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PART 2/2

COMMISSION STAFF WORKING DOCUMENT

Evaluation Report
covering the
Evaluation of the EU's regulatory framework for electricity market design and consumer protection in the fields of electricity and gas

Evaluation of the EU rules on measures to safeguard security of electricity supply and infrastructure investment (Directive 2005/89)

Accompanying the document

Proposal for a Directive of the European Parliament and of the Council on common rules for the internal market in electricity (recast)

Proposal for a Regulation of the European Parliament and of the Council on the electricity market (recast)

Proposal for a Regulation of the European Parliament and of the Council establishing a European Union Agency for the Cooperation of Energy Regulators (recast)

Proposal for a Regulation of the European Parliament and of the Council on risk preparedness in the electricity sector

{COM(2016) 861 final}
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ANNEXES AND EVALUATION FICHES

ON SPECIFIC ASPECTS OF RETAIL MARKETS

FOR ELECTRICITY AND GAS

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1. ANNEX 3: DETAILS ON THE CONSUMER VULNERABILITY AND ENERGY POVERTY PROVISIONS IN THE 2009 ELECTRICITY AND GAS DIRECTIVES

1.1. Executive Summary

Key notes:

- **Uneven protection of vulnerable consumers across the EU**
- **Insufficient measures to prevent energy poverty**

This Annex presents a more detailed **thematic evaluation** of existing provisions in EU law relating to the specific themes of **consumer vulnerability and energy poverty**. The evaluation is one of a series of evaluations looking at certain themes that have been carried out to inform the follow-up of the Communication on *The public consultation process on a new energy market design* and on *Delivering a new deal for energy consumers* adopted by the Commission in July 2015.

The protection of vulnerable and energy poor consumers is regulated in the 2009 Electricity and Gas Directive contained in the Third Energy Package.

The legislators' **original objectives** of these provisions were in summary:

1. To **ensure protection of vulnerable consumers** by having **Member States define the concept of vulnerable consumers** and implement **measures to protect them**.
2. To **mitigate the problem of energy poverty** by having **Member States address energy poverty, where identified[1], as an issue**.

These provisions were put in place to facilitate the decision by Member States to proceed with electricity and gas market liberalisation, as it was recognised by the legislators that actions to protect vulnerable consumers were needed in the context of liberalising the European energy market.[2] In fact, while progress has been achieved in liberalisation of the energy markets across the EU, 17 Member States still apply some form of price regulation in their electricity and gas markets. Growing energy poverty levels and the need to protect vulnerable consumers are often quoted as a justification for maintaining price regulation in the retail energy markets.

The provisions on vulnerable and energy poor consumers in the Electricity and Gas Directives have been partially effective.

They were **effective** in getting Member States to define the concept of a vulnerable consumer and to adopt measures to protect those in this category. The legislation was partially successful by bringing the issue of energy poverty to the attention of some Member States. It can be argued that, for some Member States, the inclusion of provisions on consumer vulnerability in the Electricity and Gas Directives provided the necessary guarantees on consumer protection to proceed in synchronization with the opening of retail energy markets.

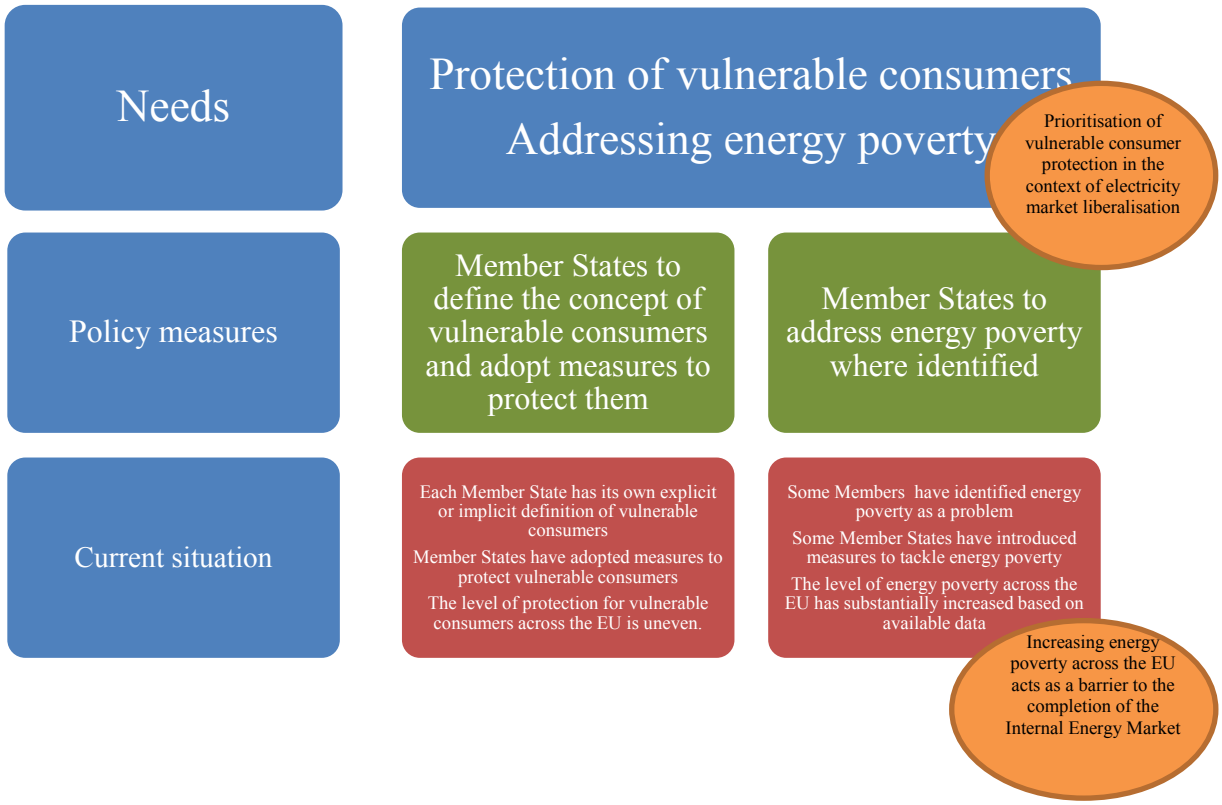
[1] Cyprus, France, Slovakia, Ireland and the UK have defined energy poverty in their national legislation.

[2] As stated in alinea (2) of the Directive 2003/54/EC concerning common rules for the internal market in electricity, which says that "important shortcomings and possibilities for improving the functioning of the market remain, notably concrete provisions are needed to ensure a level playing field in generation and (...) ensuring that the rights of small and vulnerable customers are protected (…)."

However, given the absence of a common EU definition of consumer vulnerability, in the Electricity and Gas Directive, the implementation of the provisions resulted in **uneven consumer protection** across the EU Member States. The result is even more pronounced in the case of energy poverty where a general obligation for action exists but only if energy poverty is identified as a problem. In addition, the evaluation identified **shortcomings** in the implementation of the provisions on the National Regulatory Authorities's role (NRAs) in the monitoring of electricity and gas disconnections.

Finally, the evaluation also identified that the provisions in the legislation have not been effective in assisting Member States in addressing the problem of energy poverty. Despite recent external research indicating that energy poverty and consumer vulnerability are two distinct issues (Insight_E, 2015), the provisions in the Electricity and Gas Directives refer to energy poverty only as a component of consumer vulnerability. While vulnerability and energy poverty often relate to each other[3], vulnerable households are not necessarily energy poor[4] and vice versa. This categorisation leads to a simplistic expectation that a single set of policy measures from Member States would automatically address both problems simultaneously. This will instead depend on how vulnerability is defined and the variations in the Member States are significant in this respect.

Figure 1: Effectiveness of policy measures on vulnerable and energy poor consumers



Growing levels of energy poverty as well as lack of clarity on the most appropriate means of tackling consumer vulnerability and energy poverty constitute a barrier to the further deepening of the internal energy market.

[3] For example, a citizen suffering from a disability which unable her to work is likely be vulnerable and because of her low income is also likely to find paying for her energy bill difficult.

[4] Energy poverty is a more confined concept capturing households in low income and high energy expenditure.

With regard to **efficiency,** it is likely that the benefits derived from defining consumer vulnerability at the Member State level and implementing well-targeted measures to protect them outweighed the costs of setting up such a policy. This should entail savings to public budgets and reduce fiscal pressure where it allows replacing protection measures benefiting the entire or disproportionately large parts of population without distinction to those in real need.

In relation to **relevance**, the data indicates that consumer vulnerability in the energy market is an increasingly relevant policy issue, as factors such as old age and poor health are major drivers of the problem. Without EU action, some Member States may find difficulties in striking a balance between consumer protection and market liberalisation which may appear as conflicting objectives. In fact, some Member States have already expressed interest in the Commission providing informal guidance on good practices in addressing energy poverty when phasing out regulated prices and opening markets[5].

Looking at **coherence**, the evaluation has not identified any inconsistencies or elements of legislation working against the objectives of the provisions on vulnerable and energy poor consumers. Nevertheless, as described previously, the lack of clear definitions of the concepts and caveat in obligations regarding energy poverty stand in contrast to the call for decisive action in the Electricity and Gas Directives.

In terms of the **EU added value**, while some Member States had already been protecting their vulnerable energy consumers prior to the EU intervention, others have taken action as a result of the EU intervention. Similar added value could be expected from EU intervention on energy poverty. Commission's recent talks with individual Member States (e.g. BG, FR) and in stakeholder forums demonstrate also a clear interest towards sharing of good practices at EU level.

1.2. Introduction

1.2.1. *Purpose of this evaluation*

The purpose of this evaluation is to **take stock of the actual performance and continued relevance of existing EU legal provisions on vulnerable consumers and energy poverty** so as to evaluate what is working, what is not, and why. This is done as a follow-up to *The public consultation on a new energy market design*[6] and the Communication on *Delivering a new deal for energy consumers*[7].

[5] For instance the European Commission assisted the Ministry of Energy of Bulgaria in accessing good international practices in the area of vulnerable consumer protection and tackling energy poverty as part of the Bulgaria-EC Technical Working Group on Electricity Market Liberalisation. As a result of this work the Ministry of Energy and the Ministry of Social Affairs of Bulgaria proposed a scheme for protection of vulnerable consumers in the context of electricity market liberalisation which is includes transitional social tariffs, safeguards against disconnections and a winter heating allowance. The scheme is now under public consultation.

[6] COM(2015) 340 final

[7] COM(2015) 339 final

1.2.2. *Overview of EU acquis related to vulnerable consumers and energy poverty*

The **Electricity and Gas Directives**[8] contain the following key provisions related to vulnerable consumers and energy poverty.

Recital (45)

Member States should take the necessary measures to protect vulnerable customers in the context of the internal market in electricity. Such measures may differ according to the particular circumstances in the Member States in question and may include specific measures relating to the payment of electricity bills, or more general measures taken in the social security system.

Recital (45) highlights the responsibility of Member States to put in place measures to protect vulnerable consumers in the context of market liberalisation.

Article 3(7)[9]

Member States shall take appropriate measures to protect final customers, and shall, in particular, ensure that there are adequate safeguards to protect vulnerable customers. In this context, each Member State shall define the concept of vulnerable customers which may refer to energy poverty and, inter alia, to the prohibition of disconnection of electricity to such customers in critical times. Member States shall ensure that rights and obligations linked to vulnerable customers are applied. In particular, they shall take measures to protect final customers in remote areas.

Article 3(7) states the need for Member States to provide a definition of vulnerable consumers so that adequate protection can be provided.

Article 3(8)[10]

Member States shall take appropriate measures, such as formulating national energy action plans, providing benefits in social security systems to ensure the necessary electricity supply to vulnerable customers, or providing for support for energy efficiency improvements, to address energy poverty where identified, including in the broader context of poverty. Such measures shall not impede the effective opening of the market set out in Article 33 or market functioning and shall be notified to the Commission, where relevant, in accordance with the provisions of paragraph 15 of this Article. Such notification may also include measures taken within the general social security system.

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[8] Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0072

Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0073

[9] Article 3 point 3 is the analogous provision in the Gas Directive.

[10] Article 3 point 4 is the analogous provision in the Gas Directive.

Article 3(8) states the need for Member States to consider appropriate measures to address energy poverty. Although the type of measures will be determined by Member States themselves. Energy efficiency improvements and social security measures are equally presented as possible policy areas, while National Action Plans rather appear as implementing tools. It is specified that no measures should impede the opening of electricity and gas markets[11].

The 2010 **Energy Efficiency of Public Buildings Directive** (EPBD)[12] and the 2012 **Energy Efficiency Directive** (EED)[13] also contain reference to energy poverty.

- EPBD: Recital 20 states that Member States should provide to the European Commission with a list of measures to reduce market barriers and encourage investments to increase energy efficiency in buildings contributing to reduce energy poverty.
- EED: Article 7 states that Member States shall set up an energy efficiency obligation scheme. The scheme may include requirements with a social aim in the saving obligations they impose, including by requiring a share of energy efficiency measures to be implemented as a priority in households affected by energy poverty or in social housing[14].

The **Unfair Commercial Practices Directive**[15] is the overarching piece of EU legislation regulating unfair commercial practices in business-to-consumer transactions. It applies to all commercial practices that occur before (i.e. during advertising or marketing), during and after a business-to-consumer transaction has taken place. The Unfair Commercial Practices Directive complements other EU legislation that regulates specific aspects of unfair commercial practices.

Article 5(3) of the Unfair Commercial Practices includes a fully harmonised concept of "vulnerable consumers":

Commercial practices which are likely to materially distort the economic behaviour only of a clearly identifiable group of consumers who are particularly vulnerable to the practice or the underlying product because of their mental or physical infirmity, age or credulity in a way which the trader could reasonably be expected to foresee, shall be assessed from the perspective of the average member of that group. This is without prejudice to the common and legitimate advertising practice of making exaggerated statements or statements which are not meant to be taken literally.

[11] Insight_E (2015) 'Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures'.

[12] Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings. Avaliable at:http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:153:0013:0035:EN:PDF

[13] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32012L0027

[14] Article 7(7) a: *include requirements with a social aim in the saving obligations they impose, including by requiring a share of energy efficiency measures to be implemented as a priority in households affected by energy poverty or in social housing.*

[15] Directive 2005/29/EC concerning unfair business-to-consumer commercial practices

The interplay between this provision and Article 3(7) of the Electricity Directive and Article 3(3) of the Gas Directive is regulated by Article 3(4) of the Unfair Commercial Practices Directive. This provision clarifies that where sector-specific EU law is in place and its provisions overlap with the provisions of the UCPD, the corresponding provisions of the sector-specific EU rules will prevail. Consequently, within the scope of the Electricity Directive and the Gas Directive, Member States should provide definitions of vulnerable consumers.

1.3. Scope of this evaluation

This evaluation is based on the five Better Regulation criteria (effectiveness, efficiency, relevance, coherence and EU-added value). It considers simplification, burden reduction potential, and the quantification of costs and benefits, only implicitly or to a limited extent, given its partial scope, the multiple and complex other factors affecting the objectives studied, and the limited data available.

The scope of the evaluation covers the following elements:

Electricity and Gas Directives

- **General evaluation** of the performance/continued relevance of **Article 3(7) and 3(8) of the Electricity Directive**. This covers definition and protection of vulnerable consumers and the obligation to address energy poverty where identified.
- **General evaluation** of the performance/continued relevance of **Article 3(3) and 3(4) of the Gas Directive**. This covers definition and protection of vulnerable consumers and the obligation to address energy poverty where identified.

The main discrepancy between the Electricity and Gas Directive with respect to the protection of vulnerable consumers arises from Universal Services (Article 3 (3) of the Electricity Directive). The right to universal service does not exist for gas. This limits some provisions related to the protection of vulnerable consumers in the gas sector. Member States are not obliged to ensure certain protection to all vulnerable consumers, but only to those already connected to the gas system. The reason is that a piped gas network for consumers is not available throughout every EU MS.

The EED and the EPBD articles and recitals relevant to energy poverty are assessed as part of the separate evaluation of the EPBD and the EED. In the evaluation of the EED Article 7, the social aim in the saving obligation is considered *relevant* as the need to address energy poverty continues. In terms of *coherence*, the evaluation finds that Article 7 creates the space for addressing energy poverty under the saving obligation. The evaluation of the EPBD cites energy efficiency in buildings as a tool to address energy poverty. In terms of *relevance*, addressing energy poverty is included as one of the goals the Directive contributes to achieve. The evaluation also notes that regarding *coherence*, even though several Member States are implementing programmes to improve the energy performance of the homes of those in lower-income, these actions remain a stand-alone instrument without any broader strategy at the national or even EU level[16].

[16] Alleviating Fuel Poverty in the EU, 2014, BPIE

1.4. Background to the initiative

This section identifies the objectives behind the existing provisions on vulnerable consumers and energy poverty in the Internal Energy Market (IEM) legislation based on the legislative texts (including their recitals) and on the related Commission proposals and preparatory documents accompanying the latter such as Impact Assessments (IAs). At the end of the section, we describe the intervention logic behind the legislative provisions.

1.4.1. *Description of the initiative and its objectives*

Legislation prior to the Third Energy Package

A provision calling on Member States to protect vulnerable consumers was introduced in the Second Energy Package[17] in 2003. The recitals accompanying the Directives show that consumer protection was an integral part of the plans to liberalise and to deepen the internal energy market for electricity and gas. In this context it is worthwhile to note that the requirement to protect vulnerable consumers at the Member State level was inserted by the co-legislators.

The recitals of the Second Energy Package acknowledged that the protection of vulnerable consumers was one of the shortcomings of the functioning of the internal energy market and constituted an area for possible improvement. The text called on Member States to take the necessary measures to protect vulnerable consumers in the context of the internal energy market, whilst providing full flexibility for the Member States to act according to their national circumstances. Specifically, it stated that within these protective measures, Member States could opt for measures to help vulnerable consumers avoid disconnections.

The Second Energy Package also recognised several energy consumer rights[18], which apply to all consumers, including vulnerable ones. The Directives, nonetheless, make no reference to energy poverty.

The 2007 Commission proposal for the new Electricity[19] and Gas Directive[20] (i.e. Third Energy Package) continued to argue in favour of guaranteed consumers rights and freedom to choose suppliers in the context of energy market liberalisation. **The proposal indicated that the provisions regarding vulnerable consumers included in the Second Energy Package were incorrectly applied in some Member States.** Thus, to ensure their correct implementation, it proposed to define binding guidelines on the protection of vulnerable consumers. However, the final text adopted by the co-legislators includes no reference to these binding guidelines[21].

The Third Energy Package: the Electricity and Gas Directives

[17] Second Energy Package.Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32003L0054 and http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV%3Al27077

[18] Second Energy Package. E.g. Electricity Directive - Annex A 'Measures on consumer protection'.

[19] http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1447425243567&uri=CELEX:52007PC0528

[20] http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1447425326195&uri=CELEX:52007PC0529

[21] The reference to the guidelines is likely to have been erased from the text as a result of the negotiations between the co-legislators.

The Electricity and Gas Directives included in the Third Energy Package contain some of the legal text which already appeared in the Second Energy Package but also new provisions and references to energy poverty.

The following elements remained largely unchanged:

- Member States are responsible for the protection of vulnerable consumers (Electricity Directive Recital 45).
- Member States have the flexibility to choose the measures to protect vulnerable consumers. These measures may include support to afford payments to energy bills or support within the social security system (Electricity Directive Recital 45 and Article 3; point 7 - Gas Directive Article 3 point 3).
- Safeguards against disconnection are presented as a possible measure not addressing but defining vulnerable consumers (Electricity Directive Article 3; point 7 – Gas Directive Article 3 point 3).

New elements:

- In relation to vulnerable consumers and disconnections:
    - In addition to the previous obligation to **protect** vulnerable consumers, Member States have to **define** the concept of vulnerable consumers. When defining this concept, Member States can refer, inter alia, to **energy poverty** or prohibition of **disconnection** to such customers in critical times (Electricity Directive Article 3; point 7 - Gas Directive Article 3 point 3).
    - Energy regulators are given a specific role to monitor the protection of vulnerable consumers (Electricity Directive Recital 37; Article 36; point h – Gas Directive Article 40; point j).
- In relation to energy poverty:
    - The term energy poverty appears as a new concept in the recitals and the provisions. The term energy poverty also appears in subsequent energy legislation such as the 2010 EPBD and the 2012 EED. However, the term energy poverty is not defined in any of the Directives.
    - Energy poverty is acknowledged as a growing problem and Member States affected by this problem are requested to include measures[22] to address energy poverty. (Electricity Directive Recital 53; Article 3; point 8 – Gas Directive Recital 50; Article 3 point 4).

The intention of the legislators was, within the limits of subsidiarity, to improve the protection of vulnerable consumers by requesting Member States to define the concept. The idea being that once the concept of vulnerable consumer was defined at the Member State level, the Commission would be able to assess the degree and effectiveness of the protection.

When assessing the potential impacts of the Electricity and Gas Directive in the Third Energy Package, the 2007 Commission's IA[23] said that the Commission would keep under constant

[22] Measures such as *(i) formulating energy action plans; (ii) providing benefits in social security system; (iii) support for energy efficiency improvements not all Member States are affected by this problem.*

[23] Commission Staff Working Document, Accompanying the legislative package on the internal market for electricity and gas. Impact Assessment. http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2007/sec_2007_1179_en.pdf

review the retail markets to assess the effects of liberalisation on households, in view of increasing consumers' confidence in the energy market. It also pointed to the existing protection of vulnerable consumers in the form of a recognition of the concept of universal service for electricity within the Electricity Directive. The IA concluded that the cost of provisions on vulnerable and energy poor consumers will depend on the legislative details and means of implementation of the protective measures at the Member State level.

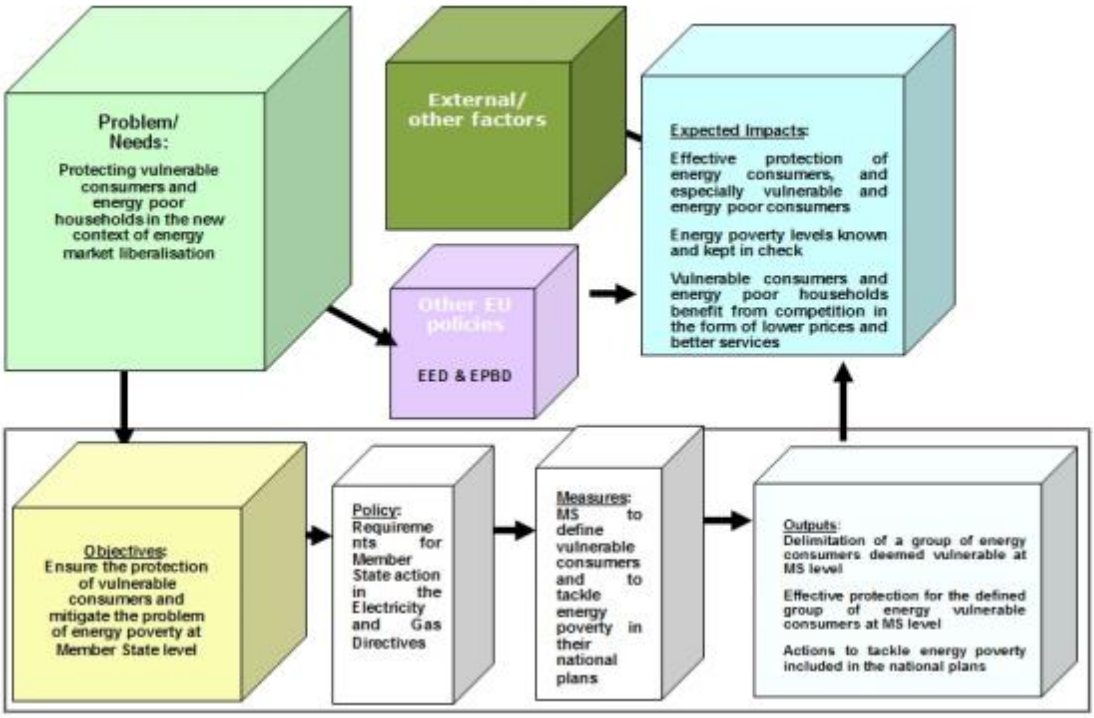
1.4.2. *Baseline*

The 2007 Electricity and Gas Directives were fundamental to the liberalisation of the EU's gas and electricity sectors and the deepening of the internal energy market. For the liberalisation process to be successful, it needed to be accompanied by the strengthening of consumer rights, including measures to protect vulnerable consumers, as stated in alinea (2) of the Directive 2003/54/EC concerning common rules for the internal market in electricity and repealing Directive 96/92/EC, which says that *"important shortcomings and possibilities for improving the functioning of the market remain, notably concrete provisions are needed to ensure a level playing field in generation and (..) ensuring that the rights of small and vulnerable customers are protected (...)."*.

Without these protective measures, it is unlikely that many Member States would have proceeded with liberalising their energy markets at the same speed and to the same extent. And without energy market liberalisation, significantly fewer EU energy consumers would have been able to benefit from market competition in terms of broader choice, lower energy costs and higher standards of service.

In the absence of the Third Energy Package, the Second Energy Package would have continued to apply. However, as mentioned before, the Second Energy Package had not proven to consistently lead to adequate protection of vulnerable consumers across the EU.

Figure 2: Intervention Logic Diagram illustrating the subject of this evaluation



1.5. Evaluation Questions

This evaluation aims, for each of the sub-themes within the scope, to answer the following questions:

1. What is the **current situation**?

2. How **effective** has the EU intervention been?

3. How **efficient** has the EU intervention been?

4. How **relevant** is the EU intervention?

5. How **coherent** is the EU intervention internally and with other (EU) actions?

6. What is the **EU added value** of the intervention?

1.6. Method

This evaluation has been carried out in-house by the Commission services. The following activities and studies have provided key inputs:

- **DG ENER** commissioned **Insight_E**[24] to assess how Member States define the concept of vulnerable consumer and energy poverty, and the measures implemented to address these issues. The report[25] lists and critically appraises the definitions of consumer vulnerability and energy poverty across the EU. The report also contains analysis of the measures to protect vulnerable consumers and to tackle energy poverty.
- **Insight_E** is currently undertaking a follow-up study in which measures of protection for vulnerable consumers across Member States will be appraised. In addition, the report will look in detail into three specific measures, among which safeguards against disconnections which are assessed in this evaluation. Interim results have been used in this evaluation as the final report is not yet finalised.
- The **Vulnerable Consumer Working Group** chaired by DG ENER produced a guidance document on vulnerable consumers[26] which provides a comprehensive analytical framework for the identification of drivers of consumers' vulnerability. The document also provides details of existing Member State instruments and practices. The Vulnerable Consumer Working Group under Citizens Energy Forum produced furthermore a **Working Paper on Energy Poverty**[27] of which findings also informed this evaluation.
- **DG ENER** led an initiative together with DG ESTAT to carry out an ad-hoc data collection on energy expenditure in Member States by income quintiles. The analysis of the data shows the increasing proportion of expenditure dedicated to pay for domestic energy services, particularly by low-income households.
- **DG JUST** commissioned a study on consumer vulnerability[28]. The aim of the study was to explore and better understand the multiple causes of consumer vulnerability. The study proposes a new definition of consumer vulnerability and identifies the main drivers of consumer vulnerability in key markets of the European Union. The energy sector is one of three sectors studied in-depth.
- **DG JUST** commissioned a study on the functioning of retail electricity markets for consumers in the EU. The study looks at consumers' perceptions of prices and reported affordability in retail electricity markets. Initial findings from the 2015 electricity study were published in November 2015 together with the State of the Energy Union 2015 Communication[29].

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[24] Insight_E is a multidisciplinary energy think-tank formed by partners from academia, research centres and consultancies.

[25] Insight_E (2015) 'Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures'. Available at: https://ec.europa.eu/energy/sites/ener/files/documents/INSIGHT_E_Energy%20Poverty%20%20Main%20Report_FINAL.pdf

[26] VCWG (2013) Available at: http://ec.europa.eu/energy/sites/ener/files/documents/20140106_vulnerable_consumer_report.pdf .

[27] VCWG (2016) Working Paper on Energy Poverty. Available at: https://ec.europa.eu/energy/sites/ener/files/documents/Working%20Paper%20on%20Energy%20Poverty.pdf

[28] European Commission (2016). Available at: http://ec.europa.eu/consumers/consumer_evidence/market_studies/vulnerability/index_en.htm-summit/2015/files/ener_le_vulnerability_study_european_consumer_summit_2015_en.pdf

[29] http://ec.europa.eu/priorities/energy-union/state-energy-union/index_en.htm; see in particular "Energy Consumer Trends 2010 – 2015", SWD(2015) 249 final, 18.11.2015, http://ec.europa.eu/priorities/energy-union/state-energy-union/docs/swd-energy_consumer_trends_en.pdf

- The **Agency for the Cooperation of Energy Regulators (ACER)**[30] produces annual Market Monitoring Reports (MMR)[31]. ACER reports, published annually since 2011, provide an in-depth coverage of issues such as protection of vulnerable consumers, number of vulnerable consumers and number of disconnections across EU Member States[32]. The findings of these reports have been used extensively in this evaluation.
- The Council of the EU conducted a survey of the Member States on the scope of consumer vulnerability which gave input to Council conclusions on the subject in June 2014. The conclusions of this survey provided information on the Member States' experiences when implementing the provisions evaluated in this document.

1.7. Implementation state of play (Results)

1.7.1. *State of play as regards implementation*

Electricity and Gas Directives

Enforcement action undertaken by the Commission in relation to the internal energy market legislation is ongoing. Procedures are set out in detail in *"Enforcement of the Third Internal Energy Market Package (SWD(2014) 315 final)"*.[33]

As of 20 January 2016, all of the infringement proceedings for partial transposition of the Electricity and Gas Directive have been closed. The focus is now on addressing incorrect transposition or bad application of the Third Energy Package at the Member State level, with priority being given to violations which have the highest impact on the functioning of the internal market, including unbundling, independence, powers and duties of the national regulatory authorities and consumer protection. On this basis, the Commission has opened structured dialogues ("EU Pilot[34]") with a number of Member States. As of 20 January 2016, eight of these dialogues have been followed by infringement procedures.

1.7.2. *Problems and issues identified*

In September 2011 the Commission opened 38 infringement proceedings against 19 Member States to ensure full transposition of the Electricity and Gas Directives. Non-resolved cases were followed up in 2012 by sending reasoned opinions and referrals to Court.

[30] The Agency for the Cooperation of Energy Regulators (ACER) is an agency created by the ACER Regulation. ACER's duties include monitoring and reporting on the internal electricity and gas markets.

[31] ACER Market Monitoring Report. Available at: http://www.acer.europa.eu/electricity/market 20monitoring/Pages/default.aspx

[32] The data used for compiling ACER's annual report is provided by national regulatory authorities for energy (NRAs), the European Commission and the European Networks of Transmission System Operators (ENTSOs). The members of the Administrative Board of ACER (Article 12(7) of the ACER Regulation) and ACER's Director (Article 16(1) of the ACER Regulation) act independently of the Commission and other interests.

[33] https://ec.europa.eu/energy/sites/ener/files/documents/2014_iem_communication_annex6_0.pdf. Figures presented here are updated.

[34] Structured dialogue between the Commission and the Member State concerned is carried out via 'EU Pilot'. This is a scheme designed to quickly resolve compliance problems without having to resort to infringement procedures for the benefit of citizen and business.

The two Directives have been now transposed by all Member States. The Commission closed all the non-communication cases.

Structured dialogues with Member States as well as infringements on incorrect transposition or bad application are currently ongoing. As of 20 January 2016, 8 of the structured dialogues have resulted in infringement procedures where, *inter alia*, violation of the EU electricity and gas consumer provisions is at stake.

So far, based on the preliminary findings of the conformity checks, Electricity Directive Article 3 point 7 and Gas Directive Article 3 point 3 on the protection and definition of vulnerable consumers seems to be the more problematic issues with regard to the implementation of the provision in five Member States[35].

In relation to the Electricity Directive Article 3 point 8 and Gas Directive Article 3 point 4 on the measures to address energy poverty where identified, the conformity checks found issues with regard to the implementation in two Member States.

1.8. Answers to the evaluation questions

In this section we first describe the current situation with respect to **consumer vulnerability**, **energy poverty** and **disconnections** across the EU. Secondly, the evaluation questions are addressed for each of the key provisions within the scope of the evaluation.

What is the current situation?

Article 3 of the Electricity and Gas Directives states that Member States shall take appropriate measures to protect final customers, and in particular, shall ensure that there are adequate safeguards to protect vulnerable consumers. In this context, each Member State should define the concept of vulnerable consumers, which may refer to energy poverty and, inter alia, to the prohibition of disconnecting to such customers in critical times.

Consumer Vulnerability[36]

a) Definitions across Member States

Member States take different approaches to the transposition of the obligation to define the concept of vulnerable consumers.

ACER MMR identifies explicit and implicit definitions at the Member State level.

Explicit definition of consumer vulnerability may refer to a list of criteria defining vulnerability, such as personal or household characteristics, or specific economic conditions which are specified in national law. In roughly half of the Member States the definition of energy consumer vulnerability refers to aspects of low income, bad health, or critical

[35] Specific guidance about the drivers of vulnerability and the population likely deemed vulnerable was published by the European Commission and the Vulnerable Consumers Working Group. The document is available at: http://ec.europa.eu/energy/sites/ener/files/documents/20140106_vulnerable_consumer_report_0.pdf

[36] Throughout the evaluation we use the term consumer vulnerability or vulnerable consumer in the context of energy markets, which differs from the definitions of consumer vulnerability used in other markets or Directives.

dependence on energy for life support. In some Member States, an additional reference is made to the energy consumption of a vulnerable households e.g. by reference to an upper limit of power or consumption level over a certain period (for instance, Portugal and Spain). Most explicit definitions also include references to existing social security laws with respect to eligibility criteria. This underlines the embedded character of the concept of vulnerable consumers in a wider social protection agenda[37].

Some Member States argue that the eligibility criteria of existing national social protection already capture the essence of the concept of vulnerable consumers[38] and opted for **implicit definitions** of consumer vulnerability. Implicit definitions, which are more difficult to grasp, are usually not encoded in law. Instead vulnerable consumers are supported by a wider social security net.

Insight_E (2015) [39] provides another categorisation of the concept of vulnerable consumers. Based on their research, the most common type of definition of vulnerable consumers adopted across EU Member States is based on *receipt of social welfare* whereby a consumer is automatically defined as vulnerable based on the eligibility criteria used for the receipt of social welfare. Other Member States define vulnerable consumers based on the difficulty to afford basic energy services. Four Member States specifically refer to *health and disability* while other Member States refer to a broad range of *socio-economic groups*, which may include income, age or health characteristics.

Table 1: Insight_E (2015) Categorisation of vulnerable consumer definitions

Definition type	Member State
Energy affordability (low income / high expenditure)	FR, IT, SE
Receipt of social welfare	BG, CY, DE, DK, EE, FI, HR, HU, LT, LU, MT, PL, PT, SI,
Disability / health	CZ, NL, SK, IE
Range of socio-economic groups	AT, BE, ES, GR, RO, UK

Source: Insight_E (2015) "Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures".

Different categories in definitions of vulnerable consumers result in significant differences among Member States with regards to the coverage of the definition of vulnerable consumers and, as a consequence, differences in the share of the population defined as vulnerable. For instance, while all households are de facto considered potentially vulnerable in Luxembourg, only consumers with health issues, connected to life-support equipment, qualify as vulnerable in the Czech energy market. Furthermore major differences exist among Member States with regards to the level of support that vulnerable consumers receive.

b) Consumer vulnerability rates across the EU

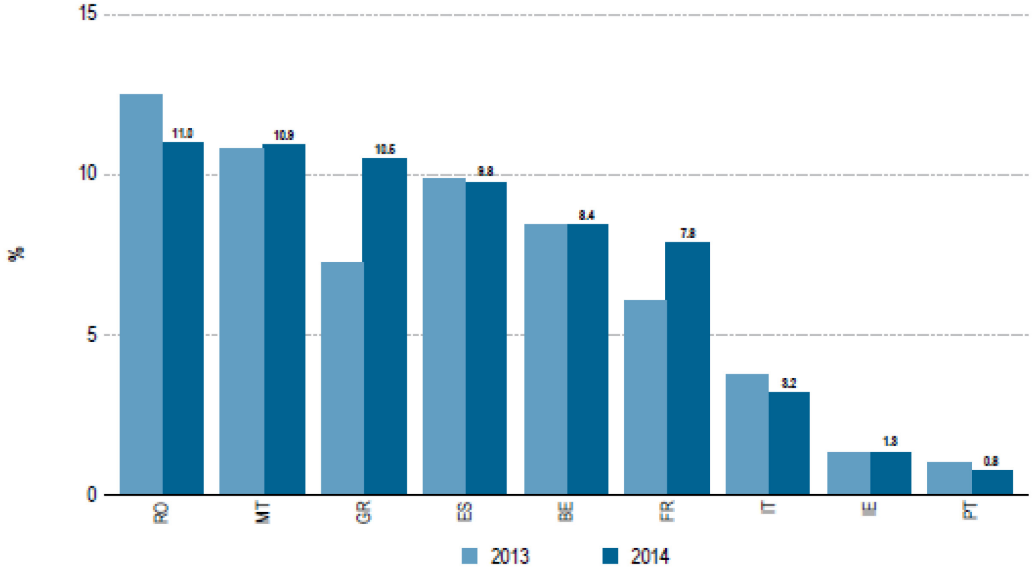
[37] ACER (2015) Annual Report of the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2014. Page 119.

[38] ACER (2015) Annual Report of the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2014. Page 117.

[39] Insight_E (2015) identifies the definition of vulnerable consumers in Member States national legislation. Annex 3 includes these definitions.

Findings from the latest ACER MMR suggest that the level of consumer vulnerability across the EU is stable, with the exception of Greece and France where the number of consumers benefiting from social tariffs has noticeably increased in the last year. However, the report also highlights that solid conclusions cannot be drawn on the exact rates and variation in energy consumer vulnerability because of incomplete and incomparable data.

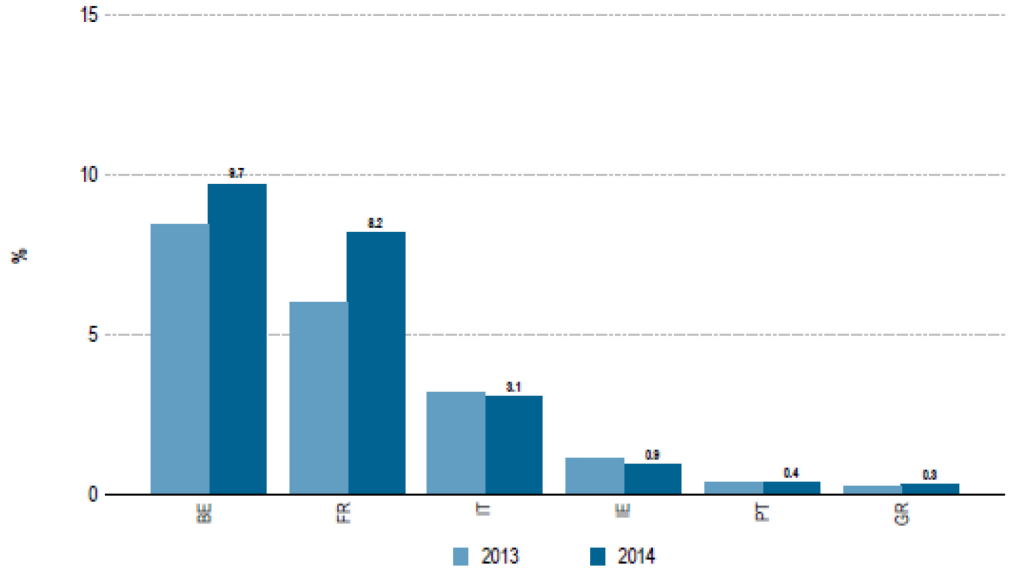
Figure 3: Share of vulnerable customers in electricity and gas - 2013-2014 (%) (ACER MMR)



Source: CEER Database, National Indicators (2015).

Note: Percentages for data for 2014.

For France, Greece and Romania, the chart shows percentages of customers on social tariffs.



Source: CEER Database, National Indicators (2015).

Note: Percentages for data for 2014.

The ACER MMR also pointed out that only a minority of Member States were able to report figures on the precise number of vulnerable consumers.

Energy poverty

a) Definitions

As of today, Cyprus, France, Ireland, UK and Slovakia define the issue of energy poverty in their legislations. The definitions focus on identifying groups facing problems of affordability in maintaining necessary energy services, heating in particular, in their homes. In addition, such definitions often consider various energy carriers, such as electricity, gas and coal. Annex 4 shows the official and unofficial definitions in use across the EU. The Commission is aware of on-going activities in several other Member States to introduce definitions of energy poverty in national legislation.

b) Energy poverty across the EU

Growing levels of energy poverty have provoked strong political interest in the issue of consumer vulnerability and energy poverty within the European Parliament[40][41], the Committee of the Regions[42], and the Economic and Social Committee[43], as well as broader stakeholder community including think tanks and consumer associations.

Since 2000 expenditure on energy services for the poorest households in the EU has increased by 50%, reaching almost 9% of their total budget on average, driven mainly by energy prices rising faster than household disposable income[44].

In 2014, the gap in the share of expenditure spent on domestic energy services between the average and the poorest households increased to three percentage points.

Figure 4: EU average - share of households' budget spent on domestic energy services[45]

[40] European Parliament. Committee on Industry, Research and Energy. Delivering a New Deal for Energy Consumers. (2015/2323(INI)). Rapporteur: Theresa Griffin.

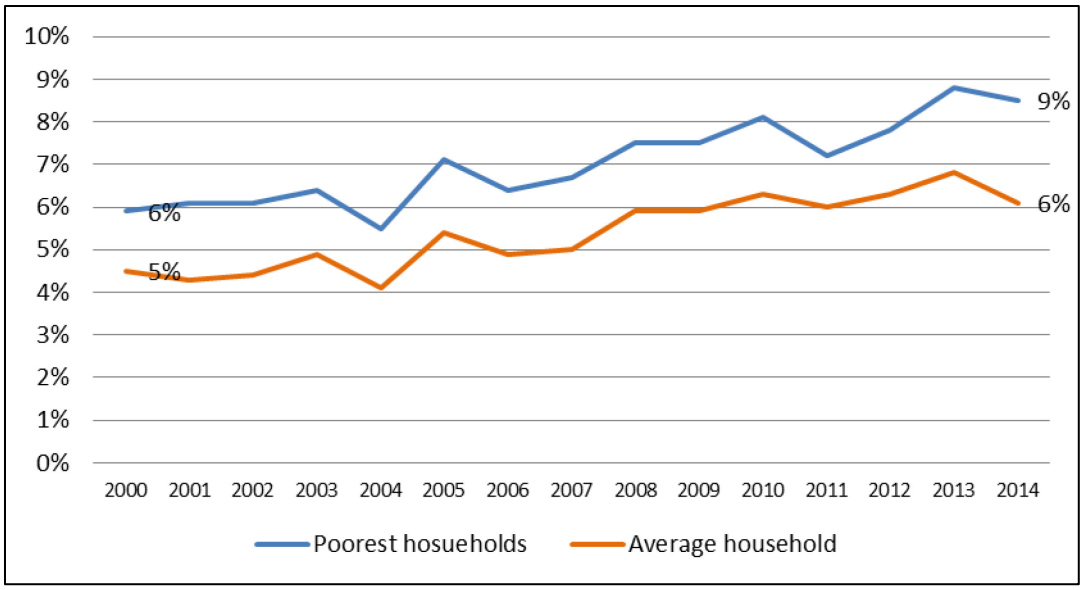
[41] European Parliament. Committee on Employment and Social Affairs. Report on meeting the antipoverty target in the light of increasing household costs. (2015/2223(INI)). Rapporteur: Tamás Meszerics.

[42] Committee of the Regions (CoR) (2014) Opinion of the Committee of the Regions - Affordable Energy for All. Official Journal of the European Union, C 174/15.

[43] European Economic and Social Committee (EESC) (2011) Opinion of the European Economic and Social Committee on 'Energy poverty in the context of liberalisation and the economic crisis' (exploratory opinion). Official Journal of the European Union, C 44/53.

[44] Source: Eurostat (Electricity prices for domestic consumers; Gas prices for domestic consumers; disposable income of households per capita; period 2010 – 2014).

[45] The figure represents the EU average including all Member States with the exception of Austria and Denmark due to lack of data availability at the time of writing.



Source: National Statistical Authorities of EU Member States

Other Eurostat indicators draw similar conclusions. For example, the number of European citizens saying that they were unable to keep warm during winter shows a similar upward trend. Yet, the incidence of this indicator changes across Member States. While more than one in four citizens in Bulgaria, Greece, Portugal and Lithuania felt their homes were cold during winter, in Denmark, Luxembourg, Austria, Finland and Sweden just less than 3% of the population felt that way.

Disconnections

Safeguards against disconnections due to non-payments are one of the most frequently used instruments to protect vulnerable and energy poor consumers. Insight_E (2015) estimates that 20% of the Member States use disconnection safeguards as their primary measure for protection of vulnerable and energy poor consumers. 25 Member States have in their legislation some kind of provision against disconnections either during winter, targeted to specific group, or general and preventative safeguards (Insight_E (2016)). Popular safeguards against disconnections include an extended notice procedure, the involvement of social support institutions in disconnections processes, and similar hurdles for suppliers and Distribution System Operators (DSOs) to prevent premature disconnections of their non-paying customers[46].

The ACER MMR shows that in 2014 disconnection rates were highest in Portugal (5.6% electricity and 4.0% gas), Italy (4.0% electricity and 2.1% gas), Malta (2.8% electricity and no data for gas) and Greece (2.5% electricity and 1.7% gas). In other Member States, disconnection rates were significantly lower.

The ACER report also states that the availability of data on disconnections remains limited. This is despite the fact that the Electricity and Gas Directives state that Member

[46] ACER (2015) Annual Report of the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2014. Page 119.

States have to provide for disconnection data to be collected by National Regulatory Authorities (NRAs)[47].

In addition, the ACER report points that looking just at disconnection rates may lead to premature conclusions as many households, unable to keep warm during winter, decide to self-disconnect to avoid falling into arrears or debt. This situation is particularly important in Great Britain, Belgium, Poland or Ireland[48].

It is important to note that, once disconnected, consumers face additional costs and waiting times to ensure reconnection. Having been disconnected from the electricity and gas grid, it takes between 5 and 76, and an average of 25 days, to be reconnected to the network[49]. Disconnections are also particularly problematic for vulnerable consumers because of their dependency on electricity and gas due to for example the need to be connected to medical equipment; and the barriers when interacting with the market.

To summarise, there is currently a broad divergence in Member States, both with regards to the definition of vulnerable consumers and to the measures adopted to protect them.

While a degree of difference is justified by the variety in national circumstances, significant differences in the level of protection of vulnerable consumers across EU Member States.

Even though levels of consumer vulnerability seem stable, energy poverty is a growing problem and is increasingly being discussed in its own right. Safeguards against disconnections represent one of the most popular measures to protect vulnerable consumers and to mitigate the impacts of energy poverty.

How effective has the EU intervention been?

This section considers how effective EU action has been in achieving its objectives. The main objectives of the provisions in the Electricity and Gas Directives in relation to vulnerable consumers and energy poverty were to:

- Incentivise protection of vulnerable consumers at the Member State level through:
  - Getting the Member States to define the concept of vulnerable consumers
  - Getting the Member States to address energy poverty where identified as an issue.
- Facilitate the decision by Member States to proceed with electricity and gas market liberalisation

EU action has successfully encouraged Member States to define the concept of vulnerable consumers as **all Member States have a definition of vulnerable consumer in their legislation**. However, the coverage of the group defined as vulnerable, as well as the

[47] ACER (2015) Annual Report of the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2014. Page 115.

[48] ACER (2015) Annual Report of the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2014. Page 116.

[49] ACER (2015) Annual Report of the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2014. Page 144.

associated protective measures vary widely across Member States.[50] The wide range of definitions of consumer vulnerability across Member States highlights the variety of problems and challenges around vulnerability in the energy market across Member States. Whilst variety of definitions is not a problem per se, it can be noted that the definition of consumer vulnerability has a bearing on the type of action that follows. This in turn led to **unequal level of energy consumers' protection across EU Member States.**

It must be noted that EU action has not been fully effective in ensuring that Member States effectively address the problem of energy poverty. As outlined previously, **the level of energy poverty across the EU has increased substantially over the past 15 years.** Moreover, only a small minority of Member States have decided to define the concept.

While tackling energy poverty is mainly a Member State issue, EU action can incentivise adequate identification and propose most appropriate solutions to the problem of energy poverty. However, **current legislation** is not effective in that respect as it does not assist Member States in defining energy poverty and **refers to the problem of energy poverty only as a sub-category of the problem of consumer vulnerability – which in today's context is too restrictive.**

It is important to recognise that energy poverty and consumer vulnerability are two distinct issues. Consumer vulnerability[51] is driven by consumer characteristics such as age, number of dependents, health, ability to interact with the market, behavioural characteristics, employment, or access to shops or the internet. Energy poverty, on the other hand, is driven by poor energy efficiency of dwellings and high energy prices correlated with stagnating or falling wages. This difference is not recognised in the Electricity and Gas Directives as both issues are treated simultaneously and none of the terms is identified, thus providing limited assistance to Member States.

It must also be noted that a study carried out for the purpose of this evaluation, Insight_E (2015), argues in favour of recognising that the issues of vulnerable consumer protection and energy poverty are distinct. The report argues that consumer vulnerability and energy poverty can affect different energy consumer groups, and require different measures. The overlap between the concept of consumer vulnerability in energy markets and energy poverty depends on the definition of consumer vulnerability used in each of the Member States. When vulnerable consumers are narrowly defined, for example by defining vulnerable consumers as those in need of access to electricity to power their medical devices, the overlap is limited.

Price regulation constitutes a barrier for liberalisation and potential cross-border integration of the electricity and gas markets in a number of Member States - the argument being that electricity and gas price regulation constitutes a form of protection against energy poverty. In fact while some progress has been achieved in liberalisation of the energy markets across the EU, 17 Member States still apply some form of price regulation in their electricity and gas markets. Growing energy poverty levels and the need to protect vulnerable consumers are often quoted by Member States as a justification for maintaining

[50] While some Member States had already previously defined vulnerable consumers in their legislation, others introduced such as definition after the Third Energy Package.

[51] European Commission (2016) concluded that consumer vulnerability refers to the risk of negative outcome on consumers' well-being. Available at: http://ec.europa.eu/consumers/consumer_evidence/market_studies/vulnerability/index_en.htm..

price regulation in retail energy markets where energy suppliers may abuse their market power to increase prices.

In that context any future legislative changes could look into reinforcing EU assistance/action on energy poverty and propose appropriate tools for addressing energy poverty which enable Member States to phase-out regulated prices.

How efficient has the EU intervention been?

This section looks at the relationship between the resources used by Member States to implement the provisions on vulnerable consumers and energy poverty in the Electricity and Gas Directives and the changes generated by the intervention.

There is no data available to assess this question quantitatively. Yet, it is likely that the benefits derived from defining consumer vulnerability at the Member State level and implementing measures to protect them outweigh the costs of setting up such a policy.

The cost of defining vulnerable consumers is likely to have been limited as in many of the Member States, the definition of vulnerable consumers is linked to other social security benefits. The administrative cost of delivering protection to vulnerable consumers is also likely to have been limited as many Member States choose to address consumer vulnerability through their general welfare system, thus limiting additional costs.

The end cost of protecting vulnerable consumers depends on the level of support and remains at the discretion of the Member States. Consequently, the rate between costs and benefits will depend on factors such as how adequately Member State definition of vulnerable consumer captures vulnerability, the type of protective measures, and the means to implement these measures.

The same logic applies to the costs of executing the provisions on energy poverty in the Electricity and Gas Directive[52].

In this context, it is important to stress that it is unlikely that Member States would have proceeded to implement the liberalisation of their energy markets without strong guarantees on the rights of consumers, including vulnerable consumers.

The distributional impact of costs and benefits associated with Member State execution of the provisions on vulnerable consumers and energy poverty depends on whether the protective measures were financed through general taxation or passed on to consumers. Assuming a progressive system of taxation, it is likely that measures financed through the energy bill have a more regressive effect than if financed through general taxation.

While the overall benefits of energy market liberalisation accrue to all consumers, the main beneficiaries of the protective measures for vulnerable consumers are those who qualify for the support. Conversely, those bearing the cost (though taxes or duties in the energy bill) and who do not receive the benefits, will be worse off. However, the overall benefits of market

[52] Article 3 point 8 states the need for Member States to consider appropriate measures to address energy poverty, as it relates to electricity and gas consumers.

liberalisation to all consumers are likely to outweigh the costs of funding the measures to protect vulnerable and energy poor consumers.

How relevant is the EU intervention?

This section looks at the relationship between the needs and problems in society and the objectives of the articles in the Electricity and Gas Directives relevant to vulnerable consumers and energy poverty.

EU action on vulnerable consumers and energy poverty is driven by the need to protect vulnerable and energy poor consumers. These objectives were identified by earlier legislative initiatives as a shortcoming of electricity and gas market liberalisation, as measures to ensure an effective finalisation of the internal energy market. Both objectives are still relevant.

Evidence quoted previously shows that the **problem of energy poverty across the EU is growing despite action by some Member States to address vulnerable energy consumers.** A number of Member States also see consumer vulnerability and energy poverty as a barrier for electricity and gas market liberalisation. Therefore the protection of vulnerable consumers and actions to address energy poverty are still a relevant area for EU intervention in the context of the completion of the internal energy market.

EU intervention is further justified by the variability in the definitions of consumer vulnerability and in the type of protective measures adopted at the Member State level, which leads to unequal consumer protection across the EU.

Recent research suggests that **consumer vulnerability in the energy market will continue to be a relevant policy issue in the future[53] as a substantial share of those characterised as vulnerable consumers may continue to find difficulties to interact with the market due to social, behavioural or cognitive drivers.** While general consumer protection measures such as consumer rights will continue to be maintained, specific provisions for vulnerable consumers will also be needed to ensure that vulnerable consumers can also benefit from the internal energy market.

Energy poverty is also likely to continue to be an important policy issue in the future. In recent years, energy prices have risen faster than household disposable income[54]. This has been particularly problematic for low-income households. If this trend continues, it is likely that the level of energy poverty in the EU will grow, which creates an even stronger case for EU intervention to deliver adequate tools for the Member States to address the problem of energy poverty without obstructing the completion of the internal energy market through practices such as electricity and gas price regulation.

How coherent is the EU intervention internally and with other (EU) actions?

This section looks at the coherence between various provisions on vulnerable consumers and energy poverty. It assesses the internal coherence of the Electricity and Gas Directives and the

[53] European Commission (2016) Available at: http://ec.europa.eu/consumers/consumer_evidence/market_studies/vulnerability/index_en.htm

[54] Source: Eurostat (Electricity prices for domestic consumers; Gas prices for domestic consumers; disposable income of households per capita; period 2010 – 2014).

external coherence in relation to other provisions on vulnerable consumers and energy poverty included in the EED and Commission actions outside legislation.

As previously explained, when defining vulnerable consumers, Member States can make reference to energy poverty and/or limitation of disconnections. Insight_E (2015) concluded that consumer vulnerability and energy poverty are distinct issues which need to be targeted by different measures. **Although both terms are highlighted in the Electricity and Gas Directives, they are not defined and it is not made clear that energy poverty and consumer vulnerability are two distinct issues which require different solutions.**

In relation to the measures to address vulnerability and energy poverty, the Electricity and Gas Directives suggest limitation to disconnections as a measure characterising vulnerability. In the absence of a more precise description of the measures, some Member States have opted to continue with price regulation. This un-targeted measure has had a negative impact on customer choice, competition, and the development of the internal energy market and the Energy Union.

Article 7 of the Energy Efficiency Directive provides the main instrument for the EU to encourage Member States to tackle energy poverty. This article states that Member States shall set up an energy efficiency obligation scheme. This scheme may include requirements with a social aim including by requiring a share of energy efficiency measures to be implemented as a priority in households affected by energy poverty or in social housing. **Nonetheless, only four Member States (Austria, France, Ireland and the UK) have added this element in their energy efficiency obligation schemes**.

Additionally the Commission has been taking action to assist Member States to meet their obligations under EU law by identifying good practices and supporting exchange of information among stakeholders and Member States representatives on how to alleviate consumer vulnerability and energy poverty in the most cost-effective way.

The Commission also finances energy efficiency improvements, in particular through the structural funds to increase efficiency in buildings which are likely to help reducing energy poverty.

What is the EU added value of the intervention?

EU-added value looks for changes due to EU intervention. The analysis of this evaluation question is limited to qualitative assessment given the difficulties to identify a counter-factual i.e. to quantify what would have happened without EU intervention.

The provisions on consumer vulnerability and energy poverty in the Electricity and Gas Directives ensure that all EU Member States have some level of protection for vulnerable energy consumers. While it is true that some Member States had been already protecting their vulnerable energy consumers prior to EU intervention, others have been brought to take action as a result of EU intervention. Annex 3[55] includes the definitions of vulnerable consumers and links to the national legislation. The table shows that some Member States

[55] Additional details on national legislation can be found in Insight_E (2015). Available at: https://ec.europa.eu/energy/sites/ener/files/documents/INSIGHT_E_Energy%20Poverty%20-%20Main%20Report_FINAL.pdf

enacted laws to transpose the Electricy and Gas directive which include a definition of consumer vulnerability in energy markets.

More importantly the consideration of consumer vulnerability and energy poverty in the Electricity and Gas Directives is key for all EU citizens, including vulnerable and energy poor consumers, to enjoy the benefits of the internal energy market. At the same time, having both concepts in the EU legislation creates a more level-playing field for energy suppliers and other retail market actors across the EU. Furthermore, it is also a necessary accompanying measure for Member States to continue the completion of the internal energy market.

Energy affordability is one of the pillars of the energy union. The completiton of the energy unions bring benefits but also costs to Member States. It is fundamental that the EU and Member States understand the impact of these policies upon European citizens and their ability to afford adequate energy services. Hence, the focus on energy poverty at the EU level and the need to address energy poverty where identified, as well as, the inclusion of energy poverty in the EED and the EPBD.

1.9. Conclusions

The legislators' **original objectives** behind the provisions were as follows:

- To **ensure protection of vulnerable consumers** by getting the **Member States to define the concept of vulnerable consumer** and **implement measures to protect them**.
- To **mitigate the problem of energy poverty** by getting the **Member States to address energy poverty where identified as an issue**.

When setting these two objectives, the legislators also wanted to facilitate the decision by Member States to proceed with electricity and gas market liberalisation. However, 17 Member States still apply some form of price regulation in their electricity and gas markets. Growing energy poverty levels and the need to protect vulnerable consumers are quoted by Member States as a justification for maintaining price regulation in the retail energy markets.

Effectiveness

The evidence available and considered in this evaluation suggests that the provisions in the Electricity and Gas Directive related to consumer vulnerability and energy poverty were partially effective.

EU action has successfully encouraged Member States to define the concept of vulnerable consumers in their legislation and to adopt measures to protect vulnerable consumers. The provisions have also brought the issue of energy poverty to the attention of some Member States. These provisions helped Member States to liberalise their retail energy markets bringing considerable benefits to all consumers in the form of competitive prices and higher standards of services.

It is nevertheless possible to identify certain unintended consequences and areas of potential improvements.

With respect to **consumer vulnerability**, whilst the variety of definitions is not a problem per se, research shows that the definition of consumer vulnerability has a bearing on the type of action that follows. This in turn led to unequal level of consumer protection across the EU.

With respect to **energy poverty**, the evaluation demonstrates that even though most Member States have correctly implemented the provisions on consumer vulnerability, the problem of energy poverty has not been effectively mitigated. While recent research indicates that energy poverty and consumer vulnerability are two distinct issues, the provisions in the Electricity and Gas Directives refer to energy poverty as a type of consumer vulnerability. This led to an incorrect expectation that a single set of policy tools can address both problems simultaneously.

This evaluation also identifies shortcomings in the effectiveness of the provisions referring to the **role of National Regulatory Authorities (NRAs) in the protection of vulnerable consumers and monitoring of electricity and gas disconnections.**

Efficiency

There is **little evidence but good reason to assume that the intervention has been efficient** in terms of the proportionality between the overall benefits and the costs of the resources deployed to fulfil the objectives of the provisions.

The cost of defining and protecting vulnerable consumers is likely to have been limited, as in many Member States, consumer vulnerability is linked to other social security benefits.

Relevance

Overall the **key provisions remain highly relevant**. For the Energy Union to be completed, strong consumer protection for all consumers and especially for the vulnerable ones is needed.

Evidence suggests that consumer vulnerability and energy poverty will continue to be increasingly relevant policy issue in the future. On one hand, a substantial share of those characterised as vulnerable consumers have permanent characteristics that make them vulnerable. On the other hand, energy poverty is likely to continue growing as energy prices have risen faster than disposable income, particularly for low-income households.

Coherence

In terms of coherence, **the evaluation has not identified any inconsistencies or elements in the legislation working against the objectives of the provisions on vulnerable and energy poor consumers.**

Nevertheless the misidentification of consumer vulnerability and energy poverty as the same issue in the Electricity and Gas Directives means that expected combined impacts are not occurring and energy poverty grows while Member States take action to protect vulnerable consumers.

Lack of a definition of energy poverty in the Electricity and Gas Directives, the EED and the EPBD makes the implementation of the provisions unclear and ambiguous.

EU added-value

The provisions addressing consumer vulnerability in the Electricity and Gas Directives are essential for protecting vulnerable consumers in the internal energy market at the retail level. **While it is true that some Member States had been already protecting their vulnerable energy consumers prior to EU intervention, others have been brought to take action as a result of EU intervention.**

1.10. Stakeholder consultation

This evaluation has benefitted from input from the following processes involving stakeholders:

1. Consultation on the retail energy market http://ec.europa.eu/energy/en/consultations/consultation-retail-energy-market

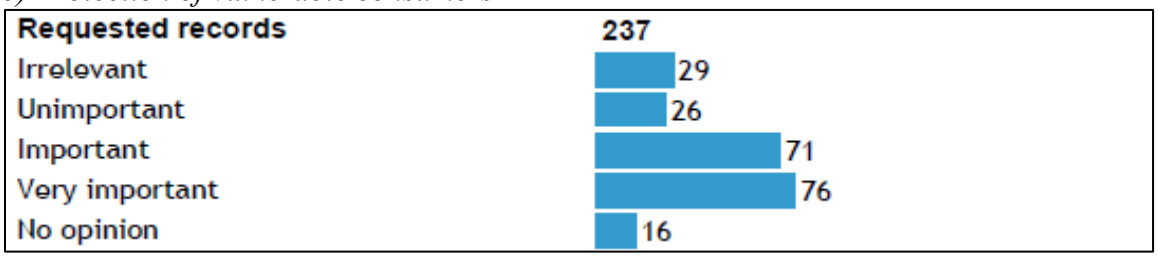
2. Meetings of the **Vulnerable Consumer Working Group** between April and December 2015.

Consultation on retail energy market - results

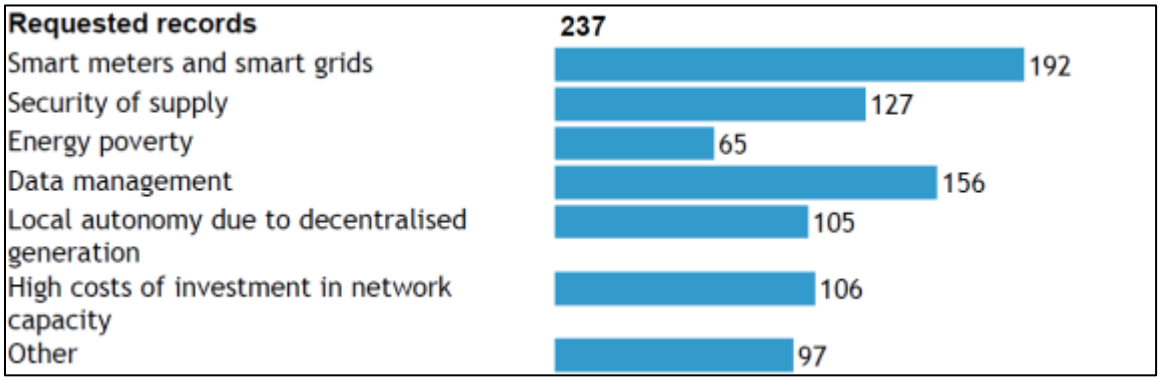
Below are summarised in graphic form a quantitative summary of the feedback from the consultation referred to in point 1 above in so far as retail energy market and the protection of vulnerable and energy poor consumers are concerned.

Please five your opinion on the relative importance of the following factors in helping residential consumers

o) Protection of vulnerable consumers



In your opinion, which of the following factors will be the main drivers of future developments in the retail market?



Meetings of the Vulnerable Consumer Working Group

The Vulnerable Consumer Working Group[56] is a stakeholder group chaired by the European Commission and attended by industry, consumer organisations, Member State and regulators representatives and academia. The group provided input to the European Commission in various aspect of this evaluation. In particular, this evaluation draws from the Guidance on Vulnerable Consumers and the Working Paper on Energy Poverty.

1.11. Member States definitions of vulnerable consumers

Member State	Definition of vulnerable consumers
Austria	The concept of vulnerable customer is implemented through a series of protection mechanisms for clearly identified groups of people/households according to social security and energy laws.
Belgium	Flanders: Cf. national definition of "sociale maximumprijs". In Flanders, vulnerable customers are those customers that are entitled to get the social tariff. National legislation defines the preconditions to get the social tariff. Brussels: The Brussels Region applies the definition of vulnerable customer such as defined in the Directive. The categories recognised by the national Government as vulnerable ones are also recognised in the Brussels Region. The Brussels Region recognises two extra categories of customers as vulnerable: 1) which are recognised as vulnerable customers by local public aid centres and 2) ones that meet certain criteria defined in the regional legislation in terms of revenues and number of persons composing the household and whom are on that basis recognised as vulnerable customers by the Brussels regional regulator. For the two additional categories recognised in the Brussels Region the 'statute' of vulnerable customers is linked to a limitation of power supply and is limited in time and ceases once the customer has paid off his debt to his supplier. Federal: The definition of the concept of vulnerable customers is implicitly recognized by the energy law and/or social security system in my country; The energy law/legal framework explicitly states what groups of customers are regarded as “vulnerable” based on personal properties of customers (disability).
Bulgaria	Social Assistance Law through Ordinance No. RD-07-5 as of 16 May 2008 for provision of targeted benefits for heating is given once a year to Persons or families whose average monthly income in the last six months is lower or equal to differentiated minimum income; these citizens are eligible for heating benefits according to Art. 10 and 11.11 From July 2012, vulnerable customers are defined in the Energy Act.*
Croatia	In its valid and effective wording, the Energy Act does not define ‘vulnerable customer’; for consumers who can be regarded as ‘socially disadvantaged’, certain measures for their protection and support for their rights are provided for at the level of generally applicable legislation in the domain of social security law
Cyprus	The definition of vulnerable customers is determined in a Ministerial decree (CEER 2013). Additional public assistance is provided to recipients to satisfy special needs, including “heating 170 euro per annum”. Recipients include persons with disability and medically confirmed patients treated abroad for a period not exceeding six months; persons with disability studying in an educational institution in Cyprus or abroad (for a period not exceeding by more than one year the normal period of their course) to obtain qualifications that will help them become independent of public assistance; and persons under the care of the director of the Social Welfare Services (SWS) when they become 18 years old and enrol in an educational institution in Cyprus or abroad in order to obtain

[56] The documents presented in the meetings of the working group are published. Available at: https://ec.europa.eu/energy/en/events/citizens-energy-forum-london

	qualifications that will help them become independent of public assistance
Czech Republic	There is a legal term "protected customer" such as hospitals and ill people dependant on life-support equipment.
Denmark	There are no specific provisions regarding vulnerable consumers in energy law; instead this issue is dealt with in social legislation.* However the principal of universality exists where every citizen has a right to social assistance when affected by a specific event. Various schemes in existence for short and longer-term support to unemployed, social security for the non-working.
Estonia	A household customer to whom subsistence benefit has been awarded pursuant to section 22(1) of the Social Welfare Act: A person living alone or a family whose monthly net income, after the deduction of the fixed expenses connected with permanent dwelling calculated under the conditions provided for in subsections 22 (5) and (6) of this Act, is below the subsistence level has the right to receive a subsistence benefit. Subsistence level is established based on minimum expenses made on consumption of foodstuffs, clothing, footwear and other goods and services which satisfy the primary needs.
Finland	In the energy market act there are defined in connection to the disconnection of the electricity. Also in the constitution there is a concept of basic rights and social security legislation defines the target groups.
France	Special tariffs are reserved for households with an income below or equal to a threshold of entitlement to supplementary universal health cover. These tariffs are available for both electricity and natural gas consumers. From the end of 2013, these social tariffs were further extended to cover all households with an annual reference fiscal income per unit (revenu fiscal de reference) lower than EUR 2,175. The number of households benefitting from the social tariff is expected to increase from 1.9 million to 4.2 million, equivalent to 8 million people.*
Germany	Vulnerable customers eligible for support are in line with the social security system (CEER 2013). Additional support is provided in terms of consumer protection in line with the Third Energy Package.*
Greece	Groups of customers defined under the Energy law: (a) The financially weak customers suffering from energy poverty. (b) Customers who themselves or their spouses or persons who live together, rely heavily on continuous and uninterrupted power supply, due to mechanical support. (c) Elderly who are over seventy years old, provided they do not live together with another person who is younger than the above age limit. (d) Customers with serious health problems, especially those with severe physical or mental disability with intellectual disabilities, severe audiovisual or locomotor problems, or with multiple disabilities or chronic illness who cannot manage their contractual relationship with their Supplier. (e) Customers in remote areas, especially those living at the Non Interconnected Islands.
Hungary	Vulnerable customers' shall mean those household customers who require special attention due to their social disposition defined in legal regulation, or some other particular reason, in terms of supplying them with electricity.
Ireland	A vulnerable customer is defined in legislation as a household customer who is: a) critically dependent on electrically powered equipment, which shall include but is not

	limited to life protecting devices, assistive technologies to support independent living and medical equipment, or b) particularly vulnerable to disconnection during winter months for reasons of advanced age or physical, sensory, intellectual or mental health.
Italy	Several measures aim to protect customers (vulnerable household customers, utilities, activities relating to 'public service', including hospitals, nursing homes and rest, prisons, schools and other public and private facilities that perform an activity recognized of public service as well as household customers that require electricity-powered life-support equipment with severe health problems). Italian decrees establish the "social bonus" (a social support program) defined by the Government for the benefit of electricity customers whose annual income does not exceed a certain threshold (set up by the law and certified by equivalent economic situation indicator, that takes into account income, assets, the characteristics of a family by number and type). The "social bonus" is a discount (annual amount fixed the same in the free market or in the enhanced protection regime) of the electricity bill each year, dependent upon the use, number of people in the family, and climate zone
Latvia	There is no clear definition of vulnerable consumers yet, but plans exist to introduce several measures to inform and support vulnerable consumers.*
Lithuania	The persons to whom according to the procedure established by the Laws of the Republic of Lithuania social support is granted and/or social services are provided can be defined as socially vulnerable customers. The list of socially vulnerable customers and the groups thereof and/or additional social guarantees, related to supply of electricity, which are applied to such customers or their groups, are set by the Government or its authorized institution. Developing the definition (list) of vulnerable consumers is currently under discussion.
Luxembourg	All customers are de facto considered as potentially vulnerable in Luxembourg.*
Malta	Vulnerable consumers are supported through social policy. Recipients of social security are eligible for support
Netherlands	Legislation states that a household consumer for whom ending the transport or the supply of electricity or gas would result in very serious health risks for the domestic consumer or a member of the same household of the household customer is regarded as vulnerable, and thus disconnection is not permitted, unless a case of fraud has been proved
Poland	The energy law states that vulnerable customer of electricity is a person who is eligible to housing allowance (income support) because the level of its income is lower than a certain degree. That means that the concept of vulnerable customers is based on poverty.
Portugal	The concept is defined in the energy sector law and corresponds to that of economically vulnerable customers which correspond to people receiving certain social welfare subsidies (social security system) with some contract limitations (e.g. contracted power). These customers have access to a social tariff.
Romania	Vulnerable customers are defined as household consumers with low income within the limits laid down in the Ordinance 27/2013*
Slovakia	The concept for the protection of consumers fulfilling conditions of the energy poverty was in preparation in 2013. Act on Energy Industry defines vulnerable household electricity customer as a strongly disabled person and whose vital functions are depending upon the offtake of electricity and uses electricity for heating. The DSO keeps records of vulnerable customers and can disrupt electricity distribution only after previous direct communication of these electricity customers with the DSO.

Slovenia	Social support is provided to households through a minimum income to households/individuals without an income or an income below the official level.
Spain	The concept of vulnerable costumers has only been defined so far for electricity customers. Vulnerable customers should fulfil at least one of the following criteria: a large family or a family where all members are unemployed; be low voltage consumers (less than 1 kV) with contracted demand lower than or equal to 3 kW; or a pensioner older than 60 years with a minimum level pension. Vulnerable customers' electricity tariffs are reduced by means of a "social bonus", which sets their tariffs at the July 2009 level. As of December 2012, 2,544,170 customers were defined as vulnerable.
Sweden	Vulnerable customers are defined as persons who permanently lack ability to pay for the electricity or natural gas that is transferred or delivered to them for non-Commercial purposes.
United Kingdom	Ofgem have defined vulnerability as when a consumer's personal circumstances and characteristics combine with aspects of the market to create situations where he or she is: -significantly less able than a typical consumer to protect or represent his or her interests in the energy market; and/or -significantly more likely than a typical consumer to suffer detriment, or that detriment is likely to be more substantial

Source: Insight_E (2015)

1.12. Member States definitions of energy poverty

Member State	Energy / fuel poverty definition	Definition metric
Cyprus	Energy poverty may relate to the situation of customers who may be in a difficult position because of their low income as indicated by their tax statements in conjunction with their professional status, marital status and specific health conditions and therefore, are unable to respond to the costs for the reasonable needs of the supply of electricity, as these costs represent a significant proportion of their disposable income.	Energy poverty is defined in the Electricity Law. Based on the provisions of the Law, a Ministerial Degree is issued specifying the various categories of vulnerable consumers and the corresponding measures to protect them.
France	*Definition according to article 11 of the "Grenelle II" law from 12 July 2010:* Is considered in a situation of energy poverty "a person who encounters in his/her accommodation particular difficulties to have enough energy supply to satisfy his/her elementary needs, this being due to the inadequacy of resources or housing conditions."	A quantitative threshold is missing.
Slovakia	Energy poverty is defined as a condition when average monthly household expenditures for the consumption of electricity, gas and heat, represent a significant share of the average monthly household income.	According to the Concept for the protection of consumers fulfilling conditions of energy poverty, issued by the Regulatory Office, the Statistical Office provides information on average monthly household expenditure for energy

Member State	Energy / fuel poverty definition	Definition metric
		consumption and household income. A household can be considered as energy poor if disposable monthly income is lower than the minimum monthly disposable household income threshold. The threshold is published on the website of the Ministry of Labour, Social Affairs and Family of the Slovak Republic, the Regulatory Office for Network Industries and on message boards of labour, social affairs and families, municipalities and municipal authorities.
Ireland	Energy poverty is a situation whereby a household is unable to attain an acceptable level of energy services (including heating, lighting, etc) in the home due to an inability to meet these requirements at an affordable cost.	Spends more than 10% of its disposable income on energy services in the home.
UK (England)	A household to be fuel poor if (i) their income is below the poverty line (taking into account energy costs); and (ii) their energy costs are higher than is typical for their household type (DECC 2013).	Low income, high consumption (LIHC). Two criteria include (i) fuel costs are above the median level, and (ii) residual income net of fuel cost spend is below the official poverty line. This applies in England, while other constituent countries use the 10% threshold metric. Note that England continues to report the 10% threshold metric for comparison, which is that *a fuel poor household is one which needs to spend more than 10% of its income on all fuel use to heat it home to an adequate standard of warmth (21^0C in living room, and 18^0C in other rooms as recommended by WHO.*
UK (Scotland)	A household is in fuel poverty if, in order to maintain a satisfactory heating regime, it would be required to spend more than 10% of its income (including Housing Benefit or Income Support for Mortgage Interest) on all household fuel use (Scottish Executive 2002).	The definition of a 'satisfactory heating regime' as per for Wales (below)
UK (Wales)	Fuel poverty is defined as having to spend more than 10 per cent of income (including housing benefit) on all household fuel use to maintain a satisfactory heating regime. Where expenditure on all household fuel exceeds 20 per cent of income, households are defined as being in severe fuel poverty (Welsh Assembly Government 2010).	As stated. The definition of a 'satisfactory heating regime' recommended by the World Health Organisation is 23°C in the living room and 18°C in other rooms, to be achieved for 16 hours in every 24 for households with older people or people with disabilities or chronic illness and 21°C in the living room and 18°C in other rooms for a period of nine hours in every 24 (or 16 in 24 over the weekend) for other households.

Member State	Energy / fuel poverty definition	Definition metric
UK (Northern Ireland)	A household is in fuel poverty if, in order to maintain an acceptable level of temperature throughout the home, the occupants would have to spend more than 10% of their income on all household fuel use (DSDNI 2011).	'Acceptable' level as per WHO 'satisfactory heating regime'

Source: Insight_E (2015)

2. ANNEX 4: DETAILS ON THE EU FRAMEWORK FOR SWITCHING AND EXIT FEES

2.1. Executive Summary

Keynotes:

- **Influence of current EU regulatory framework on switching rates is rather positive, but impossible to quantify**
- **Consumers are dissatisfied with comparability and clarity of billing information**

This Annex presents more detailed explanations on the **evaluation** of existing provisions in EU law relating to switching and exit fees in energy markets. The evaluation was carried out to inform the review of the Internal Energy Market Directives, and the follow-up of the "New Deal for Energy Consumers" Communication adopted by the Commission in July 2015 as part of the Market Design Initiative.

Switching fees are regulated by provisions in the **Electricity and Gas Directives**[57]. The legislators' **original objectives** behind the consumer-related provisions – including those around switching and exit fees – were in summary:

1. To enable effective consumer choice and boost competition, and more specifically offer every EU consumer the possibility to choose his/her electricity and gas supplier freely between any EU company;
2. To ensure competitiveness in retail market pricing;
3. To enable easy price comparison for - inter alia – households
4. To create consumer incentives to save energy.

In terms of **effectiveness**, the evidence available and considered in this evaluation generally suggests that the provisions in the **Electricity and Gas Directives are likely to have made positive contributions towards these objectives**.

Nevertheless, the legislation **may not have been fully implemented** in all Member States. The deadline for transposing the Electricity and Gas Directives was 3 March 2011, giving Member States ample time for implementation.

It is thus clear that there is **still significant room for improvement and that further action might be required** to this end. Two issues in particular should be addressed.

First, **further restricting switching-related fees** would enable consumers to - inter alia - better manage their energy costs, avoid lock-in with a particular supplier, and ensure their rights are guaranteed.

Secondly, the **current framework remains both complex and open to interpretation with regard to the nature and scope of certain key obligations**. This could be addressed by revisiting certain aspects of Annex I of the IEM.

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[57] Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0072

Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0073

In terms of **efficiency**, there is **no evidence or any reason to assume that the provisions considered have not been efficient** in terms of the proportionality between impacts and resources/means deployed.

With regard to **relevance**, **all provisions remain highly relevant**.

In terms of **coherence**, the evaluation has highlighted that the legislation could be clearer in terms of setting out final customer rights, such as Article 3(7) of the IEM. Annex I of the IEM should clearly define which switching activity should be cost-free and which switching activity should incur costs. For example, free-riding customers who switch simply to benefit from different energy companies' offers should be discouraged from doing so as this may cause detriment to final customers as a whole in terms of higher costs. In addition, where the contract has included the provision of or payment for, say, micro-generation capacity (photovoltaic panels, etc.), the supplier should be reimbursed appropriately for this investment.

Finally, as regards the **EU added-value** of provisions for free switching, the evaluation has identified **no reason to question that**. Healthy levels of consumer engagement and retail competition are key to ensuring the rollout of new products and services that will help the energy system become more flexible, and build demand for innovative energy products. In addition, the provisions addressing consumer information in the Electricity and Gas Directives are essential to ensure that the benefits of the internal energy market are passed on to all EU consumers.

2.2. Introduction

2.2.1. *Purpose of this evaluation*

The purpose of this evaluation is to **take stock of the actual performance of existing EU legal provisions on switching fees** in the context of the follow-up on the Communications on a new energy market design[58] and on *Delivering A New Deal for Energy Consumers*[59] (hereinafter referred to jointly as the *Market Design* - "MDI"), and of the parallel review of the Electricity and Gas Directives. At the same time, the evaluation presents an opportunity to look critically at provisions where problems have already been identified in the course of the ongoing work with transposition and implementation of the Directives.

2.2.2. *Summary of EU acquis related to switching fees*

The **Electricity and Gas Directives** contain the following key provisions:

- Art. 3 Public service obligations and customer protection
  - 3(5) Non-discrimination towards customers
  - 3(7) Consumer protection and easy switching
- Annex I Consumer protection
  - 1(b) Free customer withdrawal from contracts if new conditions are not accepted
  - 1(e) No customer charges for changing supplier

[58] COM(2015) 340 final

[59] COM(2015) 339 final

2.3. Scope of this evaluation

The scope of the evaluation covers the following elements:

Electricity and Gas Directives

- **A specific evaluation** of the performance/continued relevance of **Art 3(5) and 3(7) of the Electricity Directive** with regards to switching-related fees: This covers non-discrimination towards consumers, consumer protection and easy switching.
- **A general evaluation** of the performance/continued relevance of **Annex I 1(b) and Annex I 1(e) of the Electricity Directive**: These address the applicability of switching-related fees.

2.4. Background to the initiative

This section seeks to establish the objectives behind the existing provisions on switching fees in the IEM legislation based on the legislative texts (including their recitals) as well as the Commission proposals and preparatory documents accompanying the latter (impact assessments).

2.4.1. *Description of the initiative and its objectives*

The Commission's proposal for the Electricity and Gas Directives

The switching fee provisions in the current Electricity and Gas Directives were introduced in the Second Energy Package in 2003 as an integral part of measures making all consumers free to choose their supplier and to switch free of charge.

Although the 2007 Commission proposals for the **Electricity and Gas Directives** did not include new provisions on switching fees, they reiterated that the existing universal public service[60] requirements in Article 3 of the legislative texts were there "*to make sure that all consumers can benefit from **competition**.*" The Commission's Impact Assessment accompanying the 2007 proposals[61] stated that one of the specific **objectives** of the broader effort to improve consumer protection was "*[e]nabling easier **price comparisons***".

The Electricity and Gas Directives as finally adopted by the co-legislator

The recitals of the 2003 **Electricity and Gas Directives as finally adopted by the co-legislators** following the co-decision process reinforce the objectives identified by the Commission to a large extent. The **co-legislators**:

- Inserted a recital stating that the ability of electricity and gas customers to choose their supplier freely was **fundamental to the freedoms which the Treaty guarantees European citizens** (Recital 4) – a point reiterated elsewhere in the recitals.[62]

[60] Sometimes known as 'universal service' - the practice of providing a baseline level of services to every resident, most commonly through a regulated industry.

[61] http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2007/sec_2007_1179_en.pdf

[62] Recitals 20 and 18 of the Electricity and gas Directives respectively.

- Reinforced a recital on standards of public service to include the right for household customers and, where Member States deem it appropriate, small enterprises "*to be supplied with electricity of a specified quality at* ***clearly comparable, transparent and reasonable prices***" (Recital 24)

The provisions and recitals on the freedom to choose suppliers, to change supplier at any time, and the right to clear, comparable information remained largely unchanged by the **co-legislators** in the 2007 Directives.

The European Parliament stated "*Member States shall ensure that the eligible customer is in fact easily able to switch to a new supplier.*" in its Resolution of 18/6/08. "Effectively" replaced easily at some point but "easily" was the final wording.

To summarise, the switching provisions in the electricity and gas markets Directives have remained largely unchanged since they were first proposed/adopted in 2001/2003. The wording of Article 3(7) has however been changed with the addition of the word "easily": "*Member* States shall ensure that the eligible customer is in fact easily able to switch to a new supplier." Whilst no specific reference to switching-related fees was made, legislative texts and supporting documents reveal that the broader objectives of the Commission and co-legislators around the consumer-related provisions were to:

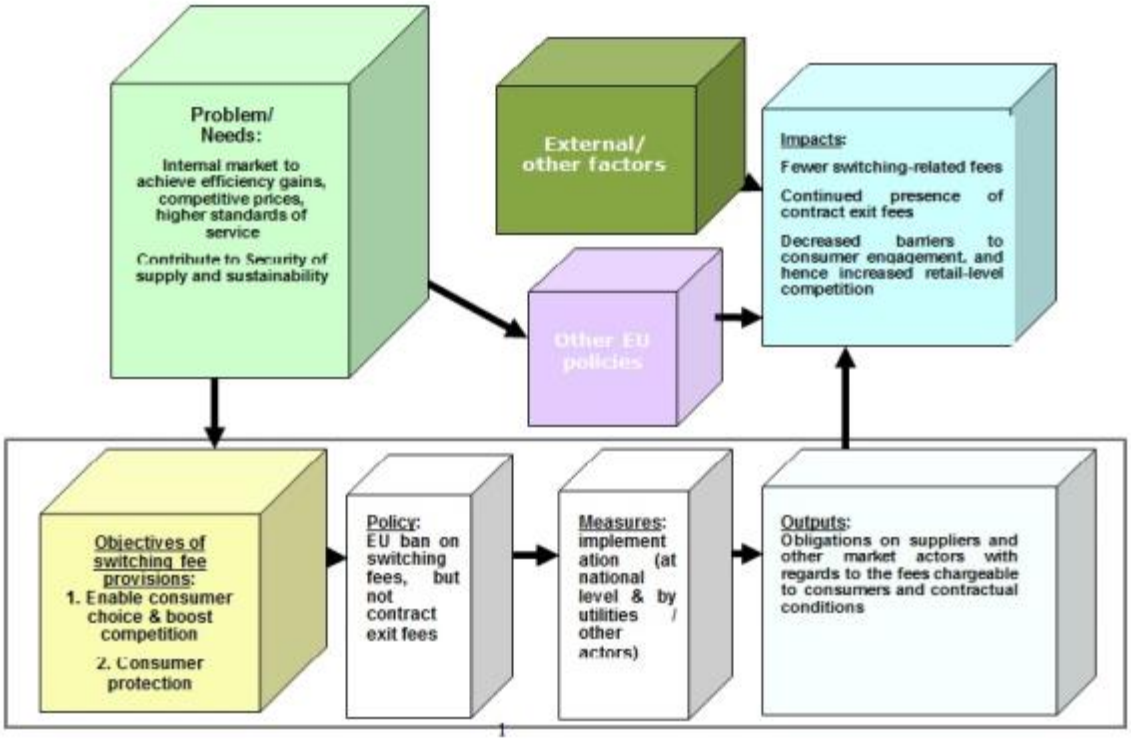
- Enable effective consumer choice and boost competition, and more specifically offer every EU consumer the possibility to choose his/her electricity and gas supplier freely between any EU company;
- Ensure competitiveness in retail market pricing;
- Enable easy price comparison for - inter alia - households;
- Create consumer incentives to save energy.

2.4.2. *Baseline*

The 2003 and 2007 Electricity and Gas Directives were fundamental to the liberalisation of the EU's gas and electricity sectors and the completion of the internal market. In their absence, it is not likely that many Member States would have proceeded with liberalising their energy markets at the same speed and to the same extent. Therefore, it is likely that significantly fewer EU energy consumers would have been able to benefit from market competition in terms of:

- increased efficiency and competitiveness;
- lower energy supply costs.

Figure 1: Intervention Logic Diagram illustrating the subject of this Annex



2.5. Evaluation Questions

This evaluation aims, for each of the sub-themes within the scope, to answer the following questions:

1. What is the current situation?

2. How effective has the EU intervention been?

3. How efficient has the EU intervention been?

4. How relevant is the EU intervention?

5. How coherent is the EU intervention internally and with other (EU) actions?

6. What is the EU added value of the intervention?

2.6. Method

This evaluation has been carried out in-house by the Commission services. The following activities and processes have provided the key inputs:

Electricity and Gas Directives

- **ACER** is an agency created by the ACER Regulation. ACER's duties include monitoring and reporting on the internal electricity and gas markets. By the end of

2015, ACER will have published four annual **Market Monitoring Reports**[63] that provide in-depth coverage of relevant issues such as consumer empowerment and protection, supplier switching and consumer information.[64]

- DG JUST (formerly DG SANCO) has commissioned two consecutive **studies on the functioning of retail electricity markets for consumers in the EU** (2010, 2015).[65] These major studies investigate whether a well-functioning electricity market is in place for consumers in the EU. They also examine the extent to which consumers are able to make informed and empowered choices and what motivates behaviour in the electricity market – evidence pertinent to evaluating the billing and metering measures put in place by the Electricity Directive.
- In addition, DG JUST's (and formerly DG SANCO's) **consumer scoreboards**[66] are an important source of information on how the single market is performing for EU consumers.
- The **Council of European Energy Regulators (CEER)** is a not-for-profit association through which Europe's national energy regulators cooperate and exchange best practice. It has recently produced a position paper on **early termination fees**,[67] presenting recommendations on how to interpret the switching fee provisions in the Electricity and Gas Directives and how switching-related fees should be regulated at the EU level.
- The **European Consumer Complaints Registration System** - ECCRS (DG JUST). In May 2010 the Commission adopted the "Recommendation on the use of a harmonised methodology for classifying and reporting consumer complaints and enquiries". The Recommendation is addressed to any body that is responsible for collecting consumer complaints, or attempting to resolve complaints, or giving advice, or providing information to consumers about complaints or enquiries, that is a third party to a complaint or enquiry by a consumer about a trader[68]. Consumer complaints collected by consumer handling bodies are a key source of information on the functioning of consumer markets across EU, in particular on problems faced by consumers. As the data will be directly comparable across the EU, this should allow for a faster, better targeted, evidence-based policy response at the EU or the national level to real problems experienced by consumers.

[63] http://www.acer.europa.eu/electricity/market 20monitoring/Pages/default.aspx

[64] The data used for compiling ACER's annual report is provided by national regulatory authorities for energy (NRAs), the European Commission and the European Networks of Transmission System Operators (ENTSOs). The members of the Administrative Board of ACER (Article 12(7) of the ACER Regulation) and ACER's Director (Article 16(1) of the ACER Regulation) act independently of the Commission and other interests. For sector-specific consumer issues, ACER also draws on data from the Commission's Consumer Scoreboard. http://ec.europa.eu/consumers/consumer_evidence/consumer_scoreboards/10_edition/index_en.htm

[65] http://ec.europa.eu/consumers/consumer_evidence/market_studies/retail_energy/index_en.htm

[66] http://ec.europa.eu/consumers/consumer_evidence/consumer_scoreboards/index_en.htm

[67] http://www.ceer.eu/portal/page/portal/EER_HOME/Whats_new/C16-CEM-90-06_CEER_early_termination_fees_final_17%20May%202016.pdf

[68] http://ec.europa.eu/consumers/consumer_evidence/data_consumer_complaints/docs/consumer-complaint-recommendation_en.pdf

2.7. Implementation state of play (Results)

2.7.1. *State of play as regards implementation*

Electricity and Gas Directives

Enforcement action undertaken by the Commission in relation to the Third Energy Package is ongoing. Procedures are set out in detail in "Enforcement of the Third Internal Energy Market Package (SWD(2014) 315 final)".[69] As of 30 September 2015, all of the infringement proceedings for partial transposition of the Electricity Directive have been closed. The focus is now on addressing the incorrect transposition or bad application of the Third Energy Package, with priority being given to violations which have the highest impact on the functioning of the internal market, including unbundling, independence, powers and duties of the national regulatory authorities and consumer protection. On this basis, the Commission has opened EU Pilot cases against a number of Member States (see further details below).

2.7.2. *Problems and issues identified*

In September 2011 the Commission opened 38 infringement proceedings against 19 Member States to ensure full transposition of the Electricity and Gas Directives. Non-resolved cases were followed up in 2012 by sending reasoned opinions and referrals to Court. The two Directives have been now transposed by all Member States. The Commission closed all the non-communication cases.

EU Pilots and infringements on incorrect transposition or bad application are currently ongoing. As of 1 December 2015, eight of these EU Pilot cases have resulted in infringement procedures where, *inter alia*, violation of the EU electricity and gas consumer provisions is at stake. However, they do not specifically address the issue of switching (exit) fees.

Annex I(1)(a) 5th indent of Directives 2009/72/EC 2009/73/EC on **whether withdrawal from the contract without charge is permitted** has been raised in an EU Pilot with three Member States. Annex I(1)(e) on **not being charged for changing supplier** has been raised in an EU Pilot with one Member State. Annex I(1) has been raised in its entirety in several EU Pilots.

The findings of a mystery shopping exercise[70] carried out between 11 December 2014 and 18 March 2015 also suggest that the implementation and/or enforcement of some measures addressed in this evaluation may be an issue in certain Member States. 4% of mystery shoppers were told they may be charged fees related to switching other than exit fees, which are contrary to the provisions in the Electricity and Gas Directives. Such fees may include administrative costs, start-up costs for a new or short-term service, or security deposits (Text Box 1 below). This finding is notable because EU legislation ensures that consumers "are not

[69] https://ec.europa.eu/energy/sites/ener/files/documents/2014_iem_communication_annex6_0.pdf. Figures presented here are updated, to the extent necessary.

[70] Mystery shopping or a mystery consumer or secret shopper, is a tool used externally by market research companies, watchdog organizations, or internally by companies themselves to measure quality of service, or compliance with regulation, or to gather specific information about products and services. Mystery shoppers were instructed to analyse one of their own monthly, bi-monthly or quarterly electricity bills.

charged for changing supplier".[71] As checks by the Commission indicate that this legislation has been correctly transposed into Member State law, the finding suggests either legal failures in the EU legislative text that prevent it from fulfilling its intention and/or non-enforcement by national authorities.

Text Box 1: Examples of "extra charges" when switching mentioned by electricity providers (when being contacted by phone)[72]

- Administration cost (€35) – France
- A service fee (€27.90) – France
- A fee for starting up the service (€27.16) – France
- An administration cost added on the first electricity bill (€27.59) – Italy
- An activation fee – Italy, Poland
- An extra charge of €20.54 on the first bill; no explanation was provided for this charge – Italy
- A security deposit (€70) – Italy
- A deposit (€77) – Italy
- A fee for contracts of less than one year – Spain
- A yearly charge of 300 SEK/year (or 25 SEK/month) for each new contract – Sweden

The responses to the Commission's Consultation on the retail energy market[73] conducted in spring 2014 generally confirm the impression that there's much room for improvement in the retail market, including when it comes to switching fees. Of a total of 237 responses, 222 responded that transparent contracts and bills were important or very important, 89 indicated that consumers were not aware of their switching rights, and 180 thought awareness of consumer rights should be improved. 110 thought that tariffs were too difficult to compare due in part to contractual conditions, and 128 though that switching offered insufficient benefits. Just 32 out of 237 respondents agreed with the statement: "There is no need to encourage switching."

2.8. Answers to the evaluation questions

Below the evaluation questions are addressed for each of the key provisions within the scope of the evaluation.

2.8.1. *Electricity and Gas Directives*

What is the current situation?

[71] This reading was recently supported by the body representing the EU's national regulatory authorities – the Council of European Energy Regulators – who write: "The 3rd Energy Package Directives clearly state that switching should be completely free for the customer."CEER (2016), 'Position on early termination fees', Ref: C16-CEM-90-06, 13 May 2016.

[72] European Commission ([ongoing]), 'Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU ', [link].

[73] https://ec.europa.eu/energy/en/consultations/consultation-retail-energy-market

Article 3 and Annex I of the Electricity and Gas Directives put forward general switching requirements. The information below is taken from the ACER 2015 Market Monitoring Report[74] and summarises the current situation for household customers.

"Among the potential barriers to switching, this Report has also identified exit fees, since they tend to increase the threshold for consumers to switch due to the perceived diminished potential savings available. However, exit fees in fully competitive retail markets are applied to cover the costs incurred by suppliers due to early contract termination. Offers which include exit fees should be made fully transparent on price comparison tools and, for instance, filterable from other offers by consumers in search of a different deal." Exit fees tend to be linked to fixed-price and fixed-term contracts i.e. they represent an early termination fee.

Exit fees in France, Belgium and Italy have been eliminated. In Belgium, this is perceived to have increased consumer trust in energy markets. In GB, AT, and DE, termination fees cannot be charged if there is a contract price change. Of 13 capital cities assessed, consumers in Amsterdam were the most affected by electricity and gas exit fees, LB: presumably because NL is renowned for its well-functioning switching market, which does not encourage customer loyalty.

Exit fees may not correspond to the actual cost incurred by the supplier of losing the customer; LB/GK: they should thus be proportionate.

Interestingly, gas offers tend to specify a contractual period more often than electricity offers. LB: If the contractual period is not defined then an exit fee (as this should be linked to, for example, premature cancellation) should not be required. Exit fees are more likely to be linked to electricity than to gas contracts; this is assumed to be because there is a higher number of suppliers and of offers in electricity markets.

According to consumer associations and NRAs, factors that prevent electricity and gas consumers from switching include insufficient monetary gain (see Figure 46 below), which takes exit fees into account.

[74] http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2015.pdf

Figure 46: Factors preventing electricity and gas consumers from switching – 2014 (1 – not at all important 10 – very important)

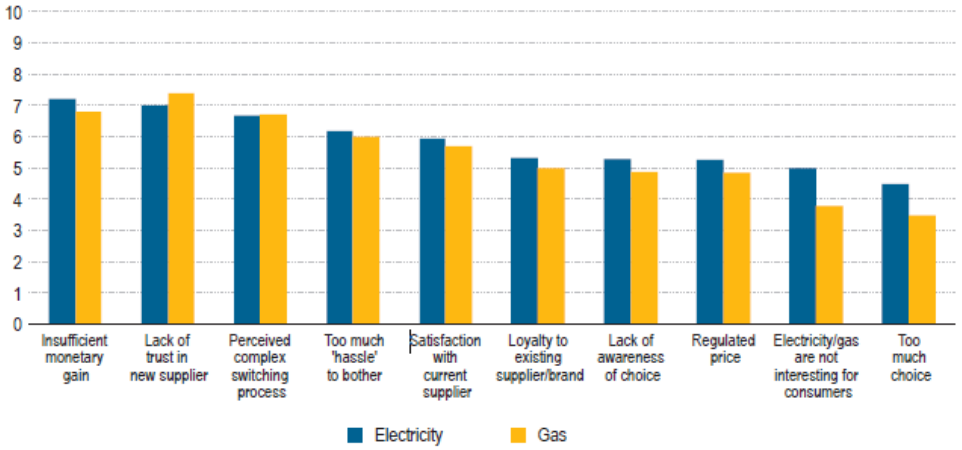
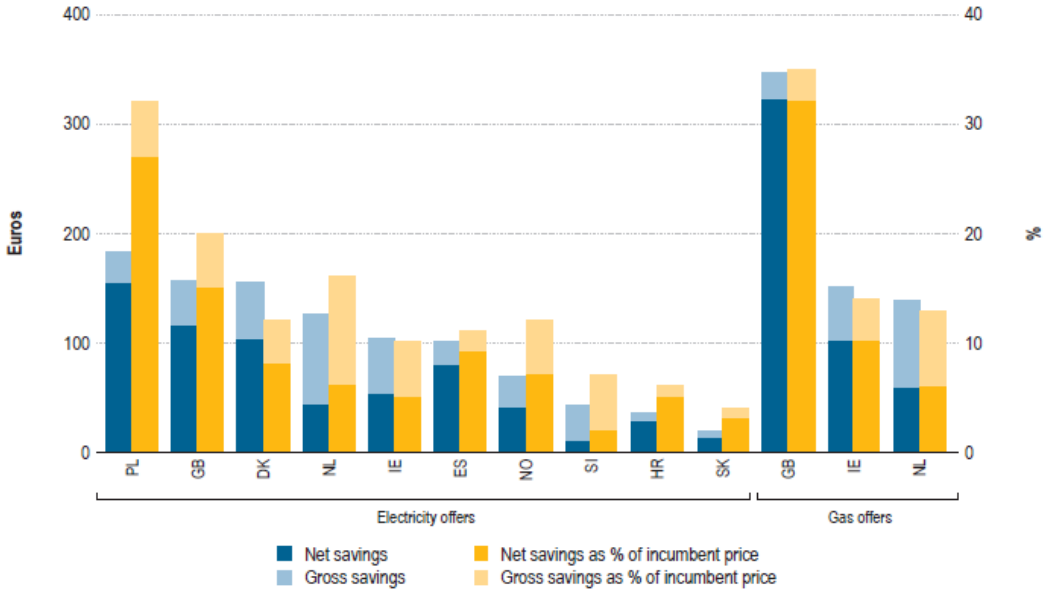


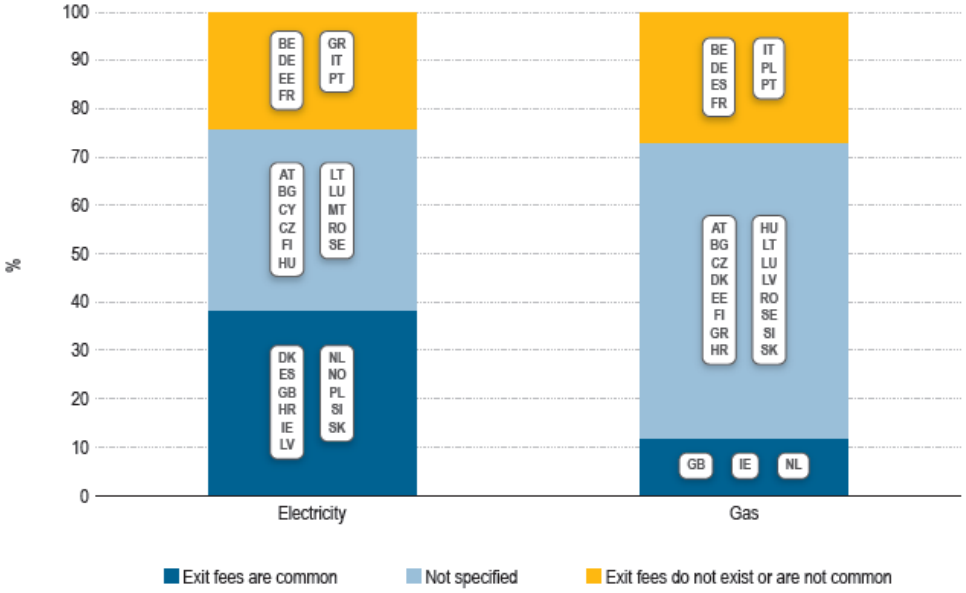
Figure 47 seems to indicate that there is a strong status quo/loss aversion bias in terms of switching that could be linked to the exit fee. The net savings represent the savings customers can make after the deduction of the exit fee. The exit fee charged in NL, IE, and SI appears to represent a significant barrier to switching.

Figure 47: Potential effect of exit fees on annual savings to be made from switching away from the incumbent in Europe – 2014 (% and euros)



Finally, one ACER recommendation is that price comparison tools should include mention of the exit fee, enabling consumers to perform improved searches.

Figure A-20: Existence of exit fees imposed by suppliers when switching offers – 2014 (%)



Source: ACER Questionnaire (February–April 2015) and ACER Database (November–December 2014).

Notes: Based on the offer data shown or as indicated by the respondents in the Questionnaire. Although MSs are listed in the Figure, the information drawn from the offer data may refer only to the capital city.

The following findings are taken from the 2nd consumer market study on the functioning of retail electricity markets for consumers in the EU.

Table 12: Electricity providers' response when asked if there are any charges when switching provider

	CZ	DE	ES	FR	UK	IT	LT	PL	SE	SI	Total
	50	100	75	75	75	75	50	100	50	50	700
You will not be charged for the change	60%	94%	83%	89%	59%	86%	80%	67%	66%	80%	77%
A fee for cancelling your current energy deal (e.g. exit fee for fixed rates)	40%	5%	11%	5%	38%	1%	0%	28%	32%	14%	17%
Another extra charge	0%	0%	7%	4%	3%	11%	8%	4%	2%	2%	4%
No response	0%	1%	0%	1%	0%	1%	12%	1%	0%	4%	2%

Q10. Ask the operator if there are any charges when switching provider; what does he/she reply?
Base: all mystery shoppers
Source: Mystery shopping exercise

In addition to the exit fees mentioned above, mystery shoppers were advised of a range of different fees linked to switching, such as an administration cost of €35 and a security deposit of €70.

Table 13: Switching rules found on providers' websites											
	SI	DE	UK	FR	PL	CZ	IT	LT	SE	ES	Total
You will not be charged for the change	82%	57%	21%	52%	50%	36%	45%	30%	10%	24%	42%
The new provider must make the change within three weeks (or less), provided you respect the terms and conditions of the original contract	10%	13%	26%	13%	6%	8%	1%	10%	12%	3%	10%
Within six weeks (or less) after you switch, you should receive the final closure account from your previous provider	10%	11%	24%	4%	7%	2%	0%	2%	2%	4%	7%
It might be that you'll incur a fee for cancelling your current energy deal	10%	5%	17%	0%	6%	8%	1%	0%	16%	5%	7%
None of the above	14%	38%	42%	43%	47%	52%	54%	66%	66%	69%	49%

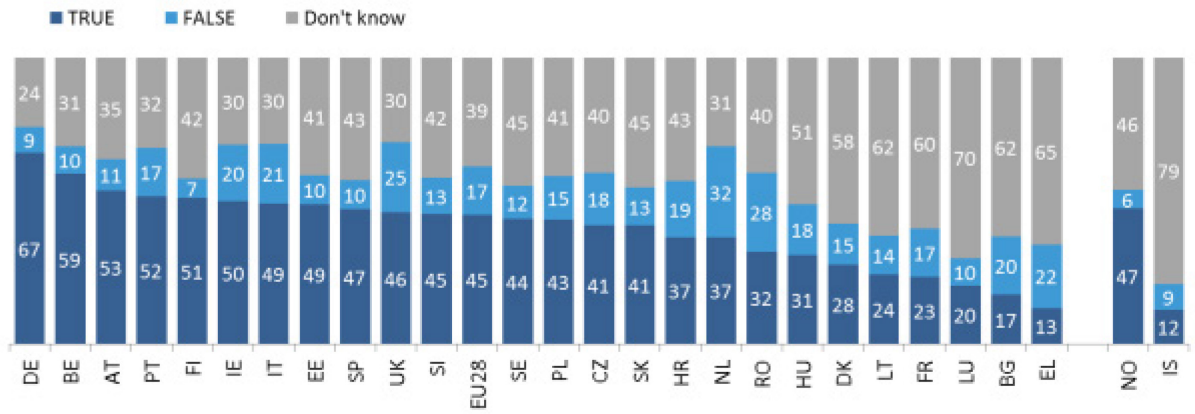
Q3. Which of the following statements about the switching process were found on the website? (multiple answers allowed)
Base: all mystery shoppers
Source: Mystery shopping exercise

There is a large disparity in the information provided: mystery shoppers were far more likely to receive the correct information on exit fees if they called the provider rather than taking the information from the provider's website, with the exception of SI. Suppliers thus seem to be using incorrectly published information as a barrier to switching. In answer to the statement "you will not be charged for the change" the ratio is 77:42 (calling : website); for the statement " a fee for cancelling your current energy deal", the ratio was the inverse, 7:17. The proviso is of course the fact that consumers may have signed a contract which mentions that an exit fee will be charged.

When survey respondents were asked whether they could be charged for the change when switching electricity company, 45% of respondents answered that no such charges were allowed, while 17% stated the opposite, and 39% selected the "don't know" response. Across the EU28, 3% of respondents stated that one of the main reasons they had not tried to switch was that they would incur an exit fee from their electricity company. This percentage rose to 7% in IT and GB, and 6% in HR.

In five Member States - Finland (51%), Portugal (52%), Austria (53%), Belgium (59%) and Germany (67%) - more than half of respondents answered that a consumer should not be charged when changing electricity company. In eight countries – Hungary (51%), Denmark (58%), France (60%), Bulgaria (62%), Lithuania (62%), Greece (65%), Luxembourg (70%) and Iceland (79%), more than half of respondents thought this statement was false.

Figure 2: Knowledge of switching rules – no charge when changing electricity company, by country



Q26_2 The following are statements regarding consumer rights in the energy sector. Please indicate whether each statement is true or false: "If you decide to change your electricity company, you will not be charged for the change"
%, by country, Base: all respondents; Question not asked in Cyprus, Latvia and Malta
Source: Consumer survey

Whereas customers in the majority of MS are currently provided with information on the consumption period, actual and/or estimated consumption, and a breakdown of the price, there is a greater diversity of national practices with regards to other potentially beneficial information, such as switching information, information about price comparison tools, and the duration of the contract. As outlined above, the duration of the contract is essential when it comes to charging exit fees.

However, the inquiries/complaints data collected through the European Consumer Complaints Registration System show an increasing trend over the last years of consumers complaints related to unclear invoice/bill for electricity or gas.

To summarise, there is currently a high level of divergence in Member States with regard to policy measures concerning exit fees, and the level of those fees. This would appear to indicate a lack of implementation of certain requirements of the Electricity and Gas Directives.

How effective has the EU intervention been?

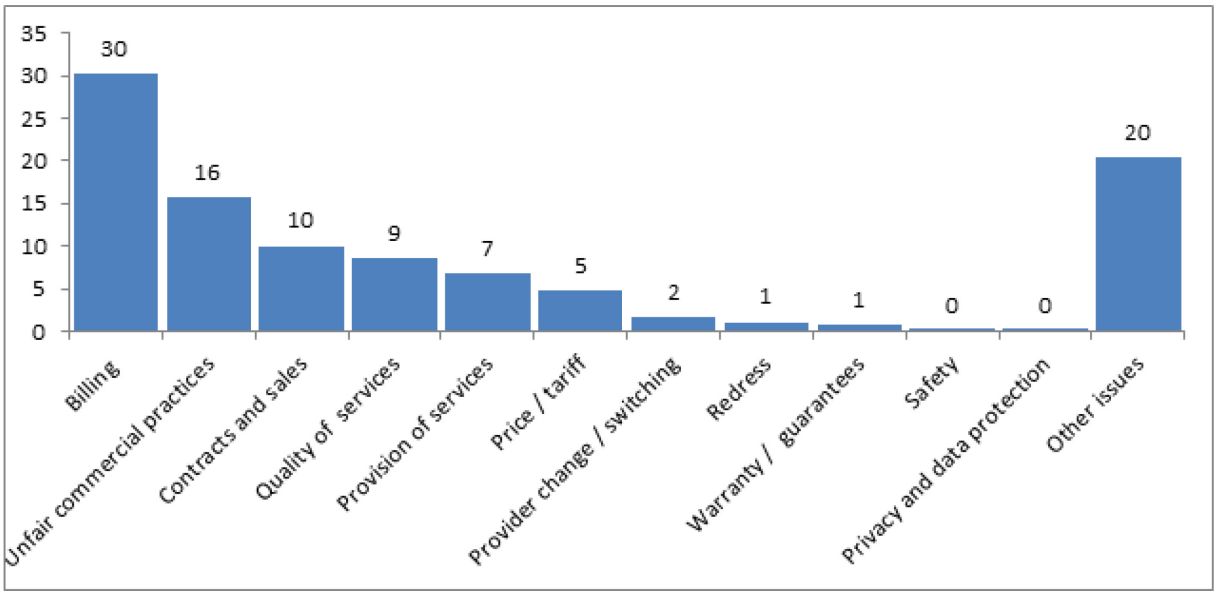
To recap, the major objectives of the Articles in the Electricity and Gas Directives relevant to switching fees were:

- To enable effective consumer choice and boost competition, and more specifically offer every EU consumer the possibility to choose his/her electricity and gas supplier freely between any EU company
- To ensure competitiveness in retail market pricing
- To enable easy price comparison for - inter alia - households
- To create consumer incentives to save energy

In terms of consumer choice, consumer organisations responding to the latest ACER Market Monitoring Report stated that the average electricity and gas consumer in their countries is only able to compare prices to a limited extent. The average score was 4.8 and 5.0 on a scale

from 1 to 10 for electricity and gas respectively.[75] These poor figures are backed by a recent Commission survey that found that just 40% of EU respondents strongly agreed that the electricity bills of their electricity company were easy and clear to understand.[76] Correspondingly, the largest share of consumer complaints reported to the Commission between 2011 and 2014 were related to billing (30%)[77].

Figure 3: Reasons for electricity and gas consumer complaints 2011 - 2015 (in % in a database with 28.490 cases)[78]



Information on energy sources appears to be one specific area of concern. Article 3(9) of the Electricity Directive requires suppliers specify the contribution of each energy source to the overall fuel mix of the supplier over the preceding year in or with consumer bills.

The consumer switching rate is perhaps the most direct indicator of consumer engagement with the market and of the available choice. Although switching is affected by a range of other factors (regulated prices, the difference in price between offers on the market and trust in new suppliers, for example), it offers an important quantitative measure of the effectiveness of the Articles in the Electricity and Gas Directives – albeit an indirect one. At the same time, other factors that may influence the switching rate besides that status quo bias/inertia are, according to consumers surveyed, linked to the difficulty of finding out what the right tariff would be for them (21%) or the fact that they will have to manage their account online (3%) in order to get cheaper tariffs. Thus, removing certain market barriers could lead to more

[75] ACER (2015) Market Monitoring report 2014, http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2015.

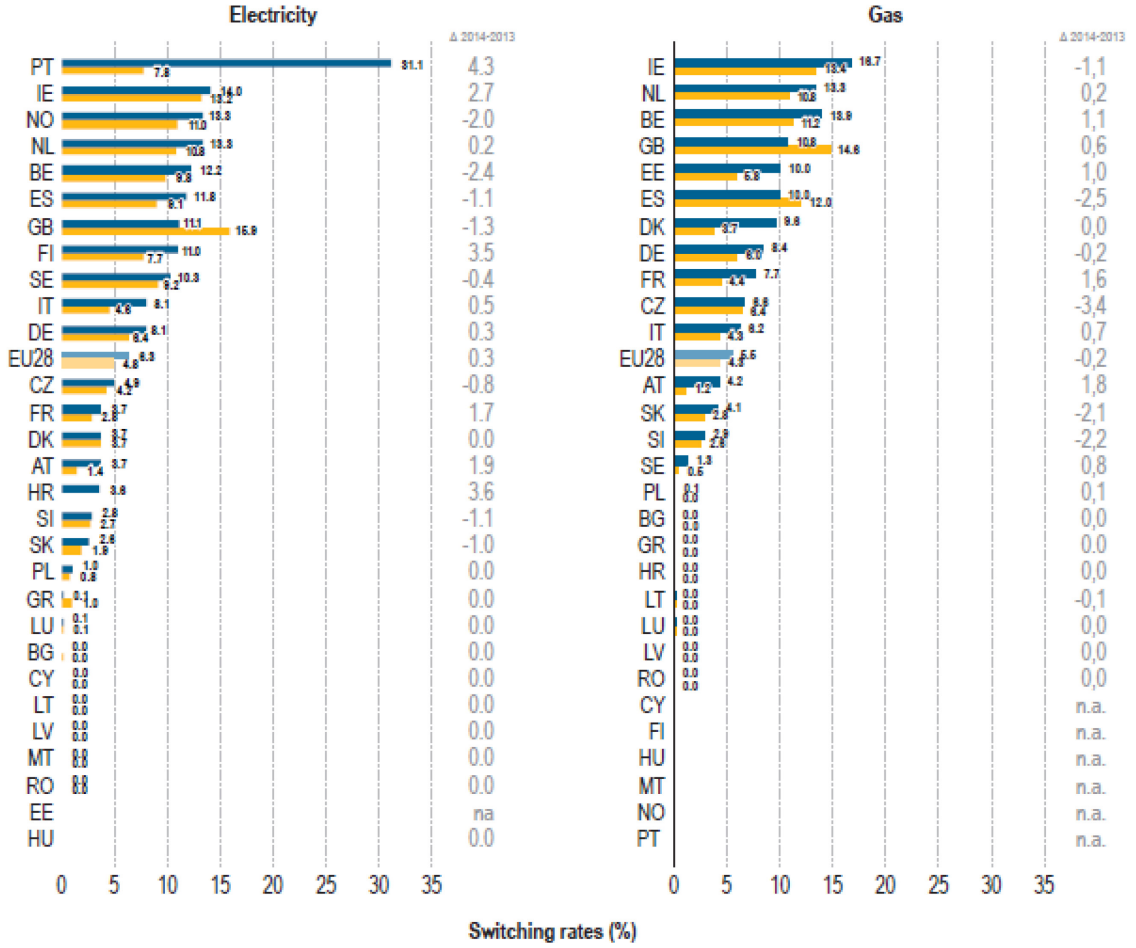
[76] European Commission, ' Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '.

[77] Recommendation 2010/304/EU is addressed to all third-party complaint bodies (national authorities, consumer organisations, etc.) and calls on them to classify complaints according to a common taxonomy and to report the data to the Commission.

[78] Source: DG JUST.

effective consumer choice. The figure 7 shows that while switching rates have generally increased since 2008, they remain relatively low in the EU-28 at around 6%.

Figure 4**:** Switching rates for electricity and gas household consumers in 2014, annual average 2008–2013[79]



At a broader level of analysis, enabling consumer choice can be seen as means of improving consumer satisfaction. Here, the data indicate that there is clearly scope for improvement. According to the 10th edition of Consumer Scoreboard,[80] which is based on consumer survey[81] and expressed in a composite Market Performance Index (MPI),[82] electricity services

[79] Source: CEER National Indicators database

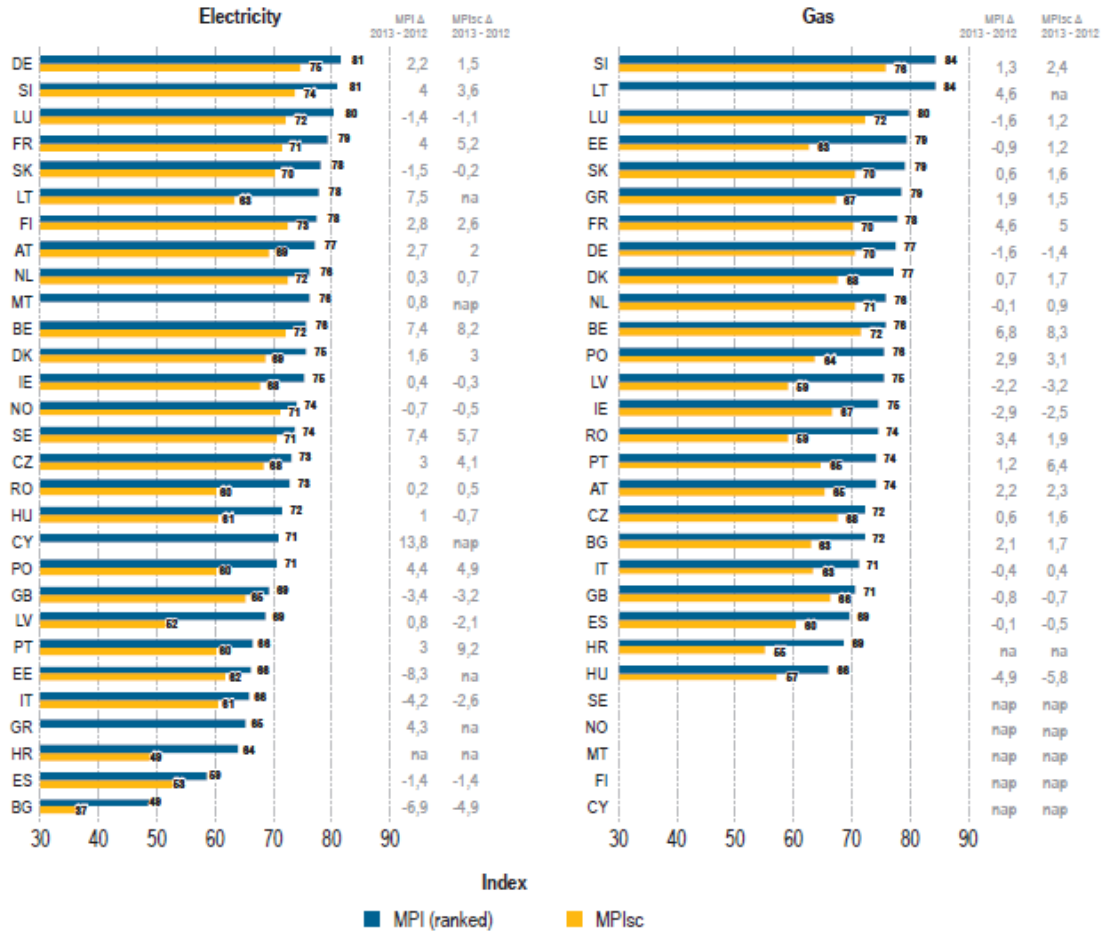
[80] DG Justice and Consumers' 'Consumer Markets Scoreboard' provides at the EU-wide level a quantitative assessment of how different markets worked for consumers The 10th edition of Consumer Market Scoreboard published is available at: http://ec.europa.eu/consumers/consumer_evidence/consumer_scoreboards/10_edition/index_en.htm.

[81] The 2013 edition of the Market Monitoring Survey is available at: http://ec.europa.eu/consumers/consumer_evidence/consumer_scoreboards/market_monitoring/index_en.htm. The 'Market Monitoring Survey' which has been used as the main statistical source for the Scoreboard has been produced annually from 2010 to 2013. However, from 2013, it will be available only every other year and therefore as data for 2014 are lacking and data for 2013 are used instead.

[82] The MPI is a composite index based on the results of survey questions on four key aspects/components of consumer experience: (1) expectations (i.e. the extent to which the market lives up to what consumers expect);

rank 28th and gas services 22nd among the 31 markets for services across the EU. Therefore, both markets can still be considered low performing frmo the consumer standpoint.

Figure 5: Overall performance of markets for electricity and gas services by country – 2013 and change on 2012 **(index)**[83]



The figure above shows large differences between the top-ranking and bottom-ranking countries in the markets for electricity and gas services, measured by composite indices MPI and MPIsc.[84] This is particularly true for the electricity markets.

With regard to the second of the three objectives – boosting competition in retail markets – evidence clearly indicates that retail market competition has increased in the EU since the articles relevant to billing and metering were introduced in the Second Energy Package. However, there have also been a great number of other relevant measures put in place at the same time as part of the broader effort to liberalise EU energy markets. These include

(2) the ease of comparing goods or services; (3) consumers' trust in suppliers to comply with consumer protection rules; and (4) the experience of problems and the degree to which they have led to complaints. These four aspects of consumer experience are equally weighted when creating the overall score.

[83] Source: DG Justice and Consumers (2014).

[84] MPIsc is the MPI supplemented with 'choice' and 'switching' components and is used only in markets where it is possible to switch services and providers.

unbundling rules and limits on price regulation. This makes it impossible to quantitatively gauge the competition gains brought about by the articles on billing and metering.

There is a similar situation for the last of the three objectives – creating consumer incentives to save energy. There is evidence to show that there has been progress in recent years.[85] However, as numerous EU energy efficiency policy measures have been put in place in parallel during the period in question, it is again impossible to quantitatively disambiguate the individual contribution to these gains by the measures introduced in the Second Energy Package. Qualitatively, however, we can estimate these gains to be relatively minor as also acknowledged in the Energy Efficiency Directive, where Recital 32 expressly states that the " *impact of the provisions on metering and billing in Directives 2006/32/EC, 2009/72/EC and 2009/73/EC on energy saving has been limited. In many parts of the Union, these provisions have not led to customers receiving up-to-date information about their energy consumption, or billing based on actual consumption at a frequency which studies show is needed to enable customers to regulate their energy use..*".

To summarise it is difficult to say how much the billing articles in the Electricity and Gas Directives have contributed to their stated objectives, inter alia because these objectives were not accompanied by indicators and it is hence difficult to judge upon achievement. However, their impact on energy savings have most certainly been quite limited, whereas their impact on enabling easier and more effective consumer choice can be judged at least a partial success. Areas for potential further improvement in this sphere may include ensuring the provision of key information elements to further improve clarity and comparability, reducing the volume of information presented in bills, as well as improving the provision and quality of information on energy sources.

How efficient has the EU intervention been?

There is no data available to assess this question quantitatively, but given that the overall impact may have been rather limited, both the effects and the costs likely have been so too. Consumer bills are currently heavily regulated beyond the requirements imposed by the Electricity and Gas Directives in most Member States.[86]

How relevant is the EU intervention?

At the time of drafting both the Second and Third energy packages, consumer bills and pre-contractual information formed the basis of consumer comparability, as consumers would be given the possibility to measure up individual offers against their current supply contract. Since then, the use of online price comparison tools has risen significantly across the EU. Over time the continuation of this trend might challenge the relevance of the EU intervention if it is not adapted to also reflect new ways of consumer-market interaction. Well-designed, reliable and transparent price comparison tools do the number-crunching necessary to accurately compare the costs of each offer for individual consumers. In the future it will be

[85] See f.ex. COM(2015) 574 final " Assessment of the progress made by Member States towards the national energy efficiency targets for 2020 and towards the implementation of the Energy Efficiency Directive 2012/27/EU as required by Article 24 (3) of Energy Efficiency Directive 2012/27/EU"

[86] European Commission' Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '.

increasingly important to ensure that bills provide all the key inputs that consumers need to be able to use comparison tools.

A recent study found that 64% of EU consumers who had compared tariffs of different electricity companies said they had used comparison tools to do so. It also showed that comparison tools – which grants access to the offers of a larger number of providers- significantly increased the number of cheaper offers consumers were able to identify compared with contacting individual providers directly.[87]

Comparison tools are likely to become even more important as the retail market for energy matures. Between 2012 and 2014, 'choice' for consumers in European capitals widened, with a greater variety of offers being available. However, the ability of consumers to compare prices can be hampered by the complexity of pricing and the range of energy products, as well as by an increasing number of offers and their bundling with additional free or payable services.[88]

ACER has therefore recommended that: "*To improve consumer switching behaviour and awareness further, National Regulatory Authorities (NRAs) could become more actively involved in ensuring that the prerequisites for switching, such as transparent and reliable online price comparison tools and transparent energy invoices, are properly implemented.*"[89]

It is important to emphasise that in the context of the general efforts to move energy markets from simple commodity markets (for kWhs) towards energy an services market, "transparent and reliable price comparison tools" need to be able to assess contracts from a holistic perspective that integrates broader aspects including energy efficiency improvement actions or services, differences in energy sourcing qualities (greenness) etc.

How coherent is the EU intervention internally and with other (EU) actions?

The provisions on switching in the Electricity and Gas Directives are not contradicted elsewhere in the EU *acquis*. However, the current framework remains both complex and open to interpretation with regard to the nature and scope of certain key obligations.

The consumer protection provisions in the Electricity and Gas Directives regulate switching fees. Largely unchanged since their 2001/2003 introduction, these provisions state that "customers are not to be charged for changing supplier".

However, the following text regarding contract exit fees was added in 2007: contracts must specify "whether withdrawal from the contract without charge is permitted". It weakened the initial provision by affirming the permissibility of certain switching-related charges without

[87] From twice to twenty times, depending on the Member State. European Commission , ' Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '.

[88] ACER (2015) Market Monitoring report 2014, http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2015 p.40, 100.

[89] ACER (2015) Market Monitoring report 2014, http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2015 p.10.

explicitly addressing whether the legislation addressed all switching-related charges in categorically exhaustive manner.

What is the EU added value of the intervention?

The provisions addressing consumer information in the Electricity and Gas Directives are essential for protecting consumers in the internal energy market at the retail level.They play an important role in ensuring the benefits of the internal market in energy can be enjoyed by all consumers, and help to create a level-playing field for suppliers and other retail market actors across the EU. Whereas there is currently still very limited if any examples of cross-border supply in the retail market, a common base of energy consumer rights is a precondition for that to develop over time.

2.9. Conclusions

The legislators' **original objectives** behind the provisions can be summarised as follows:

- To **enable effective consumer choice** and **boost competition** through the availability of transparent, comparable and reliable information on prices, costs, energy consumption, fuel mix and environmental impact of electricity supplies
- To **enable/incentivize energy savings** through sufficiently frequent feedback about (the cost of) their energy consumption

Effectiveness

The evidence available and considered in this evaluation suggests that the provisions in the **IEM and EED together are likely to have made positive contributions towards the achievement of both of these objectives**, although it is impossible to quantify this.

With regard to **comparability and clarity of billing information**, the relatively low degree of satisfaction of electricity and gas customers and the high number of complaints related to billing suggests that there is **still significant room for improvement and that further action might be required** to this end.

This said, the EED generally contains the most specific and detailed provisions in the area of metering and billing, and not just as regards energy savings but also as regards comparability. As the deadline for its transposition is also relatively recent (mid 2014) and since some of the key obligations therein have later deadlines for actual application, it is **generally speaking too early to draw too many conclusions as regards the effectiveness of the current legislative framework**. In particular, the requirement for heat meters or heat cost allocators in multi-flat/purpose buildings is not mandatory before the end of 2016, and the minimum frequencies on billing were only mandatory as of 1/1-2014.

It is nevertheless already now possible to identify certain areas of potential improvements.

With respect to the **EED** there was clearly stated intention to clarify the pre-existing requirements contained in the IEM and in the 2006 Energy Services Directive (ESD) as their effect on the second objective was considered to have been too limited. This intention has only partially been met given that the **current framework remains both complex and open to interpretation** with regard to the nature and scope of certain key obligations. From this

perspective, there might be a case already now for revisiting certain aspects of EED Art. 9(1), Art.9(3), Art. 10(1) and of Annex VII.

With regard to **disclosure of energy sources**, the evidence available suggests that the way the current requirements are implemented is not sufficient to match the intentions: a **rather high share of citizens seem to either not find or notice disclosure information with their billing information**. While this in some instance may be due to bad application/non-enforcement, it also points to a potential for making such information more accessible and visible. The fact that a high share of gas offers carry "green" labels or claims despite biogas injection still being very limited further puts a question mark over the effectiveness of what is in fact amounts to a voluntary/unregulated regime, given there currently is no disclosure obligation for gas as there is for electricity.

Efficiency

There is **neither any evidence, not any reason to assume that the intervention hasn't been efficient** in terms of the proportionality between impacts and resources/means deployed. The major reason for thist is that the obligations are modest in ambition.

Relevance

Overall the **key provisions remain highly relevant**. Switching-related fees continue to be faced by around 20% of EU electricity consumers, and a lesser, although still significant number of gas consumers. There is still a need to regulate their application.

Coherence

The evaluation has highlighted that the legislation could be clearer in terms of setting out final customer rights, such as Article 3(7) of the IEM. Annex I of the IEM should clearly define which switching activity should be cost-free and which switching activity should incur costs. For example, free-riding customers who switch simply to benefit from different energy companies' offers should be discouraged from doing so as this may cause detriment to final customers as a whole in terms of higher costs. In addition, where the contract has included the provision of or payment for, say, micro-generation capacity (photovoltaic panels, etc.), the supplier should be reimbursed appropriately for this investment.

EU added-value

Delivering a New Deal for energy consumers as part of an Energy Union with consumers at its heart means, *inter alia*, removing barriers to consumer engagement with the market and driving competition between energy supplier and service providers. **Healthy levels of consumer engagement and retail competition are key to ensuring the rollout of new products and services that will help the energy system become more flexible, and build demand for innovative energy products.** Reducing financial barriers to switching to the minimum amount practicable therefore contributes to realising the Energy Union and meeting EU goals on energy efficiency and greenhouse gas reductions.

In addition, the provisions addressing consumer information in the Electricity and Gas Directives are essential for protecting consumers in the internal energy market at the retail level. They play an important role in ensuring the benefits of the internal market in energy can be enjoyed by all consumers, and help to create a level-playing field for suppliers and other retail market actors across the EU. **Whereas there are currently very few, if any, examples**

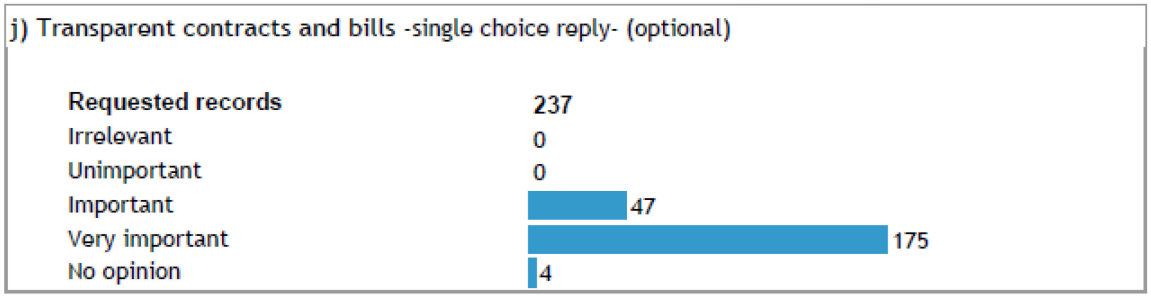
of cross-border supply in the retail market, a common base of energy consumer rights that helps national rules converge over time is a precondition for that to develop. With the perspective of developing an internal retail market where customers one day might even shop cross-border, the common definition of minimum requirements for information on consumers creates an added value. But even in absence of cross-border supplies at retail level, **common minimum requirements allow service providers to develop standard solutions and create economies of scale**, leveraging the internal market of 500 mio consumers.

2.10. Stakeholder consultation

Below are summarised in graphic form a quantitative summary of the relevant feedback from the consultation on the retail energy market[90].

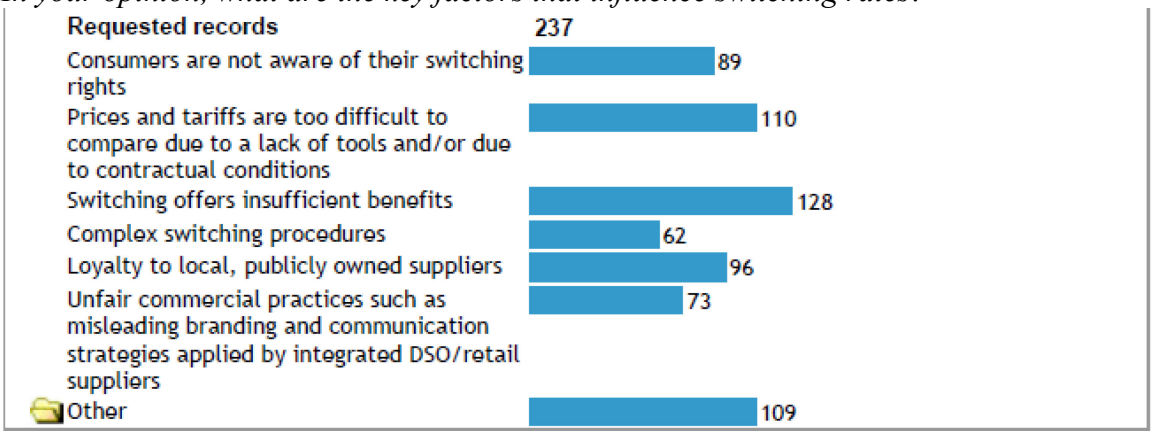
Retail market public consultation - results

Please give your opinion on the relative importance of the following factors in helping residential consumers and SMEs better control their energy consumption and costs.



ACER/CEER Annual Report concludes that consumers are dissatisfied with the information they receive in their contract and in their billing information. The report also shows the frequency with which consumers switch from one energy supplier to another. This varies between 0% to 14,8% in the EU Member States.

In your opinion, what are the key factors that influence switching rates?



[90] http://ec.europa.eu/energy/en/consultations/consultation-retail-energy-market

Please indicate if you agree or disagree with the following statements concerning ways to increase consumers' interest in comparing offers and switching to a different energy supplier.

a) Include standardised minimum information in commercial offers for easier comparison -single choice reply- (optional)

b) Ensure the availability of web-based price comparison tools -single choice reply- (optional)

c) Ensure consumers are aware of their rights -single choice reply- (optional)

d) Develop further rights for consumers -single choice reply- (optional)

e) There is no need to encourage switching -single choice reply- (optional)

3. ANNEX 5: DETAILS ON THE EU FRAMEWORK FOR METERING AND BILLING OF ENERGY CONSUMPTION

3.1. Executive Summary

This Annex presents more detailed information on provisions in EU law relating to the specific theme of metering and billing of energy consumption. The evaluation is one of a series of such evaluations looking holistically at certain themes that have been carried out to inform the review of the Energy Efficiency Directive and the follow-up of the "New Deal for Energy Consumers" Communication adopted by the Commission in July 2015 as part of the Market Design Initiative.

Metering and billing of energy consumption is regulated by provisions in the **Internal Energy Market Directives ("IEM")** for electricity and gas and in the **Energy Efficiency Directives (EED)**. In addition, provisions on guarantees of origins of electricity produced from cogeneration and renewables included in the latter and in the **Renewable Energy Directive (RED),** respectively, are of relevance for the obligation (in the Electricity Directive) to disclose the energy sources of electricity supplies to customers.

The legislators' **original objectives** of these provisions were in summary:

3. To **enable effective consumer choice** and **boost competition** through the availability of transparent, comparable and reliable information on prices, costs, energy consumption, fuel mix and environmental impact of electricity suppliers
4. To **enable/incentivize energy savings** through sufficiently frequent feedback to consumers about (the cost of) their energy consumption

It is important to stress, however, that **this evaluation does not purport to be an evaluation of all aspects of the policies of relevance to the objectives**. It is "**part of a bigger puzzle**", and further evaluation work, including on smart metering for electricity and gas, will be reported separately as part of the Market Design Initiative.

In terms of **effectiveness**, the evidence available and considered in this evaluation generally suggests that the provisions in the **IEM and EED together are likely to have made some contributions towards both of these objectives**, although it is impossible to quantify this given the multiple and complex other factors that also affect these objectives' achievement, the absence of precise indicators and the scarcity of data.

The deadline for the EED transposition is relatively recent (mid 2014) and some of the key obligations therein have later deadlines for actual application. Until the national transposition measures are in place, have been verified to be in conformity with the requirements of the Directive and have been applied by market players on the ground, it is **generally speaking too early to draw many firm conclusions as regards the effectiveness of the current legislative framework.**

It is nevertheless already now possible to identify certain gaps, problems and potential improvements.

With regard to **comparability and clarity of billing information**, the relatively low degree of satisfaction of electricity and gas customers compared to other services markets and the

high share of complaints related to billing suggests that there is **still room for improvement and that further action might be required** to this end either at national or EU level.

Specifically with respect to **energy savings** there was clear intention at the time of the EED proposal to clarify the pre-existing requirements on metering and billing that were then contained in the Energy Services Directive ("ESD"), and in the IEM legislation. This intention has only partially been met given that the **current framework remains complex and open to interpretation with regard to the nature and scope of certain key obligations**. This could be addressed by revisiting certain aspects of EED Articles 9-11 and of Annex VII.

With regard to **disclosure of energy sources**, the evidence available suggests that the way the current requirements are implemented is not sufficient to match the intentions: a **rather high share of citizens seem to either not find or not notice disclosure information with their billing information**. Others have doubts about the credibility or added-value of green claims made. While these problems in some instances may be due to bad application/non-enforcement, it also points to a potential for making such information more trustworthy, accessible, visible and easy to understand and compare.

In terms of **efficiency**, there is **little evidence but good reason to assume that the provisions considered have generally been efficient** in terms of the proportionality between impacts and resources/means deployed, notably due to the built-in cost-effectiveness conditions in key provisions. In certain cases, these could however be substituted with simpler and more relevant terms reflecting recent technological and market developments as regards the availability of remotely readable equipment.

With regard to **relevance**, **most provisions remain highly relevant**, although parts of both the IEM and the EED to some extent have been surpassed by developments and could benefit from being revisited / updated, as part of the EED review as well as the Market Design Initiative.

In terms of **coherence**, the evaluation has pointed to a **number of issues where improvements would seem possible**.

One case is **the minimum frequency of billing** which is regulated by the IEM Directives in a qualitative way (not making references to quantified frequencies), and by a more specific quantified provision in the EED but only in so far as non-smart meters are concerned. This results in what appears to be an unjustified difference in the guaranteed minimum frequency of provision of information between those customers of respectively electricity/gas and heat whose consumption is measured with smart/remotely read equipment.

In so far as billing and billing information is concerned, **the way Annex VII of the EED is drafted and referenced could be improved** to address certain internal overlaps or ambiguities as regards the nature and scope of its applicability.

Further coherence questions can be raised as regards **disclosure of energy sources**: Firstly, the **current disclosure regime is not technology-neutral.** Secondly, **whereas EU legislation establishes tools to facilitate electricity-related disclosure for both renewables and high-efficiency cogeneration, it only stimulates a demand for the former**. The obligation to disclose the fuel mix, enshrined in the Electricity Directive, does not require or stimulate disclosure of the share of cogeneration. **Moreover, even for renewables, the**

disclosure obligation is not systematically/exclusively met using guarantees of origin, despite their being available for that purpose, as their use is not mandatory.

Finally, as regards the EU added-value of provisions on metering and billing, the evaluation has identified no reason to question that. Indeed, in a single market for energy there is a strong case for suppliers being subject to similar if not identical obligations and rules, and for consumers to enjoy the same basic rights and be provided with comparable and recognisable information wherever they live and wherever they purchase their energy from. More generally, the delivery of a New Deal for energy consumers as part of the Energy Union includes providing consumers with frequent access to partially standardised, meaningful, accurate and understandable information on consumption and related costs. Guaranteeing certain minimum standards in terms of the frequency and content of billing and billing information therefore contributes to realising the Energy Union and meeting EU goals on energy efficiency and greenhouse gas reductions.

3.2. Introduction

3.2.1. *Purpose of this evaluation*

The purpose of this evaluation is to **take stock of the current performance and continued relevance of existing EU legal provisions on metering and billing** so as to evaluate what is working, what is not, and why. This is done in the context of the follow-up on the communications on a new energy market design[91] and on *Delivering A New Deal for Energy Consumers*[92] (hereinafter referred to jointly as the *Market Design Initiative* - "MDI") and as part of the parallel review of the Energy Efficiency Directive (EED). At the same time the evaluation presents an opportunity to look critically at provisions where problems have already been identified in the course of the ongoing work with transposition and implementation of the EED.

3.2.2. *Overview of EU acquis related to metering and billing*

The **Electricity and Gas Directives**[93] contains the following key provisions related to metering and billing:

- Article 3 Billing and promotional material
  - 3(3) Access to comparable and transparent supply options (Electricity only!)
  - 3(5)/3(6) Access to consumption data
  - 3(9) Disclosure of the overall fuel mix and environmental impact of the supplier (Electricity only!)
- Annex I Consumer protection
  - 1.c) The transparency of applicable prices and tariffs

[91] COM(2015) 340 final

[92] COM(2015) 339 final

[93] Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0072

Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0073

- 1.d) Consumer payment methods
- 1.i) Frequency of information on consumption and costs
- 2. Intelligent metering systems (smart meter roll-out)

The **Energy Efficiency Directive (EED)**[94] contains the following key provisions:

- Article 9 Metering
  - 9(1) Individual metering generally
  - 9(2) Requirements related to smart metering
  - 9(3) Metering of thermal energy in multi-apartment/purpose buildings
- Article10 Billing information (in conjunction with Annex VII)
  - 10(1) Consumption based billing (information) requirement in general (incl. as regards minimum frequency)
  - 10(2) Requirements on consumption information from smart meters
  - 10(3) General information and billing requirements pertinent to costs, consumption and payment
- Article 11 Cost of metering and billing information
  - 11(1) Metering and billing generally free of charges
  - 11(2) Conditions for pass-through of cost of sub-metering/-billing

In addition the following provisions are of relevance when considering **disclosure of energy sources** in bills:

The **Renewable Energy Directive (RED)**[95] contains the following key provision:

- Article 15 Guarantees of Origin (GO)
  - 15(1-12) A comprehensive framework for the issuance, transfer, and cancellation of guarantees of origin for electricity produced from renewable electricity sources for the sole purpose of disclosure.

The **EED** contains similar provisions for guaranteeing the origin of electricity produced from a high-efficiency cogeneration process:

- Article14(10)

3.2.3. *Scope of this evaluation*

This evaluation is based on the five Better Regulation criteria (relevance, effectiveness, efficiency, coherence and EU-added value) in a proportionate way and considers simplification, burden reduction potential, SMEs and quantification of costs and cost benefit only implicitly or to a limited extent, given its partial scope, the multiple and complex other factors affecting the objectives studied and the limited data available.

[94] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32012L0027

[95] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0028

The scope of the evaluation covers the following elements:

Electricity and Gas Directives

- **General evaluation** of the performance/continued relevance of **Article 3(3) of the Electricity Directive**: This covers access to comparable and transparent supply options, implicitly addressing the information presented in bills, comparison tools, metering information and pre-contractual information.
- **General evaluation** of the performance/continued relevance of **Article 3(9) of the Electricity Directive**: This addresses the disclosure of the overall fuel mix and environmental impact of the supplier. The evaluation of the legal text will therefore be performed together with Article 15 of the RED, which cross references it (see below).
- **General evaluation** of the performance/continued relevance of Articles **1.c) and 1.i) of Annex 1 of the Electricity and Gas Directives**: These cover key information presented in consumer bills.

Energy Efficiency Directive

- **General evaluation** of the performance/continued relevance of **Article 9(1)**: Substantial experience with implementing this article already exists since it has been in force longer than the remaining provisions (it was transferred virtually unchanged into the EED from the 2006 Energy Services Directive).
- **EED Article 10(1) and the related annex VII** in particular in so far is concerned **minimum billing frequency** (identified as possible area for development in MDI) and comparability of information

EED Articles 9(2) and 10(2) and Annex I point 2 of both the Electricity and Gas Directives concern requirements specifically for smart electricity and gas meters and will be considered as part of a separate thematic evaluation on smart meters.

Remaining provisions in Articles 9-11 are not within the scope of the evaluation, except to the extent justified by:

- Early indications of a need for **technical clarifications** already emerging from the ongoing implementation work;
- The need to **address overlap/coherence** with MDI actions on consumer empowerment/information/transparency,

The **RED** has already been subject to a REFIT review, so th**is evaluation contains the conclusions from that report for issues related to the GO system**. The relevant parts of the REFIT review are in Annex 3. The REFIT evaluation of the legal text will therefore be considered together with the evaluation of Article 3(3) of the Electricity Directive, which it cross references (see above), as will the EED provisions on GOs for high-efficiency cogeneration.

3.3. Background to the initiative

This section identifies the objectives behind the existing provisions on metering and billing in the IEM legislation and in the EED based on the legislative texts (including their recitals) and

on the related Commission proposals and preparatory documents accompanying the latter (impact assessments). At the end of the section the intervention logic behind the legislative provisions on metering and billing is depicted.

3.3.1. *Description of the initiative and its objectives*

The Electricity and Gas Directives as adopted by the co-legislator

The recitals of the 2003 **Electricity[96] and Gas Directives[97] as adopted by the co-legislators** following the co-decision process reinforce the objectives identified by the Commission[98] to a large extent. The **co-legislators**

- Inserted a recital stating that the ability of electricity and gas customers to choose their supplier freely was **fundamental to the freedoms which the Treaty guarantees European citizens** (Recital 4) – a point reiterated elsewhere in the recitals.[99]
- Reinforced a recital on standards of public service to include the right for household customers and, where Member States deem it appropriate, small enterprises "*to be supplied with electricity of a specified quality at **clearly comparable, transparent and reasonable prices***" (Recital 24).
- Added to the Electricity Directive a recital acknowledging the Commission's intention to ensure that **reliable information on the environmental impact of electricity from different sources** could be made available in a transparent, easily accessible and comparable manner (Recital 25).

The provisions and recitals on the freedom to choose suppliers and the right to clear, comparable information remained largely unchanged by the **co-legislators** in the 2007 Directives. Although the original recital on disclosure was removed in the 2007 Electricity Directive, the co-legislators reinforced the provisions in the Directive to specify that information on fuel sources should be clear and, at the national level, comparable.

To summarize, the metering and billing provisions in the electricity and gas markets Directives have remained largely unchanged since they were first proposed/adopted in 2001/2003. Legislative texts and supporting documents reveal that the major objectives of the Commission and co-legislators were to:

- Enable easier and more effective consumer choice;
- Boost competition in retail markets;
- Create consumer incentives to save energy.

The Commission's proposal for the EED

The 2011 Commission proposal for an Energy Efficiency Directive[100] included a comprehensive and ambitious set of provisions on metering and billing representing very

[96] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32003L0054

[97] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32003L0055

[98] For details on the Commission proposals see Annex 5.

[99] Recitals 20 and 18 of the Electricity and gas Directives respectively.

[100] http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52011PC0370

significant changes compared to the already existing provisions in the field, namely Article 13 of the Energy Services Directive[101] (ESD).

The Commission's proposal was accompanied by detailed analysis of options on metering & billing[102]. The stated specific **objective** of the proposal as regards the metering and billing provisions was to "*[e]nsure that consumers are empowered with correct, understandable and regular information on their energy use*".

More particularly, there was a clear aim to address **problems identified with the application of Art 13 of the ESD**: As the Impact Assessment summarized it: "*Because of the vague wording the provisions did not lead to improvements*" with respect to the aim that was to "*ensure understandable and accurate information is provided for consumers via individual meters and energy bills on a frequent basis*."[103]

Key **changes proposed** included:

- **minimum frequency** of consumption based billing of **every 1-2 months** in most cases, and
- clarification that **individual metering in each flat in multi- apartment buildings** was also required for heating, cooling and hot water.

The EED as adopted by the co-legislator

The recitals of the **EED as adopted by the co-legislators** following the co-decision process to a large extent mirror the *objectives* identified by the Commission despite the operative provisions being very different. Notably, the co-legislators:

- Retained a recital emphasizing the need to take account of the benefits of cost-effective technological innovations such as smart meters, albeit without stressing the need for visualization of cost and consumption indicators (Recital 26).
- Included new recitals with cross-references to the provisions on smart meters in Directives 2009/72/EC and 2009/73/EC (Recitals 27& 31), and on the appropriate conditions for using heat cost allocators and sub-metering of heating, cooling and hot water more generally in multi-apartment buildings (Recitals 28-29).
- Added two recitals expressly acknowledging the insufficient progress and clarity of the existing provisions and the need for clearer rules:

> *"(32) The impact of the provisions on metering and billing in Directives 2006/32/EC, 2009/72/EC and 2009/73/EC on energy saving has been limited. In many parts of the Union, these **provisions have not led to customers receiving up-to-date information about their energy consumption, or billing based on actual consumption at a frequency which studies show is needed** to enable customers to regulate their energy use. In the sectors of space heating and hot water in multi-apartment buildings the **insufficient clarity** of these provisions has also led to numerous complaints from citizens."*

[101] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0032

[102] http://ec.europa.eu/energy/sites/ener/files/documents/sec_2011_0779_ia_annexes.pdf, p.52

[103] http://ec.europa.eu/energy/sites/ener/files/documents/sec_2011_0779_impact_assessment.pdf, p.12

> *(33) In order to* ***strengthen the empowerment of final customers as regards access to information from the metering and billing of their individual energy consumption****, bearing in mind the opportunities associated with the process of the implementation of intelligent metering systems and the roll out of smart meters in the Member States, it is* ***important that the requirements of Union law in this area be made clearer****. This should help reduce the costs of the implementation of intelligent metering systems equipped with functions enhancing energy saving and support the development of markets for energy services and demand management. Implementation of intelligent metering systems enables frequent billing based on actual consumption. However, there is also a need to* ***clarify the requirements for access to information and fair and accurate billing based on actual consumption in cases where smart meters will not be available by 2020****, including in relation to metering and billing of individual consumption of heating, cooling and hot water in multi-unit buildings supplied by district heating/ cooling or own common heating system installed in such buildings.*

As regards the possibility to guarantee the origin of electricity from high-efficiency cogeneration the EED essentially incorporated and updated provisions from Directive 2004/8/EC:

- "*(39) To increase transparency for the final customer to be able to choose between electricity from cogeneration and electricity produced by other techniques, the origin of high-efficiency cogeneration should be guaranteed on the basis of harmonised efficiency reference values…."*

In short, based on the EED recitals the **objective** of Articles 9-11 as identified by the co-legislators was to **strengthen the empowerment of final customers as regards access to up-to-date information** on their actual, individual energy consumption at a frequency enabling them to regulate their energy use, **bearing in mind the opportunities associated with intelligent metering systems** as well as the situations where smart meters will not be available by 2020. There was a clear aim to **clarify existing provisions** that were considered unclear and ineffective. The GO provisions in Article14 and the related Annex expressly aimed at **increasing transparency** for the final customer **to be able to choose** between electricity from cogeneration and electricity produced by other techniques

As adopted, the EED's operational provisions in essence:

- Carried forward without changes the ESD provisions on individual metering (in EED Article 9(1));
- Added requirements for smart electricity and gas meters (Article 9(2));
- Added new provisions expressly requiring metering of heating/cooling/hot water in multi-apartment/purpose buildings, and on cost allocation (Article 9(3)), subject to technical feasibility and cost-effectiveness condition;
- Extended provisions on billing and billing information to include a specified minimum frequency, and elaborated on billing information requirements (Article10(1), 10(3) and Annex VII);
- Added new provisions on historical information for customers with electricity or gas smart meters (Article 10(2));

- Carried forward provisions on guaranteeing the origin of electricity produced through high-efficiency cogeneration from Dir. 2004/08/EC.

3.3.2. *Baseline*

The 2003 and 2009 Electricity and Gas Directives were fundamental to the liberalisation of the EU's gas and electricity sectors and the completion of the internal market. In their absence, it is not likely that many Member States would have proceeded with liberalising their energy markets at the same speed and to the same extent. Therefore, it is likely that significantly fewer EU energy consumers would have been able to benefit from market competition in terms of:

- increased efficiency and competitiveness;
- lower energy supply costs;
- higher standards of service.

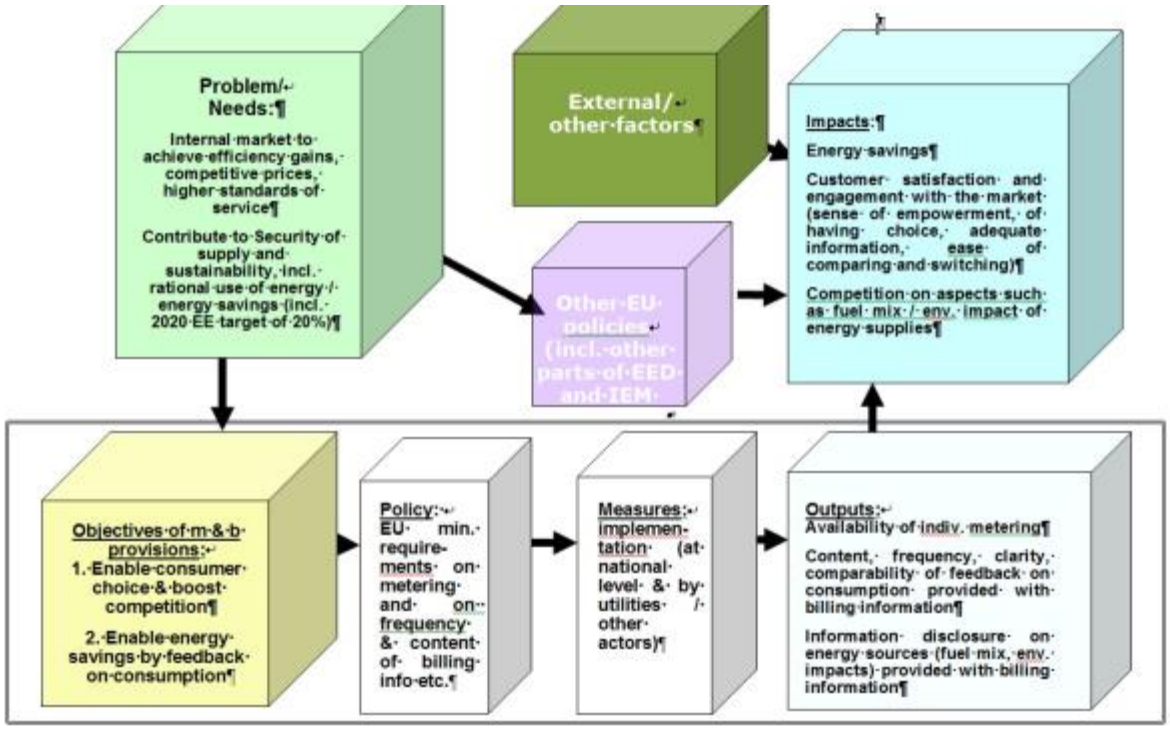
In absence of the EED, ESD provisions from 2006 would have continued to apply. As mentioned above, these had not proven to consistently lead to the expected improvements. The detailed issues with the ESD provisions will be further explored below.

As regards guarantees of origin, such were already introduced for electricity from renewables and from high-efficiency cogeneration in Directives 2004/8/EC and 2001/77/EC, respectively.

The purpose of this evaluation is somewhat atypical in that it has not aimed to evaluate a single, specific intervention. Rather, it seeks to take stock of the current situation which is the cumulative outcome of several, past policy developments/legislative processes with different timing. It does so only in so far as regards metering and billing is concerned and with a particular focus on coherence and relevance. Consequently, it has been considered less important to identify a clear baseline, but in the analysis only interventions over the last 1-2 decades have been considered (although there are examples of EU action on metering and billing even before that[104]).

[104] Cf. eg. Council Directive 93/76/EEC of 13 September 1993 to limit carbon dioxide emissions by improving energy efficiency (SAVE)

Figure 1: Intervention Logic Diagram illustrating the subject of this Annex



3.1. Evaluation Questions

This evaluation aims, for each of the sub-themes within the scope, to answer the following questions:

1. What is the **current situation**?

2. How **effective** has the EU intervention been?

3. How **efficient** has the EU intervention been?

4. How **relevant** is the EU intervention?

5. How **coherent** is the EU intervention internally and with other (EU) actions?

6. What is the **EU added value** of the intervention?

3.2. Method

This evaluation has been carried out in-house by the Commission services. No analytical models have been applied. The main activities and processes which have provided the key inputs are listed in annex 4.

3.3. Implementation state of play (Results)

3.3.1. *State of play as regards implementation*

Electricity and Gas Directives

Enforcement action undertaken by the Commission in relation to the Internal Energy Market legislation is ongoing. Procedures are set out in detail in "Enforcement of the Third Internal Energy Market Package (SWD(2014) 315 final)".[105] As of 20 January 2016, all of the infringement proceedings for partial transposition of the Electricity Directive have been closed. The focus is now on addressing the incorrect transposition or bad application of the Third Energy Package, with priority being given to violations which have the highest impact on the functioning of the internal market, including unbundling, independence, powers and duties of the national regulatory authorities and consumer protection. On this basis, the Commission has opened structured dialogues ("EU Pilot[106]") with a number of Member States. As of 20 January 2016, 8 of these dialogues have been followed by infringement procedures (see further details below).

Energy Efficiency Directive

As the deadline for transposing the EED was relatively recent (5/6-/2014), the enforcement action undertaken by the Commission in relation to the EED at this stage mainly concerns incomplete transposition. As of 20 January 2016 there were still 23 infringement procedures pending for incomplete transposition of the EED. In addition, the Commission is yet to verify the conformity of the transposed national measures with the requirements of the Directive.

Importantly, two of the key provisions in Article 9 and 10 of relevance to this evaluation have later application deadlines than the general transposition deadline as regards certain aspects of heating, cooling and hot water metering and billing in multi-apartment buildings. Although certain metering and billing requirements already existed under Article 13 of the Energy Services Directive, they were further developed in the EED which clarified the difference between heat cost allocators and individual heat meters and imposed additional metering obligation for buildings with central heating system, in addition to buildings with district heating. The obligation for frequent billing in accordance with Article 10(1) only became mandatory as of 31/12/2014, and the deadline for introducing metering of heating, cooling and hot water in individual units in multi-apartment/purpose buildings is 31/12/2016. This provision, of particular importance to owners and tenants in Member States in which large apartment blocks make up a significant percentage of the residential housing stock, obviously cannot yet be evaluated fully as the application deadline has not yet passed and it is therefore impossible to check how the legal obligation has been put into practice.

[105] https://ec.europa.eu/energy/sites/ener/files/documents/2014_iem_communication_annex6_0.pdf. Figures presented here are updated, to the extent necessary.

[106] Structured dialogue between the Commission and the Member State concerned is carried out via 'EU Pilot'. EU Pilot" This is a scheme designed to quickly resolve compliance problems without having to resort to infringement procedures for the benefit of citizen and business

3.3.2. *Problems and issues identified*

In September 2011 the Commission opened 38 infringement proceedings against 19 Member States to ensure full transposition of the **Electricity and Gas Directives.** Non-resolved cases were followed up in 2012 by sending reasoned opinions and referrals to Court.

The two Directives have been now transposed by all Member States. The Commission closed all the non-communication cases.

Structured dialogues with Member States as well as infringements on incorrect transposition or bad application are currently ongoing. As of 20 January 2016, 8 of the structured dialogues have resulted in infringement procedures where, *inter alia*, violation of the EU electricity and gas consumer provisions is at stake.

So far, Annex I(1)(d) on **consumer choice of payment methods and** Annex I(1)(i) on **frequency of information on consumption and costs** of both Directive 2009/72/EC and Directive 2009/73/EC seem to be the most problematic of the articles relevant here. Issues as regards the non-conforming transposition of Annex I(1)(d) have been raised in structured dialogues with 5 Member States and 1 Member State has received a Letter of Formal Notice regarding the transposition of the same provision. As for the Annex I(1)(i) of Directive 2009/72/EC and Directive 2009/73/EC, structured dialogues raising issues as regards the non-conforming transposition of this provision are currently pending for 5 MS and for one Member State the procedure is currently at the stage of Letter of Formal Notice.[107]

Findings of a mystery shopping exercise[108] carried out between 11 December 2014 and 18 March 2015 suggest that the implementation and/or enforcement of some measures addressed in this evaluation may be an issue in certain Member States.

Only 28% of mystery shoppers (including experts) were able to find a contact point where they could obtain information about their energy rights, as required under Article 3(9)(c) of the **Electricity and Gas Directives**.[109] In addition, Article 3(9)(a) of the Electricity Directive requires suppliers to specify the contribution of each energy source to the overall fuel mix of the supplier over the preceding year in or with consumer bills.[110] However, more than a third (35%) of mystery shoppers in the same study disagreed that their electricity company informed them about how the electricity they used was produced (scores 0 to 4 on a scale to 10).[111] As transposition checks for the directives do not indicate particular irregularities

[107]On 13 April the Czech Parliament voted a new Energy Act mainly transposing the Third Package Directives which was not notified; might contain the presumed non transposed/non-conform provisions

[108] Mystery shopping or a mystery consumer or secret shopper, is a tool used externally by market research companies, watchdog organizations, or internally by companies themselves to measure quality of service, or compliance with regulation, or to gather specific information about products and services. Mystery shoppers were instructed to analyse one of their own monthly, bi-monthly or quarterly electricity bills.

[109]' 'Member States shall ensure that electricity suppliers specify in or with the bills and in promotional materials made available to final customers… the contribution of each energy source to the overall fuel mix of the supplier over the preceding year in a comprehensible and, at a national level, clearly comparable manner…'

[110] 'Member States shall ensure that electricity suppliers specify in or with the bills and in promotional materials made available to final customers… information concerning their rights as regards the means of dispute settlement available to them in the event of a dispute.'

[111] This was the case for a majority of respondents in nine EU-28 countries, with the highest level of disagreement observed in Bulgaria (78%). On the other end of the scale, the proportion of respondents who

around these articles, this points to possible interpretation issues or the bad application of the relevant measures by national authorities.

As regards the EED, only 44% of mystery shoppers were able to find a comparison of the current energy consumption with consumption for the same period in the previous year, preferably in graphic form (EED Annex VII 1,2 b)), and only 26% were able to find tips on saving energy or contact information (e.g. link to a website) (EED Annex VII 1.2 c) / 1.3).[112] However, the transposition of the Directive is still incomplete in several Member States and even where transposition has been completed, further implementation activities are still ongoing. A preliminary analysis of notified transposition measures carried out for the Commission indicates that transposition of Articles 9-11 remains very patchy at this stage[113]. On average across all Member States, it seems that only some 44% of the mandatory provisions of these articles have been fully transposed so far (it is emphasised that this is based on preliminary analysis).

Several complaints from citizens have also been received by the Commission concerning implementation of Article 13 of the ESD (which pre-ceded the EED provisions) in multi-apartment buildings, leading to infringement procedures against a number of Member States.

The responses to the Commission's Consultation on the retail energy market[114] conducted in spring 2014 generally confirm the impression that there's much room for improvement in the retail market, including when it comes to metering and billing issues. Of a total of 237 responses, 160 didn't consider that consumers have the information they need to use energy more efficiently, and of those 160 more than half (125) considered that the availability of such information could be improved "a little" or "a lot" by more frequent and informative billing.

In terms of stakeholder views on the overall adequacy of the current EED provisions on metering and billing, roughly 3 out of 5 of respondents to the public consultation on the EED review who had an opinion on this question were satisfied. About 2 out of 5 expressed the opposite view. Unsurprisingly, **utilities were most likely to find the current provisions sufficient, with 92% of all utility respondents being of this view**. In contrast, **2 of every 3 NGOs or consumer organisations expressing an opinion considered the current provisions to be inadequate** to guarantee all consumers easily accessible, sufficiently frequent, detailed and understandable information on their own consumption of energy.

3.4. Answers to the evaluation questions

Below the evaluation questions are addressed for each of the key provisions within the scope of the evaluation.

"strongly agreed" (scores 8 to 10) that their electricity company informed them about how the electricity they used was produced varied between 5% in Bulgaria and 46% in Austria. Germany joined Austria at the higher end of the country ranking with 45% of respondents who "strongly agreed".

[112] European Commission (2016), 'Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '.

[113] Data reflecting November 2015 status.

[114] https://ec.europa.eu/energy/en/consultations/consultation-retail-energy-market

3.4.1. *Electricity and Gas Directives*

What is the current situation?

The evidence presented in this section draws extensively on survey data, as well as data from a mystery shopping exercise. The aim of the mystery shopping exercise was to replicate, as closely as possible, real consumers' experiences across 10 Member States[115] selected to cover North, West, South and East Europe countries. A total of 4,000 evaluations were completed between 11 December 2014 and 18 March 2015.[116] Whilst data from the mystery shopping exercise is non-exhaustive, the methodology enables the controlled sampling of a very large topic area,[117] as well as providing insights that would not be apparent in a desktop evaluation of legislation and bills. Using a behavioural research approach rather than a traditional survey allowed us to identify what people actually do, rather than what they say they do.

Whereas this evaluation describes the relatively small number of non-prescriptive measures on energy billing contained in the EU *acquis*, all Member States have legislation with further billing requirements (see Annex 5 or an overview of billing practices and regulation per country). For example, UK electricity and gas suppliers must follow over 70 pages of rules on the information in bills as part of their current licensing requirements.

In addition to legislative requirements, suppliers communicate and present information in different ways as a part of their non-price competition with other suppliers. For example, information may be presented in a certain format for branding purposes, or to target different customers with different kinds and levels of information to increase consumer satisfaction. There is therefore currently a broad divergence in Member States with regards to the individual elements in electricity and gas consumer bills and the total amount of information in these bills.

[115] The Czech Republic, France, Germany, Italy, Lithuania, Poland, Slovenia, Spain, Sweden and the UK.

[116] European Commission (2016), 'Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU'.

[117] For example, there were over 400 electricity and gas supply offers in Berlin alone in 2014 (source: ACER Database), making a comprehensive examination of all supply offers in the EU28 impracticable.

Text Box 1: Select requirements for UK domestic energy bills[118]

The following information must be grouped together, in a box, distinct from other information and included on page one of the Bill:

- The standardised title "Could you pay less?"
- Information on cheaper tariffs offered by the supplier and the savings available if the consumer were to switch.
- A Personal Projection* for the consumer's current tariff.
- A signpost to further tariff information.
- A standardised switching reminder "Remember – it might be worth thinking about switching your tariff or supplier".

The following information must be grouped together and included on page two of the Bill, in a box, distinct from other information, in the following order:

- The standardised title "About Your Tariff".
- The name of the customer's fuel, current tariff, payment method, any applicable tariff end date, exit fees and the customer's personalised usage in the last 12 months.

The following information must be provided anywhere on a bill:

- The standardised title "About Your TCR"**.
- The TCR for the customer's current tariff.
- A signpost to where to find independent advice on switching supplier.

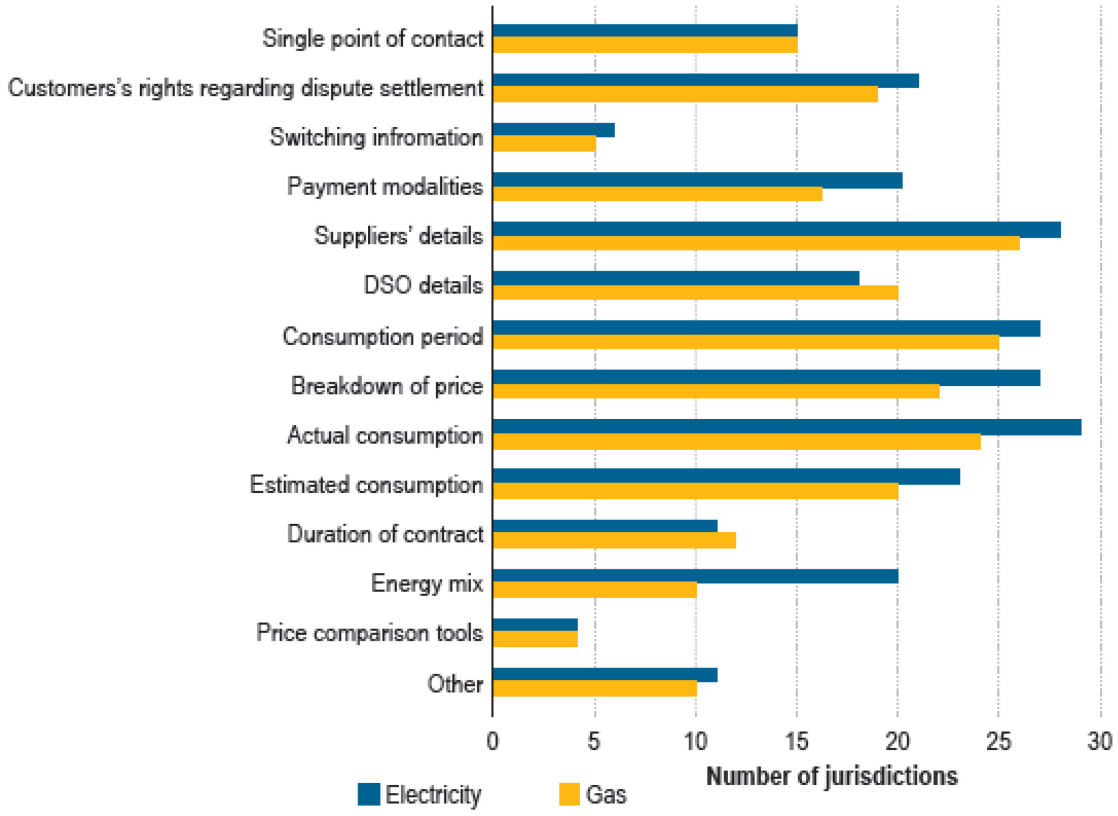
* The Personal Projection is a standardised methodology that uses a consumer's actual or estimated consumption to estimate their projected cost for a particular tariff for the next year.

** The TCR or 'Tariff Comparison Rate' is used to assist consumers to make an initial comparison of alternative tariffs. It is similar in nature to the Annual Percentage Rate used to describe savings, loan and credit agreements.

Figure 2 below from ACER summarizes the information provided to household customers on their bills. It includes general billing requirements put forward in Article 3 and Annex I of the Electricity and Gas Directives (for example, information on the single point of contact), as well as items not covered by EU law (price comparison tools). Whereas customers in the majority of MSs are currently provided with information on the consumption period, actual and/or estimated consumption, and a breakdown of the price, there is a greater diversity of national practices with regards to other potentially beneficial information, such as switching information, information about price comparison tools, and the duration of the contract.

[118] Ofgem (2013) 'The Retail Market Review – Final domestic proposals Consultation on policy effect and draft licence conditions', pp. 71-108, 130-163 https://www.ofgem.gov.uk/sites/default/files/docs/2013/03/the-retail-market-review---final-domestic-proposals.pdf

Figure 2: Information on household customer bills in MSs – 2014[119]



The results of a mystery shopping exercise on the information in energy bills covering ten representative Member States[120] provide a more detailed impression of the differences in billing practices within the EU. Mystery shoppers were instructed to analyse one of their own monthly, bi-monthly or quarterly electricity bills for a number of information elements identified as best practices by the Citizens' Energy Forum's Working Group on e-Billing and Personal Energy Data Management as well as a number of information elements addressed (although not always required) by the current Electricity Directive.[121]

[119] Source: CEER Database, National Indicators (2014-2015)

[120] The Czech Republic, France, Germany, Italy, Lithuania, Poland, Slovenia, Spain, Sweden and the UK.

[121] https://ec.europa.eu/energy/sites/ener/files/documents/20131219-e-billing_energy_data.pdf

Table 1: Information included on an electricity bill in a sample of ten Member States - I[122]

			Country									
Item	*Item in "billing" evaluation sheet*	% who found item on their bill (total)	CZ	DE	ES	FR	IT	LT[123]	PL	SE	SI	UK
Supplier's name	Provider's name	99 %	96 %	100 %	100 %	100 %	100 %	88 %	100 %	100 %	100 %	100 %
Contact details (including their helpline and emergency number)	Telephone number of customer service/helpline	96 %	92 %	100 %	100 %	100 %	100 %	80 %	93 %	100 %	100 %	97 %
	Postal address of provider	94 %	92 %	100 %	97 %	100 %	100 %	60 %	100 %	96 %	100 %	83 %
	Email address of provider	69 %	92 %	95 %	80 %	27 %	37 %	40 %	75 %	84 %	96 %	60 %
	Emergency number (e.g. to call in the event of an electrical emergency or power outage)	59 %	68 %	8%	97 %	87 %	93 %	28 %	35 %	64 %	40 %	87 %
The duration of the contract	Duration of the contract (e.g. 24 months)	22 %	8%	50 %	27 %	17 %	10 %	0%	5%	40 %	4%	50 %
The deadline for informing the supplier about switching to another supplier	The period of notice to terminate your electricity contract (e.g. 30 days before the intended termination date)	19 %	4%	50 %	0%	57 %	0%	12 %	0%	28 %	0%	27 %

[122] European Commission (2016), ' Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU.

[123] Lithuania stands out as the country where mystery shoppers were the least likely to find each of the items on their bill. Mystery shoppers in Lithuania (note: all shoppers were clients of Lesto) reported that they do not receive an electricity bill; they declare usage themselves online (via www.manoelektra.lt - a site dedicated to Lesto customers) or by means of a paper bill book.

			Country									
Item	*Item in "billing" evaluation sheet*	% who found item on their bill (total)	CZ	DE	ES	FR	IT	LT [123]	PL	SE	SI	UK
The tariff name	Tariff name/plan (e.g. '*Day & Night Fix*')	80 %	84 %	65 %	57 %	87 %	93 %	60 %	93 %	80 %	76 %	100 %
(A reference to) a clear price breakdown for the tariff (the base price plus all other charges and taxes)	A detailed price breakdown for your tariff (e.g. division of total price in base price, network charge, etc.)	79 %	92 %	65 %	100 %	83 %	93 %	8%	88 %	92 %	96 %	73 %
The base price of one energy unit (in kilowatt hours or kWh) for the selected tariff	Base price per kWh of your tariff	82 %	68 %	65 %	87 %	93 %	83 %	68 %	83 %	92 %	88 %	93 %
The switching code	Switching code/meter identification (EAN or MPAN code; a unique code for your electricity meter)	73 %	96 %	58 %	87 %	87 %	67 %	44 %	78 %	76 %	72 %	67 %
The amount to be paid, for which billing period, by when and how	Amount to be paid	97 %	100 %	100 %	97 %	97 %	100 %	72 %	100 %	100 %	100 %	97 %
	Billing period (e.g. 15 November – 14 December 2014)	95 %	96 %	90 %	100 %	97 %	100 %	80 %	93 %	100 %	100 %	97 %
	Payment method (e.g. direct deposit, cheque, bank	84 %	88 %	100 %	87 %	87 %	87 %	64 %	65 %	92 %	64 %	100 %

			Country									
Item	*Item in "billing" evaluation sheet*	% who found item on their bill (total)	CZ	DE	ES	FR	IT	LT [123]	PL	SE	SI	UK
	transfer)											
Clear information on how this amount has been calculated: is it based on an actual meter reading or estimated only?	% of shoppers stating that it not clear how the billing amount was calculated	5%	4%	18 %	3%	0%	0%	8%	3%	4%	4%	3%
For calculations based on actual consumption: meter readings and consumption during the billing period (measured in kilowatt hours or kWh)	Details about consumption during billing period (in kWh)	89 %	95 %	67 %	96 %	100 %	100 %	73 %	95 %	87 %	91 %	95 %
	Value of the meter reading at the end of the billing period	89 %	90 %	93 %	96 %	86 %	88 %	73 %	95 %	87 %	82 %	95 %
	Value of the meter reading at the beginning of the billing period	88 %	95 %	93 %	96 %	86 %	88 %	73 %	86 %	83 %	91 %	90 %
Where does the energy come from, how is it generated, how environment friendly is it ("the fuel mix")	Fuel mix/energy sources (e.g. wind power, biomass)	32 %	48 %	45 %	20 %	47 %	43 %	0%	18 %	52 %	40 %	13 %
Information on how to get tips on saving energy (e.g. a link to a website)	Tips on saving energy (e.g. link to a website)	26 %	8%	48 %	17 %	23 %	20 %	36 %	8%	24 %	20 %	57 %
Information on how to obtain the bill in alternative formats (e.g. in large print) for consumers with disabilities	Information on how to obtain your bill in alternative format (e.g.	24 %	16 %	8%	23 %	27 %	53 %	28 %	5%	20 %	16 %	50 %

			Country									
Item	*Item in "billing" evaluation sheet*	% who found item on their bill (total)	CZ	DE	ES	FR	IT	LT [123]	PL	SE	SI	UK
	paper/online, large print)											
Base *(note: figures in grey are based on a smaller sample):*		300	25	40	30	30	30	25	40	25	25	30

Table 2: Information included on an electricity bill in a sample of ten Member States - II[124]

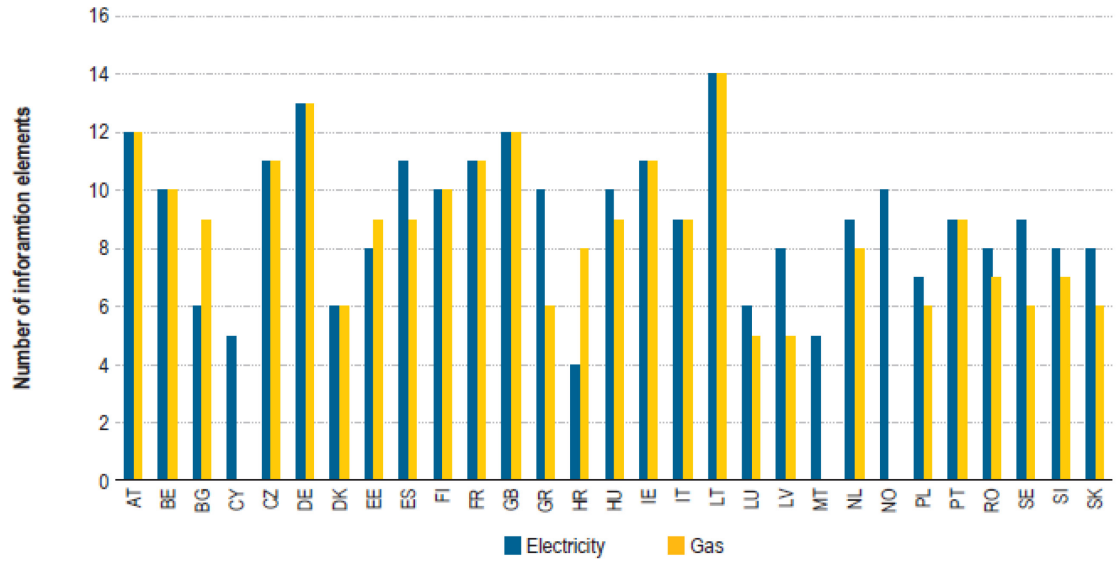
			Country									
Information	Item in "billing" evaluation sheet	% who found item on their bill (total)	CZ	DE	ES	FR	IT	LT	PL	SE	SI	UK
The contribution of each energy source to the overall fuel mix of the supplier over the preceding year	13a. Fuel mix/energy sources (e.g. wind power, biomass)	32%	48%	45%	20%	47%	43%	0%	18%	52%	40%	13%
Information concerning the consumer's rights as regards the means of dispute settlement available to them in the event of a dispute	8b. National contact information point (or single point of contact where you can obtain information about your energy rights)	28%	44%	43%	33%	43%	30%	4%	3%	16%	12%	53%
	8c. An energy mediator or third-party assistance	23%	36%	45%	23%	57%	0%	0%	3%	12%	0%	50%
Base:		300	25	40	30	30	30	25	40	25	25	30

The results show a large variation across countries for selected items; for example, information about the period of notice to terminate a contract was not found on bills in Italy, Poland, Slovenia and Spain, while in Germany and France, at least half of shoppers had found such information on their bill (50% and 57%, respectively). These variations may reflect national differences in consumer preferences and the characteristics of local markets, as reflected in Member State rules and discretionary billing practices by suppliers. In addition, the figure illustrates the possible bad application issues.

[124] Shoppers were instructed to analyse a monthly or quarterly bill. In the Czech Republic and Germany, a considerable number of shoppers reported that they only receive an annual bill from their electricity company. In these countries, 88% (n=22) and 50% (n=20), respectively, of shoppers analysed an annual bill. European Commission (2016), ' Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU.

To illustrate another dimension of divergence, the following figure shows information load in consumer bills in different Member States. This can have a significant impact on consumers' ability to comprehend their bills.

Figure 3: Information on household customer bills in MSs – 2014 (number of information elements)[125]



To summarize, there is currently a broad divergence in Member States, both with regards to the individual elements in consumer bills and the total amount of information in these bills. The widespread divergence in national practices reflects differences in national legislation and marketing by suppliers, which may themselves be influenced by consumer preferences and the characteristics of local markets. To a more limited extent, the divergence may also reflect the bad application of certain requirements of the Electricity and Gas Directives identified earlier in the Annex, particularly EU requirements on information on consumer rights and energy sources.

How effective has the EU intervention been?

To recap, the major objectives of the Articles in the Electricity and Gas Directives relevant to billing and metering were:

- To boost competition in retail markets;
- To create consumer incentives to save energy;
- To enable easier and more effective consumer choice.

With regards to the first of the three objectives – boosting competition in retail markets – retail market competition has clearly increased in the EU since the articles relevant to billing and metering were introduced in the Second Energy Package. However, there have also been a great number of other relevant measures put in place at the same time as part of the broader effort to liberalise EU energy markets. These include unbundling rules and limits on price

[125] Source: ACER

regulation.[126] This makes it impossible to quantitatively gauge the competition gains brought about by the articles on billing and metering.

There is a similar situation for the second of the three objectives – creating consumer incentives to save energy. There is evidence to show that there has been progress in recent years.[127] However, as numerous EU energy efficiency policy measures have been put in place in parallel during the period in question, it is again impossible to quantitatively disambiguate the individual contribution to these gains by the measures introduced in the Second Energy Package. Qualitatively, however, we can estimate these gains to be relatively minor as also acknowledged in the Energy Efficiency Directive, where Recital 32 expressly states that the "*impact of the provisions on metering and billing in Directives 2006/32/EC, 2009/72/EC and 2009/73/EC on energy saving has been limited. In many parts of the Union, these provisions have not led to customers receiving up-to-date information about their energy consumption, or billing based on actual consumption at a frequency which studies show is needed to enable customers to regulate their energy use*".

In terms of the third of the three objectives – enabling easier and more effective consumer choice – there exist various data that help us understand how EU consumers perceive their energy bills and the extent to which their bills are building awareness about energy use. These data are summarised in the remainder of this section.

Consumer organisations responding to the latest ACER Market Monitoring Report stated that the average electricity and gas consumer in their countries is only able to compare prices to a limited extent. The average score was 4.8 and 5.0 on a scale from 1 to 10 for electricity and gas respectively.[128]

These mediocre figures are backed by the 2016 Electricity Study that found that one in five consumers surveyed still disagree that the electricity bills of their electricity company were easy and clear to understand (note the disparity in individual Member States concerning the level of understanding with Bulgaria performing worst and Cyprus performing best). This effect was even more pronounced among mystery shoppers from ten Member States who were quizzed with their current bills to hand. Here, between 20 and 54% of respondents disagreed with the statement “My bill is easy to understand”. Correspondingly, 8% of all consumers who had reported having a problem with their electricity supplier in the past three years identified problems with billing.[129]

[126] See the Evaluation on the Electricity Directive.

[127] See f.ex. COM(2015) 574 final "Assessment of the progress made by Member States towards the national energy efficiency targets for 2020 and towards the implementation of the Energy Efficiency Directive 2012/27/EU as required by Article 24 (3) of Energy Efficiency Directive 2012/27/EU"

[128] ACER (2015) Market Monitoring report 2014, http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2015.

[129] European Commission (2016), 'Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '.

Figure 4: Agreement with statement: "bills of my electrify company are easy and clear to understand", by country[130]

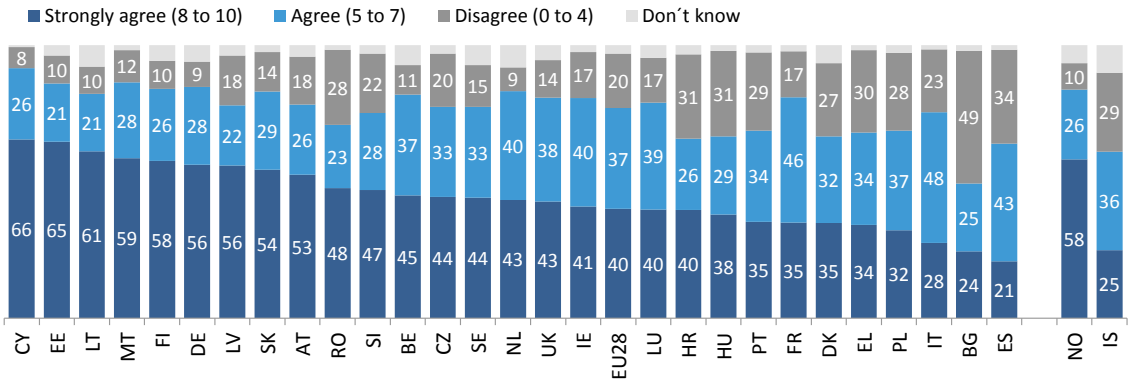
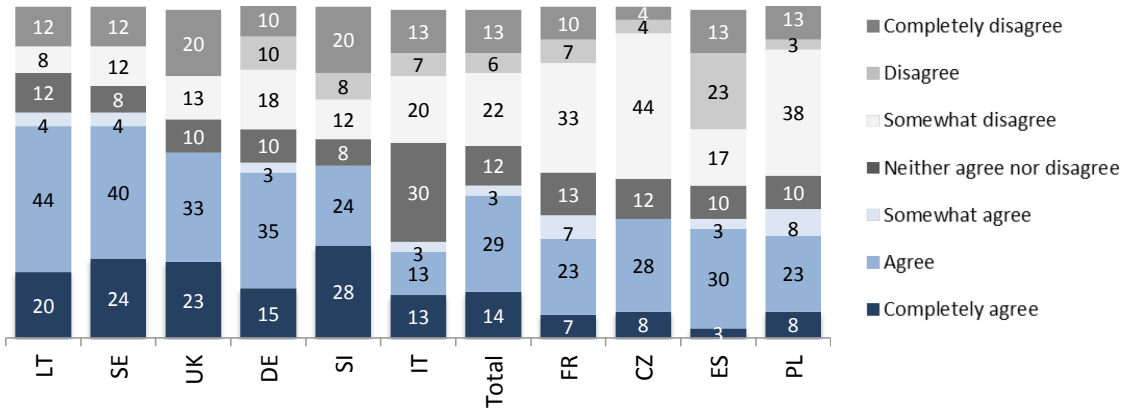


Figure 5: Agreement with the statement: "My bill is easy to understand"[131]



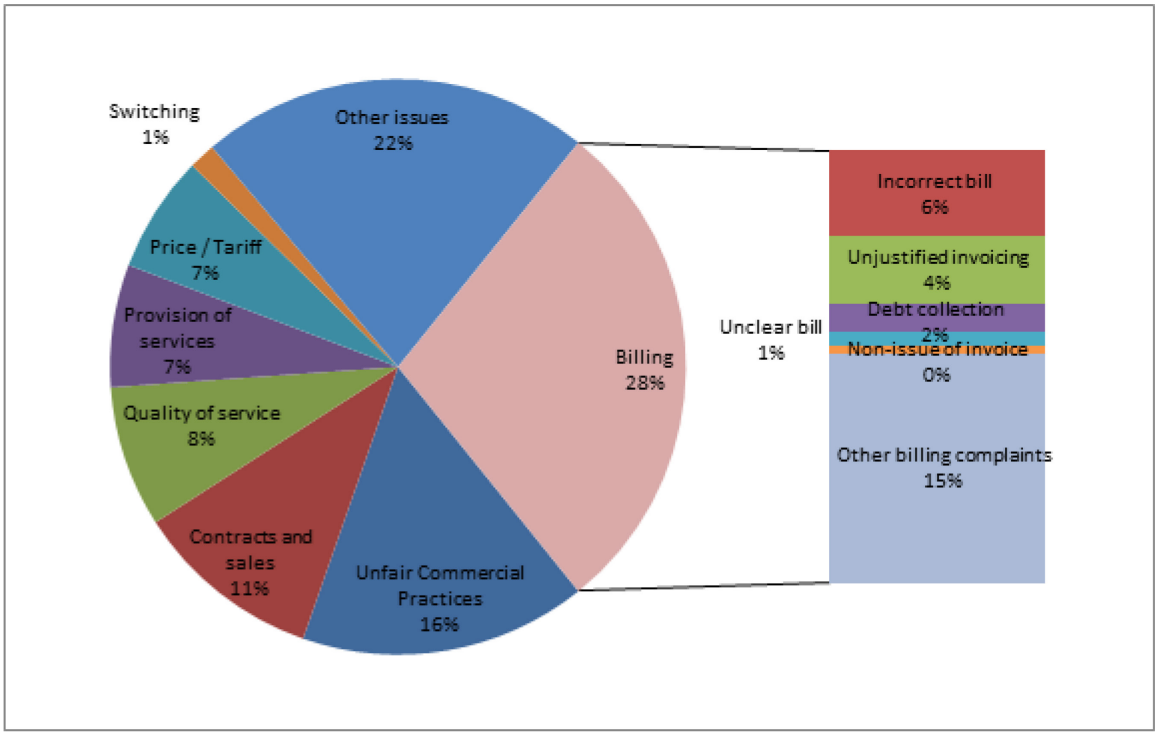
The complaints data collected through the European Consumer Complaints Registration System indicates the largest share (28%) of consumer complaints reported to the Commission between 2011 and 2016 were related to billing. Whilst the complaints classified as relating to "unjustified" or "incorrect" invoicing/billing (10% of all electricity and gas complaints) are most likely related to billing on estimated rather than actual consumption,[132] complaints about unclear invoices or bills make up around 1% of all electricity and gas complaints in the system. The category 'other billing complaints' relates to cases where users of the European Consumer Complaints Registration System did not encode a sub-category, or where their specific complaint could not be categorised according to the options presented below.

[130] Question: "The following question deals with the quality of services offered in the electricity retail market. Please indicate how much you agree or disagree with each of the following statements, using a scale from 0 to 10, where 0 means that you "totally disagree" and 10 means that you "totally agree": Bills of [PROVIDER] are clear and easy to understand." European Commission (2016), 'Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '.

[131] Agreement with the statement: "My bill is easy to understand" European Commission (2016), 'Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '.

[132] See Thematic Evaluation on Smart Metering.

Figure 6: Electricity and gas consumer complaints, 2011-2016[133]



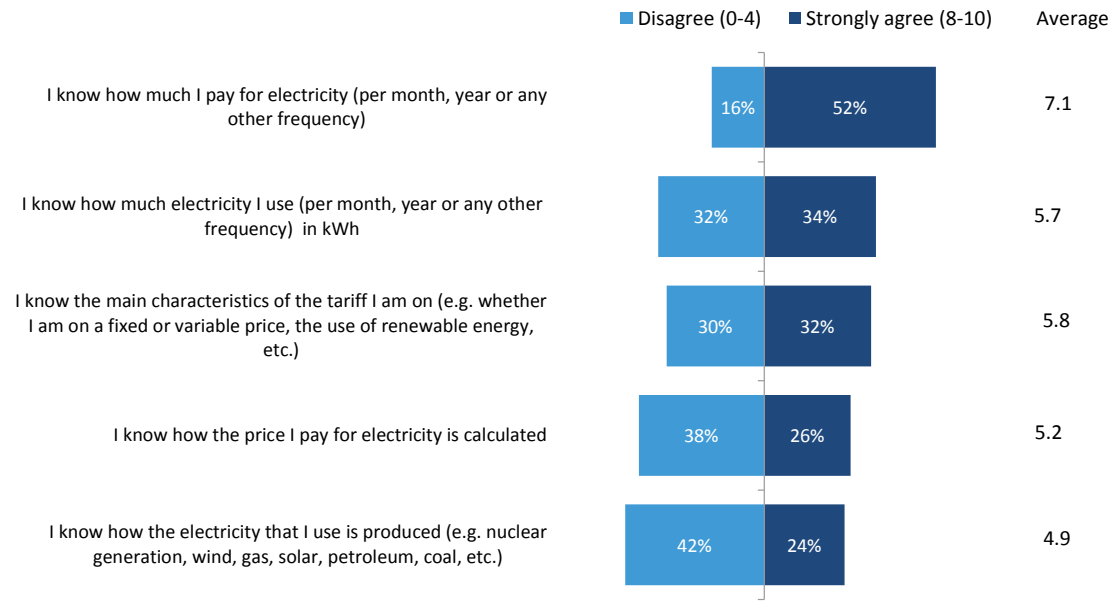
It therefore appears that whereas a significant percentage of EU consumers have difficulties understanding their energy bill, problems directly related to bill clarity have not led to a large number of consumer complaints compared with other issues such as back-billing, unfair commercial practices, and contractual clauses. However, looking at consumer complaints alone may be insufficient as complaint levels are influenced by consumer awareness and expectations, both of which may be low when it comes to energy bills.

Energy bills are the foremost means through which suppliers communicate with their customers. As such, consumers' ability to correctly answer simple questions about their own electricity use indirectly reveals the extent to which bills have been effective in providing information that could facilitate effective consumer choice. The figures show that whereas the majority of EU consumers report that they know how much they pay for electricity, fewer were aware of their consumption in terms of kWh, what type of tariff they have, or their sources of electricity.

Whilst this finding may certainly reflect a lack of consumer interest in this information, the information facilitates effective consumer choice by helping consumers identify the best offer in the market and weigh the benefits of switching. Their omission from many bills, as proven by data, may therefore be impeding the achievement of one of the stated objectives of the billing provisions in the Electricity and Gas Directives.

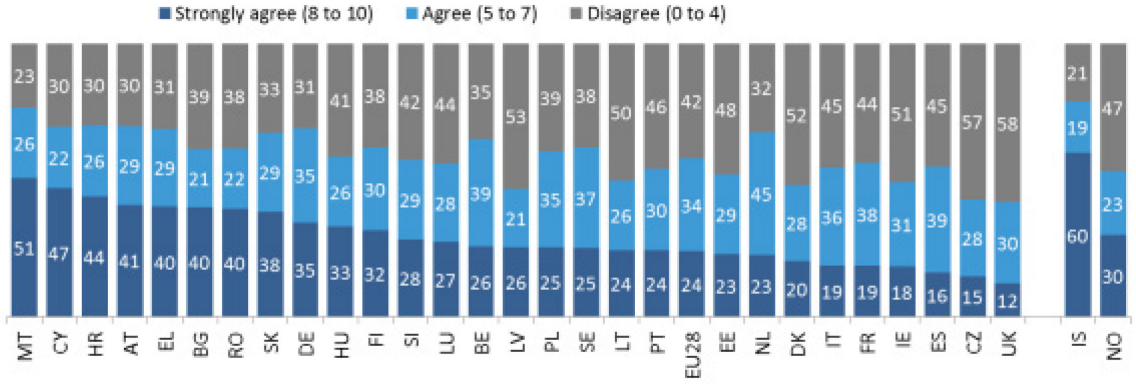
[133] Source: DG JUST, European Consumer Complaints Registration System.

Figure 7: Self-reported awareness of electricity use[134]



Looking deeper into consumer awareness of energy sources, across the EU28, just 24% of respondents "strongly agreed" (scores 8 to 10) that they knew how the electricity they used was produced. The proportion expressing strong agreement varied between 12% in the UK and 51% in Malta. This low level of awareness corresponds with the fact that just 32% of sampled bills contain this information.

Figure 8: Agreement with statement: "I know how the electricity that I use is produced (e.g. nuclear generation, wind, gas, solar, petroleum, coal, etc.)", by country[135]



[134] Question: "Please indicate how much you agree or disagree with each of the following statements, using a scale from 0 to 10, where 0 means that you "totally disagree" and 10 means that you "totally agree"." European Commission (2016), 'Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '

[135] Question: "Please indicate how much you agree or disagree with each of the following statements, using a scale from 0 to 10, where 0 means that you "totally disagree" and 10 means that you "totally agree". "I know how the electricity that I use is produced (e.g. nuclear generation, wind, gas, solar, petroleum, coal, etc.)." European Commission (2016), 'Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '.

Notwithstanding these low consumer awareness figures, data from the 2016 Electricity Study indicate that consumer demand for information on energy sources is nevertheless high. A behavioural experiment involving 10,056 consumers from 10 EU Member States (CZ, DE, ES, FR, IT, LT, PL, SE, SI and the UK) tested consumer willingness to switch to a green offer for extra-costs. 42% of consumers chose a green offer when the premium was low (€1.5/kWh) and another 37% of consumers when the premium was high (€3/kWh).[136]

The increasing proportion of green tariffs currently on offer in the EU also shows that suppliers are responding to this demand: by the end of 2014, almost one third (697) of all electricity offers and almost one quarter (178) of gas offers in the EU were labelled as 'green'.[137]

However, there may be scope to facilitate growth in this area. Improving the provision (availability, ease of access and use) and quality (clarity and comparability) of information on energy sources in bills may therefore lead not only to enhanced non-price competition and support the further development of renewable energy capacity, but also to greater overall consumer engagement and satisfaction with the market. In this respect, expert bodies such as ACER and CEER have specifically highlighted "the lack of standardisation of how Guarantees of Origin are used to prove green credentials in different Member states" as an important issue.[138]

To summarize, it is difficult to say how much the billing articles in the Electricity and Gas Directives have contributed to their stated objectives, because of other significant policy interventions aimed at fulfilling these same objectives, and because these objectives were not accompanied by specific indicators that would allow us to disentangle causal relationships. Nevertheless, the analysis presented in this section indicates that there is certainly scope to further improve the extent to which the billing provisions in the Electricity and Gas Directives facilitate consumer choice.

How efficient has the EU intervention been?

There are no data available to assess this question quantitatively, but given the narrow scope and low level of prescription of the billing provisions in the Electricity and Gas Directives, the costs are likely to have been limited. Consumer bills are currently heavily regulated

[136] European Commission (2016), ' Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '.

[137] 100% of the electricity production coming from green sources or – in the absence of information on the input of green sources – if it is labelled as such by the price comparison tool. ACER (2015) Market Monitoring report 2014, http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2015, pp. 42-43. CEER (2015).

[138] ACER (2015) Market Monitoring report 2014, http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2015, pp. 42-43. CEER (2015) Advice on customer information on sources of

Electricity,
http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/Tab5/C14-CEM-70-08_CustomerInfo-Sources%20of%20Electricity_Advice_March%202015_0.pdf

beyond the requirements imposed by the Electricity and Gas Directives in most Member States.[139]

How relevant is the EU intervention?

At the time of drafting both the Second and Third energy packages, consumer bills and pre-contractual information formed the basis of consumer comparability, as consumers would be given the possibility to measure up individual offers against their current supply contract. Since then, the use of online comparison tools has risen significantly across the EU. Over time the continuation of this trend might challenge the relevance of the EU intervention if it is not adapted to also reflect new ways of consumer-market interaction. Well-designed, reliable and transparent online comparison tools do the number-crunching necessary to accurately compare the costs of each offer for individual consumers. In the future it will be increasingly important to ensure that bills enable or even facilitate consumers' use of these online tools to compare their individual consumption or current tariff to other available offers (e.g. by providing a code that the consumer can input in the tool to customize the comparison).

The 2016 Electricity Study found that 64% of EU consumers who had compared tariffs of different electricity companies said they had used comparison tools to do so. It also showed that comparison tools – which grants access to the offers of a larger number of providers- significantly increased the number of cheaper offers consumers were able to identify compared with contacting individual providers directly.[140]

Comparison tools are likely to become even more important as the retail market for energy matures. Between 2012 and 2014, 'choice' for consumers in European capitals widened, with a greater variety of offers being available. However, the ability of consumers to compare prices can be hampered by the complexity of pricing and the range of energy products, as well as by an increasing number of offers and their bundling with additional free or payable services.[141]

ACER has therefore recommended that: "*To improve consumer switching behaviour and awareness further, National Regulatory Authorities (NRAs) could become more actively involved in ensuring that the prerequisites for switching, such as transparent and reliable online price comparison tools and transparent energy invoices, are properly implemented.*"[142]

It is important to emphasise that in the context of the general efforts to move energy markets from simple commodity markets (for kWhs) towards an energy services market, "transparent and reliable price comparison tools" need to be able to assess contracts from a holistic

[139] European Commission (2016), ' Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '.

[140] From twice to twenty times, depending on the Member State. European Commission (2016), ' Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU '.

[141] ACER (2015) Market Monitoring report 2014, http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2015 p.40, 100.

[142] ACER (2015) Market Monitoring report 2014, http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2015 p.10.

perspective that integrates broader aspects including energy efficiency improvement actions or services, differences in energy sourcing qualities (greenness) etc.

How coherent is the EU intervention internally and with other (EU) actions?

Whilst the provisions on billing in the Electricity and Gas Directives are not contradicted elsewhere in the EU *acquis*, they are complemented and reinforced by various Articles in the EED and RED, also addressed in the present document. Consolidating, streamlining or clarifying the respective scope of these articles would make the legislation as a whole easier to understand and reduce the scope for unintended interactions resulting from subsequent legislative revisions. This concerns for example the issue of billing frequency (see further discussion below) but also smart metering requirements (addressed in a separate evaluation paper).

With regard to disclosure, it is notable that gas deliveries are not subject to disclosure although this could stimulate consumer demand for green gas supplies (such as biogas injected in the gas grids) or allow some consumers to choose certain sources over others (if for example shale gas or LNG was identified separately). Equally it is notable that while the EED provides a means for guaranteeing the origin of electricity from high-efficiency cogeneration, there is no disclosure obligation to stimulate the use of that tool.

What is the EU added value of the intervention?

The provisions addressing consumer information in the Electricity and Gas Directives are essential for protecting consumers in the internal energy market at the retail level. They play an important role in ensuring the benefits of the internal market in energy can be enjoyed by all consumers, and help to create a level-playing field for suppliers and other retail market actors across the EU. Whereas there are currently still very few if any examples of cross-border supply in the retail market, a common base of energy consumer rights is a precondition for that to develop over time.

3.4.2. *EED*

Article 9(1)

What is the current situation?

Article 9(1) of the EED is, apart from some very minor editorial changes, identical to Article 13(1) of the ESD. Member States have generally transposed and implemented Article 9(1), which should not be surprising given that they have effectively been under the obligation to do so since the 2006 adoption of the identical provisions in the ESD.

However, the absence of substantial changes is somewhat paradoxical given that ESD Article 13(1) contained several elements known to be the subject of different interpretations and that a key objective of the EED, as discussed above in Section 3, was to clarify existing provisions on metering and billing. In the context of the Concerted Action on the Energy Services Directive the Member States themselves reported that there is a "*large variance in the*

interpretation of Article 13 of the ESD" and that the Article had "*….only limited causal influence on changes in metering & billing policies*"[143].

The areas where particular ambiguities persist are

- The **definition of "*final customer***"
- Meaning of "***competitively priced individual*** *meters that accurately reflect the final customer's actual energy consumption and that* ***provide information on actual time of use***"

The definition of "final customer"

A '*final customer'* means according to EED Article 2 (23) "*a natural or legal person who purchases energy for own end use*". This definition has given rise to different interpretations notably in cases where heating and cooling or hot water is purchased collectively by or on behalf of an association of end-users (for example a group of households responsible for energy consumption in each of the individual apartments in a multi-apartment building). Although it is often a housing cooperative that purchases the energy, it is arguably the individual households who are the end-user (except, perhaps, of energy used for heating stairwells and similar collective uses). The Commission services have taken the view that the definition of final customer should be understood as covering those end-users (i.e. households/tenants) as well as the entity purchasing heating/cooling/hot water on behalf of the end-users (e.g. a housing cooperative/building owner). However, some Member States (FI, FR, DE, UK,…) seem to interpret the provisions differently, taking the view that the individual households in such buildings are not to be considered as final customers if they do not have a contractual relationship with the energy supply company . This question has important implications for the effective scope of the obligations in the EED, incl. Article 9(1), 10(1), Article 10(3) and Annex VII. In principle this problem applies to all energy forms, in practice it is most relevant for thermal energy forms (electricity and gas more rarely, not being subject to individual supply contracts even in multi-apartment buildings). It is particularly problematic when it comes to new buildings or major renovations, for which the obligation in the EED Article 9(1) to fit individual meters is absolute (i.e. technical and economic conditionalities do not apply), but where the applicability of this absolute obligation is undermined by the uncertainty about the meaning of the definition of "final customers".

Meaning of "competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use"

EED Article 9(1) (and before that ESD Article 13) refers to "*competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use*." This obligation is challenging to implement/enforce for a number of reasons:

1. It is not clear what "*competitively priced*" means. The term "*competitively priced*" was presumably used to protect consumers from overly costly solutions imposed by

[143] Renner / Martins (2010). Technical Summary Report TSR03 on Informative metering and informative billing, Concerted Action ESD, http://www.esd-ca.eu/reports/outcomes-2008-2011/technical-summary-reports/tsr03-individual-metering-and-informative-billing

monopolistic utilities. In practice it is unclear precisely how this is to be interpreted/implemented.

2. It is not clear precisely how/with what time resolution "*information on actual time of use*" must be provided. Dating back to the 2006 ESD, it is arguably a reference to one of the functionalities of what is now commonly referred to as smart meters. However, firstly the provision of actual time of use data is but one of the recommended/desirable features of smart meters. Secondly, time of use is typically mostly of relevance for electricity, and less so for other energy forms[144]. Recital 28 to the ESD stated that " *[i]n the context of this Directive, competitively priced individual meters include accurate calorimeters*". Calorimeters are devices to measure thermal energy flows.
3. Thirdly, it is not entirely clear what "*individual*" meters mean (c.f. the point on the controversy around the definition of final customers above).

In short, where the provisions aimed to advance the use of sophisticated meters (with time of use capabilities), the ambiguous wording has meant that few if any Member States have interpreted it to require smart meters. Where it sought to advance the provision of meters to end-consumers, many of which are individual households in multi-flat buildings, the ambiguous definition of final customers has prevented it from doing so consistently. Eventually this issue may have to be resolved legally, either through an interpretation by the Court or through legislative changes.

How effective has the EU intervention been?

With respect to the intervention logic, there is a wealth of scientific and technical literature published over the last 40 years on the influence energy consumption feedback can have on consumers' decisions and behaviour and the resulting energy savings. By way of example the following three recent literature review papers/reports provide a useful overview:

Karlin, B., Zinger, J. F., & Ford, R. (2015, September 21). "The Effects of Feedback on Energy Conservation: A Meta-Analysis". Psychological Bulletin. Advance online publication. http://dx.doi.org/10.1037/a0039650

Zvingilaite E. and Togeby M. (2015). Impact of Feedback about energy consumption. Ea Energy Analyses, 15-05-2015. http://www.ea-energianalyse.dk/reports/1517_impact_of_feedback_about_energy_consumption.pdf

EEA Technical report No 5/2013 – "Achieving energy efficiency through behaviour change: what does it take?", http://www.eea.europa.eu/publications/achieving-energy-efficiency-through-behaviour

Individual metering is a necessary precondition for providing any feedback to consumers on their actual consumption. Billing, on the other hand, is but one way of conveying consumption feedback. Since utilities anyways bill customers for purely commercial reasons it is however a low-cost and widely used approach to providing feedback.

The literature mentioned above is generally reporting findings from specific, concrete studies, programmes and pilot projects. It establishes beyond doubt that feedback on individual actual

[144] Admittedly this could change e.g. in the context of increasingly smart and optimised, integrated systems with electricity and heat storage. At present this is however of very limited practical relevance.

consumption, including via billing, tends to trigger enduring savings. The precise impact depends a lot on the precise modalities, the situation before, the frequency etc.

No evidence is available as regards the total impact of applying the EU *acquis* on metering and billing, because there has been no systematic monitoring or reporting of the implementation of individual metering and consumption based billing, or the extent to which such practices have been furthered by EU legislation. It is safe to say, however, that *to the extent/where* the EU provisions have triggered the installation of individual meters, and consumption based (frequent) billing, this will have led to savings: this causal link is well established in the scientific literature.

There is evidence from the work and discussions on implementation in (and between) Members States to suggest that Article 9(1) of the EED has been less effective than intended because

a) Key concepts or terms used remain either ambiguously defined or undefined, and are interpreted differently by different parties.

b) In addition, Member States in many instances have made use of the caveats regarding technical feasibility and financial reasonableness / proportionality to make broad exceptions. These conditions may of course be subject to review and possible infringement action from the Commission as part of its enforcement role.

c) Other provisions meanwhile provide more impetus to reach at least some of its intended objectives (cf. e.g. Article 9(3)).

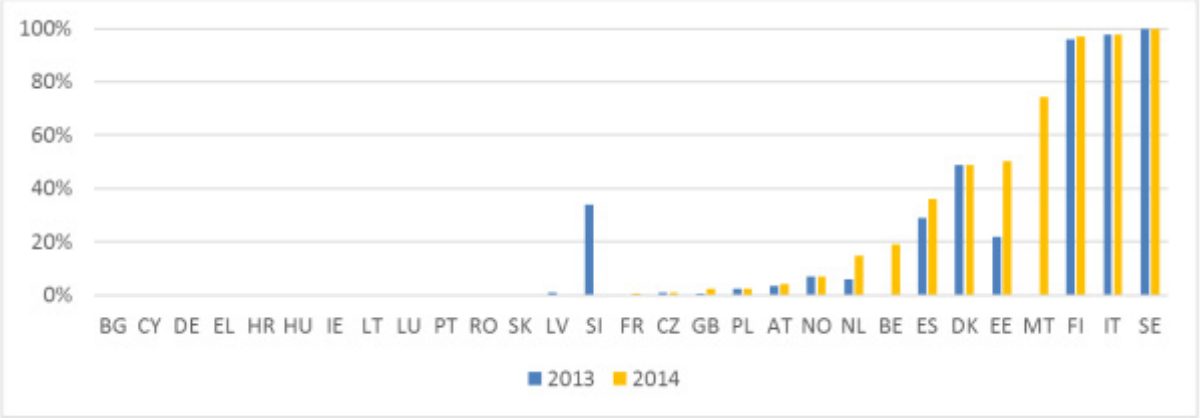
This is in line with an assessment of the effectiveness of Art. 13 ESD where the Member States argued that changes in metering and billing were mainly due to factors other than the ESD and that the causal influence of Article 13 ESD on the practice of metering and billing in the Member States was weak[145]. The relatively low penetration rate of smart electricity meters throughout most EU Member States gives an indication of the limited effectiveness of Article 9(1). Whilst time-of-use information can be provided by other types of meters (e.g. dual-tariff (night/day) meters), and while such meters may not be uncommon in some countries (e.g. FR), the fact is that most electricity meters throughout the EU remain conventional ones, despite this provision being in force since 2008 (as part of the ESD).

For gas, even fewer MS have rolled out smart meters, and gas remains dominated by conventional metering with no time-of-use capabilities. For thermal energy, time-of-use capable meters are rather the exception than the rule[146], and many individual dwellings/consumers are still not equipped with individual meters for hot water and heat consumption.

[145] Renner / Martins (2010). Technical Summary Report TSR03 on Informative metering and informative billing, Concerted Action ESD, http://www.ca-eed.eu/outcomes/outcomes-2008-2011/technical-summary-reports

[146] Applications exist e.g. in Finland and Denmark.

Figure 9: Share of household customers equipped with smart meters for electricity - 2014



Source: CEER Database, National Indicators (2014-2015)[147].

In terms of heat metering, it has been estimated that there is a theoretical potential of some 20 million permanently occupied dwellings in multi-unit buildings that are not individually sub-metered yet[148].

How efficient has the EU intervention been?

As a preface to answering this question it is worth recalling that utilities for commercial reasons in any case send bills to their customers, and requirements for feedback delivered via bills therefore entail very marginal or no additional costs except where the additional information is of a nature that is costly to collect or where the billing process is frequently repeated. They also in most cases install meters to justify such billing, although there have historically been exceptions, especially in multi-unit buildings and/or district heating networks.

Secondly, it is worth recalling that the *acquis* under consideration in this evaluation does not require the installation of smart meters (or was at least not interpreted to that effect). The additional costs of "smart" meters over conventional ones is therefore less relevant here, but it is central to the evaluation of smart metering provisions that has been conducted and will be reported elsewhere as part of the forthcoming Market Design Initiative.

There are no data available to assess the cost or efficiency of the EU intervention here considered quantitatively, but given that most of the key obligations as regards metering and billing in the current *acquis* are either expressly subject to cost-effectiveness conditions OR softly/ /ambiguously worded, Member States have typically integrated efficiency/proportionality considerations when transposing and implementing the provisions nationally. It is therefore safe to assume that obligations for enhanced metering and billing measures generally have only been introduced where there was a sound economic case, and , it is therefore very unlikely that the rules have imposed any disproportionate costs.

How relevant is the EU intervention?

[147] 2014 ACER/CEER annual report on the results of monitoring the internal electricity and natural gas markets

[148] Cf. p. 8 of http://iet.jrc.ec.europa.eu/energyefficiency/sites/energyefficiency/files/files/documents/events/2-castellazzi_heat_metering_setting_the_scene.pdf

For the purpose of strengthening consumer empowerment, Art 9(1) is very relevant and would be even more so if it were to be clarified. The fundamental notion that individual consumers (incl. households) should have the right at reasonable costs ("competitively priced") to accurate metering of their own consumption ("individual meters"), and have access to information on when their actual consumption takes place (i.e. "time of use") remains highly relevant.

However, in so far as thermal energy supplies are concerned the practical relevance of EED Article 9(1) has been diminished by the addition of the more precise Article 9(3). As regards electricity and gas the smartness/capabilities of the meters have since been addressed in more detail in the context of the smart meter roll out provisions under the IEM legislation (adopted years after the original ESD provisions) and in a subsequent Commission Recommendation[149]. At least for electricity and gas it would therefore seem appropriate to update these requirements in the light of these developments to reflect that "time of use" is but one of several important features of modern meters. For thermal energy, the emergence and increasingly common market development of remotely readable heat meters and heat cost allocators should similarly be reflected in order to remain fully relevance.

As regards the lack of individual meters the Commission services are not aware of any evidence that this is a significant issue for electricity and gas. This said, the presence of even a simple conventional meter within reasonable reach allowing at least self-checks cannot still be taken for granted even for electricity, as is evident from a case recently having been the subject of a ruling by the Court[150]. This could suggest that a clearer right without any conditions or caveats but for something more basic, namely the right to a meter allowing self-checks, might be at least as relevant going forward.

As regards billing, it should be noted that even where other forms and means of providing energy feedback (e.g. smart phone apps etc.), consumption information delivered with bills remains relevant since the various forms of feedback generally are complementary and reinforce each other. By way of example, research has shown that real-time feedback (possible only with smart equipment) tends to impact more on behaviour, whereas more indirect feedback (e.g. with monthly, quarterly or annual bills) tends to impact more on investment decisions.

How coherent is the EU intervention internally and with other (EU) actions?

The ambiguities in the wording of Article 9(1) raise questions of coherence with other EED provisions: For example,

- Are "*meters …that provide information on actual time of use*" to be considered to mean smart meters of the kind referred to in Article 9(2) (and in the IEM legislation), or another intermediate category (between smart and simple, conventional meters)?
- Are "*Individual consumption meters*" for thermal energy referred to in Article 9(3) also supposed to be "*meters …that provide information on actual time of use*"?

[149] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012H0148&from=EN

[150] Judgment in Case C‑83/14 of 16 July 2015: http://curia.europa.eu/juris/document/document_print.jsf?doclang=EN&text=&pageIndex=0&part=1&mode=lst&docid=165912&occ=first&dir=&cid=400263

What is the EU added value of the intervention?

Rules to empower consumers and provide adequate consumer protection remain absolutely critical for the well-functioning and the legitimacy of the EU's internal energy market. The provisions now contained in Article 9(1) of the EED did, when first adopted as part of the ESD in 2006, push forward the agenda of individual metering and smart metering at least in some EU Member States. This said, the current added value has been diminished because of the various ambiguities and the subsequent developments elsewhere on smart meters. By being made more precise, it could (re)gain added-value.

EED Article 9(3) Thermal energy in multi-unit buildings: Possible clarifications

Article 9(3) being new (compared to the ESD) and the deadline for achieving its effective outcome (installation of meters or heat cost allocators in individual units in multi-unit buildings) only being by 31/12/2016, it is at this stage **premature to evaluate Article9(3) as a whole**.

Nevertheless, during the Commission's work overseeing Member States' implementation, a few areas where technical clarifications could be welcome have emerged and merit attention. These concern:

- The meaning of "*multi-apartment/purpose buildings"*
- Technical feasibility and cost-effectiveness criteria for meters and heat cost allocators
- Availability of transparent cost allocation rules

The meaning of "multi-apartment/purpose buildings"

Whereas the Commission services have taken the view that a "*multi-purpose building could be understood as a building occupied by at least two entities that need to share between themselves the bill for the energy purchased*", a different reading is possible. For example, the French authorities read the (French version of) the provision as referring to buildings with both dwellings and non-dwelling uses ("*immeubles mixtes*"). The first reading implies a broader scope in that buildings containing no dwellings but more than one commercial or industrial entity (e.g. a shopping mall) would be covered.

It could be considered to clarify this aspect next time the Directive is amended anyways or through further guidance). From a coherence perspective, and given that the EPBD for the purpose of building Energy Performance Certificates (EPC) uses the notion of "building units"[151], it could be considered to align with this so that Article 9(3) metering would be required wherever EPCs are required, in order to facilitate implementation in Member States by avoiding the need to use two similar but not identical distinctions. It could also be left to MS discretion to interpret the precise boundaries in their specific national contexts.

[151] In the EPBD "building unit" is defined as "*a section, floor or apartment within a building which is designed or altered to be used separately*" - in this regard, 'separate use' could be understood as separate use of energy (i.e. individual energy metering and billing…) and/or having separate users. "*To be used separately*" would therefore mean that different building units have, or are capable of having, different tenants or different owners and may be billed separately as compared to the building as a whole. In any case, a "*building unit*" requires an energy performance certificate of its own, independently from the building as a whole, in accordance with Article 12(1) and 11(6). For example, if a building were sub divided into self-contained flats, each flat should have an EPC.

Technical feasibility and cost-effectiveness criteria for meters and heat cost allocators

The first part of Article 9(3) is relatively clear, except that the conditionality can be interpreted/applied in widely differing ways. DG ENER's ongoing contract with "empirica"[152] aimed at formulating best practice guidelines for application of these criteria and analyzing Member States' application of these criteria has revealed that many Member States literally transpose the criteria into national law without giving further guidance on how to apply them. In addition, some Member States apply general or broad exemptions based on cost-benefit analysis carried out on a single average building or a limited range of typical/example buildings. Very few Member States have adopted specific measures to ensure a building-by-building assessment of the fulfilment of the criteria, with most leaving it to local actors (heat suppliers, building managers etc) to assess if the criteria require the provision of individual meters. This situation could potentially affect the achievement of the policy objective of ensuring that individual metering and billing is implemented at least where it is cost-effective and feasible. Depending on the outcome of the ongoing transposition and implementation process, it could be considered at a later stage to "codify" (some elements of) best practice approaches in any further, future review of the EED provisions. Doing so now however seems premature given that the deadline has not even passed yet, which is why progress at this stage should better focus on encouraging MS to follow best practice based on guidance from the Commission and through the work on enforcement.

It is noteworthy that respondents to the public consultation on the EED review widely agreed that it is appropriate for the requirements to be subject to technical feasibility and/or cost effectiveness conditions – this view was not only shared by 5 of every 6 respondent expressing an opinion, but also by a majority in each category of stakeholders, including NGOs who were otherwise most critical as regards the overall adequacy of Articles 9-11. There was similarly broad agreement that conditions should not be harmonized at EU level, although NGOs and private respondents were slightly more favorable to this idea.

Availability of transparent cost allocation rules

The last sub-para of Article 9(3) provides that "*…Member States may introduce transparent rules on the allocation of the cost of thermal or hot water consumption in [multi-apartment/purpose] buildings to ensure transparency and accuracy of accounting for individual consumption.*". Although it is optional ("may") it is nevertheless of some use because it implicitly recognises that despite the right to be billed based on individual consumption (Article 10) , occupants of multi-unit buildings may not be billed exclusively on that basis but also on other factors. This is also significant in the context of the many complaints from occupants in multi-apartment buildings who, unhappy with the collective solutions, wish (and sometimes decide) to use individual solutions, and thus do not wish to pay for the collective solutions.

This topic is also the subject of work under the contract referred to above. Depending on the outcome produced by *empirica*, it could be considered to "codify" (some elements of) best practice approaches in the review of the EED provisions, or simply to encourage MS to

[152] Analysis of good practices and development of guidelines for accurate and fair allocation of costs for individual consumption of heating, cooling and domestic hot water in multi-apartment and multi-purpose buildings to support the implementation of relevant provisions of the Articles 9-11 of the Directive 2012/27/EU on energy efficiency – Tender **ENER/C3/2013-977**

follow best practice based on guidance adopted or published by the Commission. In any case there is a link with the application of Article 10(3) and Annex VII in so far as heating, cooling and hot water in multi-unit buildings is concerned.

3.4.3. *Billing (information) and frequency*

What is the current situation?

The **EED** provisions on billing contained in Article 10 essentially

1) Define the **basic right for customers without smart electricity and gas meters to accurate billing information based on actual consumption with a certain minimum frequency** (Article 10(1) & Point 1.1. of Annex VII)
2) Define certain **minimum information to be provided** with billing information, namely
   a) Current actual prices and actual consumption of energy (A.VII point 1.1 a);
   b) Comparisons with previous years (A.VII point 1.1 b);
   c) Contact information to locate further energy information information/resources/advice (A.VII points 1.1 c and 1.3);
   d) Comparisons with average customers in the same user category (A.VII point 1.1 c).
3) Define **certain other rights to request**
   a) That billing and consumption information to the extent it exists be made available to a third party energy service provider (Article 10(3) a)
   b) Electronic billing (Article 10(3) b)
   c) Clear, understandable explanations of how bills are derived (Article 10(3) b)
   d) Information/estimates on energy costs in an easily understandable format allowing to compare deals on a like-for-like basis (Article 10(3)e)

The EED does not specify a minimum billing frequency for supplies metered with smart electricity and gas meters. Where a smart metering system is available to final customers, the general provisions of the **IEM legislation** continue to apply. According to Annex I point 1 i) of the IED and IEG Directives it is to be ensured that customers "*are properly informed of actual electricity consumption and costs frequently enough to enable them to regulate their own electricity consumption. That information shall be given by using a sufficient time frame, which takes account of the capability of customer's metering equipment and the electricity product in question*". According to an interpretative note published by the Commission on 22 January 2010, **the Commission's services consider that where smart meters are installed, receiving actual consumption based information on a monthly basis would be sufficient to allow a consumer to regulate his consumption** [153].

It should be stressed that the right/obligation referred to in point 1 above applies only "where this is technically possible and economically justified". Similarly, the minimum information referred to under point 2 above is to be provided "where appropriate" according to Annex VII. The rights listed under point 3 are not subject to such caveats.

How effective has the EU intervention been?

[153] http://ec.europa.eu/energy/sites/ener/files/documents/2010_01_21_retail_markets.pdf

The Commission does not yet have comprehensive data on the detailed implementation of EED Article 10. Initial high-level analysis of the current state of transposition suggests that it is still very incomplete and patchy, although this remains to be confirmed by more in-depth analysis at country level. In the latest annual report from ACER on the results of monitoring the internal electricity and natural gas markets[154] information on the billing frequency is available for a range of Member States for 2014, but the new requirements as regards minimum frequency under the EED took effect only as of 31/12/2014.

Table 3: Frequency of billing information based on actual consumption – 2014 Source: CEER Database, National Indicators (2014-2015) . Note: * Electricity, ** Gas.

	Without smart meters		With smart meters	
	Legal	In practice	Legal	In practice
Daily			FI*	
Monthly	BG, EE, LT, SE*	BG*, EE, HR**, LV*, LT	AT, EE*, ES*, PT*, SE*	FR, ES*, PT*, SE*
Bimonthly	CY*, PT**	CY*, ES*, FR, PT**	NL	NL**
Quarterly	AT, IE, NO*, PT*, RO**	DK, IE, PT*, RO	NO*	DK*, EE*, NO*
Triannually	FI	EL		
Biannually	HR, RO*, SI	HR*, MT*		
Annually	CZ, DK, EL, ES*, FR, HU, NL, PL*, SE**, SK	LU, NL, SI, SK	DK, FR, SE**	

As discussed earlier, data collected and reported by ACER shows that a high share of registered complaints about electricity and gas retail markets are related to billing issues. But the **data are neither specific nor recent enough** to reveal if the reasons are related to issued that were (to be) addressed as part of the EED implementation as of 2015. Whereas the mystery shopping study referred did contain data from 2015 and suggested that problems exist, that is also not surprising given the less that complete situation as regards both transposition and actual implementation.

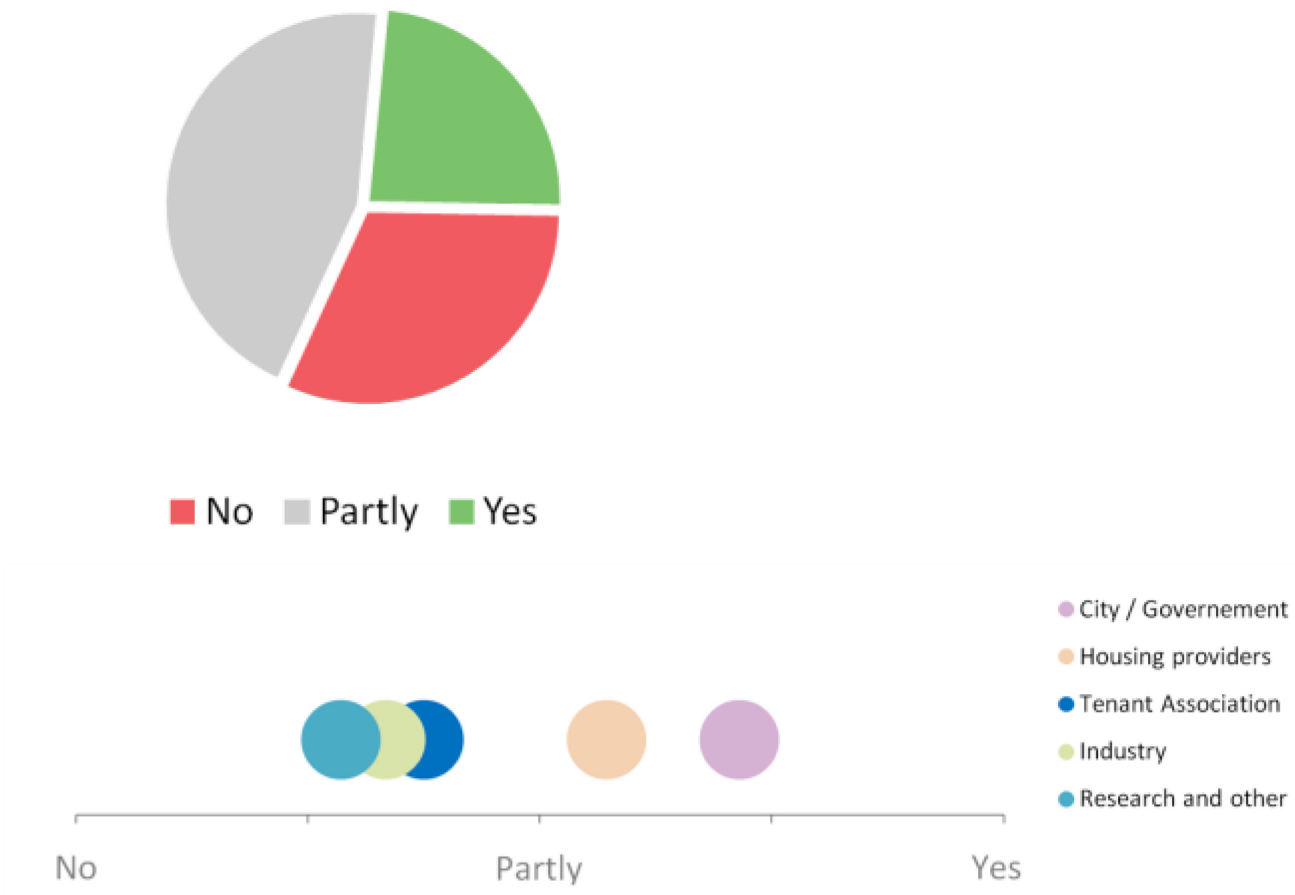
As regards **heating, cooling and hot water**, no evidence is available as regards the extent to which the various information elements are made available to final customers or at what frequency.

For consumers in **multi-unit buildings** supplied from central heating, cooling or hot water systems, these challenges ares compounded by lack of clarity as to whether the requirements are actually applicable to them at all or not (cf. the discussion in section **Error! Reference source not found.** where the consumers/occupants of individual units do not have a direct contract or commercial relationship with the energy utility. A specific stakeholder consultation carried out as part of the contract referred to in section **Error! Reference source**

[154] 2014 ACER/CEER annual report on the results of monitoring the internal electricity and natural gas markets

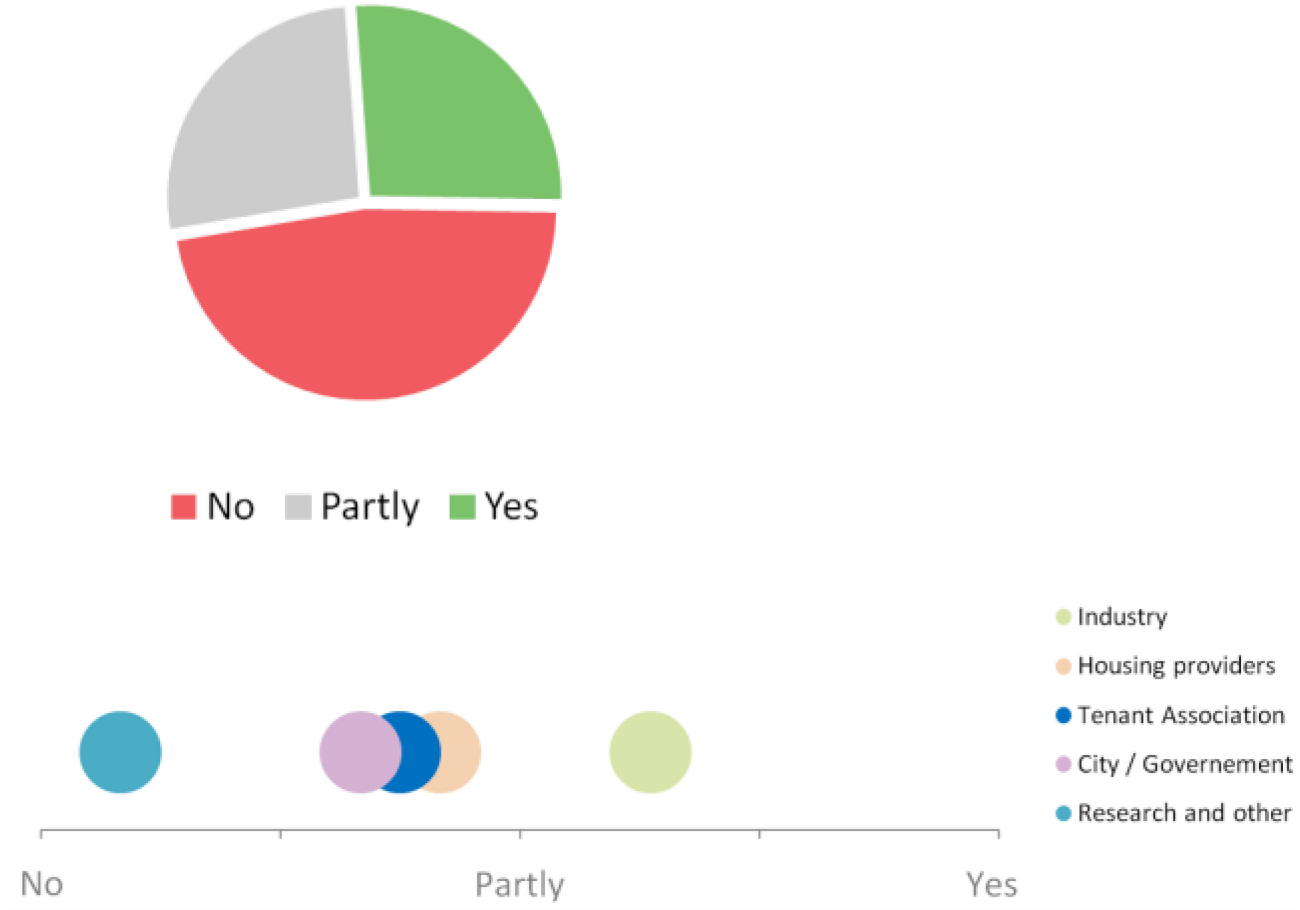
not found., confirmed that the Annex VII requirements are only considered fully applied by less than 75% of the respondents (cf. **Error! Reference source not found.**).

Figure 10: Expert stakeholder responses on the question: "Today in your country, does invoicing of heating, cooling and hot water, and information provided to tenants on their consumption pattern, generally conform to the requirements of Annex VII?"



Not surprisingly, a similar proportion of the same stakeholders did not consider that - where heating and/or hot water is sub-metered - invoices sufficiently transparent and clear, and cost allocation regarded as fair (cf.).

Figure 11: Expert stakeholder responses to the question: "Where data from heat meters or heat cost allocators are used to calculate the amount of energy invoiced to residents, are invoices sufficiently transparent and clear, and cost allocation regarded as fair?"



How efficient has the EU intervention been?

There are no data available to assess this question quantitatively yet, but given that the provision themselves (in EED Article 10(1)) contain "caveats" regarding cost-effectiveness, it is unlikely that the rules have imposed any disproportionate costs.

Even where meters or heat cost allocators are in place, the "cost plus" regulation that is typical of district heating networks, or internal heating accounts of sub-metered multi-unit buildings supplied e.g. from a central fuel oil boiler, is often operating on an annual basis. It may thus be costly or impossible to produce the cost figures that would in principle be required to produce sub-annual billing information including current energy costs. For this reason focus on consumption information (in terms of energy) rather than billing information (including also cost/price data) might be a more realistic option for sub-annual information in these cases. Depending on how MS have applied the "caveat" in Article 10(1) in this case, this may have resulted in more or less efficienct outcomes.

How relevant is the EU intervention?

With EED Article 10 and Annex VII having been adopted rather recently and aiming to address some of the problems identified, it clearly remains highly relevant.

How coherent is the EU intervention internally and with other (EU) actions?

Whereas no direct contradictions with other provisions and actions have been identified, it may seem incoherent or at least confusing that, as explained above, the minimum frequency of billing is (qualitatively) regulated in the Electricity and Gas Directives and quantitatively regulated in the EED for all but smart electricity and gas meters. Most importantly, the latter (EED) results in what would seem to be an unjustified difference between those customers of electricity/gas and thermal energy forms, respectively, who have equipment allowing for automatic/remote readings: whereas customers with smart electricity or gas meters should expect to have at least monthly information (cf. the Commission's interpretation of the IEM provisions), consumers whose consumption is measured with "smart" heat meters or heat cost allocators are only entitled to information 2 or 4 times a year (assuming that the cost-effectiveness condition has not been used to deviate from it). It would seem more logical that where supplies are measured using remotely readable equipment, and where marginal costs of more frequent information are therefore very small, the minimum frequency would be the same regardless of the energy form, and that this be clearly spelled out.

Moreover, the wording of Annex VII in some cases can be considered ambiguous. The use of the word "should" in Annex VII point 1.1. has led some Member States to consider the minimum requirements optional/non-binding, although the word "shall" is used in the operative Article itself (Article 10(1)). In the same vein, there seems to be some overlaps between the requirements listed in point 1.2 c) and point 1.3 of Annex VII, which both refer to contact information for external resources that the customer can refer to.

What is the EU added value of the intervention?

Delivering a New Deal for energy consumers as part of an Enery Union with consumers at its heart means inter alia providing consumers with frequent access to partially standardised, meaningful, accurate and understandable information on consumption and related costs[155]. Guaranteeing certain minimum standards in terms of the frequency and content of billing and billing information therefore contributes to realising the Energy Union and meet EU goals on energy efficiency and greenhouse gas reductions.

3.5. Conclusions

The legislators' **original objectives** behind the provisions can be summarised as follows:

- To **enable effective consumer choice** and **boost competition** through the availability of transparent, comparable and reliable information on prices, costs, energy consumption, fuel mix and environmental impact of electricity supplies
- To **enable/incentivize energy savings** through sufficiently frequent feedback about (the cost of) their energy consumption

Effectiveness

[155] Cf. conclusions in COM(2015) 339 final

The evidence available and considered in this evaluation suggests that the provisions in the **IEM and EED together are likely to have made some contributions towards the achievement of both of these objectives**, although it is impossible to quantify this given the multiple and complex other factors that also affect these objectives' achievement, the absence of precise indicators and the scarcity of data.

The EED generally contains the most specific and detailed provisions in the area of metering and billing, and not just as regards energy savings but also as regards the clarity and comparability of energy bills. The deadline for its transposition is relatively recent (mid 2014) and some of the key obligations therein have later deadlines for actual application. Until the national transposition measures are in place, have been verified to be in conformity with the requirements of the Directive and have been applied by market players on the ground it might be **too early to draw many firm conclusions as regards the effectiveness of the current legislative framework**.

It is nevertheless already possible to identify certain gaps and areas of potential improvements.

With regard to **comparability and clarity of billing information**, the relatively low degree of satisfaction of electricity and gas customers compared to other services markets and the high share of complaints related to billing suggests that there is **still room for improvement and that further action might well be required** to this end, at national or EU level. This conclusion is corroborated by the findings of the 2016 Electricity Study and the responses to the Commission's Consultation on the retail energy market conducted in spring 2014. A specific expert stakeholder consultation confirmed similar issues for centrally supplied thermal energy in multi-unit buildings: only 1 out of 4 consider that invoices are sufficiently transparent and clear, and cost allocation regarded as fair by consumers in such sub-metered buildings.

With respect to **energy savings** there was a clearly stated intention with the EED to clarify the pre-existing requirements contained in the IEM and in the 2006 Energy Services Directive (ESD) as their effect on this objective was considered to have been too limited. This intention has only partially been met given that the **current framework remains complex and open to interpretation** with regard to the nature and scope of certain key obligations. From this perspective, there is a case already for revisiting certain aspects of EED Articles 9-11 and of Annex VII, in particular those related to the minimum frequency of provision of information, the precise nature of that information and the situations in which the requirements are applicable.

With regard to **disclosure of energy sources**, the evidence available suggests that the way the current requirements are implemented is not sufficient to match the intentions: a **rather high share of citizens seem to either not find or not notice disclosure information with their billing information**. Others have doubts about the credibility or added-value of green claims made. While these problems in some instances may be due to bad application/non-enforcement, it also points to a potential for making such information more trustworthy, accessible, visible and easy to understand and compare. Moreover, the fact that a high share of gas offers carry "green" labels or claims despite biogas injection still being very limited also puts a question mark over the effectiveness of what is in fact amounts to a voluntary/unregulated regime, given there is no disclosure obligation for gas as there is for electricity. Finally, there is increasing demand from energy consumers, particularly the corporate sector, but also from organisations representing general consumers, for robust

information on the emissions associated with the energy use. This has resulted in a number of organisations proposing that the Guarantees of Origin system is extended to cover emissions such as CO_2.

Efficiency

There is **little if any evidence but good reason to assume that the intervention has been efficient** in terms of the proportionality between impacts and resources/means deployed. The major reason for this is that certain obligations are either modest in ambition, unclear in scope (and therefore not implemented) or qualified with conditions allowing Member States to make implementation subject to cost-effectiveness/proportionality criteria. A **possible exception is the rules on disclosure** where resources have been committed to establish systems allowing the issuance of guarantees of origin of electricity from renewable energy sources and from high-efficiency cogeneration under the RES and EED, respectively, but where the disclosure obligation in the IED does not require their use, thereby missing an obvious opportunity to use common EU tools that anyways exist.

Relevance

Overall the **key provisions remain highly relevant**, not least those of the EED which is not surprising given its relatively recent adoption. **This said, parts of both the IEM and the EED itself have to some extent been surpassed by developments** in the market as well as in the regulation (EED). This concerns notably **EED Article 9(1)** which carried forward provisions from the former Energy Services Directive without addressing certain ambiguities, and without reflecting recent technological and market developments as regards the availability of remotely readable heat cost allocators and meters. As regards the IEM, the **increasing use of online price comparison tools challenges the relevance, or at least the completeness, of certain provisions if they are not adapted** to also reflect and support new ways of consumer-market interaction.

Coherence

In terms of coherence, the evaluation has pointed to a number of issues where improvements seem possible.

Firstly, it must be noted that **smart metering is addressed by provisions in both the Electricity and Gas Directives, in the EED and in the EPBD, as well as by a non-binding Commission Recommendation**. These provisions are the subject of a separate thematic evaluation reported as part of the Market Design Initiative and not discussed in depth here. It suffices to say here that whereas no direct contradictions have been identified, **this situation is at the very least confusing** and renders it more complex to understand the applicable requirements. An **example is the minimum frequency of billing** which is regulated by the IEM Directives in a qualitative way (not making references to quantified frequencies), and by more specific quantified provision in the EED but only in so far as non-smart meters are concerned. This results in what appears to be an unjustified difference in the guaranteed minimum frequency of provision of information between those customers of respectively electricity/gas and heat that have remotely readable/"smart" equipment installed: the latter are not currently sure to fully benefit from the capabilities of the smart equipment (be it heat meters or heat cost allocators).

Secondly, the **continued use in the EED (Article 9(1)) of the term "*meter…. that provide information on actual time of use*", originating from the 2006 Energy Services Directive, raises questions about the coherence with the framework for promoting smart meters**. The latter generally aims to promote the roll-out, where cost-effective, of meters with a wider range of functionalities of which capability to provide time-of-use information is just one.

Thirdly, in so far as billing and billing information are concerned, **the way Annex VII of the EED is drafted and referenced could be improved to address certain internal overlaps or ambiguities** as regards the nature and scope of its applicability. Notably it might be worth clarifying beyond doubt that the annex is applicable to consumers of thermal energy in multi-flat/purpose buildings even where they're not directly or individually parties to an energy supply contract. The precise nature of some of the information elements (comparisons) could also be clarified.

Finally, two observations can be made as regards **disclosure of energy sources**:

Firstly, the **current disclosure regime is not technology-neutral.** Electricity supplies are subject to disclosure whereas network supplies of gas and thermal energy forms are not. It might be argued that historically this was justified a) because "gas is just gas" and b) because thermal energy supplies were not regulated by an internal market directive. However, as gas supplies are increasingly being diversified to include biogas, gas customers arguably might also start having an interest in knowing where their gas comes from and use this information as active consumers. As regards heat, switching supplier is typically not an option in the short term. Nevertheless, heat consumers – whether supplied from a central boiler in a multi-flat building or from a district heating network – arguably also could have a legitimate interest in knowing the source of their energy: at building level this could inform collective decisions to change energy source when installations have to be renovated. At the level of district heating networks, this could increase awareness and political pressure over time to transition to using more efficient and low-carbon sources or upgrading infrastructures in the network.

Secondly, **whereas EU legislation establishes tools to facilitate electricity-related disclosure for both renewables and high-efficiency cogeneration, it only stimulates a demand for the former**. The obligation to disclose the fuel mix, enshrined in the Electricity Directive, does not require or stimulate disclosure of the share of cogeneration. **Moreover, even for renewables, the disclosure obligation is not systematically/exclusively met using guarantees of** origin, despite them being available, as their use is not mandatory.

EU added-value

Delivering a New Deal for energy consumers as part of an Energy Union with consumers at its heart means *inter alia* providing consumers with frequent access to partially standardised, meaningful, accurate and understandable information on consumption and related costs. **Healthy levels of consumer engagement and retail competition are key to ensuring the rollout of new products and services that will help the energy system become more flexible, and build demand for innovative energy products.** Guaranteeing certain minimum standards in terms of the frequency and content of billing and billing information therefore contributes to realising the Energy Union and meeting EU goals on energy efficiency and greenhouse gas reductions.

In addition, the provisions addressing consumer information in the Electricity and Gas Directives are essential for protecting consumers in the internal energy market at the retail

level. They play an important role in ensuring the benefits of the internal market in energy can be enjoyed by all consumers, and help to create a level-playing field for suppliers and other retail market actors across the EU. **Whereas there are currently very few, if any, examples of cross-border supply in the retail market, a common base of energy consumer rights that helps national rules converge over time is a precondition for that to develop**. With the perspective of developing an internal retail market where customers one day might even shop cross-border, the common definition of minimum requirements for information for consumers creates added value. But even in absence of cross-border supplies at retail level, **common minimum requirements allow service providers and equipment manufacturers to develop standard solutions and create economies of scale**, leveraging the internal market of 500 million consumers.

Simplification, burden reduction potential, SMEs, and quantification of costs and benefits

From the evaluation it appears very likely that it should be possible to clarify the current legislative provisions which are somewhat complex and open to interpretations on important points. This in turn should simplify the task for the public authorities whose task it is to transpose the rules in national law and ensure their actual implementation and enforcement. However, also other market players and not least citizens would benefit from clearer and more coherent rules at the EU level. In terms of burdens for citizens economic operators, including on SMEs, the existing rules create a net benefit as they are not requiring action where it is not cost-effective, and are therefore not imposing significant burdens.

3.6. Stakeholder consultation

This evaluation has benefitted from input from the following processes involving stakeholders:

3. Consultation on the retail energy market
   http://ec.europa.eu/energy/en/consultations/consultation-retail-energy-market

4. Consultation on the Review of Directive 2012/27/EU on Energy Efficiency
   http://ec.europa.eu/energy/en/consultations/consultation-review-directive-201227eu-energy-efficiency

5. Three stakeholder workshops on metering and billing of thermal supplies organised by "empirica" for the Commission
   http://www.empirica.biz/projects/energy/details/?projectid=182

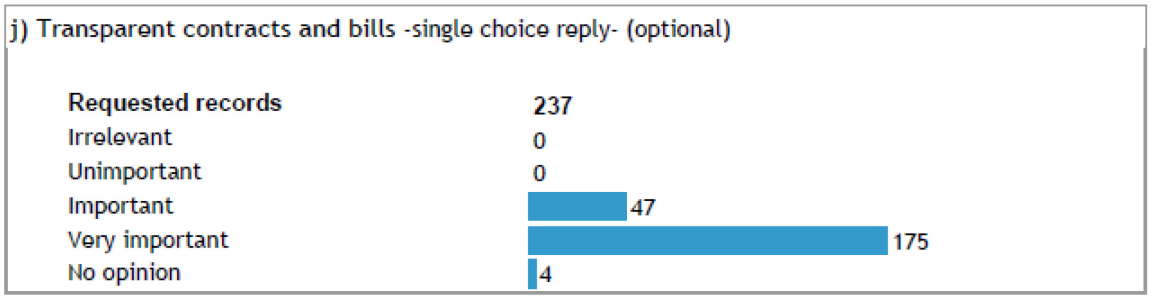
6. Three range of workshops organised by the JRC on metering and billing of heat
   http://iet.jrc.ec.europa.eu/energyefficiency/tags/heat-metering-and-billing

Retail market public consultation - results

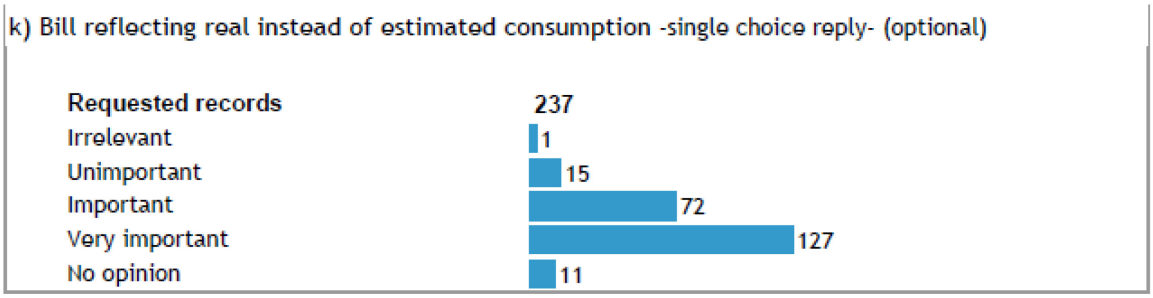
Below are summarised in graphic form a quantitative summary of the relevant feedback from the consultation referred to in point 1 above.

Please give your opinion on the relative importance of the following factors in helping residential consumers and SMEs better control their energy consumption and costs.

j) Transparent contracts and bills -single choice reply- (optional)

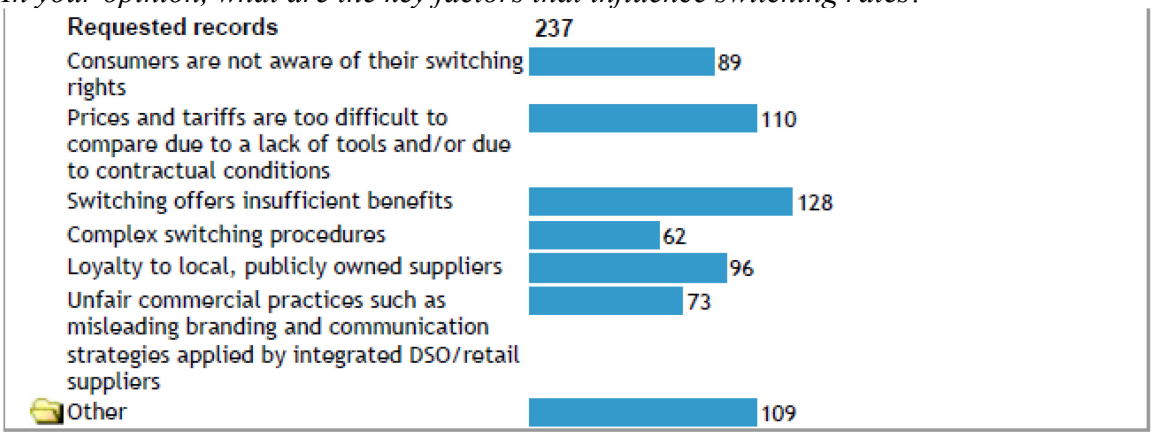


k) Bill reflecting real instead of estimated consumption -single choice reply- (optional)



ACER/CEER Annual Report concludes that consumers are dissatisfied with the information they receive in their contract and in their billing information. The report also shows the frequency with which consumers switch from one energy supplier to another. This varies between 0% to 14,8% in the EU Member States.

In your opinion, what are the key factors that influence switching rates?



Please indicate if you agree or disagree with the following statements concerning ways to increase consumers' interest in comparing offers and switching to a different energy supplier.

a) Include standardised minimum information in commercial offers for easier comparison -single choice reply- (optional)

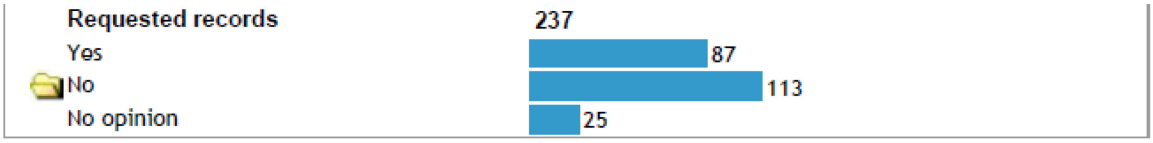
b) Ensure the availability of web-based price comparison tools -single choice reply- (optional)

c) Ensure consumers are aware of their rights -single choice reply- (optional)

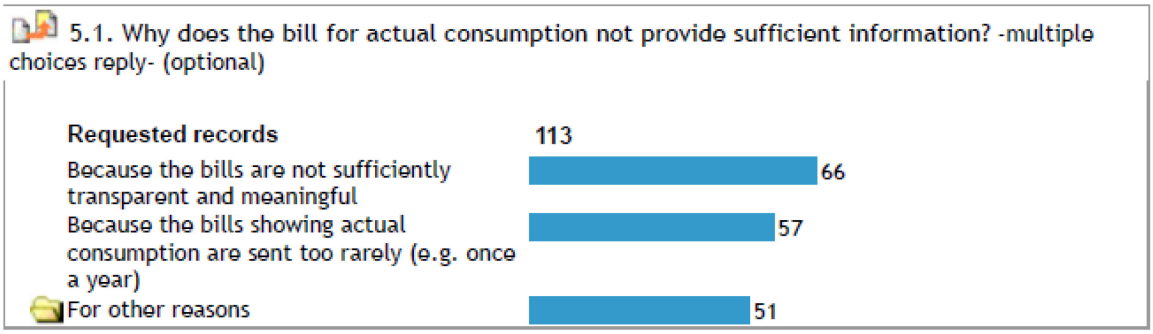
d) Develop further rights for consumers -single choice reply- (optional)

e) There is no need to encourage switching -single choice reply- (optional)

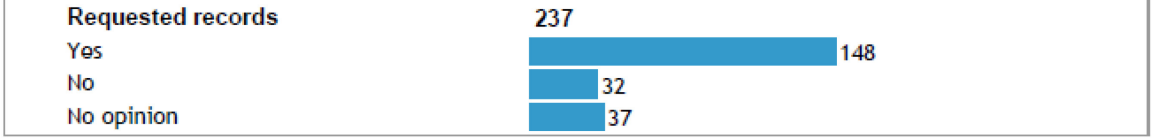
With the implementation of related provisions in the Energy Efficiency Directive by December 2014, consumers can be billed on the basis of their actual energy consumption and have the right to access their actual and historical consumption data. Do you think that bills provide consumers with sufficient information about their consumption patterns?



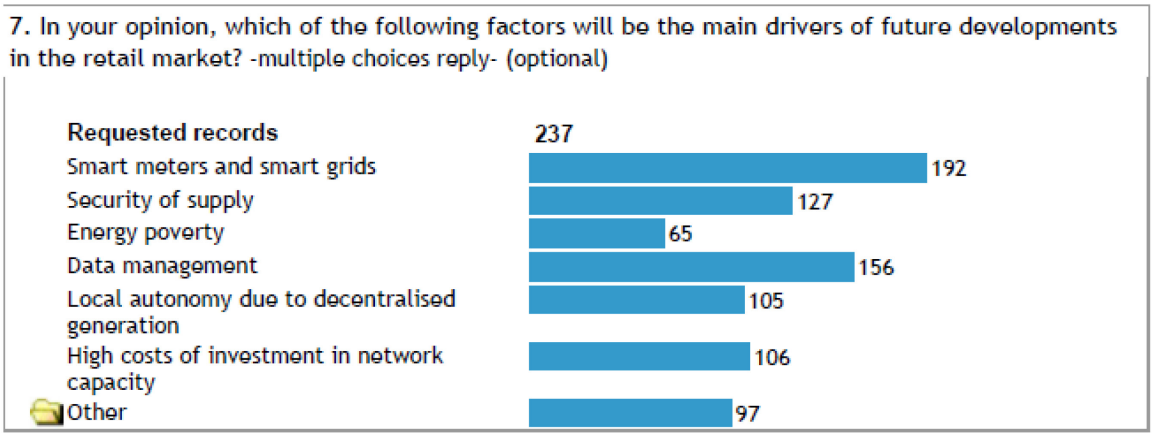
5.1. Why does the bill for actual consumption not provide sufficient information? -multiple choices reply- (optional)



6. If you were able to receive more detailed information on your energy consumption, do you think this would affect your consumption patterns? -single choice reply- (optional)



7. In your opinion, which of the following factors will be the main drivers of future developments in the retail market? -multiple choices reply- (optional)

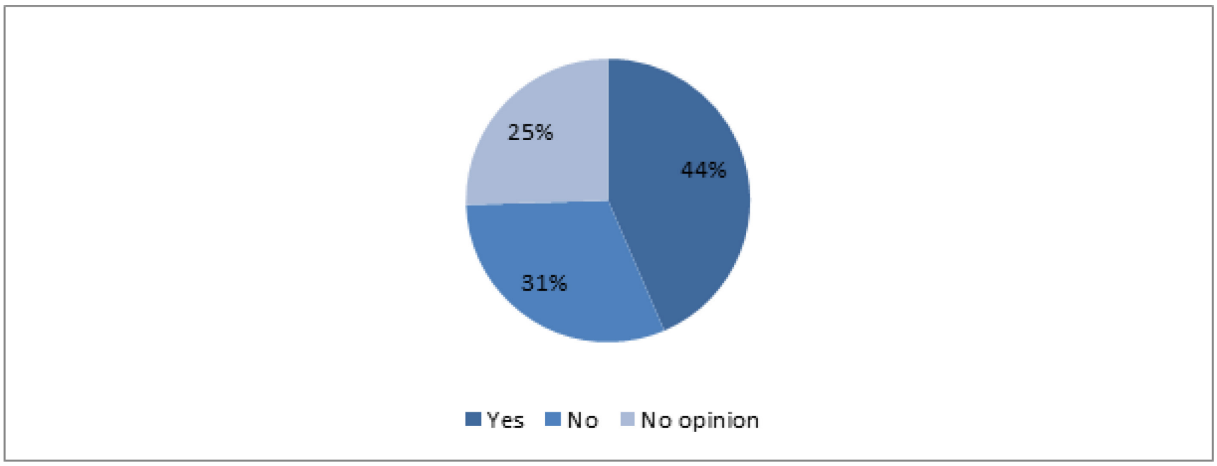


EED review - results

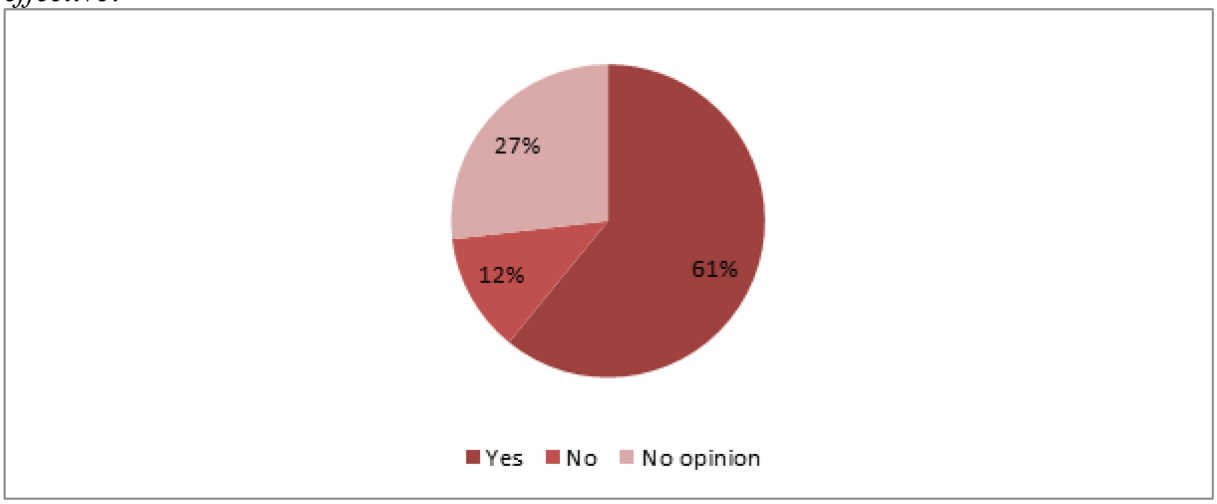
Below are summarised in graphic form a quantitative summary of the feedback from the consultation referred to in point 2 above in so far as EED Articles 9-11 are concerned, on the basis of 326 responses. Further details have been published online in a full synthesis report[156].

Overall adequacy: Do you think the EED provisions on metering and billing (Articles 9-11) are sufficient to guarantee all consumers easily accessible, sufficiently frequent, detailed and understandable information on their own consumption of energy (electricity, gas, heating, cooling, hot water)?

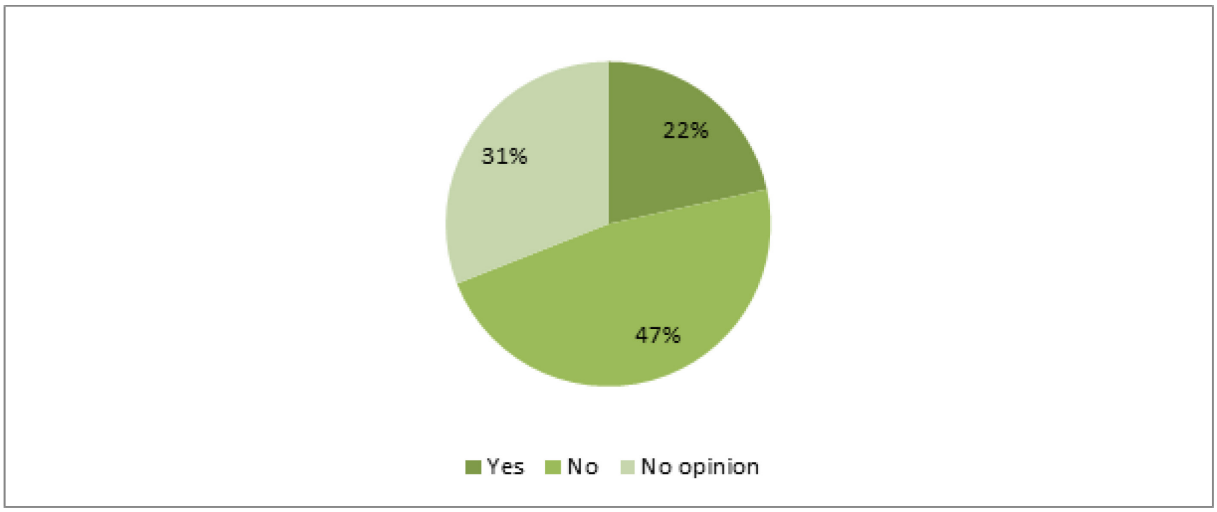
156 https://ec.europa.eu/energy/sites/ener/files/documents/Public%20Consultation%20Report%20on%20the%20EED%20Review.pdf



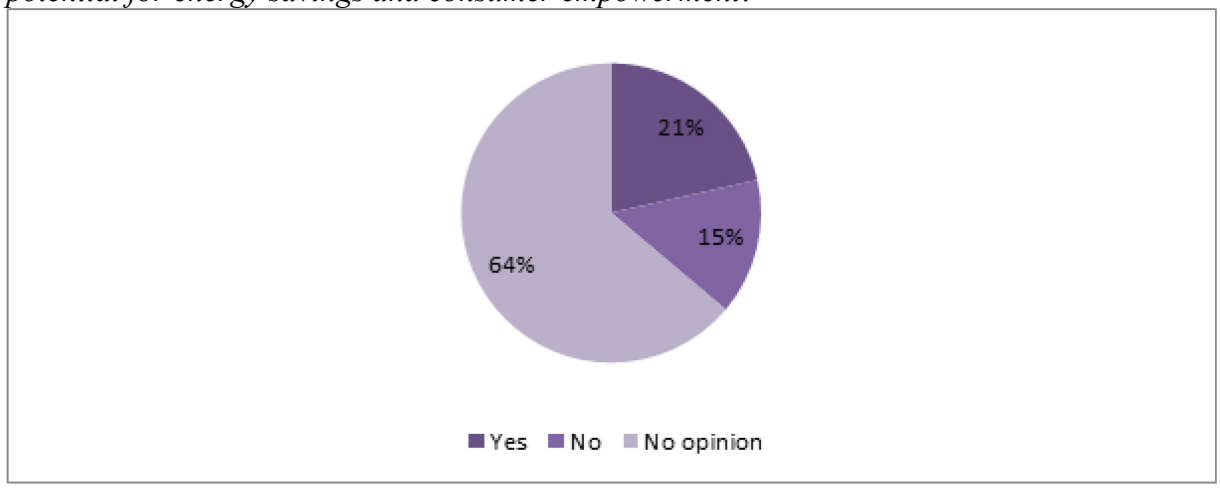
Do you think it appropriate that the requirement to provide individual metering and frequent billing (Articles 9(1), 9(3) and 10(1)) is subject to it being technically feasible and/or cost effective?



Should such conditions of being technically feasible and/or cost effective be harmonised across the EU?



How would these conditions of being technically feasible and/or cost effective affect the potential for energy savings and consumer empowerment?



3.7. REFIT assessment of the Renewable Energy Directive – Provisions related to Guarantees of Origin (GOs)

This section summarises the evaluation work that has been carried out in relation to Article 15 of the Renewable Energy Directive (Directive 2009/28/EC). This Article relates to the Guarantees of Origin (GO) system which tracks the origin of renewable electricity and can be used for disclosure purposes.

Conclusions and recommendations for GOs

The REFIT assessment concluded the following actions:

- Continue to stress the importance of MS to move towards a GO system based on the European Energy Certificate System (EECS) operated by the Association of Issuing Bodies (AIB). Also, continue to monitor progress, to ensure full implementation of this article throughout the EU.
- Assess the option to link GOs to the actual energy stream, after 2020.
- Assess the benefits of following the Best Practice Recommendations formulated by RE-DISS I and any further recommendations from RE-DISS II22. These include: extending the use of GOs for all types of power generation; streamlining the use of tracking mechanisms at MS level; clarifying the relation between support schemes and the tracking systems used for purposes of disclosure.
- Investigate the possible extension of the use of GOs beyond RES-E and high-efficient cogeneration to all types of power generation i.e. including electricity from fossil and nuclear generation.

REFIT assessment

What is the current situation?

The REFIT analysis of the RED summarised the situation with the GO system.

Article 15: Guarantees of origin (GOs)	**Key issues and barriers**
Positive contributions	
Transparency on RES generation has increased and GOs proved to be a useful tool to reduce fraud and inaccuracies. Systems throughout the EU have become more standardised.	There are still barriers to the trade and transfer of GOs; differences in the comprehensiveness of procedures and the use of GOs remain. The administrative burden seems reasonable but data are lacking and likely to depend on MS implementation and starting point

How effective has the EU intervention been?

The REFIT analysis showed:

- All MS now have some sort of RES GO system in place with competent bodies assigned for issuing, transferring and cancelling GOs. The use of GOs for heating and cooling remains limited as RED does not set a mandatory requirement regarding their issuance.
- Guarantees of Origin are used for three main purposes: fuel mix disclosure i.e. to prove how the energy was produced and ensure transparency of the energy data produced by the system and of the information provided to final consumers; to determine eligibility for national support schemes - it is up to Member States to decide whether they want to combine GOs and support schemes; as a traded commodity between MS.
- Almost all countries use GOs for consumer disclosure purposes and most recognize GOs from other countries and allow trade, albeit with different conditions.
- The number of GOs issued, traded and transferred has been increasing sharply between 2010 and 2013 but the trade in GOs remains limited due to barriers to the trade and transfer of GOs based on the fact that not all Member States are members of the Association of Issuing Bodies (AIB) and use a system compliant with the European Energy Certificate System (EECS), which means that GOs from some Member States are refused by others.
- At this stage there is no specific research which isolates and quantifies the impact that GOs have had on the level of investment in renewable energy at EU or MS level.
- GOs have proved to be useful tools to reduce fraud and inaccuracies. The effectiveness of the systems in place to avoid inaccuracy and double-counting has clearly improved significantly since the first version of the Directive (2001) and even since 2009. The majority of countries are now compliant with the EECS and have systems in place to check the validity of the information supplied by GOs. However, there still remain differences in the comprehensiveness of these procedures and therefore their likely effectiveness.
- The effectiveness of GOs as a tradable commodity which can support investment in RES across Europe is less clear. The exclusion of GO use as a compliance means for meeting national targets reduces their effectiveness in supporting investment across the EU, because it places the emphasis on domestic (national) measures irrespective of the opportunity for cheaper investment elsewhere.

How efficient has the EU intervention been?

Efficiency was examined by the REFIT analysis:

- The costs of a Guarantee of Origin regime include the development and operation costs of a registry as well as costs of plant registration and audits and transaction costs for participants.
- Implementing article 15 of the 2009 Directive will have involved additional costs for public authorities in order to meet the new mandatory requirements it included. However, in most countries the system will build on: the existing GO system if one was implemented in response to the 2001 Directive; or using an existing body as the responsible authority and allocating it these additional responsibilities in order to limit additional costs.
- Overall the administrative burden does seem reasonable, although in practice it will depend on how MS implement the system. The system costs associated with fraud and double-counting avoidance also need to be viewed in the context of the risks and costs of fraud and double-counting itself. These costs can be minimised through a standardisation of GOs across Europe.
- Ultimately the cost efficiency of the system will not only depend on the implementation and operation costs but also on the volume of GOs issued and traded: the more GOs are issued the higher the economies of scale achieved and therefore the efficiency of the system.
- There is no available overview of the costs placed on producers by the various MS systems at this point.
- The continued standardisation of the GO system at EU level – following the Best Practice Recommendations formulated by RE-DISS I and any further recommendations from RE-DISS II - seems to be the best way to maximise the potential benefits from this Article.

What is the EU added value of the intervention?

The REFIT analysis summarised added value as:

- The article is not directly related to other EU initiatives but GOs might be considered useful tools as part of the objective for a single internal energy market set out in the 2009 Energy Market Directives. Specifically, the role of GOs in supporting fuel mix disclosure helps facilitate consumer choice and supplier competition, both of which are encouraged by the 2009 Energy Market Directives.
- The 2009 RED introduced improvements in the minimum requirements originally set out in the 2001 Directive. Without further intervention at EU level the situation would likely have remained unchanged since 2001 with a fragmented system as opposed to the more standardised (although still not unified) process currently in place.
- The added value of this article in terms of cost-efficiency is limited by the need for individual MS to meet their renewable targets and the separation between GOs and the underlying commodity they related to (i.e. energy).
- It is also limited by the presence of other tracking systems in some MS along with GOs which can create confusion and duplication.

Conclusions

The main conclusions with regards to GOs from the REFIT review are that:

- They represent a generally effective tool for auditing purposes and that there is value in having a consistent approach at EU level. This consistency reduces barriers to investment (because the market has confidence in the integrity of the GOs across a standardised system) and transaction costs (because of the efficiency of common rules). The role of the Association of Issuing Bodies (AIB) and use of a system compliant with the European Energy Certificate System (EECS) is important in underpinning the integrity of GOs as internationally traded commodities.
- They could also be a useful tool for creating a voluntary, consumer-driven market for renewables. The consumer buying a green tariff supply backed up by GOs can be confident that the corresponding renewable electricity has only been accounted for once in green supply agreements. However, the decoupling of the electricity and GOs weakens this benefits since a consumer cannot directly attribute his or her electricity to a particular renewable source (or indeed any renewable source).
- Despite progress in implementation, improvements are still needed in order to achieve a consistent system across Europe.
- GO trade is still in its infancy and it is as yet unclear whether it will have net positive impacts on RES deployment at EU level and, consequently on MS ability of reaching their targets. There is a potential for conflict between EU level and country level benefits from the mainstream use of GOs should it happen. This is because the exclusion of GO use as a compliance means for meeting national targets places the emphasis on domestic (national) measures irrespective of the opportunity for cheaper investment elsewhere.
- It is important that all MS continue to move towards a GO system based on the European Energy Certificate System (EECS) operated by the Association of Issuing Bodies (AIB). Joining AIB and the EECS can provide guidance for MSs on developing a system which is compliant with others across Europe, and will facilitate trade.
- Separating GOs from the energy system itself decreases transparency since the consumer cannot associate their electricity with a renewable source. This can reduce the effectiveness of this article as a means to encourage the voluntary market in green electricity supplies.
- It is worth investigating the possible extension of the use of GOs beyond RES-E and high-efficient cogeneration (HE cogeneration) to all types of power generation i.e. including electricity from fossil and nuclear generation. This would help support the tracking and auditing on non-renewable supplies and underpin the integrity of the supply mix disclosure statements that inform consumer choices concerning these generation types.

Finally, the overall future effectiveness of GOs will be improved by continuity of the RED beyond 2020 (and communicating that continuity), especially to avoid uncertainty in the GO market as we approach 2020.

3.8. Main sources used for the analysis

Electricity and Gas Directives

- **ACER** is an agency created by the ACER Regulation. ACER's duties include monitoring and reporting on the internal electricity and gas markets. By the end of

2015, ACER will have published four annual **Market Monitoring Reports**[157] that provide in-depth coverage of relevant issues such as consumer empowerment and protection, supplier switching and consumer information.[158]

- DG JUST published in 2010 (2009 data) a **study on the functioning of retail electricity markets for consumers in the EU** ("the 2010 electricity study").[159] This major study examined whether a well-functioning electricity market was in place for consumers in the EU. It also examined the extent to which consumers were able to make informed and empowered choices and what motivates behaviour in the electricity market. The study provided evidence pertinent to evaluating the billing and metering measures put in place by the Electricity Directive.
- DG JUST commissioned a follow-up study on the functioning of retail electricity markets for consumers in the EU ("the 2016 Electricity Study"[160]) to assess the development of consumer conditions across the EU28 Member States' (and Norway, Iceland) electricity markets following the implementation of the Third Energy Package. The 2016 Electricity Study assesses the extent to which the electricity market benefits consumers and what is still missing for better consumer outcomes. It also examines the extent to which consumers are able to make informed and rational choices corresponding to their energy consumption needs, whether they possess the necessary tools to compare prices and offers, and what motivates consumer behaviour in the energy market. The study makes comparisons with the findings of the 2010 electricity study. The findings provide evidence for future policy initiatives and identify actions needed for further integration of the EU Internal Energy Market. Initial findings from the 2016 Electricity Study were published in November 2015 together with the State of the Energy Union 2015 Communication.[161] The final report will be published in summer 2016.
- DG JUST published a **study on the coverage, functioning and consumer use of comparison tools and third-party verification schemes**,[162] which addresses the possible improvements that can be made to ensure comparison tools are reliable, transparent and user-friendly and that they benefit consumers given that consumers are increasingly using such tools to compare offers on the market.
- In addition, DG JUST's (and formerly DG SANCO's) **consumer scoreboards**[163] are an important source of information on how the single market is performing for EU consumers.

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[157] http://www.acer.europa.eu/electricity/market 20monitoring/Pages/default.aspx

[158] The data used for compiling ACER's annual report is provided by national regulatory authorities for energy (NRAs), the European Commission and the European Networks of Transmission System Operators (ENTSOs). The members of the Administrative Board of ACER (Article 12(7) of the ACER Regulation) and ACER's Director (Article 16(1) of the ACER Regulation) act independently of the Commission and other interests. For sector-specific consumer issues, ACER also draws on data from the Commission's Consumer Scoreboard. http://ec.europa.eu/consumers/consumer_evidence/consumer_scoreboards/10_edition/index_en.htm

[159] http://ec.europa.eu/consumers/consumer_evidence/market_studies/retail_energy/index_en.htm

[160] 2nd Consumer market study on the functioning of retail electricity markets for consumers in the EU, EC, 2016

[161] http://ec.europa.eu/priorities/energy-union/state-energy-union/index_en.htm; see in particular "Energy Consumer Trends 2010 – 2015", SWD(2015) 249 final, 18.11.2015, http://ec.europa.eu/priorities/energy-union/state-energy-union/docs/swd-energy_consumer_trends_en.pdf

[162] http://ec.europa.eu/consumers/consumer_evidence/market_studies/comparison_tools/index_en.htm

[163] http://ec.europa.eu/consumers/consumer_evidence/consumer_scoreboards/index_en.htm

- The **Council of European Energy Regulators (CEER)** is a not-for-profit association through which Europe's national energy regulators cooperate and exchange best practice. It has recently produced advice on **customer information on sources of electricity**,[164] presenting recommendations on how to make the system for disclosing how electricity has been produced more comprehensive, coherent and reliable.
- The **European Consumer Complaints Registration System** - ECCRS (DG JUST). In May 2010 the Commission adopted the "Recommendation on the use of a harmonised methodology for classifying and reporting consumer complaints and enquiries". The Recommendation is addressed to any body who is responsible for collecting consumer complaints, or attempting to resolve complaints, or giving advice, or providing information to consumers about complaints or enquiries, that is a third party to a complaint or enquiry by a consumer about a trader[165]. Consumer complaints collected by consumer complaint handling bodies are a key source of information on the functioning of consumer markets across the EU, in particular on problems faced by consumers. As the data is directly comparable across the EU, this should allow for a faster, better targeted, evidence-based policy response at the EU or the national level to real problems experienced by consumers.

EED

- In so far as metering and billing of thermal supplies is concerned, the work performed under a **service contract[166] with the consultants empirica** has provided input. Under this contract two **workshops** with Member States and stakeholders have been organised to exchange views on existing and best practices focusing on Member States' interpretation of "technical feasibility and cost-effectiveness" for the purpose of the application of Article 9(3) and 10(1).
- Another **workshop on heat metering and billing more generally** was held with the assistance of the JRC[167].
- DG ENER's general **analysis of Member States' transposition and implementation**, assisted by external consultants.

Reports from the **Concerted Actions** on the Energy Services Directive and the Energy Efficiency Directive[168].

3.9. Details on Commission proposals

The Commission's proposal for the Electricity and Gas Directives

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http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/Tab5/C14-CEM-70-08_CustomerInfo-Sources%20of%20Electricity_Advice_March%202015_0.pdf

165 http://ec.europa.eu/consumers/consumer_evidence/data_consumer_complaints/docs/consumer-complaint-recommendation_en.pdf

166 Analysis of good practices and development of guidelines for accurate and fair allocation of costs for individual consumption of heating, cooling and domestic hot water in multi-apartment and multi-purpose buildings to support the implementation of relevant provisions of the Articles 9-11 of the Directive 2012/27/EU on energy efficiency – Tender **ENER/C3/2013-977**

167 Full documentation available here: http://iet.jrc.ec.europa.eu/energyefficiency/node/9072

168 http://www.esd-ca.eu/reports

The metering and billing provisions in the current Electricity and Gas Directives were introduced in the Second Energy Package in 2003 as an integral part of measures making all consumers free to choose their supplier. The 2001 proposal for these directives[169] cited "*transparency of information*" as **a basic right for consumers**. A subsequent amended proposal[170] added that "*disclosure is important in **enabling effective choice***".

Although the 2007 Commission proposals for the **Electricity[171] and Gas Directives**[172] did not include new provisions on metering or billing, they reiterated that the existing universal public service[173] requirements in Article 3 of the legislative texts were there "*to make sure that all consumers can benefit from **competition***." As for the provisions on the frequency of information on energy costs, these were intended to "*create incentives for **energy savings***". The Commission's Impact Assessment accompanying the 2007 proposals[174] stated that one of the specific **objectives** of the broader effort to improve consumer protection was "*[e]nabling easier **price comparisons***".

The Commission's proposal for the EED

The 2011 Commission proposal for an Energy Efficiency Directive[175] included a comprehensive and ambitious set of provisions on metering and billing representing very significant changes compared to the already existing provisions in the field, namely Article 13 of the Energy Services Directive[176] (ESD).

The Commission's proposal was accompanied by detailed analysis of options on metering & billing[177]. The stated specific **objective** of the proposal as regards the metering and billing provisions was to "*[e]nsure that consumers are empowered with correct, understandable and regular information on their energy use*".

More particularly, there was a clear aim to address **problems identified with the application of Art 13 of the ESD**: As the Impact Assessment summarized it: "*Because of the vague wording the provisions did not lead to improvements*" with respect to the aim that was to "*ensure understandable and accurate information is provided for consumers via individual meters and energy bills on a frequent basis*."[178]

Key **changes proposed** included:

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[169] http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1447663534789&uri=CELEX:52001PC0125(01).

[170] http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1447663534789&uri=CELEX:52002PC0304(01)

[171] http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1447425243567&uri=CELEX:52007PC0528

[172] http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1447425326195&uri=CELEX:52007PC0529

[173] Sometimes known as 'universal service' - the practice of providing a baseline level of services to every resident, most commonly through a regulated industry.

[174] http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2007/sec_2007_1179_en.pdf

[175] http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52011PC0370

[176] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0032

[177] http://ec.europa.eu/energy/sites/ener/files/documents/sec_2011_0779_ia_annexes.pdf, p.52

[178] http://ec.europa.eu/energy/sites/ener/files/documents/sec_2011_0779_impact_assessment.pdf, p.12

- **minimum frequency** of consumption based billing of **every 1-2 months** in most cases, and
- clarification that **individual metering in each flat in multi- apartment buildings** was also required for heating, cooling and hot water.

3.10. Billing practices and regulation per country[179]

The regulatory environment in relation to billing is well elaborated across the EU28, Norway and Iceland. Nonetheless, there is a large variation in how countries choose to approach the subject, in particular with regards to the extent they are willing to define the content of electricity bills specifically in the national legislation. Three broad approaches were identified:

Highly prescriptive (HP) approaches relying on legal instruments or resolutions, which request a large amount of detail and/or give very specific instructions on what information to provide in electricity bills.

Legislation which specifies the main information (MI) that must be included in bills, which is subsequently reinforced by guidance from the regulator (in terms of mandatory information and format, or best practice guidance).

Legislation that specifies the main information, but leaves electricity providers broad freedom (BF) to communicate this within their own format.

In the following table, billing practices in each country are described, noting what are considered to be a highly prescriptive approach (HP), an approach enforcing communication of main information (MI) and, finally, an approach that allows broad freedom (BF).

Table 4: Billing practices and regulation per country

Austria (MI)	Article 81 of EIWOG specifies which information should be presented on the electricity bill. This provision is further detailed by ordinances from the regulator, in which suggestions are given as to how to present the mandatory information, including the energy sources breakdown and the price components. The contents of the documents (e.g. electricity bill, contract, etc.) are detailed not only in the Electricity Act, but also in the Renewable Energy Act, the System Charges Order, the Electricity Duty Act, as well as in individual Federal states legislation. The 'DAVID-VO' Ordinance (Articles 1-5) specifies the information that electricity suppliers must give to customers.
Belgium (HP)	Law April, 29th 1999 'Loi relative à l'organisation du marché de l'électricite' details the mandatory information to be present in a consumer's bill. The information to be presented in the bill is highly regulated, with 10 mandatory headings and many mandatory sub-headings which detail the information to be provided.
Bulgaria (BF)	The Bulgarian Consumer Protection Act (Art. 4, Par. 1) outlines a minimum set of requirements for information to be provided to the customer such as: (1) information on the composition, (2) the supplier's contact details, (3) the trader's complaint handling process, and 4) arrangements for payment.

[179] Source for this annex: European Commission (2016), ' Second Consumer Market Study on the functioning of retail electricity markets for consumers in the EU.

Croatia (MI)	Articles 49 and 63 of the Act on Electricity Market (Official Gazette, no. 22/13, 95/15 and 102/15) regulate billing. In Croatia, regulations specify that the supplier needs to deliver an electricity bill that contains the following elements: the share of the price that is freely negotiated, the share that is regulated and fees and other charges prescribed by special regulations.
Cyprus (MI)	Article 91 (1)(d)(iv) and Article 93 (1)(j) of the Electricity Law 206(I)/2015 regulate how the consumption of electricity should be communicated to consumers. The tariffs of the main energy provider are regulated by the Cyprus Energy Regulatory Authority (CERA) and they can be found on the website of the Electricity Authority of Cyprus (EAC).
Czech Republic (DF)	Bills for electricity, gas, heat supply and related services are governed by Act nr. 458/2000 Coll. in articles 11a and 98a. Electricity suppliers are to publish the conditions and price of electricity supply for households and residential customers in a way that can be accessed remotely. If increasing the prices for the supply of electricity, the supplier is obliged to notify the consumer in advance. In the case of electricity and gas, outstanding charges are billed at least once a year.
Denmark (MI)	Regulation of billing information is implemented in Executive Order no.486 of 2007 on electricity billing. However, the Danish Energy Regulatory Authority has presented an executive order which gives consumers the possibility to receive a simplified bill. The purpose of this order is to give consumers a better understanding of the price elements and an incentive to be active on the energy market. This order was implemented in Danish law in October 2015.
Estonia (MI)	Electricity Market Act §75 stipulates the following: "the seller shall submit an invoice for the electricity consumed to the customer once a month, unless agreed otherwise with the customer". It is mandatory for suppliers to include information not just on consumption but also on emissions and waste (nuclear and oil shale) as well as dispute resolution options.
Finland (MI)	Part III, Ch. 9, 69 § of the Electricity Market Act (588/2013) outlines the legal requirements with regards to billing imposed by the electricity provider. In the bill, the provider is to include details on how the price is broken down, information on the contract's duration and which dispute-solving tools consumers have at their disposal.
France (HP)	Article 4 of the Regulation 18 April 2012 covers electricity or natural gas bills, their payment modalities and reimbursement of overpayment (i.e. bill based on an estimation of the consumption). The bill must include information on over 16 different headings. The website 'Energie info', made available by the National Energy Ombudsman, illustrates and explains this mandatory content to consumers.
Germany (MI)	The right to receive clear information on one's energy contract before signing, and to be informed in advance if any changes are made to the contract, are provided for within German law (article 41 EnWG). The EnWG (section IV art. 40) specifies the content that should be provided to consumers on their electricity bills. The German Institute for Transparency on Energy (DIFET) produces certificates for those suppliers that provide consumer-friendly bills.
Greece (BF)	The new Code of Electricity Supply regulates the tariffs of electricity suppliers. Specifically, this code describes what must be included in the bill and how the bill must be broken down into three different elements: (1) regulated charges; (2) competitive charges or supply charges; and (2) other charges.
Hungary	*Law 2013. évi CLXXXVIII. törvény az egységes közszolgáltatói számlaképről*

(HP)	regulates the content of bills. The law gives actual examples of the minimal information necessary on each bill and also gives examples as to which elements may be changed or added without infraction. The law also imposes such details as fonts and font sizes and provides in its annexes a detailed example of the respective bill in its actual detail. Additionally to the law, the electricity suppliers also regularly provide a dedicated section on how to read the electricity bill.
Iceland (BF)	Regulation 1050/2004, Art. 42 (referred to in Act 65/2003, Art. 20) lists the information that must be shown in the invoice sent to customers. Bills shall show unit prices used for basic account types and quantities of electricity. Charges levied for the transportation, distribution services and electricity must be clearly seperated.
Ireland (MI)	Statutory instruments S.I. No. 426/2014 Part 4, Art. 6, Art. 7 and S.I. No. 463/2011, Art. 9, regulate the communication of charges and consumption information to electricity consumers in Ireland. Under Irish law, suppliers must also inform customers of upcoming price changes at least one month before a price change comes into effect.
Italy (MI)	D.Lgs 93/11 Art. 43(2); L 125/07 Art. 1(6) and Art. 1(5) legislate the communication of charges and consumption information. Consumers should be informed of the components relating to supply cost (*servizi di vendita*), network cost (*servizi di rete*), general system charges (*oneri generali di sistema*), and taxes (VAT and consumption tax). The regulator has set up several tools in order to help the consumer understand his bill, most notably a dedicated webpage "Your Bill Explained" (*la bolletta spiegata*) and a consumer help-desk (*lo Sportello per il Consumatore*).
Latvia (MI)	According to Art. 31 3° of Electricity Market Law, the Public Utilities Commission (PUC) shall determine what kind of information and to what extent electricity supplier shall include in their bills and informative materials that are issued to the consumer. The regulations of the PUC determines that a bill shall include at least the electricity amount in kWh supplied in billing period, the amount charged for consumed electricity in euros and the average electricity price in euro per kWh during the billing period and fees for electricity distribution system services, other additional services and the mandatory procurements components and total fees for the billing period for consumers and other end-users to whom shall be issued invoices regarding electricity service supply.
Lithuania (BF)	Law on Energy of the Republic of Lithuania No. IX-884 and Law on Electricity of the Republic of Lithuania No VIII-1881. Article 31 regulate the communication of charges and consumption information to electricity consumers in Lithuania, as well as contractual conditions and changes to contracts. The consumer is entitled to receive information on conditions of service and electricity prices and tariffs, reports on prices, contract terms, conclusion and termination conditions.
Luxembourg (BF)	Article 2(5) of the Law of 1 August 2007 regulates the communication of charges and consumption information to electricity consumers in Luxembourg, as well as contractual terms. With respect to billing, the law states that electricity providers must transmit to residential customers transparent information on tariffs and prices.
Malta (MI)	Electricity Market Regulations (S.L. 545.16), Art. 8(3) regulates billing. Bills issued by Enemalta Corporation, Malta's electricity supplier, must include

	contact details of its subcontractor, ARMS Ltd, which is the company responsible for meter reading, billing, debt collections and customer care services. Households should receive bills calculated on actual consumption at least every six months. For households with a smart meter, these bills based on actual readings are more frequent. All bills show a breakdown of the price calculation, the total electricity consumption for that period as well as the average daily energy consumption, relevant tariffs and CO_2 emissions.
Netherlands (MI)	The Electricity Act, article 95, details the mandatory information to be provided on an energy bill and some associations provide recommendations for data presentation. The breakdown of an energy bill concerns supply costs ("*leveringskosten*"), network costs and metering costs, and then taxes ("*Belasting*"). While using green energy, some taxes are refunded ("*Belastingvermindering*").
Norway (MI)	FOR-1999-03-11-301, chapter 7 §7-2 regulates the communication of charges and consumption information to electricity consumers in Norway. The regulation is detailed, and lays down stipulations for frequency of billing. For Internet billing, the bill shall contain a graphical comparison of the annual consumption of each settlement period with the corresponding period during the previous year. For paper invoicing, the company's logo and contact information must appear on the top of the first page. In both cases, "the invoice must be clear and easy to understand".
Poland (MI)	The Energy Law, Art. 5. 6a - 6c. regulates the communication of charges and consumption information to electricity consumers in Poland. Electricity suppliers are to inform consumers about the fuel supply mix used in the previous calendar year and about a place where information is available about the impact of the production of energy on the environment (at a minimum in terms of carbon dioxide emissions and radioactive waste created). Electricity suppliers must also inform consumers about the amount consumed in the previous year and the place where information is available about the average electricity consumption for each connection group of recipients, energy efficiency improvement measures and the technical characteristics of energy-efficient appliances.
Portugal (BF)	Art. 54 d) and Art.55 c) and d) of Decree Law of 15 February 2006 regulate the communication of charges and consumption information to electricity consumers in Portugal. Under the law, consumers are entitled full and adequate information to enable their participation in the electricity market, access information in a transparent and non-discriminatory manner on applicable prices and tariffs, as well as complete and adequate information in order to promote energy efficiency and the rational use of resources.
Romania (HP)	Law 123/2012 (modified in 2014) ART.62 (1) h[9]) and art. 145 (4) p) and Law 123/2012 (modified in 2014) ART. 66 (1),(2) regulate the content of bills. The Energy Authority ANRE has made available to the consumer an explanatory sample of the components that have to be included in the bill. This model has been adopted by electricity suppliers, who can also opt to display the same document at their websites, in order to inform consumers about the contents of their bill.
Slovakia (MI)	The supplier of electricity and gas is, according to the § 17 article 14 of the Law 251/2012, obliged to inform the customer on the invoice or attached material about the particular components of the energy supply including the unit price. Information about the composition of the price component has to

	include the unit price especially for electricity purchase including the commercial activity of the supplier, distribution, losses during distribution, system services, system operation and taxes.
Slovenia (MI)	Beside standard items that must be included in every invoice issued in Slovenia that are stipulated by the Value Added Tax Act (invoice date, number, invoice issuer's contact details, amounts billed, VAT rate,…), consumers also have to receive certain information in their electricity bills, stipulated within Article 42 of the Energy Act, including the proportion of energy source that supplier used in preceding year in a way comparison between different suppliers can be made, the reference source where publicly available data on environmental impacts, expressed in CO_2 emissions and amounts of radioactive waste resulting from the electricity production in the preceding year, and consumers' rights related to dispute resolution.
Spain (HP)	Law 24/2013 establishes the type of information that should be included in an electricity bill. This format is mandatory for the suppliers of last resort. The details of the information are formally listed in the resolution N.5655 of 23 May 2014 of the Ministry for the Industry, Energy and Tourism. The resolution illustrates in its annex a template to be followed when producing electricity bills, showing in explanatory graphs and in detailed tables the mandatory information and its granularity.
Sweden (BF)	The Electricity Act chapter 8, §14-16 specifies that an electricity supplier's billing shall be clear. It shall contain information on the measured consumption and current electricity prices that the billing shall be based on. The Swedish Energy Markets Inspectorate specifies in detail what shall be contained in electricity bills. The electricity cost consists of two parts: (1) a payment to the grid operator to stay connected and (2) payment for the actual electricity consumption and the electricity cost.
UK (BF)	The consumers' right to accurate consumption information is captured in Condition 31A of the Standard Licence which makes it incumbent on suppliers to provide customers with electricity consumption information in each bill (or, within the space of 30 days from a notice of increase in charges in cases where the latter is issued). In addition, suppliers must send an annual statement to all customers in a pre-defined format. Schedule 2ZB to the Electricity Act stipulates that licence-exempt suppliers must also provide consumption data to customers on an annual basis. Under Condition 12 of the Standard Licence, suppliers must take meter readings at least once every two years. Condition 21B of the Standard Licence allows customers to read their own meters as often as they choose. Suppliers are to reflect that reading in the subsequent bill. The structure of the bill is not fixed by any legislation.

4. ANNEX 6: DETAILS ON THE EU FRAMEWORK FOR SMART METERING ROLL-OUT AND USE OF SMART METERS

4.1. Executive Summary

This annex presents the thematic evaluation of smart metering provisions placed in energy legislation, namely in the Electricity Directive 2009/72/EC (Article 3 (11) and Annex I.2)), the Gas Directive 2009/73/EC (Article 3(8) and Annex I.2), the Energy Efficiency Directive 2012/27/EU (Article 9(2); Article 10(2); Article (12(2b)) and the Energy Performance in Buildings Directive 2010/31/EU (Article 8(2)).

These measures promote smart metering roll-out as part of the modernisation of the retail energy market and target the active participation of consumers in the energy supply market, as was the original objective of the legislator, intended to be achieved through:

i. transparency provided by the meter (in terms of timely and accurate information on consumption: predictability of costs, awareness of options and choices);

ii. third party access to data, connectivity and interoperability (to facilitate in practice competitive offers and exercise of choices at the customer end, but also system integration, and result in higher efficiencies and lower cost);

iii. due regard to best practises (installation of in-home displays for a direct information provision, connection to home automation, self-consumption, etc.);

iv. consumer access to schemes that reward flexible consumption, such as demand response, as a specific means for energy efficiency benefits via novel services that rely on smart metering data.

The aim of the legislator was not to enforce in a systematic way an EU-wide smart metering roll-out but to encourage it only in those situations where it is beneficial, economically reasonable, and therefore appropriate. Accordingly, the provisions instructed: (i) the deployment of gas and electricity smart metering, potentially as subject to a cost-benefit analysis; (ii) the target and timing of the operation in the case of electricity; but also (iii) the function of the systems to be rolled-out, namely to be interoperable, with due regard to standards and to enable the active participation of consumers in the energy supply market). The Commission also tabled non-binding Recommendations (EC Recommendation 2012/148/EU and 2014/724/EU) to guide and assist Member States in their choices and in meeting these obligations in the field.

Despite the progress noted, EU-wide implementation is falling short of the legislator's intentions. The current advancement is rather slow particularly in view of the fast approaching 2020 original target in the case of electricity, and the gap to delivery may be further widened by recurring delays in national programmes. In addition, there is a risk that the systems being rolled-out may not be fit for purpose and not bringing all the desired benefits to consumers and the market as a whole. This is due to the fact that the legislative provisions in the aforementioned Electricity and Gas Directives are silent on the practicalities/specifications for reaching the ultimate requirement to roll-out systems that shall assist the consumers' *'active participation'* in the energy supply market. These requirements were later on to some extent touched upon, but not sufficiently addressed, in the Energy Efficiency Directive (Directive 2012/27/EU, Article 9(2)). Furthermore, they were prescribed as guiding provisions on

functionalities, interoperability, connectivity, and measures for data privacy and security in a smart metering environment, in follow-up, but not legally binding, Recommendations (2012/148/EU and 2014/724/EU) tabled by the Commission.

In all cases, the successful roll-out is controlled to large extent by Member States that are ultimately responsible for the deployment and respective market arrangements, and may or may not decide to take on-board non-binding guidelines.

In the light of the developments so far, the existing provisions can be assessed as follows.

In terms of **effectiveness**, the evidence suggests that the smart metering provisions currently in place have been less effective than intended. This is partly a result of the 'soft'/unspecific nature of some obligations they lay (i.e. Article 8(2) of the Energy Performance in Buildings Directive 2010/31/EU), but mainly due to caveats that they contain regarding the assessment of the cost-effectiveness of the operation, and lack of definition of the concept of *'active participation'* of consumers and of the underlying requirements for this to be realised. Consequently, enforcing functional requirements for smart metering systems being rolled out in the EU, and consistently promoting the use of available standards to ensure their connectivity and '*interoperability'*, while having due regard to data security and privacy, would guarantee a coherent, future-proof system able to support novel energy services and deliver benefits to consumers, in line with the legislator's intentions.

Given that actual field data are scarce, there is not enough evidence at the moment, a part from cost/benefit projections, regarding the **efficiency** of the intervention in terms of proportionality between impacts and resources/means deployed. However, the overall impact of the current provisions is until now rather limited, and likely so are the effects and costs. Considering that the provisions themselves contain caveats regarding financial proportionality / cost-effectiveness, it seems unlikely that the respective measures have or could impose as they stand any disproportionate costs. At the same time, and in order to coherently assess the benefit/cost ratio, more harmonised rules could potentially be tabled on the methodology to use, along with a requirement to incorporate the functionalities and standardised interfaces recommended by the Commission in the set-ups considered.

The present analysis shows that the current smart metering provisions in terms of **relevance** remain valid, but could be further enhanced, by elaborating them so as to (i) specify how the term of *'active participation'* is to be understood, and realised in practical terms; (ii) include an obligation to Member States to officially set the minimum technical and functional requirements for the smart metering systems to be deployed, the market arrangements, and clarify the roles/responsibilities of those involved in the roll-out. Furthermore, in anticipation of future demand, and always in the context of realising the internal market also for consumers, extension of the provisions should be considered. This is to potentially include the consumer right to request a smart meter (or its functional upgrade), even in those cases where there is no national roll-out.. Such a framework should examine the possibility of consumer direct participation in associated expenses for the deployment, and ensure that the installation/upgrade takes place within a reasonable time upon request and at a cost-reflective manner (verified by the National Regulatory Authority).

In terms of **coherence** – internally and with other EU actions – the evaluation has identified the necessity to clarify that a wide range of smart metering functionalities is promoted, as

those recommended by the Commission, that go much beyond the capability of just *'actual time of use'* information currently mentioned in the related provisions of the Energy Efficiency Directive. Moreover, in order to ensure consistency, coherence, and streamline any future changes in provisions, it is advised to consider that all smart metering requirements be consolidated/embedded in one single legal act.

Finally, evidence points to the need to eliminate ambiguities and to further elaborate, clarify, and even strengthened the existing provisions, in order to give certainty to those planning to invest and ensure that smart metering roll-outs move in the right direction, and regain **EU added-value**. This is to be done by (i) safeguarding common functionality, and share of best practices; (ii)ensuring coherence, interoperability, synergies, and economies of scale, boosting competitiveness of European industry (both in manufacturing and in energy services and product provision), and (iii) ultimately delivering the right conditions for the internal market benefits to reach also consumers across the EU.

4.2. Introduction

4.2.1. *Purpose of the evaluation*

The present document intends to assess the performance and continued relevance of the current EU provisions related to smart metering[180]. These provisions which are herein considered are laid down in the following Directives[181]:

- **Gas Directive 2009/73/EC[182] (Article 3(8) and Annex I.2);**
- **Electricity Directive 2009/72/EC[183] (Article 3 (11) and Annex I.2);**
- **Energy Efficiency Directive (EED) 2012/27/EU[184] (Articles 9(2); 10(2); 12(2b)[185]);**
- **Energy Performance in Buildings Directive (EPBD) 2010/31/EU[186] (Article 8(2)).**

The findings of this assessment will feed into or complement the evaluation reports to be prepared in advance for the market design initiative (MDI)[187] and for the review of the Energy

[180] 'Smart metering system' or 'intelligent metering system' is understood as an electronic system that can measure energy consumption, providing more information than a conventional meter, and can transmit and receive data using a form of electronic communication.

[181] Annex 1 presents a short description of the related smart metering provisions covered in EU legislation

[182] Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC, EUOJ L211, 14.8.2009, pp. 94-136.

[183] Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC, EUOJ L211, 14.8.2009, pp. 55-93.

[184] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC,, EUOJ L315, 14.11.2012, pp. 1-56.

[185] The following recitals in the Energy Efficiency Directive 2012/27/EU are also of relevance to smart metering: (26), (27), (31), (33), and implicitly (45).

[186] Directive 2010/31/EU of the European Parliament and of the Council of 19 May 20102 on the energy performance of buildings,, EUOJ L153, 18.6.2010, pp. 13-35.

Efficiency Directive and the Energy Performance in Buildings Directive. These evaluation reports are expected to provide input into the respective Impact Assessments on potential legislative actions and will be particularly used in the problem definition and framing of policy options.

4.2.2. *Scope of the evaluation*

The present evaluation covers both natural gas and electricity; however, the analysis focuses mainly on smart metering in electricity since

i. the potential for added value services enabled by smart metering may be limited due to the gas nature; for instance gas networks can store large amounts of energy and have less need for flexibility on the demand side; and as a result,

ii. the expected benefits from implementation in the gas system are lower and the resulting benefits/cost ratio less favourable;

iii. there is a quantitative target, and a time condition, just for electricity - rolling out 80% roll-out by 2020 (Electricity Directive 2009/72/EC, Annex I.2);

iv. furthermore, both the market design initiative and most of the provisions of relevance to smart metering in the EED and the EPBD exclusively focus on electricity.

It is noted that the main provisions for rolling-out smart meters are laid down in the Gas and Electricity Directive, which are cross-referenced in the respective EED and EPBD articles. The EED also introduces to a certain extent some functional requirements for the metering systems in order to make a substantial contribution to energy efficiency and serve consumers' needs and their energy supply market participation. Accordingly, the present analysis addresses the degree and speed of deployment in the EU Member States vis-à-vis the target (as stated in the Electricity and Gas Directives), and the extent to which the completed/ongoing and/or envisaged roll-outs are fit for purpose. This is understood as smart metering systems with due regard to available standards[188] and best practices (Annex I.2 of Electricity and Gas Directives), and equipped with the right functionalities[189] and connectivity (both implied in the Annex I.2 of the Electricity and Gas Directives, but more explicitly stated, yet partly covered under Art 9(2) of the EED). The reason for that is to support the development of markets for novel energy services, and enable consumers to reap the full benefits of flexible retail markets. This is argued as such in the Electricity and Gas Directives, as well as in the EED, and it is to be realised for instance through the consumer participation

[187] Market Design Initiative – this is the follow-up to the Communications on a new energy market design (COM(2015) 340 final) and on delivering a new deal for energy consumers (COM(2015) 339 final).

[188] Developed under the mandates M/441 (on smart meters for utilities - electricity, gas, heat and water applications) and M/490 (electricity smart grids) issued by the Commission to the European Standardisation Organisations.

[189] In practical terms, these are functionalities and technical requirements identified, for both gas and electricity smart metering systems, in the standard architecture developed by CEN/CENELEC/ETSI under the M/441 standardisation mandate. Moreover, for the specific case of electricity, these are further complemented, and the complete list is laid down, in the Commission Recommendation of 9 March 2012 on preparations for the roll-out of smart metering systems (2012/148/EU).

in demand response schemes and by making efficient use of decentralised renewable energy sources (for example via self-consumption schemes).

Moreover the present assessment considers the costs related to this deployment (and the stakeholders paying for them) as well evidence (or forecasts) of benefits from smart metering such as reduced consumer bills, more flexibility in the market, development of a market for energy service aggregators, or more demand side response. This is in line with the provisions for an economic assessment of such a deployment (Annex I.2 of Electricity and Gas Directives), and in the spirit of rolling-out where is economically reasonable and cost-effective.

This evaluation intends to find out to what extent the EU legislative provisions on smart metering can be directly accountable for the changes that happened or are expected (given that the deployment is on-going) in national markets, and how far other factors, such as national programmes/policies, technological developments, changes and/or implementation of other EU pieces of legislation (i.e. EED/EPBD) triggered these impacts.

This evaluation also addresses the question whether the cost benefit assessments carried out in the past are still relevant, given the technology and price development in the sector of smart meters since the introduction of the legislation, and lessons learned from recent experiences from pilot installations.

4.3. Background to the initiative

4.3.1. *Description of the initiative and its objectives*

Smart metering can deliver benefits to the energy system[190] by supporting its flexible functioning and enhancing its efficiency through better control and avoidance of unnecessary grid reinforcements, but it is also of value to consumers. It allows them to get accurate and frequent feedback on their energy consumption and better manage it in volume and in time, save energy and lower their bill. Smart metering also minimises errors and delays in their invoices, and reduces the costs for the operation and maintenance of energy distribution infrastructure which are ultimately borne by consumers through distribution tariffs. Finally, smart metering systems are indispensable for some smart home solutions and innovative services, and essential for measuring the electricity a household supplies to the grid (for example from a solar panel installed on the roof) and communicate this supply to the grid manager on a continuous/frequent basis.

Therefore, smart metering is a key element in the development of a modern, consumer-centric retail energy system which encompasses active involvement of consumers. In recognition hereof, provisions were included in the Gas Directive 2009/73/EC and in the Electricity Directive 2009/72/EC fostering the smart metering roll-out and targeting the active participation of consumers in the energy supply market, through:

i. transparency provided by the meter (timely and accurate information on consumption: predictability of costs, awareness)

[190] COM(2015) 339 final.

ii. third party access to data and interoperability (facilitate competitive offers at the customer end, facilitate system integration, lower cost)

iii. due regard to best practises (for instance the installation of in-house displays, connection to home automation, self-consumption, etc.).

These provisions were then complemented with provisions under the Energy Performance in Buildings Directive 2010/31/EU, and the Energy Efficiency Directive 2014/32/EU which amongst others added

v. demand response as a specific means for energy efficiency benefits, supporting the development of novel energy services based on smart metering data.

These provisions were intended to capitalise on opportunities opened up with smart metering both for the energy system and for consumers, and to mandate it in such a way as to enhance the cost-effectiveness of this deployment.

Accordingly, the Electricity and Gas Directives[191] require Member States to ensure the implementation of intelligent metering systems that shall assist the active participation of consumers in the energy supply market, and encourage decentralised generation[192], and promote energy efficiency. Article 3 (11) of the Electricity Directive and Article 3(8) of the Gas Directive explicitly state that *"in order to promote energy efficiency, Member States or, where a Member State has so provided, the regulatory authority shall strongly recommend that electricity (or natural gas) undertakings optimise the use of electricity (or gas), for example by providing energy management services, developing innovative pricing formulas, or introducing intelligent metering systems or smart grids, where appropriate."*

This implementation may be conditional, according to Annex I.2 of both the electricity and gas Directive, on a positive economic assessment of the long term cost and benefits to be completed by 3 September 2012. For electricity, the roll-out can be limited to 80% by 2020 of those positively assessed cases as potentially indicated in a Cost Benefit Analysis (CBA). Furthermore, subject to this Cost Benefit Analysis where conducted, Member States are required to prepare a timetable - for up to 10 years in the specific case of electricity – for the implementation of smart metering. Finally, Member States, or any competent authority they designate, are obliged according to the Electricity and Gas Directive (Annex I.2) to "*ensure the interoperability of those metering systems to be implemented within their territories"* and to "*have due regard to the use of appropriate standards and best practice and the importance of the development of the internal market"* in electricity or natural gas, respectively.

The recast of the EPBD, adopted in May 2010, obliges (Art 8(2)) Member States to "*encourage the introduction of intelligent metering systems whenever a building is constructed or undergoes major renovation, whilst ensuring that this encouragement is in line with point 2 of Annex I to [the Electricity Directive]*".

[191] Annex I.2 of the Electricity Directive 2009/72/EC and of the Gas Directive 2009/73/EC.

[192] Specifically for electricity and linked to smart grid deployment - Electricity Directive 2009/72/EC recital (27)

To assist with the preparations for the roll-out, and based on lessons learned and good practices identified through experiences accumulated in Member States[193], the Commission adopted the Recommendation 2012/148/EU[194]. It aimed at guiding Member States in their choices, drawing particular attention to (i) key functionalities for fit-for-purpose and pro-consumer arrangements[195], (ii) data protection and security issues, and (iii) a methodology for a Cost-Benefit Analysis that takes account of all costs and benefits, to the market and the individual consumer, of the roll-out.

Following this Recommendation, complementary smart metering provisions were adopted as part of the Energy Efficiency Directive[196]. More precisely these concern, as given in Article 9(2):

a) Provision of time-of-use information and integration of energy efficiency considerations in the determination of minimum functionalities of smart meter;

b) Security and privacy of smart meters and data communication;

c) Meter ability to account for electricity flows into the grid (negative consumption due to own production);

d) Availability of metering data on electricity input and off-take (to customer or a third party designated by him) in easily understandable format;

e) Customer advice in context of smart meter installation.

This was done to *"strengthen the empowerment of final customers through smart metering as regards access to information from the metering and billing of their individual energy consumption"* and was expected to *"help reduce the costs of the implementation of intelligent metering systems equipped with functions enhancing energy saving and support the development of markets for energy services and demand management"*[197]. Under the EED Member States are also required to take appropriate measures to promote and facilitate an efficient use of energy by small energy customers, including domestic customers. This could be part of a national strategy, and can include "*ways and means to engage consumers and consumer organisations, during the possible roll-out of smart meters, through communication*

[193] (i) Based on a review of 219 projects, accounting for a total investment of about €5.5 billion, a joint ENER/JRC Reference Report: "Smart Grid projects in Europe: lessons learned and current developments" was issued in 2011;

(ii) Joint Report 'A joint contribution of DG ENER and DG INFSO towards the Digital Agenda, Action 73: Set of common functional requirements of the Smart Meter', October 2011; available online: http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/2011_10_smart_meter_funtionalities_report_full.pdf;

(iii) European Regulators' Group for Electricity and Gas. 'Final Guidelines of Good Practice on Regulatory Aspects of Smart Metering for Electricity and Gas', February 2011, Ref.: E10-RMF-29-05.

[194] Commission Recommendation (2012/148/EU), OJEU of 13.04.2012, L 73/9.

[195] When it comes to functionalities for electricity smart metering, particularly important for residential consumers are: a readings' update rate of 15 minutes and a standardised interface to transfer and visualise individual consumption data in combination with information on market conditions and service or price options.

[196] Art 9(2), 12(2b) Energy Efficiency Directive (2012/27/EU).

[197] Cf. EED Recital 33

of cost-effective and easy-to-achieve changes in energy use, and information on energy efficiency measures"[198]

Continuing its efforts to guide Member States in their smart metering deployment choices, the Commission adopted in 2014 the Recommendation 2014/724/EU[199] to help mainstream the consideration for data protection in all smart grid/metering deployment exercises where concerns in data security/privacy could arise.

In summary, the European legislation instructed: (i) the deployment of gas and electricity smart metering, potentially subject to a cost-benefit analysis; (ii) the target and timing of the operation; but also (iii) the function of the systems to be rolled-out (to be interoperable, with due regard to standards/best practices and to empower consumers). The Commission tabled also Recommendations to assist Member States to meet these obligations in the field.

4.4. Evaluation Questions

The current evaluation aims to first of all gauge the general progress so far with implementation and state what is the current situation, and then answer questions on the performance and continued relevance of the said provisions. The key questions to address are about the effectiveness, efficiency, relevance, coherence - internally and with other actions, as well as EU-added value of this intervention.

There follows a list of typical sub-questions and issues to consider in this reflection as part of the present evaluation exercise.

Effectiveness:

- To what extent have the objectives regarding smart metering in Electricity Directive 2009/72/EC, the Gas Directive 2009/73/EC, the EED 2012/27/EU and the EPBD 2010/31/EU have been achieved?
- To what extent do the observed effects correspond to the original ambition and were there unintended impacts as well?
- To what extent can the deployment of smart meters in Member States be credited to the Electricity Directive 2009/72/EC, the Gas Directive 2009/73/EC, the EED 2012/27/EU and the EPBD 2010/31/EU?
- What factors, and to what extent, influenced the achievements observed, e.g. technological developments in the sector of smart metering?

Efficiency:

- To what extent are the costs involved justified, given the changes/effects which have been achieved?
- Which differences in costs or cost projections, as well as benefits across MS can be observed and what are the reasons for these differences?

[198] EED Art 12(2b)

[199] Commission Recommendation on Data Protection Impact Assessment Template for Smart Grid and Smart Metering Systems (2014/724/EU).

- Which factors could potentially guarantee a low cost of deployment?
- On whom did or will the costs fall, which stakeholder, and was or will the sharing of costs be the same in all MS?
- How affordable were or will be the costs borne by different stakeholder groups, given the benefits they receive(d)?
- To what extent has the intervention been cost effective?
- Are there any benefits in terms of more flexibility/demand side response, or lower consumer bills that can be observed after smart metering deployment happened?

Relevance:

- To what extent is it still relevant to pursue the achievement of the original objective to have 80% electricity smart meters rolled-out across Europe by 2020?
- To what extent have the (original) objectives proven to have been appropriate for the intervention in question?
- How well do the (original) objectives (still) correspond to the needs within the EU?
- How well adapted is the intervention to subsequent technological or scientific advances?
- Are the cost benefit analysis carried out by MS still relevant or did significant cost reductions etc occur in the meantime?

Coherence:

- To what extent are these interventions coherent with one another (Electricity and Gas Directive provisions for smart metering with other interventions which have similar objectives in particular EED, EPBD, upcoming MDI)?
- To what extent is the intervention coherent internally?
- To what extent is the intervention coherent with international obligations?

EU-added value:

- What is the additional value resulting from the EU intervention(s), compared to what could be achieved by Member States at national and/or regional levels?
- To what extent do the issues addressed by the intervention continue to require action at EU level?
- What would be the most likely consequences of stopping or withdrawing the existing EU intervention?

4.5. Method

The evaluation is performed based on information collected throughout the monitoring of the implementation of the respective legislation in the EU Member States. Moreover, it draws on the following data sources and studies carried out:

a. COM(2014)356 *Benchmarking smart metering deployment in the EU-27 with a focus on electricity,* and accompanying Staff Working Documents (country fiches: SWD(2014) 188; data analysis: SWD(2014)189)[200]. The analysis is based on the long-term economic assessments of costs and benefits (CBAs) for smart metering implementation in electricity and gas performed by Member States, and on their respective deployment plans.

b. Smart Grids Task Force EG1 Report: *Status report based on a survey regarding Interoperability, Standards and Functionalities applied in the large scale roll-out of smart metering in EU Member States*, October 2015[201].

c. ICCS-NTUA & AD Mercados EMI Study on *Cost benefit analysis of smart metering systems in EU Member States*, 25.06.2015[202].

d. ACER/CEER Fourth Energy Market Monitoring Report[203], *entitled Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2014*, 30.11.2015.

Potential limitations of the analysis may arise from data limitations, as explained below.

a. *COM(2014)356*; most of the key smart metering roll-out parameters available at this stage are based on projections and forecasts, as very few Member States have completed their roll-outs, or got to an advanced stage. Care must be therefore taken in interpreting results of the countries' comparison analysis, bearing in mind that divergences may also reflect different starting conditions and local realities.

b. *Smart Grids Task Force EG1 Report*; this analysis concentrates on the 17 EU Member States that have so far committed to proceeding with a large-scale roll-out of smart metering.

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[200] COM(2014) 356: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2014%3A356%3AFIN;

SWD(2014) 188: http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52014SC0188;

SWD(2014) 189: http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52014SC0189

[201] SGTF EG1 report on interoperability: https://ec.europa.eu/energy/sites/ener/files/documents/EG1_Final%20Report_SM%20Interop%20Standards%20Function.pdf

[202] ICCS-NTUA & Mercados smart metering CBA study: https://ec.europa.eu/energy/sites/ener/files/documents/AF%20Mercados%20NTUA%20CBA%20Final%20Report%20June%2015.pdf; Annex-https://ec.europa.eu/energy/sites/ener/files/documents/AF%20Mercados%20NTUA%20CBA%20Annex%20June%2015.pdf

[203] ACER/CEER Market Monitoring Report: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2015.pdf

c. *ICCS-NTUA & AD Mercados EMI Study*; this investigation concentrated on the CBAs performed in those countries where the CBA result was reported in the Commission Report COM(2014)356 as negative or inconclusive; the study also considered a sample only of those CBAs with positive results. The aim was to better understand the key drivers of the results in those Member States reporting a negative or inconclusive finding regarding the cost-effectiveness of smart metering in their territory.

d. *ACER/CEER 2015 Energy Market Monitoring Report*; this report presents data on the number of smart meters rolled-out in EU Member States, for both gas and electricity, by end of 2014, but it is not sufficiently addressing issues related to the appropriateness of deployed set-ups in terms of functionalities, interoperability and connectivity.

4.6. Implementation state of play (Results – description of current situation)

The main references describing the state-of-play with smart metering deployment in the EU, as well as some key parameters of the Member States' implementation programmes, and the progress so far on the way to 2020, is the aforementioned Commission smart metering Benchmarking Report COM(2014) 356 [Reference 1], and the latest ACER/CEER Energy Market Monitoring Report [Reference 4].

According to data from the Commission Report COM(2014) 356, as also recently updated[204], to date 19 Member States have committed to rolling out close to 200 million smart meters for electricity by 2020 at a total potential investment of €35 billion.

- 17 Member States - Sweden, Italy, Finland, Malta, Spain, Austria, Poland, UK-GB, Estonia, Romania, Greece, France, Netherlands, Denmark, Luxembourg, Ireland, and lately Latvia[205] – are targeting a nation-wide roll-out to at least 80% of customers by 2020 (with 13 of them going much beyond the target of the Electricity Directive) – schedules for implementation are shown in Figure 1 (in section 4.10 of the present Annex).
- 2 Member States – Germany, Slovakia - are moving to deployment in a selected segment of consumers (to max. 23% by 2020).
- The rest 9 Member States have either decided against at least under current conditions, or have not made a firm commitment yet for a mass-scale or even a selective roll-out,.

By 2020, it is projected that almost 72% of European consumers will have a smart meter for electricity[206]. Smart meters for electricity are already being rolled out across the EU. As of 2013, nearly all consumers in Sweden, Finland and Italy, were equipped with smart meters. Malta is more recently added to this list of the completed national roll-outs, while the rest of the EU countries are proceeding with a pilot phase installation or have just started rolling-out. Austria, Estonia, Spain and Great Britain have seen an increase in consumers equipped with

[204] Smart Grids Task Force EG1 Report: *Status report based on a survey regarding Interoperability, Standards and Functionalities applied in the large scale roll-out of smart metering in EU Member States*, October 2015.

[205] See Figure 1 in section 4.10.

[206] COM(2014)356

smart meters from 2013 to 2014, as shown in the latest ACER/CEER Energy Market Monitoring Report[207]. In many of the remaining Member States though, very few consumers were equipped with smart meters in 2014. These installations all over Europe represent in total an actual EU-28 penetration rate of 21%[208]. There is no data available at this point in time on how many of these installations have materialised in renovated or new buildings, as prescribed in Article 8(2) of the EPBD.

Regarding gas, to date only 7 Member States are proceeding with a large scale roll-out while the rest have either a negative CBA for a wide-scale deployment or have yet to conclude their assessment[209,210].

- 6 Member States – France, Ireland, Italy, Luxembourg, the Netherlands and the UK-GB have decided to roll-out gas smart meters by 2020 or earlier.
- 1 Member State – Austria – has plans to proceed but have yet to take an official decision
- In 13 Member States - Belgium, the Czech Republic, Denmark, Finland, Germany, Greece, Latvia, Lithuania, Portugal, Romania, Slovakia, Spain and Sweden – there are no plans for a mass roll-out.

Based on this Member States' original planning, it is expected that, by 2020, 45 million gas meters (corresponding to 40% of consumers) will be installed[211]; however, so far low progress has been registered. Available data show that few Member States have rolled out smart meters for gas. In the Netherlands, the share of consumers equipped with smart meters for gas increased from 6% in 2013 to 16.2% in 2014, while in Great Britain, the share increased from 0.5% to 1.9%[212]. In France and Belgium, around 1% of consumers were equipped with smart meters for gas in 2014[213]; a lower penetration rate is quoted for Italy where the final installation target of 60% to households by 2018 was recently reduced to 50%[214]. Overall, approximately 1.5 million gas smart meters have been installed (by end of 2014) representing a diffusion rate of just 1.5% in the EU-28

Despite the progress noted, these implementation plans, for electricity and gas, are falling short of the legislation's intentions. The current advancement is rather slow particularly in view of the fast approaching 2020 original target in the case of electricity, and the progress gap to delivery may be further widened by recurring delays in national programmes. In

[207] See Figure 2 in section 4.10.

[208] As calculated based on data from [Reference 2]: 2015 ACER/CEER Market Monitoring Report; and considering the number of metering points in the EU.

[209] See Figure 1 in section 4.10.

[210] n.b. there is no gas network in Cyprus or Malta.

[211] COM(2014)356

[212] 2015 ACER/CEER Market Monitoring Report.

[213] *Idem*

[214] AEEGSI regulatory decision N. 554/2015/R/gas; 23.11.2015

addition, there is a risk that the systems being rolled-out may not be bringing after all the desired benefits to consumers and the market as a whole.

In all cases, the successful roll-out is controlled to large extent by Member States who are ultimately responsible for the deployment and respective market arrangements[215], and may or may not decide to follow the guidelines tabled by the Commission regarding functionalities and implementation measures for data privacy and security (see EED (Art 9(2b)) and aforementioned Recommendations).

a. Cost/benefit considerations and level of commitment by Member States

According to the EU provisions, Member States have the option to undertake a CBA to assess the cost-effectiveness of the operation; and this is an option that the majority of Member States have taken[216]. However, there are no requirements in the legislation, apart from the guiding provisions in the Recommendation 2012/148/EU, on the comprehensiveness of this assessment. As a result, some CBAs are less elaborated and less inclusive than others; negative/inconclusive findings may also appear to be on some occasions driven by thinly substantiated or particularly conservative assumptions as has been shown in a recent analysis for the case of electricity[217], which are nevertheless difficult to challenge. Furthermore, a very small number of Member States have chosen not to undertake or have not communicated yet a CBA or their plans for the smart metering deployment in their territory, at the risk of missing the (electricity) target of 2020.

While divergence in key roll-out parameters as shown in Member States' CBA data[218] calls for caution, available data reveals (see Tables) that a smart metering system could cost on average €200 to €250 per customer. Cost per metering point ranges, in the case of electricity, from under €100 (€77 in Malta, €94 in Italy) to €766 in the Czech Republic (see Figure 3 in Annex Section 4.10).

Regarding benefits, smart metering systems are expected to deliver an overall benefit per customer of €160 for gas and €309 for electricity and average energy savings of 3% (see Tables). The latter range from an assumed 0% in the Czech Republic to 5% in Greece and Malta. Of the countries that have completed roll-outs, Finland and Sweden have indicated energy savings of the order of 1-3%, but no data were available for Italy, or actual field data from Malta.

Other types of benefits are associated with energy savings[219] and peak load shifting[220] over total electricity consumption. Also, when analysing these two indicators, a scattered picture of

[215] see sections 2.4 and 2.7 of SWD(2014) 189 accompanying COM(2014) 356

[216] See table 2 and Table 14 in SWD(2014) 189

[217] ICCS-NTUA & AD Mercados EMI Study on *Cost benefit analysis of smart metering systems in EU Member States*, 25.06.2015

[218] COM(2014) 356; SWD(2014) 189

[219] This is calculated as a percentage with reference to the total electricity consumption (MWh) in a given Member State.

[220] The term 'peak load transfer' is defined in the Annex of Recommendation 2012/148/EU as: the Value in EUR = wholesale margin difference between peak non-peak generation margin (EUR/MWh) * % Peak Load transfer (%) * total energy consumption at LV (MWh)."

the expected positive effects of smart metering roll-out emerges. Expected energy savings vary from 0% (considered in the CBA of the Czech Republic) and 1% (Poland, Slovakia) to 5% (Greece, Malta), with an average — for all data available — around 2.6% (±1.4%) or 3% (±1.3%) considering only the data from those countries who have rolled out or are proceeding with large-scale roll-out. The peak load shifting varies greatly across the Member States; namely from 0.75% (UK-GB) and 1% (Poland) to 9.9% in Ireland in the cluster of Member States that are preparing a roll-out, and from 1.2% (in CZ) to 4.5% quoted in Lithuania in the batch of Member States that are not presently proceeding with large-scale deployment. These significant differences may be due to (i) different experiences in pilot projects and/or hypotheses adopted in building the scenarios, e.g. consumers' participation rate in demand response programmes (time-of-use pricing, etc.), different consumer engagement strategies (e.g. indirect vs. direct feedback); and (ii) different patterns in electricity consumption, e.g. presence of district heating, wide-spread use of gas, etc. Indeed, the observable effect of feedback depends on many and complex factors and available studies and pilots are rarely designed in a away that allows comparing and disentangling the contributions of each and every one[221].

It is important to note that to obtain full benefits, particularly consumption-related ones, greater meter functionality is required. Yet, the CBAs show no direct link between cost and functionality[222]. On the other hand, negative or inconclusive results in the cost/benefit analyses performed so far showed to be, on a number of cases, highly sensitive to key variables[223].

Therefore, and in order to accommodate in the near future potentially more favourably conditions, but also technological change and experience from rollouts, there is a need for regular revision of costs and benefits. This is particular important in cases where roll out has been initiated to better understand key cost and benefit drivers, to inform the public of the accrued benefits, and to adjust the programme where necessary[224].

With these reflections on costs/benefits in mind, it is stressed that the intention of the legislator[225] is not to enforce in a systematic way an EU-wide smart metering roll-out but to encourage it only in those situations where it is beneficial, economically reasonable, and therefore appropriate.

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[221] Cf. E.g. Karlin, B., & Ford R. (2013). "Beyond kWh: A New Tool for Assessing Behavior-Based Energy Interventions". Report prepared for the International Energy Agency's Demand Side Management Program (IEA-DSM) Task 24 – Behaviour change in DSM

[222] COM(2014) 356 and SWD(2014) 189; also confirmed in [Reference 3] ICCS-NTUA & AD Mercados EMI Study

[223] The German CBA outcome can change dramatically based on the assumed consumption impact, while the CBAs in Portugal and the Slovak Republic can be interpreted as returning a positive rather than inconclusive or negative result.

[224] [Reference 3] ICCS-NTUA & AD Mercados EMI Study; for instance the UK-GB is periodically updating its Impact Assessment as informed from data coming from the Foundation Phase of its roll-out programmes; also the NL, DK, PT have updated respective cbas, while others (e.g. HU, CZ, CY etc.) intend to refine their assessments based on pilot data they are currently aggregating.

[225] Recital (55), Annex I.2 of the Electricity Directive 2009/72/EC; recital (52) and Annex I.2 of the Gas Directive 2009/73/EC.

b. Speed of deployment

Current deployment progress is rather slow. So far close to €6 billion have been invested in the completed smart metering roll-outs for electricity (IT, FI, SE[226], and MT more recently).

In view of financial constraints or regulatory barriers[227], or field practices in some countries[228], delays may occur with the already announced or intended roll-outs (for example official decision pending in PL, RO), which could restrict the extent and ambition of the programme[229]).

In other cases, and in the presence of a negative CBA (for instance for electricity in CZ) under the current conditions smart metering roll-outs are not likely to get support from public schemes. There are cases, like PT, where the cost/benefit analysis for smart metering in electricity turns out positive – even though marginally - but the existing economic situation still prohibits wide-scale implementation.

Finally, the fate of legacy systems is a challenge that may be holding back developments in some countries. Therefore, they prefer to 'wait and see' (regarding the developments in technology, standardisation, but also legislation) before they engage in such a deployment. Others are already confronted with this issue as they started their roll-out at a time that solid European standards for smart metering were not available. Member States may fear that mandatory implementation of new standards or requirements without a sufficiently long transition period would lead to high cost and stranded investments.

c. Appropriateness of systems rolled-out: functionality, interoperability & interconnectivity

According to the Electricity and the Gas Directive provisions, Member States are required to roll-out *'interoperable'* systems, with *due regard to standards*, for the *'active participation'* of consumers. None of these terms is explicitly defined in the provisions; and no requirements are stated on how this function/principle is to be realized. Furthermore, the respective standards were not available at the moment of the writing of the legislative provisions. This situation created a climate of uncertainty, resulting in inaction in some cases, or vacuum of responsibility in others, due to a failure in setting up technical requirements at national level for the roll-out.

The Commission prompted to rectify the situation by addressing these issues in different fora, tabling soft legislation (Recommendation 2012/148/EU), complementary provisions in the EED, and issuing related standardisation mandates to the European Standardisation Organisations to guide Member States in their choices.

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[226] For Sweden, a re-deployment is scheduled enabling hourly readings of consumption accessible to customers.

[227] For instance in Poland an incentive mechanism for smart metering was suspended by the regulator in the beginning of this year removing an incentive from DSOs for such investments.

[228] In DE, SK the economic analysis, based on current conditions, turns out positive only for a restricted customer segment (up to max. 23% penetration rate by 2020); in DE delays in stakeholders consultation and reflection on the technical requirements may further lower this target.

[229] See for instance the case with the gas smart metering roll-out in Italy where the target is progressively lowered (now down to 50% diffusion rate by 2018 (L'Autorità per l'energia elettrica il gas ed il sistema idrico Delibera 554/2015/R/gas 23.11.2015; http://www.autorita.energia.it/it/schedetecniche/15/554-15st.htm)

In the Recommendation 2012/148/EU, Member States were provided with guidance on *inter alia* a set of common minimum functional requirements for electricity smart metering, based on those proposed by standards on smart meters (applicable to both electricity and gas), and following consultation with Member States and regulators. The recommended functionalities concern access and frequency of meter readings for the consumer, the network operator and any third party designated by the consumer. They state that the meters must provide two-way communication for maintenance and control, support advanced tariff systems, allow for the remote control of the power supply and/or flow or power limitation, and provide import/export and reactive metering. Furthermore, the meters must provide secure data connections, fraud prevention and detection.

Table 3 in section 4.10 shows a comparison of the complete list of these recommended common minimum functionalities vis-à-vis those included in the EED under Article 9(2) and those proposed in standards for smart meters[230].

Introducing this set of recommended functionalities, based on those listed in standards and applicable also for gas, was meant to help Member States to identify common means of achieving cost-efficiencies in their roll- out plans. This could in turn serve Member States, metering suppliers and network operators as a common basis for their own cost-benefit analyses and investments to facilitate the procurement associated with roll-out, and provide regulators with European reference definitions. Furthermore, these functionalities were recommended to help secure consumer benefits and contribute to increases in energy efficiency. They were seen as a means for facilitating the linking of smart metering systems with standardised interfaces for third party access or equipped with consumer oriented tools such as in-home displays (IHDs) that combine consumption data and cost information, encouraging consumer interest in energy saving actions and response to demand, in line also with the EED provisions.

The Member States were therefore encouraged to take this approach fully into account when analysing the costs and benefits of the roll-out of smart metering of electricity in line with Union legislation.

Bearing in mind the legally binding provisions, and using this Recommendation to translate them into field measures, the smart metering systems to be rolled-out are expected in practice to be equipped with the desired functionalities for delivering also consumer services and benefits, and ensuring connectivity and interoperability between the metering infrastructure and other network platforms in the energy market, in order to encourage consumer interest in energy saving and demand flexibility actions.

To this end, and given that *"Member States...shall ensure the interoperability of those metering systems to be implemented within their territories and shall have due regard to the use of appropriate standards"* , the systems to be rolled-out must adhere to the relevant standards issued by CEN-CENELEC-ETSI under the M/441 and M/490 mandates. Furthermore, they could be equipped with the complete set of the EC recommended

[230] Extracted from [Reference 1]: SWD(2014) 189; Table on Correspondence of the smart metering systems functionalities identified by M/441 with the recommended common minimum functional requirements in 2012/148/EU, for electricity; comparison table extended to include the functional requirements by EED.

functionalities (Recommendation 2012/148/EU) which build upon in the case of electricity those recommended by standards (original ones applicable also to gas)[231].

The EC recommended functionalities are not obligatory. Nevertheless, their application ensures the set-up of smart metering systems that enable in practice the execution of operations and delivery of services to consumers that support their active participation which is in fact a requirement in the legislation. These recommended functionalities, when used, support the appropriate interfaces that ensure connectivity between the metering and other network platforms, and enable the provision of energy management services, in line with the objective of the smart metering deployment and the development of the internal energy market.

There are recent data[232] on the assessment of smart metering systems being rolled-out in Europe against the aforementioned requirements and desired smart metering features, and in particular with reference to i) their adherence to appropriate standards and their degree of interoperability with other components/operations of the energy system, meaning in practice the implementation of the M/441 and M/490 standardised local interfaces; and ii) the extent that these smart metering set-ups are equipped with functionalities for the provision of energy management services, i.e. compliance with the EC recommended, and consumer-benefitting, functionalities (a)[233], (b)[234] and (f)[235] (EC Recommendation 2012/148/EU) which can in practice assist in realising the active participation of consumers which is a binding condition according to legislation. If one or more of these functionalities are not present, some of the information which the consumers require to make educated decisions on their consumption may not be available. If the right communication interfaces in the set-up deployed are not enabled, then the consumers have no means to exercise their choices, e.g. actively engage in demand response schemes.

(c.1) Regarding functionalities

According to the EED provisions (Article 9(2a)), Member States must ensure that *"objectives of energy efficiency and benefits for final household customers are fully taken into account when establishing the minimum functionalities of the meters and the obligations imposed on the market participants"*. In doing so, Member States are advised[236], but not legally bound by the EED (Article 9(2a) and 9(2b) specifically for data protection, privacy and security), to consider the Commission Recommendation 2012/148/EU on the preparations for the roll-out of smart metering systems. In any case, it is for Member States to decide which energy efficiency objectives and which benefits to the final customers are taken into account when

[231] CEN/CLC/ETSI/TR 50572 "Functional reference architecture for communications in smart metering systems", December 2011.

[232] COM (2014) 356 and SWD(2014) 189; Smart Grids Task Force EG1 Report on Interoperability, Standards and Functionalities, October 2015.

[233] Functionality (a): provide readings directly to the consumer and any third party designated by the consumer.

[234] Functionality (b): update the readings referred to in functionality (a) frequently enough to allow the information to be used to achieve energy savings.

[235] Functionality (f): support advanced tariff systems.

[236] SWD(2013) 448 final: Guidance note on Directive 2012/27/EU on energy efficiency, Articles 9 - 11: Metering; billing information; cost of access to metering and billing information

obliging market participants and setting minimum functionalities for smart meters. Based on the recently released ACER/CEER Market Monitoring Report, fourteen Member States[237] have minimal technical and other requirements for smart meters in their legislation to ensure benefits to consumers, and therefore there is room for further action. Most of these States require that smart meters provide information on actual consumption (in line with the requirements of EED Art 9(2a), make billing based on actual consumption possible[238] (EED Art 10(2)) and may have an interface with the home, for easy access to information for consumers. In Spain, for instance, and following the Resolution of June 2015, customers equipped with smart meters are to be billed, as of October 2015, based on metered hourly consumption and hourly prices, putting an end to the discrepancy between standard consumption profiles and the actual demand of a given customer which can be quite significant.

Moreover, EED instructs Member States to ensure connectivity of those meters being rolled out; it states that they must (Art 9(2c)) *"...in the case of electricity and at the request of the final customer, ...[to] require meter operators to ensure that the meter or meters can account for electricity put into the grid from the final customer's premises"*. No official data is currently available attesting to the correct implementation of this provision, as the respective conformity checks for the EED Directive are not yet completed. The same holds also for the progress with implementation in Member States of Article 9(2d) and 9(2e) of the EED.

It is worth noting that the full range of the recommended functionalities (Recommendation 2012/148/EU) grasp all aspects of the legislator's intention to empower consumers while serving the needs of the energy system. In fact, they go beyond (as demonstrated in Table 3 of section 4.10) the functional requirements set in Article 9(2a, to 2d) of the EED.

Taking stock of the situation at this moment in time, and of the intentions of Member States regarding the adoption of the full range of the recommended functionalities (Recommendation 2012/148/EU), and comparing with data from the Commission's COM(2014) 356 benchmarking report (data collection in 2013) where 8 Member States only indicated that they intended to follow them[239], and in particular those benefitting consumers, we observe that now more Member States implement or plan to implement the recommended functionalities[240]; so progress has been made. In detail, all 17 Member States committed to a large-scale roll-out intend to implement the consumer-benefitting functionality (a)[241], with

[237] See Table 4 in section 4.10 of the present annex (reference: 2015 ACER/CEER Energy Market Monitoring Report).

According to the 2015 ACER/CEER Monitoring Report, the following Member States have minimal technical and other requirements of smart meters in their legislation to ensure benefits for consumers: Austria, Belgium, Denmark (for gas), Finland, France, Great Britain, Hungary (for electricity), Italy, the Netherlands, Norway (for electricity), Portugal, Romania (for electricity), Slovenia (for electricity) and Spain (for electricity).

[238] See Table 5 in section 4.10 of the present annex (reference: 2015 ACER/CEER Energy Market Monitoring Report).

[239] See table 8 and table 9 of SWD(2014) 189

[240] Smart Grids Task Force EG1 Report: *Status report based on a survey regarding Interoperability, Standards and Functionalities applied in the large scale roll-out of smart metering in EU Member States*, October 2015.

[241] Functionality (a): provide readings directly to the consumer and any third party designated by the consumer.

three (DK, IT, SE) of them indicating to do so in the next planned roll-out. Three Member States (LV, EE, ES) out of 17 Member States (18%) do not implement functionality (b)[242] as it was specified by the Commission in its Recommendation (with at least 15 minute update frequency). Two of them (LV, EE) will do so on consumer request. The three Member States currently not implementing functionality (b) represent approximately 30 million (15%) from the approximately 200 million meters to be installed in the EU by the Member States by 2020. However, almost one out of three Member States (namely AT, SE, DK, IE, FI), from those rolling out will not use the smart metering system to implement functionality (f)[243]. In these cases it is important to understand if consumers will be able to check their consumption per tariff zone on the meter, if tariff zones are used for billing.

Nevertheless, in most cases technical requirements and therefore smart metering functionalities as now mentioned by the responsible authorities are neither mandated nor regulated yet by them, so in the absence of an actual obligation there is a risk that these functional requirements may not be adhered to in practice.

(c.2) Regarding interfaces/connectivity & interoperability

Based on recently gathered information[244], there is the intention within the majority of those rolling-out to implement interfaces[245] – at home or station level – initially, later or on consumer request, to support the delivery of the aforementioned functionalities. In practice these interfaces can be used for the smooth exchange of information and inter-working between the metering infrastructure and devices, components, processes, or other network platforms in the energy market (although full smart home interoperability requires additional standardisation efforts at the level of the interfaces inside the home). Some Member States[246] though indicated that they intend to use instead (or complementary to the local interfaces) a web interface, which may not necessarily be making information available to consumers (or any third party they designate) in real time.

Furthermore, a majority of Member States have not made additional specifications or profiles for improving interoperability on these interfaces, as advised by standards, and are therefore restricting the interoperability they can reach with the systems they are deploying. In addition, there appears to be within those currently rolling out limited awareness on data exchange standards and actual requirements between the metering and other network platforms, risking that the data provided by metering is not in line with the data needed for in-home energy management.

[242] Functionality (b): update the readings referred to in functionality (a) frequently enough to allow the information to be used to achieve energy savings.

[243] Functionality (f): support advanced tariff systems.

[244] [Reference 2]: Smart Grids Task Force EG1 Report: *Status report based on a survey regarding Interoperability, Standards and Functionalities applied in the large scale roll-out of smart metering in EU Member States*, October 2015.

[245] Only Spain, from the 17 Member States rolling-out in a wide scale for electricity, does not plan to use these interfaces

[246] Seven Member States (DK, EE, ES, LV, IT, MT, RO) indicated that they currently use a web portal as an alternative or complementary to the home interfaces.

In any case, as also with functionalities, there are no minimum technical/communication specifications officially set nor mandated; as a result there is the risk that such interfaces are finally not activated, and/or the smart metering set-ups deployed are of limited connectivity and interoperability, ultimately failing to deliver and serve the interests of the consumers.

d. Deployment arrangements & data handling options

A successful roll-out is very much dependent upon criteria largely decided by Member States, including also the regulatory set-up for deployment. According to available data COM (2014) 356), the Distributor System Operators (DSOs) are the responsible party for the implementation, ownership and data handling in the vast majority of Member States proceeding with a roll-out by 2020.

Smart metering has implications in the market and data handling requirements and options for the respective transactions that may be calling for new business models and a review of key stakeholders' relations. There are extra responsibilities to be bestowed on the DSOs in addition to their 'traditional' ones, and are not necessarily coupled at the moment with an obligation to share potentially commercial data in a transparent and non-discriminatory way with third parties (to be designated by consumers). Furthermore, clear roles and responsibilities for the roll-out, technical specifications and financial arrangements for the related investments are not yet defined in most of the cases.

This situation creates uncertainties, delays the deployment and could jeopardise the success of the roll-out.

e. Consumer acceptance & engagement

There are encouraging recent data coming from pilot installations of smart metering systems indicating that consumers are satisfied with their performance. Approximately 70-90% of British consumers[247] who have received a smart metering system with an In-Home Display are reportedly satisfied, and most feel that they have already reduced energy consumption as a result. Evidence suggests that these reductions persist and are not short-term gains only. Savings after more than two years are even better than in the first year. Nevertheless, the messages that come out from the pilot installations reinforce the fact that consumers should be properly informed of their rights and also be made aware from the very beginning of the opportunities opened up by smart metering, in line with the provisions also of the EED (Art 9(2e)).

At the moment, very few Member States are setting up such communication campaigns, or intend to systematically monitor the extent of consumer engagement and overall satisfaction[248]

[247] VaasaETT Report "Assessing the use and value of energy monitors in Great Britain", 03/04/2014.

[248] E.g.

(i) UK-GB: see activities under the Smart Energy GB and their recent report monitoring how public opinion and appetite for smart meters is changing; http://www.smartenergygb.org/national-rollout/about-smart-energy-gb; http://www.smartenergygb.org/sites/default/files/Smart%20Energy%20Outlook%20September%202015_0.pdf

4.7. Answers to the evaluation questions (Assessment of current situation)

The legislator's original objective for the smart metering provisions was to enable the active participation of consumers in the energy supply market. This was meant to happen through:

i. transparency as provided by the smart metering set-ups, in terms of reliable, timely and accurate information on consumption, predictability of costs, and awareness of options and choices;

ii. third party access to data, connectivity and interoperability to facilitate in practice competitive offers and exercise of choices at the customer end, but also system integration, and result in higher efficiencies and lower costs;

iii. due regard to best practises and tools to ensure the provision of timely and meaningful information, connectivity, and access to choices (for instance the installation of in-house displays for a direct information provision, connection to home automation, self-consumption, etc.);

iv. consumer access to schemes that reward flexible consumption, such as demand response, as a specific means for energy efficiency benefits via novel energy services that rely on smart metering data.

As stated earlier, in order to realise this objective the European legislation instructed: (i) the deployment of electricity and gas smart metering, potentially subject to a cost-benefit analysis; (ii) the target and timing of the operation in the specific case of electricity; but also (iii) the function of the systems to be rolled-out (to be interoperable, with due regard to standards, and to empower consumers). The Commission tabled also non-binding Recommendations to assist Member States to meet these obligations.

***Effectiveness:* How effective has the EU intervention been?**

Commitment to smart metering is not uniform across the EU; the roll-out is overall progressing in a rather conservative manner, at different speeds and operational environments across the Member States.

The least ambitious deployment and slowest pace for rolling-out is noted in the gas sector. Seven Member States only intend to roll-out by 2020 in total 45 million gas smart meters, corresponding to 40% of EU consumers; so far as little as a 1.5% penetration rate has been achieved, as explained earlier. Moreover twelve Member States concluded in their CBAs that for now the costs outweigh the benefits; others intend to install smart metering systems only for selected groups of consumers or have reached no binding decisions yet[249]. This is

(ii) NL smart metering programme: http://www.metering.com/wp-content/uploads/2014/06/Dutch-Smart-Meter-Energy-savings-Monitor-final-version.pdf; https://www.consuwijzer.nl/sites/consuwijzer.nl/files/downloads/Checklist-privacy-besparingsdiensten-slimme-meters.pdf

(iii) http://www.esd-ca.eu/reports/working-group-executive-summaries/metering-billing-and-information-smart-meters-and-consumer-engagement].

[249] SWD(2014) 189

coherent with the observation that the business case for gas is more challenging given that the expected benefits are either less significant than for electricity, or do not apply[250].

For electricity, still a majority of Member States intend to proceed with large-scale deployment by 2020. So far, 19 Member States have committed to rolling out close to 200 million smart meters for electricity by 2020, to at least 80% of households in 17 of these nations, and close to 23% in 2 countries that are rolling out to a specific segment of consumers. But Member States are at different stages of the process when it comes to actual installations. Only four have completed so far the roll-out in electricity, while the target date of 2020 is approaching.

The current slow advancement (which is to peak much later than originally foreseen) , the low diffusion rates achieved to date (21% for electricity, and just 1.5% for gas in the EU-28), and the recurring delays in national roll-out programmes, further widen the gap to delivery.

The deployment of smart metering in Member States, which is not as ambitious as originally intended, can be credited to a certain extent to the legislation in place, even though it is difficult to quantify it. However it should not be forgotten that in a number of cases it has been influenced by other factors, e.g. market drivers, regulatory environments.

Some DSOs or legally responsible metering companies, even in the absence of national legal requirements for a roll-out, have proceeded with the installation of advanced metering equipment, serving their specific purposes, looking for internal synergetic effects or responding to customer demand, and accordingly dictating technical requirements and configurations for the metering systems deployed.

Equally influential has been the regulatory environment or the maturity of the national framework in place. There are cases where a legal and/or a regulatory framework has been established to some extent, or is expected to be soon defined, and smart metering may be high on the agenda of the relevant stakeholders. However, due to lack of clarity in this framework, and/or in anticipation of developments, or in fear of potentially new binding requirements, limited action has taken place, or the whole operation was delayed. Such factors could be holding back in many cases the progress with the roll-outs, or are framing the conditions for the deployment.

Moreover, there is a risk that the smart metering set-ups being rolled-out may not be fit for purpose and not bringing after all the desired benefits to consumers and the market as a whole, given that the legislative provisions are not specific on the practicalities for reaching the ultimate requirement to roll-out systems that shall assist the consumers' *'active participation'* of consumers in the energy supply market.

Furthermore, in the absence in the current energy provisions of an actual definition of *interoperability* in a smart grid environment that these systems are meant to reach, erroneous interpretations have emerged. So far the interoperability requirement has been understood by some as holding within a specific distribution network that may be restricted in one region within a country. In other words, a system installed in a specific distribution network covering

[250] The fact that gas can be held in storage while the supply and prices of gas do not vary much over short time periods, makes the expected advantages of smart metering more modest than for electricity – [SWD(2014) 189 and EP briefing (September 2015) on smart electricity grids and meters in the EU Member States

region A of country X may not be interoperable with that installed in region B in country X (see for instance cases in Spain), or a system in country Y. At the same time, smart meter manufacturers have focused on interoperability of components within a metering system, so that different components of different manufacturers could operate together. But *'interoperability'* stretches beyond just devices and components, into networks, systems and applications, and covers the ability to inter-connect as implied in the energy legislation. This is explicitly defined in recently developed standards[251] which unfortunately were not available to shed light in this issue at the moment of writing of the respective pieces of legislation. According to standards, there are different dimensions of interoperability, namely (i) technical at component or hardware level (e.g. the plugs and cables), (ii) at communication level (e.g. the language to be used), (iii) at information level (e.g. the content to be exchanged), (iv) at functional level (e.g. the transactions / use cases to be implemented) and finally (v) at business level (e.g. the business processes to be supported). Consequently, in the presence of a number of options and combinations, regional differences may arise with respect to interoperability, as different regions can choose for different standards, which may result in set-ups that are not necessarily interoperable at national level, or within the EU. This adds complexity and costs to those, be it for instance energy services/product developers or aggregators, who would like to trade in different European countries and optimise their business model.

The lag time in developing the smart grid-related standards since the issuing of the mandates, and the actual enforcement of the legislative provisions, despite being inevitable, created a climate of uncertainty that resulted in inaction in some cases, or contributed to a vacuum of responsibility in others when it came to setting up technical requirements at national level for the roll-out.

The Commission sought to rectify the situation by addressing these issues in different fora, tabling soft legislation (Recommendation 2012/148/EU), complementary provisions in the EED, and issuing related standardisation mandates to the European Standardisation Organisations to guide Member States in their choices. One of the key choices is the functionalities that the systems to be rolled-out should have and the technical specifications they should follow.

Recent data show, as argued earlier, that more and more Member States seem to intent to implement the recommended functionalities, standards, and required interfaces to deliver energy management services also for consumer benefit. However, in practice and in most cases, none of these are mandated or regulated at national level. Furthermore, a majority of Member States have not made any additional specifications for improving interoperability on the respective interfaces, nor have set minimum technical/communication specifications, risking limiting the connectivity and performance of the smart metering set-ups deployed. In practice: smart meter tenders that come out in most of the cases do not include specific requirements for functionalities, or interfaces, leaving them to the discretion of those rolling-

[251] See Deliverable by M/490 CEN-CLC-ETSI Smart Grid Coordination Group (issued 31/10/2014)

"Methodologies to facilitate Smart Grid system interoperability through standardization, system design and testing";
ftp://ftp.cencenelec.eu/EN/EuropeanStandardization/HotTopics/SmartGrids/SGCG_Interoperability_Report.pdf .

out; this attests to the need to clarify and mandate such requirements at national level prior to deployment in order to avoid redundant, or unnecessary further, investments.

Moreover, given that we are still in the early stages of deployment, Member States are still exploring in their pilots, and only few of them have already implemented, best practises and tools for consumers' awareness, for their eventual engagement in market processes with due respect to data protection and security, and finally for the systematic feedback on their overall satisfaction with the operation.

This is one element for a successful roll-out which is largely controlled by Member States that are ultimately responsible for the deployment and respective market arrangements, and may or may not decide to take on-board non-binding recommendations tabled by the Commission, or mandate adherence to technical standards which are in fact of voluntary nature. Accordingly, there is no clear incentive, and therefore guarantee that the Member States will positively regard, and ensure, the availability of the full range of recommended functionalities or interoperability settings that are of essence for connectivity and for delivering consumers' benefits and enabling their active participation.

We are therefore lacking momentum in the EU since some smart metering systems currently being considered for installation in Europe may not make after all available to customers relevant, meaningful and timely information, and tools, for realising the full potential of smart metering. Enforcing the minimum functionalities on an EU level, and consistently promoting the use of available standards to ensure connectivity and interoperability, as well as best practices, while having due regard to data security and privacy, would guarantee a coherent, future-proof system able to support novel energy services and deliver benefits to consumers.

To summarise, there is evidence to suggest that the smart metering provisions currently in place have been less effective than intended, mainly due to caveats that the provisions contain regarding the assessment of the cost-effectiveness of the operation, and lack of definition of the concept of *'active participation'* of consumers and of the underlying requirements for this to be realised. This may have created a climate of uncertainty, resulting in inaction in some cases, or a vacuum of responsibility in others and failure in setting up technical requirements at national level for the roll-out, holding up progress and risking delivery of benefits to consumers.

***Efficiency*: How efficient has the EU intervention been?**

It is rather difficult to assess at this stage of limited deployment, with field data even from the very few completed roll-outs to large extent missing, the actual cost/benefit of the roll-out and to what extent they can be directly linked to the EU intervention. Currently available figures are in most cases only a forecast and do not represent actual costs or benefits. As the roll-outs unfold will the consolidated figures become clear.

We can though make some observations and draw initial conclusions looking at the projected cost/benefits, based on Member States CBAs[252], and indicate how costs are expected to accrue to different stakeholders, and whether they can be considered proportionate to benefits. Furthermore, we can comment on what extent the existing legal provisions could still drive the process.

[252] An analysis of Member States CBAs is included in [Reference 1]: EC smart metering Benchmarking Report

Cost-effectiveness has been central to the spirit of the provisions for rolling-out smart metering, and it was stated that the decision for proceeding with deployment could be taken on the basis of *"an economic assessment of all the long-term costs and benefits to the market and the individual consumer or which form of intelligent metering is economically reasonable and cost-effective and which timeframe is feasible for their distribution"*.

Based on the national CBAs, which even though optional were conducted by a majority of Member States, the outcome is positive for a number of cases where the benefits outweigh the costs, but not equally favourable for all. Looking at the specifics, the estimated cost of installing smart meters varies widely between different Member States (for electricity, from €77 to €766 per metering point). This is partly because of inconsistent methodologies in the national CBAs and in the absence of specific instructions in the legislation, and in view of only recommending guidelines tabled by the Commission (EC Recommendation 2012/148/EU). As a result, Member States applied different discount rates and time horizons to assess the economic viability of smart metering, while the expected lifetime of smart meters and the speed of implementing the roll-out schemes varied widely. The discount rate has a significant impact on the assessment of potential smart metering investments as the costs are incurred predominantly at the beginning of the scenarios considered whereas the smart intervention often produces benefits in the long-term. Furthermore, it is acknowledged that differences between national energy transmission systems do have some effect on the costs and benefits of smart grid-related installations and therefore metering. It should also be noted that some CBAs, or scenarios considered in them, are rather abstract, or less elaborated or substantiated than others, and could have more illuminated the assessment of the roll-out viability should they have been more comprehensive. This raises once again the issue of possibly developing an even more standardized methodology, and going beyond the setting-up of principles for the CBA as given in the EC Recommendation 2012/148/EU.

The predominant cost driver, according to a majority of Member States[253], is the meter and associated installation costs, followed by the data communication costs. Meter related costs vary significantly across the CBAs, in part reflecting wide divergence in estimates of the type and cost of the smart meter, differences in labour costs (installation), and complementary investment identified in some cases (for example, meter boards and wiring). At the same time data communication costs vary with the range in communications technologies being considered across the Member States[254]. In particular, overall costs are highly sensitive to the extent to which GPRS[255] and UMTS[256] are adopted. While the appropriate choice of communications technology is location-specific, advances in the cheaper PLC (Power Line Communications) technology increasingly support its widespread use for data transfer, where feasible[257], thus contributing to a lower overall expenditure for the deployment.

[253] SWD(2014) 189 accompanying the COM(2014) 356; and [Reference 3] ICCS-NTUA & AD Mercados EMI Study

[254] See table 24 [SWD(2014) 189] on communication infrastructure options considered in smart metering roll-outs in Member States

[255] GPRS: General Packet Radio Service

[256] UMTS: Universal Mobile Telecommunications System

[257] [Reference 3] ICCS-NTUA & AD Mercados EMI Study

In an attempt to reduce capital and operational costs, some countries (see for instance, UK-GB, NL, IE) have decided in favour of joint roll-outs of electricity and gas, and are thus exploiting economies of scale (in communication, data management, customer information campaigns, installation etc.). Moreover, in a joint roll-out synergies between electricity and gas smart metering systems may arise in the telecommunication infrastructure or in data handling where for instance a central data hub can serve both systems.

Regarding benefits, it is anticipated that, based on the CBAs projections and as stated earlier, smart metering systems will deliver to consumers cost savings in the longer run, with an overall average benefit per customer of €160 for gas and €309 for electricity. In general, some caution is needed in interpreting these figures given the different methodologies used to estimate benefits[258] and the different items included in the evaluation: in fact, several Member States only accounted for the benefit associated with the DSO rolling out and not for the consumers' benefit or other benefits accruing to the society as a whole[259].

The benefit attributed to the DSO is in general easier to estimate, as smart metering primarily implies savings in meter reading operations, switching, non-technical losses etc. In addition, advanced metering infrastructure allows for more accurate billing of electricity consumption, reducing complaints and litigations, to which a monetary value for the DSO can be calculated.

The benefit for consumers, besides the part arising from more accurate billing information, is instead more difficult to estimate, as it also depends on the actual involvement of consumers themselves in for example demand response mechanisms, time-of-use pricing, etc. This can be also confirmed by the low number of countries from those proceeding with the electricity smart metering roll-out that provide an estimate in their CBAs— as a percentage — for such a benefit. Based on the estimates available, an average energy savings of 3%[260] (Tables 1, 2 in section 4.10) is calculated, while some report that certain types of consumers could be able to reduce energy costs up to 12%[261], as pilot installations have shown. But data from countries that have completed roll-outs are rather modest indicating savings in the order of 1 to maximum 3%. This has prompted some Member States to decide to roll-out smart meters only to those with high energy usage, arguing that this is the way to reduce the costs of deployment while keeping the average savings higher (see case of DE, SK).

In most countries (and relative to the electricity deployment arrangement of the country), the smart metering investment and installation cost appears as an upfront cost for the DSO in the initial stage of the deployment; however, later fully or partly passed to the final consumer

[258] ICCS-NTUA & AD Mercados EMI Study

[259] A list of the top three cost and benefits considered by Member States in their cost/benefit assessments for the rolling-out of smart meters in their territory is given in Tables 25 and 30 of the SWD(2014) 189 accompanying COM(2014) 356.

[260] This is also consistent with the findings of the Energy Demand Research Project carried out by four energy suppliers in the UK, on behalf of the Office for Gas and Electricity Markets (see House of Commons Library Research Briefing, *Smart Meters*, 2014); http://researchbriefings.files.parliament.uk/documents/SN06179/SN06179.pdf

[261] OECD Digital Economy Paper, *ICT Applications for the Smart Grid: Opportunities and Policy Implications*, 2012; http://www.oecd-ilibrary.org/science-and-technology/ict-applications-for-the-smart-grid_5k9h2q8v9bln-en

through network tariffs[262], with the exception of the UK-GB where the cost is faced by the energy supplier. At the same time, in a number of Member States[263] the DSO is reported as the first/large direct beneficiary of the electricity smart metering, and electricity losses reduction (technical and commercial), or avoided meter reading and operations costs as key drivers for smart metering roll-outs. Also, energy suppliers are beneficiaries of the smart metering roll-out; their benefits come from more and easier prcedure-wise switching, reduced call centre costs, etc.

Furthermore, consumers' energy saving potential is a strong driver in the Member States' decisions for smart metering deployment[264]. The smart metering infrastructure in itself does not save energy, but using it correctly (and timely) does. Therefore, consumers have a central position in achieving energy savings and whether they will accept and the way they will use it would have a major influence in exploiting the energy saving potential[265]. To this end, some Member States, such as the Netherlands, dedicated particular focus in their analysis on the consumer behaviour in smart metering acceptance and efficient use.

The energy saving potential, as also argued in the Commission's Smart Metering Benchmarking Report, is also heavily dependent on the functionality of smart metering deployed; those systems with broad functionality can yield greater savings in the longer run. This is due to the fact that they are capable of providing a wider range of information to customers, at frequently enough intervals to make it meaningful, and more easily accessible, thereby facilitating their participation in demand side management schemes, such as demand response. Yet, as stated earlier, only very few Member States from those proceeding with large scale roll-outs have already mandated the use of the EC recommended functionalities, and standardised interfaces to ensure interoperability and connectivity of the systems they deploy, while some early movers used older technology that does not deliver the full range of desired functions. A particular challenge therefore arises to cost-efficiently upgrade or even replace legacy, or limited functionality, meters.

Furthermore, current provisions do not dictate an explicit obligation to Member States for mandating functional requirements. As a result, most of them choose to delegate this task to DSOs which in many cases own the meters, but may not necessarily pick consumer-benefitting settings for their systems. Given that deployment costs will at some stage fully or partly be passed to final consumers through on many occasions network tariffs, it is important that costs are borne proportionately by all those benefitting from this deployment. National Energy Regulatory Authorities are the most appropriate entities to ensure this.

To summarise, there is not enough field data available, but rather projections based on Member States CBAs for smart metering deployment, to assess quantitatively the cost-

[262] Reference: SWD(2014) 189 accompanying the EC Smart Metering Benchmarking Report (COM(2014) 356)

[263] Such as CZ, DK, EE, FR, IT, LU and RO,

[264] SWD(2014) 189: A number of Member States (AT, DE, GR, IE, LT, LV, NL, PL, PT, UK-NI) shed particular light on this potential in their economic analysis of long-term benefits and costs associated with smart metering, indicating the energy saving as the major benefit coming out from smart metering roll-out.

[265] Another benefit serving consumers, the environment, and the society as a whole, is CO_2 emissions reduction due to first energy savings and then more efficient electricity network operation (reduced technical and commercial losses).

effectiveness and overall efficiency of the operation and of the existing legislative provisions. However, given that the deployment is rather slow, and most of the large-scale roll-out campaigns have yet to start unfolding, the overall impact of the current provisions is till now rather limited, and both the effects and the costs likely have been so too. Importantly, the provisions themselves contain caveats regarding financial proportionality / cost-effectiveness, therefore, it is unlikely that the rules have imposed or will impose as they stand any disproportionate costs.

However, at the same time, and while bearing in mind that the assessment and final decision for a wide-scale roll-out remain with the Member States, more harmonised rules could potentially be tabled regarding the methodology to use in order to evaluate the cost-effectiveness and viability of the operation. Moreover, stronger encouragement should be given to Member States to adhere to the recommended functionalities and use of standards and best practices for their smart metering systems. This will accordingly increase the benefit/cost ratio in the exercise by enabling customers' participation in, and accruing of benefits from, demand side management schemes or use of distributed energy resources,

***Relevance* - How relevant is the EU intervention?**

For the purpose of ensuring active participation of consumers and their empowerment, the provisions of smart metering in this legislation remain highly relevant, considering current needs and problems. For the reasons outlined earlier, there could though be further enhanced, by elaborating them as to (i) spell out how the term of *'active participation'* is to be understood, and expected to be realised, in practical terms - functionality, connectivity, interoperability, standards; (ii) issue an obligation to the Member States to officially adopt, publish and notify the minimum technical requirements for the smart metering systems to be deployed, the market arrangements, and clarify the roles/responsibilities of those involved in the roll-out.

With the rationale in mind that smart metering enables participation in demand response schemes, and can contribute to the functioning of the internal energy market, access to fit-for-purpose smart metering is fundamental to guarantee the active participation of consumers and to serve the system as a whole. This is only possible if technologies enabling innovative energy services are available to all consumers across all Member States, including those that are currently not rolling-out smart metering at large following a non-favourable assessment. The current provisions do not account for the occasion where individuals may be asking in the near future for such an installation possibly triggered by the wish to make use of novel energy services and products or similar market drivers. It is therefore important that current legislative provisions be extended to account for this scenario, and instruct that this operation takes place within a reasonable time upon request and at a cost-reflective manner (verified by the National Regulatory Authority).

***Coherence:* How coherent is the EU intervention internally & with other EU actions?**

The current smart metering provisions placed mainly in the Electricity and Gas Directives, and complemented in the EED and the EPBD, work in principal well together towards achieving the common objective.

There appears though to be some ambiguity regarding the frequency of information made available to consumers to enable them to manage their energy in volume and time, and participate in the energy supply market.

As analysed earlier, the intention of the legislator is to promote smart metering set-ups that enable the active participation of consumers, and therefore implies that (near) real time information is made available to consumers; this is in practice grasped by functionalities (a) and (b) that the Commission is recommending to Member States (EC Recommendation 2012/148/EU) .

Article 9(2a) of the EED instructs Member States to ensure that the *"metering systems provide to final customers information on actual time of use".* This does not involve (near) real time information, but refers to a simple automated meter reading function. Such information can be made available to consumers with a time delay; it can be useful for them to make changes concerning their energy consumption patterns, but does not give them the means to receive and dynamically react to market signals. This requires the activation of 'smart' meter functionalities that involve the timely delivery of meaningful information to help consumers become active participants in the market and make themselves, or designated parties on their behalf, educated choices and proceed in specific actions, e.g. engage in demand response schemes.

Furthermore, the situation becomes more complicated and issues of coherence, even within the EED in this respect, are raised. The EED Article 9(1) when referring to the consumers right to individual metering states *"Member States shall ensure that ...final customers for electricity, natural gas, district heating, district cooling and domestic hot water are provided with competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use".* The fact that the provision of *'actual time of use'* is also instructed for other forms of energy, whereas is typically of relevance to electricity, somehow makes the intention of the legislator obscure. In fact, due to the ambiguous wording few, if any, Member States have interpreted it to require smart meters[266].

The continued use of the term *'actual time of use'* in Article 9(2) restricts the functional requirements of the systems targeted and raises questions about coherence with the framework for promoting smart meters.

Moreover, there may be issues of coherence arising when reading smart metering provisions in the EPBD, in the light of the EED related text. The EPBD Article 8(2) requires Member States to "*encourage the introduction of intelligent metering systems whenever a building is constructed or undergoes major renovation, whilst ensuring that this encouragement is in line with point 2 of Annex I to [the Electricity Directive]*". However, so far Member States seem to have given little attention to this part of the EPBD and the Commission services are not aware of any evidence suggesting that smart meters roll-out plans (or CBA) have given any preference or priority to this sub-set of buildings. This may be in part due to the rather soft/unspecific nature of this obligation. It may also be related to the fact that the EED (and before that the Energy Services Directive) contains a more absolute requirement applicable

[266] Reference: internal document "Evaluation of EU provisions on metering and billing of energy consumption", ENER draft 12/01/2016.

whenever "*a new connection is made in a new building or a building undergoes major renovations, as set out in [the EPBD]"* to install a "*competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use*." As discussed in the separate thematic evaluation on metering and billing, Member States have interpreted this latter provision differently, with some but not all considering it to imply a need for smart meters.

Overall, there seems therefore to be a case for considering in the context of the EPBD review more effective and concrete/operational means of encouraging the installation of smart meters than what the current Article 8(2) constitutes. Moreover, in the context of the EED review the cross-reference/provision quoted above could also be revisited.

In short, there are no clear contradictions with other EU actions, but overall coherence could be improved, and associated measures strengthened by for instance clarifying that the legislator promotes the roll-out of smart metering with a wide range of functionalities going beyond the capability of providing time-of-use information. This will in practice mean enforcing by legislation the adherence to the recommended functionalities (as appear in M/441 standards and in the Commission Recommendation 2012/148/EU for the specific case of electricity) for all smart metering systems being installed (or upgraded). Moreover, to ensure coherence, avoid any further confusion and unnecessary administrative burden for updating the related provisions in different legislative documents, it is advised to consider that all existing requirements and any future legislative interventions on smart metering be consolidated/embedded in one single legal act.

EU added value: What is the EU added value of the intervention?

In the context of completing the EU's internal electricity market and making retail work also for consumers, it remains highly relevant for the EU to ensure a degree of consistency and alignment, as well as gain momentum, in the deployment and use of smart metering.

The costs of rolling out smart meters - with all the benefits that this can bring for consumers, network and energy companies, the energy system as well as society and the environment more widely - will greatly increase if the economies of scale of the EU's internal market are not properly leveraged. This appears to be a serious risk in the absence of further, urgent initiatives to standardize systems requirements and functionalities of smart electricity meters.

When originally adopted, the smart metering provisions in the related legislative initiatives pushed forward the agenda of smart metering at least in a number of EU Member States. However, given the aforementioned uncertainties and caveats, its current value diminished. As explained earlier, there is a need now to eliminate ambiguities and to further elaborate and precise these provisions, to ensure that smart metering roll-outs move in the right direction, and regain EU added-value. Placing a set of precise EU-wide requirements, preferably in a single legal act, will result in

- safeguarding common functionality, and share of best practices;
- ensuring coherence, interoperability, synergies, and economies of scale, boosting competitiveness of European industry (both in manufacturing and in energy service and product provision), and

- delivering the right conditions for the internal market benefits to reach also consumers across the EU.

4.8. Conclusions (Gap Analysis)

*S*mart metering is a key element in the development of a modern, consumer-centric retail energy system which encompasses active involvement of consumers. In recognition hereof, provisions were included in the Gas Directive 2009/73/EC and in the Electricity Directive 2009/72/EC fostering the smart metering roll-out and **targeting the active participation of consumers in the energy supply market,** through:

i. transparency provided by the meter (timely and accurate information on consumption: predictability of costs, awareness);

ii. third party access to data and interoperability (facilitate competitive offers at the customer end, facilitate system integration, lower cost);

iii. due regard to best practises (for instance installation of in-home displays, connection to home automation, self-consumption, etc.);

These provisions were then complemented with provisions under the Energy Performance in Buildings Directive 2010/31/EU, and the Energy Efficiency Directive 2014/32/EU which amongst others added

iv. demand response as a specific means for energy efficiency benefits via novel energy services based on smart metering data.

The intention was to promote smart metering by placing these measures and capitalise on opportunities it opens both for the energy system and for consumers, and to mandate the deployment in such a way as to enhance the cost-effectiveness of the whole operation.

Looking at the current situation with smart metering deployment in the Member States, despite the progress noted, EU-wide implementation is falling short of the legislator's intentions, in terms of level of commitment, roll-out speed, and purpose.

The least ambitious deployment and slowest pace for rolling-out is noted in the gas sector, given also that there is no actual target and the business case is more challenging. Seven Member States only intend to roll-out by 2020 in total 45 million gas smart meters, corresponding to 40% of EU consumers; so far as little as a 1.5% penetration rate has been achieved, as explained earlier. The rest have either decided against it given that the calculated costs outweigh the benefits, or intend to install smart metering systems only for selected groups of consumers or have reached no binding decisions yet.

For electricity, still a majority of 19 Member States intend to proceed with deployment by 2020. So far they have committed to rolling out close to 200 million smart meters for electricity by 2020, to at least 80% of households in 17 of these nations, and close to 23% in 2 countries that are rolling out to a specific segment of consumers. But Member States are at different stages of the process when it comes to actual installations. Only four have completed so far the roll-out in electricity, which along with installations in other Member States gives a penetration rate of 21% in the EU-28, while the target date of 2020 is approaching.

The current advancement is rather slow particularly in view of the fast approaching 2020 original target in the case of electricity, and the progress gap to delivery may be further

widened by recurring delays in national programmes, in view of financial constraints, regulatory barriers or field practices. In addition, there is always the risk that the systems being rolled-out may not be fitted for purpose and not bringing after all the desired benefits to consumers and the market as a whole, given that the legislative provisions are silent on the practicalities/specifications for reaching the ultimate requirement to roll-out systems that shall assist the consumers' *'active participation'* of consumers in the energy supply market. These were later on prescribed as guiding provisions regarding functionalities, interoperability, connectivity, and measures for data privacy and security in a smart metering environment, in follow-up, not legally binding Recommendations tabled by the Commission.

In all cases, the successful roll-out is controlled to large extent by Member States that are ultimately responsible for the deployment and respective market arrangements, and may or may not decide to take on-board non-binding guidelines.

In the light of the developments so far, the existing provisions can be assessed as follows.

In terms of **effectiveness**, the evidence available generally suggests that the smart metering provisions currently in place have been less effective than intended. This is mainly due to caveats that the provisions contain regarding the assessment of the cost-effectiveness of the operation, and lack of definition of the concept of *'active participation'* of consumers and of the underlying requirements for this to be realised. This may have created to some extent a climate of uncertainty, that led to inaction in some cases, or vacuum of responsibility in others, and failure to set up technical requirements at national level for the roll-out, holding up progress, and risking delivery of benefits to consumers. As a result, we are lacking momentum given that some smart metering systems currently being considered for installation in Europe after all may not make available to customers relevant, meaningful and timely information, and tools, for realising the full potential of smart metering. Enforcing the minimum functionalities on an EU level, and consistently promoting the use of available standards to ensure connectivity and '*interoperability'*, as well as best practices, while having due regard to data security and privacy, would guarantee a coherent, future-proof system able to support novel energy services and deliver benefits to consumers, in line with the legislator's intentions.

There is not enough evidence at the moment to evaluate the **efficiency** of the intervention in terms of proportionality between impacts and resources/means deployed. This is due to the fact that most of the large-scale roll-out campaigns have yet to start unfolding making the field data available rather scarce; there are only projections available based on Member States cost/benefit assessments. In any case, the overall impact of the current provisions is until now rather limited, and both the effects and the costs have likely been so too. Importantly, the provisions themselves contain caveats regarding financial proportionality / cost-effectiveness, therefore, it is unlikely that the rules with such inherent provisions have imposed or will impose as they stand any disproportionate costs.

At the same time, it is recognised that central to this operation is the ex-ante national assessment of the economic viability of the smart metering roll-out. While bearing in mind that the economic viability and final decision for a wide-scale roll-out remains with the Member States, more harmonised rules could potentially be tabled, beyond the exiting recommending guidelines, regarding the methodology to use in order to evaluate the cost-effectiveness of smart metering deployment. Moreover, stronger encouragement should be

given to Member States to incorporate in their assessments, and later adhere to the recommended functionalities and use of standards/best practices for their smart metering set-ups. This will accordingly increase the benefit/cost ratio in the exercise by enabling customers' participation and accruing of benefits from demand side management schemes or use of distributed energy resources.

In terms of **relevance**, the herein evaluated smart metering provisions, considering current needs and problems, remain highly valid. This said, they could though be further enhanced, by elaborating them as to (i) spell out how the term of *'active participation'* is to be understood, and expected to be realised in practical terms, namely define requirements for functionality, connectivity, interoperability, and standards to use; (ii) include an obligation to Member States to officially set the minimum technical and functional requirements for the smart metering systems to be deployed, the market arrangements, and clarify the roles/responsibilities of those involved in the roll-out.

Furthermore, and in view of the fact that smart metering is considered by many stakeholders as a prerequisite for demand response and active participation of consumers, with all the benefits that this implies, it seems appropriate that future legislative initiatives examine the possibility of granting the right for a smart meter to all, even in the absence of a national roll-out. This is to be done while ensuring that the installation takes place within a reasonable time upon request and at a cost-reflective manner (verified by the National Regulatory Authority). Such installation requests could possibly be triggered in the future by availability of novel energy services and products, or similar market drivers.

In terms of **coherence** – internally & with other EU actions – even though no clear contradictions could be pointed out, the evaluation has identified some room for improvement. Linking of the term *'actual time of use'* in Article 9(2a) and Article 9(1) of the EED to smart metering provisions erroneously restricts the functional requirements of the targeted set-ups and raises questions about coherence with the framework for promoting smart meters. There is therefore a need to clarify that a wide range of functionalities is in fact promoted, as those recommended by the Commission, that go much beyond the capability of just *'actual time of use'* information which usually refers to advanced, and not smart, metering. Moreover, to ensure coherence, avoid any further confusion and unnecessary administrative burden for updating the related provisions in different legislative documents, it is advised to consider that all existing requirements and any future legislative interventions on smart metering be consolidated/embedded in one single legal act.

Finally, considering the **EU added value**, it remains relevant to ensure that smart metering provisions are in place at EU level to guarantee a degree of consistency and alignment, potentially leverage economies of scale as well as gain momentum in the installation and later use of smart metering systems. When originally adopted, the smart metering provisions in the related legislative initiatives pushed forward the agenda of smart metering at least in a number of EU Member States. However, given the aforementioned uncertainties and caveats, their current value diminished. There is a need now to eliminate ambiguities and to further elaborate and precise these provisions, to ensure that smart metering roll-outs move in the right direction, and regain EU added-value, by (i) safeguarding common functionality, and share of best practices; (ii)ensuring coherence, interoperability, synergies, and economies of scale, boosting competitiveness of European industry (both in manufacturing and in energy

services and product provision), and (iii) ultimately delivering the right conditions for the internal market benefits to reach also consumers across the EU.

4.9. Summary of smart metering provisions are found in the following EU Directives:

- **Gas Directive 2009/73/EC[267] (Article 3(8) and Annex I.2);**
  - Art 3(8): introduction of intelligent metering systems (or smart grids) where appropriate and in order to optimise use of gas
  - Annex I.2: conditions for rolling out smart metering that shall assist the active participation of consumers in the gas supply market
    - option for a cost/benefit analysis; preparation of timetable for implementation; condition of ensuring interoperability of the systems to be rolled out and have due regard to the use of appropriate standards and best practice, and the importance of the development of the internal market in natural gas)
  - Preamble (52): introduction of smart metering where economically reasonable and cost-effective based on an economic assessment (rolling-out to those with a certain amount of consumption)
- **Electricity Directive 2009/72/EC[268] (Article 3 (11) and Annex I.2);**
  - Art 3(11): introduction of intelligent metering systems (or smart grids) where appropriate and in order to optimise use of electricity
  - Annex I.2: conditions for rolling out smart metering that shall assist the active participation of consumers in the gas supply market
    - option for a cost/benefit analysis; preparation of timetable with a target of up to 10 years for implementation; target set to 80% of positively assessed cases; condition of ensuring interoperability of the systems to be rolled out and have due regard to the use of appropriate standards and best practice, and the importance of the development of the internal market in natural gas)
  - Preamble (55): introduction of smart metering where economically reasonable and cost-effective based on an economic assessment (rolling-out to those with a certain amount of consumption)
  - Preamble (27): [indirectly related] smart grids for the modernisation of distribution grids and to encourage decentralised generation and energy efficiency

[267] Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC, EUOJ L211, 14.8.2009, pp. 94-136.

[268] Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC, EUOJ L211, 14.8.2009, pp. 55-93.

- **Energy Efficiency Directive (EED) 2012/27/EU[269] (Articles 9(2); 10(2); 12(2b)[270]);**
    - Art 1 (28): definition of smart or intelligent metering system
    - Art 9(2): where and to the extent smart metering is introduced (in line with 2009/72/EC and 2009/73/EC Directives), the following should be ensured
        - (a) Provision of actual time-of-use information and integration of energy efficiency considerations in the determination of minimum functionalities of smart meter;
        - (b) Security and privacy of smart meters and data communication;
        - (c) At the request of final customer, meter ability to account for flows into the grid (from customer's premises) – electricity only;
        - (d) At customer's request, availability of metering data on electricity input and off-take (to customer or a third party designated by him) in easily understandable format that can be used to compare deals– electricity only;
        - (e) Customer advice and information in context of smart meter installation particularly about their full potential linked to meter reading management and monitoring of energy consumption.
    - Art 10(2): where electricity or gas (also smart) meters are installed, enable accurate billing information based on actual consumption, and easy access to complementary information on historical consumption allowing detailed self-checks;
        - conditions on cumulative data (last 3 years or since start of contract if this is shorter) and of detailed data (time-of-use for any day/week/month/year) made available to final customer via internet or meter interface for last 24 months (or since start of contract if shorter)
    - Art 12(2b): may include communication of energy efficiency and energy management options with smart metering, as part of a national strategy to promote energy efficient use by small consumers including households
    - Preamble (26): when designing energy efficiency improvement measures, possibilities with smart meters should be considered; smart meters not to be used for unjustified back billing
    - Preamble (27), (31): reference to conditions for rolling-out smart meters stated in the Electricity and Gas Directives; requirement for provision to final customers of actual electricity/gas consumption and costs frequently enough to regulate own consumption

[269] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC,, EUOJ L315, 14.11.2012, pp. 1-56.

[270] The following recitals in the Energy Efficiency Directive 2012/27/EU are also of relevance to smart metering: (26), (27), (31), (33), and implicitly (45).

- Preamble (33): reference to the need to clarify requirements for roll-out in the context of empowering final customers (access to and use of information) and supporting the development of markets for energy services and demand management.
- Preamble (45): (related through smart grids); reference to demand response

– **Energy Performance in Buildings Directive (EPBD) 2010/31/EU[271] (Article 8(2)).**

- Art 8(2): introduction of intelligent metering systems (or smart grids) whenever a building is constructed or undergoes major renovation, in line with Annex I.2 of Directive 2009/72/EC (only for electricity)

4.10. Smart metering roll – out

[271] Directive 2010/31/EU of the European Parliament and of the Council of 19 May 20102 on the energy performance of buildings,, EUOJ L153, 18.6.2010, pp. 13-35.

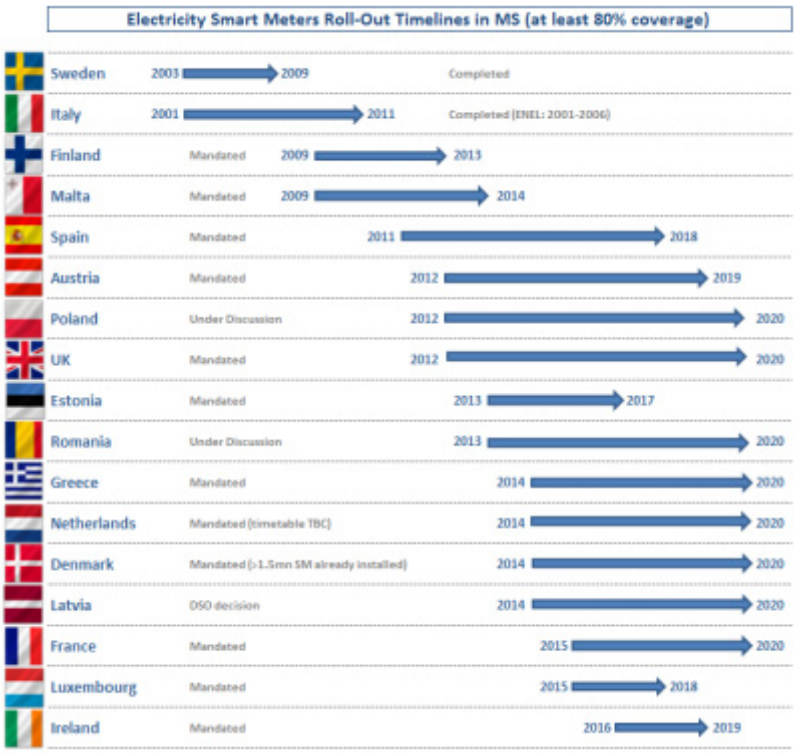
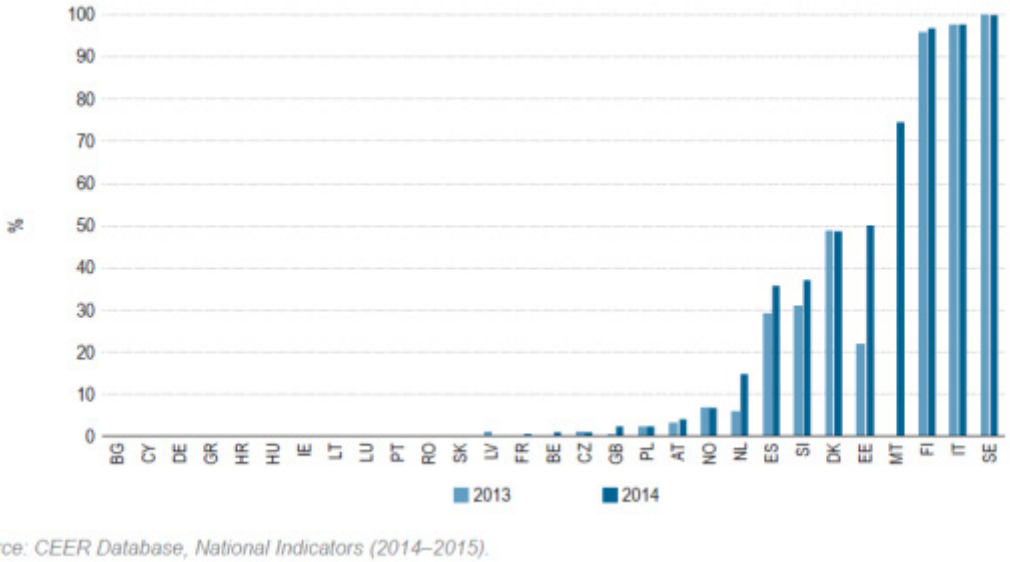


Figure 1 – Smart metering deployment plans in the EU Member States, for electricity (top left) and gas (top right) in the light of a national cost/benefit analyses undertaken by the Member States, and the respective timelines for roll-out in the case of electricity towards 2020

SWD(2014) 189, accompanying COM(2014) 356; respective timelines updated in July 2015, and Latvia added to the countries proceeding with a wide-scale roll-out of electricity by 2020]



Source: CEER Database, National Indicators (2014–2015).

Figure 2: Share of household customers equipped with smart meters for electricity – 2014 (%) – extracted from 2015 ACER/CEER Energy Market Monitoring Report

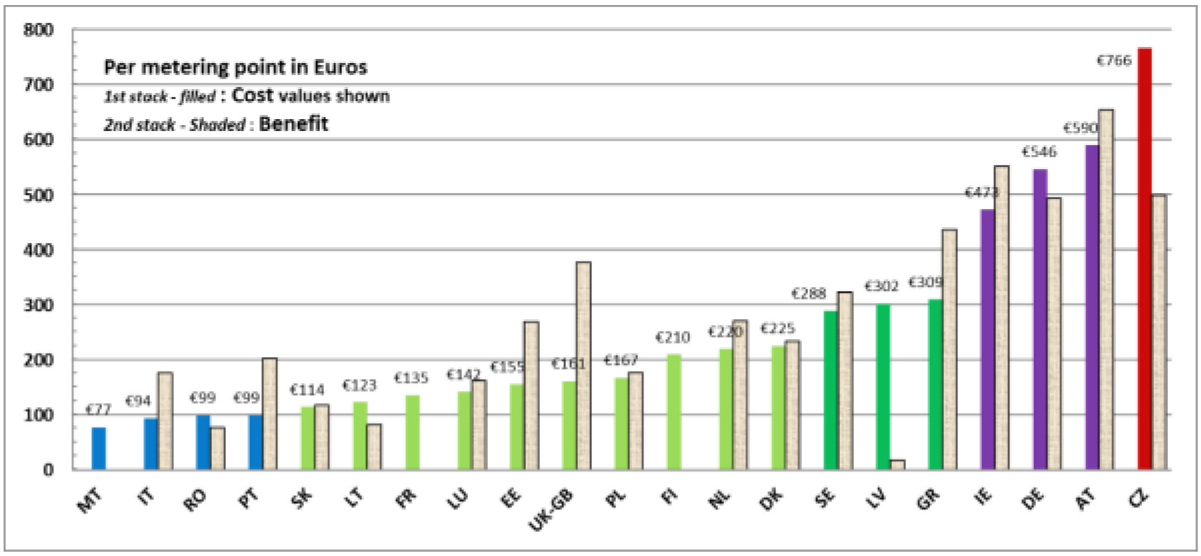


Figure 3 Normalised cost and benefit values per metering point estimated from the Member State CBA cost-benefit data in the case of electricity -Reference: COM(2014) 356 & accompanying SWD(2014) 189

Table 1 Summary statistics — key smart metering roll-out parameters for electricity (based on Member States' long-term economic assessments)[272] – Reference: COM(2014) 356

	Range of values	Average based on data from positively assessed cases
Discount rate	3.1 to 10%	5.7% ± 1.8% (70%[273])
Lifetime	8 to 20 years	15 ± 4 years (56%)
Energy saving	0 to 5%	3% ± 1.3% (67%)
Peak load shifting	0.8 to 9.9%	n.a.
Cost per metering point	€77 to €766	€223 ± €143 (80%)
Benefit per metering point	€18 to €654	€309 ± €170 (75%)
Consumer benefits (as % of total benefits)	0.6% to 81%	n.a.

[272] The 'discount rate' is applied to costs and benefits of smart metering investments in the respective scenarios considered. It takes into account the point in time to which the monetary values relate and the risk or uncertainty of anticipated future cash flows. The discount rate has a significant impact on the assessment of potential smart metering investments as the costs are incurred predominantly at the beginning of the scenarios considered whereas the smart intervention often produces benefits in the long-term.

'Cost per metering point' and 'benefit per metering point' statistics are based on numbers calculated using the net present value of the respective costs (CAPEX and OPEX) and benefits.

[273] This percentage relates to the number of measurements (as part of the data consulted) that fall within the range of the average value quoted ± the standard deviation given. The data set considered for electricity relates to the positively assessed cost-benefit analyses from 16 countries that have already completed or will proceed with large-scale roll-out.

Table 2 Summary statistics — key smart metering roll-out parameters for gas (based on Member States' long-term economic assessments) – Reference: COM(2014) 356

	Range of values	Average based on all data
Discount rate	3.1 to 10%	n.a.
Lifetime	10 to 20 years	15 - 20 years (75%)
Energy saving	0 to 7%	1.7% ± 1% (55%)
Cost per metering point	€100 to €268	€200 ± €55 (65%)
Benefit per metering point	€140 to €1000	€160 ± €30 (80%)

Table 3 Correspondence of the smart metering systems functionalities identified by M/441 with the recommended common minimum functional requirements in 2012/148/EU, for electricity, and the EED related provisions

[Extracted from SWD(2014) 189 accompanying COM(2014) 356 and updated]

SMART METERING FUNCTIONALITIES for ELECTRICITY			
M/441 additional functionalities **identified in** **CEN-CLC-ETSI TR 50572:2011** ***'Functional reference architecture for communications in smart metering systems"***		**2012/148/EU common minimum functionalities** **identified in** **EC Recommendation of 9 March 2012 *'on preparation for the roll-out of smart metering systems"*, OJ L 73 p.9**	**EED requirements specifically concerning smart electricity meters** **identified in** **Directive 2012/27/EC (Art.9(2) and 10(2))**
F1	*Remote reading of metrological register(s) and provision to designated market organisations*	***For the customer:*** *a) Provide readings directly to the customer and to any third party designated by the consumer* *b)Update the readings referred to in point (a) frequently enough to allow the information to be used to achieve energy savings* *...The rate has to be adapted to the response time of the energy-consuming or energy-producing products. The general consensus is that an update rate of every 15 minutes is needed at least.*	*"ensure that if final customers request it, metering data on their electricity input and off-take is made available to them or to a third party acting on behalf of the final customer in an easily understandable format"* *"ensure that the metering systems provide to final customers information on actual time of use..."* *"..ensure that final customers have the possibility of easy access to complementary information on historical consumption [including]..* *- cumulative data for at least the*

			three previous years or the period since the start of the supply contract if this is shorter.. *- detailed data according to the time of use for any day, week, month and year. These data shall be made available to the final customer via the internet or the meter interface for the period of at least the previous 24 months or the period since the start of the supply contract if this is shorter*
F2	*Two-way communication between the metering system and designated market organisation(s)*	***For the metering operator:*** *c) Allow remote reading of meters by the operator* *d) Provide two-way communication between the smart metering system and external networks for maintenance and control of the metering system* *e)Allow readings to be taken frequently enough for the information to be used for network planning*	
F3	*To support advanced tariffing and payment systems*	***For commercial aspects of energy supply:*** *f) Support advanced tariff systems*	
F4	*To allow remote disablement and enablement of supply and flow power limitation*	*g) Allow remote on/off control of the supply and/or flow or power limitation*	
F5	*To provide secure communication enabling the smart meter to export metrological data for display and potential analysis to the end consumer or a third party designated by the end consumer*	***For security and data protection:*** *h) Provide secure data communication* *i) Fraud prevention and detection*	*"...ensure the security of the smart meters and data communication, and the privacy of final customers, in compliance with relevant Union data protection and privacy legislation"* (reg. data and analysis, cf. also entry above, corresponding to F1)
6	*To provide information via web portal/gateway to an in-home/building display or auxiliary equipment*	*a) (...) readings provided directly from the interface of customer's choice to the customer and any third party designated by the consumer ... equipped with a standardised interface which provides visualised individual consumption data to the*	*" detailed data according to the time of use for any day, week, month and year... shall be made available to the final customer via the internet or the meter interface "*

		consumer.	
Note: The smart metering system may be used for a further important functionality: *To enable communication of AMI components with devices or gateways within the home / building used in the provision of energy efficiency and demand-side management services.*		***For distributed generation:*** *j) Provide import/export and reactive metering*	*" in the case of electricity and at the request of the final customer, they shall require meter operators to ensure that the meter or meters can account for electricity put into the grid from the final customer's premises "*

Table 4: Minimum technical and other requirements of smart meters set in legislation and/or deployed in the field for delivering customer services [Reference 2015 ACER/CEER Energy Market Monitoring Report]

	Electricity		Gas	
	Legal point of view	Practical point of view	Legal point of view	Practical point of view
Information on actual consumption	AT, BE, ES, FI, FR, GB, IT, NL, NO, PT, RO	AT, BE, DK, ES, FI, FR, GB, IE, IT, MT, NL, SE, SI,	AT, BE, DK, FR, GB, IT, NL, PT	AT, BE, DK, FR, GB, IE, IT, NL
Information on cost	ES, GB, HU, NO	DK, ES, GB, NL	DK, GB	DK, GB, NL
Access to information of consumption on customers' demand	AT, BE, ES, FI, GB, HU, IT, NL, NO, PT, RO	AT, BE, DK, ES, FI, GB, IE, IT, MT, NL, SE, SI	AT, BE, GB, NL, PT	AT, BE, GB, IE, NL
Remote power capacity reduction/increase	AT, BE, ES, FI, FR, GB, HU, IT, NL, NO, PT, RO	AT, BE, ES, FI, FR, IT, MT, NL, SI	BE, FR, GB, NL, PT	BE, DK, FR, NL
Remote activation/de-activation of supply	AT, BE, ES, FR, GB, IT, NL, NO, PT, RO	AT, BE, ES, FI, FR, GB, IE, IT, MT, NL, SE, SI	BE, FR, GB, IT, NL, PT	BE, FR, GB, IE, IT, NL
Timely adaptation to customers' demand	BE, ES, FR, NL, PT	DK, ES, FR, NL, SE	BE, FR, NL, PT	DK, FR, NL
Easier supplier switching process	AT, BE, FR, IT, NO	AT, DK, FI, FR, IE, IT, NL, SE, SI	AT, BE, FR, IT	AT, FR, IE, IT, NL
Customer control of metering data	AT, BE, FR, GB, HU, IT, NL, NO, PT	AT, BE, DK, FR, GB, IE, IT, MT, NL, SE, SI	AT, BE, FR, GB, IT, NL, PT	AT, BE, DK, FR, GB, IE, IT, NL
Bills based on actual consumption	AT, BE, ES, FI, FR, GB, IT, NL, NO, PT	AT, BE, ES, FI, FR, GB, IE, IT, MT, NL, SE, SI	AT, BE, FR, GB, IT, NL, PT	AT, BE, DK, FR, GB, IE, IT, NL
Alert in case of non-notified interruption	AT, GB, NO	AT, MT, NL	GB	NL
Alert in case of exceptional energy consumption	IT, NO, PT	GB, IT, MT, NL	PT	GB, NL
Interface with the home	AT, BE, FI, FR, GB, IT, NL, NO, PT	AT, FI, FR, GB, IE, IT, NL, SI	BE, FR, GB, IT, NL, PT	FR, GB, IE, NL
Other	BE, ES, FI, NL, SI	FI, NL	BE, FI, NL	FI, NL

Source: CEER Database, National Indicators (2015).

Table 5: Frequency of billing information based on actual consumption – 2014[Reference 2015 ACER/CEER Energy Market Monitoring Report]

	Without smart meters		With smart meters	
	Legal	In practice	Legal	In practice
Daily			FI*	
Monthly	BG, EE, LT, SE*	BG*, EE, HR**, LV*, LT, SE*	AT, EE*, ES*, PT*, SE*	FR, ES*, PT*, SE*
Bimonthly	CY*, PT**	CY*, ES*, FR, PT**	NL	NL**
Quarterly	AT, IE, NO*, PT*, RO**	DK, IE, PT*, RO	NO*	DK*, EE*, NO*
Triannually	FI	GR		
Biannually	HR, RO*, SI	HR*, MT*		
Annually	CZ, DK, GR, ES*, FR, HU, NL, PL*, SE**, SK	LU, NL, SI, SK	DK, FR, SE**	

Source: CEER Database, National Indicators (2014-2015).

*Note: * Electricity, ** Gas.*

5. ANNEX 7: DETAILS ON THE EU FRAMEWORK FOR DEMAND SIDE FLEXIBILITY (DSF)

5.1. Introduction

This evaluation aims at providing an integrated and coherent assessment of the currently existing legal provisions of relevance for Demand Side Flexibility (DSF). As such it provides the basis for the evaluation report to be prepared under the market design initiative (MDI). The evaluation focuses on DSF in the electricity system since the challenges in terms of increasing flexibility needs are less pronounced for gas, and since both the market design initiative and most of the key provisions of relevance to DSF in the Energy Efficiency Directive (EED, 2012/27/EU) and the Electricity Directive (2009/72/EC) exclusively focus on electricity.

"Demand side flexibility" is for the purpose of this document used interchangeably with "demand response" to refer to the change in electricity usage by end-users from their normal or current consumption patterns in response to changes in the price of electricity over time, or to other signals or incentive payments. Two demand response mechanisms can be distinguished:

- **price-based (or implicit) demand response** refers to consumers who choose to be exposed to time-varying electricity prices and who adjust their consumption according to real time price signals that reflect the value and cost of electricity and/or transportation in different time periods;

- **incentive-based (or explicit) demand response** refers to schemes under which participating consumers receive direct payments for changing their consumption patterns. This flexibility (or renouncement of a planned consumption) is then traded in the wholesale, balancing or capacity market. Such schemes require the presence of demand response service providers (e.g. aggregators) who initiate the changes in consumer behaviour and then aggregate and trade flexibility on the markets.

The analysis focusses on addressing the degree and speed of the deployment of Demand Response in the EU Member States. This analysis forms the basis for the work under the Impact Assessment where the expected take up of Demand Response is calculated under differernt policy scenarios and where costs/benefits are analysed that are related to this deployment.

5.2. Background to the initiative

5.2.1. *Why Demand response*

Developing demand response in electricity markets and making it an option accessible to a wide range of consumers is needed in the context of the current energy system transition. It can increase system efficiency and reduce the need for building and running peaking generation units by shifting electricity consumption away from peak hours. It can also provide cost-effective balancing for intermittent renewable generation and decrease the need for local network investments in areas with tight network capacity. A more efficient use of conventional power plants and networks and a better integration of renewables will moreover lead to primary energy savings. Finally, demand response can increase consumer surplus by financially rewarding consumers for the value of their flexibility and improving price and

non-price competition on retail markets. The graph below summarises the concrete benefits for consumers as well as for the electricity system as such.

Graph 1: benefits of demand Response across the electricity value chain

Type of Benefit	Recipient(s)	Benefit		Description / Source
Direct benefits	Customers undertaking demand response actions	Financial benefits		• Bill savings
		Reliability benefits		• Incentive payments (incentive-base demand response)
Collateral benefits	Some or all consumers	Market Impacts	Short-term	• Cost-effectively reduced marginal costs/prices during events • Cascading impacts on short term capacity requirements and LSE contract prices.
			Long-term	• Avoided (or deferred) capacity costs • Avoided (Or deferred) T&D infrastructure upgrades. • Reduced need for market interventions (e.g., price caps) through restrained market power.
		Reliability benefits		• Reduced likelihood and consequences of forced outages. • Diversified resources available to maintain system reliability.
Other benefits	• Some or all consumers • ISO/RTO • LSE	More robust retail markets		• Market-based options provide opportunities for innovation in competitive retail markets.
		Improved choice		• Customers and LSE can choose desired degree of hedging • Options for customer to manage their electicity costs, even where retail competition is prohibited.
		Market performance benefits		• Elastic demand reduces capacity for market power • Prospective demand response deters market power
		Possible environmental benefits		• Reduced emissions in systems with high-polluting peaking plants
		Energy independence/ security		• Local resources within states or regions reduce dependence on outside supply.

Source: US Department of Energy, Benefits of demand response in electricity markets and recommendations for achieving them, February 2006

While a number of studies investigated the potential for demand response, there is little evidence available as to whether this potential is fully attainable and at what cost. For example, with regards to peak demand reduction potential, which if sustained leads to lower investment in peak capacity peak, a review of the literature suggests that while demand response could conceivably in the long term shave between 15 to 20 percent from peak demand and 10 percent from energy consumption, the real response may be closer to 1 to 10 percent peak demand reduction and a 0 to 5 percent overall energy consumption reduction[274].

With regards what type of demand response has what potential, it is not clear from the literature how much of this expected peak demand response is attributable to price-based and incentive-based demand response, and within these two categories what tool would deliver what response. Nevertheless, in 2011, the US FERC noted that the vast majority (92%) of peak reduction potential of the demand side resources will come from incentive based demand response, at least in the short run, while only 8% would come from priced based programmes.

[274] Jacapo Torriti, *Peak energy demand and demand side response*, 2015.

5.2.2. *Legislative Background*

Mechanisms to remove the barriers to demand flexibility are set out in the Electricity Directive. The EED builds on those provisions and elaborates further, promoting its access to and participation in the market and the removal of existing barriers.

The Electricity Directive refers to demand response measures as a means to pursue a wide range of system benefits. The Directive clearly identifies demand response as an alternative to generation to be considered on an equal footing, e.g. when Member States are launching tendering procedures for new capacity in situations where the system adequacy is insufficient to ensure security of supply (Art. 8). The Electricity Directive also gives a wider dimension to demand response for achieving objectives of social and economic cohesion and environmental protection (Art. 3(10)). Demand response, alongside energy efficiency, is viewed as one of the measures to combat climate change and ensure security of supply.

Demand response is recognised as a means to provide ancillary services to the system in the provisions related to TSO tasks (Art. 12(d)), and demand side management/energy efficiency measures must be considered as an investment alternative in the context of distribution network development by DSOs planning for new grid capacity (Art. 25(7)).

Moreover, the Electricity Directive establishes that in order to promote energy efficiency, Member States or, where a Member State has so provided, the regulatory authority must recommend that electricity undertakings optimise the use of electricity, for example by developing innovative pricing formulas.

Effective price signals are important to encourage efficient use of energy and demand response. In this context, recital 45 of the Energy Efficiency Directive (EED) indicates that Member States should ensure that national energy regulatory authorities are able to ensure that network tariffs and regulations support dynamic pricing for demand response measures by final customers. Under Art. 15(1), Member States must ensure that network regulation and tariffs meet criteria listed in Annex XI of the EED, which i.a. refers to different possibilities for network and retail tariffs to support dynamic pricing for demand response and incentivise consumers, such as:

a) Time of use tariffs, whereby electricity prices are set for a specific time period and known in advance;
b) Critical peak pricing, which requires that time of use prices are in effect for certain peak days, where prices may reflect the cost of generating and/or purchasing at wholesale level;
c) Real time pricing, also referred to as ‘dynamic pricing’, whereby electricity prices may change as often as hourly, exceptionally more often; and
d) Peak time rebates, which are monetary rewards in exchange for participating in the market.

According to Article 15(4), Member States must ensure the removal of those incentives in transmission and distribution tariffs that might hamper participation of demand response in balancing markets and ancillary services procurement.

Under Article 15(8), in summary, Member States must comply with the following obligations:

1. Ensure that national energy regulatory authorities encourage the participation of demand side resources, including demand response, alongside supply in wholesale and retail markets.
2. Ensure – subject to technical constraints inherent in managing networks - that TSOs and DSOs treat demand response providers, including demand aggregators in a non-discriminatory way and on the basis of their technical capabilities.
3. Promote - subject to technical constraints inherent in managing networks - access to and participation of demand response in balancing, reserve and other system services markets, requiring that the technical or contractual modalities to promote participation of demand response in balancing, reserve and other system services markets - including the participation of aggregators - be defined.
4. Ensure the removal of those incentives in transmission and distribution tariffs that might hamper participation of demand response in balancing markets and ancillary services procurement. [275]

Member States had to transpose Article 15 of the EED by June 2014.

5.2.3. *Main objectives of the European legislation*

The EED recitals (44 and 45) clearly identify the main objectives of the legislator and Art 15.8 translates these objectives into regulatory action. Explicit and implicit demand response is recognised as an instrument to reduce and/or shift consumption resulting in energy savings in both final consumption and, through the more optimal use of networks and generation assets, in energy generation, transmission and distribution. As such the EED aims at improving the conditions for, and access to, demand response and clearly identifies the need for equal market entry opportunities for demand side resources alongside generation.

5.3. Evaluation Questions

The analysis in this evaluation will focuses on:

- The transposition of Art 15(8) EED. Here especially the question of the role of demand response providers and their non-discriminatory market access as well as access of flexibility products to balancing, wholesale and capacity markets will be assessed;
- Access to dynamic electricity pricing contract as a prerequisite for price based demand response.

The measures are evaluated primarily for their effectiveness, coherence and relevance, and therefore are formulated in identifying to what extent Member States have strived to

[275] See also guidance note on EED Art 15 which also covered IED elements http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52013SC0450

implement the measures and how effective and coherent those measures were. Below a number of sub-questions and issues to consider are listed that form the basis for this evaluation exercise.

General:

- To what extent have the objectives regarding Demand Response in Electricity Directive 2009/72 and EED 2012/27 been achieved?
- To what extent do the observed effects correspond to the original ambition and where there unintended impacts as well?
- Which market barriers still exist for Demand Response?
- Are the existing provisions for Demand Response sufficient for ensuring necessary levels of flexibility?

Effectiveness:

- Which differences across Member States can be observed and what are the reasons for these differences?
- Which factors guarantee a beneficial deployment of Demand Response?
- Can the benefits of Demand Response be quantified in those Member States were Demand Response took off? Are the quantifiable effects in countries outside the EU?
- On whom (which stakeholder, incl. consumers) did the benefits/costs fall, and was the sharing of costs/benefits the same in all Member States?

Relevance

- To what extent have the (original) objectives proven to have been appropriate for the intervention in question?
- How well do the (original) objectives (still) correspond to the needs within the EU?
- How well adapted is the intervention to subsequent technological or scientific advances?
- Do current regulations ensure that final consumers can actively participate in the market?

Coherence

- To what extent is this intervention coherent with other interventions which have similar objectives in particular EED, EPBD, upcoming MDI ?
- To what extent is the intervention coherent internally?

EU-added value

- What is the additional value resulting from the EU intervention(s), compared to what could be achieved by Member States at national and/or regional levels?

- To what extent do the issues addressed by the intervention continue to require action at EU level?
- What is the cross border dimension of Demand Response?
- What would be the most likely consequences of stopping or withdrawing the existing EU intervention?

Other evaluation criteria

- Utility: To what extent do the changes/effects of an intervention satisfy (or not) stakeholders' needs? How much does the degree of satisfaction differ according to the different stakeholder groups?

5.4. Method

This evaluation has been carried out in-house by the Commission services. The evaluation covers measures addressed in both, in the Energy Efficiency Directive and Electricity Directive. The following data sources were used:

- 2013 SWD on "Incorporating demand side flexibility, in particular demand response, in electricity Markets" (from electricity market intervention package)[276]
- Smart Grids Task Force (Expert Group 3) report: "Regulatory Recommendations for the Deployment of Flexibility"
- Initial legal contractor's checks of EED transposition limited so far on communication / non communication legal contractor's conformity checks of Electricity Directive transposition
- JRC report on DR "Demand Response status in EU Member States" (2016)
- ACER/CEER: Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2014
- Concerted Actions Joint Working Group report on DSF
- External stakeholder reports on DR/DSF in Europe, such as SEDC's report "Mapping Demand Response in Europe today"
- Impact Assessment support Study on downstream flexibility, demand response and smart metering, COWI, 2016

Information has also been gathered through direct stakeholder input, e.g.

- Responses to the Commission's communication "Launching the public consultation process on new energy market design".
- Workshop on Status, Barriers and Incentives to Demand Response in EU Member States, organised be the European Commission on 23 October 2015.
- Smart Grids Task Force, Expert Group 3 workshop on market design for demand response and self-consumption, March 2, 2016
- Florence Forum, Session on demand response June 13, 2016

[276] http://ec.europa.eu/energy/sites/ener/files/documents/com_2013_public_intervention_swd07_en.pdf

5.5. Implementation / state of play

5.5.1. *Implementation of EU legislation in Member States*

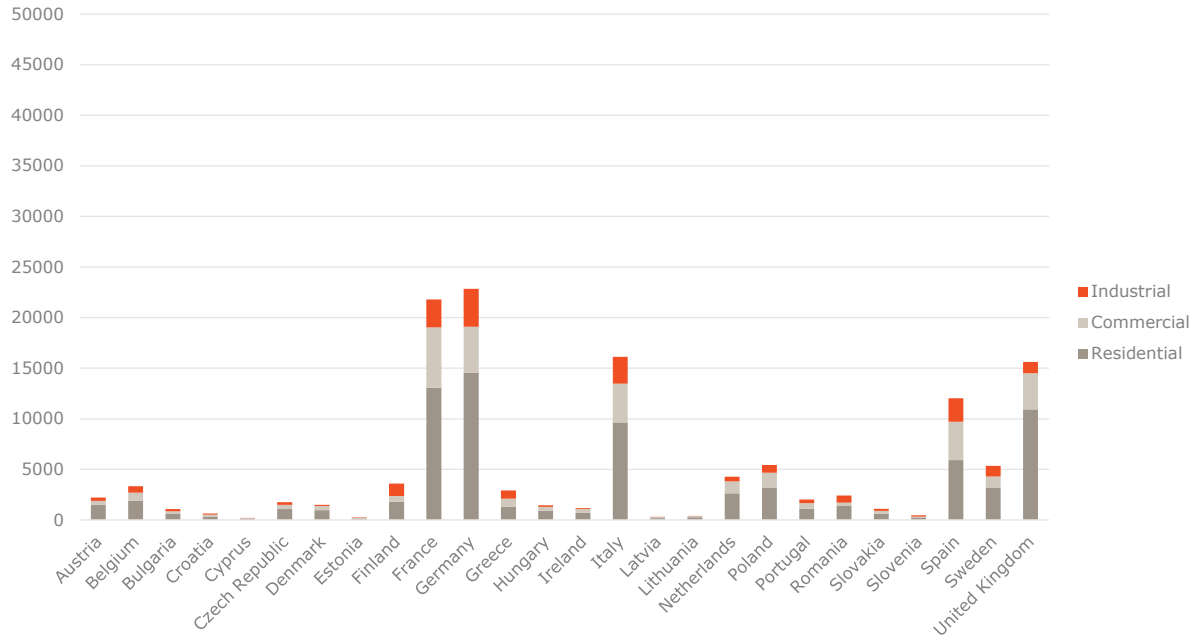
Member States have transposed the provisions of the EED in different national legal acts. While a full transposition check has not yet been carried out it can already be seen that different national provisions have led to a fragmented European market on demand response with different rules and market opportunities for (independent) demand response service providers, different market arrangements between service providers and balancing responsible parties (including compensation payments) and different rules for trading flexibility in the balancing, wholesale and capacity markets. Accordingly, demand response has only taken off in a limited number of Member States and its potential remains largely untapped.

5.6. Uptake of Demand response in MS

5.6.1. *Theoretical potential of Demand Response*

The current theoretical potential of demand response adds up approximately 120 GW. It is predicted to increase to approx. 160 GW in 2030[277] and will lay mainly with residential consumers. However, the potential for 2030 will greatly depend on the uptake of new flexible loads such as electric vehicles and heat pumps in the residential sector.

Graph 2: Theoretical demand response potential 2016



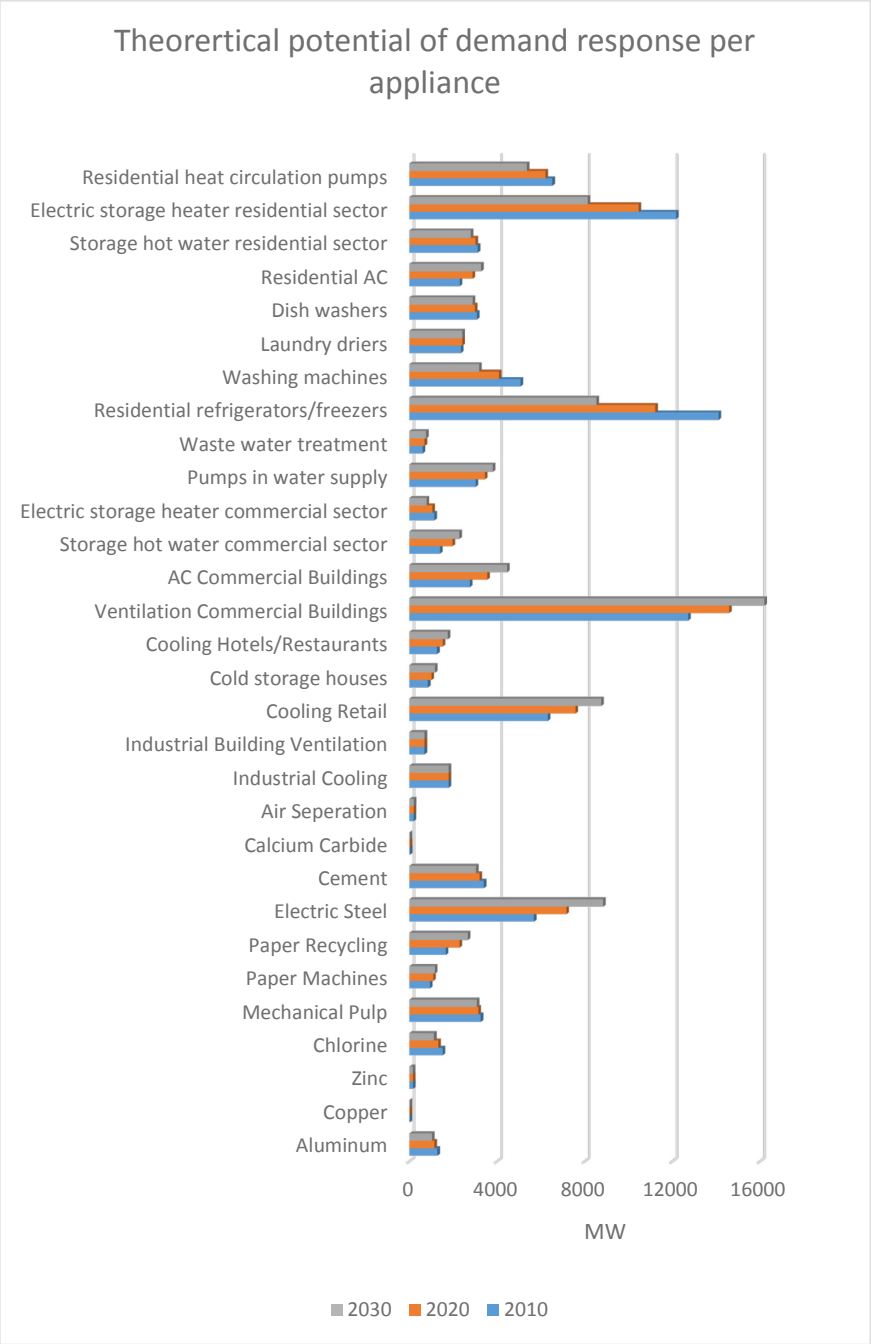
Source: Impact Assessment support Study on downstream flexibility, demand response and smart metering, COWI, 2016

A detailed analysis of the loads that can be shifted and hence be activated under demand response schemes has been conducted in preparation of this evaluation and its related impact

[277] Impact Assessment support Study on downstream flexibility, demand response and smart metering, COWI, 2016

assessment. This analysis has shown that for the industrial sector demand response is mainly related to flexible loads in electric steel makings. In the commercial sector, a high theoretical potential exist for ventilation of commercial buildings while in the residential sector mainly freezers and refrigerators, and the electric heater with storage capacity show a high theoretical potential.

Graph 3: Theoretical potential of demand response per appliance



Source: Impact Assessment support Study on downstream flexibility, demand response and smart metering, COWI, 2016

5.6.2. *Current Situation in Member States*

The EU Demand Response market is still in its early development phase, and this early development has proceeded very differently across Member States. Apart from the fact that Member States still show varying levels of market opening and unequal market structures; Member States have also chosen different approaches to make use of demand side flexibility and to implement demand response. In fact, while Article 15.8 of the EED formulates important principles for the market access of demand service providers and demand side products it has left substantial freedom for Member States to implement these.

In this chapter the main drivers for demand response are analysed. A detailed analysis per Member State is provided in the documents "Demand Response status in EU Member States" and in the "impact assessment study on downstream flexibility, price flexibility, demand response & smart metering".

Explicit Demand Response

For explicit demand response, full customer participation in the electricity markets is a prerequisite as addressed in the relevant provisions of the EED. However, because of its complexity only very large industrial consumers can directly engage in the electricity markets while commercial and residential consumers will in most of the cases need to go through demand response service providers (aggregators). This requires fair market access for such aggregators and open balancing, wholesale and capacity markets for flexibility products as well as for aggregated loads.

a) Market Access for aggregators

The EED stipulates that demand response providers (including aggregators) have to be treated in a non-discriminatory manner. However, market access and market rules for aggregators are regulated differently across Europe. In order to ensure full access to the market at least the following main features should be addressed in national regulation:

- Clear definition of roles and responsibilities of aggregators within the energy market to ensure legal certainty;
- Clear definition of the relationship between aggregators and Balancing Responsible Partiess (BRP) that ensures market access of the aggregators at fair conditions. Such rules are essential to ensure that the BRP (which is often the supplier) has no means of stopping a competitor (e.g. independent aggregator) for engaging with one of its customers.

In many Member States such a framework for aggregators is effectively missing or independent aggregation is legally banned. This applies for Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece Italy, Malta, Portugal, Spain and Slovakia. But also in Member States where legislation for aggregators and demand response has been established many differences can be noted.

To date, France is the only Member State that developed a complete framework for demand response explicitly enabling independent aggregation by guaranteeing contractual freedom between the consumer and the aggregator without supplier's consent. A standardised framework also exists for the compensation mechanisms, however, it is claimed by

independent aggregators that this mechanism greatly penalises the aggregator, overcompensates the BRP and hence renders the business case for independent aggregators negative.

Other Member States allow (independent) aggregation but at varying degrees. Independent aggregators are allowed in Belgium, IRE, UK, Germany and Austria albeit not all markets are effectively opened to them as rules, e.g. in Austria, effectively limit their activity to aggregate loads of big consumers. In some MS like PL, NL and in the Nordic markets aggregators have also to become suppliers or offer their services jointly with suppliers but cannot act as completely independent service providers. In all MS apart from France, UK and Ireland, explicit consent of the consumer's supplier is required for aggregators to enter into the market. Equally, in those MS a clear framework for compensation payments is missing and such payments need to be individually negotiated. As such the incumbent supplier ha smeans to effectively block market access at least for independent aggregators.

In those MS where regulation on DR and aggregators has been put in place, it has been implemented in line with the provisions of the EED that does not make explicit reference to independent aggregators. At the same time it is noted that demand response only takes off in those MS were independent aggregators are active as suppliers seem to have little incentive to enter the DR market by themselves or through aggregators.

b) Access of flexibility to the markets

The EED requires Member States to promote access to and participation of demand response in balancing, reserve and other system services markets inter alia by engaging the national authorities (or where relevant, the TSOs and DSOs) to define technical modalities on the basis of the technical requirements of these markets and the capabilities of demand response; these specifications must include the participation of aggregators.

Technical modalities or requirements can be for example the minimum size of a load, the activation time or the duration for which a product needs to be provided. Traditionally, requirements have been designed along the capacities of big generation units, e.g. coal power plants, thus demand side products naturally face problems to meet these requirements, even if aggregated. Another aspect is that prequalification requirements often have to be fulfilled per unit and not at the aggregated level. As the following stock-taking will show, access of demand resources to the wholesale, balancing and recently capacity markets varies considerably across Member States.

The analysis of the status quo suggests that in most of the Member States access to the markets is either up-front restricted or preconditions make it difficult for demand side products to qualify and compete. In roughly only a third of the Member States demand side products have fair access to the markets and in even fewer Member States demand response is actually happening. Generally, the balancing markets tend to be more open to demand side products than the wholesale markets.

In many Member States, electricity markets are still not fully liberalised and remainders of monopolistic structures persist, or there are no functioning wholesale and balancing markets in place at all. Accordingly, demand side resources do not play any role in these countries. Examples for this situation would be Cyprus, Malta and Croatia. Size is a very important aspect, too. Luxemburg for example has a joint balancing market with Germany, thus would need to organise the access of demand response products with the German TSO, for which the

structures have not yet been established. Having said this, also small countries are able to explore new ways and implement innovative solutions, like Estonia, where the TSO set up a data sharing platform which eventually should also be used to facilitate demand response.

But also in many other Member States markets are practically closed and allow for only very restricted participation of the demand side. Often it is only suppliers or big industrial actors that are allowed to bid in the markets. In those cases, there are usually very specific demand flexibility programmes for selected, mainly very large, actors. For example, in Italy, Spain and Greece interruptibility programmes have been or are being introduced for large industrial loads. In Italy, these kinds of programmes exist for decades but have been used only rarely; in Spain the programme will only be launched in 2016. The interruptibility programme in Greece is linked to a clear and reasonable framework which - if it was extended to smaller costumers connected to the lower voltage grids – could be a good starting point. In Bulgaria, Voluntary Agreements between the state agency on the one hand and suppliers and large industrial customers on the other are envisaged to involve the demand side and this for both, the wholesale and balancing markets. In Portugal, a handful of very large consumers participate in the markets; they can even be obliged to shed load in case of system events. A special case is the Czech Republic where a ripple control mechanism for household electric appliances was introduced in the 60es to which 40% of the Czech consumers have subscribed but which hampers the deployment of state-of-the-art smart technologies.

Other countries are one step ahead and have partly opened their markets, while practical barriers still hamper the market access. The balancing market in Germany for example is in principle open to demand loads, but heavy prequalification (e.g. extensive testing) and programme requirements (e.g. bid size) block any major DR-activity. Similarly, practical barriers, in particular for aggregated demand, hamper access to the – theoretically open – balancing markets in Slovenia and Denmark and to some degree also in Sweden. Prequalification procedures and very small remuneration make participation also in Poland's balancing market unattractive; however, Poland has lately introduced an Emergency Demand Response Programme which considers specifically demand side resources. The Netherlands offer some possibilities for demand flexibility provided by retailers to be traded at the wholesale markets; for the balancing markets there are specific Reserve programmes that involve (for big consumers even mandatory) participation of demand side resources. Austria has opened its balancing market to demand response services, but the design of the technical requirements favour large generators.

There is a group of countries where demand response has already assumed a more important role. Belgium for example adapted their technical requirements and offers quite a large range of possibilities for demand side resources to participate in the balancing and ancillary markets; however some barriers in particular for aggregated load persist while the wholesale market remains almost fully closed. A different, but interesting case is Finland which is, together with France and UK, one of the three countries where demand side participation expands to households and the commercial sector (mainly through steering refrigeration appliances).

In a slightly different set-up, up-coming capacity markets - while having the potential to undermine the business case for demand response - can offer new possibilities to demand side participation. In Ireland for example, so-called prequalified Demand Side Units (DSU) can receive capacity payments. Italy too has introduced a new regulation in 2014 which foresees the participation of demand side resources; Greece is currently evaluating the possibility to

establish a capacity mechanism with a strong role of demand response. Also the UK's capacity market is open to demand side bidding; however, the actual design of the requirements has overall led to a decrease of demand side participation within the capacity market. More broadly, UK is the only Member States where the volume of demand response decreased between 2014 and 2015.

Still, UK is one of the few countries where demand response has reached a significant volume. The market for ancillary services is open to Demand response and a dedicated Demand Side Balancing Reserve mechanism was established in 2015. Meanwhile, France has become probably the Member State with the broadest general access of demand response to both, the balancing and the wholesale market. A general framework is in place that facilitates demand side participation, which has started to trigger a real activity.

Demand Response is participating in many Member states in the wholeseale energy markets. The energy markets may represent the highest Demand Response volumes and has been proved to represent over 10 per cent of peak load in the Nordic markets in terms of volumes of price sensitive bids in high price periods with high risk of price peaks. In periods with low prices and low risk of price peaks, the price sensivtive bids may be less than 1 per cent as shown for the German/Austrian, French and Sanish/Portugees markets. This shows that DR participation the wholesale markets is very dependent on specific conditions in each MS.

Table 1 below summarizes the amount of incentive based DR found in Member States. Currently there is no common European methodology to calculate and report Demand Response participation in the different markets. However, the actual volumes as stated in literature from 12 Member States is about 15 GW. For Member States that allow incentive based DR but where no data on volumes is available conservative estimated have been inroduced. It should also be noted that not all volumes reported in the table below are active in the markets as some volumes are only offered but rarely activated (this is especially true for Italy and Spain where high volumes are reported tha are not activiated).

Table 1: Uptake of incentive based Demand Response

MS	DR in energy markets	DR in balancing markets	DR in capcity mechanisms	Current Estimated DR in MW
Austria	Yes	Yes		104
Belgium	Yes	Yes	Yes	689
Bulgaria	No	No		0
Croatia	No	No		0
Cyprus	No market	No market		0
Czech Republic	Yes	Yes		49
Denmark	Yes	Yes		566
Estonia	Yes	No		0
Finland	Yes	Yes	Yes	810
France	Yes	Yes	Yes	1689
Germany	Yes	Yes	Yes	860
Greece	No (2015)	No		1527
Hungary	Yes	Yes		30
Ireland	Yes	Yes	Yes	48
Italy	Yes	No	Yes	4131
Latvia	Yes	No	Yes	7
Lithuania	unclear	No		0
Luxembourg	No information	No information		
Malta	No market	No market		
Netherlands	Yes	Yes		170
Poland	Yes	Yes	No	228
Portugal	Yes	No		40
Romania	Yes	Yes		79
Slovakia	Yes	Yes		40
Slovenia	No	Yes		21
Spain	Yes	No	Yes	2083
Sweden	Yes	Yes	Yes	666
UK	Yes	Yes	Yes	1792
Total				**15628**

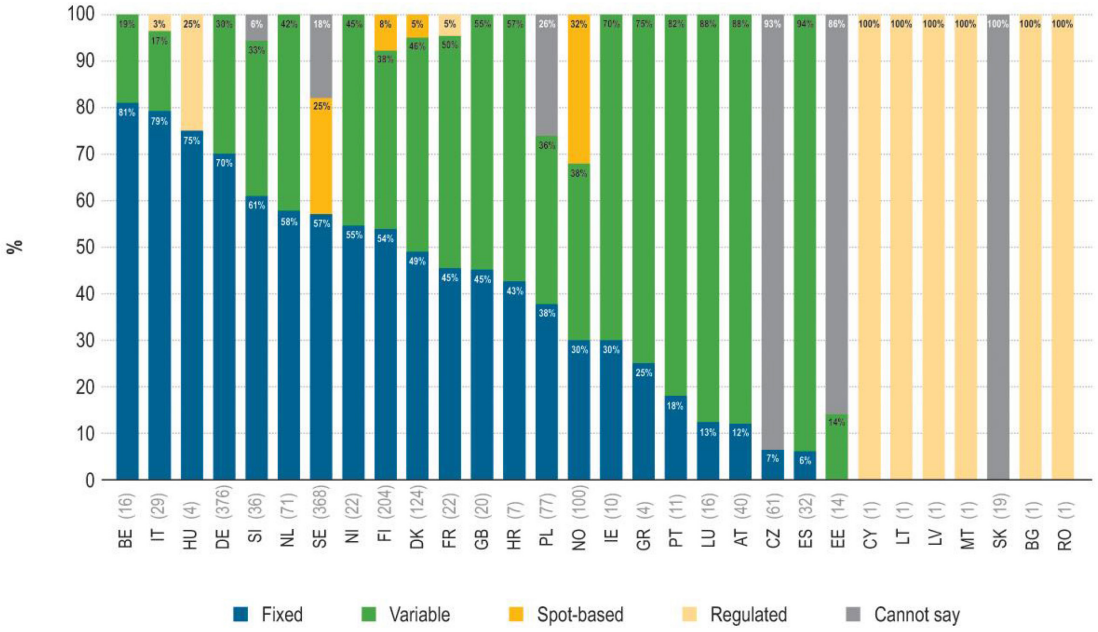
Source: Impact Assessment support Study on downstream flexibility, demand response and smart metering, COWI, 2016

Implicit Demand Response

For implicit Demand Response, smart metering systems as well as the availability of dynamic pricing contracts linked to the wholesale market are prerequisites. For smart metering systems roll out plans exist for 17 MS, while in 2 MS a partial roll out is planned and in many of those MS the functionalities of the smart metering systems (communication interfaces, update intervals, etc.) may not allow for automatically reacting to price signals (a complete analysis is provided within the evaluation fiche on smart metering). EU legislation does currently not impose any requirements on Member States to activating price based (or implicit) demand

response. In order to activate price based DR the availability of dynamic electricity pricing offers are a prerequisite to incentivise consumers to adjust their consumption according to the real time price signal. The ACER/CEER Market monitoring report contains a dedicated analysis of the competition situation in all MS in the retail market and the different offers available to the customers. This analysis shows that only in Denmark, Sweden and Finland dynamic pricing contracts that are linked to the spot market are available to residential consumers while only in Sweden and Norway such contracts represent more than 10% of all consumer contracts. In terms of costs for the consumers the ACER/CEER analysis shows that offers linked to the spot market are slightly cheaper for the consumer than fixed or variable offers in the same country.

Graph 4: Type of energy pricing of electricity offers in EU MSs capital cities



Source: ACER/CEER market monitoring report (2014)

In addition to the three MS mentioned also in Estonia, Spain, Austria, Belgium, Netherlands and Germany dynamic pricing contracts are available on the market – at least for certain consumer groups - which were not yet included in ACER/CEER analysis. However, the uptake of such tariffs is currently very low (see table 9 in the annex of this evaluation for details on availability of dynamic and time of use tariffs in Member States).

As a high level estimate for EU, studies and data support current load shifting due to price based Demand Response (dynamic prices and Time of Use (ToU) prices) ranging from negligible (most Member States), to around 1% (most Northern European Countries) to 6-7% (Finland and France, in te latter only ToU tariffs are available). If a value of 1% is applied for Northern European countries and those with some reported Demand Response (e.g., Spain) and 6% for Finland and France, the overall load that is shifted due to dynamic and ToU tariffs to date would be of the order of 5.7GW or 1.2% of peak load. The approx. 5.7 GW demand response through dynamic and times of use tariff only represents less than 10% of the potential of more than 70 GW potential for residential and commercial consumers.

Table 2: Estimate of theoretic residential and small commercial load reduction potential

Member State	**MW**
Austria	1284
Belgium	1775
Bulgaria	644
Croatia	394
Cyprus	134
Czech Republic	1123
Denmark	972
Estonia	173
Finland	1610
France	11551
Germany	12869
Greece	1565
Hungary	1008
Ireland	681
Italy	9303
Latvia	220
Lithuania	302
Luxembourg	80
Malta	61
Netherlands	2557
Poland	3534
Portugal	1165
Romania	1449
Slovakia	692
Slovenia	261
Spain	6623
Sweden	2984
UK	9788
TOTAL	**74802**

Source: Impact Assessment support Study on downstream flexibility, demand response and smart metering, COWI, 2016

The analysis shows that price based demand response is currently only possible in very few Member States and that in the vast majority of MS at least residential consumers are effectively deprived from participating in implicit demand response schemes that can be beneficial to them. As such it can be concluded that the policy objective to activate implicit Demand Response across the EU has not been reached.

Market Barriers for Demand Response

Explicit Demand Response

One main barrier for explicit demand response results from non-favourable conditions for independent aggregators to access the market. In the majority of Member States consumer access to Demand Response service providers is problematic; unless they are seeking the services of their current supplier. Consumers have the right to select any third party provider of, for example, energy management services. However, in most European markets,

consumers cannot choose a separate services provider for providing Demand Response at least not without the supplier's consent. They are therefore restricted to their supplier, or depend on their supplier's permission before entering into a contract with a third party aggregator. Often the supplier is in direct competition with the aggregator, or as an owner of generation assets may have little interest in uptake of Demand Response, and thus has an incentive to block the aggregator from doing business with the consumer.

In the majority of the countries examined, the roles and responsibilities are unclear, and do not allow for direct access of consumers to service providers, therefore they do not offer them a clear path to market. There is therefore an urgent need to clarify the role of new market participants, such as third party aggregators, and their interaction with existing market participants, such as BRPs/suppliers when helping consumers sell their flexibility into the market.

A further market barrier is the access of flexibility products to the balancing, wholesale and capacity markets. As already outlined before, technical requirements or "modalities" (as referred to in the EED expressing that not only technical specifications - "values" - but also procedures and involvement of actors are included) determine the access possibilities of demand side products. This starts with the procedures a product or service must undergo to qualify for the participation in the markets, for example measurement and verification procedures. If single demand side units have to meet the same procedures as large generation units, disproportionate costs and efforts will diminish the business case. But also the criteria for the product itself can facilitate or otherwise de facto rule out participation. For example, the minimum bid size (or in other words, the minimum size of the sheddable load) is one of the requirements that typically exclude flexibility provided by residential and commercial consumers in many markets. Moreover, very short call (activation) times of a few seconds or excessive delivery periods shut out demand side participation as demand side patterns can hardly match these requirements[278]. The EED therefore required the definition of technical modalities that would meet the capabilities of demand response. A basic question is for many of the requirements whether they need to be met at individual or at aggregated level. This has in particular an impact on the fulfillment of the load size requirements but also the prequalification (measurement and testing) procedures for example become more proportionate if they don't have to be carried out for every unit.

Implicit Demand Response

In order to activate implicit demand response, access has to be guaranteed to fully functional smart metering systems and to dynamic pricing contracts that are linked to the wholesale market (e.g. spot market) and therefore give a real team price signal. The roll out of smart metering system is not market driven, but depends on corresponding Member State decisions. The status of the roll out and the barriers are analysed in a separate evaluation document.

Dynamic pricing contracts will only be offered in those MS where a sufficient number of consumers has a smart meter with the required functionalities (at least hourly update intervals, etc.). The roll out of such meters has only been completed in the Nordic countries, where

[278] The European standard full activation time is 30 seconds which is usually well sufficient for demand side products to respond. The standard delivery period in the balancing markets should be 15 minutes while in the reserve markets 1-2 hours would be appropriate (in some countries up to 12 hours are requested). Minimum sheddable loads are often established at 5 MW and above which can only be met by large industrial sites or generation plants.

some suppliers already started offering dynamic pricing contracts without any specific regulatory incentive. Those contracts are on average cheaper for the consumers than fixed price contracts (see also chapter 6.1) as they do not have to pay a risk premium to the supplier for fluctuating market prices. Those contracts are also more attractive to the suppliers, because they are no longer exposed to the risk of fluctuating prices at the wholesale market. It can therefore be concluded that in a competitive retail market dynamic pricing contracts will be offered by suppliers once fit for purpose smart metering systems are in place. However, in less competitive retail markets such offers may not develop without regulatory intervention as incumbents may generate profit by charging a high risk premium to their consumers.

5.7. Answers to the evaluation questions (Assessment of current situation)

General

To what extent have the objectives regarding Demand Response in Electricity Directive 2009/72 and EED 2012/27 been achieved? To what extent do the observed effects correspond to the original ambition and where there unintended impacts as well?

The EED recitals (44 and 45) clearly identify explicit and implicit demand response as an important instrument for improving energy efficiency. It is aimed at an instrument to reduce and/or shift consumption resulting in energy savings in both final consumption and, through the more optimal use of networks and generation assets, in energy generation, transmission and distribution. As such the EED aimed at improving the conditions for, and access to, demand response by ensuring that NRAs are able to ensure that network tariffs and regulations incentivise improvements in energy efficiency and support dynamic pricing. The directive clearly identifies the need for equal market entry opportunities for demand side resources alongside generation.

Market Access for aggregators

According to SEDC's report "Mapping Demand Response in Europe today" 5 MS (France, Belgium, Finland, Ireland, Great Britain) have reached a level where demand response is a commercially viable product. However, only France has fully enabled independent aggregation by establishing standardised arrangements between BRP and aggregator. In 3 MS (Sweden, Netherlands, Austria) independent aggregation is established, but still faces significant barriers. In most other MS only preliminary developments in opening the markets for demand response and independent aggregation can be observed while in some MS independent aggregators are effectively banned.

The reasons for the slow development are plentiful and vary from Member State to Member State. One common obstacle found across Member States is the need to treat demand response as a generation source (as required for explicit demand response) that leads to a considerable increase in the complexity of the overall market design that needs to be regulated. The existing European provisions in the EED may not be sufficiently detailed to guide Member States to develop all of those aspects in their national regulatory framework.

However, some progress can be noted in comparison with an earlier assessment in 2013. Those eight MS where commercial offers for DR exist, made significant progress in opening the markets as envisaged by the provisions of the EED while in some other MS also early developments can be noted. As such it can be concluded that the provisions in the EED indeed helped to open up the electricity markets to consumers but that they have not yet proved

sufficiently detailed to guarantee this opening across all Member State and provide a level playing field for demand response service providers in all Member States.

Access of flexibility products to the wholesale market

Overall, positive trends can be observed and quite some Member States have either recently adapted their requirements for demand side products, or evaluate and even plan to implement additional mechanisms that would involve demand side resources; this seems to happen mainly with a view to the balancing, and in some cases, capacity markets. Yet, the markets develop still rather slowly and in a little systematic, heterogenic way.

The EED requires Member States to ensure the definition of technical modalities through their National Regulatory Authorities (NRA) or system operators. Accordingly, these requirements would typically be developed and applied at the level of the national markets, which at a longer-term perspective might be insufficient to deploy demand response at EU scale.

A first step to align technical specifications was made in the draft Demand Connection Code (DCC) which is foreseen to lay down *inter alia* requirements for the grid connection of equipment providing demand side response services to system operators. The Code defines for example voltage and frequency ranges within which demand side equipment must be capable to operate to be eligible for TSO procurement. The EED-provisions and principles have been considered during the development of the draft DCC, notably regarding the role of aggregators and the validity of aggregated load as a reference unit.

The positive trends and the recognition of the role of the demand side in the energy system have certainly been supported by the EED-provisions which put the relevance and the potential of demand side resources into the right perspective. An increased interest in demand response will however also be triggered by the actual needs of the Member State to cope with new generation and consumption patterns.

Consumer access to dynamic electricity price contracts linked to the wholesale market

There is currently limited evidence of consumers directly adjusting their consumption according to market developments. Most of this activity can be found in France where many residential consumers are on Time of Use (ToU) tariffs and approx. 6% of the load is shifted. However, price based demand response on the basis of fluctuating retail prices requires specific conditions:

- a relevant price difference between peak and off-peak prices that are passed on to consumers;
- Consumers have access to appliances that permit consumers to easily shift usage from peak periods to off peak periods, which currently are electric heating, thermal uses such as water boilers and in the future will also include electric vehicles, heat pumps and storage:;
- Fully functional Smart Metering systems are installed

These conditions are currently most prevalent in Finland, where there is a sufficient difference between on-peak and off-peak electricity prices, and many customers have appliances like electric heaters and hot water tanks, that make it beneficial to shift demand to off-period periods. Moreover, fully functional smart meters have been rolled out in Finland that allow for accurate metering adjusted to the intervals of price adjustments. However, as pointed out

in chapter 5.6 dynamic electricity price contracts to residential consumers are only available in very few Member States.

Which market barriers still exist for DR?

According to available documents and the stakeholder responses to the Commission's communication "Launching the public consultation process on new energy market design", the following main market barriers can be identified:

For explicit demand response:

- Clear definition of roles/responsibilities for aggregators are missing in many Member States (e.g. in terms of market access and balancing responsibility);
- independent aggregation remains forbidden in some MS
- Even when roles and responsibilities are defined many Member States restrict aggregation to suppliers or at least require the consent of the supplier. This effectively forms a market barrier for independent aggregators and hence competition. However, in those Member States where independent aggregators have no access to the market Demand Response is often not offered by the incumbent supplier which suggests that independent aggregators are indeed needed for exploiting the full potential of Demand Response;
- In those Member States where independent aggregation is enabled undue compensation payments that overcompensate the BRP can risk to render the business case for independent aggregators negative;
- Access of flexibility products to balancing, wholesale and capacity markets is limited in many Member States.

For implicit Demand response:

- Access to smart metering systems with the full set of functionalities (addressed under the smart meter evaluation) is currently not available to most consumers. According to MS roll out plans less than 70% of consumers will have a fully fit for purpose smart meter installed by 2020;
- Access to dynamic electricity pricing contracts linked to the spot market is only available in very few MS. However, in competitive retail markets it is likely that such contracts will be offered when smart meters will have been rolled out.

Are the existing provisions in EU legislation for DR sufficient for ensuring necessary levels of flexibility?

The uptake of demand response within the EU has been slow compared to for examples the US and Australia. While this can partly be explained by different market conditions, e.g. existing overcapacities in the EU compared to shortages in the US and more complicated attribution of benefits due to the European unbundling regime, many additional market barriers exist in the EU (see above and chapter 5.6). Those market barriers can persist also in those MS that correctly transposed the EED. This is especially relevant for market access of independent aggregators that play an important role in developing flexibility services as experiences from the US and Australia but also from France and Switzerland have shown.

While the EED recognises the important role aggregators can play in the market, the directive does not make any specific reference to independent aggregators. It remains to be verified whether this leaves scope for Member States to link the role of aggregation to the supplier and thereby effectively ban independent aggregators. To ensure the uptake of demand response it may therefore be necessary to explicitly allow independent aggregation and guarantee fair market access through European legislation.

As regards the access of demand side products to the balancing and other system services markets, positive trends can be observed. Member States seem to increasingly consider demand response as a real option to optimise their energy system. However, the opening of the markets and the adaptation of requirements along the capabilities of demand side products often happen in a little systematic way and overall too slowly. Moreover and in the longer term, technical requirements should eventually not be developed for and applied at the national markets but should be coordinated and finally harmonised to enable cross-border demand response in integrated energy markets.

For price based demand response the key will be the roll out of fully fit for purpose smart metering systems. Once those smart meters are available experience from the Nordic market has shown that suppliers will offer dynamic pricing contracts as it reduces the risk for the supplier and can be offered at favourable conditions to the consumer. This can then provide the basis for consumers to participate in Demand Response. However, many EU retail markets are not fully competitive and incumbent suppliers still have a great market share and/or prices are regulated. In those markets more legislative intervention may be required to enforce the offering of dynamic pricing contracts.

Effectiveness:

Which differences across MS can be observed and what are the reasons for these differences?

In terms of potential for demand response great differences exist across Member States with respect to for example:

- Industrial structure in Member States
- Availability of flexible loads, such electric heating, heat pumps, air conditioning in residential and commercial buildings, electric vehicles, etc.

The extent to which demand response potential is being used highly depends on the legislative framework in each Member State. As described in chapter 5, significant differences across Member States can be observed in many aspects related to DR:

- The role of (independent) aggregators within the electricity system
- The relationship or contractual framework between aggregator and BRP
- Access of flexibility products to the wholesale, balancing and capacity markets
- Roll out of fit for purpose smart metering systems
- Access to dynamic electricity prices for consumers

The Smart energy Demand Coalition (SEDC) assessed 14 established EU and two non-EU electricity markets and ranked them in accordance with the following success criteria for explicit demand response:

- Consumer Access and Aggregation
- Programme Description and Requirements
- Measurement and Verification
- Finance and Penalties

Table 3: Classification of success criteria for demand response

Score	Consumer Access and Aggregation	Programme Description and Requirements	Measurement and Verification	Finance and Penalties
5	Aggregated load is accepted in a range of markets, standardised arrangements between involved parties are in place – enabled through an independent third party	Programme requirements adjusted to enable a range of resources (supply and demand) to participate in multiple markets	Requirements are well defined, standardised, proportionate to customer capabilities, and dealt with at the aggregated level	Payment is fair and penalties are reasonable
3	Aggregated load is accepted only in limited number of markets, lack of standardised arrangements between involved parties	Minor barriers to demand-side participation in market remain, however participation is still possible	Requirements are under development, but do not act as a significant barrier	Payment is adequate, but unequal per MW between supply and demand; Penalty structures create risk issues for service providers, but participation is still possible
1	Aggregated load is accepted only in one or two programmes, lack of standardised arrangements between involved parties	Significant barriers remain, creating major competition issues for demand-side resource participation	Requirements act as a significant barrier to consumer participation	Payment structures seem inadequate, unequal pay per MW between supply and demand, penalty structures create high risk issues
0	Load is not accepted as a resource in any market	Programme requirements block demand-side participation	There are no measurement and verification rules for Demand Response participation	Payment structure inadequate and non-transparent; penalty structures act as a critical barrier

Source: SEDC's report "Mapping Demand Response in Europe today", SEDC, 2015

In short, the SEDC's list of best practices would be based on:

- Aggregated load being accepted in a range of markets and standardised arrangements between involved parties put in place (enabled through an independent third party)

- Programme requirements are adjusted to enable a range of resources (supply and demand) to participate in multiple markets
- Requirements that are well defined, standardised, proportionate to customer capabilities, and dealt with at the aggregated level
- Payment is 'fair' and penalties are reasonable

Their overall results by Member States are presented in the figure below.

Table 4: SEDC assessment of performance of Member States with regards to incentive based demand response

2015					
	Consumer Access	Programme Requirements	Measurement & Verification	Finance & Penalties	Overall
Austria	1	3	3	3	10
Belgium	1	5	1	5	12
Denmark	1	1	3	3	8
Finland	1	3	3	5	12
France	5	3	5	3	★ 16
Germany	1	1	1	3	6
Great Britain	3	3	3	3	12
Ireland	3	3	1	5	12
Italy	0	1	1	1	3
Netherlands	1	3	3	3	10
Norway	1	3	1	5	10
Poland	1	1	1	1	4
Slovenia	1	1	1	3	6
Spain	0	1	0	1	2
Sweden	1	3	3	3	10
Switzerland	5	1	5	5	★ 16
Overall	26	36	35	52	149
Max score	80	80	80	80	320

Source: SEDC's report "Mapping Demand Response in Europe today", SEDC, 2015

As can be seen above, according to the SEDC, even those countries with the most favourable market rules in place do not score highly on all issues. Therefore this analysis would infer that market rules can be improved in all of the countries surveyed. In addition, the paper notes that progress towards greater demand response cannot be assumed and that some countries, in their opinion, are at risk of taking a step back.

The forerunners in demand response include Belgium, Ireland, France, UK and Finland. These are also those Member States that already have a higher share of demand response in their market. Italy and Spain are specific cases where a relevant share of demand response is present at the market but not activated. It can therefore be concluded that a solid legal framework is indeed a necessity for demand response to take off.

Table 5: Current Demand response activation in MW

Member State	Price based Demand Response	Incentive Based Demand Response	Total Demand Response
Austria	94	104	198
Belgium	130	689	819
Bulgaria	54	0	54
Croatia	34	0	34
Cyprus	12	0	12
Czech Republic	93	49	142
Denmark	78	566	644
Estonia	15	0	15
Finland	140	810	950
France	841	1689	2530
Germany	930	860	1790
Greece	137	1527	1664
Hungary	88	30	118
Ireland	49	48	97
Italy	699	4131	4830
Latvia	19	7	26
Lithuania	27	0	27
Netherlands	195	170	365
Poland	306	228	534
Portugal	90	40	130
Romania	128	79	207
Slovakia	60	40	100
Slovenia	22	21	43
Spain	537	2083	2620
Sweden	269	666	935
UK	733	1792	2525
TOTAL in MW	5779	15628	21407

Source: Impact Assessment support Study on downstream flexibility, demand response and smart metering, COWI, 2016

Which factors guarantee a beneficial deployment of DR?

According to the results of the analysis as presented in the previous chapter and according experiences in the US, Australia and New Zealand, most importantly, clear rules for Demand Response must exist that are currently not implemented in many Member States. These rules must among others clearly determine market access rules and financial arrangements for independent aggregators to ensure on the one hand that they contribute adequately to system costs they induce while on the other hand must ensure that aggregators are not unduly charged. Such clear rules are indispensable for the development of demand response and demand response does not take off in Member States where those rules are not clearly defined. Fully competitive retail markets are another element that helps the development of

innovative Demand Response services, while in markets that are dominated by (vertically integrated) incumbents the incentives for offering those new services are lower.

However, those rules are necessary conditions for Demand response but other market conditions also have to be in place for Demand Response to take off. For example in many parts of the US, there is serious shortage of generation capacity and/or grid capacity, which makes Demand Response a lot more necessary as well as valuable than in countries with overcapacities. Equally important are relevant price fluctuations (peak prices) in the wholesale market that are more likely to incur in markets with a high renewables share.

Can the benefits of DR be quantified? Are the quantifiable effects in countries outside the EU?

There is currently little experience in Europe with respect to demand response which makes the quantification of benefits of demand response difficult to calculate. A recent study for the European Commission found that enabling demand response could bring €70-105 billion of cost reductions a year to Europe in terms of power plant fuel consumption, grid investment and backup generation. However, other studies have found that certain consumer classes have such a high willingness-to-pay for on-demand electricity that the benefits of demand response would be marginal, at best. The expected monetary benefit of demand response as calculated within the work on the Impact Assessment for the MDI amounts to €4.4 to 5.8 billion net benefit per year depending on the policy scenario.

The evidence from different markets within the US indicates that the demand side may provide peak load reductions of 1-2 per cent of peak load in the wholesale market, and 1-6 per cent of peak load from other incentive based DR (AEMC, 2015). Data from FERC summarized by AEMC (2015) and ECI (2015) indicates a total incentive based DR of approx. 8 percent of peak load reductions in Pennsylvania, New Jersey, Maryland (PJM) where the incentive based DR has the largest uptake. However, as for Europe the overall benefits of demand response are hard to quantify and no reliable, widely accepted data is currently available.

On whom (which stakeholder, incl. consumers) did the benefits/costs fall, and was the sharing of costs/benefits the same in all MS? If there are significant differences in costs (or benefits) between Member States, what is causing them?

The allocation of benefits between different stakeholders is hard to assess because those data is confidential business data and hence not publicly available. However in principle the following allocation aspects can be expected:

- Consumers participating in demand response schemes are likely to realise benefits as they will be awarded for the flexibility they provide to the system. While currently most offers on the market address industrial or commercial consumers also consumers with shiftable loads (e.g. heating systems) participate in some countries, e.g. in Switzerland;
- For consumers not participating in demand response schemes effects can be either positive or negative. Demand response will reduce the prices on the energy markets and in competitive retail markets these cost reductions will be passed on to all consumers. But there is also a minor risk that these consumers will face higher average prices if the high peak prices will be fully paid by those who are not participating in

demand response. However, this may be justified as they are charged according to the costs they induce to the system when consuming at times of low supply;

- Aggregators (either independent or linked to a supplier) offering demand response services are expected to generate profits;
- Suppliers not offering demand response services may face reduced sales but at the same time they benefit from lower wholesale prices. The net effect may either be positive or negative;
- Generators will no longer profit from very high peak prices and will hence likely suffer losses;
- Marginal generators operating at peak demand times are likely to generate losses as the very expensive electricity provided by them will no longer be demanded;
- Network operators – both at transmission and distribution level – are expected to benefit from solutions that offer flexibility and reduce investment costs;
- Manufacturers of smart grid-ready equipment (smart meters, smart appliances, energy management systems, distributed generation technologies) should be able to benefit from a deployment of technologies that enable demand response.

Relevance

To what extent have the (original) objectives proven to have been appropriate for the intervention in question? How well do the (original) objectives (still) correspond to the needs within the EU?

The original objectives as stipulated in the electricity directive, the renewables energy directive as well as the energy efficiency directive of creating efficient electricity markets, efficiently integrating variable renewables into the electricity system and increase energy efficiency are still valid as confirmed e.g. in the Commission's communication "Launching the public consultation process on new energy market design" and the stakeholder responses to that communication.

How well adapted is the intervention to subsequent technological or scientific advances?

The basic technology components exist for the implementation of DR i.e. the necessary communication technologies, control systems, sensors etc. Since 2008 several demonstration projects have been completed in European and national RTD programmes e.g. ADDRESS, LINEAR, E-DEMA, ECOGRID-EU, and Grid4EU. However, particularly for the residential DR, the validation of positive business cases and the cost of the components are not yet conducive to large scale roll out. E.g. Ecogrid-EU estimates that the retrofitting of one zone in a house with an electric radiator would be 160-200 € in a ~100.000 unit rollout. Further technology developments and in particular cloud connected home automation and appliances in smart homes will increase the economic benefits of price based demand response. It is expected that in a 15 year time scale the installation process will be un-necessary because appliances are already connected to the internet (IOT appliances). In such a case and with a roll-out to millions of households, the direct cost of DR could be virtually zero [279]. To grasp the significant potential of DR in legacy appliances it is however necessary to further develop the business models and validate their integration into the energy system.

[279] Deliverable 7.4 EcoGrid EU Replication Roadmap

Do current regulations ensure that final consumers can actively participate in the market?

While the existing European legal framework allows consumers to participate in the market it has not yet succeeded in enabling this participation in all Member States. Under the current legislation consumers do not have access to dynamic pricing contracts in most Member States while in 23 Member States no dedicated and solid framework for incentive based demand response exists. In 20 Member States there are currently no commercial demand response services on the market. According to this analysis, currently consumers in 18 Member States cannot actively participate in the market. It also needs to be stressed that most incentive based Demand Response schemes are only available to commercial and industrial consumers which suggests that residential consumers have no access to Demand Response Services in more than 18 Member States.

Coherence

To what extent is this intervention coherent with other interventions which have similar objectives in particular EED, EPBD, upcoming MDI? To what extent is the intervention coherent internally?

Further developing demand response is fully coherent with the objectives of other priorities in the field of energy policy as a suited market framework for demand response:

- is an enabler for integrating renewables efficiently into the electricity system. It also contributes to render energy storage and self-consumption viable;
- is a key factor for increasing energy efficiency with savings of final but mainly primary energy;
- is a key factor in promoting new products in balancing markets where new rules are being elaborated under the MDI to increase competition;
- may help to reduce the need for creating capacity markets and will therefore be considered under the rules for capacity markets to be proposed under the MDI;
- will be needed to make efficient use of existing networks and may reduce the need for investments in the physical network. Therefore,flexibility is also at the core of the proposal concerning new distribution tariff rules under the MDI;
- will likely trigger the deployment of smart homes and smart buildings technologies while these will vice-versa increase the interest of residential and commercial consumers in participating in demand response programmes. This deployment is foreseen to be supported by measures to be adopted under the Ecodesign/Energy Labelling Framework and by new approaches for smart buildings to be proposed in the context of the review of the EPBD in 2016.

5.7.1. *EU-added value*

What is the additional value resulting from the EU intervention(s), compared to what could be achieved by Member States at national and/or regional levels? To what extent do the issues addressed by the intervention continue to require action at EU level?

Under the market design initiative (upgrading of the wholesale market) the Commission will also look into opening national balancing markets where flexibility may then be traded across borders. Full availability of DR in all Member States will then be crucial for the functioning

of those cross border balancing markets. Furthermore in a functioning internal energy market similar conditions must exist for all market actors, including for aggregators.

What is the cross border dimension of Demand Response

Currently commercial demand response offers remain national. This is mostly due to the fact that balancing and capacity markets are mostly national. Within the ongoing market design initiative measures will be addressed to open these markets not only to flexibility products but also to cross border trading which may in the future open up cross border markets for demand response. These aspects are however part of the market design evaluation fiche.

What would be the most likely consequences of stopping or withdrawing the existing EU intervention?

In case existing EU legislation on demand response was withdrawn one could imagine, that some Member States will develop the market while for others there is a risk that demand response will effectively be banned from taking place by e.g. not allowing (independent) aggregators on the market (or by putting market barriers that will effectively render any business case negative) or by banning dynamic pricing contracts. In any case, under such scenario the full benefits of demand response cannot be realised across Europe.

5.7.2. *Other evaluation criteria*

Utility: To what extent do the changes/effects of an intervention satisfy (or not) stakeholders' needs? How much does the degree of satisfaction differ according to the different stakeholder groups?

Public consultation shows great support for DR and the need for further action. However, different stakeholder groups will be affected by stricter European legislation enabling demand response:

- consumers will rather endorse any measure that will help them to reduce their electricity bill as long as data privacy is ensured and vulnerable consumers who cannot shift their consumption are protected from higher electricity prices. Furthermore, it has to be ensured that participation in demand response remains purely voluntarily to have support from consumers;
- independent aggregators are likely to endorse any proposal that gives them more certainty with regards to market access and provide them with standardised frameworks;
- suppliers may be divided on such proposals:
    - independent suppliers may rather support enabling rules for demand response as it will open new business opportunities also for suppliers. On the other hand they may oppose a strengthened role of independent aggregators as this will lead to additional competitors on the market;
    - vertically integrated suppliers will rather oppose new legislation on demand response as demand response competes with their generation assets;
    - all suppliers are likely to be against any measure that will oblige them to offer specific products, such as dynamic electricity pricing contracts as they would rather see them developing as a competitive business;

- generators will rather be against any stronger European demand response legislation as it will create additional competition;
- national regulatory authorities may rather be sceptical about additional EU legislation as it may affect existing national frameworks and requires adjustments.

5.8. Conclusions (Gap Analysis)

It is the Commission's objective to make electricity demand more flexible to enable the energy system to better cope with variable RES and new loads as well as to reduce the need for related capacity investments. The full development of demand response potential will be crucial in achieving this objective but will only become accessible if all consumer groups (residential, commercial, industrial) can voluntarily and gainfully engage in demand response. Current EU legislation recognises this need and provides a legislative framework for incentive-based demand response obliging Member States to comply with the following obligations:

1. Ensure that national energy regulatory authorities encourage the participation of demand side resources, including demand response, alongside supply in wholesale and retail markets.
2. Ensure – subject to technical constraints inherent in managing networks - that TSOs and DSOs treat demand response providers, including demand aggregators in a non-discriminatory way and on the basis of their technical capabilities.
3. Promote - subject to technical constraints inherent in managing networks - access to and participation of demand response in balancing, reserve and other system services markets.

Whereas the existing acquis has provisions that aim to ensure incentive-based demand response providers are treated in a non-discriminatory manner, they potentially allow a degree of subjective interpretation by MS for example regarding the recognition of independent aggregators that are not specifically addressed in the existing legislation. To date, price-based demand response has only been addressed in a non-binding provision in Annex XI of the Energy Efficiency Directive. In the light of the developments so far, the existing provisions can be assessed as follows.

In terms of **effectiveness**, the evidence available generally suggests that the demand response provisions currently in place have been less effective than intended. The provisions have not been effective in removing the primary market barriers especially for independent demand response service-providers and creating a level playing field for them. This is mainly due to the high degree of freedom the existing provisions leave to Member States. As such in many Member States, the roles and responsibilities for aggregators are not defined and incumbent suppliers in many Member States are able to prevent independent DR service-providers from entering the market by not granting them access to their customers. Significant 'compensation' payments in some Member States from aggregators to BRPs risk to overcompensate those parties and diminish the business case for Demand Response. At the same time, rules and technical requirements at national balancing, wholesale and capacity markets often prevent flexibility products from entering those markets which forms another barrier for incentive based demand response.

The current total theoretical demand response potential amounts to approx. 100 GW of which only about 21 GW are activated. Approx. 15GW of this Demand Response is provided by industry under incentive based demand response schemes, while approx. 6GW are provided by residential and commercial consumers under price based demand response schemes of which most are under static time of use tariffs (ToU). It is evident form the analysis that this potential is only activated in those Member states where a framework for demand response exist while in most Member States demand response does not take place at all or to a negligible extent.

It can be concluded, that the existing measures have not been effective to remove market barriers to demand response and demand response potential remains largely untapped, especially in the residential and commercial sector. The different treatment of independent Demand Response service-providers in national energy markets as well as of flexibility products in electricity markets risk that the full demand response potential in Europe will not be activated and hence the internal energy market cannot function as efficient as possible.

There is currently not sufficient quantitative evidence to fully evaluate the **efficiency** of the intervention in terms of proportionality between impacts and resources/means deployed. This is mostly due to the limited empirical data on the value of demand response in current markets and the overall benefits it produces to the system. The costs for implementing incentive based demand response can be considered to be rather minor as it does not require major technical infrastructure. For price based demand response the installation of smart metering systems – that have many system benefits themselves that are not accounted for in this evaluation - is required (for additional information please see evaluation on smart metering). However, figures from the Impact Assessment study suggest that the overall costs for activating Demand Response remain rather low and only represent approx. 5% of the additional benefits.

In terms of **relevance**, the herein evaluated demand response provisions remain highly valid. Full exploitation of demand response remains crucial to manage the energy transition as it is an enabler for efficiently integrating variable renewables into the energy system. However, as pointed out above, the existing provisions have not been effective in deploying demand response across Europe. According to this analysis consumers in 18 Member States do not have access to price or incentive based demand response services. And even in those 10 MS where demand response is in principle enabled some of the DR schemes are only available to commercial and industrial consumers.

In terms of **coherence** the evaluation has shown that the provisions on demand response are fully coherent with other legislative provisions within the electricity directive, the energy efficiency directive (EED), the renewable energy directive (RED) and the energy performance of buildings directive (EPBD). As all of those directives currently undergo revisions this coherence needs to be continuously ensured to allow demand response to a) enable the integrating of renewables efficiently into the electricity system in line with the RED, b) contribute to energy savings in line with the EED, c) participate as a resource in the electricity markets, d) be considered when capacity mechanisms are established, e) be supported under the distribution tariff design.

Finally, considering the **EU added value**, it remains crucial to ensure that harmonised demand response provisions are in place across the EU to guarantee a functioning internal energy market. Even more because under the upgrading of the wholesale market within the market design initiative the Commission also addreses the opening national balancing markets where flexibility may then be traded across borders. Common rules on Demand Response in

all Member States will then be crucial for the functioning of those cross border balancing markets.

Gap analysis

It was the objective of the existing European legislation to put demand response on equal footing with generation and to ensure that demand response service providers, including aggregators are treated in a non-discriminatory way. While provisions aiming at realising those objectives have been put in place in many Member States, the development of Demand Response across Member States varies significantly and has led to fragmented markets. Especially the different treatment of independent aggregators across the EU that are expected to play a crucial role in developing demand response services is a matter of concern. It can therefore be concluded that additional provisions further specifying the existing provisions are needed to ensure a harmonised development and enable price and incentive based demand response across Europe.

5.9. Annex: Demand-Side participation in energy markets in the Member States

Table 6: Demand Response participation in wholesale energy markets in Member States

Member State	Market place	Day – ahead	Intra-day	Comments
Austria	EPEX	X		DR participation is allowed
Belgium	Belpex	X	X	DR participation is allowed, but only a few large industrial players are active.
Bulgaria				No DR participation and not a well-function market.
Croatia	CROPEX			No DR participation. Plans of launching DA and ID market in 2016.
Cyprus	-	-	-	No wholesale market exists
Czech Republic	PXE	X	X	Bids only from BRP, only large consumers are active
Denmark	Nord Pool	X	X	Bids only from BRP
Estonia	Nord Pool			Bids only from BRP, DR participation unclear
Finland	Nord Pool	X	X	Bids only from BRP, large consumers are active
France	EPEX	X	X	Bids accepted from non-BRPs. 1,5 GWH from non-BRP in 2015
Germany	EPEX	X		DR participation is allowed in DE, but only large consumers are active
Greece				DR participation is not allowed. Price caps have been removed.
Hungary	HUPX/PXE	X	X	DR from lagre consumers and aggregators take place
Ireland		X	X	DR participation by bidding and dispatch. NO BRP, energy is settled ex-post.
Italy		X		Bids only from BRP, increasing DR participation.
Latvia		X		DR is allowed in the wholesale market (unclear which markets exist)
Lithuania				Low competition and unclear whether DR takes place at all
Luxembourg				No information
Malta	-	-	-	No wholesale market exists
Netherlands		X	X	Bids only from BRP
Poland	PXE	X	X	Bids only from BRP, low activity
Portugal	MBIEL/ OMIE	X	X	DR participation is allowed (BRP), but low level of participation. Price cap on electricity.
Romania	PXE	X	X	All trade must take place in the market places. DR and aggregators are allowed, but no activity.
Slovakia	CENTREL/ PXE	X	X	DR participation (with licence) is allowed. Only large consumers are active
Slovenia				DR participation is not allowed
Spain	MBIEL/ OMIE	X	X	Bids only from BRP, level of participation is not known.
Sweden	Nord Pool	X	X	Bids only from BRP, large consumers are active
UK	APX & N2EX	X	X	Bids only from BRP, limited DR participation.

Source: Impact Assessment support Study on downstream flexibility, demand response and smart metering, COWI, 2016

Table 7: Demand Response participation in balancing markets in Member States (volumes in MW where available)

MS	FCR	FFR	RR	Other	Comments
Austria	No	Yes	Yes		
Belgium	27	321			FFR from 2014, FCR from 2016
Bulgaria	No	No	No		
Croatia	No	No	No		Mandatory participation from generators
Cyprus	-	-	-		There are no such markets
Czech Republic	No	No	Yes		DR can only participate in RR
Denmark	23	555	Yes		Nordic market for primary and tertiary reserves.
Estonia	No	No	No		Most participants from outside Estonia, FCR provided by Russia
Finland	100	Max 300	40		Nordic market for primary and tertiary reserves.
France	60	160	1800		Test phase for DR participation
Germany	Yes	Yes	Yes		Low DR participation in balancing markets. Interruptible loads programme for large consumers
Greece	No	No	No		
Hungary	No	No	Yes		DR can only participate in RR
Ireland	No	No	No	Yes	
Italy	No	No	No		DR not allowed to participate.
Latvia	No	No	No		DR not allowed to participate (FCR provided by Russia)
Lithuania	No	No	No		DR not allowed to participate (FCR provided by Russia)
Luxembourg					No information
Malta	-	-	-		Such markets do not exist
Netherlands	No	Yes	Yes		
Poland	Yes	Yes	Yes		DR does not participate on equal basis as thermal plants. No DR participation.
Portugal	No	No	No		DR not allowed to participate.
Romania	Yes	Yes	Yes		DR does not participate on equal basis as generation, participation is low
Slovakia	No	No	YEs		DR can only participate in RR, bilateral contracts for large industries with TSO or DSO
Slovenia	20				
Spain	No	No	No		DR not allowed to participate. DR only from large interruptible loads
Sweden	Yes	10	626		Nordic market for primary and tertiary reserves.
UK	374	Yes	1260	Yes	(2015) DR-RR is established for large consumers to reduce demand during winter weekdays between 4 and 8 PM

Source: Impact Assessment support Study on downstream flexibility, demand response and smart metering, COWI, 2016

Table 8: Demand Response participation in capacity mechanisms in Member States (volumes in MW where available)

MS	Mechanism	DR Volume	DR participation
Austria			
Belgium	Strategic reserve	358	2015-2016 (elia.be)
Bulgaria			Over-capacity and no need for capacity mechanisms
Croatia			
Cyprus			
Czech Republic			
Denmark	No reserve/ CM		
Estonia	No capacity market		
Finland	Strategic reserve	10	
France	Capacity market – DR only		Capacity market to start in 2017 including DR participation
Germany	Interrubtible load programme	694	Discussions on Capacity market, most likely not including DR
Greece	Interrubtible load program Planning for capacity mechanism	1500	Interruptible loads program from 2016 – consumers > 5MW
Hungary			
Ireland	Fixed pric per half hour through the year		Open to all, but with high requirements to participate. New capacity market planned to include DR.
Italy	Capacity market Interrubtible loads	4061	Volume from interruptible loads from large industry (>1 MW). Exploring to include DR in capacity mechanism
Latvia	Capacity market		DR included
Lithuania			
Luxembourg			
Malta	No capacity market		
Netherlands			
Poland	Capacity reserves		Generation only
Portugal			
Romania			
Slovakia			
Slovenia	No Capacity market		
Spain	Capacity mechanism Interrubtible loads	2050	Generation only in the CM.
Sweden	Strategic reserves	626	42 % DR (2015)
UK	Capacity market	174	Open to DR, but low participation

Source: Impact Assessment support Study on downstream flexibility, demand response and smart metering, COWI, 2016

Table 9: Price offers for consumers on the electricity market

Member State	Spot price	CPP	TOU	Comments
Austria	X		X	EVU offers TOU, specifically Day-and Night tariffs.
Belgium	X		X	Peak, off-peak and real time tariffs are offered, though no smart metering roll out.
Bulgaria				No reported price-based DR.
Croatia			X	No price-based DR reported.
Cyprus			X	TOU tariffs are theoretical available for domestic, commercial and industrial customers.
Czech Republic			X	TOU tariffs are combined with load control, with space heating and water heating restricted to off-peak periods with lower tariffs.
Denmark			X	ToU is available for customers with hourly metering, and mandatory for those customers connected to grid with a voltage level of 10 kV or higher.
Estonia	X		X	Off-peak tariffs and real time tariffs are available. However, limited motivation to participate in DR schemes reported.
Finland	X		X	TOU are commonly used and are combined with smart meters.
France		X	X	System of ToU tariffs in place for more than 40 years. Selection of available tariff schemes (peak and off-peak, Tempo tariff (CPP tariff)).
Germany	X		X	Mostly Peak (day hours) and Off-peak tariff (night hours) – system considered in need of redesign, given increase of RE in the energy mix.
Greece			X	ToU tariff available.
Hungary			X	ToU available: In addition, "ripple control" provided for some loads. Load shifting more control- than price- based.
Ireland			X	ToU tariffs offered, with different load profile for those on the tariff reported.
Italy			X	Full smart meter roll out and on-peak and other TOU tariffs are available.
Latvia			X	Off-peak tariffs are available, but few incentives exist in distribution or TSO tariffs
Lithuania			X	Tariffs are differentiated between day and night.
Luxemb.			X	TOU tariffs are available.
Malta				For non-residential larger consumers there is a day- and night tariff.
NL	X	X	X	TOU, CPP, Real Time Pricing and Peak Time Rebate (PTR) are already an option.
Poland			X	ToU Tariff available
Portugal			X	Consumers have access to dynamic prices (since 1997), but most consumers chose flat tariffs.
Romania			X	Seasonal and on-peak tariffs are available.
Slovakia			X	Smaller consumers do not participate in DR (legally allowed, but probably due to the lack of technology). Larger consumers participate mostly through incentive-based contracts.
Slovenia		X	X	TOU and CCP are applied in Slovenia.
Spain	x		X	TOU are offered. Wholesale price pass through tariffs apply to some customers.
Sweden	x		X	TOU are offered to all customers by some grid companies. Mandatory for customers with main fuses above 80 A. .
UK			X	ToU tariffs exist for small medium consumers and I&C sector

Source: Impact Assessment support Study on downstream flexibility, demand response and smart metering, COWI, 2016

6. Annex 9: Evaluation Fiche on Distribution System Operators

6.1. Introduction

Purpose of the evaluation

The present fiche intends to lay an integrated and coherent analytical foundation for the evaluation of the current legal provisions of relevance to operation of distribution systems and Distribution System Operators (DSOs).

It supports the evaluation prepared in advance of the market design initiative (MDI). The evaluation report will provide input to the Impact Assessment and particularly in the problem definition and partly on the policy options.

Scope of the evaluation

The present evaluation focuses on evaluating existing measures on tasks and unbundling of DSOs. The main focus will be on measures envisaged in the Electricity Directive, and in particular:

- Article 25 regarding the tasks of DSOs
- Article 26 regarding the unbundling framework of DSOs
- Article 41 regarding further tasks which are assigned to DSOs and other market actors

The evaluation will assess the existing measures and the extent to which those measures have contributed in achieving the objectives of the Electricity Directive (2009/72/EC).

This evaluation will assess to what extent the EU legislation on DSO related issues has contributed to a competitive market through better regulation, unbundling and reducing information asymmetry. It will also assess to what extent existing measures have been spurred any progress towards distribution systems which are able to support the future energy system.

6.2. Background to the initiative

Description of the initiative and its objectives

DSO tasks

Article 25 of the Electricity Directive ('Tasks of distribution system operators') set the core tasks of DSOs, as well as, specific obligations that DSOs have to comply with. Under these provisions DSOs are mainly responsible to operate, maintain and develop under economic conditions a secure, reliable and efficient electricity distribution system. The provisions under Article 25 are similar with the provisions of Article 15 of the repealed Directive 2003/54/EC.

Except the core tasks, under Article 25(6) the Electricity Directive sets some specific obligations for e.g. cases where DSOs are responsible for balancing of the distribution system. Moreover, under Article 25(7) DSOs shall consider measures such as energy efficiency and demand-side management, in order to avoid investing in new capacity.

According to Article 41 Member States are responsible to define roles and responsibilities for different actors including DSOs. These roles and responsibilities concern the following areas: contractual arrangements, commitment to customers, data exchange and settlement rules, data ownership and metering responsibility.

DSO unbundling

The provisions of the Electricity Directive concerning unbundling framework of DSOs (Article 26) are also similar to the ones of the repealed Directive 2003/54/EC, with the level of unbundling remaining the same (i.e. legal unbundling) and also the threshold of applying these rules (i.e. 100,000 customers).

Member States can decide not to apply the unbundling rules (no legal/functional unbundling) on DSOs serving less than 100.000 customers (maximum threshold), in such case only accounting unbundling applies. It is on the discretion of Member States to apply this threshold or not, or to set a lower threshold.

The unbundling requirements are classified as follows:

- Full ownership unbundling (ownership separation) is where the DSO is a separate company to any interests in generation or supply (not required by the Electricity Directive).
- Legal unbundling is where the DSO is a legally separate entity with its own independent decision making board, but remains within the umbrella of a Vertically-Integrated Undertaking (VIU).

  - Functional or management unbundling is where the operational, management and accounting activities of a DSO are separated from other activities in the VIU; and

  - Accounting unbundling is where the DSO business unit must keep separate accounts for its activities to prevent cross subsidisation, from the rest of the VIU.

Article 26(3) includes an additional obligation which seeks to strengthen regulatory oversight on vertically integrated undertakings and to mitigate communication and branding confusion.

6.3. Evaluation Questions

General:

- To what extent have the objectives regarding DSOs in Electricity Directive 2009/72/EC been achieved?
- To what extent do the observed effects correspond to the original ambition and where there unintended impacts as well?
- What factors influenced the achievements observed?
- To what extent did different factors influence the achievements observed, e.g. changes in electricity market, technological developments?

Effectiveness:

- To what extent the intervention had the expected impact on promoting competition?
- Which differences across MS can be observed and what are the reasons for these differences?

- On whom did the costs fall, which stakeholder and was the sharing of costs the same in all MS?
- How affordable were the costs borne by different stakeholder groups, given the benefits they received?
- To what extent has the intervention been cost effective?

Relevance:

- To what extent have the (original) objectives proven to have been appropriate for the intervention in question?
- How well do the (original) objectives (still) correspond to the needs within the EU?
- How well adapted is the intervention to subsequent market or technological advances?

Coherence:

- To what extent is this intervention coherent with other interventions which have similar objectives?
- To what extent is the intervention coherent internally?
- To what extent is the intervention coherent with international obligations?

EU-added value:

- What is the additional value resulting from the EU intervention(s), compared to what could be achieved by Member States at national and/or regional levels?
- To what extent do the issues addressed by the intervention continue to require action at EU level?
- What would be the most likely consequences of stopping or withdrawing the existing EU intervention?

<u>Other evaluation criteria</u>

Utility:

- To what extent do the changes/effects of an intervention satisfy (or not) stakeholders' needs?
- How much does the degree of satisfaction differ according to the different stakeholder groups?

Complementarity:

- To what extent do EU policies and interventions support and usefully supplement other policies (in particular those pursued by the Member States)?

Equity:

- How fairly are the different effects distributed across the different stakeholders / regions? / genders? / Social groups?

Sustainability:

- How likely are the effects to last after the intervention ends? It is often hoped that the changes caused by an intervention are permanent. It can be important to test this expectation for interventions which have a finite duration, such as particular programmes.

Acceptability:

- To what extent can we observe changes in the perception of the intervention (positive or negative) by the targeted stakeholders and/or by the general public?

6.4. Method

The evaluation draws on the following data sources and studies carried out:

a. COM(2012) 663 final 'Making the internal energy market work'

b. COM(2014) 634 final 'Progress towards completing the Internal Energy Market'

c. 'Status Review on the Transposition of Unbundling Requirements for DSOs and Closed Distribution System Operators', CEER (2013)

d. 'The Future Role of DSOs', CEER (2015)

e. 'Study on tariff design for distribution systems', AF Mercados (2015)

f. 'The role of DSOs in a Smart Grid environment', Ecorys-ECN (2014)

g. 'From Distribution Networks to Smart Distribution Systems: Rethinking the Regulation of European Electricity DSOs', THINK (2013)

Infringement cases or complaints were also considered to identify any problems in the implementation or shortcomings in the effectiveness of the measures.

Potential limitations of the analysis may arise from data limitations, as the main scope of the above policy documents and studies was not the evaluation of measures envisaged under the third energy package. Therefore, lack of data may occur in some of the areas that this evaluation covers.

6.5. State of play and implementation (Results – *description* of current situation and development since 2009)

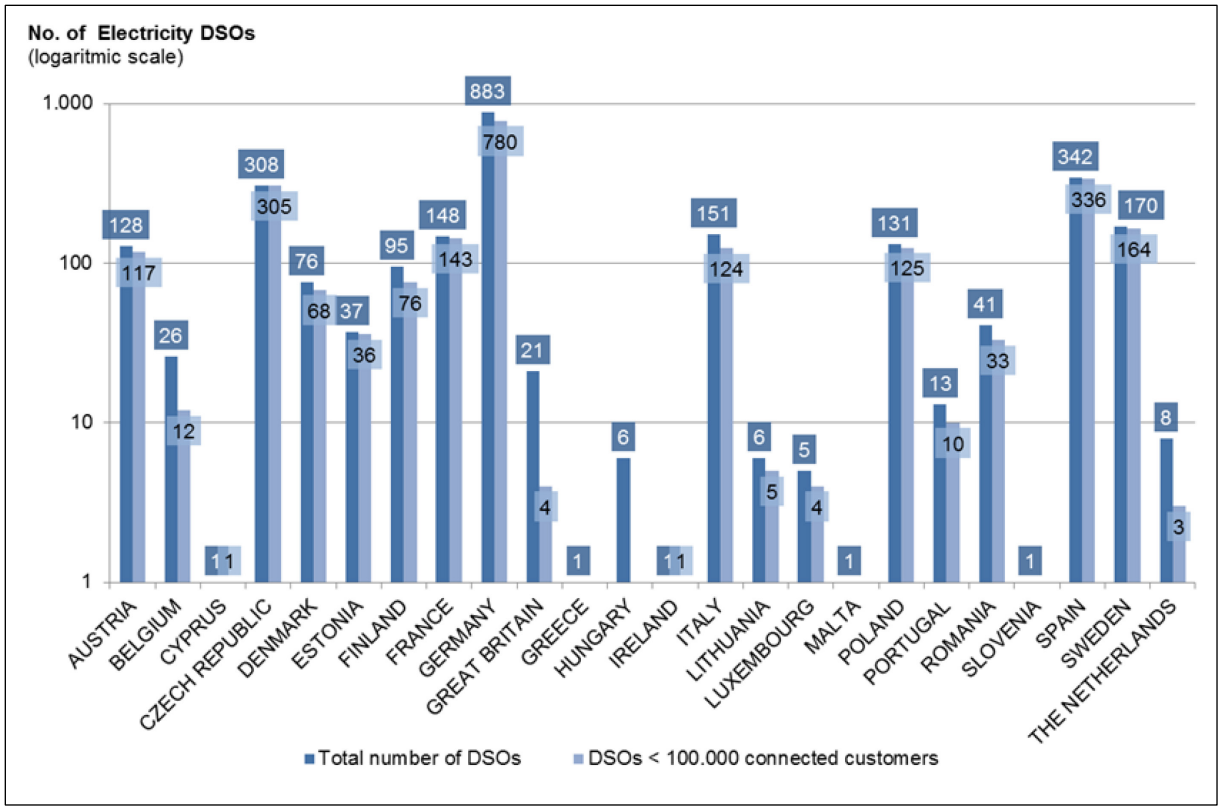
6.5.1. *State of play*

a. Description of DSO structure across EU

Electricity distribution differs widely across EU Member States in terms of number of DSOs in each country, voltage level of the distribution system, and tasks of system operators. According to CEER's data for 24 EU Member States[280] there is a total of 2,600 electricity DSOs operating in across EU. From these DSOs, 2,347 fall under the 100,000 rule and according to Article 26(4) for these DSOs Member States are not obliged to implement unbundling provisions under Article 26 of the Electricity Directive.

[280] *"Status Review on the Transposition of Unbundling Requirements for DSOs and Closed Distribution System Operators"* (2013) CEER.

Figure 1: Number of DSOs per Member State



Eurelectric[281] also reports a total number of 2,331 DSOs operating in EU (data for 27 Member States). According to Eurelectric from this total number 2,148 DSOs fall under the 100,000 rule leaving only 183 to have obligations of unbundling[282].

In Member States where there is a high number of DSOs, usually there are two layers of distribution systems, local distribution systems and then regional distribution systems which connect local networks with the transmission network. For instance in Czech Republic at lower voltage levels (110 kV and lower), electricity distribution is provided by three DSOs with more than 90,000 customers, whose grids are connected directly to the transmission system. Besides these regional distributors there are also 277 operators of distribution systems connected only to these three DSOs. These local distribution system operators distribute electricity within areas specified in their electricity distribution licences.

b. RES integration in distribution networks

In meeting 2020 targets some Member States are already experiencing a high penetration of RES with an increasing number of the resources being variable (wind and solar). A large share of these resources in many cases is connected to distribution grids (low and medium

[281] *"Power Distribution in Europe Facts & Figures"*, Eurelectric.

[282] CEER and Eurelectric numbers only coincide for very few Member States. In some cases the discrepancy is very high, for instance for the Czech Republic CEER reports 308 DSOs while Eurelectric only 3, also in Romania 41 (CEER) and 8 (Eurelectric).

voltage). According to available data this number is estimated to be as high as 90% (e.g. in Germany)[283].

There is a common view among DSOs and other stakeholders that in order for DSOs to cope with this increasing number of variable RES-E they should become more active in managing their networks. This would involve the use of flexible resources in order to alleviate short-term and long-term congestions. Moreover, it would require investments in smarter grid elements.

c. DSO tasks

There are a number of factors which may affect the tasks of DSOs across EU. Structure of electricity distribution and ownership (i.e. public/private, municipalities etc.), development of the electricity sector, size of the DSOs, voltage level of distribution grid, are some of these factors. In this context each Member State has to determine the national regulatory framework under of course the boundaries set by the Electricity Directive.

According to the Electricity Directive the core tasks of DSOs are to maintain, develop and operate the distribution network. The Electricity Directive does not assign other specific tasks to DSOs such as for instance metering activity or data management. The more specific activities are left to Member States to decide, for instance according to Article 41. Moreover, according to the Electricity Directive DSOs may also perform balancing activity, this may be the case for some regional DSOs but no specific data are available.

Therefore, as the EU legislation leaves a quite open framework, there is a variety of tasks that DSOs are performing depending on the Member State they are operating. For instance, even activities such as metering or connection of customers which traditionally in the majority of the Member States are performed by the DSOs, there are few cases (e.g. in UK or DE) where the activity is open to other market parties.

CEER is grouping existing and future activities under three categories: core activities, grey area activities (allowed under conditions or not allowed), and forbidden activities[284].

d. Data Handling

The activity of handling metering data in the majority of Member States is associated with the metering activity. Where DSOs are responsible for the metering activity then they are responsible of collecting and handling metering data as well.

Table 1 below presents the responsible entity in each Member State for the metering activity (market regulated/non-regulated), responsible for the smart-metering roll out and also for the access to data, based on data from smart metering cost benefit analyses (CBAs).

Table 1: Metering and data handling responsibility in Member States

[283] Based on data from the EvolvDSO Project (FP7/2007-2013).

[284] *"The Future Role of DSOs"* (2014) CEER.

Wide-scale roll-out (at least 80% of consumers by 2020)	Metering Market	Deployment Strategy	Responsible party - implementation and owneship	Responsible party - access to metering data	Financing of roll-out
Austria	Regulated	Mandatory	DSO	DSO	Metering & Network tariffs
Denmark	Regulated	Mandatory	DSO	Central Hub	Network Tariffs
Estonia	Regulated	Mandatory	DSO	Central Hub	Network Tariffs
Finland	Regulated	Mandatory	DSO	DSO	Network Tariffs
France	Regulated	Mandatory	DSO*	DSO	NA
Greece	Regulated	Mandatory	DSO	DSO	NA
Ireland	Regulated	Mandatory	DSO	DSO	Network Tariffs
Italy	Regulated	Voluntary + Mandatory	DSO	DSO	DSO resources + network tariffs
Luxembourg	Regulated	Mandatory	DSO	DSO	Network Tariffs
Malta	Regulated	Voluntary	DSO	DSO	Network Tariffs
Netherlands	Regulated	Mandatory w/ opt-out	DSO	DSO	Network Tariffs
Poland	Regulated	Mandatory	DSO	Central Hub	Network Tariffs
Romania	Regulated	Mandatory	DSO	DSO	Network Tariffs
Spain	Regulated	Mandatory	DSO	DSO	Network Tariffs + SM rental
Sweden	Regulated	Voluntary	DSO	DSO	DSO resources + network tariffs
United Kingdom - GB	Competitive	Mandatory	Supplier	Central Hub	Funded by suppliers

Source: COM(2014) 356 final

According to the data in most of the cases DSOs are the responsible party for metering and for deploying smart meters, as well as for providing data access. Regarding data access it must be noted that Finland and Sweden are planning a central data hub under the responsibility of the TSO.

In general, in countries with a high number of DSOs like for instance Sweden and Finland, it seems to be a more effective solution to establish a central hub which collects the information from several DSOs and in this way increase efficiencies in the energy market operations.

On the other hand, as the DSOs are almost always responsible for deploying and operating the smart metering systems they will participate in data handling as part at least of the data flow. Therefore, even if DSOs are not assuming the role of a data hub, they will collect consumption data and pass those data to a central hub, while storing also possibly these data in their data bases for a time period foreseen in legislation.

e. Use of flexibility from DSOs

In general, dispatching of generation and use of flexibility resources for e.g. frequency control, are usually part of TSO tasks. From data presented in a study by AF Mercados et al (2015)[285] regarding the responsibility of DSOs in dispatching of embedded generation, use of interruptible contracts and other sources of flexibility, it is concluded that in most of Member States where DSOs can be involved in dispatching this most of the times takes place in times of emergency (security reasons). In less than 1/3 of the Member States DSOs are using solutions such as flexibility resources or interruptible contracts in order to address grid problems.

6.5.2. *Implementation of existing measures*

Regarding the implementation of unbundling provisions as already pointed out there is a large number of DSOs which fall under the *de minimis* rule. According to CEER only around 189 DSOs across EU are legally unbundled. There are no known cases where Member States have decided to go beyond the provisions of the Electricity Directive. There is only the exception of Netherlands where ownership unbundling requirements have been introduced for DSOs. Moreover, CEER is reporting that it has not identified any major shortcomings in the implementation of unbundling requirements.

On more specific points CEER reports the following[286]:

- ***"Rebranding of DSOs:*** *It is still too early to fully evaluate the results of unbundling in terms of rebranding, as the process is on-going. Nevertheless, information received suggests that several NRAs were still not fully satisfied with the rebranding process. In very few cases, a DSO has been found to refuse compliance with the rebranding requirements (and in certain situations, the NRA has exercised its right to commence legal proceedings against the DSO).*
- ***Resources of DSOs:*** *In general, NRAs remain satisfied that DSOs have sufficient financial and personnel resources.*
- ***Compliance officers:*** *Overall, NRAs remain satisfied with the compliance programmes and officers put in place by DSOs. Independent decision-making is guaranteed via national law, licence agreements or network codes and evaluated in the annual compliance report sent to the NRAs.*
- ***Closed distribution systems:*** *Most countries do not have closed distribution systems (as defined in the directives) and only a minority transposed the respective article (Article 28).*

  Closed distribution systems vary widely from country to country as in some cases, specific national rules regulate access conditions and unbundling requirements or stipulate that there is no obligation to provide public service."

[285] *"Study on tariff design for distribution systems"* (2015) AF Mercados, refE, Indra.

[286] *"CEER Memo on the transposition of unbundling requirements for Transmission, Distribution and Closed Distribution Systems Operators"* (2014) CEER.

6.6. Answers to the evaluation questions (Assessment of current situation)

***General*:**

One of the main objectives of the Electricity Directive was to improve competition through better regulation, unbundling and reducing asymmetric information. In general, unbundling measures contribute to the contestability of the retail market and thus facilitate market entry by third party suppliers.

As discussed in section 5, the Directive puts in place a quite open framework for Member States to decide on the particular responsibilities for national DSOs setting only their core tasks, namely, to develop, maintain and operate the distribution network. Regarding the level of unbundling, the *de minimis* threshold leaves to Member States with small DSOs the possibility not to enforce unbundling rules to operators with less than 100,000 customers.

Regarding the unbundling rules, the additional provisions that the third energy package introduced were limited to branding and communication of DSOs.

According to the impact assessment of third energy package[287] the risks of 'less' unbundling have been briefly assessed and recognised that at that point the benefits of stricter unbundling rules didn't seem to justify the costs. These risks link to suboptimal switching procedures in order to deter market entry, competitive advantage which may come from the use of the same brand name or privileged access to network information, consumption data information and cross-subsidies. In particular and as regards metering, privileged and priority access to consumption information for the integrated network company can be a strong advantage. Furthermore, there is a risk that the supply business of a DSO benefits from cross-subsidies of the network business of the integrated company, including easier access to capital.

On the other hand, according to the same impact assessment, discrimination for distribution network access appears to be less relevant than at transmission level, with a possible exception of small generation connected at distribution level. DSO unbundling is less relevant with respect to cross-border flows as flows are more local. In the case of smaller DSOs with few employees are likely to suffer from over-proportionality from loss of synergies.

The above arguments are still valid as there have not been major changes in the structure and operation of distribution systems across EU in past few years.

CEER is reporting problems in the implementation of branding and communication requirements under the Electricity Directive. The Commission has taken action towards the proper implementation of the relevant provisions through compliance checks and infringement procedures, requesting Member States to ensure a clear separation of identity of the supply and distribution activities within a vertically integrated undertaking.

Moreover, requirements of Article 1(h) of Annex I have been subject to formal actions against several Member States.

Some factors that may influence and raise the impact of the foreseen risks are the increased penetration of RES-E generation at distribution level and introduction of smart metering systems.

[287] SEC(2007) 1179

***Effectiveness*:**

The fundamental objective of unbundling requirements on vertical integrated companies is to promote competition in the energy market. The unbundling of network activities from supply and generation activities has the objective to ensure non-discriminatory and transparent third party access in distribution networks, and in addition to ensure that the integrated company does not have any other competitive advantage towards other market parties.

There is no evidence that the intervention within the boundaries of the unbundling requirements, did not achieve the objective of promoting competition in the market.

As discussed in section 5 there is a quite diverse situation across EU Member States when it comes to the structure of distribution business, arising from the different ownership regimes, technical network specifications, energy mix etc. Consequently these differences have resulted in different responsibilities for DSOs across EU.

At a policy level the Electricity Directive leaves at the discretion of Member States to decide on the level of unbundling and tasks that DSOs should carry out at a national level.

Some provisions such as Article 25(7) do not impose any obligation on Member States as this is only an optional provision that Member States could introduce in their national policy framework. Therefore, this requirement cannot be assessed on its effectiveness in a strict sense. However, it is clear that the initial aim to enhance the DSOs position in using demand side management and energy efficiency measures in planning their networks, has not been achieved. Only in few Member States DSOs are in position to use such tools in order to avoid costly investments and operate their networks more efficiently.

There is not a cost-benefit analysis regarding the impact of the measures under discussion in order to assess the share of costs for different stakeholder groups and consequently an assessment on affordability of those costs.

***Relevance*:**

The original objectives of DSO unbundling requirements and the framework of DSO responsibilities still correspond to the EU objective of a competitive internal energy market. There is no evidence that the objectives of those measures were not effective or that they had an opposite effect of the one initially envisaged.

The introduction of smart metering systems will generate more granular consumption data and new business opportunities in in retail market. Moreover, the integration of more RES-E generation at distribution level will require a more active management of the network from DSOs. Even if the measures had included in a certain extent these developments the focus of the intervention was not on these new conditions.

***Coherence*:**

The measures which are subject of this evaluation are fully coherent with the objectives of the internal energy market. Unbundling provisions for DSOs complement the relevant requirements for TSOs, by providing a transparent and non-discriminatory framework for third party access also at a retail market level. These provisions are fundamental for the promotion of competition in the energy market, the entrance of new energy service providers and the development of new services.

EU-added value:

The requirements on unbundling are fundamental for the promotion of competition in the internal energy market. There is no evidence that Member States would proceed to unbundling of the electricity sector and distribution networks without the intervention. The large majority of the Member States have not set unbundling requirements beyond those of the Electricity Directive, demonstrating that the intervention is necessary in order to structure the EU energy sector in such way so as to pursue the wider objectives of the internal market, to promote competition and economic growth.

Provisions which are relevant to DSOs have the characteristic of a permanent effect and are fundamental for the objectives of the internal market.

6.7. Conclusions (Gap Analysis)

One of the main objectives of the Electricity Directive was to improve competition through better regulation, unbundling and reducing asymmetric information. In general, unbundling measures contribute to the contestability of the retail market and thus facilitate market entry by third party suppliers.

The risks of less unbundling link to suboptimal switching procedures in order to deter market entry, competitive advantage which may come from the use of the same brand name or privileged access to network information, consumption data information and cross-subsidies.

On the other hand, discrimination for distribution network access appears to be less relevant than at transmission level, with a possible exception of small generation connected at distribution level. DSO unbundling is less relevant with respect to cross-border flows as flows are more local.

CEER finds that in general the implementation of unbundling rules has been satisfactory[288]. Regarding the implementation of the measures, CEER is reporting problems in the implementation of the provisions related to branding and communication. The Commission has taken action towards the proper implementation of the relevant provisions through compliance checks and infringement procedures, requesting Member States to ensure a clear separation of identity of the supply and distribution activities within a vertically integrated undertaking.

Some of the factors that may influence and raise the impact of the foreseen risks are the increased penetration of RES-E generation at distribution level and introduction of smart metering systems.

In terms of **effectiveness**, the intervention mainly aimed at the unbundling of vertical integrated distribution companies with the objective to ensure non-discriminatory and transparent third party access in distribution networks, in order to promote competition in the energy market. There is no evidence that the intervention within the boundaries of the unbundling requirements, did not achieve the objective of promoting competition in the market.

The Electricity Directive leaves at the discretion of Member States to decide which level of unbundling will apply for small DSOs (less than 100,000 customers) and the detailed tasks

[288] *"Status Review on the Implementation of Distribution System Operators' Unbundling Provisions of the 3rd Energy Package"* (2016) CEER.

that DSOs should carry out at a national level. There is a quite diverse situation across EU Member States when it comes to responsibilities of DSOs across the EU.

Provisions which aimed to enhance the DSOs position in using demand side management and energy efficiency measures in planning their networks did not prove to be effective. Only in few Member States DSOs are in position to use such tools in order to avoid costly investments and operate their networks more efficiently.

In terms of **relevance**, the original objectives of DSO unbundling requirements and the framework in which Member States can decide on the responsibilities of operators still correspond to the EU objective of a competitive internal energy market. The implementation of smart metering systems (wide scale roll-out in 17 Member States) will generate more granular consumption data and new business opportunities in the retail market. Moreover, the introduction of more RES-E generation at distribution level will require a more active management of the network from DSOs. Even if the measures under the Electricity Directive had included to a certain extent these developments the focus of the intervention was not on these new needs that is estimated to grow with the completion of smart metering systems and the installation of distributed RES-E.

In terms of **coherence**, the measures are fully coherent with the objectives of the internal energy market. Unbundling provisions for DSOs complement the relevant requirements for TSOs, by providing a transparent and non-discriminatory framework for third party access also at retail market level. These provisions are fundamental for the promotion of competition in the energy market, the entrance of new energy service providers and the development of new services.

In terms of **EU-added value**, the requirements on unbundling are fundamental for the promotion of competition in the internal energy market. Provisions which are relevant to DSOs have the characteristic of a permanent effect.

Gap analysis

With the deployment of smart metering systems across EU Member States a large amount of data will be available to DSOs. This development requires a closer assessment and consideration of specific measures.

In terms of DSO responsibilities, it is clear that there is a wide variety of roles and tasks for DSOs across the EU. This situation does not allow for the application of a uniform set of responsibilities for all DSOs, as such measure would have a disproportionate effect on the different DSOs across the EU, based mostly on the variety of distribution voltage levels and number of connected customers.

It seems however appropriate to enhance the role of DSOs when it comes to additional tools such as the use of flexible resources in order to improve their efficiency in terms of costs and quality of service provided to system users. Such measures however could only be introduced with the parallel introduction of suitable provisions which prohibit DSOs to take advantage of their monopolistic position in the market by clarifying their role in specific activities. In the absence of such measures the DSOs could foreclose the market and reduce the benefits for the system users, leading to an inefficient allocation of resources and reduction of social welfare.