

Benefits to Consumers and Climate of Article 7 of the Energy Efficiency Directive

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Briefing Note

The policy measures deployed by EU Member States to comply with Article 7 deliver benefits that far outweigh costs.

Given that Article 7 of the Energy Efficiency Directive (EED) is a key driver for energy efficiency in Europe, it is a legitimate question to ask how well it delivers benefits for consumers. So far, there is no comprehensive assessment of the cost and benefits of Article 7 other than high-level economic modelling in the Impact Assessment of the EED. However, work by the Regulatory Assistance Project (RAP) and others shows that the policy measures deployed by Member States to comply with Article 7 deliver a wide range of benefits to consumers, the energy system, and society—benefits that far outweigh the costs.

Evidence Shows that Negawatts Are Much Cheaper Than Megawatts

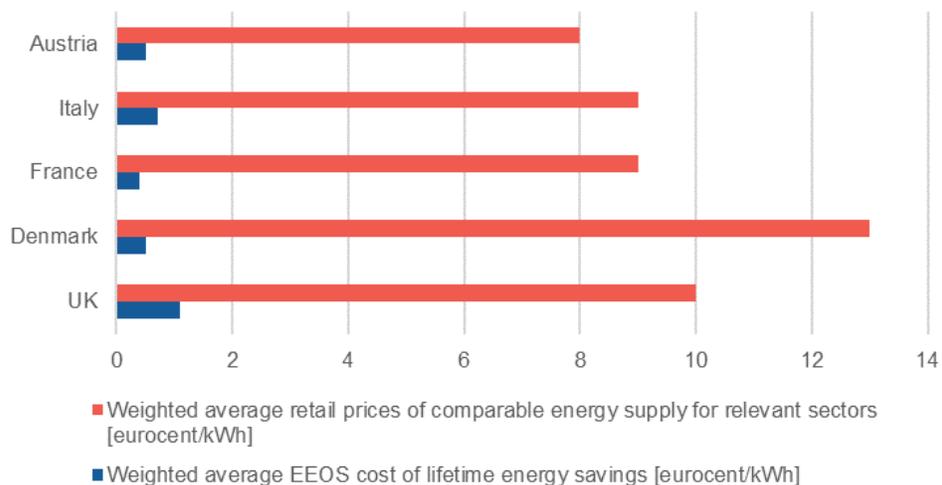
The most comprehensive data on the investment requirements of measures promoted by Article 7 of the EED can be found for energy efficiency obligations (EEOs), the instruments that provide the largest share of the savings. A review of all EEOs in Europe where data exists demonstrates high cost-effectiveness.¹ The figure below shows the cost of EEOs to the public in eurocents/kWh and

¹ Rosenow, J., & Bayer, E. (2016). Costs and Benefits of Energy Efficiency Obligation Schemes. Report for the European Commission. Brussels: Regulatory Assistance Project. Retrieved from <http://www.raponline.org/knowledge-center/costs-benefits-energy-efficiency-obligation-schemes/>

compares those costs to the typical consumer cost of supplied energy. In the case of all five EEOs analysed, the data clearly show that the cost of negawatt-hours is much lower than that of megawatt-hours. Even if the contributions from those who benefit from the programme to the investment cost of efficiency measures are added (which is typically about one to two times as much as the programme cost), the cost per kWh even in the most “expensive” programme is just above 3 eurocents/kWh. This compares to an average cost of supplied energy of 10 eurocents/kWh.

Can we be confident that this data is reliable? We can: It is in line with the most recent data from the De-Risking Energy Efficiency Platform (DEEP) database, which contains close to 6,000 individual energy efficiency projects across the Member States of the EU. Overall, the costs per kWh saved in buildings are 2.5 eurocents, and in the industry sector 1.2 eurocents.²

Figure 1 — Weighted Cost of Energy Supply vs. Savings, By Country



Data for alternative measures such as loans, tax rebates, and grants shows that the costs of those measures are of a similar scale, although somewhat higher. On average, saving 1 kWh through those measures has a public cost of 1.4 eurocents/kWh.³

Both for EEOs and alternative measures, the cost of saving one unit of energy is much less than the cost of supplied energy, meaning that the public and consumers benefit directly from the cost savings. The key point is that from a customer’s perspective, it is five times cheaper to save one unit of energy than it is to supply it.

² De-Risking Energy Efficiency Platform. Retrieved from <https://deep.eefig.eu/>

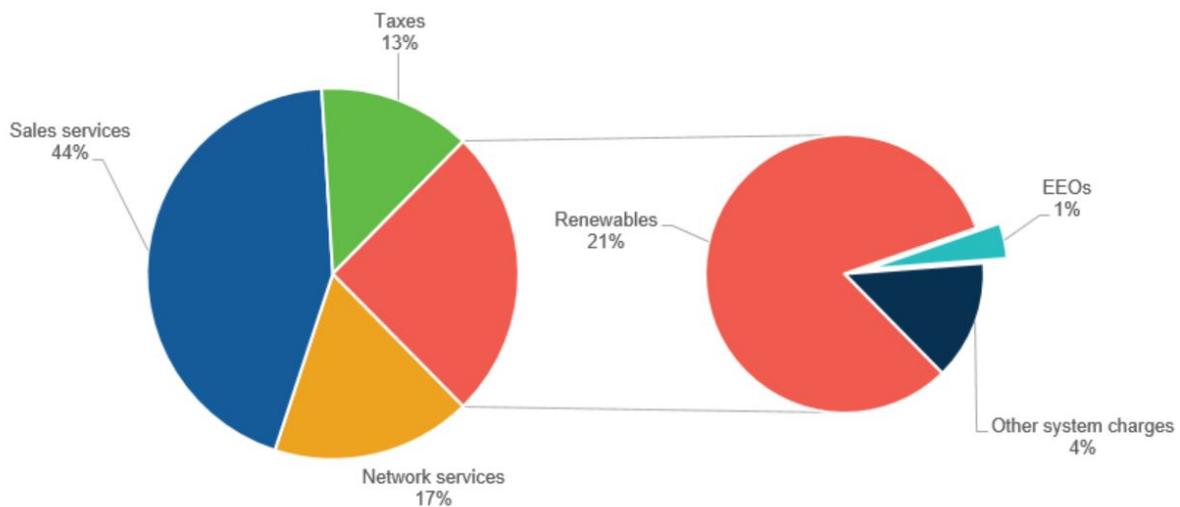
³ Scheuer, S. (2013): Energy efficiency: How effective are public support schemes? Retrieved from http://www.stefanscheuer.eu/Brochure_Public%20EE%20investments_April%202013%20FINAL.pdf

Energy Efficiency Obligations Lower Energy Bills

Most of the alternative measures are funded through general taxation rather than through energy bills. EEOs are financed through energy bills, either through a surcharge or simply as a cost of doing business. The example of Italy below shows the share of EEOs of the total energy bill in the household sector. It demonstrates that the direct cost of the obligation only represents 1 percent of the total household energy cost, even for customers who choose not to receive direct benefits.

Similar analysis by the UK government estimates the direct cost of EEOs in 2013 to be around 3 percent of households' energy bills.⁴

Figure 2 — EEO Costs as a Share of Total Customer Bill, Italy



However, this does not mean that customers' bills have actually gone up, even by this small amount. The costs of funding energy efficiency measures through EEOs is more than offset by the energy cost savings—as one would expect given the much lower cost of saving one unit of energy than of supplying it. The most systematic analysis of how EEOs affect consumers' bills has been carried out by the UK government. It shows that by 2020, consumers on average will pay 9 percent less for their energy as a result of past EEOs.⁵ This analysis is corroborated by historic data on UK household gas demand: Between 2004 and 2011, total household gas consumption in the UK decreased by 5 percent per year on average, or approximately 3.6 percent per year after temperature correction. This led to a cumulative reduction in residential gas demand of around 15

⁴ UK Department of Environment and Climate Change. (2013): Estimated impacts of energy and climate change policies on energy prices and bills: 2013. London: DECC. Retrieved from <https://www.gov.uk/government/publications/estimated-impacts-of-energy-and-climate-change-policies-on-energy-prices-and-bills>

⁵ DECC, 2013.

percent, even as the number of households in the country was increasing.⁶ From independent analysis we know that most of this was driven by energy efficiency improvements, of which the majority were delivered by EEOs.⁷

Power System Savings Benefit All Customers

Lowering demand at the customer end of the power system lowers costs at every link in the power system. These benefits, often overlooked in Europe, include avoided transmission and distribution costs, avoided line losses, and minimisation of reserve requirements. In competitive power markets, lower demand also means lower clearing prices for power, which reduces per-kwh charges for all customers. A recent study exploring the scale of system benefits in Europe affirms what international experience has demonstrated for a long time: Comprehensive, long-term, and aggressive investment in end-use energy efficiency will yield substantial energy system cost savings. The value of electricity savings in Germany to the power system alone is in the range of 0.11–0.15 eurocents per kilowatt-hour saved.⁸

Efficiency Delivers Multiple, Wide-Ranging Benefits

In addition to bill savings and system cost savings (the most obvious benefits of energy efficiency improvements), Article 7 delivers a wide range of so-called “non-energy” benefits to consumers and society. Amongst those are improvements in health, comfort, air quality, public housing and welfare costs, job creation and economic growth. Energy efficiency (and the resulting demand reduction) also delivers substantial environmental benefits in terms of CO2 mitigation.⁹

Those benefits are summarised in the figure on the following page. There are good examples of where they have been quantified too, most recently from Germany¹⁰ and the UK¹¹.

⁶ DECC. (2014). Energy consumption in the UK. London: DECC.

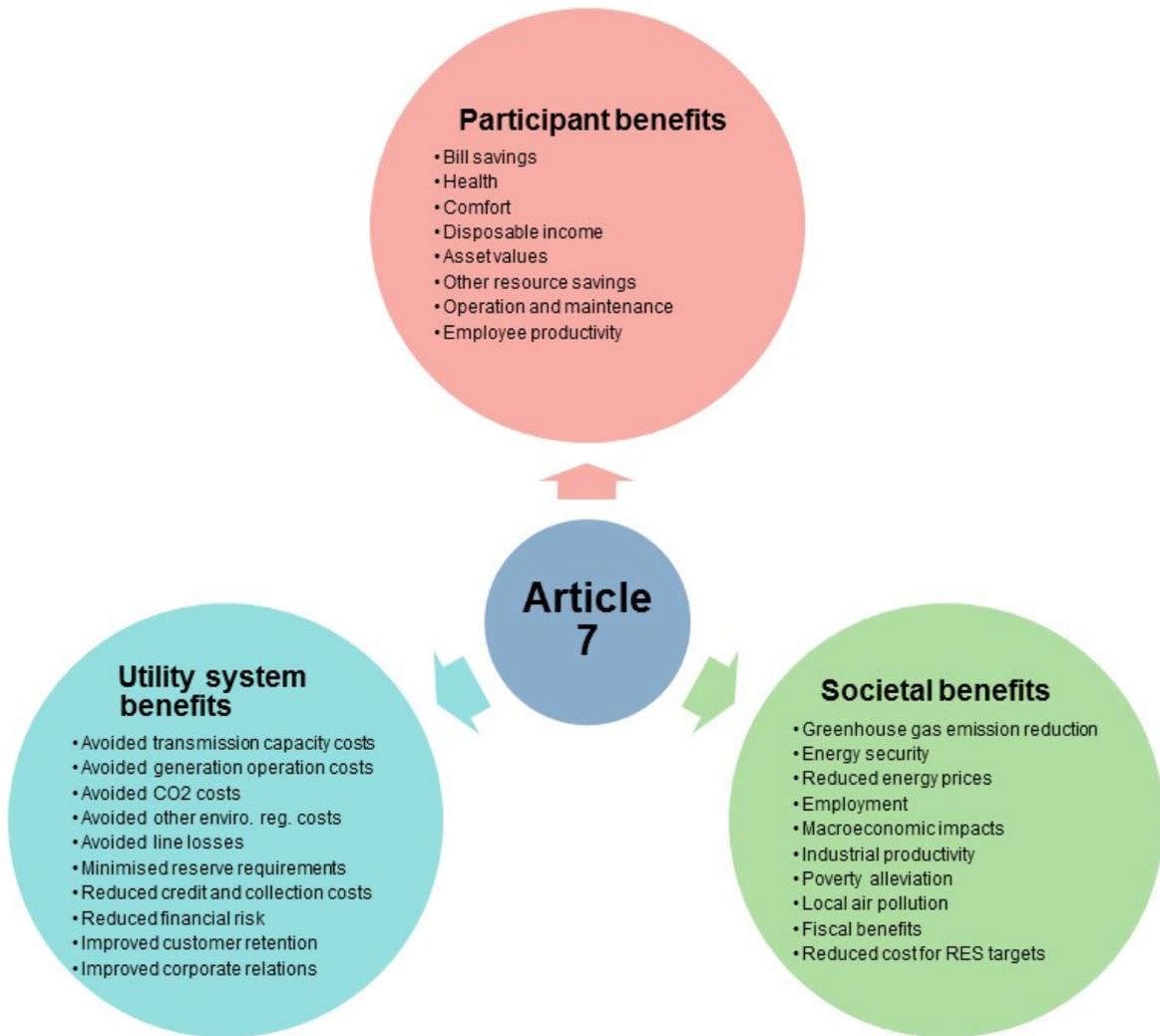
⁷ Centre for Economic and Business Research. (2011). British Gas Home Energy Report 2011: An assessment of the drivers of domestic natural gas consumption. Retrieved from https://www.centrica.com/sites/default/files/bg_home_energy_report_110202_0.pdf

⁸ Agora Energiewende et al. (2014). Benefits of Energy Efficiency on the German Power Sector. Retrieved from www.raonline.org/document/download/id/7095

⁹ For an in-depth review of the multiple benefits, see International Energy Agency (2015). Capturing the Multiple Benefits of Energy Efficiency. Retrieved from <https://www.iea.org/publications/freepublications/publication/capturing-the-multiple-benefits-of-energy-efficiency.html>

¹⁰ Agora Energiewende, 2014.

¹¹ Guertler, P., & Rosenow, J. (2016). Buildings and the 5th Carbon Budget. Report funded by the European Climate Foundation. Retrieved from <http://www.ukace.org/wp-content/uploads/2016/09/ACE-RAP-report-2016-09-Buildings-and-the-5th-Carbon-Budget.pdf>

Figure 3 — Multiple Benefits of Article 7

Summary

Cost-effective efficiency programmes directly lower bills for participating customers, and indirectly lower bills for everybody. While the benefits to customers alone provide ample reasons to justify ambitious efficiency programmes, the multiple benefits of efficiency make the case for strong targets and policies—such as those in Article 7 of the EED—even more compelling.



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