



## ENERGY EFFICIENCY DIRECTIVE - Implementation of the articles 3, 4, 7 and 8

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### INTRODUCTION

The Energy Efficiency Directive (EED) establishes a common framework of measures to promote energy efficiency within the EU Member States (MS). Moreover, it should contribute to achieve the target of 20% increase in energy efficiency by 2020 in EU28<sup>1</sup> and pave the way for further energy efficiency improvements beyond 2020. The focus of the EED is to remove market failures and promote a more efficient use of energy.

The EED consists of minimum requirements and MS have to transpose it into national legislation. This provides MS with a certain degree of liberty in respect of the implementation. The deadline for the transposition was set to 5 June 2014.

The European Commission (EC) remains optimistic about reaching the 20% target providing a full implementation of the existing EU legislation. Currently, MS' energy efficiency targets add up to 17.6% primary energy saving in 2020.<sup>2</sup>

This study provides for views from selected MS on the implementation of four of the most discussed articles in the EED: energy efficiency targets (article 3), building renovation strategies (article 4), energy efficiency obligations schemes or alternative measures (article 7), as well as the energy audits in SMEs and non-SMEs (article 8). The aim is to gather best (and worst) practices across the MS with the implementation of those articles, which focus on energy efficiency in industry, SMEs and buildings.

<sup>1</sup> As stipulated in the conclusions of the European Council, March 2007 and Energy Efficiency Directive 2012/27/EU.

<sup>2</sup> (COM(2015) 574 final, 2015).



## EXECUTIVE SUMMARY AND THE METHODOLOGY

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This study is divided into five chapters, with an executive summary of the main results, followed by chapters covering each of the four articles. Each article chapter is structured in four parts – an introduction describing the legal provision, a section with facts about the transposition in the EU28. The third section provides for the views and experience of BusinessEurope member federations. These are based on answers of 9 member federations<sup>3</sup> to BusinessEurope's online questionnaire. BusinessEurope questionnaire is presented in Annex I, meanwhile some further details according to article 4, 7, and 8 are specified in the Annexes II-IV.

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### ARTICLE 3: Energy efficiency targets

The article 3 outlines the indicative national targets that each MS must specify and is a central provision of the EED. The article will be amended in view of 2030 to underpin reaching the 2030 energy efficiency target in the EU28.

#### Facts about the transposition in the EU28

Nearly half of the MS interpret the target in respectively primary or final energy consumption (13), while ten MS use primary energy savings. In six MS we see final energy saving targets and two use energy intensity. In addition, three MS have sector specific energy efficiency targets for transport or public sector and four MS take national circumstances into account when calculating the target.

#### BusinessEurope member federations' views on the article 3 implementation

The target in article 3 does not cause major difficulties for the federations. However, the challenge concerning the measurement of energy efficiency is repeatedly mentioned in the questionnaire answers. In addition, one federation recommends that existing energy efficiency potential and early actions in MS should also be taken into account when calculating the targets. Another federation commented that the target should be expressed by using only one indicator.

### ARTICLE 4: Building renovation

Energy efficiency in buildings remains Commission's priority, as it is a one of the pillars of the Energy Union. In fact, the building sector accounts for approximately 40% of EU's primary energy consumption.<sup>4</sup> As a consequence, MS must outline a long-term

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<sup>3</sup> Austria, Belgium, Czech Republic, Denmark, Finland, Germany, Ireland, Spain and Sweden. In addition, Italy, Malta and France have commented on the study before it was published as well as Denmark, Finland, Spain and Sweden has.

<sup>4</sup> (COM (2016) 51 final) and (Joint Research Centre, 2016).



renovation strategy to underpin energy efficiency improvements in the European building stock.

## Facts about the transposition in the EU28

31 renovation strategies<sup>5</sup> have been submitted to the Commission including 449 notified policy measures to encourage cost-effective renovations. The most commonly-used measure is a financial and fiscal measure, which is applied in all MS and accounts for 43% of the notified measures. In comparison, the regulatory measures account for 25% and approximately 13% are information campaigns.<sup>6</sup>

## BusinessEurope member federations' views on the article 4 implementation

None of the nine federations consider their national implementation of article 4 as a best practice. This may be because this article is not a focus area in most of the federations. Nevertheless, article 4 has increased the focus on buildings' renovation according to four member federations.

## **ARTICLE 7: Energy efficiency obligation schemes (EEOS)**

The provision of the article 7 obliges MS to save yearly 1.5% of the national annual energy sales to final customers through an EEOS or using alternative measures.

## Facts about the transposition in the EU28

23 MS utilise the 25% exemption in the calculation of the 1.5% energy saving target whereas three MS exempt less than 25%. Two MS have not decided yet.<sup>7</sup> As a result, the expected savings from the article 7 is rather 0.8% than 1.5%.<sup>8</sup>

16 MS have notified an EEOS under the article 7, four of these MS use an EEOS as the only measure while the remaining 12 MS use an EEOS in combination with alternative measures. On the other hand, 12 MS use solely alternative measures. The EEOS covers all sectors in seven MS, while ETS facilities, industry sector, the public sector and parts of the transport sector are examples of sectors that are omitted. In addition, three countries use the EEOS to reduce energy poverty. 24 MS apply alternative measures partly or entirely and in total 372 policy measures are notified under article 7 as alternative measures. So far, the most widely used alternative measure is financing schemes with 133 schemes across EU28.

The cumulative energy savings in this article are expected to be delivered mainly by EEOS (40%), CO<sub>2</sub> taxes (16%) and fiscal incentives (16%).<sup>9</sup> If the cumulative energy

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<sup>5</sup> 27 strategies from MS, three Belgian regions (Brussels, Wallonia and Flemish regions), and one strategy from Gibraltar, which is a part of the British Overseas Territory.

<sup>6</sup> (Joint Research Centre, 2016) and BusinessEurope calculations.

<sup>7</sup> (Ricardo-AEA, 2015).

<sup>8</sup> (Climate policy info hub, 2016).

<sup>9</sup> (Ricardo-AEA, 2015).



savings notified in the article 7 are distributed at sector level, approximately 48% of the savings are achieved in buildings and 11% in the industry.<sup>10</sup>

## BusinessEurope member federations' views on the article 7 implementation

The article 7 may belong to the most discussed articles in the EED. All nine federations (that contributed to this study) have experienced challenges in connection to this article, due to, for instance, too complex implementation.

Three BusinessEurope federations consider a voluntary agreement with industry as an example of a best practice, while another federation calls attention to its good experience with the Energy Efficiency Networks for Industry. On the other hand, one member federation draws attention to their good experience with the EEOS as a marked-based and cost-efficient approach to save energy especially within the industry. However, the cost per kWh energy saving has increased too much recently according to this federation.

## **ARTICLE 8: Energy audits and energy management systems**

The provision of the article 8 obliges MS to promote high quality and cost-effective energy audits and energy/environmental management systems in companies. The objective of the energy audit is to map the company's energy consumption along with the possibilities to improve its energy efficiency. SMEs should be encouraged to undertake an energy audit and implement its' recommendations, whereas non-SMEs are obliged to carry out an energy audit by 5 December 2015 and at least every four years afterwards.<sup>11</sup>

## Facts about the transposition in the EU28

In total, 22 of the 30 MS/regions<sup>12</sup> have transposed the article 8 into the national (regional) legislation. Six MS have the transposition in progress, while the remaining two did not start the procedure yet.<sup>13</sup>

MS have different requirements according to the mandatory energy audit for non-SMEs – in particular there are 25 different definitions of a large (non-SME) company, diverse scopes of the audit, different deadlines and diverse penalties for non-compliance. Furthermore, one MS has a no-fine-period after the deadline. 14 MS have exemptions for certain companies and processes such as companies with annual energy consumption below a certain limit. Moreover, in four MS the energy audits have to cover less than 100% of a company's energy consumption (between 70-90%).

It appears that several MS have support schemes for the energy audit (nine MS) and/or schemes to support the implementation of the energy efficiency improvements (six

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<sup>10</sup> (Ricardo-AEA, 2015). Please note that the split is an approximation, because MS do not provide a sectoral split of the expected savings in their notifications.

<sup>11</sup> (Energy Efficiency Directive 2012/27/EU).

<sup>12</sup> 27 MS and the three Belgian regions (Brussels, Wallonia and Flemish regions). In this chapter concerning article 8 "MS" imply "27 MS and the three Belgian regions".

<sup>13</sup> This analysis is prepared from February to May 2016.



MS). In addition, 23 MS have programs and/or support schemes that encourage SMEs to undergo energy audits.<sup>14</sup>

## BusinessEurope member federations' views on the article 8 implementation

The mandatory energy audit has been implemented in all of the nine MS that contributed to this study. Five federations<sup>15</sup> have experienced difficulties with the energy audit for instance due to lack of a coherent implementation across the EU28 and a too narrow time span to do the first energy audit.

None of the nine federations found their national implementation of article 8 a best practice example even though five MS have had a successful voluntary energy audit scheme before the implementation of the article 8. According to the Finnish federation in Finland this is because the current audit system is worse than the voluntary system earlier.

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<sup>14</sup> (Hirzel, 2016).

<sup>15</sup> The Austrian federation IV has not answered this question.



## In-depth study

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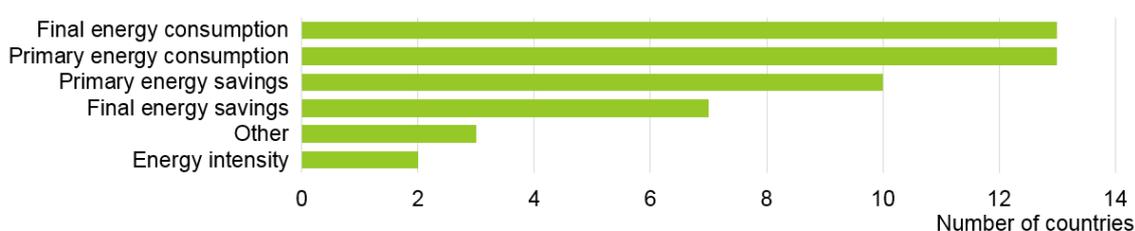
### ARTICLE 3: Energy efficiency targets

Article 3 is the central provision of the EED because it outlines the indicative national targets that each MS must specify. The article will be amended in view of 2030 to underpin reaching the 2030 energy efficiency target in EU28. The target should be based on either primary or final energy consumption, primary or final energy savings, or energy intensity.

### Facts about the transposition in the EU28

Most MS (13) express the target respectively in primary or final energy consumption<sup>16</sup> while only Sweden and Greece do so in energy intensity as illustrated in Figure 1. In addition, three MS have sector specific energy efficiency targets for transport (Finland) and the public sector (Ireland and Portugal).<sup>17</sup>

**FIGURE 1: INDICATIVE NATIONAL ENERGY EFFICIENCY TARGET IN THE EU28 BY TYPE**



**Note:** Final energy consumption: Austria, Croatia, {Czech Republic}, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Lithuania, Luxembourg and United Kingdom. Primary energy consumption: Austria\*, Cyprus, {Czech Republic} Denmark, France, Germany\*, Greece, Hungary, Italy, Malta, Romania, Slovenia and Spain\*. Primary energy savings: Belgium, Bulgaria, Cyprus, {Germany}, Ireland, Latvia, Poland, Portugal and Slovakia and {Spain}. Final energy savings: {Austria}, {Belgium}, Bulgarien, Czech Republic\*, the Netherlands, Slovakia and {Spain}. Energy intensity: Sweden and Greece. Other: Finland\* has a sector specific target at transport and Ireland and Portugal have sector specific targets for the public sector.

**Explanation of the notation:**

{Country} indicates the use of this measurement is only mentioned in (BUSINESSEUROPE, 2016).

\* Indicates that this measurement is not mentioned in (BUSINESSEUROPE, 2016).

**Source:** BUSINESSEUROPE, 2016; NEEAP and MSs' annual reports, 2014 and 2015.

<sup>16</sup> Several MS have recalculated the target into other indicators, which could be why the answers from the questionnaire show a slightly different picture from the NEEAPs for Austria, Czech Republic, Finland, Germany and Spain.

<sup>17</sup> (NEEAP and annual reports, 2014-2015).



The article 3 allows MS to take into account national circumstances affecting primary energy consumption when the indicative national energy efficiency target is set. The EED specifies such circumstances as:

- a) remaining cost-effective energy-saving potential;
- b) GDP evolution and forecast;
- c) changes of energy imports and exports;
- d) development of all sources of renewable energies, nuclear energy, carbon capture and storage;
- e) early action.

Nevertheless, only four MS exploit this option. Lithuania takes GDP and population growth and related increase in energy consumption into consideration, while Malta capped the aviation share at 4.12% and assumes the conversion efficiency for power stations to be 30.31% as in 2009 in the calculation of primary energy consumption. The UK excludes energy consumption covered by ETS in the calculation of final energy consumption. And finally, Estonia considers: climate conditions, economic development, the intensity of building reconstruction and new construction and lastly the rate of abandonment of buildings in the calculation of final energy consumption. While Estonia considers losses and transformation in the energy sector in the calculation of primary energy consumption.

## BusinessEurope member federations' views on the article 3 implementation

The target in article 3 does not cause major difficulties to the federations according to the questionnaire answers. As the Czech respond states: *"There is no problem with the Article 3 implementation from the side of the Czech Republic and/or Czech businesses."*

However, the difficulty with choosing an appropriate indicator for improvements in the energy efficiency is noted. The Danish federation declares: *"The Danish implementation of the article 3 is not a best practice example because it is not measured in energy intensity. The Confederation of Danish Industry would prefer that production and growth are not limited by the absolute energy saving targets. In addition, Denmark does not consider the remaining cost-effective energy-saving potential or early action in the Danish target..."* Swedish federation raises the same point that a target expressed in energy intensity is more suitable to prevent limitations in energy consumption, promote efficient use of energy and at the same time stimulate growth and new investments in industrial production. The Swedish target is currently expressed as reducing energy intensity by 20% compared to 2008.

However, the Finnish federation has experienced that: *"energy intensity is influenced by structural industrial changes in the economy. For instance, energy intensity decreased in Finland, when mobile phone sector grew strongly on 2000-2008 (mainly driven by Nokia), and after its collapse the energy intensity increased again"*. Consequently, Finland expresses the target in final energy consumption despite the fact that the Finnish federation acknowledges *"absolute energy unit does not at all represent measuring energy efficiency."*



The Belgian federation points out that it is not the target that is important but the implementation of the effective measures. The target should take a stock of the MS's energy saving potential that should be calculated with a bottom up approach, looking at existing potential and taking early actions into account. On the other hand, the Italian federation considers it more efficient to express the target by using just one indicator. As lack of uniformity in measuring the target could bring to distortion of the competition and to uncertainty in the accounting of EU energy savings in their view.

## ARTICLE 4: Building renovation

The building sector is an important sector with an extensive potential to improve energy efficiency. Currently, the building sector accounts for approximately 40% of the EU's primary energy consumption and is responsible for 36% of the EU's greenhouse emissions.<sup>18</sup> For this reason, energy efficiency in buildings is among the EC's priorities and a pillar of the Energy Union.<sup>19</sup> Consequently, MS must outline a long-term renovation strategy to underpin energy efficiency improvements in the European building stock and the achievement of the energy efficiency targets in the EU28.

The article 4 of the EED requires MS to establish long-term building renovation strategies with the aim to mobilise investment in renovations of residential and commercial buildings. The strategy should address cost-effective deep renovations and reduce the energy consumption of buildings.

The deadline for the first strategy was 30 April 2014 and it shall be repeated every third year. 31 strategies<sup>20</sup> have been submitted to the EC.

## Facts about the transposition in the EU28

According to the EED, MS have to introduce policy measures to encourage cost-effective renovations.<sup>21</sup> The wide range of applied measures could be categorised as follows<sup>22</sup>:

- **Regulatory measures:** building codes, Minimum Energy Performance Standards for new and existing buildings and refurbishment obligations,
- **Financial and fiscal measures:** grants, subsidies, preferential loans, tax incentives, energy taxation and Energy Efficiency Obligation Schemes,
- **Information campaigns:** awareness raising and information campaigns,
- **Labelling measures:** energy performance certification and energy labelling schemes,
- **Voluntary Agreements:** voluntary certification, voluntary and negotiated agreements,
- **Others measures:** energy audits, skills development and capacity building programme, demonstration programmes, research and innovation programmes, quality standards and smart meter roll-out.

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<sup>18</sup> (COM (2016) 51 final).

<sup>19</sup> (Joint Research Centre, 2016).

<sup>20</sup> It is 27 of the strategies from MS, three from Belgium, and one from Gibraltar.

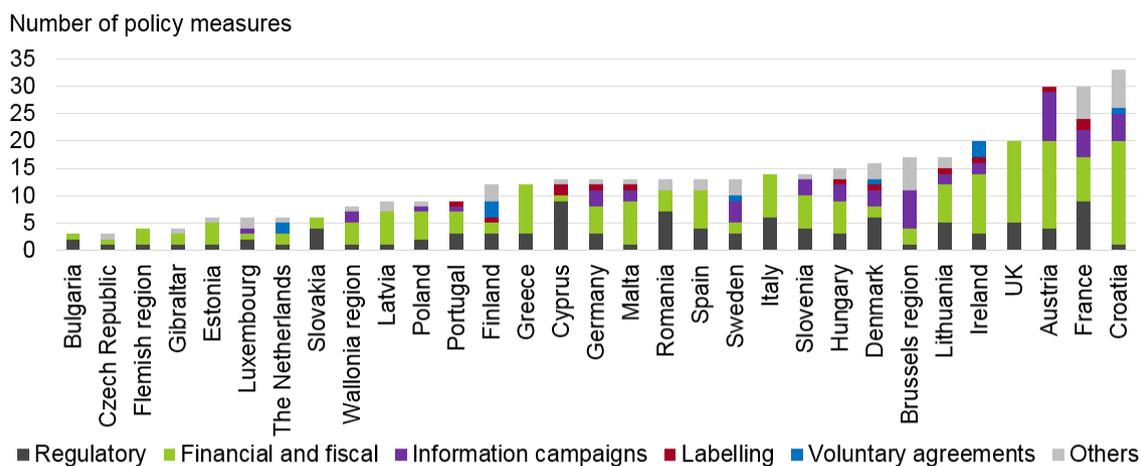
<sup>21</sup> The strategy shall encompass the five elements, which is described in annex II.

<sup>22</sup> (Joint Research Centre, 2016).



The most common applied policy category to support building renovations is ‘financial and fiscal measures’. This category is applied in all MS and accounts for 43% of the measures as Figure 2 illustrates. In comparison, the regulatory measures account for 25%, information campaigns for 13%, while labelling only 3% and voluntary agreements 3%. Other measures account for 12%.<sup>23</sup>

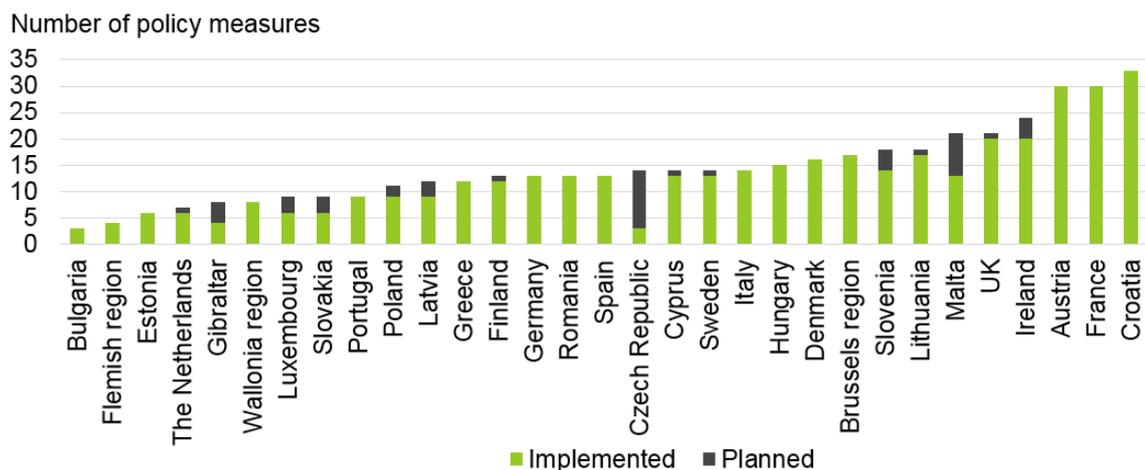
**FIGURE 2: IMPLEMENTED POLICY MEASURES TO INCREASE ENERGY RENOVATION BY COUNTRY AND TYPE**



Source: Joint Research Centre, 2016.

So far the MS have notified 449 policy measures in relation to the article 4. In total 401 are implemented, while 15 MS have planned to implement the remaining 48 measures as illustrated in the Figure 3.

**FIGURE 3: IMPLEMENTED VERSUS PLANNED MEASURES BY COUNTRY**



Source: Joint Research Centre, 2016.

To large extent the policy measures focus at renovations in residential buildings, for example tax relief in Greece, France, Germany, Denmark, Finland, Italy, the

<sup>23</sup> (Joint Research Centre, 2016) and BusinessEurope calculations.



Netherlands and Portugal.<sup>24</sup> Moreover, Italy and the Netherlands have a reduced VAT rate on labour costs for maintenance and renovation of residential buildings to housing corporations and homeowners.

The business-oriented examples could be grants, for example to projects in the public and private sectors in Ireland.<sup>25</sup> In addition, the Netherlands has the Energy Investment Allowance (EIA), a tax-relief program. The EIA enables companies to deduct 41.5% of their expenditures in energy-saving installations or sustainable energy from their taxable profit in the year of purchase.<sup>26</sup> Ireland has a tax-relief program similar to the EIA called Accelerated Capital Allowance (ACA) that enables companies to deduct 100% of the purchase value in the year of purchase.<sup>27</sup>

## BusinessEurope member federations' views on the article 4 implementation

None of the member federations consider their national implementation of the article 4 as a best practice. This may be because this article is not a focus area in most of the federations.

Nevertheless, four federations conclude that the article 4 has increased the focus on the building renovation (Belgium, Denmark, Germany and Ireland). The federations from Austria, Finland and Spain do not share this view. The Czech and Swedish federations have not answered this question. In addition, the Czech federation noted that the article 4 has provided additional stimulus to continue establish the national building renovation financial scheme called the New Green Savings. The Swedish federation noted that the Swedish authorities study the possibilities to expand the loan guarantees for new construction also to renovation. Furthermore, the Swedish member emphasizes that the construction industry in Sweden does not call for investment subsidies.<sup>28</sup>

The Danish federation praised the fact that the nation-wide Danish strategy was created with a broad group of organisations involved and this process created a good debate amongst the stakeholders. Additionally, it increased the focus on building renovation and on how to mobilise investments to renovate the Danish building stock. Yet, the Danish strategy focuses primarily existing policies. Also the Finnish federation experiences that not much new was added in the strategy and the Spanish member federation adds they do not perceive this part of the directive as that relevant in Spain, saying: *"...If the focus on energy efficiency has improved [it] is thanks to companies and business associations. We think it is necessary to reflect the inactivity of public authorities. It exist a contradiction between the European energy efficiency policy objectives and the European System of National and Regional Accounts (ESA10). The accounting treatment for energy performance contracting constitutes a major burden to*

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<sup>24</sup> (Joint Research Centre, 2016).

<sup>25</sup> (Joint Research Centre, 2016).

<sup>26</sup> The individual investment must exceed EUR 450 and no grant is provided for investments above EUR 118,000,000 in a tax year.<sup>26</sup> Examples of energy-saving installations in the program are: heat pumps, cogeneration plants, energy-efficient lighting systems and effective insulation systems. (Taxci - Tax Consultants International , 2016).

<sup>27</sup> (Sustainable energy authority of Ireland, 2016).

<sup>28</sup> (BusinessEurope, 2016).



*the roll-out of energy performance contracts. Eurostat defines energy efficiency investments by default as government expenditure and thus increasing the debt level. European regional and local public authorities need to have this rule changed so that energy performance contracts are considered “off-balance”. This change would incentivize energy efficiency investments via public-private financial schemes, hence creating the most needed local jobs.”* <sup>29</sup>

## ARTICLE 7: Energy efficiency obligation schemes

The provision of the article 7 obliges MS to save yearly 1.5% of the national annual energy sales to final customers. This article is expected to contribute with more than half of the planned energy savings by 2020.<sup>30</sup>

The target in the article 7 could be achieved by an Energy Efficiency Obligation Scheme (EEOS) or/and alternative measures such as voluntary agreements, energy or CO<sub>2</sub> taxes, financing schemes, standards and norms.

### Facts about the transposition in the EU28

Firstly, this section describes the use of the EEOS, followed by the overview of the use of alternative measures. Second part shows some general facts about the article 7 implementation and lastly, it provides the experience of the BusinessEurope member federations.

#### **Energy Efficiency Obligation Schemes**

The EEOS was an instrument already introduced in the legislation preceding the EED, the Energy Service Directive (2006/32/EC) as a recommended tool to achieve energy savings.<sup>31</sup> At present, only four MS have implemented an EEOS as the only measure in line with this article (Bulgaria, Denmark, Luxembourg and Poland). In addition, Portugal has an EEOS but it is not notified as a measure in relation to the article 7, and therefore it is not counted under article 7 for the purpose of the study. The current EEOS have taken very different forms but the common feature is that energy utilities /suppliers are obliged to reach the required cumulative energy savings.<sup>32</sup>

Furthermore, 12 MS apply a combination of EEOS and alternative measures as illustrated in the Figure 4 (Austria, Croatia, Estonia, France, Ireland, Italy, Latvia, Lithuania, Malta, Slovenia, Spain and UK).<sup>33</sup>

10 out of the 16 MS that have notified an EEOS are still planning the implementation (Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Spain). In fact, Bulgaria and Luxembourg are planning to adopt an EEOS as the only measure as indicated in Figure 4.<sup>34</sup>

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<sup>29</sup> (BusinessEurope, 2016).

<sup>30</sup> (Ricardo-AEA, 2015).

<sup>31</sup> (Ricardo-AEA, 2015).

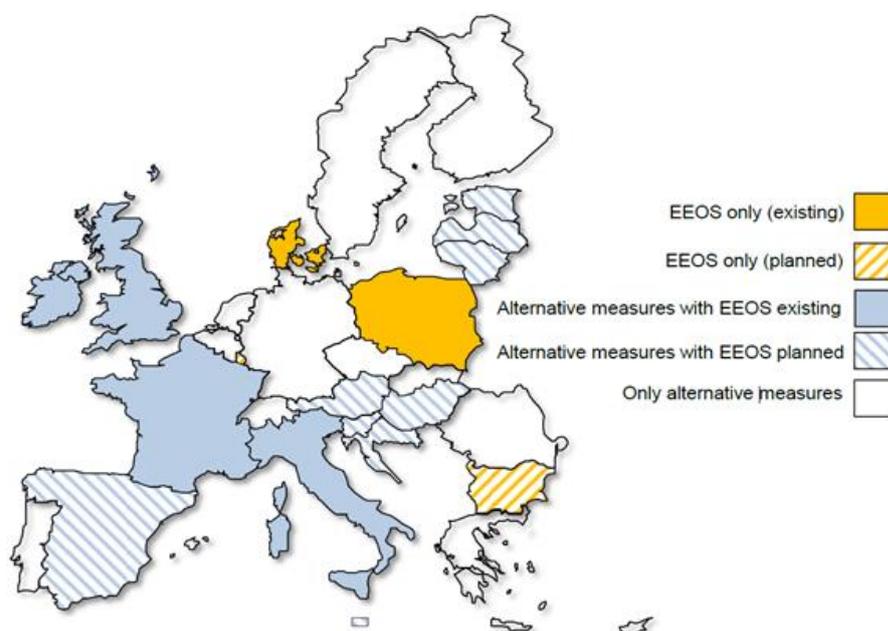
<sup>32</sup> (Ricardo-AEA, 2015).

<sup>33</sup> (Ricardo-AEA, 2015).

<sup>34</sup> (Ricardo-AEA, 2015).



**FIGURE 4: MAP OF MS MEASURE NOTIFIED UNDER THE ARTICLE 7 (PLANNED AND EXISTING)**



**Source:** (Ricardo-AEA, 2015).

In seven MS the EEOS cover all sectors (Austria<sup>35</sup>, Bulgaria, Estonia, Italy, Latvia, Lithuania and Slovenia), while the French EEOS covers all sectors except facilities in the ETS system and in Ireland energy savings in the public sector are excluded. In the UK the EEOS merely includes the residential sector and in Malta it covers electricity users. The Polish EEOS covers end users in the residential, commercial, industrial sectors, as well as energy efficiency improvements in transmission and distribution systems or energy savings in energy companies. Currently, Spain uses an Energy Efficiency National Fund to comply with the article 7. That means that the energy distributors and retail energy sales companies in Spain contribute annually to the fund with an amount equal to the investments required to achieved the saving obligation under the article 7. The fund promotes energy efficient projects through subsidies in the following areas: building refurbishment, transport of goods and people, industrial projects and municipal lighting and desalination plants. Parts of the transport sector are excluded in Denmark and Luxembourg. Whereas in Croatia it is not yet specified, which sectors the EEOS covers.<sup>36</sup>

Furthermore, the EEOS in France, Ireland and UK have a focus on reducing energy poverty and at least 5% of the Irish energy savings have to be realized in energy poor households. In Austria there is no obligation to reduce energy poverty however each kWh saved in an energy poor household counts as 1.5 energy saving.<sup>37</sup> According to another study (Ricardo-AEA, 2015) the EEOS “*have delivered large energy savings at a relatively low cost, leveraging additional capital from recipients and third parties*”, despite the fact that the EEOS have taken very different forms.

<sup>35</sup> Nevertheless, at least 40% of the energy savings in the Austrian EEOS have to be reached in households, private mobility or public transport.

<sup>36</sup> (Ricardo-AEA, 2015) and (BusinessEurope, 2016).

<sup>37</sup> (Fuchs, 2016).

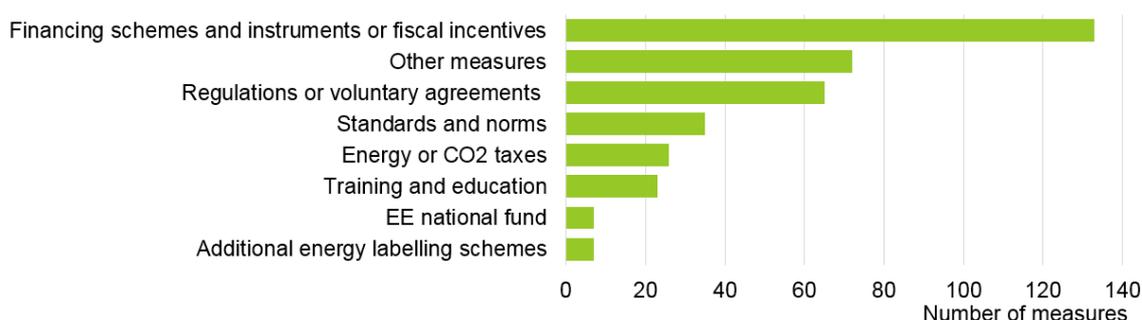


## Alternative measures

Currently, there are 12 MS applying solely alternative measures (Belgium, Cyprus, Czech Republic, Finland, Germany, Greece, Hungary, the Netherlands, Portugal, Romania, Slovakia and Sweden).

The vast majority, 24 MS, exploit alternative measures fully or partly, and it includes a wide range of different schemes. Slovakia is the country applying most types of alternative measures, 65 in total, while the Netherlands has 44 different schemes and Malta 33. In total 372 policy measures are notified under the article 7. That means another 12 measures comparing to other sources (Ricardo-AEA, 2015). BusinessEurope member federations indicated nine additional measures and (University of Piraeus Research Center et. al., 2016) specifies another three measures used in Sweden. These 12 measures are included in this study and indicated with an “?” or “#” in the notes of the Figure 5. The most widely used alternative measure is ‘financing schemes’ with 133 of these across the EU28. In comparison, the energy labelling schemes, in addition to those in the Energy Labelling Directive, are used only seven times as Figure 5 illustrates.

**FIGURE 5: INCIDENCE OF DIFFERENT ALTERNATIVE MEASURES BY TYPE**



**Note:** The sources are not aligned in the description of which alternative measures are used in the MS.

**Financing schemes and instruments or fiscal incentives:** Austria(3), Belgium(14), Croatia(8), Cyprus(3), Czech Republic(11), Estonia(1), Finland(2), Germany(7\*), Greece(7), Ireland(5), Italy(2), Latvia(4), Lithuania(1), Malta(14), the Netherlands(10), Portugal(3), Slovakia(21), Spain(8\*), Sweden(3#) and UK(6). **Other measures:** Austria(1), Belgium(Wallonia 8), Cyprus(2), Finland(?), Germany(1), Greece(5), Latvia(1), Lithuania(1), Portugal(6), Slovakia(44), Sweden(?) and UK(1). **Regulations or voluntary agreements:** Austria(1), Belgium(4), Czech Republic(?), Finland(2), Germany(?), Ireland(?), Latvia(1), Malta(19), The Netherlands(19), Portugal(4), Romania(2), Sweden(4#) and UK(6). **Standards and norms:** Austria(1), Belgium(3), Czech Republic(?), Finland(3\*), Germany(3), Ireland(5\*), Lithuania(7), the Netherlands(5), Portugal(3), Sweden(1\*), UK(3). **Energy or CO2 taxes:** Austria(2), Croatia(1), Estonia(1), Finland(1), Germany(4\*), Greece(1), Ireland(1), the Netherlands(10), Portugal(2), Spain(1), Sweden(1) and UK(1). **Training and education:** Belgium(?), Croatia(1), Czech Republic(?), France(1), Germany(3\*), Greece(4), Ireland(1), Lithuania(3), Portugal(2), Romania(2), Spain(1) and Sweden(3#). **EE national fund:** Belgium(1), Estonia(1), France (1), Latvia(1), Romania(1), Slovenia(1) and Spain(1). **Additional energy labelling schemes:** Germany(?), Lithuania (1), Portugal (4), Romania(1).

**Explanation of the notation:**

(number) indicates how many of the alternative measure that is used in the specified country.

\* indicates that the use of this alternative measure is not mentioned in (BUSINESSEUROPE, 2016).

? indicates that the use of this alternative measure is only mentioned in (BUSINESSEUROPE, 2016). Each “?” is counted as one alternative measure in the addition.

# indicates that the measure is included in (University of Piraeus Research Center et. al., 2016) but not in (Ricardo-AEA, 2015) or in BUSINESSEUROPE, 2016).

**Sources:** (BUSINESSEUROPE, 2016), (University of Piraeus Research Center et. al., 2016) and (Ricardo-AEA, 2015).

## Article 7: Implementation in general

In number of the MS (12) the measures notified under the article 7 are new (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Spain). The measures are partly new in three MS (Austria, Finland and Germany), while the measures are existing in seven MS (Belgium, Denmark, France, Italy, Poland, Sweden and UK). It is unknown if the measures are new or



existing in the remaining six MS (Cyprus, Greece, the Netherlands, Portugal, Romania and Slovakia).<sup>38</sup>

The directive allows the MS to exempt up to 25% of the 1.5% energy saving target. While 23 MS use the maximum exemption (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Slovakia, Slovenia, Spain and UK), few states have different approach. Sweden applies 21% exemption, Denmark 3% and Portugal 0%. Hungary has not yet decided on the exemption and it is unclear in Romania.<sup>39</sup> As a result, the expected savings from the article 7 is rather 0.8% than 1.5%.<sup>40</sup>

In total, the EEOS are expected to deliver 40% of the expected cumulative energy savings in the EU28, far more than any other type of policy measure under the article 7. The three alternative policy measures that generate most cumulative energy savings are – energy or CO<sub>2</sub> taxes (16%), financing schemes or fiscal incentives including grants (16%) and standards and norms (14%).<sup>41</sup>

If the cumulative energy savings, notified in the article 7, are calculated at sector level, approximately 48% of the savings are made in buildings and 11% in industry (26,551 ktoe<sup>42</sup>). In comparison, 3% comes from the transport sector and 13% is due to cross-cutting taxation, while it is unclear which sectors the remaining 25% of the energy savings accounts for.<sup>43</sup> However, due to lack of statistics on the sectorial split of the expected saving the in the notifications by MS, the calculations are only approximate.<sup>44</sup>

Most (75%) of the cumulative energy savings under the article 7 are based on policy measures existing before the EED entered into force. Whereas 19% of the savings are from new measures and for the remaining 6% it is unclear if based on new or existing policy measures.<sup>45</sup>

## BusinessEurope member federations' views on the article 7 implementation

The article 7 may belong to the most discussed articles in the EED. All nine federations (that contributed to this study) have experienced challenges in connection to this article, due to for instance too complex implementation.

The Czech federation stated that this article is the most problematic within the entire directive.<sup>46</sup> And the Finnish federation adds that *"the article 7 overlaps with the national indicative target, which is not a cost-optimal approach."*<sup>47</sup>

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<sup>38</sup> (Ricardo-AEA, 2015).

<sup>39</sup> (Ricardo-AEA, 2015).

<sup>40</sup> (Climate policy info hub, 2016). For more information on the use of exemptions please see Annex III.

<sup>41</sup> (Ricardo-AEA, 2015). Taxes have to be above minimum EU-levels, where applicable, to count as an alternative measure in the article 7.

<sup>42</sup> kilotonne of oil equivalent.

<sup>43</sup> (Ricardo-AEA, 2015).

<sup>44</sup> (Ricardo-AEA, 2015).

<sup>45</sup> (Ricardo-AEA, 2015).

<sup>46</sup> (BusinessEurope, 2016).

<sup>47</sup> (BusinessEurope, 2016).



The Spanish member federation considers the main challenge to achieve the energy saving target in the article 7 as: a lack of awareness and engagement of the end-users of the EEOS or alternative measures; complex implementation; high administrative burden, ensuring consistent application of the requirements with other energy efficiency legislation as well as the limited timeframe (2014-2020) that makes it difficult to attract investment for long term measures.<sup>48</sup>

The Swedish federation thinks that it is positive that there are alternative options to EEOS in the article, since such a system might not be the most cost efficient way to promote energy efficiency in all countries. At the same time, the Swedish federation finds the guidelines for the use of alternative measures vague, which has made it difficult to get an overview of whether the implementation fulfils the requirements of the article 7.

The Belgian as well as the Swedish member federation considers a voluntary agreement with the industry as an example of the best practice. A point where the Finnish industry agrees *“We see the voluntary long-term energy efficiency agreement is an example of the best practices. Finland will continue to use these at least until 2025. The results are good, and all the savings are reported: 12 TWh reported in 2014, which means over 440 million Euros lower energy bill [for the energy consumers]. Companies are satisfied with the scheme despite there are no tax reductions included. The large companies appreciate especially the possibility to fulfil Industrial emissions directive demand: energy use needs to be efficient via agreement.”*<sup>49</sup>

The Danish federation finds the EEOS based on voluntary agreement a best practice example as well. The Danish EEOS has shown to be a cost-efficient way of saving energy and in addition, evaluations of the scheme show about half of the energy savings come from the industrial sector. That shows commitments and full support of the industry for the scheme. Furthermore, it is very important that it is a market-based and cost-efficient approach to save energy. Nevertheless, the cost of the energy savings has increased too much recently. The reason is a combination of a high energy saving target (3% of final annual energy sale to final customers) and the fact that many of the low-hanging energy savings have already been taken in Denmark.

Moreover, the Italian federation considers the mechanism of White Certificates as a best practice because it is a market based scheme that has delivered cost-efficient increases in energy efficiency, especially in industry. In addition, it has promoted cogeneration as well as innovation in technological processes and production. In Italy, the White Certificates scheme is the main regulatory instrument promoting energy efficiency. Lastly, the German federation points to their good experience with the Energy Efficiency Networks for Industry.

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<sup>48</sup> (BusinessEurope, 2016).

<sup>49</sup> The Industrial Emissions Directive (IED) is the main EU instrument regulating pollutant emissions from industrial installations in particular through better application of Best Available Techniques (BAT). BAT conclusions shall be the reference for setting the permit conditions to installations covered by the IED. BAT for energy efficiency and associated energy consumption levels are given in the appropriate sector-specific (vertical) BAT Reference Documents (BREFs). For more information, please see (European Commission, 2016).



## ARTICLE 8: Energy audits and energy management systems

In terms of the energy audits and management systems, the article 12 of the Energy Service Directive (2006/32/EC) preceded the provisions of the article 8 in the EED. However, the article 8 in the EED has been tightened and has more focus on an actual implementation of energy audits, environmental or energy management systems.

More specifically, the article 8 obliges MS to promote and ensure the use of high quality and cost-effective energy audits and energy/environmental management systems in companies. Whilst non-SMEs are required to carry out an energy audit by 5 December 2015 and at least every four years afterwards, SMEs should be encouraged to undertake energy audits and implement their recommendations.<sup>50</sup>

The energy audit has to map the company's energy consumption along with possibilities to improve its energy efficiency.

### Facts about the transposition in the EU28

In total, 22 of the 30 MS/regions<sup>51</sup> have transposed the article 8 into the national (regional) legislation. Six MS have the transposition in progress (Croatia, Estonia, Luxembourg, Greece, Latvia, Wallonia Region), while the remaining two did not start the procedure yet (Slovenia and Poland).<sup>52</sup>

The amount of companies that are obliged to undergo an energy audit varies largely across the MS. In Malta, it is 54 entities while in Germany the expected number is 50,000 companies.<sup>53</sup>

The transposition of the mandatory energy audit is quite different across MS. Firstly, the 30 MS have 25 different definitions of a large (non-SME) company.<sup>54</sup> 23 of the definitions are based on the EU definition of a SME “...enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million;” (2012/27/EU, 2012). Despite the fact that Poland and Slovenia have not transposed the obligation into their national legislation, both MS have a definition of a non-SME.

Secondly, there are also different interpretations as to which parts of the company fall into scope of a non-SME. As (Hirzel, 2016) writes: “Generally, the Member States deal differently with multi-national and multi-site companies. Some Member States take all company parts located inside and outside their national territory into consideration for determining the status as an SME [...] The majority of Member States have limited the scope of the energy audits to company parts located within their national territory.”

Also, the deadline for the energy audit is another issue that varies across the EU. The Figure 6 illustrates that nearly half of the MS (12) use 5 December 2015 as deadline as

<sup>50</sup> (Hirzel, 2016) and (Energy Efficiency Directive 2012/27/EU).

<sup>51</sup> 27 MS and the three Belgian regions (Brussels, Wallonia and Flemish regions). In Belgium, the mandatory energy audit is a regional matter, which is why the requirements in Belgium differs across regions. In this chapter concerning article 8 “MS” imply “27 MS and the three Belgian regions”.

<sup>52</sup> (BusinessEurope, 2016), (Joint Research Center, 2015) and (NEEAP and MS' annual reports, 2014 and 2015).

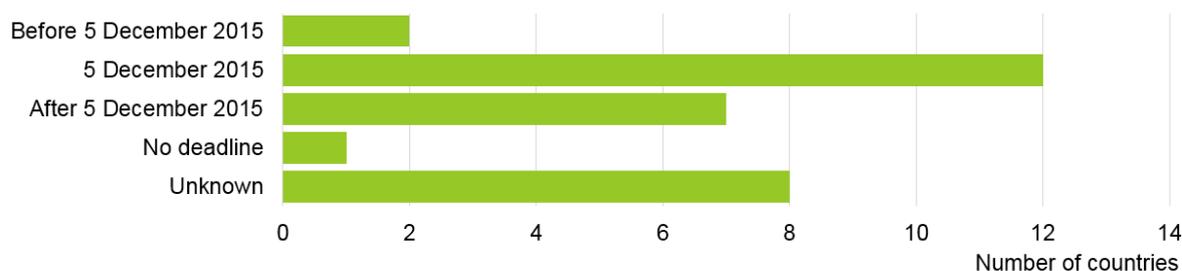
<sup>53</sup> (Hirzel, 2016) and (COM, 2015a).

<sup>54</sup> For more information please see annex IV.



stated in the EED article 8, section 4. In Austria and the Flemish region, the deadlines are set even before this date, respectively 30 November and 1 December 2015. And seven MS have a later deadline, while Brussels region has no final deadline and instead it stipulates that companies need to have an energy audit undertaken within the last 12 months before they can obtain a new permit or a re-application.

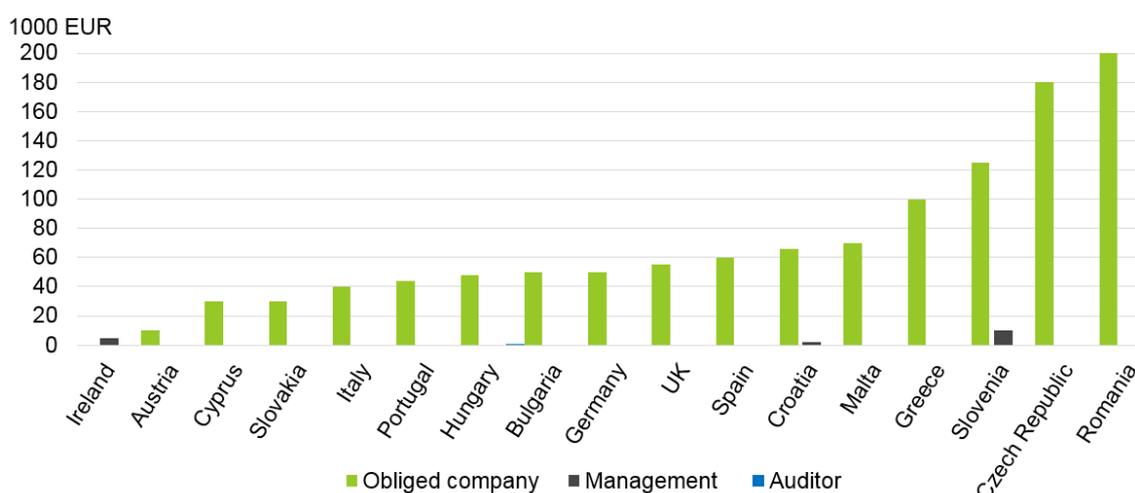
**FIGURE 6: DEADLINES FOR THE MANDATORY ENERGY AUDIT FOR NON-SMES BY CATEGORY**



**Note:** Before 5 December 2015: Austria (30 November 2015) and the Flemish region (1 December 2015). 5 December 2015: Croatia, Finland, Germany, Italy, Ireland, Latvia, Lithuania, Malta, Portugal, Romania, Slovakia and UK. After 5 December 2015: Czech Republic (January 2016), Bulgaria (15 May 2016), France (30 June 2016), Denmark (1 July 2016), Greece (9 November 2016), Spain (13 November 2016) and Sweden (first quarter of 2017). No deadline: Brussels region. Unknown: Wallonia region, Cyprus, Estonia, Hungary, Luxembourg, the Netherlands, Poland and Slovenia.  
**Sources:** (BUSINESSEUROPE, 2016), (Joint Research Center, 2015), (NEEAP and MS' annual reports, 2014 and 2015) and (Togni, 2016).

Fourthly, the penalty for non-compliance with the mandatory energy audit for non-SMEs also varies. Ranging from a lower limit of EUR 250 to companies in Wallonia to an upper limit at EUR 200,000 in Romania as shown in the Figure 7.<sup>55</sup> Several MS have not specified any sanction (Estonia, Latvia, Lithuania, Luxembourg, Poland and Slovenia), whereas another six MS have not specified the level of the penalty (Denmark, Finland, France, Ireland, the Netherlands and Sweden).

**FIGURE 7: THE UPPER LIMIT OF THE PENALTY FOR NON-COMPLIANCE WITH THE MANDATORY ENERGY AUDIT FOR NON-SMES BY COUNTRY AND TYPE OF PENALTY**



**Source:** (Joint Research Center, 2015) and (BUSINESSEUROPE, 2016).

<sup>55</sup> (Ricardo-AEA, 2015). Please note that the source have different information on the penalty level in Romania at page 151 the penalty is between EUR 2,250-45,000, while at page 213 the penalty amounts to EUR 200,000.



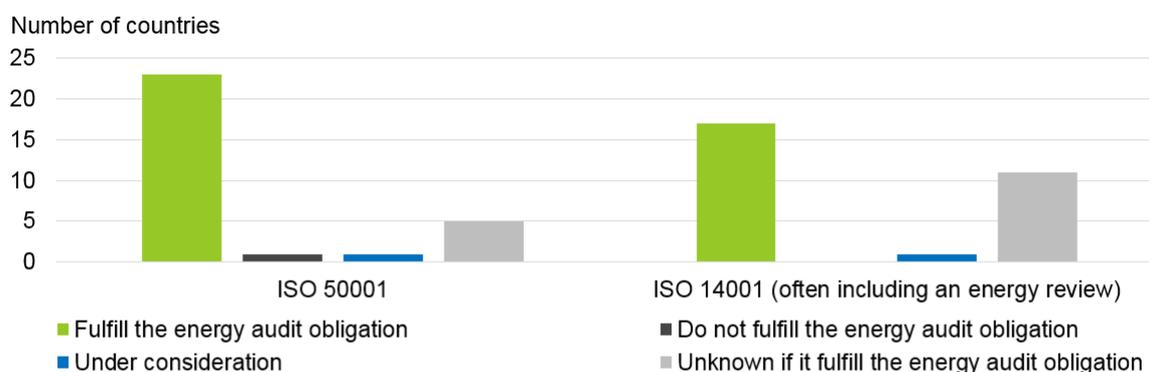
According to the Figure 7, Croatia and Slovenia have penalties for the management of the obliged company as well as for the company as such, while Ireland only sanctions the management (respectively at EUR 2,000, 10,000 and 5,000). In Hungary, both the obliged company and the auditors get a penalty for non-compliance, respectively at maximum of EUR 48,000 and EUR 320.<sup>56</sup>

The fine in Malta is a daily penalty of EUR 1,398 per each day of the report delay, but the maximum amount is capped to EUR 69,881. According to the procedure in France, in case of non-compliance with the energy audit by 5 December 2015, the company gets a notice (which can be made public) to comply within a specified time. If the company does not comply before this new deadline, a fine is issued and that is proportionate (to seriousness of the infringement, damage and the benefits derived, etc.). The fine varies but shall not exceed 2% of the company's revenues (or 4% of revenues in case of repeated non-compliance).<sup>57</sup>

Greece has implemented a no-fine-period: even though the deadline is set to 9 November 2016, no sanction will be imposed before 31 December 2016.<sup>58</sup>

As far as ISO systems are concerned, in vast majority of MS (23) companies with an energy management system (ISO 50001) fulfil the energy audit obligation, whereas an environment management system (ISO 14001) complies with the energy audit obligation in 17 MS as illustrated in the Figure 8.<sup>59</sup> In several countries, ISO 14001 does not comply with the energy audit obligation alone, for instance in Denmark the energy review from chapter 4.4.3 in ISO50001 has to be added to ISO 14001 to comply with the energy audit obligation.

**FIGURE 8: USE OF ISO 14001 AND ISO 50001 TO COMPLY WITH THE ENERGY AUDIT REQUIREMENT BY CATEGORY**



**Note:**

**ISO50001:** Fulfill: Austria, Flanders region, Wallonia region, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Ireland, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, Spain and Sweden. Do not fulfill Bulgaria. Under consideration: Estonia. Unknown: Brussels region, Luxembourg, Netherlands, Portugal and UK.

**ISO14001 (often including an energy review):** Fulfill: Austria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Latvia, Lithuania, Malta, Romania, Slovakia, Slovenia, Spain and Sweden. Under consideration: Cyprus. Unknown: Brussels region, Flanders region, Wallonia region, Greece, Hungary, Italy, Luxembourg, Netherlands, Poland, Portugal and UK.

**Sources:** (BUSINESSEUROPE, 2016), (Joint Research Center, 2015) and (NEEAP and MS' annual reports, 2014 and 2015).

The sixth area where the transposition differs substantially, are the exemptions. These are allowed in 14 MS (Austria, Flemish region, Brussels region, Wallonia, Denmark,

<sup>56</sup> (Ricardo-AEA, 2015).

<sup>57</sup> (Hirzel, 2016) and (Concerted Action, 2014).

<sup>58</sup> (Hirzel, 2016) and (Concerted Action, 2014).

<sup>59</sup> (Hirzel, 2016) and (BusinessEurope, 2016).



Finland, Italy, Ireland, Malta, the Netherlands, Portugal, Slovenia, Spain and Sweden). For instance, in the Brussels region – companies are fully exempted if they have an Energy Performance of Buildings (EPB) proposal for new buildings or major renovations as well as companies participating in the EU ETS. In addition, buildings with very low energy consumption per m<sup>2</sup> of floor area are also exempted in Brussels region. Five MS have approved that companies participating in the national voluntary energy efficiency agreement fulfil the energy audit requirements (Finland<sup>60</sup>, Flemish region, Wallonia, the Netherlands and Slovenia).<sup>61</sup>

In Denmark energy audit reports made between 4 December 2012 and 1 July 2014 are allowed to count as the first energy audit reports despite the fact that the report may not fulfil all the current requirements of the EED provision. In addition, Denmark exempts the following: vessels below 5,000 gross tons, building and civil engineering projects (but machinery of the contractors is included). In addition, Denmark exempt entities that are subject to the BAT<sup>62</sup> conclusions in the context of an environmental permit under the Environmental Protection Act, when they relate to energy consumption. Furthermore, Denmark and Malta exempt companies with annual energy consumption below respectively 100,000 kWh and 50,000 kWh and Sweden considers introducing a lower limit at 10 GWh.<sup>63</sup>

### **A best and worst practice example – Portugal**

In Portugal, the energy audit has to be profitable. That means the costs of the audit itself cumulated with the implementation costs of the energy efficiency measure identified are lower than the monetary value of the energy savings realized as a result of the energy efficiency measures undertaken. If an energy audit is not profitable the audit has to be carried out only every eight years.

Source: (Eurochambres, 2015) and (Dr. Simon Hirzel, 2016).

Lastly, it should be noted that four MS allow that energy audits may cover less than the total energy consumption of a company. In Ireland, at least 70% of the company's energy consumption should be covered, while in Spain it is at least 85% and 90% in case of Denmark and the UK.

Finland has chosen the energy audit reports to include all energy consumption in the company, so-called company level audit. It has to include a targeted audit, which has to focus at 10% of the total energy consumption or 5% of total consumption of electricity or heat production or a certain number of buildings (determined by law). These targeted audits need to cover the relevant energy consumption.<sup>64</sup>

In Austria, the energy audits must include all essential areas of the energy consumption and at the same time these must be proportionate and representative. Furthermore, the energy audit has to consider buildings, processes and transportation,

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<sup>60</sup> This approval requires companies to be in the voluntary agreement and implement the Finnish energy efficiency management system (ETJ+), which is mandatory for the energy intensive industry. No certification is needed to demonstrate that the company participate in the (voluntary) energy efficiency agreement.

<sup>61</sup> (Hirzel, 2016) and (BusinessEurope, 2016).

<sup>62</sup> Best Available Technologies under the Industrial Emissions Directive.

<sup>63</sup> (BusinessEurope, 2016), (Flink, 2016) and (Andersen, 2016).

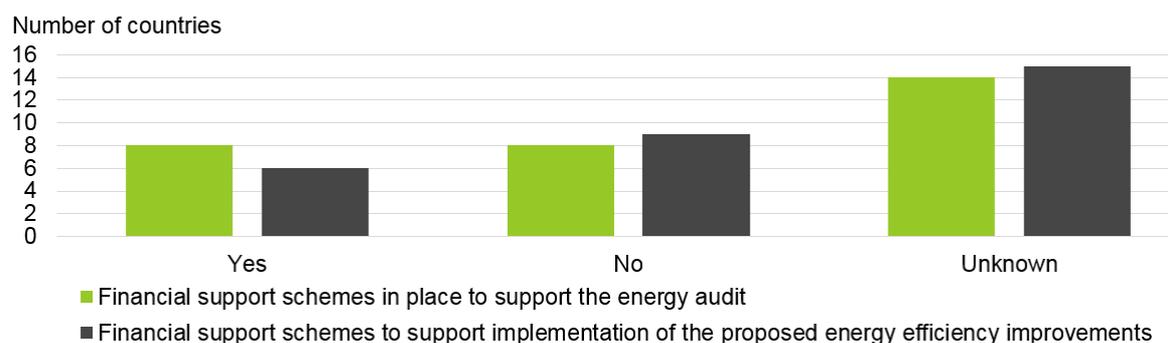
<sup>64</sup> (Hirzel, 2016) and (BusinessEurope, 2016).



when these account for at least 10% of the energy consumption of the company. If the threshold of 10% is exceeded, the energy audits for all sites of the company have to consider the respective area, even if the examined energy consumption area in the subsidiary is not essential.<sup>65</sup>

In addition, the financial support schemes available for large companies (to undergo the energy audit and/or to implement energy efficient investments) also differentiate. As the Figure 9 illustrates, eight MS have financial support schemes in place to underpin the energy audit (Austria, Flemish Region, Wallonia Region, Bulgaria, Greece, Lithuania, Portugal and Spain). At the same time six MS have a financial support scheme to underpin implementation of the proposed energy efficiency improvements (Austria, Denmark, Finland, France, Poland and Spain). And three MS have support schemes for both the energy audit and implementation of energy efficiency improvements (Austria, Finland and Spain).<sup>66</sup>

**FIGURE 9: FINANCIAL SUPPORT SCHEMES FOR NON-SMEs BY CATEGORY**



**Note:** Financial support schemes to support the energy audit: Austria, Flemish region, Wallonia region, Bulgaria, Greece, Lithuania, Portugal and Spain. Financial support schemes to support implementation of the proposed energy efficiency improvements: Austria, Denmark, Finland, France, Poland and Spain.

**Source:** (Joint Research Center, 2015) and (BUSINESSEUROPE, 2016).

A majority of MS (23) have programs and/or support schemes that encourage SMEs to undergo energy audits. The support system differs across MS ranging from regulatory instruments, information based instruments, financial instruments and voluntary agreements. Several MS have more than one support scheme in place. Some of the support schemes cover partly the costs of an energy audit and/or the cost of implementing energy-efficient technologies, or even offer low-cost loans to companies. With regard to audit costs, the covered share of the audit costs as well as the upper absolute ceiling varies and may be up to 80% of the audit costs.<sup>67</sup>

<sup>65</sup> (Hirzel, 2016).

<sup>66</sup> (Hirzel, 2016), (BusinessEurope, 2016) and (NEEAP and annual reports, 2014-2015).

<sup>67</sup> (Hirzel, 2016).



## Case study on support level according to energy efficiency in Finland

Finland supports both energy audit and implementation of energy efficiency improvements. SMEs could get financial support up to 50% of the cost of the energy audit rapport, while non-SMEs cannot get support for the mandatory energy audit.

However, both SMEs and non-SMEs could get up to 40% support for investments to implement new energy efficiency technology. The support level depends on the support budget of the year as well as ESCO projects are rewarded with a higher support. In addition, companies that have a voluntary energy efficient agreement could get support up to 30% when implementing conventional energy efficient technology.

Source: (Ruohomäki, 2016).

Currently, seven MS (Denmark, Greece, Latvia, Lithuania, Malta, Poland and Spain) do not have such support schemes in place; however, Greece, Latvia, Lithuania and Malta are planning to introduce such programs.

## BusinessEurope member federations' views on the article 8 implementation

The mandatory energy audits have been implemented in all of the nine MS that responded to the questionnaire. Five of these federations<sup>68</sup> observed that companies in their country of origin experience difficulties with the energy audits.

Firstly, they argue that the lack of a coherent implementation across EU28 is burdensome to companies with sites in several MS and that affects competition among companies across Europe as well as vis-à-vis their competitors in non-EU countries.<sup>69</sup> One clear example on this is that not all member states have defined non-SMEs in the same way. Several international companies expressed that they had to put a lot of resources into assessing the different implementation and in which countries they are obliged to perform the energy audits. The Italian federation find the Italian definition of a large company a good practice because the threshold values include the numbers in Italy.

Secondly, the EED's deadline (5 December 2015) of the first mandatory energy audits for non-SMEs was too soon after the transposition. Consequently, the associated costs increased, the quality of audits was lowered and it creates a competitive disadvantage to companies in countries with earlier deadlines. The lack of certified auditors is also an issue in several MS and have led to delays in the implementation, for instance Sweden and Denmark to name some.

<sup>68</sup> The Austrian federation has not answered this question.

<sup>69</sup> This experience is underpinned in other studies. For instance (Hirzel, 2016): "*There are particular challenges with the implementation of Article 8 for large enterprises that operate in multiple Member States, and therefore may be subject to multiple and varying legislative requirements across Europe*". In addition (Joint Research Center, 2015) states that it is especially important for multinational companies "*...if this common ground is not achieved may lead to a great fuss while undergoing energy audits with different criteria.*"



Another point raised by the Swedish federation is the lack of energy consumption threshold in the definition of obliged entities. As described above, only four MS have introduced such threshold values.<sup>70</sup> The Swedish federation also experienced that the implementation has been complicated for companies with complex business structures.

Five MS had an energy audit scheme before the implementation of the article 8. Such schemes were of voluntary nature and the federation find the former schemes successful. For instance the Finnish federation noted: *“Earlier there was no administrative burden (less people handling these), no urgency of buying nonsense audits [...] nothing was done “just for the law requirements”*.<sup>71</sup>

None of the nine federations found their national implementation of the article 8 an example of a best practice. On the other hand, the Danish federation finds it a good practice that large companies in Denmark with annual energy consumption below 100.000 kWh/year are not obliged to have a mandatory energy audit, despite the fact they have preferred the limit to be higher. Moreover, the Italian federation considers as a best-practice the Italian technique of clusterization: sites with energy consumption less than 100 toe can be excluded from the audit. Companies can choose to include in the audit a sample of their sites with consumption between 100 toe and 10.000 toe (between 100 toe and 1.000 toe for companies operating in the tertiary sector) if the sample fully represents the energy performance of the whole group of sites.

Additionally, the Irish federation recognizes that it is positive that the Green Business and Sustainable Energy Authority of Ireland provide consultancy support for energy saving activities. Both federations in Denmark, Italy and Malta have experienced good dialogues with the authorities on the effort to reduce the compliance burdens and avoid potential issues on non-compliance regarding the energy efficiency audits. In Malta the result was compliance that the returns of the energy auditing were increased for individual non-SMEs through support schemes and increased access to industry practices.

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<sup>70</sup> This issue is pointed out in (Joint Research Center, 2015) *“...one of the main subjects raised by countries with programmes already in place is the one concerning that companies should be obliged to undertake energy audits on an energy consumption criterion instead of the one now proclaimed in the directive that relates to the number of employees, turnover and balance sheets.”*

<sup>71</sup> This experience has been noticed in Czech Republic as well according to (Joint Research Center, 2015): *“since the passing of energy audits from voluntary to a mandatory state it has been acknowledged that the quality of audits has decreased as the organizations’ main ambition is to meet the formal requirements set in the legislation rather than actually improving their energy efficiency performance“*



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## Annex I: Questions in the online questionnaire

The answers to the below mentioned questions are included in the study marked with “(BusinessEurope, 2016)”.

Please state **your name**, the name of your **organization**, your **email** and your **telephone number** in case of questions or a need for an elaboration of your answers.

### Article 3: Energy efficiency targets

1. How is the indicative national energy efficiency target measured in your country? (Please choose one or more of the following possibilities: Energy intensity, Primary energy consumption, Final energy consumption, Primary energy savings, Final energy savings).
2. Please specify your experience with the Article 3 implementation (the most difficult and the most well-functioning aspects of the implementation. Please state if you find the implementation in your member state an example of best practice).

### Article 4: Building renovation

3. Is there a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private established in your country? (Yes, No).

If ‘yes’ in question 4, please answer:

- a. In your view, has Article 4 increased the focus on energy efficiency improvements in building renovation in your country? (Please explain why).

If ‘no’ in question 4, please answer:

- b. Even though your country does not have a long-term renovation strategy has Article 4 increased the focus on energy efficiency improvements in building renovations in your country? (Please explain why not).
4. Please specify your experience with the Article 4 implementation (the most difficult and the most well-functioning aspects of the implementation. Please state if you find the implementation in your member state an example of best practice).



## Article 7: Energy efficiency obligation schemes

5. In your country, is the 1.5 per cent target accomplished using Energy Efficiency Obligation Scheme (EEOS)? (No, Partly, Fully).

If 'Partly' or 'Fully' in question 6, please answer:

- a. Are the policy measures used to comply with Article 7 new, compared to previous practice? (Yes, Partly new, No – existing measures).
- b. Which sectors does your EEOS cover? (Industry sector, service sector, residential sector, public sector or other sectors – please specify which other sectors).
- c. What is the cumulative exemption rate (Article 7 paragraph 1 and 2)? (Please state in per cent - the maximal allowed exemption is 25 per cent).
- d. Which exemption possibilities (Article 7 paragraph 1 and 2) does your country use in the calculation of the energy saving target? (Please specify the use for all the following options)
  - **Energy used in transport:** The sales of energy, by volume, used in transport may be partially or fully excluded from this calculation. (No, partly, fully).
  - **Gradual phase-in:** Carry out the calculation required by the second subparagraph of paragraph 1 using values of 1 per cent in 2014 and 2015; 1,25 per cent in 2016 and 2017; and 1,5 per cent in 2018, 2019 and 2020. (No, partly, fully).
  - **ETS activities:** Exclude from the calculation all or part of the sales, by volume, of energy used in industrial activities listed in Annex I to Directive 2003/87/EC. (No, partly, fully).
  - **Energy savings in the energy transformation, distribution and transmission sectors:** Allow energy savings achieved in the energy transformation, distribution and transmission sectors, including efficient district heating and cooling infrastructure, as a result of the implementation of the requirements set out in Article 14(4), point (b) of Article 14(5) and Article 15(1) to (6) and (9) to be counted towards the amount of energy savings required under paragraph 1. (No, partly, fully).
  - **Early action:** Count energy savings resulting from individual actions newly implemented since 31 December 2008 that continue to have an impact in 2020 and that can be measured and verified, towards the



amount of energy savings referred to in paragraph 1.” (No, partly, fully).

If ‘No’ or ‘Partly’ in question 6, please answer:

e. Please specify and explain in detail how the types of alternative measures your country has chosen work. The list below includes measures specified in the EED as “alternative measures”.

- **Energy or CO<sub>2</sub> taxes** that have the effect of reducing end-use energy consumption.
- **Financing schemes and instruments or fiscal incentives** that lead to the application of energy-efficient technology or techniques and have the effect of reducing end-use energy consumption.
- **Regulations or voluntary agreements** that lead to application of energy-efficient technology or techniques and have the effect of reducing end-use energy consumption.
- **Standards and norms** that aim at improving the energy efficiency of products and services, including buildings and vehicles, except where these are mandatory and applicable in Member States.
- **Energy labelling schemes**, with the exception of those that are mandatory and applicable in the Member States.
- **Training and education**, including energy advisory programmes, that lead to application of energy- efficient technology or techniques and have the effect of reducing end-use energy consumption.
- **Other:** Please specify which other measure(s) is used and explain in detail how it/these work.

6. Please specify your experience with the Article 7 implementation (the most difficult and the most well-functioning aspects of the implementation. Please state if you find the implementation in your member state an example of best practice).

7. Do you experience that the 1.5 per cent target in the Article 7 overlaps with the EU ETS? (Please answer ‘yes’ or ‘no’).

If ‘Yes’ in question 8, please answer:

f. Please explain how Article 7 overlaps with EU ETS.



## Article 8: Energy audits and energy management systems

### Focus on large companies (non-SMEs)

8. Is the mandatory energy audit for non-SME implemented in your country? (Yes, No).

#### If 'Yes' in question 9, please answer:

- a. Please specify the definition of a large (non-SME) company in your country.
  - b. What is the expected number of companies covered by the energy audit scheme in your country? (Please state a number).
  - c. Please specify the possible exemptions from the energy audit (for instance, how much of the company's energy consumption the energy audit has to cover? If certain processes or part of the company could be exempted from the audit? If ISO50001 or ISO14001 certified companies comply with the energy audit?).
  - d. Please specify the deadline for handing in the first audit report.
  - e. Does your country have any financial support schemes in place to support the energy audit and/or to implement the proposed energy efficiency improvements? Please specify at the list below and explain in detail how it works.
    - Support schemes for both energy audit and to implement the proposed energy efficiency improvements.
    - Support to conduct the energy audit.
    - Support to implement the proposed improvements.
    - No financial support schemes related to the energy audit.
  - f. Do large companies in your country experience difficulties with the energy audit? (Please answer: 'yes' or 'no'. If 'yes' please explain which difficulties the companies experience when they comply with the energy audit).
9. Did your country have an energy audit scheme before the implementation of Article 8 in EED? (Yes, No).
10. In your opinion, was the former scheme successfully implemented? (Yes, No, please explain why/why not).
11. Has the scheme been changed to fulfil the requirements of Article 8? (Yes, No, if 'yes' please specify).



Focus on large companies (non-SMEs)

12. Does your country have programmes/support schemes to encourage SME's to undergo energy audits? (Please explain how these programmes/support schemes work).

Focus on Article 8 in general

13. Please specify your experience with the Article 8 implementation (the most difficult and the most well-functioning aspects of the implementation. Please state if you find the implementation in your member state an example of best practice).

**General question about the EED implementation**

14. Do you have any best and/or worst practices to share in terms of the implementation of other Articles in EED in your country? (Please specify).

## Annex II: Article 4 details: Compliance with the requirements of the long-term building renovation strategies

	Yes - fully compliant	Yes - almost fully compliant	Yes - but not fully compliant	Yes - but unsatisfactory	No - not compliant
a) An overview of the national building stock based, as appropriate, on statistical sampling	18 (Austria, Brussels region, Croatia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Luxembourg, the Netherlands, Romania, Slovakia, Slovenia, Spain, Sweden, UK*).	9 (Flemish region, Cyprus, Czech Republic, Denmark, Gibraltar, Italy, Lithuania, Malta and Poland).	1 (Estonia).	3 (Wallonia region, Bulgaria and Portugal).	0
b) Identification of cost-effective approaches to renovations relevant to the building type and climatic zone	5 (Brussels region*, Croatia, France, Spain and UK).	14 (Austria, Cyprus, Czech Republic, Denmark, Estonia, Gibraltar, Greece, Hungary, Ireland, Lithuania, Malta, the Netherlands, Romania and Slovenia).	7 (Bulgaria, Finland, Italy, Latvia, Luxembourg, Slovakia and Sweden).	4 (Flemish region, Wallonia region, Germany and Poland).	1 (Portugal).
c) Policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations	13 (Brussels region, Czech Republic, Denmark*, Finland, France, Greece, Ireland, Luxembourg, Malta, Romania, Slovenia, Spain and UK).	12 (Croatia, Cyprus, Germany, Gibraltar, Hungary, Italy, Latvia, Lithuania, the Netherlands, Poland, Slovakia and Sweden).	5 (Austria, Flemish region, Bulgaria, Estonia and Portugal).	1 (Wallonia region).	0
d) A forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions	5 (Croatia, Czech Republic, Greece*, Romania and Spain*).	12 (Brussels region, Estonia, Finland, France, Hungary, Ireland, Latvia, Lithuania, Malta, Slovakia, Slovenia and UK).	8 (Bulgaria, Cyprus, Denmark, Germany, Gibraltar, Italy, Luxembourg and the Netherlands).	5 (Austria, Flemish region, Poland, Portugal and Sweden).	1 (Wallonia region).
e) An evidence-based estimate of expected energy savings and wider benefits	7 (Czech Republic, Finland, Greece, Lithuania, Romania*, Slovenia and Spain).	13 (Cyprus, Estonia, France, Germany, Gibraltar, Hungary, Ireland, Italy, Latvia, Luxembourg, the Netherlands, Slovakia and UK).	7 (Brussels region, Flemish region, Croatia, Denmark, Malta, Sweden and Poland).	1 (Austria).	3 (Wallonia region, Bulgaria and Portugal).

**Note:** \* indicates it is a best practice example according to (Joint Research Centre, 2016).

**Source:** (Joint Research Centre, 2016) and (NEEAP and annual reports, 2014-2015).



## Annex III: Article 7 details

The actual exemption is often a combination of the different possibilities as it appears from table below. According to (BusinessEurope, 2016) the most widely used exemption is the energy sale in transport, as six out of nine MS use this fully, while Germany uses this option only partly. According to (Ricardo-AEA, 2015) it is the case for almost all MS that they use the option to fully exclude the transport sector from the calculated baseline. The consequence is that the total EU energy savings target in Article 7 is approximately 32% lower compared to the situation when transport would have been included.

In contrast, none of the nine MS fully exploits the opportunity to allow energy savings achieved in the energy transformation, distribution and transmission sectors in the calculating of the saving target (only Germany use the exemption to some extent). This may be because MS find it easier to use some of the other exemptions. As long as the sum of the other exemptions add up to 25%, there is no need to use further exemptions possibilities.

**TABLE A: USE OF EXEMPTIONS IN THE CALCULATION OF THE ENERGY SAVING TARGET IN ARTICLE 7**

Used exemptions	Fully	Partly	No	Unknown
Energy sale used in transport	6 (Belgium, Czech Republic, Denmark, Finland, Spain, Sweden)	1 (Germany)	3 (Austria, France, Ireland)	18
Gradual phase-in	3 (Belgium, Czech Republic, Spain)	2 (Germany, Ireland)	5 (Austria, Denmark, Finland, France, Sweden)	18
ETS activities	0	5 (Finland, France, Germany, Ireland, Spain)	5 (Austria, Belgium, Czech Republic, Denmark, Sweden)	18
Energy savings in the energy transformation, distribution and transmission sectors	0	1 (Germany)	9 (Austria, Belgium, Czech Republic, Denmark, Finland, France, Ireland, Spain, Sweden)	18
Early action	1 (Finland)	5 (Austria, Czech Republic, France, Germany, Sweden)	4 (Belgium, Denmark, Ireland, Spain)	18

Source: (BusinessEurope, 2016) and (Togni, 2016).

## Annex IV: Article 8 details: Applied definitions of a non-SME in the EU

Employees		Turnover		Balance sheet	Member States that applies the definition
> 250	and	> € 50 m	and/or	> € 43 m	Wallonia region <sup>A</sup> , Hungary, Poland, Austria <sup>B</sup>
> 250	or	> € 50 m	and	> € 43 m	Finland <sup>C</sup> , Flemish region <sup>D</sup> , Bulgaria <sup>E</sup>
> 250	or	> € 50 m	or	> € 43 m	France <sup>F</sup>
>250	and	> € 50 m	and/or	> € 43 m	Czech Republic <sup>G</sup>
> 250	and	> € 50 m	or	> € 43 m	Portugal <sup>H</sup>
> 250	and	> € 50 m	and	> € 43 m	Estonia <sup>A</sup>
> 250	or	Annual trading volume > € 50 m	and	> € 43 m	Spain <sup>I</sup>
≥ 250	and	> € 50 m	and/or	> € 43 m	Malta, the Netherlands, Romania <sup>J, K</sup>
≥ 250	and	≥ € 50 m	or	≥ € 43 m	Greece, Lithuania, Denmark <sup>C</sup> , Sweden <sup>C</sup>
≥ 250	and/or	> € 50 m	and	> € 43 m	Latvia
≥ 250	and	> € 50 m	or	> € 43 m	Luxembourg <sup>F</sup>
≥ 250	or	> € 50 m	and	> € 43 m	Italy <sup>N</sup> Ireland <sup>D</sup> , Germany <sup>L</sup> , UK <sup>M</sup>
> 250	and	> € 50 m			Cyprus
≥ 250					Slovakia
> 250					Slovenia <sup>O</sup>
					Brussels region <sup>P</sup> , Croatia <sup>Q</sup>

### Note:

<sup>A</sup> The definition in the draft decree.

<sup>B</sup> The calculation of the thresholds are both related to the company parts operating in Austria, regardless of where the parent company has its headquarters. Enterprises, which are more than 50% owned by another company, are attributable to the parent company.

<sup>C</sup> The three criteria are at a global level.

<sup>D</sup> The three criteria are at site level.

<sup>E</sup> Furthermore, each industrial system that consumes more than 3,000 MWh of energy per annum has to be subject to mandatory energy audits.

<sup>F</sup> It is not dependent upon an enterprise's group structure.

<sup>G</sup> And whose total energy consumption >35,000 GJ/year (10 GWh). All four criteria are at a global level.



<sup>H</sup> Portugal's energy efficiency schemes do not distinguish on the basis of organization size, but established qualification dependent on energy use. Companies with energy consumption over 500 toe/year are therefore required to carry out energy audits under SGCIE every eight years. They will also be required to implement their findings. There are therefore a large number of SMEs participating in these schemes (>500, which is around 50% of SGCIE participants) and, in this context, all of the requirements that apply to the large enterprises in Portugal also applies to SMEs.

<sup>J</sup> A "large company" is not defined explicitly but as a "non-SME".

<sup>K</sup> All non-SME (at company/site level) are obliged to do an energy audit. In addition, companies with an energy consume in excess of 1000 toe (tonnes of oil equivalent) annually at company/site level is certified through an independent agreement. As a consequence, each site should have (a) a certified Energy Manager and (b) an energy efficiency programme including measurement, local investment and completion of an energy audit every four years (the audit must cover all energy consumption). Companies that consume less than 1,000 toe annual energy consumption must complete the energy audits as well. If a site consumes less than 1,000 toe annual energy it must complete the energy audits as well. If the site is a part of a group that meets the 1,000 toe threshold across the number of sites, it must comply with the requirements of the energy efficiency programme as well.<sup>l</sup> This definition is from the Royal Degree 56/2016 according to the Spanish federation, please note that the Spanish NEEAP has a different definition of a non-SME in Spain: "large enterprises with more than 250 employees and with an annual trading volume in excess of €50 million or whose annual balance sheet exceeds €43 million.". (BusinessEurope, 2016).<sup>l</sup> In addition, the entity usually has to undertake an economic activity to fall under the regulation.

<sup>M</sup> The criteria should be applied to all overseas employees directly employed by the company. In the case of corporate groups, where one large enterprise meets the threshold in the UK, then the entire UK corporate group is deemed in scope of the regulatory requirement.

<sup>N</sup> The three criteria are at a national level within a group of companies. As a consequence, a company with its base outside Italy that controls two independent and completely different companies in Italy have to do an energy audit on the Italian sites if the three threshold values in sum in Italy is above the threshold values. Moreover, energy-intensive companies that are registered in the annual list CCSE (English: Equalisation Fund for the Electricity Sector) have to do an energy audit. Energy-intensive companies consume  $\geq 2.4$  GWh energy/year and have a ratio cost of energy used/turnover  $> 3\%$ .

<sup>O</sup> Furthermore, the company should have a net sales revenues of over 35 million euros and have assets totalling over 17.5 million euro to be a large company.

<sup>P</sup> Businesses' that meet at least two of the following conditions: (1) total assets of at least HRK 130 m. (~€17m.) (2) an annual income of at least HRK 260 m. (~€34m.) (3) an average of at least 250 employees during the business year.

<sup>Q</sup> Occupies more than 3,500 m<sup>2</sup> of floor space in the region. In addition, the Regional Government can require owners of buildings whose total floor area in the region is greater than 100,000 m<sup>2</sup> to develop an energy management plan, which may include an audit.

**Sources:** (Hirzel, 2016), (NEEAP and annual reports, 2014-2015), (BusinessEurope, 2016), (Fuchs, 2016), (Eurochambres, 2015) and (Le Gouvernement Du Grand-Duché Luxembourg, 2016).