double counting of energy savings is to be made'.

4.8.1 Best practice

Best practice regarding double counting is defined as:

- providing an explicit description of how double counting is corrected, in accordance with Annex V, part 4(f).

MS with no or very minor issues on the aspect of double counting are Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, Sweden and the UK. These are regarded as best practice in this respect. It should be noted that Bulgaria, Denmark and Sweden have only one policy measure, EEOS or tax respectively, making it much easier to avoid double counting.

4.8.2 Main issues

The main issues relating to double counting are listed in Table 26**Error! Reference source not found.**.

Table 26: Double counting – main issues

Issue	MS where issue has been found
No information provided MS do not provide any information at all on the how double counting is avoided.	Estonia, Greece, Hungary, Lithuania, Romania, Slovakia and Spain
Not enough information provided Most MS that provided limited information on double counting simply state that correction will be made, but do not provide any further information about how it will be assessed and how the corrections will be carried out.	Austria, Luxembourg, Malta, Netherlands, Poland and Slovenia

When we assessed the notifications on double counting, we did not identify any MS with major credibility issues. However, 13 of the 28 MS analysed did not provide information or provided insufficient information to be able to assess this aspect.

For those MS that provided information on double counting, Cyprus, France, Germany, Ireland, Italy, Latvia and Portugal are all assessed as having minor issues with this requirement. In these cases, the notifications provided information on how double counting is dealt with, however there were minor questions on the robustness of the approach. For example in case of Germany, the notification states clearly how double counting has been avoided, however, this is not done consistently for all policy measures.

4.9 Calculation of savings for taxation measures

Energy or CO_2 tax measures (Article 9(a)) require special attention because the approach taken to quantify the savings from these measures is different to almost all other types of measure. Specifically, the price signal that is provided by energy and CO_2 taxes is, in most cases, technology/measure neutral, so a range of energy saving behaviours and/or technologies can be encouraged. Therefore, energy taxation measures cannot easily be assessed bottom-up. Instead, they are quantified on the basis of price elasticities, which represent the responsiveness of energy demand to price changes[31].

As shown in Table 27, energy and CO_2 taxes were included by 10 MS and tax rebates for energy savings technologies or measures were notified by 6 MS. In four cases, other tax measures were included in notifications, on the basis that they increase the cost of energy consumption, but are not specifically labelled as energy taxes. In 14 of the notifications, no taxation measures were proposed.

Table 27: Use of taxation measure by MS in their notifications

Energy and CO_2 taxes	Tax rebates for energy saving technologies or measures	Other tax measures	No taxation measures
Austria (electricity, natural gas and mineral oil) Estonia (electricity, natural gas, transport fuels and district heating) Finland (transport fuels) Germany (electricity, fuel oil, petrol, diesel and natural gas)) Greece (heating oil) Ireland (all fossil fuels) Netherlands (electricity, natural gas and transport fuels) Spain (electricity, natural gas and coal) Sweden (electricity,	Ireland (vehicle tax and home renovation tax) Italy (tax deductions for building renovations) Malta (tax incentive for air-conditioning improvements in industry and tax credit scheme for more energy efficient lighting) Portugal (vehicle tax) Croatia (vehicle environmental fee) Netherlands (tax incentives for fuel efficient cars)	Austria (green electricity and road toll) Finland (strategic stockpile fee) Germany (truck toll and air passenger duty) Spain (spent nuclear fuel production, storing spent nuclear fuel and radioactive waste in centralised facilities)	Belgium Bulgaria Cyprus Czech Republic Denmark France Hungary Latvia Lithuania Luxembourg Poland Romania Slovakia Slovenia

[31] An exception is where tax rebates are offered as subsidy to incentivise the uptake of specific energy savings technologies or measures (for example, reduced vehicle tax for the most energy efficient vehicles). For these measures, the savings can be calculated more easily using a bottom-up approach, but care is required when determining the additionality of the policy.

fossil fuels in industry and transport fuels) United Kingdom (coal, gas and non-renewable electricity)			

In most cases, the taxation measures are part of larger package of policy measures i.e. other measures in addition to tax measures have been proposed to meet the target. This requires, as specified in Article 7(12), MS to ensure that no double counting of energy savings is made. In the case of Sweden, this requirement was met by only using taxation measures as the basis for delivering the energy savings target.

In addition, in determining the energy saving from energy and CO_2 taxes, MS are required to follow these principles:

(a) credit shall only be given for energy savings from taxation measures exceeding the minimum levels of taxation applicable to fuels as required in Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity or in Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax (Annex V part 3(a));

(b) recent and representative official data on price elasticities shall be used for calculation of the impact (Annex V part 3(b)); and

(c) the energy savings from accompanying taxation policy instruments, including fiscal incentives or payment to a fund, shall be accounted separately (Annex V part 3(c)).

4.9.1 Best practice

Best practice regarding taxes can be defined as:

- use of taxes that have the effect on end-use energy consumption;
- clearly specifying the calculation approach (including recent price elasticities applied), the treatment of inflation or any other factors linked to structural changes of the economy and how additionality over EU minimum levels in ensured;
- selecting elasticities that are relevant to the country, sector and fuels concerned; and
- addressing possible overlaps with other policies.

No single examples of best practice were identified. The Swedish notification covered a number of elements of best practice, although there were concerns relating to the choice of elasticities selected to assess the savings impacts.

4.9.2 Main issues

A number of issues were identified during the review and are summarised below. These only relate to energy and CO_2 taxes. Issues relating to fiscal measures (such as tax rebates) are dealt with in the previous sections of the report together with other alternative policy measures.

4.9.2.1 Target sectors and segment of taxpayers

In one case (Austria), the target sector for energy and CO_2 taxes was not clearly specified. However, the target sector could be inferred from the energy sources that were targeted. The nature of energy and CO_2 taxes means that they are typically differentiated by fuel type (for example, they are based on energy content or CO_2) rather than by target sector. Therefore, the measures might be classified as cross-sectoral (Estonia's energy and CO_2 taxes, and Germany's energy and electricity tax). However, there were some examples of sector specific measures. The Climate Change Levy in the UK applies to business consumers, but

excludes residential consumers. In Greece, the excise duty on heating oil consumption only applies to the residential sector.

4.9.2.2 Implementing public authority

In almost all cases, the implementing public authority was clearly specified. An exception was the Netherlands, where it was not clear which public authority was responsible for the taxation measures. In the case of Spain, the implementing public authority was not stated at all.

4.9.2.3 Duration of the taxation measures

Since the savings from taxation measures are often short-term behavioural changes, for savings to be realised in 2020 it is required that the fiscal policy remains in place over the full savings period. In several cases, this was not explicitly stated in the notifications (Austria, Finland and Estonia). This is particularly an issue for savings from taxation measures based on short term elasticities since these do not assume significant changes in capital stocks (for example, more efficient appliances), which will lead to savings persisting for the lifetime of the goods.

4.9.2.4 Calculation methodology

The following issues relating to the calculation methodology were identified:

- **Insufficient information on price elasticities.** As described above, the energy savings from energy and CO_2 taxation measures are required to be assessed using recent elasticities of demand with respect to prices. To check that the energy savings have been calculated correctly, information is required on the elasticities that have been applied and their relevance to the sector in question. In two cases (Austria and Ireland) insufficient information was provided.
- **Relevance of the chosen price elasticity to the application.** The elasticities applied should be representative of the sectors concerned, since the elasticities that might be relevant in the transport sector may be different to those in the household sector. They should also be relevant to the national circumstances (for example, the relevant fuel mix and the potential for changing demand and/or fuel switching). Ideally, MS should justify the elasticities that they have applied on this basis. However, insufficient information was provided to support this explanation by Austria, Estonia and Greece.
- **Values for price elasticities used in the energy savings calculation.** A comparison of the values reported in the notifications are summarised below. Only six out of the 10 countries proposing energy or CO_2 taxes provided details of the values used. There are no default values for price elasticities to determine if the energy savings have been calculated correctly or not. However, published literature can provide benchmark values that can be used to determine if the elasticities applied are in the expected range. However, any such benchmarking should be treated with caution and the specific context needs to be understood.

Table 28: Values for price elasticities used in the energy savings calculation

		Benchmark	Estonia	Germany	Greece	Finland	Netherlands	Spain	Sweden	UK
Sector	Fuel									
Households	Oil			-0.05 to -0.2	-0.44				Not reported (small consump-tion)	
	Gas	-0.10 SR	-0.26 SR	-0.05 to -0.2			-0.10 SR, -0.20 LR	-0.19 SR, -0.36 LR		
	Electricity	-0.20 to -0.40 SR	-0.18 SR	-0.05 to -0.2			-0.15 SR, -0.25 LR	-0.18 SR, -0.53 LR	-0.07 SR, -0.50 LR	

		Benchmark	Estonia	Germany	Greece	Finland	Netherlands	Spain	Sweden	UK
Sector	Fuel									
	District Heating		-0.20 SR							
	All fuels	-0.1 to -0.35 SR								
Services	Oil			-0.025 to -0.2					Not reported (small consumption)	
	Gas		-0.26 SR	-0.025 to -0.2			-0.10 SR, -0.23 LR	-0.18 SR, -0.32 LR		
	Electricity		-0.18 SR	-0.025 to -0.2			-0.10 SR, -0.22 LR	-0.03 SR, -0.2 LR	-0.07 SR, -0.50 LR	
	District Heating		-0.20 SR							
	All fuels									
Road transport	Petrol	-0.10 to 0.40 SR	-0.26 SR	-0.25		-0.49 SR	-0.05 SR, -0.40 LR		-0.40 SR, -0.60 LR	
	Diesel	-0.10 to 0.40 SR	-0.26 SR	-0.05		-0.17 SR	-0.05 SR, -0.40 LR		-0.50 SR, -0.00 LR	
	All fuels	-0.10 to 0.40 SR							-0.19 SR, -0.26 LR	
Industrial	Electricity			-0.025			-0.03 SR, -0.10 LR	-0.05 SR, -0.2 LR	-0.00 to -1.24	
	Gas			-0.1			-0.03 SR, -0.15 LR	-0.18 SR, -0.32 LR	-0.21 to -1.43	
	Coal									
	All fuels	0 to -0.5 SR								-0.20
Agriculture and horticulture	Electricity						-0.05 SR, -0.10 LR		-0.39	
	Natural gas						-0.05 SR, -0.23 LR			
	Fossil fuels								-0.21	

Notes: SR = Short Run, LR= Long Run. Finland values are without cross prices elasticities taken into account, so will overstate the level of impact, No data was provided on the elasticities applied in Austria, Ireland, Portugal or Spain

- **Use of long-run elasticities.** Taxation measures will have impacts in the short term (for example, reducing the number of miles driven) and the longer term (for example, purchasing more efficient vehicles). The latter impacts are typically associated with changes in capital stocks and the scale of these impacts is reflected in long-run elasticities. It is arguable whether or not savings from taxation measures quantified using long-run elasticities should be counted as contributing towards the energy saving target. This is because MS can only include savings from 2014 to 2020, so there is a limited time for changes in capital stock and long-run elasticities to be realised. In practice, few MS appear to use long-run elasticities, although it is not clear in all cases. A notable exception is Sweden, which has applied long-run elasticities, but assumed only a proportion of the long-run effects are realised by 2020. In Spain, the June 2014 notification adopts a similar approach to Sweden, with the strength of the elasticities increasing over time to reflect a transition from short-run to the long-run effects. However, unlike Sweden, Spain has also included savings from other policies, so double counting is much more likely.
- **Additionality of taxation measures.** MS can only claim savings for energy and CO_2 taxes that are additional to EU minimum levels of taxation. It was not clear in all cases if MS had taken this into account when calculating the savings. Specifically, in the case of

Greece energy savings were calculated for the national policy to equalise excise duty on heating oil and diesel fuel. However, it was not clear from the notification if this increase in excise duty was over and above the duty level required under the Energy Taxation Directive. In the case of Austria, the notification stated that the taxes lay down higher tax rates than the EU Energy Taxation Directive (Directive 2003/96/EC). However, it is not clear from the reported information that the savings estimate has been made on the basis of just the additional proportion of the tax rate. In the case of the Netherlands and Spain, insufficient information was provided to check that that savings calculation was made on the basis of the additional component of the tax rates over the EU minimum levels.

- **Inclusion of VAT and other non-energy taxes**. Estonia, Finland and Sweden included savings relating to value added tax on general goods and services in their notifications. Other MS included other fees and levies which increase the cost of energy consumption, but are not directly related to the energy or CO_2 content of the fuels. In Austria, charges relating to green electricity and road usage increase the price of electricity and road transportation, respectively. In Finland, a strategic stockpile fee was applied to the price of transport fuels. In Germany, a toll for trucks above a permitted total weight of 12 tonnes for journeys on motorways was included. In Spain, costs relating to spent nuclear fuel production and storage was added to the electricity prices. VAT on fuels and non-energy related taxes will increase the cost of energy consumption. Therefore, this will have the effect of reducing end-use energy consumption. Our interpretation of the Directive is that these measures can be counted as energy and CO_2 taxes (Article 7(9)(a)) even though their primary aim may not be the reductions in energy consumption. However, in such cases, the resulting energy savings need to be well substantiated following the requirements of Annex V Part 3. An alternative interpretation is that since the primary purpose of these measures is not to deliver savings of end use energy, then any price effects cannot be counted against the energy saving target.
- **Overlap with other policy measures.** Savings from energy and CO_2 taxes are calculated top-down, based on elasticities and derived from aggregated statistics. Therefore, there is a risk that savings calculated using this approach will double count the savings claimed from measures quantified bottom-up (for example, based on specific behaviours or technologies). This is because elasticities provide a measure of consumers' response to change in energy prices on their consumption. This response may be associated with behaviours (e.g. car drivers choose to travel less, or drive more efficiently as fuel prices increase) or technologies (e.g. driver choose to purchase more efficient vehicles). Therefore, by claiming savings from tax measures, but also claiming savings from policies which stimulate changes in consumption behaviours or technologies, may double count savings. In some notifications, it was not fully clear that these overlaps had been fully considered (Austria, Estonia and Spain). In other cases, some attempts were made to explicitly deal with this issue. For example, Finland notified that it would count savings from taxation measures in the transport sector; taxation measures in other sectors were excluded due to the risk of double counting. In the UK's notification, an explicit adjustment was made for the Climate Change Levy to consider overlaps with Climate Change Agreements. In Sweden, to avoid this issue, no savings from any bottom-up measures were counted.
- **Inflationary effects.** The elasticities are typically based on real prices. Therefore, for the savings from the taxation measures to remain over the full savings period, it is important that the level of taxation is inflation adjusted. This way, the price signal remains the same even when prices rise in response to inflation. It was not clear in all cases that this adjustment was reflected (Estonia, Spain and Greece). It should be noted that, in part, this relates to the design of the instrument rather than the calculation methodology. For example, if the levy is defined as a specific value, then this value will need to be updated over time. However, if the levy is expressed as a percentage of the value of the fuel (ad

valorem), then as prices increase or decrease (e.g. in response to inflation), so does the tariff associated with the instrument.

5 Monitoring, verification, control and compliance regime

Only through a robust monitoring, verification, control and compliance regime can MS ensure that policy measures deliver real energy savings. A robust monitoring, verification, control and compliance regime provides assurance that the obligated, participating or entrusted parties are performing in accordance with the scheme rules regarding the quality of the measures implemented, their physical installation, that the claimed measures have actually been implemented, and that the measures are delivering the expected energy savings.

The Directive makes important provisions for monitoring, verification, control and compliance regimes to be adopted by MS: Article 7(6) states that MS "*shall put in place measurement, control and verification systems under which at least a statistically significant proportion and representative sample of the energy efficiency improvement measures put in place by the obligated parties is verified. That measurement, control and verification shall be conducted independently of the obligated parties.*"

Following the above, MS need to implement a monitoring, verification, control and compliance regime (also see Article 7(10)(h) and Annex V, part 4) covering all policy measures proposed. Thus, the notifications need to set out in detail how the monitoring, verification, control and compliance regime is going to operate.

The results of our analysis indicate that the area of monitoring, verification, control and compliance is currently only addressed partially by MS notifications. Overall, most MS mention monitoring, verification, control and compliance but do not provide sufficient information (in some cases none) that would allow for an appraisal of its robustness.

Since, for some MS at least, a great deal of additional work is still required to define the policies that will be implemented, it is perhaps not surprising that the monitoring, verification, control and compliance regime is not well specified at this stage. However, at the same time this is an important and necessary component of the notifications, and an area where further efforts are required.

The main issues observed regarding the description of the monitoring, verification, control and compliance regime include:

- **No information or very limited information**: MS do not mention a system for monitoring, verification, control and compliance at all or mention it very briefly (Austria, Bulgaria, Croatia, Germany, Hungary, Netherlands, Poland, Portugal, Romania, Slovakia).
- **Insufficient detail:** MS mention a system for monitoring, verification, control and compliance but do not provide sufficient detail on several aspects of the system (Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Slovenia, Spain, UK).
- **Independence:** MS mention a system for monitoring, verification, control and compliance but do not explain whether it operates independently from the participating parties (Cyprus, Czech Republic) or there are doubts regarding impartiality (Denmark).
- **Coverage**: MS do not implement a system for monitoring, verification, control and compliance for all policy measures (Austria, Estonia, France, Greece) e.g. only describe a monitoring, verification, control and compliance for EEOS but not for the other policy measures proposed.

The remainder of this section provides a brief summary of the appointed monitoring and verifying authorities and the results of a credibility rating, discusses audits, sampling, quality standards, and penalties.

5.1 Overview of monitoring, verification, control and compliance regimes

5.1.1 Appointed monitoring and verifying authorities

According to Annex V(4)(j) MS need to define who the monitoring and verifying authorities are and ensure they are independent from the obligated parties in the case of EEOS but also in general. For example, an industry body representing the interests of energy efficiency companies is not independent and has a conflict of interest when it comes to monitoring the quality of the work carried out by its members. A summary of the appointed monitoring and verification authorities, as set out in MS notifications, is provided below.

Table 29: Appointed monitoring and verification authorities

	independent regulator	energy agency	ministry	local government	arm's length body	programme administrator	not clear
Austria	x						
Belgium		x					
Bulgaria							x
Croatia			x	x			
Cyprus			x				
Czech Republic							x
Denmark		x					
Estonia							x
Finland		x					
France	x		x				
Germany			x			x	
Greece			x		x		
Hungary	x						
Ireland	x						
Italy	x	x	x				
Latvia			x				
Lithuania		x	x				
Luxembourg							
Malta		x					
Netherlands		x	x				
Poland	x						
Portugal							x
Romania							x
Slovakia			x				
Slovenia		x					
Spain					x		
Sweden	x		x				x
UK	x		x	x	x		

	independent regulator	energy agency	ministry	local government	arm's length body	programme administrator	not clear
Total	8	8	11	1	3	1	5

Most MS have appointed ministries to carry out the monitoring and verification followed by independent regulators and energy agencies. When ministries (or programme administrators) are the appointed monitoring and verification bodies there is a risk that those bodies have to monitor their own policies and may have a conflict of interest. Most MS do not explain how independence of the appointed monitoring and verifying authorities is ensured and it is difficult to judge the appropriateness of the appointed bodies on that basis.

5.1.2 Credibility of monitoring, verification, control and compliance regimes

For each country we have assessed the credibility of the monitoring, verification, control and compliance regime based on the information provided in the notification.

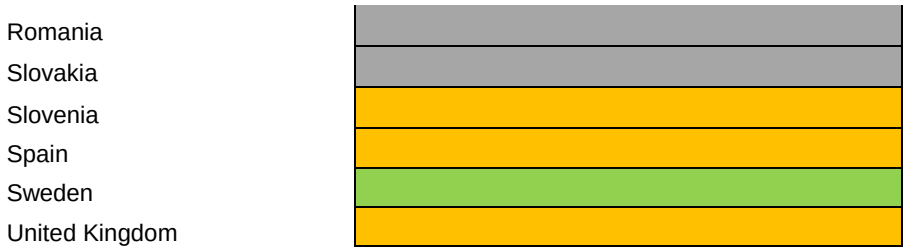
In most cases there is either not enough or no information to perform the assessment or there are some gaps in the information provided making it difficult to judge the credibility. Further information may result in a green rating or, if the information reveals further shortcomings, a red rating.

The table below provides our initial credibility rating for each MS.

Table 30: Credibility rating of monitoring, verification, control and compliance regimes

	no issues
	minor issues but possibilities for major issues
	major issues
	not enough information provided

Austria	
Belgium	
Bulgaria	
Croatia	
Cyprus	
Czech Republic	
Denmark	
Estonia	
Finland	
France	
Germany	
Greece	
Hungary	
Ireland	
Italy	
Latvia	
Lithuania	
Luxembourg	
Malta	
Netherlands	
Poland	
Portugal	



Only two MS provided sufficient evidence that shows they have robust monitoring, verification, control and compliance regimes (Belgium, Sweden).

Due to the uncertainties which are related to the insufficient information our assessment has to be treated with caution. MS that do not provide any information may in theory have a robust monitoring, verification, control and compliance regime in place but do not provide the information in their notification to prove this sufficiently. In other cases the missing information may reveal serious issues that are not obvious from the current notifications.

Below we have addressed in more detail the specific aspects of the monitoring, verification, control and compliance regimes[32].

5.2 Audits

Regular audits are a key component of a credible monitoring, verification, control and compliance regime. Without audits the obligated and entrusted parties may claim energy savings on paper that were never delivered in reality. Audits are a mechanism to satisfy the MS (and ultimately the Commission) that the claimed savings are based on real actions. Credible audits need to be conducted by independent bodies and not by the obliged parties for example (in Denmark energy companies themselves carry out bi-annual audits).

The Directive requires MS to establish audit procedures and protocols (see Annex V, part 4(k)). MS need to notify the Commission of "*their proposed detailed methodology for operation of the energy efficiency obligation schemes and for the purposes of Article 7(9) and Article 20(6). Except in the case of taxes, such notification shall include details of […] (k) audit protocols.*"

5.2.1 Best practice

The **Belgium and Italy notifications** contain detailed descriptions of the audit procedures which allow it to be assessed against the Directive's requirements. In case of Belgium, this includes all three regions (Flanders, Wallonia, and Brussels).

5.2.2 Main issues

Overall, the information on audits provided in the notifications is limited. This may partly be a result of limited guidance with very little information on how audits need to be performed, for example what kind of information needs to be checked during an audit and whether physical inspections are required. It may be helpful to specify in more detail what is expected of MS.

The key issues we found include:

- no information provided;
- insufficient information on auditing provided;
- information only provided for some policy measures; and
- audits not carried out independently.

[32] Since Sweden chose to only use taxation measures, the following sections are not relevant to Sweden (except for penalties)

The table below list all MS where we found those issues followed by further analysis. No issues were found for Belgium and Italy.

Table 31: Audits – main issues

Issue	MS where issue has been found
No information provided: Some MS do not describe the auditing approach.	Austria, Bulgaria, Croatia, Germany, Netherlands, Portugal, Romania, Slovakia, Spain
Insufficient information on auditing provided: Some MS mention audits but fail provide sufficient information that allow for an assessment of its robustness.	Cyprus, Czech Republic, Greece, Estonia, Finland, Hungary, Latvia, Lithuania, Luxembourg, Malta, Poland, Slovenia, UK
Information only provided for some policy measures: Some MS provide good information on auditing approach for some policy measures, no or insufficient information is however provided on other policy measures.	France
Audits not carried out independently: MS does not ensure complete independence of auditing procedures.	Denmark, Ireland

5.3 Sampling

When audits and checks are carried out the sampling approach needs to make sure that a statistically representative sample is selected providing sufficient certainty that there is no sampling bias (e.g. only the best or worst cases are selected).

MS need to put in place measurement, control and verification systems under which *"at least a statistically significant proportion and representative sample of the energy efficiency improvement measures is put in place by the obligated parties is verified"* (see Article 7(6) and Article 7(10)(i)).

5.3.1 Best practice

Ireland and Luxembourg clearly state that audits will be conducted covering a statistically representative sample. The UK does not state it in the notification but refers to guidance documents that explain the sampling approach for EEOS in detail.

5.3.2 Main issues

The notifications currently do not provide sufficient detail on sampling approaches taken by MS. The main issues we found are:

- no information provided;
- no reference to statistically representative sampling given;
- insufficient information on statistically representative sampling provided; and
- information only provided for some policy measures.

The table below lists all the issues and maps them against the MS. No issues were identified for Ireland, UK and Luxembourg.

Table 32: Sampling – main issues

Issue	MS where issue has been found

No information provided: Some MS do not describe the sampling approach at all.	Austria, Croatia, Estonia, Finland, Germany, Hungary, Lithuania, Malta, Netherlands, Poland, Portugal, Romania, Slovakia
No reference to statistically representative sampling given: Sampling is mentioned in notification, but MS fail to explain how it is ensured that a statistically representative sample is monitored.	Bulgaria, Cyprus, Denmark, Greece, Latvia, Spain
Insufficient information on a statistically representative sampling provided: Some countries only state that they monitor a statistically representative sample.	Czech Republic, Slovenia
Information only provided for some policy measures: Some MS provide good information on the statistically representative sample approach for some of the proposed policy measures, no or insufficient information is however provided on other policy measures.	Belgium, France, Italy

5.4 Quality standards

A source of discrepancy between estimated and actual energy savings is related to the technical quality of energy efficiency measures. For example, studies comparing the calculated and measured heating energy consumption of 100,000 dwellings suggested that part of the discrepancy between calculated and actual consumption might be explained by technical faults in the exacting processes of applying insulation materials.[33] This is also known as the 'performance gap'.

It is therefore important to ensure sufficient quality standards are met when energy efficiency actions are promoted. Quality standards can be achieved in a variety of ways, for example through:

- technically monitoring a statistically significant sample of recipients of energy efficiency measures (common for insulation installations);
- customer satisfaction monitoring of a statistically significant sample of recipients of energy efficiency measures, often required of energy providers for heating and insulation installations in properties;
- customer utilisation monitoring of a statistically significant sample of recipients of energy efficiency measures, which ensures that the measures are being used and that energy savings are actually being realised; using an approved list for specific energy efficiency measures;
- appliances and products carrying an energy label; products with specifications for performance such as specific U-values compliant with the national or European standards; and
- ensuring that installers use national best practice guides regarding the installation of energy efficiency measures like insulation and heating.

In recognition of the above, the EED makes provisions that for all of the policy measures an explanation of how high quality of technical measures installed is ensured (see Annex V, part

[33] M. Greller, F. Schröder, V. Hundt, B. Mundry, O. Papert, Universelle Energiekennzahlen für Deutschland–Teil 2: Verbrauchskennzahlentwicklung nach Baualtersklassen, Bauphysik 32 (1) (2010) 1–6.

2(g)): *"in promoting the uptake of energy efficiency measures, MS shall ensure that quality standards for products, services and installation of measures are maintained. Where such standards do not exist, MS shall work with obligated, participating or entrusted parties to introduce them."*

5.4.1 Best practice

The UK notification provides links to guidance documents which set out in detail how quality standards are dealt with. The procedures appear to be robust and the notification goes into sufficient detail.

5.4.2 Main issues

Currently most MS do not describe the quality standards adopted or planned in sufficient detail or no information is provided. We found the following issues:

- no information provided;
- insufficient detail; and
- no quality checks carried out.

MS are mapped against these issues in the table below. No issues were identified for the UK.

Table 33: Quality standards – main issues

Issue	MS where issue has been found
No information provided at all: MS do not explain how technical measures are checked for quality.	Austria, Bulgaria, Croatia, France, Germany, Lithuania, Luxembourg, Netherlands, Poland, Romania, Slovakia, Slovenia, Latvia
Insufficient detail: MS provide insufficient information to ensure the quality of the technical measures.	Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Malta, Portugal, Spain
No quality checks carried out: MS does not carry out quality checks for all policies and/or categories of actions.	Italy

5.5 Penalties

Penalties are essential to ensure compliance particularly when implementing EEOS but also when using alternative policy instruments. Without penalties there is little incentive for obligated parties to follow the requirements. Low penalties may discourage obligated parties to opt for paying the penalty instead of delivering energy savings which would lead to a lower amount of savings delivered by a policy measure than intended.

The Directive makes provisions for penalties involved in non-compliance with the national transposition of Article 7 need to be specified in the notifications (see Article 13). The Guidance Note F paragraph 58 clearly states that MS "*have to lay down rules on effective, proportionate and dissuasive penalties applicable in case of non-compliance with the national provisions adopted pursuant to Articles 7 and 18(3) and must take the necessary measures to ensure that they are implemented.*"

5.5.1 Best practice

Only Belgium, France, Ireland, and Poland included the level of detail on penalties required by specifying the kind of penalty and the amount obligated parties will be charged in case of non-compliance.

5.5.2 Main issues

Only a small number of MS refer to penalties in their notifications (Belgium, Denmark, France, Hungary, Ireland, Italy, Poland, Slovenia, UK and Spain). We found three common issues related to penalties:

- no information provided; and
- insufficient detail

The table below lists all MS where found those issues. No issues were identified for Belgium, France, Ireland and Poland.

Table 34: Penalties – main issues

Issue	MS where issue has been found
No information provided: MS do not mention penalties	Austria, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, Germany, Greece, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Romania, Slovakia, Sweden
Insufficient detail: MS mention penalties but do not provide sufficient detail	Denmark, Hungary, Italy, Slovenia, Spain, UK Denmark provides information on the penalty regime in a separate document but do not specify the level of penalties. The UK mentions penalties for some policy measures, but does not state the level of penalties for those

6 Suggestions to MS for further improvements

When reviewing the notifications we have given guidance to the Commission and provided suggestions to MS for compliance with the EED requirements.

The suggestions have been split into two tables – (1) suggestions that relate to provision of further information in order to assess the compliance with the EED requirements and (2) suggestions on the substance/compliance itself. Those detailed tables are provided in Appendix 2 of this report. The most common suggestions for MS based on 5 December 2013 notifications are listed in those tables, with indication to which country the suggestions apply to.

It should however be noted that the suggestions are expressed in general terms. Also, the tables do not cover very specific suggestions that apply only to one MS. The gaps on "design features" are aggregated for all policy measures and therefore where a gap is identified in regards to one measure it does not necessarily apply to all of the measures.

6.1 Overview of main suggestions

As evidenced by the lengths of the two tables, the notifications frequently provided insufficient information to be able to assess the compliance and therefore most of the suggestions to MS were related to the provision of further information. These have been indicated in Table 36. As shown in the table, the large majority of the suggestions that relate to lack of information are on baseline, exemptions and design features of policy measures.

As regards to the baseline, suggestions included for MS to explain adjustments to the baseline and any baseline discrepancies compared to Eurostat data. In regards to exemptions, we suggested that MS explain the exemptions used and provide calculations. On design features, we have, for example, suggested to almost all MS to provide further information on measurement methodology, monitoring, verification, control and compliance, quality standards and penalties and explain lifetime of measures and how additionality and materiality have been determined. Lack of information on parties involved, duration of intermediate periods and categories of individual actions was identified in regards to fewer countries.

Other suggestions included for MS to provide further information related to overall eligibility of policy packages and savings delivered. For example, recommendations included the provision of evidence that measures were primarily addressed to trigger end use energy savings, and that the expected savings were stated for intermediate periods and for individual policy measures. For MS that had proposed tax measures, the most common recommendations relating to lack of information were to provide further information on elasticities and explain how the elasticities relate to national situation and respective sectors.

Where the notifications provided sufficient information to check the compliance with the EED requirements, a coherence assessment was undertaken. There were occasions where the notifications indicated non-coherence with Article 7 and Annex V provisions – in these cases suggestions for corrective actions were then highlighted, which have also been indicated in Table 37**Error! Reference source not found.**.

The most common suggestions for compliance were issued in relation to policy measure packages and tax measures. For example, for several MS we suggested the introduction of

further policy measures to meet their target, count supply-side savings only within the 25% exemptions bundle and only count the impact of 2014-2020. Fewer issues with non-compliances were identified in relation to baseline, exemptions and target calculations.

6.2 Changes since 5 December 2013 notification

Following the NEEAPs or the updated 5 December 2013 notifications further colour coding has been added to the tables to reflect whether the Member States have followed the recommendations provided. New recommendations do not however appear in colour. Also, the Member States that have submitted neither the NEEAP nor the updated 5 December 2013 notifications appear in grey.

As evidenced by the tables in Appendix 2, the majority of our recommendations have not been followed by the Member States. Comparing the tables further, it is evident that more recommendations were followed that related to provision of further information rather than compliance. Often however where some further information was provided, it was not sufficient to assess the compliance with Article 7 EED and the Guidance.

Overall, it appears that few Member States have followed the recommendations to a higher degree than the others - Austria, Croatia, Spain and Cyprus have all improved their plans for transposition. On the other hand more improvement has been expected from the countries as Spain and Cyprus have issued an updated 5 December 2013 notifications. The rest of the countries that have issued their updated 5 December 2013 notifications (UK, Italy, Latvia, Slovakia and Germany) have also showed some improvement with their transposition plans (Germany to the lesser extent however). As the NEEAPs do not solely address Article 7 EED transposition, they tend to be more general and contain little information about Article 7 transposition. Further information in relation to Article 7 transposition may therefore be expected if updated 5 December 2013 notifications are issued.

7 Suggestions for further guidance

For a number of issues, we concluded that further guidance to MS might be helpful to improve the implementation of Article 7.

7.1 Own energy use

Some MS have corrected the baseline of final energy use for energy production for own use by households and companies. Considering households, this is in accordance with the Guidance, para 10. However, the reference made in Guidance para 10 to point c of part 4 of Annex 4 does not seem specific enough for this purpose.

Paragraph 10 of the Guidance follows Article 7(1) EED, which bases the savings target on energy sales, not on energy consumption. Thus, it follows that energy consumption from own energy production (that is, energy not sold to the final energy consumer by a company), may be excluded from the baseline. For example, this includes energy production with solar cells or solar heaters on the roof of a household or company, own production of wood fuel and the use of coal for energy consumption from own coal mines by industries. However, in our interpretation, direct buying by consumers on the spot market should not to be excluded from the baseline since this energy is sold to the final user and does not constitute own production. The only Member State that uses this latter correction in the notification is Finland (that is, energy bought directly from the Nord Pool market, by industries).

As guidance for MS we suggest that all consumed final energy that is produced by households or companies for own use and is not sold to other consumers may be excluded from the baseline. The methodology to establish the amounts should be justified in the notification. All data used in the calculations should be provided in the notification, with a clear and specific reference (link) to the source of these data.

7.2 Additionality and European minimum requirements

Additionality to current minimum requirements resulting from EU legislation is an important issue, which some MS have not addressed sufficiently. The Guidance sets out the requirements regarding this aspect. It states that only savings resulting from actions going beyond mandatory EU standards can be counted.

However, given that some MS (for example, Ireland and the UK) propose to include large amounts of savings from building regulations and boiler efficiency standards, it may be beneficial to provide more detail in the guidance notes making it clearer what can and cannot be included by MS. This is particularly relevant to the revised Energy Performance of Buildings Directive (EPBD), which requires MS to establish a cost-optimal methodology for new buildings and refurbishments of existing buildings.

As guidance for MS, we suggest that if policy measures support technologies that are also mandatory under European minimum requirements, in particular the revised EPBD (which requires MS to establish a cost-optimal methodology, both for new buildings and for refurbishments of existing buildings) and the Eco-design Directive (which sets minimum standards for energy using products), MS should explain how this activity is additional to the existing European requirements. For example, if promoted through minimum standards, such as building regulations, then only savings from technologies that exceed the minimum European requirements can be counted. If all new boilers are required to have a certain energy performance, only the difference between the required performance and the

performance mandatory under the Eco-design Directive can be counted. The full savings can only be counted when the policies promote technologies that are not required under European legislation (at the time of delivery).

European minimum requirements are not static, but increase over time. This is regardless of when the policy measure was introduced (that is, even if the policy measure pre-dates European minimum requirements, only the additional savings at the time of delivery can be counted). The same applies to early actions – only if early actions exceed the minimum requirements at the time of delivery can the savings be counted.

7.3 Renewable energy technologies

MS often include policy measures that promote renewable energy technologies. The eligibility of such policy measures is of crucial importance due to the recurrent inclusion of such measures in many MS notifications. In our interpretation of Article 7, the measures/actions are eligible if they primarily target energy savings. The argument for this interpretation is based on two principles:

1. RES production/deployment is accounted for by each Member State against its own renewable target defined by the RED. If the same actions are accounted for under the EED and the RED, then it would undermine the coherence of energy efficiency and RES policies at the EU level.
2. Capturing energy saving data from renewable resources is difficult, theoretically and practically. The energy savings from replacing a gas boiler with a heat pump has the potential to decrease primary energy used to meet the same heat demand, but there is not much point of measuring the amount of geothermal heat used as it can be considered abundant with the current deployment level. If only conventional primary energy is used in the calculation, then it is not an energy use calculation but a greenhouse gas focused one (contrasting the amount of gas used with the electricity use of the heat pump). The same applies to the use of solar power. The substitution of fossil fuel with biomass is a borderline case. In this case, it is possible to argue that biomass is a limited resource and, hence, savings can be captured meaningfully, besides the fuel switch.

Furthermore, MS can adjust the baseline for renewable energy generated for their own use (see section 7.1). Counting savings from the same measure would be double counting and needs to be omitted.

Considering the arguments above, we suggest that, as a default, MS should not include renewable energy technologies in the policy measures proposed for the implementation of Article 7. In cases where policy measures combine energy efficiency and renewable actions (such as the complex refurbishment of buildings, including RES element), they should be separated and only the proposed savings of energy efficiency actions should be counted. If the whole policy measure is aimed at deploying renewables (typically, the substitution of fossil-fuel-based production), then it should then be deleted from the list of Article 7 measures.

7.4 EU ETS

Further guidance around the EU ETS exemption may be useful. This relates to the energy sources that can be excluded, and further clarity that the exemption relates to final rather than primary energy.

We suggest the guidance is updated in line with the following comments.

When calculating exemptions under Article 7(2)(b), the following approach should be adopted. Firstly, calculate the annual energy sales to final consumers of all energy distributors or all retail energy sales companies by volume, as an average over the most

recent three-year period (2010/12) with ETS industries included, and calculate the target according to Article 7(1) second subparagraph. Secondly, calculate the average of the energy sales to final consumers without ETS industries included and calculate the target according to Article 7(1) second subparagraph. Thirdly, compare the results from point 1 and 2 to see whether the difference (reduction) with the target calculated according to point 1 does not exceed 25% cap (taking into consideration any other exemptions used).

When calculating the energy consumption by ETS industries, the assessment should be based on final energy consumption. Since some of the activities listed in Annex I of Directive 2003/87/EC are concerned with primary energy use, the energy consumption associated with these activities should be excluded from the calculation. Therefore, the exemption is concerned with final energy consumption by ETS industries and not primary energy consumption.

Since the aviation sector is included in ETS (Annex 1) as of 1 January 2012, it could be used for this type of exemption if MS wish to do so, but only for the final energy consumption covering the year 2012 (not 2010 and 2011).

7.5 Measurement methods

A clear description of the measurement methods used to establish the energy savings is one of the requirements of the Directive. However, most notifications do not sufficiently address the measurement methods used, lacking important detail.

We suggest the guidance is updated in line with the following comments.

When describing measurement methods, MS should:

a) State which of the four measurement methods (deemed, metered, scaled and/or surveyed savings) are used for each policy measure and whether or not different measurement methods have been used for different eligible actions.

b) State what categories and/or individual actions (that is, energy efficiency measures) are included for each policy measure to establish the savings.

c) If deemed and scaled savings are used, describe if and how rebound effects, free-rider effects and performance gaps are taken into account.

d) If based on metered savings, clearly explain the process by which metered savings were established and what sample size was used.

e) If metered and scaled savings are used, describe how factors such as occupancy, production levels and the weather, which may affect consumption, have been taken into account.

f) For scaled savings, state which methodologies and benchmarks have been used and whether or not those have been established by qualified or accredited experts that are independent of the obligated, participating or entrusted parties.

g) For surveyed savings, describe how the surveys will be conducted, whether or not a control group for those consumers not receiving the behavioural change initiatives is to be established and how a statistically relevant sample size will be determined.

h) Explain how the savings have been calculated independently (that is, not based on values proposed by those with a vested interest).

i) List the key sources that have been used for the calculations.

j) Set out how policy overlaps and additionality have been accounted for in the calculations (see section 7.2).

The information listed above would allow for a much more robust assessment of whether or not MS are compliant with the requirements of the Directive and Annex V.

8 Conclusions

The objective of this project is to assess the notified national measures and methodologies under Article 7. Since it is estimated that Article 7 will generate about half of the savings of the EED by 2020, this assessment is important as it gives an indication of whether or not the EED is likely to achieve this goal.

8.1 Overall credibility of savings

We assessed whether the MS will realise the cumulative energy savings target as obliged by Article 7 of the EED. For this overall credibility assessment, we used the various elements as described in this report of a) the notified baselines, b) the notified savings targets, c) the sums of the savings of the notified policy measures, and d) the quality assessment of the policy measures. The methodology we used to assess the credibility of the energy savings in the notifications was based on an analysis of the following elements:

e) **notified baselines**: We checked whether the adjusted baseline was notified by the Member State was equal to or higher than an adjusted baseline calculated using Eurostat data. In making this comparison account was taken as to whether and how the Member State excludes final energy use for transport and/or energy production for own use.

f) **notified cumulative energy savings target:** We checked whether the notified cumulative energy savings target was equal to or higher than the target as calculated using Eurostat data. This took into account the use of exemptions notified by the Member State.

g) **notified expected cumulative energy savings**: We checked whether or not the expected cumulative energy savings of the notified policy measures were equal to or higher than the required target based on Eurostat data.

h) **quality of the notified policy measures**: We reviewed the quality of the information that was notified on policy measures, as a proxy for the likelihood of the policies delivering the expected savings. The review assessed if the MS had demonstrated in their notifications that they had correctly taken into account the requirements from specific provisions in Article 7 and Annex V which are intended to ensure the credibility of the savings notified under the Article. The specific aspects that we assessed were: eligible measure categories and/or individual actions; measurement methods; distribution of savings over the obligation period; additionality; materiality; lifetimes; climatic variations, and double counting. Where the requirements were correctly implemented the savings estimates were considered to have higher credibility, and vice versa.

Following the analysis of the above elements we then classified each of the MS into one of the following categories:

- Green: good confidence that the policy package[34] as notified by the Member State will meet or exceed the required target;
- Amber: minor issues, confidence that the policy package as notified by the Member State will realise 90% or more of the required target;

[34] Where MS notified that they would use more than one policy measure to deliver their energy saving target we assessed the overall credibility of the policy package as a whole.

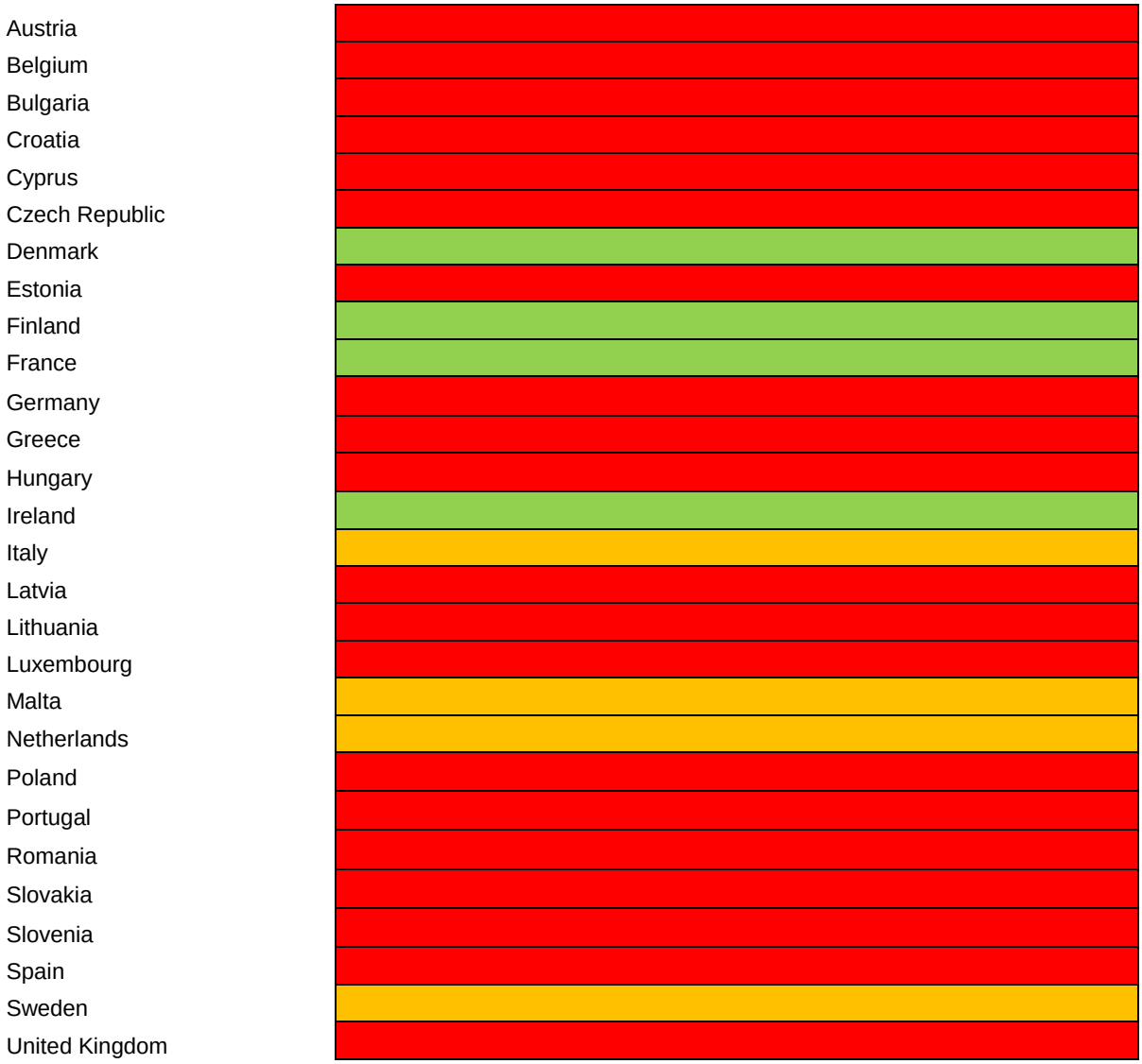
- Red: major issues, risk that the policy package as notified by the Member State will realise less than 90% of the required target either due to insufficient policy savings and/ or significant methodological issues.

This classification was based on expert judgement of the project team flowing the assessment of the all criteria listed above.

The outcome of this assessment is presented in Table 35.

Table 35: Overall credibility rating of the notified policy packages

	confidence that the required target will be met or exceeded
	confidence that the policy package as notified by the Member State will realise 90% or more of the required target
	risk that the policy package as notified by the Member State will realise less than 90% of the required target either due to insufficient policy savings and/ or significant methodological issues

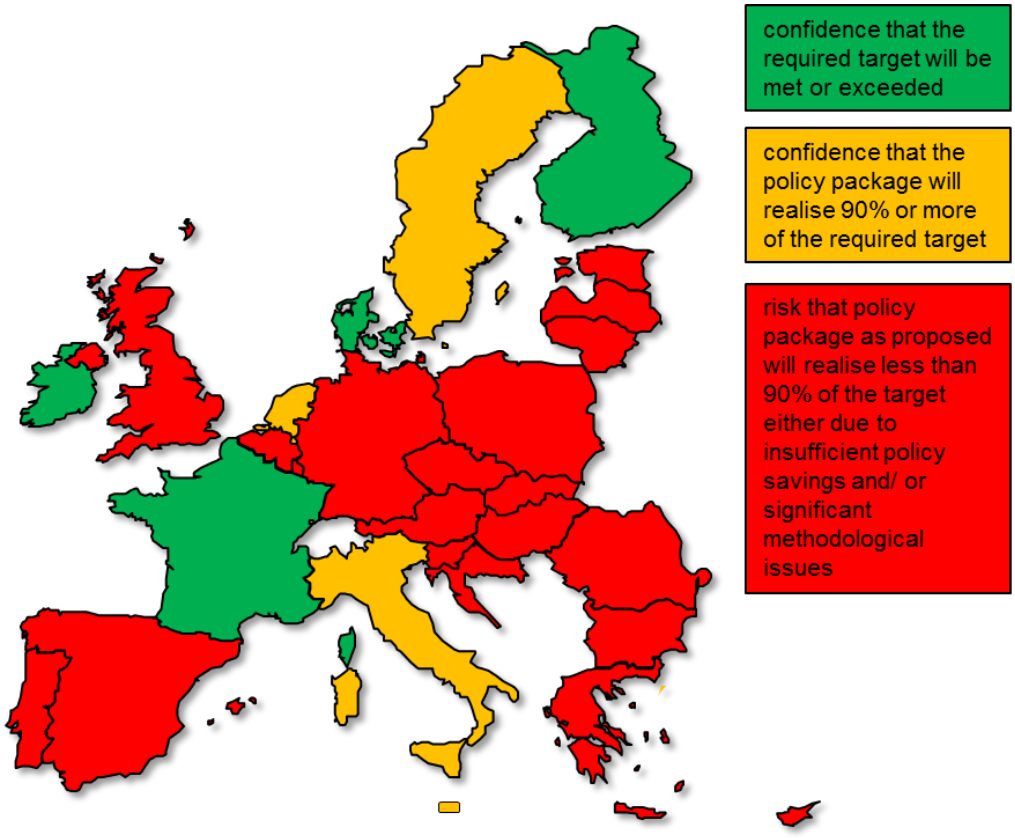


Note that for example a Member State that notified a well-designed and well-described policy package with notified savings that match the notified savings target may be assessed as 'red' in case the notified baseline or notified target is at least 10% lower than the required target based on Eurostat data and without providing sufficient evidence for deductions made. On

the other hand a Member State that notified a policy package with some methodological issues but expected savings that by far exceed the required target, may be assessed as green here.

Figure 14 also presents the results of the analysis in a map format.

Figure 14: Overall credibility rating of the notified policy packages



8.2 Policy measures

One of the EED's primary objectives is to encourage MS to implement an EEOS given the impressive results this instrument has achieved in the EU and overseas. Our initial findings clearly indicate that the EED led to the increased uptake of EEOS across MS – 12 MS plan to implement (Austria, Bulgaria, Croatia, Estonia, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Spain) and five have already implemented EEOS and notified them for the purpose of transposing Article 7[35] (Denmark, France, Italy, Poland and the UK). As 40% of the proposed savings will be generated by EEOS, this makes it the most important policy instrument by far. For some MS, the details of the proposed EEOS are still being developed. However, about two-thirds of all MS have decided to implement EEOS – four using it as the only policy instrument for Article 7 (Bulgaria, Denmark, Luxembourg and Poland). The remaining MS use or plan to use EEOS in combination with other policy measures (Austria, Croatia, Estonia, France, Hungary, Italy, Ireland, Latvia, Lithuania, Luxembourg, Malta, Slovenia, Spain and the UK).

We have assessed the credibility of the savings of all policy measures proposed by MS and our analysis shows that most of the policy measures proposed are associated with minor or major issues regarding their consistency with the EED requirements. Issues of concern include the eligibility of policy measures (for example, whether their primary focus is support of renewable energy), additionality (mainly related to the mandatory EU minimum

[35] Some MS have an EEOS in place but do not notify them (Portugal).

requirements already in place) and the calculation methods of the energy savings used (often lack of sufficient information).

We also determined if the notified policy measures were new or existed before the EED, or have a status that was unclear from the notification or comprised a mix of policies of different status (policy packages with new and existing policy measures). Our findings show that around **75%** of the savings proposed are based on existing policy measures.

A first analysis of the sectoral split of the savings has been carried out that provides an indication of which sectors the savings are likely to come from. It should be noted that MS do not provide a sectoral split of the expected savings in the notifications; sectors had to be inferred by checking each of the 360 policy measures. Most of the savings come from measures that are cross-cutting (such as taxes). Out of the remaining savings, the household sector clearly dominates the sources of savings.

It is not feasible yet to give a thorough credibility rating for all expected savings of all policy measures. If we give an overall credibility rating on the proposed policy packages of MS (on the basis of the criteria derived from the requirements of Article 7 and Annex V of the EED), we see that only the policy measure packages of **Denmark, Finland, France** and **Ireland** can be regarded as having minor or no credibility issues at this stage, compared to the policy packages of other MS, which are notified to deliver the greater part of the expected savings.

8.3 Comparison of targets to initial impact assessment

Our analysis shows that the notified targets and the projected savings from policy measures are slightly lower than (notified targets) or match (savings from policy measures) the European Commission's estimate of the impact of the final EED text[36].

The total annual savings in 2020 derived from the notified energy saving targets is equivalent to 77.8 Mtoe (primary energy) for the EU28 (a detailed description how this has been calculated is provided in the main body of the report section 3.10). In our analysis, we have assumed a linear delivery of savings to 2020. The total projected savings in 2020 from policy measures are 82.6 Mtoe (primary energy).

8.3.1 Comparison to energy saving target

Compared to the figure estimated by the Commission based on the negotiated EED text, the notified targets are 8% lower[37]. Our estimate does not account for MS using the slow-start option which, in theory, increases savings in later years. However, using this exemption (Article 7(2)(a)) has no impact on the actual phasing of when the savings will be delivered, and most MS have not provided annual figures that would allow for this to be checked.

8.3.2 Comparison to policy measures

Similarly, the savings resulting from the policies notified by MS are 3% lower than estimated during the negotiations of the EED proposal.[38] Again, the effect of slow start has not been quantified, but our previous analysis suggests that it is likely to be small.

8.4 Methodological issues

All MS show at least minor issues in any one area, which is often due to insufficient or no information. The quality of the notifications and the detail provided on methodological aspects varies widely, with some MS not providing any information (Bulgaria, Hungary,

[36] The savings and targets are significantly lower than the 2011 Impact Assessment estimate but this estimate did not include exemptions.
[37] A comparison to the initial 2011 Impact Assessment shows that the targets are 31% lower than the expected savings.
[38] A comparison to the 2011 Impact Assessment shows that the savings from policy measures are 27% lower than the expected savings.

Lithuania, Romania and Slovakia) and others (Denmark and Sweden) disclosing close to sufficient detail.

We found several issues regarding:

- lack of completeness of information on methodological aspects;
- insufficient accounting for additionality;
- insufficient accounting for materiality;
- doubts around the credibility of the proposed method;
- using categories of actions that are not eligible within the scope of Article 7;
- reduction factors (such as rebound effects, performance gaps and prebound effects) not addressed when using deemed or scaled savings;
- unrealistic lifetimes used;
- in case of taxation measures, use of inappropriate elasticities and inclusion of non-energy taxes; and
- lack of evidence on how double counting is avoided between policy measures or individual actions.

8.5 Monitoring, verification, control and compliance

For each Member State, we have assessed the credibility of the monitoring, verification, control and compliance regime based on the information provided in the notification. The analysis of the monitoring, verification, control and compliance regimes has been restricted due to a lack of information provided in the notifications. We expected that the NEEAPs and the updated 5 December 2013 notifications would provide further detail as indicated by some MS. However, only a limited amount of additional information has been provided by MS in the NEEAPs and the updated 5 December 2013 notifications.

Hence, our findings so far indicate that most MS need to strengthen their monitoring, verification, control and compliance regimes to follow the requirements of the Directive. Belgium and Sweden appear to have robust monitoring, verification, control and compliance regimes in place.

Due to the uncertainties related to the insufficient information provided by MS, our assessment has to be treated with caution. MS that do not provide any information may, in theory, have a robust monitoring, verification, control and compliance regime in place, but do not provide the information in their notification to prove this sufficiently. In other cases, the missing information may reveal serious issues that are not obvious from the current notifications.

Since, for some MS at least (such as Hungary, Lithuania, Romania and Slovenia), a great deal of additional work is still required to define the policies and methodologies that will be implemented and used, it is perhaps not surprising that the monitoring, verification, control and compliance regime is not well specified at this stage. However, at the same time, this is an important and necessary component of the notifications, and an area where further efforts are required to ensure the proposed savings are delivered in reality.

Appendices

Appendix 1: Detailed table of policy measures and savings

Appendix 2: Detailed list of suggestions to MS

Appendix 1 – Detailed table of policy measures and savings

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
Austria		number of policy measures per policy type (#)	1	-	2	3	1	1	-	-	1
		cumulative energy savings per policy type (ktoe)	-	-	1,956	2,246	430	119	-	-	597
	EEOS		-								
	Grants for building retrofits and energy efficient new buildings					1,744					
	Grants for environmental management in companies					263					
	Feed-in tariff for small scale renewable electricity					239					
	Regulations for district heating						430				
	Advancement of building regulations							119			
	Energy taxes				1,789						
	Other measures										597
	Tolls for trucks				167						
Belgium		number of policy measures per policy type (#)	-	1	-	14	4	3	-	-	-
		cumulative energy savings per policy type (ktoe)	-	34	-	3,044	3,963	99	-	-	-
	companies operating under VER (verifiable emission reduction)						2,288				

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	companies not operating under VER						579				
	grant for roof insulation					1,178					
	grant for wall insulation					131					
	grant for floor insulation					20					
	grant for high efficiency glazing					255					
	Branche agreements 2						843				
	New voluntary agreements						253				
	UREBA ordinaire					67					
	UREBA exceptionnel					17					
	Eco Pack					67					
	grants for energy renovations					236					
	energy grants for citizens					713					
	energy grants for industry					12					
	Call for project building practices 2					4					
	Plage (= 'beach')							31			
	Periodic inspection of boilers							38			
	Energy audits							30			
	Energy house					16					
	Energy grants					295					

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	Passing the costs of occupancy					33					
	Obligation for oil suppliers (mazout)			34							
Bulgaria		number of policy measures per policy type (#)	1	-	-	-	-	-	-	-	-
		cumulative energy savings per policy type (ktoe)	1,944	-	-	-	-	-	-	-	-
	EEOS		1,944								
Croatia		number of policy measures per policy type (#)	1	-	1	8	-	-	-	1	-
		cumulative energy savings per policy type (ktoe)	529	-	29	727	-	-	-	9	-
	EEOS		529								
	Program for energy reconstruction of family houses					102					
	Program for energy renovation of apartment buildings					183					
	Introduction of individual measurements of thermal energy					58					
	Program for energy renovation of public buildings (2014 -2015)					30					
	Program for energy renovation of public buildings (2016 -2020)					43					
	Program for energy renovation of commercial non-residential buildings					219					

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	"Energy-efficient public lighting"					54					
	Financial incentives for energy efficient vehicles					38					
	Promoting eco-driving									9	
	Special tax on motor vehicles based on CO2 emissions				29						
			-	-	-	3	-	-	-	-	2
Cyprus		number of policy measures per policy type (#)	-	-	-	116	-	-	-	-	128
		cumulative energy savings per policy type (ktoe)				5					
	Energy efficiency investments and use of RES in public buildings					68					
	Energy efficiency investments and use of RES by businesses					43					
	Energy efficiency investment and use of RES in homes										69
	Installation of PV systems (Net-metering in the residential sector and auto-production by tertiary sector)										59
	Installation of an integrated AMI system with 500 000 smart meters										
			1	-	2	3	1	1	-	-	1
Czech Republic		number of policy measures per policy type (#)	-	-	-	11	-	-	-	1	
		cumulative energy savings per policy type (ktoe)	-	-	-	4,620	-	-	-	-	-
	Regeneration of tenement houses -					108					

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	Program PANEL respectively. NEW PANEL										
	New Green Savings in 2013					48					
	New Green Savings 2014 -2020					727					
	JESSICA Program					22					
	Integrated Regional Operational Programme					686					
	Operational Programme Environment 2007 -2013					198					
	Operational Programme Environment 2014 -2020					395					
	State programs to promote energy savings and the use of RES (EFFECT) -investment subsidies					4					
	Operational Program Prague pole of growth -the building					4					
	Operational Programme Enterprise and Innovation					516					
	Operational Programme Enterprise and Innovation competitiveness					1,911					
Denmark		number of policy measures per policy type (#)	1	-	-	-	-	-	-	-	-
		cumulative energy savings per policy type (ktoe)	7,908	-	-	-	-	-	-	-	-
	EEOS		7,908								
Estonia		number of policy measures per policy type (#)	1	1	1	1	-	-	-	-	-

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
		cumulative energy savings per policy type (ktoe)	103	-	413	146	-	-	-	-	-
	EEOS (on network operators) plus energy efficiency fund (?)		103								
	Energy and CO_2 taxes				413						
	Financing schemes and instruments					146					
Finland		number of policy measures per policy type (#)	-	-	1	2	2	3	-	-	-
		cumulative energy savings per policy type (ktoe)	-	-	1,979	1,364	3,317	2,159	-	-	-
	Energy efficiency agreement activities						2,589				
	Transport fuel taxation / road traffic				1,979						
	Energy audit activities							233			
	Energy efficiency agreements/Action plan for energy services and Hoyla-III customers						728				
	Heat pumps for single family houses, terraced houses					1,015					
	Boiler house investments					349					
	Energy efficiency regulations for renovation and start-up assistance for building renovation							626			
	Energy efficiency regulations for new construction							1,300			

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
France		number of policy measures per policy type (#)	1	1	-	-	-	-	-	1	-
		cumulative energy savings per policy type (ktoe)	27,212	3,702	-	-	-	-	-	217	-
	EEOS		27,212								
	Energy fund			3,702							
	Renovation passports									217	
Germany		number of policy measures per policy type (#)	-	-	4	7	-	3	-	3	1
		cumulative energy savings per policy type (ktoe)	-	-	14,379	9,178	-	9,446	-	1,332	717
	Energy Savings Ordinance (new built)							2,173			
	Energy Savings Ordinance (existing buildings)							6,771			
	Renewable Energies Heat Act							502			
	KfW programmes for energy-efficient construction and renovation					5,255					
	KfW investment programmes in municipalities and social facilities					192					
	Investment support in companies					2,943					
	Combined Heat and Power Act										

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
						110					
	National Climate Protection Initiative — market incentive programme to promote the use of renewable energies in the heating market (BAFA part)					573					
	National Climate Protection Initiative — further programmes at national level to promote investments in energy efficiency:					74					
	Energy efficiency loans from agricultural pension bank					31					
	Measures implemented by states (Länder)										717
	Energy tax				12,205						
	Truck toll				502						
	Air traffic tax				693						
	EU ETS				979						
	Federal Advisory Programmes									1,256	
	Promotion of energy management systems (EMS) under the Energy Efficiency Fund									21	
	Promotion of municipal concepts and networks									55	
Greece		number of policy measures per policy type (#)	-	-	1	7	-	-	-	4	5
		cumulative energy savings per policy type (ktoe)	-	-	225	384	-	-	-	206	114

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	"Save Energy at Home" Programme					82					
	"Save" Programme										4
	"Save II" Programme										8
	Energy Upgrade of Residential Buildings					177					
	Energy Upgrade of Public Buildings					47					
	Energy Upgrade of Commercial Buildings					34					
	Implementing ISO 50001 standard									25	
	Energy upgrade of commercial buildings through Energy Service Companies										51
	Education and training actions for tertiary sector staff									64	
	Developing smart metering systems for final electrical energy consumption									97	
	Replacing old public and private light trucks					11					
	Replacing old private passenger vehicles					23					
	LPG passenger vehicles					10					
	Excise duty on heating oil				225						
	Information and training actions for domestic users									20	

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	Thessaloniki Metro development										21
	Extension of Athens metro										29
Hungary		number of policy measures per policy type (#)	1	?	?	?	?	?	?	?	?
		cumulative energy savings per policy type (ktoe)	-	-	-	-	-	-	-	-	-
	an EEOS is considered		x								
	other policy measures are not excluded, a decision has not been made yet										
Ireland		number of policy measures per policy type (#)	1	-	1	5	-	5	-	1	-
		cumulative energy savings per policy type (ktoe)	1,083	-	-	1,607	-	594	-	44	-
	EEOS		1,083								
	SME programme					71					
	Large Industry Energy Network					221					
	2008 Building Regulations							238			
	2011 Building Regulations							129			
	2014 Building Regulations							t.b.c.			

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	2015 Building Regulations							30			
	EE boiler regulation for replacement boilers							197			
	Smart Meters									44	
	Accelerated Capital Allowances (ACA)					173					
	VRT/Motor tax					59					
	Home Renovation Tax Incentive					1,083					
	CO2 tax				t.b.c.						
Italy		number of policy measures per policy type (#)	1	-	-	2	-	-	-	-	-
		cumulative energy savings per policy type (ktoe)	16,030	-	-	9,800	-	-	-	-	-
	EEOS		16,030								
	Tax reductions					3,920					
	The thermal account					5,880					
Latvia		number of policy measures per policy type (#)	1	1	-	4	1	-	-	-	1

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
		cumulative energy savings per policy type (ktoe)	851	-	-	280	13	-	-	-	3
	EEOS		851	p.m.							
	NDP2020					145					
	EU Infrastructure and services					90					
	Agreements on energy efficiency						13				
	Modernisation of trains										3
	CCFI					33					
	Public lighting					11					
Lithuania		number of policy measures per policy type (#)	1	-	-	1	-	7	1	3	1
		cumulative energy savings per policy type (ktoe)	-	-	-	-	-	-	-	-	-
	EEOS		-								
	Energy audits and energy management systems									-	
	Long-term buildings strategy for renewal of										

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	the National Fund (draft)										-
	STR 2005: 2.05.01 “Thermal technology of building partitions”							-			
	STR 2013: 2.05.01 “Energy performance of buildings design”							-			
	STR 2005: 2.09.02 “Heating, ventilation and air-conditioning”							-			
	STR 2005: 2.01.09 “Energy performance of buildings. Energy performance certification”							-			
	Energy efficiency of heating systems, verification of compliance with requirements							-			
	Air conditioning systems of buildings energy efficiency requirements for verification of conformity							-			
	The environmental pollution tax relief					-					
	Labelling of energy-related products								-		
	Eco-design (eco-design)							-			
	Information, educational and training activities									-	
	Qualification and certification schemes									-	
Luxembourg		number of policy measures per policy type (#)	1	-	-	-	-	-	-	-	-
		cumulative energy savings per policy type (ktoe)	532	-	-	-	-	-	-	-	-

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	EEOS		532								
Malta		number of policy measures per policy type (#)	1	-	-	14	19	-	-	-	-
		cumulative energy savings per policy type (ktoe)	10	-	-	31	25	-	-	-	-
	EEOS		10								
	Street Lighting Retrofitting (**2 measures**)						5				
	Retrofitting of Energy Efficiency Measures in Public Buildings (**7 measures**)						3				
	Installation of Cogeneration Plants (**2 measures**)						1				
	Initiatives in Government-Owned Industries (**8 measures**)						16				
	Incentive Schemes for Building Envelope Improvement (**2 measures**)					0					
	Solar Water Heater Incentive Scheme					1					
	Energy Efficiency in Low Income Houses in MED Grant Scheme					-					
	Scheme for the Installation of Heat Pumps					0					
	Grant Schemes to Improve Vehicle Fleet Efficiency (**2 measures**)					19					
	Cogeneration Plants in private sector (**3 measures**)					10					

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	Installation of 37 Solar Thermal Water Heaters					-					
	Scheme for the installation of heat pumps of industrial use					0					
	Tax Incentive Scheme for Industry for the Improvement of its Energy Consumption for Air Conditioning					0					
	Tax Credit Scheme to Shift to More Energy Efficient Lighting					0					
Netherlands		number of policy measures per policy type (#)	-		10	10	19	5	-	-	-
		cumulative energy savings per policy type (ktoe)	-	-	1,338	1,052	788	1,994	143	96	5,938
	The notification provided a list with 44 individual policy measures that are counted towards art.7 EED (Annex G). The notification (Annex C) provides ranges of cumulative energy savings per policy package, not for every individual policy measure. A package may consist of several policy measures of different categories. A distinction of cumulative savings over new and existing policy measures is provided. The listing below is extracted from Annex C										
	Buildings (households): EPC=0,6							1,170			
	Buildings (households): Voluntary agreements, existing buildings						621				

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	Buildings (households): Other policy, including energy taxation and SDE supplement				1,147						
	Buildings (households): Further than Ecodesign								143		
	Buildings (utility): EPC and other national policy							549			
	Buildings (utility): Other policy										143
	Buildings (households): Owner-occupier sector										239
	Buildings (households): (Social) rental sector										729
	Buildings (utility): Social and other real estate										1,254
	Industry; Combined impact of existing policy										3,141
	Industry: Energy Investment Allowance (EIA)					358					
	Industry: Long-term voluntary agreement on energy efficiency, ETS companies (MEE)						48				
	Industry: Enforcement, MJA3						24				
	Industry: Enforcement, other industry						96				
	Industry: Enforcement, building-related consumption, industry							275			
	Horticulture: Direct use of solar heat										7

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	Horticulture: LED lighting										38
	Horticulture: Avoidance of summer heating										48
	Horticulture: *Het Nieuwe Telen* [Ecocultivation]										50
	Horticulture: Better insulation										7
	Horticulture: Private system, greenhouse horticulture										239
	Transport: Construction of loading docks for inland waterway transport										10
	Transport: Increase in duty on diesel by 3 ct./l in 2014				177						
	Transport: Increase in duty on LPG by 7 ct./l in 2014				15						
	Transport: Electric cars					168					
	Transport: Modal split in freight traffic through port policy										33
	Transport: Electric bicycles with 10% car replacement (or autonomous)										0
	Transport: Continuation of more fuel-efficient driving among new drivers									96	
	Transport: Continuation of incentives for fuel-efficient cars					526					
Poland		number of policy measures per policy type (#)	1	-	-	-	-	-	-	-	-

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
		cumulative energy savings per policy type (ktoe)	14,818	-	-	-	-	-	-	-	-
	EEOS		14,818								
Portugal		number of policy measures per policy type (#)	-	-	2	3	4	3	4	2	6
		cumulative energy savings per policy type (ktoe)	-	-	69	370	1,010	597	910	502	830
	Green Taxes				47						
	Mobi.E				22						
	Mini-bus										7
	Taxi Management										176
	Soft Modes										15
	RGCE TRP						104				
	Nitrogen					29					
	Fleet Management									88	
	Efficient Equipment								109		
	Efficient Lighting										

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
									298		
	Efficient Windows								4		
	Efficient Insulation							4			
	Green Heat										530
	Residential Certification							118			
	Services Certification							475			
	Solar Residential					233					
	Solar Services					108					
	Transversal measures						414				
	Sectorial measures						414				
	Other sectors									414	
	Energy Certification for State Buildings and Energy Performance Contracts								499		
	Public Administration Energy Efficiency Action Plans - ECO.AP										91
	More efficient State sector transport										11
	Efficient Public Lighting						78				

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
Romania		number of policy measures per policy type (#)		1			2		1	2	
		cumulative energy savings per policy type (ktoe)	-	-	-	-	-	-	-	-	-
	Energy efficiency investment fund										
	Energy audits										
	Training of auditors										
	Consumer awareness campaign										
	Regulations or voluntary agreements										
	Supporting ESCOs										
Slovakia		number of policy measures per policy type (#)	-	-	-	21	-	-	-	-	44
		cumulative energy savings per policy type (ktoe)	-	-	-	622	-	-	-	-	1,464
	Policy measures targeted on building and construction sector (21 measures, mainly loans)					622					
	Policy measures targeted on industry sector (8 measures, type unclear)										663
	Policy measures targeted on public sector (25 measures, type unclear)										391
	Policy measures targeted on transport sector (4 measures, type unclear)										223

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	Policy measures targeted on electric appliances (7 measures, type unclear)										187
Slovenia		number of policy measures per policy type (#)	1	1							
		cumulative energy savings per policy type (ktoe)	314	631							
	EEOS		314								
	National fund 'ECO Fund'			631							
Spain		number of policy measures per policy type (#)	1	1	1	8	-	1	-	1	-
		cumulative energy savings per policy type (ktoe)	11,317	-	2,947	715	-	1,000	-	12	-
	EEOS		11,317								
	Energy efficiency national fund			x							
	Movele					11					
	Pive 3					25					
	Pive 4					120					
	Pive 5					357					
	Pareer										

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
						43					
	Jessica Fund					33					
	Information campaigns									12	
	Pima Air					57					
	Pima Sol					69					
	Tax measures				2,947						
	Eco-driving							1,000			
Sweden		number of policy measures per policy type (#)	-	-	1	-	-	-	-	-	-
		cumulative energy savings per policy type (ktoe)	-	-	11,505	-	-	-	-	-	-
	Energy and CO2-taxes (no other policy measures proposed)				11,505						
UK		number of policy measures per policy type (#)	3	-	1	6	6	3	-	-	1
		cumulative energy savings per policy type (ktoe)	14,617	-	2,666	1,978	6,622	16,939	-	-	344
	EEOS - CERT		9,974								
	EEOS - CESP										

Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
			430								
	EEOS - ECO		4,213								
	Green Deal (domestic)					344					
	Building Regulations domestic							11,264			
	Home Energy Efficiency Programmes (Scotland)					430					
	Private and Social Sector Regulation (Scotland)							172			
	Northern Ireland Sustainable Energy Programme					86					
	Green Deal (non-domestic)					258					
	Building Regulations non-domestic							5,503			
	Smart Metering						1,204				
	CRC						2,236				
	ESOS						1,290				
	CCL				2,666						
	CCAs						1,720				
	SALIX					516					

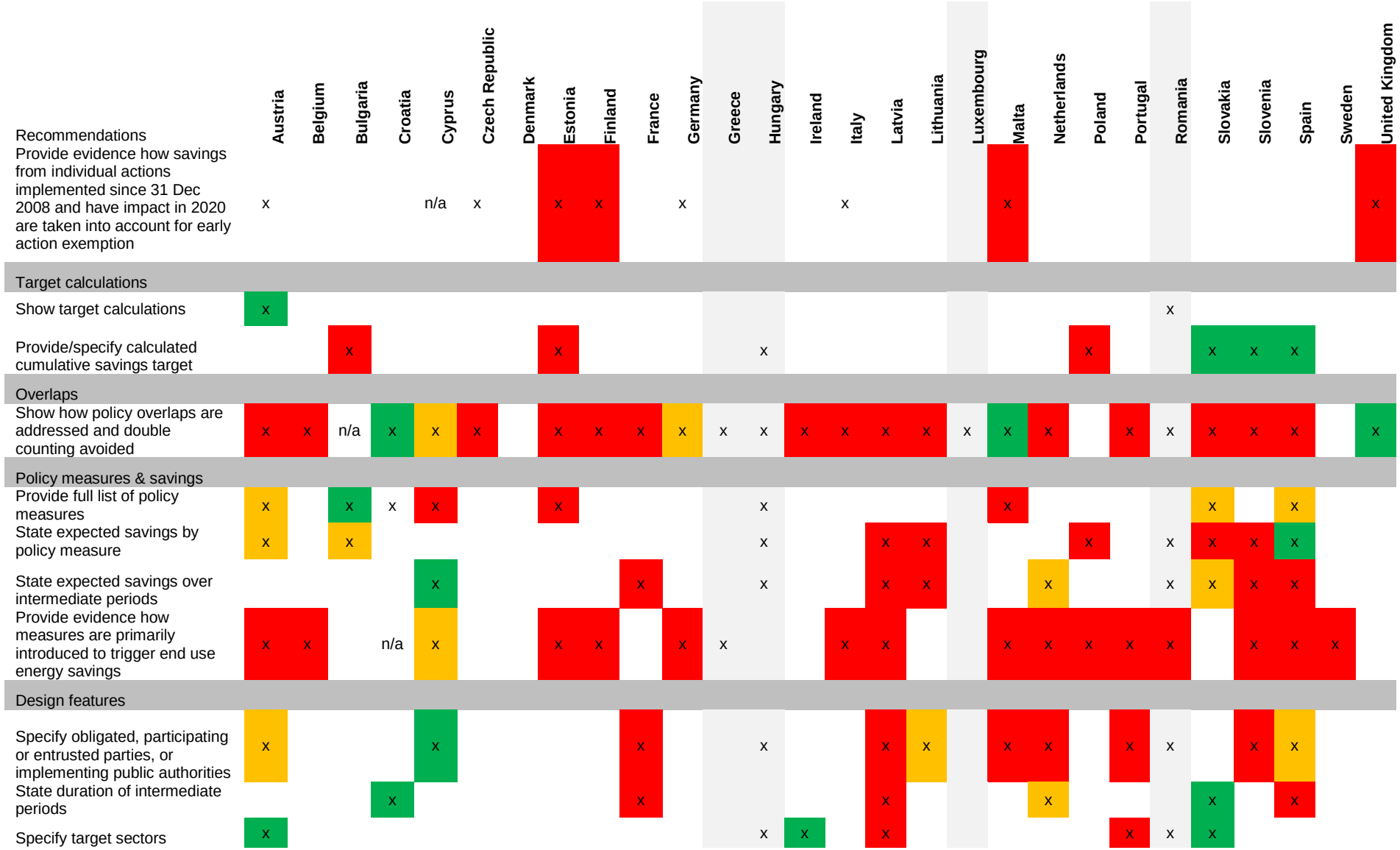
Member State	Policy measures		EEOS	Energy efficiency National Fund	(a) energy or CO_2 taxes	(b) financing schemes or fiscal incentives (incl. grants)	(c) regulations or voluntary agreements	(d) standards and norms mandatory and applicable in Member States under EU-law (*)	(e) energy labelling schemes	(f) training and educationof reducing end-use energy consumption	i) any other policy measures, and/or category not clear
	RE:FIT						86				
	Greening Government Commitment						86				
	Rail electrification										344
	Low emissions vehicle policies					344					
TOTALS (ktoe)			**96,972**	**4,367**	**37,506**	**38,280**	**16,168**	**32,948**	**1,053**	**2,417**	**10,134**

Appendix 2 – List of suggestions to MS

Table 36: Summary of suggestions to MS relating to lack of information

Sufficient information has been provided
Some additional information has been provided, which is however not sufficient
No additional information has been provided
MS has submitted neither the NEEAP nor the updated 05 Dec 2013 notification
n/a The recommendation is no longer relevant as MS has changed its transposition plans

Recommendations	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Baseline																												
Show detailed baseline calculation	x		x																				x	x			x	
Explain adjustments to the baseline	x	x			x			x	x	x	x	x				x				x		x	x	n/a	x		x	
Explain the baseline discrepancy compared to Eurostat data		x			n/a	x							x			x						x		x	x	x	x	x
Explain why other than Eurostat data has been used	x	x	x																							x	x	x
Exemptions under Article 7(2) EED																												
Explain the exemptions used and provide calculations		x	x				x	x		x	x		x		x	x	x	x			x	x	x	x		x	x	x
Clarify how the supply side savings meet the requirements of Article 14(4), Article 14(5)(b) and Article 15(1) to (6) and (9) of the EED								x																				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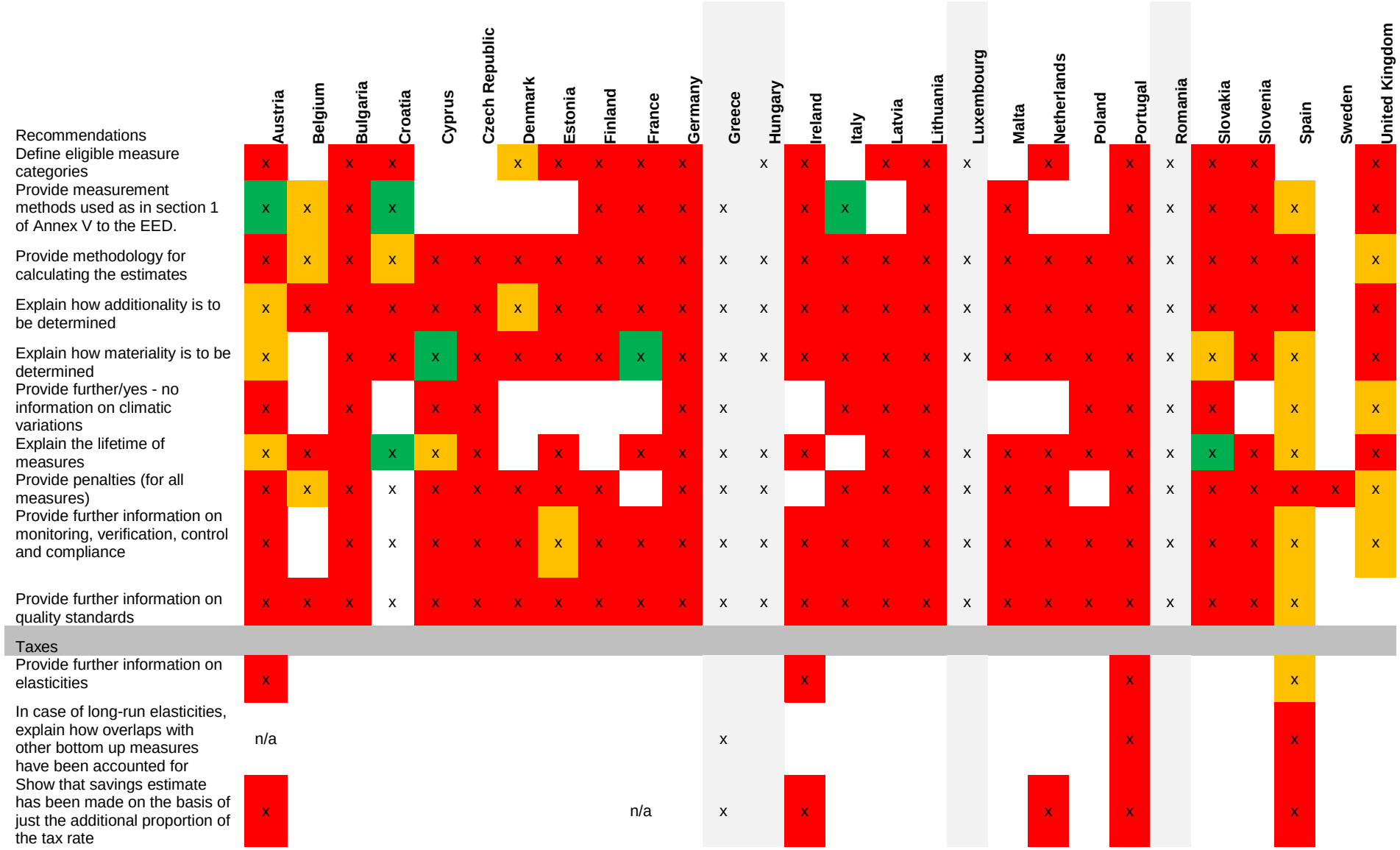
United Kingdom
Recommendations
Provide evidence how savings from individual actions implemented since 31 Dec 2008 and have impact in 2020 are taken into account for early action exemption
Target calculations
Show target calculations
Provide/specify calculated cumulative savings target
Overlaps
Show how policy overlaps are addressed and double counting avoided
Policy measures & savings
Provide full list of policy measures
State expected savings by policy measure
State expected savings over intermediate periods
Provide evidence how measures are primarily introduced to trigger end use energy savings
Design features
Specify obligated, participating or entrusted parties, or implementing public authorities
State duration of intermediate periods
Specify target sectors
n/a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Netherlands
Poland
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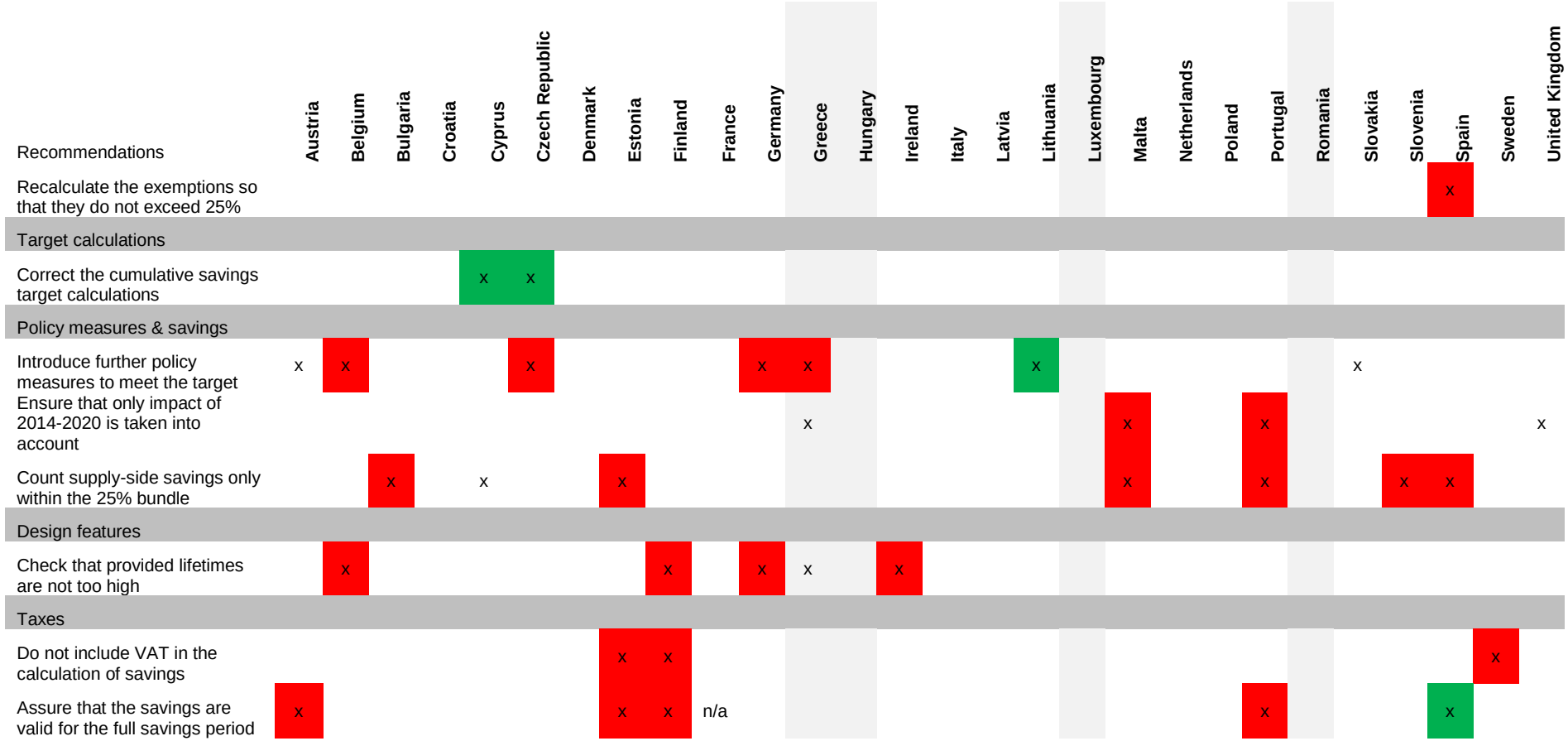
Recommendations
Define eligible measure categories
Provide measurement methods used as in section 1 of Annex V to the EED.
Provide methodology for calculating the estimates
Explain how additionality is to be determined
Explain how materiality is to be determined
Provide further/yes - no information on climatic variations
Explain the lifetime of measures
Provide penalties (for all measures)
Provide further information on monitoring, verification, control and compliance
Provide further information on quality standards
Taxes
Provide further information on elasticities
In case of long-run elasticities, explain how overlaps with other bottom up measures have been accounted for
n/a
Show that savings estimate has been made on the basis of just the additional proportion of the tax rate
n/a

Recommendations	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Show how inflationary effects have been taken into account in the energy savings calculation	x							x				x										x				x		
Explain how the selected elasticities are relevant to the national situation and respective sectors	x							x				x										x				x		

Table 37: Summary of suggestions to MS relating to non-compliances

	MS has complied with the observation
	MS has not complied with the observation
	MS has submitted neither the NEEAP nor the updated 05 Dec 2013 notification
n/a	The recommendation is no longer relevant as MS has changed its transposition plans

Recommendations	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Baseline																												
Recalculate the baseline																			x									
Exemptions under Article 7(2) EED																												


Recommendations
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Spain
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United Kingdom
Recalculate the exemptions so that they do not exceed 25%
Target calculations
Correct the cumulative savings target calculations
Policy measures & savings
Introduce further policy measures to meet the target
Ensure that only impact of 2014-2020 is taken into account
Count supply-side savings only within the 25% bundle
Design features
Check that provided lifetimes are not too high
Taxes
Do not include VAT in the calculation of savings
Assure that the savings are valid for the full savings period
n/a

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