



**CONCERTED ACTION
ENERGY EFFICIENCY
DIRECTIVE**

Energy efficiency in network design and regulation

Article 15 (2b) of the Energy Efficiency Directive

Executive Summary 3.6

Metering and Billing

Fernando Martins, Executive Director of Portuguese NEAAP (Portugal)

Henk van Elburg, Netherlands Enterprise Agency (Netherlands)

Miroslav Marias, Ministry of Economy of the Slovak Republic (Slovakia)

Date: November 2015

1 Summary

Article 15 of the Energy Efficiency Directive (EED), and the related Annexes XI and XII, aim to maximise grid and infrastructure efficiency and to promote demand response. It is important to consider which measures will be implemented in Member States (MS) in response to Article 15 and their impact on transport and energy distribution networks.

Article 15 (2b) introduced the concepts of operation and design of gas and electricity infrastructure. MS have an obligation to ensure that national regulatory authorities, within the framework of Directive 2009/72/EC and taking into account the costs and benefits of each measure, provide incentives for grid operators to improve energy efficiency. Point 2 (b) of Article 15 gives the opportunity to all MS to create rules relating to the ranking of different access and dispatch priorities, where such priorities are granted in their electricity systems and are clearly explained and published. All MS have a duty to ensure that an assessment and improvements are made to energy efficiency in the design and operation of gas and electricity infrastructure.

The EED imposes a deadline for Metering and Billing topics, defined in Article 15, 2 (b) that states:

“Member States shall ensure, by 30 June 2015, that:

(b) Concrete measures and investments are identified for the introduction of cost-effective energy efficiency improvements in the network infrastructure, with a timetable for their introduction” in EED

Member States' prior knowledge of this topic was assessed through a questionnaire. Additionally, the questionnaire aimed to identify which measures each MS will adopt under Article 15.

17 MS provided responses to the questionnaire. 14 MS identified at least one energy efficiency measure for electricity or gas grids.

A lot is happening in energy efficiency in electricity and gas grids. Article 15 (2) has glued all related measures under one topic, showing the complexity of measures utilised in the electricity and gas sectors. Only the full energy chain covered by the EED has opened up the existence of these measures to the public and included them in the energy savings that are now visible.

Classical replacement of equipment is providing a lot of savings. Network reconfiguration, balancing three-phase loads, demand side management, reduction of fixed losses, distributed generation and the use of renewable energy sources, reactive power management, network reconfiguration and power flow controllers are the main measures used for network architecture and management solutions. The introduction of smart meters has increased the capability to provide such measures. Smart meters are also a prerequisite for providing demand side management measures. 16 MS have planned to introduce smart grids in electricity and 11 MS smart gas grids. Some elements for smart grids are already installed; however, operational measures are less utilised.

8 MS have also identified measures by other electricity and gas market players, e.g. supporting renewables and distributed generation, using energy services and ESCOs, providing regular information to consumers or introducing energy saving programmes at local levels. These measures are supported with various financial mechanisms. Most of these measures are, however, set in other articles of the EED but still have a significant impact on energy savings in electricity and gas grids.

All Member States are challenged to share amongst themselves the measures and investments identified through Article 15 2(b) of the EED, so as not to become obsolete once smart grids are implemented.

The unfortunate conclusion drawn from the CA EED plenary meeting in October 2015 was that despite the importance of Article 15 (2b), as it is not mandatory, only a few MS have identified concrete measures and cost effective investments to improve the efficiency of their network infrastructure. Only 9 MS send to the European Commission (Directorate-General for Energy) the Assessment foreseen on Article 15 (2b). The UK Assessment on the energy efficiency potential of gas and electrical infrastructures in Great Britain should be noted, due to the quality and consistency of the final report.

2 Recommendations/Conclusions

The principle recommendation is that, in line with energy efficiency improvement measures in the context of the continuing deployment of smart grids, all MS make an effort to implement the measures identified according to article 15(2b).

The potential for savings in energy networks is huge. Technical and non-technical losses range from 4% to 17% for electricity, and range from 0.2% to 3.9% for gas. Keeping these statistics in mind, a key way to improve energy efficiency in network infrastructures is by reducing energy waste.

There are multiple measures that could be adopted in each MS. Despite the unique circumstances of every MS, there are universal measures applicable to all. For example, in the case of electricity, loss reduction can be achieved primarily by using low-loss transformers and installing larger than necessary conductors to provide energy. In the case of gas, benefits can be achieved with investment in maintenance and replacement of older equipment; however, innovative solutions will certainly become available in the near future.

Only measures that can efficiently reduce electricity losses or gas shrinkage with a positive life cycle cost should be targeted and these will vary from MS to MS.

This brings us to the topic of smart grids as the future of energy. As defined by the International Energy Agency, “a Smart Grid is an energy network that uses digital and other advanced technologies to monitor and manage the transport of electricity from all generation sources to meet the varying electricity demands of end-users”. The aim of Smart Grids is to maximise system reliability, resilience and stability and minimise costs and environmental impacts by coordinating the needs and resources of end-users and generation, grid and market operators.

Since smart grids are mainly based on information sharing, the new information and communication technologies are their vital enabler. The first levels of smartness are ensured by smart meters. Therefore, smart meters have a decisive role in the modernisation of electricity grids, particularly in the adoption of smart grids.

3 Practical Examples

UK Final Report - An assessment of the energy efficiency potential of Great Britain's gas and electricity infrastructure

As previously mentioned, the final report from the UK on the energy efficiency potential of the gas and electricity infrastructure in Great Britain is a very good example of an assessment of the energy efficiency potential of energy network infrastructure for any MS in the context of Article 15 (2b).

This report describes the measures that network companies currently adopt and their expected benefits. It also describes various potential measures that might improve energy efficiency in future but are currently not commitments of the network companies.

Final report: <https://www.ofgem.gov.uk/publications-and-updates/energy-efficiency-directive-assessment-energy-efficiency-potential-great-britain-s-gas-and-electricity-infrastructure>

Smart Metering project for Luxembourg

Another good example is the project of modernisation of the energy metering system in Luxembourg. From July 1st 2016, every newly installed or replaced electricity and gas meter will be a smart meter (more than 95% of all electricity meters must be replaced by December 31st 2019 and up to 90% of all gas meters must be replaced by December 31st 2020).

Website: <http://www.luxmetering.lu/>

For more information please email
fernando.martins@pnaee.pt

Legal Disclaimer

The sole responsibility for the content of this report lies with the authors. It does not necessarily reflect the opinion of the European Union or the Member States. Neither EASME nor the European Commission are responsible for any use that may be made of the information contained therein.

The Concerted Action for the Energy Efficiency Directive (CA EED) was launched by Intelligent Energy Europe (IEE) in spring 2013 to provide a structured framework for the exchange of information between the 29 Member States during their implementation of the Energy Efficiency Directive (EED).

For further information please visit www.ca-eed.eu or contact the CA EED Coordinator Lucinda Maclagan at lucinda.maclagan@rvo.nl



Co-funded by
the Intelligent Energy Europe Programme
of the European Union